This is the Introduction, Degree Program/Majors Directory, General Information, and Policies sections of the 2006-2008 Undergraduate Catalog for the University of Minnesota.

Undergraduate Catalog

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Note: The information in this catalog is subject to change without notice. Many departments make changes in their degree requirements and course descriptions frequently. For the most current information, check with department offices.


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How to Use This Catalog

This is the University of Minnesota, Twin Cities *Undergraduate Catalog* for the academic years 2006-08. This catalog is an academic planning tool for undergraduates. To learn how to use it, read this page.

Directory of Undergraduate Programs/Majors and Directory of Undergraduate Minors

The directories on the following pages list majors and minors and their corresponding colleges, as well as the type of degree offered and the page where the program or minor can be found.

General Information

All undergraduates should read the General Information section, beginning on page 9. It includes information about academic support services, such as advising, that are crucial to success at the University. The section also includes basic information about admissions, financial aid, and student services.

Tuition and fees and registration information vary from semester to semester. Check www.onestop.umn.edu for the most up-to-date information.

Policies

All undergraduates should read the Policies section, beginning on page 25. It lists requirements and standards that are common across all undergraduate colleges and programs on the Twin Cities campus. Topics include credit load, declaring a major, four-year graduation plan, grading and transcript policy, graduation requirements, liberal education requirements, and graduation with distinction or with honors.

Colleges and Programs

The college and program sections of this catalog provide detailed information about undergraduate degree programs and services offered by colleges on the Twin Cities campus. Most of the colleges are subdivided into departments. Certain departments offer cross-curriculum programs that incorporate the resources of two or more departments. Interdepartmental groups, special studies, special projects, and other nondepartmental units are listed alphabetically within the degree listings for each college program.

To find an academic area of interest and its corresponding college, use the **Directory of Undergraduate Programs/ Majors** on pages 4 through 6 or the index at the back of this catalog.

General Information About Each College

The general information section at the beginning of each college section contains information about admission, orientation, honors, policies, and graduation requirements. This information expands upon the general information at the beginning of the catalog and gives college-specific detail in these areas. Contact information for each college can be found in the directory listings after each college's general information section.

Degree Program Information

The degree program descriptions contain curriculum overviews, degree requirements, and other relevant academic information. Students can choose from 162 majors, 35 stand-alone minors, and a wide variety of concentrations or tracks within many of the majors and minors.

To receive a bachelor's degree, students must satisfy specific degree program requirements, college requirements, and University requirements. Each college or program lists general information and college requirements and services at the beginning of its section. Degree requirements are listed at the end of each section. For information about University graduation requirements, see Graduation Requirements in the Policies section.

Course Descriptions

All undergraduate courses on the Twin Cities campus are listed in this section. See page 355 for a directory to find courses by academic categories, called "course designators." Course descriptions are listed alphabetically by course designator. Each course description includes the designator (abbreviation), number, title, prerequisites, and course content.

The courses listed in the catalog are available during the day and during fall and/or spring semester. Evening, May session, and summer courses can be found in the *Summer Session Catalog* or at www.cce.umn.edu/summer.

Some courses in this catalog are not offered every semester. To find out whether a course is offered in a particular semester, consult the online *Class Schedule* at www.onestop.umn.edu. It lists courses, class hours, locations, and instructors; it also provides registration instructions, fees, final exam schedules, and courses that satisfy liberal education requirements. For detailed information about particular courses, consult the online Course Guide at http://www.onestop.umn.edu.

To find a major or minor and its corresponding college, use the Directory of Undergraduate Programs/Majors and the Directory of Undergraduate Minors on the following pages.

Administration and Faculty

University administrators and college administrators and faculty are listed in this section. In addition to name and title, the information about faculty includes their teaching awards, universities that awarded their degrees, and current research/teaching interests.

Directory of Undergraduate Programs/Majors

Degree Program	College/School	Degree	Page
Accounting	Management	B.S.B.	277
Acting	Liberal Arts	B.F.A.	179
Actuarial Science	Management	B.S.B.	278
Aerospace Engineering and Mechanics	Technology	B.A.E.M.	329
African American and African Studies	Liberal Arts	B.A.	179
Agricultural and Food Business Management	Food, Agricultural and Natural Resource Sciences	B.S.	132
Agricultural Education	Education and Human Development	B.S.	101
Agricultural Industries and Marketing	Food, Agricultural and Natural Resource Sciences	B.S.	131
American Indian Studies	Liberal Arts	B.A.	181
American Studies	Liberal Arts	B.A.	183
Ancient Mediterranean Studies	Liberal Arts	B.A.	183
Animal Science	Food, Agricultural and Natural Resource Sciences	B.S.	135
Anthropology	Liberal Arts	B.A.	184
Applied Economics	Food, Agricultural and Natural Resource Sciences	B.S.	138
Applied Plant Science	Food, Agricultural and Natural Resource Sciences	B.S.	141
Architecture	Design	B.S.	83
	Liberal Arts	B.A.	185
Art	Liberal Arts	B.A., B.F.A.	186
Art History	Liberal Arts	B.A.	187
Asian Languages and Literatures	Liberal Arts	B.A.	188
Astronomy	Liberal Arts	B.A.	191
Astrophysics	Technology	B.S.Astro.P	330
Bachelor of Individualized Studies	Liberal Arts	B.I.S.	192
Bio-Based Products	Food, Agricultural and Natural Resource Sciences	B.S.	142
Bio-Based Products Engineering	Technology	B.B.P.E.	331
Biochemistry	Biological Sciences	B.S.	44
Biology	Biological Sciences	B.S.	46
Biology, Society, and the Environment	Liberal Arts	B.A.	193
Biomedical Engineering	Technology	B.Bm.E.	332
Biosystems and Agricultural Engineering	Technology	B.B.A.E	333
Business and Marketing Education	Education and Human Development	B.S.	104
Career and Technical Education	Education and Human Development	B.S.	105
Chemical Engineering	Technology	B.Ch.E.	335
Chemistry	Liberal Arts	B.A.	194
	Technology	B.S.Chem.	335
Chicano Studies	Liberal Arts	B.A.	195
Child Psychology	Liberal Arts	B.A., B.S.	197
Civil Engineering	Technology	B.C.E.	336
Classical and Near Eastern Archaeology	Liberal Arts	B.A.	198
Classical Civilization	Liberal Arts	B.A.	200
Clinical Laboratory Science	Continuing Education	B.A.Sc.	60
Clothing Design	Design	B.S.	84
Communication Studies	Liberal Arts	B.A.	200
Computer Engineering	Technology	B.Comp.E.	338
Computer Science	Liberal Arts	B.A.	201
	Technology	B.S.Comp.Sc.	339
Construction Management	Continuing Education	B.A.Sc.	61
Cultural Studies and Comparative Literature	Liberal Arts	B.A.	202
Dance	Liberal Arts	B.A., B.F.A.	204
Dental Hygiene	Dentistry	B.S.	76
Design in Architecture	Design	B.D.A.	85
Ecology, Evolution, and Behavior	Biological Sciences	B.S.	48
Economics	Liberal Arts	B.A., B.S.	205
Electrical Engineering	Technology	B.E.E.	341
Emergency Health Services	Continuing Education	B.A.S.	62
English	Liberal Arts	B.A.	208
Entrepreneurial Management	Management	B.S.B.	279
Environmental Design	Design	B.E.D.	86
Environmental Horticulture	Food, Agricultural and Natural Resource Sciences	B.S.	146
Environmental Sciences, Policy and Management	Food, Agricultural and Natural Resource Sciences	B.S.	148
Family Social Science	Education and Human Development	B.S.	107
Finance	Management	B.S.B.	281
Fisheries and Wildlife	Food, Agricultural and Natural Resource Sciences	B.S.	153

Degree Program	*College/School*	*Degree*	*Page*
Food Science	Food, Agricultural and Natural Resource Sciences	B.S.	155
Forest Resources	Food, Agricultural and Natural Resource Sciences	B.S.	157
Foundations of Education: Early Childhood	Education and Human Development	B.S.	108
Foundations of Education: Elementary	Education and Human Development	B.S.	110
French Studies	Liberal Arts	B.A.	210
French and Italian Studies	Liberal Arts	B.A.	211
General Management Self-Desgned	Management	B.S.B.	282
Genetics, Cell Biology, and Development	Biological Sciences	B.S.	49
Geography	Liberal Arts	B.A., B.S.	212
Geological Engineering	Technology	B.Geo.E.	342
Geology	Liberal Arts	B.A.	215
	Technology	B.S.Geol.	343
Geophysics	Technology	B.S.Geop.	344
German Studies	Liberal Arts	B.A.	216
Global Studies	Liberal Arts	B.A.	217
Graphic Design	Design	B.S.	87
Greek	Liberal Arts	B.A.	218
Hebrew	Liberal Arts	B.A.	219
History	Liberal Arts	B.A.	220
Housing Studies	Design	B.S.	89
Human Resource Development	Education and Human Development	B.S.	112
Human Resources and Industrial Relations	Management	B.S.B.	283
Individually Designed Interdepartmental Major	Liberal Arts	B.A.	222
Information Technology Infrastructure	Continuing Education	B.A.Sc.	63
Inter-College Program (ICP)	Continuing Education	B.A., B.S.	64
Interior Design	Design	B.S.	92
International Business	Management	B.S.B.	284
Italian Studies	Liberal Arts	B.A.	223
Jewish Studies	Liberal Arts	B.A.	223
Journalism	Liberal Arts	B.A.	225
Kinesiology	Education and Human Development	B.S.	113
Latin	Liberal Arts	B.A.	227
Linguistics	Liberal Arts	B.A.	229
Management Information Systems	Management	B.S.B.	285
Manufacturing Technology	Continuing Education	B.A.Sc.	66
Marketing	Management	B.S.B.	287
Materials Science and Engineering	Technology	B.Mat.S.E.	346
Mathematics	Liberal Arts	B.A.	230
	Technology	B.S.Math.	346
Mechanical Engineering	Technology	B.M.E.	349
Medical Technology	Medical	B.S.	299
Microbiology	Biological Sciences	B.S.	50
	Liberal Arts	B.A.	232
Mortuary Science	Medical	B.S.	305
Music	Liberal Arts	B.A., B.Mus.	233
Music Education	Liberal Arts	B.Mus.	237
Music Therapy	Liberal Arts	B.Mus.	239
Neuroscience	Biological Sciences	B.S.	51
Nursing	Nursing	B.S.N.	311
Nutrition	Food, Agricultural and Natural Resource Sciences	B.S.	161
Operations	Management	B.S.B.	288
Philosophy	Liberal Arts	B.A.	240
Physics	Liberal Arts	B.A.	241
	Technology	B.S.Phys.	351
Physiology	Liberal Arts	B.A.	242
Plant Biology	Biological Sciences	B.S.	52
Political Science	Liberal Arts	B.A.	243
Program for Individualized Learning (PIL)	Continuing Education	B.A., B.S.	67
Psychology	Liberal Arts	B.A.	245

Degree Program	*College/School*	*Degree*	*Page*
Radiation Therapy	Continuing Education	B.A.S.	68
Recreation, Park and Leisure Studies	Education and Human Development	B.S.	117
Recreation Resource Management	Food, Agricultural and Natural Resource Sciences	B.S.	162
Religious Studies	Liberal Arts	B.A.	247
Respiratory Care	Continuing Education	B.A.Sc.	70
Retail Merchandising	Design	B.S.	93
Risk Management and Insurance	Management	B.S.B.	289
Russian	Liberal Arts	B.A.	353
Scandinavian Languages and Finnish	Liberal Arts	B.A.	249
Scientific and Technical Communication	Food, Agricultural and Natural Resource Sciences	B.S.	165
Sociology	Liberal Arts	B.A., B.S.	251
Sociology of Law, Criminology, and Deviance	Liberal Arts	B.A., B.S.	253
Spanish and Portuguese Studies (combined)	Liberal Arts	B.A.	256
Spanish Studies	Liberal Arts	B.A.	255
Speech-Language-Hearing Sciences	Liberal Arts	B.A.	257
Sport Studies	Education and Human Development	B.S.	120
Statistics	Liberal Arts	B.A.	258
	Technology	B.S.Stat.	297
Studies in Cinema and Media Culture	Liberal Arts	B.A.	259
Supply Chain Management	Management	B.S.B	290
Technology Education	Education and Human Development	B.S.	121
Theatre Arts	Liberal Arts	B.A.	260
Urban and Community Forestry	Food, Agricultural and Natural Resource Sciences	B.S.	167
Urban Studies	Liberal Arts	B.A., B.S.	261
Women's Studies	Liberal Arts	B.A.	265

Directory of Undergraduate Minors

Minor	College/School	Type of Minor	Page
Accounting	Management		278
Actuarial Science	Management		279
African American and African Studies	Liberal Arts		181
Agronomy	Food, Agricultural and Natural Resource Sciences	Minor Only	134
American Indian Studies	Liberal Arts		182
American Studies	Liberal Arts		183
Animal Science	Food, Agricultural and Natural Resource Sciences		137
Anthropology	Liberal Arts		185
Applied Economics	Food, Agricultural and Natural Resource Sciences		140
Architecture	Design		84
Art	Liberal Arts		186
Art History	Liberal Arts		187
Asian American Studies	Liberal Arts	Minor Only	188
Asian Languages and Literatures	Liberal Arts		190
Astronomy	Liberal Arts		192
Austrian and Central European Studies	Liberal Arts	Minor Only	192
Biblical Studies	Liberal Arts	Minor Only	193
Bio-based Products Engineering	Food, Agricultural and Natural Resource Sciences		144
Biochemistry	Biological Sciences		45
Biology	Biological Sciences		47
Chemistry	Liberal Arts		195
Chicano Studies	Liberal Arts		195
Child Psychology	Liberal Arts		198
Classical and Near Eastern Archaeology	Liberal Arts		199
Classical Civilization	Liberal Arts		200
Climatology	Food, Agricultural and Natural Resource Sciences	Minor Only	144
Coaching	Education and Human Development	Minor Only	106
Communication Studies	Liberal Arts		201
Computer Science	Liberal Arts		202
Construction Management	Continuing Education		61
Corporate Environmental Management	Food, Agricultural and Natural Resource Sciences		144
Cultural Studies and Comparative Literature	Liberal Arts		203
Construction Management	Continuing Education		61
Danish	Liberal Arts		250
Design	Design	Interdisciplinary	85
Designing Documents With New and Emerging Technologies	Food, Agricultural and Natural Resource Sciences	Minor Only	145
Dutch	Liberal Arts	Minor Only	205
East Asian Studies	Liberal Arts	Minor Only	205
Economics	Liberal Arts		207
English	Liberal Arts		209
English as a Second Language	Liberal Arts	Minor Only	210
Entomology	Food, Agricultural and Natural Resource Sciences	Minor Only	145
Entrepreneurial Management	Management		280
Environment and Natural Resources	Food, Agricultural and Natural Resource Sciences		145
Environmental Design	Design		87
Environmental Horticulture	Food, Agricultural and Natural Resource Sciences		148
European Area Studies	Liberal Arts	Minor Only	210
Family Social Science	Education and Human Development		107
Family Violence Prevention	Education and Human Development	Minor Only	108
Finance	Management		282
Finnish	Liberal Arts		250
Fisheries and Wildlife	Food, Agricultural and Natural Resource Sciences		155
Food Science	Food, Agricultural and Natural Resource Sciences		156
Food Systems and the Environment	Food, Agricultural and Natural Resource Sciences	Minor Only	156
Forest Resources	Food, Agricultural and Natural Resource Sciences		158
French Studies	Liberal Arts		211
Gay, Lesbian, Bi-sexual, Transgendered	Liberal Arts	Minor Only	212
Geography	Liberal Arts		215
Geology	Liberal Arts		216
German	Liberal Arts		217
Global Studies	Liberal Arts		218
Greek	Liberal Arts		219
Hebrew	Liberal Arts		220
History	Liberal Arts		221

Minor	*College/School*	*Type of Minor*	*Page*
History of Medicine	Liberal Arts	Minor Only	221
History of Science and Technology	Liberal Arts	Minor Only	222
Housing Studies	Design		92
Human Resources and Industrial Relations	Management		284
Humanities in the West	Liberal Arts	Minor Only	222
Information Technology	Technology	Interdisciplinary	345
Integrated Pest Management in Cropping Systems	Food, Agricultural and Natural Resource Sciences	Minor Only	159
International Agriculture	Food, Agricultural and Natural Resource Sciences	Minor Only	159
Internet, Science and Society	Food, Agricultural and Natural Resource Sciences	Minor Only	160
Italian Studies	Liberal Arts		223
Jewish Studies	Liberal Arts		225
Joint Military Science Leadership	Continuing Education	Minor Only	65
Land, Nature and Environmental Values	Food, Agricultural and Natural Resource Sciences		160
Latin	Liberal Arts		228
Latin American Studies	Liberal Arts	Minor Only	228
Leadership	Education and Human Development	Minor Only	116
Learning Abroad	Liberal Arts	Minor Only	228
Linguistics	Liberal Arts		229
Management	Management	Minor Only	285
Management Information Systems	Management		286
Marketing	Management		288
Mathematics	Liberal Arts		232
Medieval Studies	Liberal Arts	Minor Only	232
Music	Liberal Arts		236
New Media Studies	Liberal Arts	Interdisciplinary	240
Norwegian	Liberal Arts		250
Nutrition	Food, Agricultural and Natural Resource Sciences		162
Operations	Management		289
Philosophy	Liberal Arts		241
Physics	Liberal Arts		242
Plant Biology	Biological Sciences		53
Political Science	Liberal Arts		245
Portuguese Studies	Liberal Arts		257
Psychology	Liberal Arts		246
Recreation Resource Management	Food, Agricultural and Natural Resource Sciences		164
Religious Studies	Liberal Arts		248
Retail Merchandising	Design		93
Risk Management and Insurance	Management		290
Russian	Liberal Arts		249
Russian Area Studies	Liberal Arts	Minor Only	249
Social Justice	Education and Human Development	Minor Only	119
Sociology	Liberal Arts		252
Sociology of Law, Criminology, and Deviance	Liberal Arts		254
Soil Science	Food, Agricultural and Natural Resource Sciences	Minor Only	165
South Asian and Middle Eastern Area Studies	Liberal Arts	Minor Only	255
Spanish Studies	Liberal Arts		256
Speech-Language-Hearing Sciences	Liberal Arts		257
Statistics	Liberal Arts		259
Studies in Cinema and Media Culture	Liberal Arts		260
Sustainable Agriculture	Food, Agricultural and Natural Resource Sciences	Minor Only	166
Swedish	Liberal Arts		251
Technical Communication	Food, Agricultural and Natural Resource Sciences	Minor Only	166
Theatre Arts	Liberal Arts		261
Urban and Community Forestry	Food, Agricultural and Natural Resource Sciences		168
Urban Studies	Liberal Arts		264
Water Science	Food, Agricultural and Natural Resource Sciences	Minor Only	168
Women's Studies	Liberal Arts		266
Youth Studies	Education and Human Development	Minor Only	122

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UNIVERSITY
OF MINNESOTA

Overview

The University of Minnesota—with campuses in the Twin Cities, Duluth, Morris, and Crookston—is one of the most comprehensive universities in the country and ranks among the most prestigious universities in the United States. It is both the state land-grant university, with a strong tradition of education and public service, and a major research institution, with scholars of national and international reputation.

The University of Minnesota, Twin Cities is a classic Big Ten campus in the heart of the Minneapolis-St. Paul metropolitan area. The largest of the four campuses, it is made up of 17 colleges and offers undergraduate and graduate degrees in more than 370 fields of study, including about 160 bachelor's degree programs. With a host of nationally recognized, highly ranked programs, the University's Twin Cities campus provides a world-class setting for lifelong learning.

Other important parts of the University are the Supercomputer Institute in Minneapolis, Hormel Institute in Austin, Itasca Biological Station and Laboratories in Itasca State Park, Cloquet Forestry Center, Cedar Creek Natural History Area near Bethel, Rosemount Research Center, Horticultural Research Center at Excelsior, Minnesota Landscape Arboretum near Chanhassen, Sand Plain Research Farm at Becker, University of Minnesota Rochester, Soudan Underground Research Site, and research and outreach centers at Rosemount, Crookston, Grand Rapids, Morris, Lamberton, and Waseca. Through the University of Minnesota Extension Service, the University has a statewide presence.

History

The University of Minnesota was founded as a preparatory school in 1851, seven years before the territory of Minnesota became a state. Forced to close during the Civil War, the school reopened in 1867 and persevered with the help of Minneapolis entrepreneur John Sargent Pillsbury, a University regent, state senator, and governor, who is known today as the "Father of the University." Another factor in the school's survival in those tenuous early years was the enactment of the Morrill Act, or Land-Grant Act. Signed into law by President Lincoln in 1862, the act gave each state a grant of land within its borders stipulating that the income from the land was to be used to provide education for people of the state.

In 1869, the school reorganized as an institution of higher education. William Watts Folwell was inaugurated as the first president of the University on December 22, 1869. There were only nine faculty members and 18 students that year. Four years later at the first commencement, 2 students received bachelor of arts degrees. The first doctor of philosophy degree was awarded in 1888. In that same year, the Department of Agriculture opened on the University Farm in St. Paul. The Duluth campus joined the University in 1947; the Morris campus opened in 1960, the Crookston campus in 1966. A campus in Waseca opened in 1971 and closed in 1992.

Mission Statement

The University of Minnesota, founded in the belief that all people are enriched by understanding, is dedicated to the advancement of learning and the search for truth; to the sharing of this knowledge through education for a diverse community; and to the application of this knowledge to benefit the people of the state, the nation, and the world.

The University's mission, carried out on multiple campuses and throughout the state, is threefold:

Research and Discovery

Generate and preserve knowledge, understanding, and creativity by conducting high-quality research, scholarship, and artistic activity that benefit students, scholars, and communities across the state, the nation, and the world.

Teaching and Learning

Share that knowledge, understanding, and creativity by providing a broad range of educational programs in a strong and diverse community of learners and teachers, and prepare graduate, professional, and undergraduate students, as well as non-degree-seeking students interested in continuing education and lifelong learning, for active roles in a multiracial and multicultural world.

Outreach and Public Service

Extend, apply, and exchange knowledge between the University and society by applying scholarly expertise to community problems, by helping organizations and individuals respond to their changing environments, and by making the knowledge and resources created and preserved at the University accessible to the citizens of the state, the nation, and the world.

In all of its activities, the University strives to sustain an open exchange of ideas in an environment that embodies the values of academic freedom, responsibility, integrity, and cooperation; that provides an atmosphere of mutual respect, free from racism, sexism, and other forms of prejudice and intolerance; that assists individuals, institutions, and communities in responding to a continuously changing world; that is conscious of and responsive to the needs of the many communities it is committed to serving; that creates and supports partnerships within the University, with other educational systems and institutions, and with communities to achieve common goals; and that inspires, sets high expectations for, and empowers the individuals within its community.

The University of Minnesota is one of the nation's top research universities according to the most recent study by the University of Florida.

Accreditation

The University of Minnesota, Twin Cities is accredited by the Higher Learning Commission of the North Central Association of Colleges and Schools (NCA). The University has been accredited continuously since 1913, when the NCA's first list of accredited institutions was published. Its institutional accreditation was continued most recently in 2006. The scheduled year of the next comprehensive evaluation is 2016. Background information about the most recent review and the current "Record of Status and Scope" of the University's accreditation is available online at http://academic.umn.edu/img/assets/12720/newrecord.pdf. For more information, contact the NCA's Higher Learning Commission at 1-800-621-7440 or visit their Web site at www.higherlearningcommission.org. The Twin Cities campus also includes more than 100 academic programs that are accredited separately by various professional and disciplinary associations. An inventory of these programs is available at http://academic.umn.edu/planning/accred/tc_specialized.html.

Academic Support Services

Advising

When students arrive on campus for orientation, a primary concern is selecting a schedule of classes for the first term. Students should also begin planning their academic future. Academic advising, available to all undergraduates, is an important part of that process.

A University of Minnesota degree can (and should) represent an integrated experience that has broadened and deepened students' interests and refined their intellectual skills—skills used throughout life. Students should construct a program in which each course relates to the next and contributes to their personal development. Academic advisers—faculty, professional advisers, graduate students, and peers—are prepared to help students define and achieve their educational goals at every stage of their college career.

Colleges and programs have different advising systems, which are tailored to meet the specific advising needs of their students. Advising offices also have different preferences and procedures for communicating and setting up appointments. To begin planning, check with the following offices or visit http://onestop.umn.edu for links to college advising Web sites:

College of Biological Sciences
Student Services, 223 Snyder Hall, 612-624-9717

College of Continuing Education
Information Center, 101 Wesbrook Hall, 612-624-4000

Division of Dental Hygiene
Student Services, 9-436 Moos Tower, 612-625-9121

College of Design
Minneapolis Campus: 107 Rapson Hall, 612-626-9068

St. Paul Campus: 12 McNeal Hall, 612-624-1717

College of Education and Human Development
Student Information Center, 25 Appleby Hall, 612-625-3339

College of Food, Agricultural and Natural Resource Sciences
Student Services, 190 Coffey Hall, 612-624-6768

College of Liberal Arts

Student Information, 49 Johnston, 612-625-2020

Carlson School of Management
Undergraduate Program, 1-105 Carlson School of Management, 612-624-3313

Division of Medical Technology
Student Services, 15-170 Phillips-Wangensteen, 612-625-9490

Program of Mortuary Science
Student Support Services, A-275 Mayo, 612-624-6464

College of Natural Resources
Student Services, 135 Skok Hall, 612-624-6768

School of Nursing
Student Services, 5-160 Weaver-Densford Hall, 612-625-7980

Institute of Technology
Student Affairs, 105 Lind Hall, 612-624-8504

Getting the Most From an Adviser

Advisers help students develop a perception of themselves and their future. Advisers introduce students to the University—teaching them to value the learning process, put the college experience into perspective, become more responsible, set priorities, and be honest with themselves. Although advisers have many different academic backgrounds, they share a broad vision of the University and help students navigate their academic progress in the most efficient and successful ways.

Students are encouraged to see their adviser before registration each term. This is especially important for first-year students, who may need help developing sound academic and career goals. Establishing regular communication with an adviser also allows the adviser to gain insights into a student's academic needs.

Students should schedule their appointments well before registration begins. They also should be prepared by studying this catalog, the online *Class Schedule*, and the online *Course Guide* before each registration period. Students should mark classes they are considering, have a tentative schedule in mind, and write down questions before talking to their adviser. To get the most from an adviser, students should also:

- ask questions and ask again if an answer is not clear.
- note the cancel/add deadlines for the registration period.
- become familiar with the Academic Progress Audit System (APAS) to understand what is required for a degree and to chart progress toward it. (See the Policies section of this catalog.)
- keep copies of their registration printouts, fee statements, and transcripts.
- ask advisers to share information about their academic areas of interest and how they chose their majors.
- make thoughtful decisions. Advisers can help define options, but students must make their own choices.

Achieving Academic Success

For many students, the first year of study is a time to explore academic interests and abilities. With careful planning, students can explore their interests and satisfy degree requirements at the same time. Nearly any academic interest can be satisfied by some program at the University. Advisers can help students discover the opportunities.

Undergraduates are admitted to the University on the basis of their accomplishments in high school and their achievements on college entrance examinations. Once on campus, their success depends on the quality and quantity of work applied to their studies. Many beginning students find themselves surprised by the amount of work they are expected to do outside of class and the speed at which they are expected to master subjects that they studied at a slower pace in high school. Satisfactory adjustment to the more demanding pace of the University is a key to academic success.

Academic workload is based on the number of credits a student takes. The University Senate has established the policy, consistent with policies at other universities, that students are expected to average three hours of work per week for each credit taken. Therefore, a student taking 15 credits should expect 45 hours of work per week. The most successful students learn to plan and manage their workload, and they:

- attend all their classes,
- study every day,
- use instructors' office hours and tutorial services,
- take part in extracurricular campus activities.

Balance is a key to success, and successful students find that much valuable learning occurs outside the classroom in employment, student organizations, teams, clubs, and volunteer opportunities. For more information, see the *Gopher Guide,* available in University Bookstores.

Undergraduates must complete at least 15 credits per semester to graduate within four years. The number of courses a student will need to take each semester will vary. Most semester courses will be either 3 or 4 credits, so students need to take four or five courses per semester.

Many students must work to pay for college. Family and other obligations may also be significant for some students. Students need to consider all of their obligations as they plan their schedules each term. Advisers can help students make realistic choices and maintain steady progress toward a degree.

13-Credit Requirement—Degree-seeking students are required to register for at least 13 credits each semester. To apply for part-time status, or to take fewer credits temporarily, students must petition their college. More information can be found at http://onestop.umn.edu.

The course registration queue gives priority to students whose immediately previous registration was "full-time" (i.e., for at least 13 credits). Under the queue, full-time seniors register first, followed by part-time seniors, full-time juniors, part-time juniors, full-time sophomores, etc. More information can be found at http://onestop.umn.edu.

Four-year Graduation Plan

The Four-year Graduation Plan is an agreement between a student and the University that guarantees institutional support for completing degrees within four years. Under the plan, the student agrees to meet certain expectations for academic planning and performance. In turn, the University agrees to ensure that classes the student needs will be available. If the University cannot provide a required course, offer a substitution, or waive the requirement, it will pay the student's tuition to stay an extra semester to complete the course.

A few degree programs are designed to take longer than four years, and students in those programs are not eligible for the four-year guarantee.Whether students in qualifying programs elect the four-year plan or not, they can graduate in four years simply by taking 15 or more credits each semester and working with an academic adviser to make sure their graduation requirements are being fulfilled. Throughout the academic experience, certain steps will help students stay on track. Most are common sense and apply for any student.

Freshmen: During their first year, students should complete the freshman writing requirement and at least 30 credits—more if they are in a major that requires more than 120 credits. Credits earned while in high school (AP, IB, or PSEO) can give students a head start on their college degree.

Sophomores: Students should make sure that they are taking classes to satisfy the liberal education requirements. They should also be exploring majors if they haven't yet selected one. Students must declare a major by the end of sophomore year.

Juniors: Students should confirm that their liberal education and core requirements are being completed. They should meet with their adviser to determine that they understand and are working toward completion of their major requirements.

Seniors: Students must file for graduation by the beginning of the final semester. They must complete their senior project if their program requires one.

All students: Students should meet with their academic adviser once each semester during their freshman year and at the beginning of every subsequent year. All students are advised to take an average of 15 credits per semester and maintain good academic standing based on the requirements of their department or college.

Students should develop a study plan and review it with their adviser. They also should work with their adviser regularly to be certain that all checkpoint requirements are being met.

For more information, see Four-year Graduation Plan in the Policies section of this catalog, visit www.academic.umn.edu /fouryear, or call 612-625-2525.

Using Online Resources

The computer is an essential tool for University students. Access to personal computing resources and the Internet is becoming increasingly important for students in and out of the classroom. (See Computing in this section of the catalog.) Helpful Web sites have been created to assist students and advisers. A good starting point is the Student Services site at http://onestop.umn.edu.

Registered students receive a University Internet account to access e-mail and other Internet services. See Computing in this section of the catalog.

Career Planning

Exploring a future career path is an important task for University students. The Twin Cities campus has many resources to assist them in career planning.

Each undergraduate college provides career planning and academic advising assistance. In addition, several specialized University-wide student services offices are available. By visiting the offices listed below, students will find advisers and resources to help explore career or major interests, gain relevant career related experience, develop job search skills, and connect with future employers.

Career planning takes time. Students should plan to begin this process early in their University experience. Many of the following college career centers can be found online at http://onestop.umn.edu/onestop/Services/Employment.html.

College of Biological Sciences
Career Center for Science and Engineering, 50 Lind Hall, 612-624-4090

College of Continuing Education
Information Center, 101 Wesbrook Hall, 612-624-4000

Division of Dental Hygiene
Student Services, 9-372 Moos Tower., 612-625-9121

College of Design
Minneapolis Campus: 107 Rapson Hall, 612-626-9068

St. Paul Campus: 12 McNeal Hall, 612-624-1717

College of Education and Human Development
Exploratory, Transfer, and Career Services, 127 Appleby Hall, 612-624-4346

College of Food, Agricultural and Natural Resource Sciences

Career Center, 198 McNeal Hall, 612-624-2710

College of Liberal Arts
Career & Community Learning Center, 135 Johnston Hall, 612-624-7577

Carlson School of Management
Undergr aduate Business Career Center, 1-110 Carlson School of Management, 612-624-0011

Division of Medical Technology
Student Services, 15-170 Phillips-Wangensteen, 612-625-9490

Program of Mortuary Science
Student Support Services, A-275 Mayo, 612-624-6464

Institute of Technology
Career Center for Science and Engineering, 50 Lind Hall, 612-624-4090

Campus-wide Career Centers

University Counseling & Consulting Services
Career Development Center, 109 Eddy Hall, 612-624-3323
Career counseling appointments, 612-624-3323
St. Paul Office, 199 Coffey Hall, 612-624-3323

Learning Abroad Center
230 Heller Hall, 612-626-9000

International Student and Scholar Services
190 Hubert H. Humphrey Center, 612-626-7100

Disability Services
Careers Online Projects, 230 McNamara Alumni Center, 612-626-9658

Other Academic Support Services

In addition to collegiate advising offices, the Twin Cities campus has many resource offices to help students achieve academic success. Below is a list of several of these offices. For more detail about these and other services, students should contact their college offices or refer to the *Gopher Guide*.

Center for Writing
15 Nicholson Hall, 612-625-1893
http://writing.umn.edu/sws

Disability Services
180 McNamara Alumni Center, 612-626-1333
http://ds.umn.edu

Gay, Lesbian, Bisexual, Transgender, Ally (GLBTA) Programs Office
138 Klaeber Court, 612-625-0537
www.umn.edu/glbt

Multicultural and Academic Support Services
432 Morrill Hall, 612-624-0594
www.oma.umn.edu

Multicultural Centers for Academic Excellence (MCAE)
185 Klaeber Court, 612-624-6386
www.mcae.umn.edu

Learning Abroad Center
230 Heller Hall, 612-626-9000
www.UMabroad.umn.edu

International Student and Scholar Services (ISSS)
190 Hubert H. Humphrey Center, 612-626-7100
www.isss.umn.edu

Residence Hall Academic Service Centers
612-624-2994
www.housing.umn.edu

University Counseling & Consulting Services (UCCS)
109 Eddy Hall, 612-624-3323
www.ucs.umn.edu

Academic Resources

Bookstores

The University Bookstore is located on the ground level of Coffman Memorial Union. The Coffman Union location carries course materials for all undergraduate, graduate, continuing education, IDL and most professional school courses. The Coffman Store carries new and used textbooks, course packets, reference and research materials, school supplies, and University of Minnesota clothing and gifts. In addition, the University Bookstores offer other services, including a textbook buy-back program, photo processing, visiting author discussions, and graduation needs including caps and gowns, announcements, and college rings.

Complete textbook information is available from the University Bookstore Web site at www.bookstore.umn.edu This site generates your personalized book list from your registration records and includes estimated prices and availability. Textbooks may be ordered online or you may shop for your books in the store.

The University Bookstore also has locations on the St. Paul campus in the St. Paul Student Center, which carries textbooks and materials for courses offered on the St. Paul campus, and in the U of M Law Center, which carries textbooks and materials for the Law School.

Coffman Store
Coffman Memorial Union, 612-625-6000

Law School Store
85 Mondale Hall, 612-626-8569

St. Paul Store
St. Paul Student Center, 612-624-9200

Libraries

Housed in six major facilities and nine branch sites, the University Libraries includes 6.3 million print volumes, 47,000 serial subscriptions, 5.7 million microforms, 2.6 million government documents, and 400,000 maps, making it the 15th largest research library in North America.

To support the many disciplines at an institution as comprehensive as the University of Minnesota, the University Libraries acquire, catalog, and maintain information in practically every field of knowledge, in every language, from every time period, and in every format. Within the system are outstanding special collections including the history of medicine, social welfare, computing, architecture, American poetry, Afro-American literature, children's literature, history of European expansionism, cartography, British colonialism in India, Scandinavian studies, forestry, engineering and technical standards, and federal and international government documents.

Libraries' Web site, provides online access to the collections and serves as a gateway to local, national, and global information sources. MNCAT®, the online catalog, is accessible through LUMINA® and provides a nearly complete listing of book and journal holdings. Since 1992, the University Libraries have added access to thousands of full-text periodicals, academic journal articles, and newspapers. Students can access the University Libraries' Web site at www.lib.umn.edu.

Each major branch of the University Libraries houses different subjects.

- Andersen Library (West Bank)—computer history; children's literature; immigration history; manuscripts; social welfare history; special collections/rare books; University Archives; YMCA Archives; MINITEX

- Bio-Medical Library (Diehl Hall, East Bank)—health sciences
- Law Library (Law Building, West Bank)—legal materials
- Magrath Library (St. Paul)—agriculture; biological sciences; human ecology; design, housing, and apparel; vocational education; applied statistics; food science and nutrition; family social science; rural sociology; social work; applied economics
- Science and Engineering Library (Walter Library, East Bank)
- Wilson Library (West Bank)—social sciences, literature, art, education, psychology

For locations of other special collections or subject areas, and for information on library hours, visit www.lib.umn.edu or call 612-624-4552.

Computing

Academic and Distributed Computing Services (ADCS) is the first point of contact for information about computer purchasing, troubleshooting, training, and Web design and development. Computer and Internet support is provided to students, faculty, staff, and University departments.

The Technology Helpline provides assistance with e-mail, passwords, hardware, software, ResNet, telephones, voice mail, WebCT, Statistical software, UNIX, mainframe, and PeopleSoft. Call 612-301-4357 (1-HELP) or visit www.umn.edu/adcs/help for hours.

Walk-in Locations

East Bank

• 152 Shepherd Labs

• B60 Coffman Memorial Union

West Bank

• 93 Blegen Hall

St. Paul

• 50 Coffey Hall

Computer Facilities

Qualified University of Minnesota students can access student computer labs. See http://publabs.umn.edu for locations, hours of operation, and equipment available.

Computer Software

Student Computer and Software Discounts are available at http://umart.umn.edu. Free Microsoft operating system upgrade and Microsoft Office are available to download at www.umn.edu/ucs.

Computer Training

Hands-on instruction is available for a variety of computer and Internet applications. CLA students can participate in "Get Wired!" short-courses at no cost. See http://uttc.umn.edu for more information.

Undergraduate Research

The Undergraduate Research Opportunities Program (UROP) offers financial awards twice yearly to full-time undergraduates for research, scholarly, or creative projects undertaken in partnership with a faculty member. UROP offers a maximum award of $1,700 ($1,400 in a stipend for the hours worked on the project and $300 for supplies and expenses required by the project). Undergraduate students in all colleges are welcome to participate in the program and are able to work with any University faculty member. Applications are judged on the quality of the proposed project and the educational benefit to the student. Although the program is competitive, funding rates are often over 80 percent.

Application deadlines are in early March for a July 1 start date and in early October for a January 1 start date. Information and applications are available from the UROP office in 325 Johnston Hall (612-625-3853) or www.urop.umn.edu.

In addition, several summer research opportunities are available in a variety of areas at the University. These programs often involve full-time summer projects and can include a stipend, expense money, and room and board. For more information, contact the UROP office.

Study Abroad

Study abroad is the single most effective experience students can have to broaden their international awareness and sharpen their skills for today's global job market. More than 220 study abroad options in 60 countries are available to University undergraduates through the Learning Abroad Center in the Office of International Programs. Undergraduates in every major are encouraged to earn credit toward their degree through study abroad.

Opening Doors of the World—The Learning Abroad Center offers world-class programs, including short-term faculty-led opportunities, intensive language study, internships, study at a foreign university, service learning, and special theme programs. Programs are offered in collaboration with academic departments and on-site foreign institutions, and many courses have been evaluated to meet the University's liberal education and major requirements. Students may choose from academic year, semester, May session, and summer terms. Many programs in English are available. A number of programs offer credit-bearing internship and research opportunities in addition to classroom coursework.

The vast majority of students on study abroad earn University of Minnesota resident credit. Some students earn transfer credit, which is facilitated by the Learning Abroad Center.

Studying Abroad in a Major—Virtually every academic discipline is represented in study abroad. Students in any field—from accounting to engineering, sociology to zoology—can make progress toward their degree while overseas. The Learning Abroad Center works with University colleges and departments to develop a list of options for each major. Students should consult with the Learning Abroad Center and major advisers to discuss how study abroad can fit smoothly with their degree program; see www.UMabroad.umn.edu/academic/advisingsheets for details.

Learning Abroad Minor—The learning abroad minor is an individualized, interdisciplinary College of Liberal Arts minor open to all University of Minnesota undergraduates. This minor integrates a study abroad experience with intercultural communication, language study, and related coursework focusing on a country or region of study. See the College of Liberal Arts section of this catalog or contact the Learning Abroad Center for more information.

Scholarships and Other Financial Resources—Most financial aid can be used for study abroad, and financial aid awards can often be revised to include study abroad costs. Over $400,000 in scholarships and grants are available annually to University students for study abroad. Also, the Learning Abroad Center has secured reduced program fees for University students participating in a variety of programs.

Work, Intern, Volunteer, and Travel—The Learning Abroad Center also has information on international work, intern, and volunteer opportunities; and sells a variety of travel products, such as guides, railpasses, and affordable passport photos.

For More Information—Advisers, program information, and computers are available in 230 Heller Hall. Or call 612-626-9000, e-mail UMabroad@umn.edu, or visit the Learning Abroad Center Web site at www.UMabroad.umn.edu.

Admissions and Prospective Student Services

Admission Information

For information about University of Minnesota, Twin Cities admission, academic programs, and other student services and educational resources, write or call:

Office of Admissions

University of Minnesota
240 Williamson Hall
231 Pillsbury Drive S.E.
Minneapolis, MN 55455 USA
Telephone (Twin Cities) 612-625-2008
Toll free (continental US) 1-800-752-1000
TTY (for deaf/hard-of-hearing callers) 612-625-9051
or visit the Web site at http://admissions.tc.umn.edu

Campus Visits and Tours

To make visit reservations, register online at http://admissions.tc.umn.edu or call the Office of Admissions VISITLINE at 612-625-0000 or 1-800-752-1000 (TTY 612-625-9051).

Admissions Office Hours

The Office of Admissions is open year-round, from 8:00 a.m. to 4:30 p.m., Tuesday through Friday, and Monday until 6:00 p.m. It is also open on Saturday mornings between early September and mid-May, except around University holidays. During term breaks and around University holidays, some campus services may be limited. Students planning to schedule a visit to campus should call ahead to confirm that the services they need will be available.

Admission Information

For official and up-to-date information about the University's admissions policies, procedures, and deadlines, contact the Office of Admissions or visit http://admissions.tc.umn.edu.

How to Apply—Prospective freshmen and transfer students may apply at http://admissions.tc.umn.edu or by contacting the Office of Admissions (see addresses and phone numbers above). There are separate applications for:

- freshmen,
- transfer students from colleges outside the University of Minnesota system,
- transfer students from other campuses inside the University system,
- international students, and
- adult special (non degree-seeking) students.

Freshmen must submit a completed application, official high school transcripts, official college transcripts (if applicable), ACT or SAT test scores (including writing exams), the application fee, counselor form, and any other information requested by the University.

Transfer students must submit a completed application, official transcripts from high school (if the student has fewer than 26 semester credits or is applying to the College of Food, Agricultural and Natural Resource Sciences or College of Design) and all postsecondary institutions attended, ACT or SAT scores (if the student has fewer than 26 semester credits), the application fee, and any other information requested by the University.

International students must submit a completed application, official transcripts, official English translations for secondary school and all postsecondary institutions attended, the application fee, English proficiency test scores (see TOEFL or MELAB under English Proficiency below) for nonnative English speakers, the financial certification statement (for students requiring the I-20 form for a student visa), and any other information requested by the University.

All transcripts and English test scores must be received by the application deadlines. International students applying as freshmen are not required to submit ACT or SAT scores, although they are welcome to do so as additional support for their application. International students applying for non-degree seeking admission should use the international student application.

When to Apply—Prospective students should apply as early as possible for the term they wish to start. For information on specific application deadlines for upcoming semesters, contact the Office of Admissions. Applications completed after the deadline are reviewed on a space-available basis, and admission is often more competitive.

English Proficiency—Students whose native language is not English may be required to take the Test of English as a Foreign Language (TOEFL), the International English Language Testing System (IELTS), or the Michigan English Language Assessment Battery (MELAB) in place of the ACT or SAT.

For more information about the English proficiency tests, please contact the testing agencies:

TOEFL
www.ets.org/toefl
Educational Testing Service
P.O. Box 899
Princeton, NJ 08541-6151 USA
Inside the U.S. and Canada: 1-877-863-3546
Outside the U.S. and Canada: 1-609-771-7100

IELTS
www.ceii.org
100 East Corson St., Suite 200
Pasadena, CA 91103, USA
612-626-564-2954

MELAB
www.lsa.umich.edu/eli/melab.htm
English Language Institute
MELAB Office, TCF Building
University of Michigan
401 E. Liberty, Suite 350
Ann Arbor, MI 48104-2298
1-866-696-3522

Readmission—Students who were previously enrolled in an undergraduate degree program on the University of Minnesota, Twin Cities campus but have not registered for two consecutive semesters will be placed on inactive status. Students should contact their former college of enrollment for more information. See also the Policies section of this catalog.

Orientation—Newly admitted students receive information from their college of admission, including an invitation to New Student Orientation. Attendance at orientation is required. Invitations will specify the exact dates of each student's orientation. For most new students, orientation lasts two days, although some transfer students attend only one day. The dates of orientation vary by college and date of admission. (Students who cannot attend their assigned date may request an alternate date.)

Twin Cities Campus Colleges

See below for Twin Cities campus colleges that admit freshmen, those colleges and programs that require a year or more of undergraduate work for admission, and those colleges and programs that require a bachelor's degree or the equivalent.

Freshman- and transfer-admitting colleges

Carlson School of Management

College of Biological Sciences

College of Design

College of Education and Human Development

College of Food, Agricultural and Natural Resource Sciences

College of Liberal Arts

Institute of Technology

Transfer colleges and programs requiring one or more years of previous college work before entry

College of Continuing Education

College of Pharmacy*

College of Veterinary Medicine*

Program in Dental Hygiene

Program in Medical Technology

Program of Mortuary Science

School of Dentistry*

School of Nursing

Colleges and programs requiring a bachelor's degree before entry

Graduate School*

Law School*

Medical School*

Program in Occupational Therapy*

Program in Physical Therapy*

School of Public Health*

*See other University catalogs for details about these schools, colleges, and programs. Most College of Education and Human Development teaching licensure programs are postbachelor's programs. Professional architecture and landscape architecture programs are master's level. Physical therapy and occupational therapy are master's programs.

Freshman Admission

Definition

You are considered a freshman if you have not enrolled in any college courses after graduating from high school.

Application Review Process

Admission to the University of Minnesota is competitive. Each year we have more applicants than we can accommodate in the freshman class. We consider applicants for admission to their first-choice college. If we are not able to offer admission to the first choice, we consider applicants for admission to their second choice, and/or to the college that best matches their interests and academic records.

Enrolling an academically qualified, diverse student body is essential to the University's mission. The academic and social environment of the campus is greatly enhanced by a diverse student body, and students are better prepared to thrive in a multicultural world. Admission decisions are based on an overall assessment of each application.

Primary consideration is given to the following factors:

- Successful completion of a college preparatory curriculum. (See list below.)
- High school rank percentile. (Students from non-ranking schools and those with GED or other high school equivalency scores are given full consideration.)
- Grade point average.
- ACT or SAT scores.
- Strength of the curriculum through high school graduation, including courses that exceed the core subject requirements and any advanced courses (i.e., honors, AP, IB, college level).

Core Subject Requirements

Freshmen are expected, at a minimum, to have successfully completed the University's core subject requirements listed below.

A strong college preparatory curriculum enhances your chances for success in college. Because admission is competitive and students admitted to the University typically exceed the minimum requirements, we strongly encourage you to choose courses above and beyond those listed below.

If you are planning to apply to the University of Minnesota, you should pursue a rigorous curriculum throughout your high school years. In particular, you should continue taking core academic courses such as English, math, science and a second language through your senior year.

(Applicants who are not on track to complete all of the core subject requirements may sometimes be admitted if they have promising academic records and meet other admission requirements. Students admitted with any course deficiencies must make them up before graduating from the University.)

- Four years of English[1], with an emphasis on writing, including instruction in reading and speaking skills and in literary understanding and appreciation
- Three years of mathematics, including one year each of elementary algebra, geometry, and intermediate algebra (integrated math 1, 2 & 3)

Please note: The Carlson School of Management, College of Biological Sciences, and Institute of Technology require a fourth year of mathematics, such as pre-calculus, analysis, calculus, integrated math 4, or advanced math.

- Three years of science, including one year each of biological and physical science, and including laboratory experience

Please note: The Carlson School of Management, College of Biological Sciences and the Institute of Technology require three years of science to include one year each of biological science, chemistry, and physics.

- Three years of social studies[2], including one year each of U.S. history and geography (or a course that includes a geography component such as world history, western civilization, or global studies)
- Two years of single second language
- One year of visual and/or performing arts[3], including instruction in the history and interpretation of the art form (e.g., theatre arts, music, band, chorus, orchestra, drawing, painting, photography, graphic design, media production, theatre production)

[1] If you are a non-native speaker of English, and if you have ACT English and/or reading scores of 17 or lower (or SAT critical reading [verbal] score of 420 or lower), you may be asked to submit scores from the Michigan English Language Assessment Battery (MELAB) or Test of English as a Foreign Language (TOEFL). Call the Office of Admissions for details.

[2] Applicants who are missing one year of geography will not be denied admission if they are otherwise admissible.

[3] Applicants who are missing this requirement will not be denied admission if they are otherwise admissible.

Admission to Honors Programs

Students who have an outstanding record of academic achievement and seek the challenge and special rewards of honors study may be eligible for admission to an honors program.

Honors opportunities and benefits include:

- special enrichment programs,
- personalized instruction,
- research partnerships with professors,
- participation in honor societies, and
- graduation with honors.

Admission of Post-Secondary Enrollment Options (PSEO) Students

Credits earned by students in the Minnesota PSEO program will count as part of their regular University record should they be admitted to a Twin Cities campus degree program after graduating from high school (see transfer credit guidelines below).

PSEO students must follow all freshman application procedures and deadlines.

Transfer Admission

Applicants who have enrolled at a post-secondary institution or internationally recognized foreign college or university after high school are designated as transfer students. Most colleges and programs require a cumulative grade point average of at least 2.50 or higher (on a 4.00 scale) for applicants to be competitive. Applicants should also have completed designated prerequisite courses.

Admission decisions are based on applicants' demonstrated potential for successfully completing the program to which they apply. In programs with restricted class size, applications are individually reviewed by a committee.

Applicants who have completed less than a full year of college coursework at the time of application will be considered for admission using a combination of transfer and freshman admission criteria. High school and college transcripts and ACT or SAT (where required) will be reviewed.

Transfer students who graduated from high school in 1987 or later and have not earned a bachelor's degree or its foreign equivalent will be expected to complete any missing high school preparation requirements within one year of enrollment and before graduation. See High School Course Preparation on page 17.

Transfer Application Procedures

Applications—Complete the University of Minnesota, Twin Cities Campus Application for Admission (available online or from the Office of Admissions). Special additional applications required by professional schools will be sent to applicants, either on request or following receipt of the regular application.

Transcripts—Applicants must arrange for official transcripts to be sent from every postsecondary institution they have attended, whether or not they successfully completed coursework at those institutions. To be regarded as official, transcripts must bear the original signature of the registrar or the seal of the institution or must be college-certified or printed on security paper. The transcripts must have been issued within the last year.

Timing—Applicants should be sure that transcripts are sent at the time they apply, even if they have coursework in progress.

Transfer Credit Evaluation—When students are admitted, their previous college record will be evaluated to determine which courses they have taken at other institutions will transfer to the University of Minnesota.

Special Types of Transfer Admission

Summer-only Registration—Students who have previous college work and are in good standing at their own college may enroll in summer session courses without being formally admitted to the University. Registration for summer session courses does not constitute admission to the University. Students who plan to continue in the regular academic year must apply for admission by the published application deadline.

Non-degree Admission—Students who wish to enroll in day school courses for personal reasons and who do not wish to be formally admitted to an undergraduate degree program may apply for admission as a non-degree student by filling out a special application. Subsequent admission to a degree program may be possible on recommendation of the college.

To qualify for admission as a non-degree student, a student generally must meet the same requirements as a student applying for admission to a degree program. Most non-degree students already have earned bachelor's degrees. Some colleges—including the College of Liberal Arts—will consider requests for non-degree status from students who do not have degrees.

Note: Formal application is necessary for non-degree status.

For more information, contact the Office of Admissions.

Change of College or Status From Within the University—The Office of the Registrar processes admission applications from current and former University students who wish to transfer into another University undergraduate program. To transfer to another undergraduate program, a student must submit a completed Application for Undergraduate Change of College to the One Stop Student Services Center (200 Fraser Hall, 130 West Bank Skyway, or 130 Coffey Hall) by the application deadline.

For deadlines or to download an application, see the Office of the Registrar Web site at www.onestop.umn.edu/Forms.

National Student Exchange Program—The University is a member of the National Student Exchange (NSE) program, which sponsors student exchanges between participating institutions of higher learning in the U.S. and Canada. Exchange students usually have highly specific educational goals. For information on the program, contact the NSE Coordinator, Career and Community Learning Center, 345 Fraser Hall, 106 Pleasant Street S.E., Minneapolis, MN 55455, (612-626-2044).

Transfer of Credit Policies

Credit for coursework taken at other institutions will be transferred subject to the following considerations: the mission of the institution from which credits would be transferred; the comparability of the coursework with University of Minnesota coursework; and the appropriateness of the coursework for meeting baccalaureate degree requirements at the University of Minnesota.

Regional accreditation usually serves as the primary criterion for determining the transferability of coursework from other institutions. Coursework from institutions lacking such accreditation may be individually reviewed. Appropriate coursework from internationally recognized foreign colleges and universities will transfer for credit. Credit is not normally transferred from specialized or proprietary institutions, military schools, or industry-based education programs.

All attempted credits, whatever the outcome, must be reported on a student's application and will be considered in the review process. Students may not, in the interest of "making a fresh start," fail to report courses taken at other institutions for which they received less-than-satisfactory grades.

Residence Requirement for Graduation—To complete a degree at the University, a student must complete at least 30 semester credits offered through the University, including 24 credits taken after admission to the major or program and taken from the college offering the major or program.

For more information, see Graduation Requirements in the Policies section of this catalog.

Grade Records—Individual transfer courses, credits, and grades will not appear on a student's University transcript. The transfer GPA is not computed into the University of Minnesota GPA.

General Transfer Guidelines

- Credits earned in courses comparable to those offered by the University of Minnesota, Twin Cities will usually transfer routinely. General education courses are routinely accepted in transfer (although they will not necessarily fulfill the University's liberal education requirements).
- Credit is usually not allowed for courses that are not designed for transfer to baccalaureate degree programs on the Twin Cities campus. Such courses are usually highly specialized or are vocational.
- There is no absolute limit on the number of credits that may be transferred from another college.
- Religious studies credits transfer if they are not doctrinal, confessional, or sectarian in nature. Religious studies courses from public institutions transfer without special review; religious studies courses from all other institutions will be evaluated by appropriate college or department faculty.
- No more than 6 semester credits from physical education, study skills, or applied music (in any combination) will count toward a student's degree, unless the credits are a required part of the student's program requirements. This provision establishes a total of 6 credits from all three areas combined (not 6 from each) as the number that will count toward a degree.
- Upper division credit (junior or senior level) is allowed when the course was upper division at the previous school, regardless of the level of an equivalent course at the University.
- Repeated courses: When a student has repeated a course, only the last enrollment for the course shall transfer.
- The minimum grade required for transfer is D. The college or program determines how the course may be used to meet degree requirements.
- Independent study, field experience, and internships may or may not transfer, depending on the level and appropriateness of the learning experience.
- Remedial or developmental courses are not considered college-level and do not transfer.
- Study abroad courses may or may not transfer, depending on the international institution offering the courses and other variables.

Each year, the University offers more than 150 freshman seminars—courses designed specifically for first-year students.

- Credit for nontraditional learning (AP, IB, CLEP, military schools, DANTES) will be evaluated by the Office of Admissions for appropriateness and comparability to University of Minnesota bachelor's degree programs. Credit granted by another institution for these nontraditional experiences will be re-evaluated for content and comparability.
- Twin Cities campus colleges do not automatically grant junior standing to students with associate in arts degrees. Credit is granted for coursework, not for degrees.

Advanced Placement (AP)—High school students may earn college credit in some subject areas by receiving satisfactory scores on the College Entrance and Examination Board Advanced Placement Program examinations. For a list of AP credit awards, contact the Office of Admissions or see the admissions Web site at http://admissions.tc.umn.edu.

International Baccalaureate (IB)—High school students may earn college credit in some subject areas by receiving acceptable scores on higher-level International Baccalaureate examinations. For a list of IB credit awards, contact the Office of Admissions or see the admissions Web site at http://admissions.tc.umn.edu.

College Level Examination Program (CLEP)—Students may earn college credit for successful completion of some CLEP examinations. For a list of the CLEP exam awards and curriculum scores for college credit, contact the Office of Admissions or visit http://admissions.tc.umn.edu/academics/clep.html.

Minnesota Transfer Curriculum

To simplify the transfer process, the University of Minnesota and the Minnesota State College s and Universities have developed a Minnesota Transfer Curriculum (MnTC). Students who complete the MnTC at a participating college and then transfer to the University of Minnesota, Twin Cities have completed the lower division portion of the University's liberal education (LE) requirements. MnTC completion must be noted on the official transcript.

Note: Applied science degrees through the College of Continuing Education (CCE) do not follow the Minnesota Transfer Curriculum. For more information, call CCE Student Support Services at 612-624-4000.

Planning to Transfer?

Minnesota's public colleges and universities are working to make transfer easier. Students can help if they plan ahead, ask questions, and use pathways created by transfer agreements. The following transfer information is included in catalogs from all Minnesota public colleges and universities.

Preparing for Transfer

If students are currently enrolled in a college or university, they should

- discuss their plans with the campus transfer specialist in the Office of Admissions.
- call or visit their intended transfer college. They should obtain the following materials and information:

  1. college catalog

  2. transfer brochure

  3. information on admissions criteria and on materials required for admission (e.g., portfolio, transcripts, test scores). Note that some majors have limited enrollments or their own special requirements such as a higher grade point average

  4. information on financial aid (how to apply and by what date)

After they have reviewed these materials, they should make an appointment to talk with an adviser/counselor in the college or program they want to enter. Be sure to ask about course transfer and admission criteria.

If they are not currently enrolled in a college or university, they might begin by meeting with a transfer specialist or an admission officer at their intended transfer college to plan the steps they need to take.

Understanding How Transfer of Credit Works

The receiving college or university decides what credits transfer and whether those credits meet its degree requirements. The accreditation of both a sending and a receiving institution can affect the transfer of the credits a student earns.

Institutions accept credits from courses and programs like those they offer. They look for similarity in course goals, content, and level. "Like" transfers to "like."

Not everything that transfers will help a student graduate. Baccalaureate degree programs usually count credits in three categories: general education, major/minor courses and prerequisites, and electives. The key question is, "Will a student's credits fulfill requirements of the degree or program chosen?"

Students who change career goals or majors might not be able to complete all degree requirements within the usual number of graduation credits.

Applying for Transfer Admission

Application for admission is always the first step in transferring. The transfer application and guidelines are available at http://admissions.tc.umn.edu.

After the college notifies students that they have been accepted for admission, their transcripted credits will be evaluated for transfer. A written evaluation should tell students which courses transfer and which do not. How students' courses specifically meet degree requirements may not be decided until they arrive for orientation or have chosen a major.

If students have questions about their evaluation, they should call the Office of Admissions and ask to speak with a credit evaluator. Ask why judgments were made about specific courses. Many concerns can be cleared up with an understanding of why decisions were made. Students can appeal of they are not satisfied. See the following "Rights as a Transfer Student."

Rights as a Transfer Student

- A clear, understandable statement of an institution's transfer policy.
- A fair credit review and an explanation of why credits were or were not accepted.
- A copy of the formal appeals process.

Usual appeals steps are:

- Student fills out an appeals form. Supplemental information you provide to reviewers—a syllabus, course description, or reading list—can help.
- Department or committee will review.
- Student receives, in writing, the outcome of the appeal.
- Student can appeal decision to Office of Admissions.
- At a student's request, a review of her or his eligibility for financial aid or scholarships.

For help with transfer questions or problems, students should see their campus transfer specialist.

Residency and Tuition Discounts

Residency—To be eligible to pay Minnesota resident tuition, you must have resided in Minnesota continuously for at least one calendar year before the first day of your first semester of enrollment, and be able to demonstrate that during that year your primary purpose for being in Minnesota was something other than school attendance. You can download a booklet called "Residency, Reciprocity, and Tuition Exemption" at http://admissions.tc.umn.edu/PDFs/index.html. This booklet contains our official policy, and no other information replaces that policy.

Reciprocity—If you are a resident of Wisconsin, North Dakota, South Dakota, or Manitoba, you may be eligible for reciprocity, which entitles you to pay a tuition rate equal or comparable to the resident rate.

Midwest Student Exchange Program (MSEP)—If you are a resident of Kansas, Michigan, Missouri, or Nebraska, and you are enrolling in an approved academic program, you may qualify for a tuition discount through the Midwest Student Exchange Program (MSEP). Tuition for eligible students from these states is 150 percent of the Minnesota resident rate. The applications for residency, reciprocity, or MSEP are separate from the application for admission.

For more information about residency and tuition discounts, visit http://admissions.tc.umn.edu/CostsAid/index.html.

Registration

Students are responsible for registering for classes before each term. One Stop (http://onestop.umn.edu) is the essential resource for registration. It includes complete registration instructions and time limits for making registration changes.

New students receive detailed registration instructions during orientation. Registration opens about five weeks before the start of each term, except fall semester, for which continuing students register during spring semester. Students register according to an alphabetical rotation, which is available online at onestop.umn.edu/registrar/registration/index.html.

Students register via the Web at http://onestop.umn.edu; or credit enrollment request form and take it to One Stop Student Services Centers in 200 Fraser Hall, 130 West Bank Skyway, or 130 Coffey Hall.

Students should follow these basic steps before registration:

- Make an appointment with an adviser at least two weeks before registration begins.
- Check for registration holds or the need for adviser approval.
- Check the online Class Schedule at http://onestop.umn.edu.
- Consult other resources, including college handbooks, the online course guide, and this catalog.

Tuition and Fees

For current information about tuition and fees, see the tuition and fees Web site at http://onestop.umn.edu.

Financial Aid

A good place for students to start planning their college finances is the University's One Stop Student Services Web site at http://onestop.umn.edu. It includes links to information about University student accounts, tuition and fees, financial aid eligibility, and the types of aid available—grants, scholarships, work-study employment, student loans—that might be available to help students meet their educational costs.

Cost estimates are based on anticipated state funding for the University and cost of living averages for the Twin Cities metropolitan area. Actual costs will depend on where students live, their transportation, and other lifestyle choices. Estimated cost of attendance charts for each college are available at the Tuition & Billing link.

To apply for financial aid, students are required to complete the Free Application for Federal Student Aid (FAFSA) available at fafsa.ed.gov. A new application cycle begins each year on January 1.

New students who apply before the March 1 priority date may have a better opportunity for funds (including the most desirable type—gift aid) that are often depleted later in the financial aid cycle. Additional scholarship funds from University departments may be available to students, depending on their major and their academic record.

Students must reapply for financial aid each year after January 1. Continuing students are encouraged to apply for financial aid by the priority date of April 1 to have their aid ready by fall term and to improve the possibility that they will receive a higher proportion of gift assistance. They may contact their individual department or college to find out what scholarships are available in particular areas of study.

Post-Secondary Enrollment Options Program (PSEO) participants must declare those transfer credits to ensure that they receive their maximum Minnesota State Grant award. They should complete the Minnesota State Grant Additional Information Request form available at http://onestop.umn.edu/onestop/forms.html or for pickup in a One Stop Student Services center. The form asks students to identify all postsecondary or college credit earned as a high school student and to provide a copy of academic transcripts with the terms highlighted in which they were a PSEO student. The Office of Student Finance will deduct these high school quarters or semesters of attendance from students' accumulated state grant eligibility to ensure students get the maximum award amounts.

Visit, Call, or Write

Financial aid assistance is provided year-round at three campus One Stop Student Services Centers to help students through the financial aid application process. All of the centers provide a range of publications and forms for pickup. Full services are provided at the One Stop Student Services Center located in 200 Fraser Hall, Minneapolis East Bank campus. General office hours are 8:00 a.m. to 5:30 p.m., Monday through Thursday, and 8:00 a.m. to 4:00 p.m., Friday. Financial aid counseling is available by phone at 612-624-1111 (8:00 a.m. to 4:00 p.m., Monday through Friday), 1-800-400-8636 toll-free outside the Twin Cities metropolitan area, or TTY (text telephone for hearing impaired only) 612-626-0701. Students may also see counselors in person on a walk-in basis or by appointment to discuss their concerns, have their questions answered, to review their applications or other forms for completeness, and to obtain any additional forms or application materials that may be needed. In addition, a self-service computer area allows students to conduct online scholarship searches, complete an online FAFSA application, or review their student accounts. Students may also go to the One Stop Student Services Center in 130 Coffey Hall, 1420 Eckles Avenue, St. Paul campus, 8 a.m. to 4 p.m., Monday–Friday; or in 130 West Bank Skyway, West Bank campus, 8 a.m. to 5 p.m., Monday–Tuesday (on days when classes are in session); 8 a.m. to 4 p.m., Monday–Tuesday (on days when classes are not in session and May/summer term); 8 a.m. to 4 p.m., Wednesday–Friday.

The University Job Center posts many jobs on and off campus (between 6,000 and 7,000 on campus), and offers a job guarantee program for 500 first-year students.

Send correspondence to:

OneStop Student Services
University of Minnesota, Twin Cities
200 Fraser Hall,
106 Pleasant Street S.E.
Minneapolis, MN 55455-0422

General information (Twin Cities): 612-624-1111
TTY (for hearing-impaired callers only): 612-626-0701
Fax: 612-624-9584
E-mail: helpingu@umn.edu
Web site: http://onestop.umn.edu
Student Accounts Receivable: 612-624-1111

For FAFSA questions, students may call 1-800-433-3243 or 1-800-801-0576 (TTY for hearing impaired only) or connect to FAFSA on the Web at www.fafsa.ed.gov and select the "Check My Submitted FAFSA" tab. Customer service is also available live, online, by selecting the "Live Help" link at the top of the Web page. The center can help students through the application process by:

- explaining comments on the Student Aid Report (SAR) and how to make corrections to erroneous or inconsistent information.
- answering technical questions regarding the PIN (personal identification number).
- assisting a student in navigating through the FAFSA Web site.
- confirming application or correction processing and issuing a duplicate SAR.
- identifying the holder of any currently held student loans.

Student Services and Activities

For the most complete listing of resources and student services on the Twin Cities campus, students should refer to the *Gopher Guide*. A good Web site for exploring Twin Cities campus life is http://onestop.umn.edu/Events. Highlights of some services and activities are presented below, followed by a directory of resources and services. Check the college and program sections of this catalog for college-specific services.

Boynton Health Service—All University students, staff, faculty, alumni, retirees, and their dependents are eligible to use Boynton Health Service on a fee-for-service basis. Students who pay the student services fee or the extended coverage fee and have any form of hospitalization insurance are eligible to receive most services at Boynton at no additional charge and others at reduced cost. Boynton can address most non-hospital medical needs, including physician, dentist, or mental health counselor visits; eye examinations; lab tests and x-rays; and prescriptions. For more information, call 612-625-8400 or visit www.bhs.umn.edu. Boynton clinics are located at 410 Church Street S.E. on the Minneapolis campus and at 109 Coffey Hall on the St. Paul campus.

Housing & Residential Life—The University has 11 housing facilities on campus serving about 6,300 individual students: eight residence halls (six on the East Bank, one on the West Bank, and one on the St. Paul campus) and three apartment-style complexes (all three on the East Bank). The Housing & Residential Life office (in Comstock Hall-East, 612-624-2994 or housing@umn.edu) also has information about family/partnered housing and off-campus housing. For housing information on the Web, go to www.housing.umn.edu.

Intercollegiate Athletics—Several men's and women's sports are offered. For more information, visit www.gophersports.com or call 612-625-4838 for men's programs or 612-624-8000 for women's programs.

Job Center—A variety of on-campus job opportunities are available to students through the Job Center (612-625-2000). Some jobs require little or no experience or training; others require considerable expertise and training. Typical pay for students in these positions ranges between $6.50 and $10.00 per hour. Students can view job opportunities on the Web www.umn.edu/ohr/employment/student/index.html and contact employers directly. Work-Study positions are available. Job Center staff are available to advise students as they search for jobs.

Recreational Sports—The University offers recreational sports programs and facilities to improve the quality of life for students, staff, and faculty. The Sport Clubs Program offers 26 clubs in a wide variety of competitive and instructional sport activities. The Intramural Program offers nearly 500 leagues and tournaments in 15 sports. The University Recreation Center and the St. Paul Gym offer fitness centers, swimming pools, gyms for basketball and volleyball, running tracks, and courts for racquetball, handball, and squash. For information, visit the Web site at www.recsports.umn.edu or call 612-626-9222 (Minneapolis campus) or 612-625-8283 (St. Paul campus).

Student Activities Office—The Student Activities Office, Coffman Memorial Union, Room 126, (612-626-6919), offers various programming initiatives and learning opportunities, including the events calendar Web site http://events.tc.umn.edu, leadership development programs, and support for student groups. For a complete listing of registered student groups, see the *Gopher Guide* or visit the Web site at www.sao.umn.edu.

Student Unions—The student unions—St. Paul Student Center and Coffman Memorial Union and its West Bank services—offer lounge and study spaces, dining services, convenience stores, meeting/conference space, game rooms, non-credit art courses, copy centers, postal stations, ATMs, e-mail kiosks, and bookstores. The student unions also sponsor numerous events and activities for the campus community, including films, lectures, concerts, art exhibits, outdoor adventures, and Spring Jam.

Coffman Memorial Union houses the University's new, central 40,000 square-foot bookstore, 24-hour computer lab, 400-seat multi-purpose theater, food court, campus security escort station, study lounges, student organization office space, convenience store, post office, a bank, and other services and facilities for students on the Minneapolis campus.

For student union information, call the St. Paul Student Center at 612-625-9794 or visit www.spsc.umn.edu; call 612-624-INFO or visit www.coffman.umn.edu for more information about Coffman Memorial Union and its West Bank services.

Student Services Directory

Campus Information

Emergency 911

Escort service 612-624-WALK (9255)

Campus directory assistance
- From off campus, 612-625-5000
- From on campus, dial 0
- 7:30 a.m.-8:00 p.m., Monday-Saturday; 12:00 noon-8:00 p.m., Sunday

Campus events (http://events.umn.edu)
- Student Activities Office 612-626-6919
- Coffman Memorial Union 612-625-2272
- St. Paul Student Center Union Station 612-625-9794

University of Minnesota Alumni Association
200 McNamara Alumni Center
612-624-2323
www.alumni.umn.edu

University of Minnesota Police Department
100 Transportation and Safety Building
Non-emergency 612-624-COPS (2677)
Emergency 911

Activities, Programs, and Entertainment

Bell Museum of Natural History
612-624-7083
www.bellmuseum.org

Coffman Memorial Union program information
www.coffman.umn.edu/events

Events calendar
http://events.umn.edu

Frederick R. Weisman Art Museum
612-625-9494
www.weisman.umn.edu

The Goldstein Museum of Design
612-624-7434
http://goldstein.che.umn.edu

Katherine E. Nash Gallery
612-624-7530
hppt://nash.umn.edu

Northrop Auditorium arts ticket office
612-624-2345
www.northrop.umn.edu

Orientation and First-Year Programs
612-624-1979

Paul Whitney Larson Gallery
612-625-0214
www.sao.umn.edu/events/arts

School of Music/Ted Mann Concert Hall events hotline
612-626-8742
www.tedmann.umn.edu

Student union activities/events
612-626-6919

University Film Society hotline
331-3134

University Theatre
120 Rarig Center 612-625-4001
www.theatre.umn.edu

Admissions

Change of college
- 200 Fraser Hall 612-624-1111
- 130 West Bank Skyway 612-624-1111
- 130 Coffey Hall 612-624-1111

Residency and reciprocity
240 Williamson Hall 612-625-2008

Transfer information
Contact the individual college admissions office or

240 Williamson Hall 612-625-2008
8:00 a.m.-6:00 p.m., Monday
8:00 a.m.-4:30 p.m., Tuesday-Friday

Athletics

Intercollegiate Athletics
- Information: 250 Bierman Field Athletic Building 612-624-8080

www.gophersports.umn.edu

Recreational Sports
- University Recreation Center 612-625-6800
- 104 St. Paul Gym 612-625-8283

www.recsports.umn.edu

Bookstores

Coffman store
Coffman Memorial Union 612-625-6000

Law School store
85 Mondale Hall 612-626-8569

St. Paul store
St. Paul Student Center 612-624-9200

Campus newspaper

The Minnesota Daily
450 University Office Plaza
612-627-4080

Computing services

Computer Helpline 612-301-4357 (1-HELP)
- 152 Shepherd Labs, East Bank
- B60 Coffman Memorial Union
- 93 Blegen Hall, West Bank
- 50 Coffey Hall, St. Paul

Copying services

Printing Services Copy Centers
- East Bank, G14 Coffman Memorial Union 612-625-1092
- East Bank, 147 Smith Hall 612-625-4390
- East Bank, 130 McNamara Alumni Center 612-624-7531
- Health Sciences, D-104 Mayo Memorial Building 612-625-8914
- St. Paul, 8 St. Paul Student Center 612-625-4771
- West Bank, L-129 CarlSMgmt 612-624-6588
- West Bank, 33 Social Sciences Building 612-625-9047

Counseling and Student Services

Aurora Center for Advocacy & Education
24-Hour Crisis Line 612-626-9111
407 Boynton Health Service 612-626-2929

Career Development Center
109 Eddy Hall 612-624-8344

Circle of Indigenous Nations
125 Fraser Hall 612-625-2555
www.mcae.umn.edu/circle

College of Continuing Education Student Support Services
150 Wesbrook Hall 612-625-3333

Disability Services
180 McNamara Alumni Center
612-626-1333 (voice or V/TTY)

Equal Opportunity and Affirmative Action
419 Morrill Hall 612-624-9547
www.eoaffact.umn.edu

Gay, Lesbian, Bisexual, Transgender, Ally Programs Office
138 Klaeber Court 612-625-0537

International Student and Scholar Services
190 Hubert H. Humphrey Center
612-626-7100

Mental Health Clinic
N400 Boynton Health Service 612-624-1444

Multicultural Center for Academic Excellence
185 Klaeber Court 612-624-6386
www.mcae.umn.edu

Student Academic Success Services
104 Eddy Hall 612-624-7546

Student Conflict Resolution Center
211 Eddy Hall 612-624-7272

Student Parent HELP Center
24 Appleby Hall 612-626-6015

University Counseling & Consulting Services
- 109 Eddy Hall (Mpls.) 612-624-3323
- 199 Coffey Hall (St. Paul) 612-624-3323

University of Minnesota Alumni Association
200 McNamara Alumni Center
612-624-2323

Office for University Women
432 Morrill Hall 612-625-9837
www.umn.edu/women

Urgent Counseling
410 Boynton Health Service 612-625-8475

Employment

Graduate Assistant Office
200 Donhowe Building
612-624-7070

Student Employment
U of M Job Center
100 Donhowe Building
612-625-2000

Financial Aid

Student Finance, Office of
200 Fraser Hall 612-624-1111

130 Coffey Hall 612-624-1111

Student Financial Collections
20 Fraser Hall 612-625-8007

Health and Public Services

Aurora Center for Advocacy & Education
24-hour crisis line 612-626-9111

407 Boynton Health Service 612-626-2929

Boynton Health Service (information)
Minneapolis 612-625-8400

St. Paul 612-624-7700

TTY 612-625-6184

www.bhs.umn.edu

Boynton Health Service (appointments)
- Medical 612-625-3222
- Eye Clinic 612-624-2134
- Dental Clinic 612-624-9998
- Mental Health Clinic 612-624-1444
- St. Paul 612-624-7700

Boynton Health Service (emergency)
When Boynton is closed:
- Medical Emergencies 612-672-5555
- Dental Emergencies 612-273-3000
- Crisis Connection 612-379-6363 or 612-625-7900

Dental School Clinic
Seventh floor, Moos Tower 612-625-2495

University of Minnesota Medical Center, Fairview
612-273-3000

University Police
511 Washington Avenue S.E. 612-624-3550

Women's Health Clinic
Ground floor, Boynton Health Service
612-625-3222

Housing

Housing & Residential Life
Comstock Hall-East 612-624-2994
www.housing.umn.edu

Residence halls
- Bailey (St. Paul) 612-624-0700
- Centennial 612-625-4452
- Comstock 612-624-1995
- Frontier 612-624-9999
- Middlebrook (West Bank) 612-625-0536
- Pioneer 612-626-3333
- Sanford 612-624-2526
- Territorial 612-625-0971
- University Village 612-625-3909
- Wilkins 612-624-0044
- Yudof 612-625-8786

International Resources

China Center
290 Hubert H. Humphrey Center 612-624-1002

Learning Abroad Center
230 Heller Hall 612-626-9000

International Programs, Office of
645 Heller Hall 612-624-5580

International Student and Scholar Services
190 Hubert H. Humphrey Center 612-626-7100

Legal Service

University Student Legal Service
160 West Bank Skyway 612-624-1001

Libraries

General information 612-624-0303
www.lib.umn.edu

Bio-Medical Library
270 Diehl Hall 612-626-5653

Humanities/Social Sciences
Wilson Library 612-624-0303

Journalism, Eric Sevareid Library
20 Murphy Hall 612-625-7892

Law Library
120 Mondale Hall 612-625-4300

Magrath Library (St. Paul Campus)
1984 Buford Avenue 612-624-2233

Science and Engineering Library
Walter Library 612-624-0224

Library Learning Resource Center
204 Walter Library 612-624-1584

University Archives and Special Collections
Andersen Library 612-625-9825

Personal Services

Automated teller machines
- Blegen Hall basement
- Coffman Memorial Union
- St. Paul Student Center lower level
- Willey Hall upper concourse
- Williamson Hall lower concourse

Banking services
University of Minnesota Federal Credit Union
Stadium Village Mall 612-465-0400
www.umfcu.net

Check cashing
- 145 Williamson Hall 612-625-7535
- 101A Anderson Hall 612-625-1383
- 107 Coffey Hall 612-625-8108
- St. Paul Student Center 612-625-9794
  8 a.m.-7 p.m., Monday-Friday

Child care
- **Child Care Center, University**
  East Bank 612-627-4014
- **Community Child Care Center**
  1250 Fifield Avenue, St. Paul
  651-645-8958
- **Como Community Child Care**
  1024 27th Avenue S.E., Mpls. 331-8340

Lost and found
- **CMU Info**
  East Bank 612-624-4636 (INFO)
- **WBS Convenience Store**
  West Bank 612-624-6338
- **St. Paul Student Center**
  Union Station 612-625-9794
- **Student Services Center**
  130 Coffey Hall 612-624-3731

Notary service
240 Williamson Hall 612-625-2008

Postal Services
- G11 Coffman Memorial Union 612-624-8602
- Dinkytown, 1311 Fourth Street S.E.
  800-275-8777
- St. Paul Student Center 612-625-9794
- West Bank Skyway 612-624-6338

Recreation

- Recreational sports information 612-625-6800, 612-626-9222
- University Rec Center 612-625-6800
- 104 St. Paul Gym 612-625-8283
- Center for Outdoor Adventure
  St. Paul Gym 612-625-8790
- Goldy's Gamerroom
  Coffman Union 612-624-8722
- Gopher Spot
  St. Paul Student Center 612-625-5246

Registration, Fee Payment, and Student Records

Fee payment, Bursar's Office
- 145 Williamson Hall, East Bank
  612-625-7535 8 a.m.-4 p.m.
- 101a Anderson Hall, West Bank
  612-625-1383 8 a.m.-3 p.m.
- 107 Coffey Hall, St. Paul
  612-625-8108 8:00 a.m.-3:30 p.m.

Paid fee verification
200 Fraser Hall 612-624-1111

One Stop Student Services Centers
Registration, transcripts, records problems
- 200 Fraser Hall 612-624-1111
- 130 Coffey Hall 612-624-1111
- 130 West Bank Skyway 612-624-1111

Student Groups

Student Activities Office 612-626-6919
www.sao.umn.edu

Transportation Information

Bikes, buses, and parking
300 Transportation & Safety Building
612-626-7275

Commuter (bus) cards
- University Bookstore, Coffman Memorial Union 612-625-6000
- St. Paul Student Center, Union Station
  612-625-9794
- West Bank Skyway Service Center
  612-624-6338

Metro Transit buses
612-373-3333

Motorist Assistance Program
612-626-PARK (7275)

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Policies

The University of Minnesota has many policies pertaining to academic work and student life on campus. Students are responsible for complying with these policies. The following is a guide to policies that are relevant to undergraduates; it is not a compilation of all policies or their word-for-word presentation.

Many University policies can be found online at www.fpd.finop.umn.edu. If students have questions about these and other requirements, they should check with their advisers or college or department offices.

Absences

Students are expected to attend all meetings of their courses. They may be excused from class, however, to participate in religious observances. Students are responsible for notifying instructors at the beginning of the term about such planned absences.

Students must attend the first class meeting of every course in which they are registered, unless they obtain approval before the first meeting. Otherwise, they may lose their place in class to another student. For more information, see http://onestop.umn.edu.

See also **Leave of Absence.**

Academic Integrity

Students, faculty, and staff are expected to uphold the highest standards of academic integrity. The Office for Student Academic Integrity (OSAI) is a central resource that promotes scholastic responsibility and skill on the part of individual students; aids faculty and instructional staff in providing a positive learning environment through the prevention and detection of cheating; and serves as a centralized forum for the fair and even-handed resolution of reported cases of student scholastic dishonesty. For more information, see the OSAI Web site www.osai.umn.edu or call 612-624-6073.

See also **Conduct Code** and **Grievance.**

Academic Progress

All colleges and programs require students to make satisfactory academic progress toward their degree. The U.S. Department of Education and the state of Minnesota also require the University to verify that students receiving federal or state financial aid maintain satisfactory progress.

Students' progress is monitored each term and annually by the college of enrollment. Term monitoring is based solely on GPA. The annual review may also include *coefficient of completion* in conjunction with GPA. The coefficient of completion is defined as credits graded A, B, C, or S divided by credits graded A, B, C, S, D, F, N, or I. Plus or minus modifiers are not included in determining coefficient of completion.

See also **Probation**.

Academic Progress Audit System (APAS)

Each student has an individualized APAS that compares past and current coursework with the requirements for the student's academic program. Advisers can help students understand the various sections of the report and plan a course of study to satisfy degree requirements. Copies are available in One Stop Student Services Centers located in 200 Fraser Hall, 130 West Bank Skyway, or 130 Coffey Hall or online at http://onestop.umn.edu.

Access to Educational Records

In accordance with regents' policy on access to student records, information about a student generally may not be released to a third party without the student's permission. (Exceptions under the law include state and federal educational and financial aid institutions.)

Some student information—name, address, electronic (e-mail) address, telephone number, dates of enrollment and enrollment status (full time, part time, not enrolled, withdrawn and date of withdrawal), college and class, major, adviser, academic awards and honors received, and degrees earned—is considered public or directory information. Students may prevent the release of public information. To do so, they must notify the records office on their campus.

Students have the right to review their educational records and to challenge the contents of those records. The regents policy is available for review online at http://onestop.umn.edu, at 200 Fraser Hall, Minneapolis, and at records offices on other campuses of the University. Questions may be directed to the One Stop Student Services Center, 200 Fraser Hall (612-624-1111).

Students are responsible for updating their personal information, which can be done online at http://onestop.umn.edu.

Advising

Academic advising is a crucial component of the University's educational mission. Although the approach to advising varies among colleges and departments, these general principles apply:

- Academic advising is available to all students.
- Students are encouraged to see their adviser before registration each term.
- Academic advising addresses students' needs in coursework, program planning, career options, and development issues.
- Faculty, professional advisers, graduate students, and peers are involved in academic advising.

Students should expect academic advisers to assist them in designing and implementing a program of study and related activities that will allow them to achieve their educational goals. Advisers expect students to prepare for program planning sessions by giving careful thought to possible course selections, program schedules, and short- and long-term education and career goals, and to come to appointments with pertinent academic records and materials. (See Advising in the General Information section of this catalog.)

Auditing

Students auditing a course pay full tuition, but do not take exams, do homework, or receive credit. A student may take a previously audited course for credit.

Change of College

Students who wish to transfer from one college of the University to another must submit a completed *Application for Undergraduate Change of College* to the One Stop Student Services Center (200 Fraser Hall, 130 West Bank Skyway, or 130 Coffey Hall). Deadlines are available at http://onestop.umn.edu. College offices can provide information on admission requirements.

Change of Registration

Details about adding and canceling courses, changing grading options, or making other post-registration changes are available at http://onestop.umn.edu.

Class Standing
A student's class standing is determined by the number of semester credits completed: freshman, 1-30 credits; sophomore, 31-60 credits; junior, 61-90 credits; senior, 91 or more credits.

Conduct Code
Students are responsible for complying with the University's Student Conduct Code, which is available in college student affairs offices and Student Judicial Affairs, 612-624-6073. The code is published regularly and also available on the Web at www.sja.umn.edu. See also **Academic Integrity** and **Grievance**.

Course Numbering
Courses have four-digit numbers. The first number designates the course level.

0xxx	Courses that do not carry credit toward any University degree.
1xxx	Courses primarily for undergraduate students in their first year of study.
2xxx	Courses primarily for undergraduate students in their second year of study.
3xxx	Courses primarily for undergraduate students in their third year of study.
4xxx	Courses primarily for undergraduate students in their fourth year of study; graduate students may enroll in such courses for degree credit. 4xxx courses can be counted for a Graduate School degree if the course is taught by a member of the graduate faculty or an individual appointed to Limited Teaching Status (LTS).
5xxx	Courses primarily for graduate students; undergraduate students in their third or fourth year may enroll in such courses.
6xxx	Courses for postbaccalaureate students in professional degree programs.
7xxx	Courses for postbaccalaureate students in professional degree programs. 6xxx and 7xxx courses are to be used primarily for postbaccalaureate professional programs that are not offered through the Graduate School.
8xxx	Courses for graduate students.
9xxx	Courses for graduate students.

Credit by Examination
The University offers proficiency examinations and special examinations for credit at the discretion of academic departments. Likewise, the University recognizes and awards credits based on examinations that are taken as part of the Advanced Placement Program, the International Baccalaureate Program, and the College Level Examination Program. (See Transfer Admission in the General Information section of this catalog.)

Credit Limits
No student may enroll for more than 20 credits per semester without college approval. Some colleges or programs may set a minimum credit limit. For more information, students should check with their adviser.

Credit Load
Undergraduates must complete at least 15 credits per semester to graduate within four years.

13-Credit Requirement—All degree-seeking students are required to register for at least 13 credits each semester. To apply for part-time status, or to take fewer credits temporarily, students must petition their college. More information can be found at http://onestop.umn.edu.

The course registration queue gives priority to students whose immediately previous registration was "full-time" (i.e., for at least 13 credits). Under the queue, full-time seniors register first, followed by part-time seniors, full-time juniors, part-time juniors, full-time sophomores, etc. More information about the queue can be found at http://onestop.umn.edu.

Dean's List
Each semester, all colleges and programs publish a dean's list, which includes students who achieve a 3.666 GPA or higher and who complete at least 12 credits on the A-F grading system. This achievement is noted on students' transcripts.

Declaring a Major
Students in freshman-admitting colleges may have an *undeclared* major for a limited time. Colleges and programs have different procedures for students to declare a major, but all students must declare a major or be accepted into a program before or upon completing 60 semester credits. Undeclared students with 60 or more credits will have a registration hold and will not be allowed to register without first meeting with their adviser and gaining college approval.

Diplomas
Diplomas are issued at the end of each term to students graduating with a bachelor's degree. Diplomas are mailed approximately two to three months after graduation. Duplicate diplomas may be ordered for $15 per copy. For more information, see http://onestop.umn.edu or call One Stop Student Services at 612-624-1111.

Discretionary Course Cancellation or Withdrawal
Students are allowed to withdraw from a course after the eighth week of class and at any time up to and including the last day of class for that course, without college approval, **once** during their undergraduate enrollment. A "W" is recorded on the student's transcript. Check with your college office for withdrawal procedures. Complete grading policies are online at www.umn.edu/usenate/usen/policies.html.

E-Mail
E-mail is the University's official means of communication with students. Students are responsible for all information sent via their University e-mail account. Students who forward their University e-mail account are still responsible for all the information, including attachments, sent to the account.

Equal Opportunity
The University of Minnesota is committed to the policy that all persons shall have equal access to its programs, facilities, and employment without regard to race, color, creed, religion, national origin, sex, age, marital status, disability, public assistance status, veteran status, or sexual orientation.

Inquiries regarding compliance may be directed to the Director, Office of Equal Opportunity and Affirmative Action, University of Minnesota, 419 Morrill Hall, 100 Church Street S.E., Minneapolis, MN 55455, 612-624-9547, eoaa@umn.edu. Web site: www.eoaffact.umn.edu.

This publication/material is available in alternative formats upon request. Please contact (name, department, address, phone number).

Extracurricular Events

No extracurricular events requiring student participation may be scheduled from the beginning of study day to the end of finals week. Exceptions to this policy may be granted by the Senate Committee on Educational Policy. The Senate advises all faculty that students who are unable to complete course requirements because of approved events during finals week will be provided an alternative and timely opportunity to do so.

Final Exams

Detailed information each term about final exam schedules and policies can be found at http://onestop.umn.edu.

Four-year Graduation Plan

The Four-year Graduation Plan offers a structured program for incoming freshmen to graduate in four years. A complete set of eligibility rules and eligible majors is listed in the information packet sent to all new freshmen and is online at http://academic.umn.edu/fouryear.

Students on the plan must meet the eligibility requirements when they enter the University and must plan their program with the assistance of their adviser. Checkpoint course guides have been set up for degree programs on the Four-year Graduation Plan to help students stay on track. The checkpoint course guides are available online at http://academic.umn.edu/fouryear to help students plan their degree program.

If a student cannot get into a required course, he or she must notify an adviser within two days of the assigned registration date by filing a *Notification of Unavailable Course*. If a required course is unavailable, the University will arrange for additional course seats, substitute another course, give priority registration during the next registration period, or waive the requirement, at the University's option. If the University's inability to provide a required course causes a student to graduate beyond four years, the University will cover the tuition cost of the additional required courses. For more information, see page 13 in the General Information section or call 612-625-2525.

Full-time Student Status

To graduate in four years, students must complete at least 15 credits each semester. State financial aid also defines full-time status as 15 credits. Maximum need-based federal financial aid is available to students who enroll for 12 credits, but note that students cannot graduate in four years by taking only 12 credits a semester.

See also **Credit Load.**

Grading and Transcripts

The complete University Senate grading policy can be found online at www.umn.edu/usenate/usen/policies.html. More information about transcripts can be found online at http://onestop.umn.edu.

1. The policy has been in effect since fall 1997 for the Crookston, Morris, and Twin Cities campuses, replacing all previous grading policies. It may not be applied retroactively to any grades or symbols awarded before that time.
2. The University has two grading systems, A-B-C-D-F (with pluses and minuses) and S-N. Students may receive grades only from the grading system under which they have registered for a course.

   Each campus, college, and department determines to what extent and under what conditions each grading system is used, may specify what courses or proportion of courses must be on one system or the other, and may limit a course to either system.

Grading Policy

A .....4.000 ...Represents achievement that is outstanding relative to the level necessary to meet course requirements.

A- 3.667

B+ ...3.333

B .....3.000 ...Represents achievement that is significantly above the level necessary to meet course requirements.

B- 2.667

C+ ...2.333

C .....2.000 ...Represents achievement that meets the course requirements in every respect.

C- 1.667

D+ ...1.333

D .....1.000 ...Represents achievement that is worthy of credit even though it fails fully to meet the course requirements.

S.....Represents achievement that is satisfactory (equivalent to a C- or higher and meets or exceeds course requirements in every respect). The S does not carry grade points and is not included in GPA calculations, but the credits count toward the student's degree program if allowed by the department.

F or N.....Represents failure or no credit and indicates that coursework was completed but at an achievement level unworthy of credit, or was not completed and there was no agreement between the instructor and student that the student would be awarded an I. Academic dishonesty is grounds for an F or N for the course. The F carries 0.00 grade points and is included in GPA calculations; the N does not carry grade points and is not included in GPA calculations.

I.....Incomplete, a temporary grade that indicates coursework has not been completed.

The instructor assigns an I when, due to *extraordinary* circumstances, a student is prevented from completing coursework on time. An I requires a written agreement between the instructor and student specifying the time and manner in which the student will complete the course requirements during the student's next term of enrollment.

For undergraduates and non-degree seeking students, work to make up an I must be submitted within one year of the final examination; if not submitted by that time, the I will automatically change to an F (if A-F registration) or N (if S-N registration).

The instructor is expected to turn in the new grade within four weeks of the date work is submitted.

When an I is changed to another symbol, the I is removed from the record. Once an I has become an F or N, it may be converted to any other grade by petition of the instructor (or department if the instructor is unavailable).

K.....Indicates the course is still in progress and a grade cannot be assigned at the present time.

NG.....No grade required.

T.....Transfer credit or test credit.

V.....Visitor, indicates registration as an auditor or visitor; does not carry credit or grade points.

W.....Withdrawal, indicates a student has officially withdrawn from a course. If a student withdraws from a course during the first two weeks of classes, that course registration is not recorded on the student's transcript. The W is recorded if the student withdraws from the course during the third through sixth week of class (second or third weeks of summer terms). Withdrawal in the seventh or later week of classes (fourth or later in summer terms) requires college approval.

Each student may, once during his or her under-graduate enrollment, withdraw from a course without college approval, and receive a W, at any time up to and including the last day of class for that course.

X.....Indicates a student may continue in a sequence course in which a grade cannot be determined until the full sequence of courses is completed. The instructor submits a grade for each X when the student completes the sequence.

3. When both grading systems are available, students must choose one when registering for a course. For more information, go to http://onestop.umn.edu.
4. Instructors must clearly define for a class, at one of its earliest meetings, the performance necessary to earn each grade or symbol.
5. No student may receive a bachelor's degree unless at least 75 percent of the degree-qualifying residence credits carry grades of A, B, C, or D (with or without pluses or minuses). Each campus, college, and department may choose not to accept academic work receiving a D (with or without a plus or minus).
6. The University's official transcript, the chronological record of the student's enrollment and academic performance, is released by the University only at the student's request or in accord with state or federal statutes; mailed copies have the University's official seal printed on them. Students may obtain an unofficial transcript at http://onestop.umn.edu.
7. The University calculates a grade point average (GPA) for each student, both at the end of each grading period and cumulatively. GPA is calculated as the ratio of grade points earned divided by the number of credits earned with grades of A-F (including pluses and minuses). Transcripts report the periodic and cumulative GPA for each term.
8. A student may repeat a course once. Both grades for the course appear on the transcript, but the course credits may not be counted more than once toward degree and program requirements. Only the last enrollment for the course counts in the student's grade point average.
9. Students may petition the college scholastic committee or other appropriate body about this policy up to one calendar year after the grade was assigned.
10. The grades on page 29 (with grade points as indicated) and symbols are used on transcripts.

Graduation, Applying for

In general, Twin Cities campus undergraduate degree applications are due by the end of the second week of the semester of graduation. For more information, go to http://onestop.umn.edu.

Graduation Requirements

Colleges and programs specify degree requirements, but the following graduation requirements apply to all undergraduates:

- Students must earn at least 120 credits to graduate.
- Students who are admitted to a degree program and who complete all campus, college, and program requirements with a minimum GPA of 2.00 in the major and a cumulative GPA of 2.00 or higher in all University coursework will be cleared to graduate.
- All degree programs require a C- or better in each course in the major.
- At least 30 semester credits must be awarded by the campus from which a student seeks to graduate. At least 15 of the last 30 credits must be awarded by the campus from which a student seeks to graduate. Half of a student's upper division work must be completed on the campus from which the student seeks to graduate.
- No more than 6 semester credits from physical education, study skills, or applied music (in any combination) will count toward a student's degree, unless additional credits are a required part of a student's program requirements; i.e., no more than 6 credits total from these areas will count toward the degree.

Any course that carries University credit in one department or college will carry University credit in all other University departments or colleges, at least as an elective, including all transfer coursework that is accepted when a student is admitted. Some courses that carry University credit may not count toward college or department/program degree requirements, or may, if a student changes programs, exceed the limit of 6 credits from the areas identified in the preceding paragraph and thus not count toward the degree.

Graduation With Distinction or With Honors

Some colleges offer degrees with distinction and with honors. Students should check with an adviser to determine if their college offers either or both of these degree awards. To qualify for either, a student must have completed 60 or more semester credits at the University. Only University coursework is considered in determining GPA for distinction or honors. For details on honors programs, check the college and program sections of this catalog.

To graduate *with distinction*, a student must have a cumulative GPA of 3.750 or higher at graduation. To graduate *with high distinction*, a student must have a cumulative GPA of 3.900 or higher.

To graduate *with honors*, students must participate in a fully developed honors program in their college or program, complete a designated amount of coursework, achieve a stipulated GPA, and achieve a definite standard of excellence in scholarship with specific evidence of ability to accomplish independent or original work. Further, the minimum GPA in upper division (i.e., the last 60 graded semester credits) required for achievement of a degree *cum laude* is 3.500; *magna cum laude* is 3.666; *summa cum laude* is 3.750. Details on graduating with honors are available from college honors programs.

Grievance

Academic grievances are complaints brought by students regarding the University's provision of education and academic services affecting their role as students. A step-by-step process, moving from informal to formal resolution is described in the Student Academic Grievance Policy www.umn.edu/usenate/policies/stugrieve.html. Students should also check with the Student Conflict Resolution Center Web site at www.umn.edu/sos or call 612-625-5900 for assistance.

Grievances by student employees or other employees of the University are handled through the Office for Conflict Resolution, 662 Heller Hall (612-624-1030).

Matters arising from student misconduct or actions taken under the Student Conduct Code are the responsibility of Student Judicial Affairs (612-624-6073). Student Judicial Affairs provides a forum for resolution of such issues within the services of its own office and through consultation and advisement of colleges, individuals, and administrative units within the University. Whenever possible, conduct complaints are handled on an informal, person-to-person basis with emphasis on educational development.

Complaints alleging discrimination in the University/student relationship, including student complaints alleging sexual harassment by University staff or faculty, are handled by the Office of Equal Opportunity and Affirmative Action, 419 Morrill Hall (612-624-9547).

Holds

A hold may be imposed for financial indebtedness to the University (e.g., for unpaid tuition or library fines, or delinquent health service payments) or for disciplinary or scholastic reasons. Students who have holds on their records may not register or, in many cases, obtain transcripts until the holds are cleared with the office imposing the holds.

Students are usually notified of an existing or impending hold by the department or office authorizing the hold. Notice of any hold, including the name of the department or office where it may be cleared, is available online at http://onestop.umn.edu or from One Stop Student Services at 612-624-1111.

Honors

Many undergraduate colleges offer honors programs. See Admissions in the General Information section and the college sections of this catalog for more information.

See also **Graduation With Distinction or With Honors**.

Hospitalization Insurance

Students taking 6 or more credits, or those who purchase an extended coverage benefits plan through Boynton Health Service, are required to carry hospitalization insurance. Students who enroll for 6 or more credits and do not have hospitalization insurance will automatically be enrolled in a University-sponsored plan when they register. Students who already have insurance through their parents, employer, or spouse will need to provide documentation of coverage during registration to avoid being charged for the University-sponsored plan. For more information, see the Boynton Health Service Web site at www.bhs.umn.edu or call 612-624-0627.

Immunization

Students born after 1956 who take more than one University class are required under Minnesota law to submit an *Immunization Record.*

The form, which is sent along with the official University admission letter, must be filled out and returned to Boynton Health Service within 45 days of the first term of enrollment in order for students to continue registering for classes.

Incompletes

See **Grading and Transcripts**.

Leave of Absence

Students who plan to leave school for one or more semesters must request a leave of absence from their college office. The form is available online at http://onestop.umn.edu. Students who follow the policy and whose leave is approved need not apply for readmission when they return. Colleges may condition readmission on availability of space in a program provided that they caution students that readmission will be so conditioned. Colleges must inform students who request a leave whether they will be held to old or new program requirements upon their return. If a leave is for more than two academic years, the student must follow new program requirements.

See also **Readmission.**

Liberal Education Requirements

Each semester, the online *Class Schedule* publishes the requirements and lists courses that count toward the liberal education requirements at http://onestop.umn.edu. The *Class Schedule* also lists which courses are offered for a particular semester and which are tentatively scheduled for subsequent terms during the academic year. A link to the online *Class Schedule* is available at http://onestop.umn.edu.

A liberal education introduces students to the modes of inquiry and subject matter of the major branches of knowledge, including the factual information and theoretical or artistic constructs that form their foundations; the "ways of knowing" (i.e., the kinds of questions asked and ways in which insight, knowledge, and data are acquired and used); the changes over time of their central ideas or expressive forms; and the interrelationships among them and human society in general. To these ends, study by all undergraduate students on the Twin Cities campus is guided by a common framework.

The Diversified Core Requirements

Physical and Biological Sciences—a minimum of two courses totaling at least 8 credits, including one course in physical science with a laboratory or field experience, and one course in biological science with a laboratory or field experience.

Social Science and Humanities—a minimum of 15 credits distributed as follows:

Social Science—at least 6 credits.

Humanities—at least 6 credits, including one course in literature and one course in "other humanities." (The "other humanities" category includes courses in philosophy, visual or performing arts, and other humanities or arts.)

Historical Perspective—at least 3 credits.

Mathematical Thinking—one course of at least 3 credits.

The Designated Themes of Liberal Education

The designated themes of liberal education offer a dimension to liberal learning that complements the diversified core curriculum. Each of the themes focuses on an issue of compelling importance to the nation and the world, the understanding of which is informed by many disciplines and interdisciplinary fields of knowledge.

The list of courses that can be used to satisfy liberal education requirements changes often. For the most up-to-date information, check One Stop at http://onestop.umn.edu.

Requirement: A minimum of one course of at least 3 credits in each of the following:

Environment
Cultural diversity
International perspectives
Citizenship and public ethics

Some diversified core courses also meet one theme requirement. Other courses may satisfy two theme requirements. Students who have completed the required coursework in the diversified core or designated theme areas but are missing one credit in either may apply for a one-credit waiver. More information is available at http://onestop.umn.edu.

Writing Requirement

One or two first-year writing courses are required, depending on the student's college of enrollment. Four writing intensive courses are required. Two of the courses must be upper division courses, one of which should be taken in the student's major.

Minnesota Transfer Curriculum

If students complete the Minnesota Transfer Curriculum (MTC) at any participating Minnesota college or university, they fulfill the University's Twin Cities campus liberal education requirements. Students completing the MTC will have completed the first-year writing requirement. The writing intensive requirement is separate from the MTC; however, transfer courses might count as writing intensive.

For more information on using transfer credits for the liberal education requirements, contact the Office of Admissions (612-625-2008). College advising offices also have information about these requirements.

Prerequisites
Students should take only those courses for which they have satisfied all prerequisites. Instructors may require students to withdraw from a course if they have not met prerequisites. Instructors may, however, grant permission for a student to take a course without having satisfied prerequisites.

Probation
All colleges and programs shall use the following probationary system. A student will be placed on probation (and will remain on probation) if either the term or the cumulative GPA is below 2.00. A student on probation will have a hold placed on his or her record and must see an adviser in order to register. A student is suspended if a) at the end of the probation term (semester), both the term and the cumulative GPA are below 2.00, or b) the conditions of an academic contract are not fulfilled. A suspension is effective on the first day of the next fall or spring term.

Colleges may also require students on probation to complete a contract for academic performance developed by the college of enrollment. Students will be given an override for the probation hold to enable them to register when they have met with an adviser and, if a contract is required, when the student's academic adviser and college office are satisfied that the conditions of the contract have been met. The academic contract may include GPA expectations more rigorous than the 2.00 term and cumulative GPA minimum standard, where programmatically warranted and where clearly communicated to the student. If the student meets the conditions of the contract, and the term and cumulative GPA are at least 2.00, the student will be removed from probation. If the contract conditions are met but the cumulative GPA is still less than 2.00, the student will remain on probation. If the conditions are not met, the student will be suspended.

When suspended, a student is no longer in the program and cannot register for University courses for at least one full academic year. All colleges at the University recognize the probationary holds and do not allow students, including non-degree seeking, with these holds to register without the approval of the college placing the hold. Students may appeal suspension decisions or petition for re-admission in writing to the college's Student Scholastic Standing Committee (SSSC) according to a defined collegiate petition process. Re-admission after a period of suspension is not automatic. To be re-admitted, a student must show evidence of changes in circumstances that demonstrate that the student will succeed in an academic program.

Upon return to the college after petitioning to reenter, students will be placed on probation, and all colleges shall use a probation hold and contract for the purpose of monitoring the student's performance. If the student does not successfully complete the contract, he or she shall be suspended again, but then shall be required to reapply for admission, rather than petition to reenter.

Readmission
Undergraduates who have not been granted a leave of absence and who do not register for one semester, excluding summer, will be placed on *inactive* status. To regain *active* status, students must contact their college office for approval. Students in good academic standing at the time they became inactive are routinely allowed to return to active status if there is space in the program.

Students who have left the University without a leave of absence for more than one semester (not including summer session) will be held to new program requirements upon their return. Students returning after only one year out or less will be allowed to follow the program requirements in effect when they were last enrolled. Exceptions may be made only for students who are returning after a formal leave of absence.

Repetition of Courses
See **Grading and Transcripts**.

Residence Requirements for Graduation
See **Graduation Requirements**.

Retention of Student Records
College-specific student records are kept for seven years following a student's last registration. For more information, see http://recmgmt.finop.umn.edu/retention.htm.

Smoke-free Campus
Smoking is prohibited in all facilities of the University of Minnesota, Twin Cities campus except for designated private residence hall rooms.

Student Responsibilities
Students are responsible for complying with policies in this catalog and other policies of the University. Advisers and staff are available to provide guidance, but students are responsible for their choices, including selecting courses that fulfill requirements for their academic programs.

Student Right-to-know Act
Under federal law, students may receive information about campus security and about graduation and retention rates at the Twin Cities campus at www.irr.umn.edu/SRTK.

Suspension
See **Probation**.

Transcripts
See **Grading and Transcripts.**

Transfer of Credit/Credit Evaluation
See Admissions in the General Information section of this catalog.

Undeclared Major
See **Declaring a Major**.

Withdrawal From a Course
See **Discretionary Course Cancellation** and http://onestop.umn.edu.

Withdrawal From the University
See **Leave of Absence.**

This is the College of Biological Sciences General Information and Degree Programs section of the 2006-2008 Undergraduate Catalog for the University of Minnesota, Twin Cities campus.

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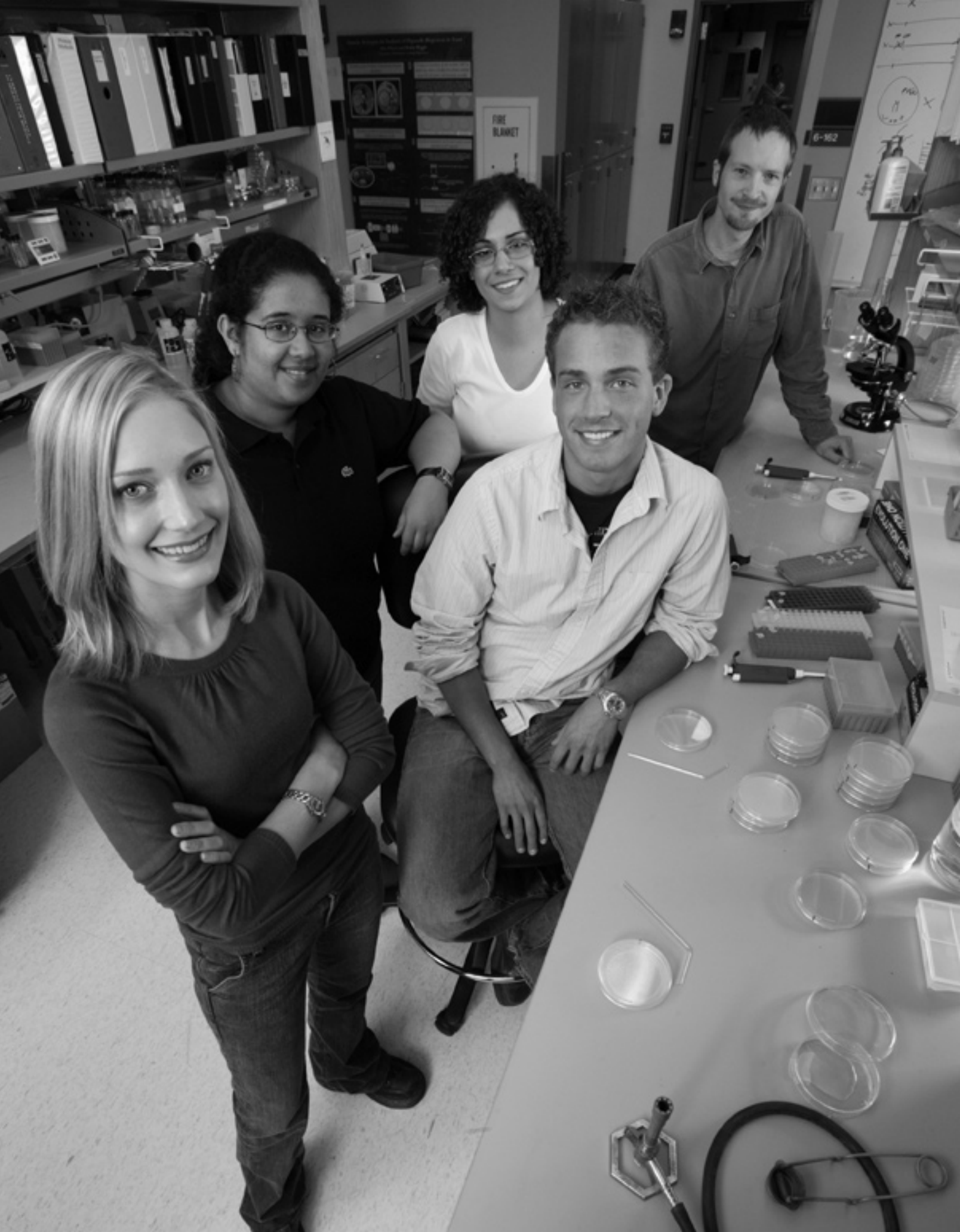
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College of

Biological Sciences

General Information

The mission of the College of Biological Sciences (CBS) is to advance knowledge of the mechanisms of life through breakthrough discoveries and prepare today's students to create the biology of tomorrow. To accomplish this mission, the college integrates a strong basic research program with both traditional and innovative classroom teaching and with intensive mentoring of students at all levels.

Admission

Admission to the College of Biological Sciences is competitive. Decisions are based on an overall assessment of each applicant's accomplishments and potential as presented in the application materials. New freshmen are admitted once a year in the fall. Transfer students are admitted at any point in their course of study and can enter either fall or spring semesters. Admission of transfer students is also based on overall assessment of their application and usually requires satisfactory completion of prerequisite coursework and/or a record of past academic success in the sciences. All prospective students are encouraged to visit campus and meet with admissions. For more information, see the Office of Admissions Web site at http://admissions.tc.umn.edu.

Requirements

Freshman Admission Requirements

For official and up-to-date information about the University's admissions policies, procedures, and deadlines, please see the latest edition of the Undergraduate Application Booklet available from the Office of Admissions or online at http://admissions.tc.umn.edu.

Admission requirements for students transferring from within the University of Minnesota:

1. 2.00 or higher grade point average (GPA) and grades of at least C- in the following courses is usually required:
   a. BIOL 1009 or 1001 or equivalent
   b. CHEM 1021 or equivalent
   c. MATH 1271 or 1281 or equivalent
2. Prerequisite courses must usually be completed at the time of application, with the following exception: students with a 3.00 or higher GPA may be admitted with two of the three prerequisite courses completed and the last prerequisite course in progress (courses in progress during summer session are not included). For specific transfer information visit the CBS Web site at www.cbs.umn.edu or call 612-624-9717.

Admission requirements for transfer students from higher education institutions other than the University of Minnesota:

The College of Biological Sciences (CBS) admits qualified transfer students to all of its majors. Admission is competitive and based on an overall assessment of the applicant's academic record and potential for success as presented in the application materials. Completion of science-related courses will be viewed as important evidence of preparation and interest in studying biology.

Primary review factors include cumulative GPA and course grades in science-related courses, such as calculus, chemistry, and biology. Secondary review factors include grade trends, completion patterns, and biology-related lab or field research experience. High school grades, class rank and ACT or SAT scores may also be factored into the admission decision for students who have completed fewer than 26 transferable credits.

Most successful CBS applicants have completed one semester each of calculus, chemistry, and biology.

Priority consideration is given to students who intend to complete a degree program in CBS. Students who have previously completed bachelors degrees and wish to complete prerequisites for professional or graduate schools should strongly consider completing coursework as non-degree-seeking students through the College of Continuing Education.

Visit the CBS Web site at www.cbs.umn.edu/studentservices/transfercredits.html to find specific transfer information and course equivalencies for chemistry, math, and physics, or call 612-624-9717.

Applications to the University of Minnesota, Twin Cities may be requested from the Office of Admissions (612-625-2008) or toll free in the United States (1-800-752-1000).

For more information, contact the Office of Student Services (612-624-9717).

Beginning College in Biological Sciences

If you're about to begin college and think biology may be your area of interest, there are some important questions you need to consider. (If you've already completed one or two years of college work and are thinking of transferring to the University of Minnesota, see Transfer Admission in the General Information section of this catalog.)

How do I know if biology is a good choice for me?

Some students have always had an interest in biology. Others were inspired to learn more about biology by a special teacher or course in high school. Some see biology as a step toward a career in medicine or preserving the environment; others think they may have a strong interest, but want to learn more. If you fall into one of these categories and have a strong high school background in science and math, consider the following questions.

Is biology a good choice right now? Do biology careers look promising for the future?

Thanks to advances such as the sequencing of the human genome and the development of new biotechnologies, biology is playing an increasingly important role in health, agriculture, the environment, the economy, and society in general. New career opportunities are emerging in the biotechnology industry, government, and education. As a result, there has never been a better time to earn a degree in biology.

The University of Minnesota is a research university. What does this mean for undergraduates?

It means that faculty are engaged in federally sponsored research, which gives undergraduates many opportunities to gain research experience working with faculty in laboratories. It also means that many of your classes will be taught by leading researchers in their fields.

Do all students have the opportunity to be involved in research?

Most CBS students participate in research, choosing from opportunities in basic sciences, medicine, dentistry, pharmacy, veterinary medicine, agriculture, and natural resources. Hands-on experience in a laboratory or in the field is an essential part of the educational experience in CBS. Research experiences help students gain admission to competitive graduate programs, and many employers require candidates to have research or internship experience.

The University has a College of Biological Sciences rather than just a department. What does this mean for students?

As a college, CBS has a much larger faculty, more varied course offerings, and more services for biology students. Services for students include an honors program, research, internships, study abroad opportunities, and career services offered jointly with the Institute of Technology.

What if I'm not sure I want to major in biology? If I choose CBS now, will I have problems if I change my major later?

All undergraduates take general education courses, including biology. It is always possible to change your mind and transfer to another college, but this decision may affect your ability to graduate in four years. If you are undecided and considering several options, liberal education courses can help you explore a variety of interests.

Orientation

Before classes begin, all freshmen and transfer students are required to attend orientation. Orientation acquaints students with the campus and provides information about CBS and the University. Students spend part of the session with an adviser who helps them plan their undergraduate program.

Freshmen attend a two-day program that provides information for a successful beginning at the University. During the first day, students meet other incoming students while attending small group sessions about University of Minnesota programs. Advisers in CBS familiarize students with CBS programs, courses, and opportunities. CBS advisers also help students start planning their class schedule. During the second day, students register for fall semester classes.

Transfer Orientation is a one-day program designed to help students make a smooth transition to the University. During orientation new transfer students meet other CBS students, get acquainted with the Twin Cities campus, plan a schedule of classes, and register online. CBS offers a Web-enhanced orientation with a required online component before students attend the on-campus program.

Undergraduate Programs

Students choose CBS because it has high quality programs offered by professors who are nationally recognized researchers and educators. As students begin planning for a specific career, they should supplement their coursework with research experiences and internships to further develop their skills and prepare for their chosen professions. Students may also explore biology career interests through the biology colloquium, freshman seminars, and the Career Center for Science and Engineering.

The CBS bachelor of science degree program is composed of four essential elements. Each helps prepare students to be leaders in their chosen professions in an increasingly complex and interdisciplinary world.

I. Liberal Education—A liberal education gives students a broad perspective that strengthens judgment and critical thinking skills. Students develop communication skills, an understanding of the ways scientists and others contribute to knowledge, historical and philosophical perspectives on the world, and insights into life and nature provided by literature and the arts.

To help achieve these goals, the University requires all students to distribute a portion of their coursework in areas of study outside of those linked to their specialized interests in their major.

II. Physical Sciences and Mathematics—The biological sciences rely heavily on the tools of mathematics and physical science. Organisms consist of molecules that obey the rules of physics and chemistry; these rules are often described using mathematics. Modern biologists in the field and in the laboratory must be able to use principles of mathematics, chemistry, and physics to understand living organisms at all levels from molecules to ecosystems.

III. Biology Core Curriculum—Specialists will always be important in biology, but today there is a growing need for people whose understanding spans the disciplines of biology. CBS students are introduced to diverse aspects of biology by completing a set of core courses. Some courses introduce students to various kinds of organisms—animals, plants, and microorganisms. Biochemistry introduces students to organic compounds of importance to organisms, enzyme-catalyzed reactions, and metabolic pathways involved in the synthesis or catabolism of macromolecules. Cell biology provides an in-depth analysis of cellular structure and function. Genetics examines mechanisms of heredity, including molecular genetics and population genetics. Ecology, evolution, and behavior introduce students to populations, evolution, and the behavior of animals.

IV. Specialization in the Major—All seven major programs in CBS lead to the bachelor of science degree. Students may major in

- biology
- biochemistry
- ecology, evolution, and behavior
- genetics, cell biology, and development
- microbiology
- neuroscience
- plant biology

All CBS freshmen start as lower division students and choose one of the majors listed above at the end of their first year. During the first year, students take foundation courses in mathematics, chemistry, and general biology essential for success in any of the biological sciences majors. Transfer students declare a specific major when they begin their studies in CBS. During their junior and/or senior years, most students complete a research project in their area of interest by taking Directed Research (4994 and 4794W).

Graduate Programs

Graduate study at the University is coordinated and administered by the Graduate School. For information about general policies regarding admission requirements, registration procedures, financial aid, and requirements for graduate degrees, see the *Graduate School Catalog*. Application materials may be obtained from CBS department offices.

Questions regarding specific bioscience programs should be addressed to the director of graduate studies in the appropriate program area.

Biochemistry, Molecular Biology, and Biophysics— David LaPorte, 612-625-4983, and Claudia Schmidt-Dannert, 612-625-5782

Conservation Biology—Susan M. Galatowitsch, 612-624-3242

Ecology, Evolution, and Behavior—Andrew Simons, 612-624-6292

Genetic Counseling—Bonnie LeRoy, 612-624-7193

Joint Program in Law, Health, and Life Sciences— Susan Wolf, 612-625-3356

Microbial Engineering—Robert J. Brooker, 612-624-3053

Microbiology, Immunology, and Cancer Biology— Yoji Shimizu, 612-626-6849

Molecular, Cellular, Developmental Biology, and Genetics— Margaret Titus, 612-625-8498

Neuroscience—Paul Letourneau, 612-624-5999

Plant Biological Sciences—Carolyn Silflow, 612-624-0729

Water Resources Science—Ray Newman, 612-624-9282

Honors Program

The CBS honors program is designed for highly motivated students who want more challenging courses, closer contact with faculty, an extensive research experience, and a supportive academic community. Students in honors choose from dozens of honors courses and benefit from special co-curricular events and extended library privileges.

Freshman-Sophomore Program—During the first two years, students are strongly encouraged to explore research opportunities and to complete at least two honors courses per year. First-year students participate in early orientation sessions and a Nature of Life honors focus session during the summer. Honors students may choose to live in the CBS Honors Living and Learning Community in Middlebrook Hall.

Students apply to the honors program when they apply to the University by completing the *Application for Scholarships and Honors Programs*. Admission is based on high school grades, coursework, standardized test scores, an essay, extracurricular involvement, evidence of leadership, and a letter of recommendation. Application forms are available in the Office of Admissions and online at http://admissions.tc.umn.edu/apply/.

Students who complete the honors program course requirements and achieve a minimum cumulative GPA of 3.50 receive a certificate and a notation on their transcript after the second year. The requirements to complete the freshman-sophomore program include:

1. a freshman seminar during the first year,
2. two honors courses in any subject, and
3. BIOL 2960H, the CBS honors colloquium, during fall semester of the second year.

Junior-Senior Program—The junior-senior honors program focuses on a directed research project, which is presented in a written thesis and at the Undergraduate Research Symposium. Seniors participate in a two-semester sequence of capstone seminars, in which they explore the breadth of biological inquiry and have opportunities to refine their communication skills. Admission to the upper division honors program is based on grades earned during the first two years of college and does not require participation in the freshman-sophomore program. Students with a 3.50 GPA are eligible to apply to upper division honors upon completion of 60 college credits. Participants are encouraged to select a research adviser from University faculty and start on a research project early in their junior year.

Graduation With Honors—To qualify for a degree "with honors" (e.g., *cum laude*), a student must have completed 60 or more semester credits at the University of Minnesota and be enrolled in the upper division honors program for at least two semesters. In addition to the requirements for graduation, candidates for graduation with honors must complete the following:

1. two semesters (6 credits) of directed research, the results of which are reported in an honors thesis, written in the style of a publishable manuscript. The thesis must be approved by the faculty research adviser and by two other faculty (at least one of whom must be from CBS).
2. two semesters of CBS honors seminars (BIOL 3960H), one of which must be completed during the fall semester and the other during the last spring semester in residence.
3. one additional honors research opportunity, which may be selected from

   a. an additional semester (or 2 credits) of participation in directed research

   b. an upper division honors course or seminar (3xxx-4xxx)

   c. a graduate-level course (seniors only; requires permission)
4. achieve a GPA for the last 60 credits of A-F registration of 3.750 for *summa cum laude*, 3.666 for *magna cum laude*, and 3.500 for *cum laude*.

   a. The last 60 credits include all courses taken in the earliest term included in this calculation.

   b. If a portion of the last 60 credits has been transferred from another institution, the proportion of residence credits with grades of A must at least equal the proportion of transfer credits with grades of A.

Graduation With Distinction—A student may obtain a degree with both honors and distinction. To qualify for a degree "with distinction," a student must have completed 60 or more semester credits at the University and have a cumulative GPA of 3.75 or higher. To graduate "with high distinction," a student must have a cumulative GPA of 3.90 or higher.

For More Information—For information and application materials, please refer to the honors program Web site at http://www.cbs.umn.edu/studentservices/honors. Students may also inquire about the honors program with a CBS adviser or honors staff member (612-624-9717).

Advising

To help students navigate the University and take advantage of these opportunities, current and prospective students are served by the advising services, resources, and programs provided by CBS Office of Student Services. CBS academic advising helps students develop meaningful educational plans that are compatible with their long-term goals.

First-year students and transfer students are assigned to a professional adviser in CBS Student Services. Students meet with their adviser during fall semester of their first year and spring of their sophomore year to review academic progress, plan course schedules, and learn about additional college and University resources. During their second year of study, CBS students are also assigned to a faculty mentor in their particular area of interest. Professional advisers continue to assist all CBS students with setting goals, selecting courses, developing skills, and interpreting and navigating University rules and policies throughout their academic careers.

In addition to academic advising, the Office of Student Services coordinates undergraduate admission, provides student orientation and registration programs, offers academic progress

review, updates APAS reports, and evaluates student records for degree certification.

Program Planning—Students should meet with their faculty mentor each year to evaluate and plan their academic program. Students consult their faculty mentors regarding courses specific to their major, graduate study, planning internships, or arranging directed research in laboratory and field settings.

Special Learning Opportunities and Resources

Students are encouraged to explore the full scope of learning experiences available at the University, including those beyond the required curriculum. Many students plan projects they carry out under faculty supervision in research laboratories and at environmental field stations. Some students participate in off-campus internships in private industry, government agencies, and nonprofit organizations. Other students seek employment as undergraduate teaching and research assistants or museum tour guides.

Nature of Life—Incoming freshmen are required to take a class at the Itasca Biological Station and Laboratories. At Itasca, students explore some of the major issues in biology, learn about ways of discovery in various fields of biology, and begin to see the interdisciplinary nature of the field. In addition, they get to know each other and many CBS faculty and staff, leaving Itasca with new friends and a better understanding of how to make the most of their CBS experience. Follow-up activities during fall semester continue to build a sense of community and connection among students and faculty.

Biology House—Biology House, located in Frontier Hall, combines residence hall life with social and academic opportunities for students interested in the biological sciences. Activities include social events, lab tours and field trips, study groups, on-site advising, faculty and student research presentations, and career exploration. Space in Biology House is limited to incoming freshmen and PSEO students, and applicants are encouraged to apply early for admission to this community. For more information, visit the Housing and Residential Life Web site at www.housing.umn.edu.

New Student Reception—This annual welcome event helps new students connect with CBS departments, majors, clubs, and research opportunities.

Biology Colloquium (BIOL 1020)—This unique course, organized and run by students, provides an opportunity to explore a variety of fields and careers in the biological sciences. The course offers large group seminars, featuring prominent scientists discussing their research programs, and small group tours to research facilities on and off campus, such as the Raptor Center, the International Wolf Center in Ely, or behind-the-scenes at the Minnesota Zoo.

Freshman Seminars—These discussion-focused small classes are taught by the University's finest faculty. Students explore exciting topics and also learn more about the wide range of services and opportunities available at the University.

The College of Biological Sciences Alumni/Student Mentor Program—This program provides an opportunity for CBS students to connect one-to-one with an alumnus or friend of the college for career exploration, planning, and networking. Mentors advise about career-related issues such as career options, the value of networking and gaining work experience, resume writing, and interviewing skills. Mentors also provide feedback and support to help students succeed in their chosen fields.

Multicultural Affairs—CBS and its constituent programs are committed to providing equal access to educational opportunities while promoting diversity and fostering successful academic experiences. Diversity encompasses many characteristics that are inclusive of economic or educational disadvantage, special talents, leadership qualities, race or ethnicity, disability, sexual orientation, and gender identification.

Achieving College Excellence in the Sciences (ACES)—This structured multicultural honors tutorial program for high-achieving students in mathematics or science whose long-term plans include attending professional or graduate programs in the life sciences. Freshmen in ACES have the opportunity to receive individualized attention from distinguished faculty through a SEAM (Student Excellence in Academics and Multiculturalism) freshman seminar: Success on the Road to Medical School or Graduate Programs in the Science Community. Additionally, graduate student mentors help students earn A's and B's in University mathematics and science courses.

Internships for credit—Students can earn internship credit by registering for BIOL 3610 - Internship: Professional Experience in Biological Science.

Recent internships involved:

- developing plastics from renewable resources at a new biotech company
- assisting with dolphin care and training at a local aquarium
- researching new forensic science techniques in a criminal identification lab
- organizing volunteers for tissue donor programs
- assisting high school biology teachers
- helping develop a groundwater monitoring program
- researching the needs of people with neurological injuries

Undergraduate Research—As part of a large public research university, CBS offers a wealth of opportunities for hands-on research experience. Most students complete an independent research project under the supervision of a faculty member. All students are invited to present their research at the Undergraduate Research Symposium, which is held annually in the spring. Opportunities to get involved in research include volunteer experiences, directed research for academic credit, part-time jobs, and special grants through the Undergraduate Research Opportunities Program. Information about research opportunities and resources for finding a faculty mentor are available at www.cbs.umn.edu/studentservices/research.html.

Scholarships—CBS offers a variety of scholarships to new and continuing students based on academic achievement, leadership, research experience, and humanitarian service. Scholarship information, deadlines, and application materials are available at www.cbs.umn.edu/studentservices/scholarships.html.

Career Information

Biology encompasses many fields and appeals to students with diverse interests. Career avenues are equally broad, including employment by scientific research and testing laboratories, pharmaceutical and medicine development industries, health-care related organizations, and federal, state, or local government agencies.

According to the Bureau of Labor Statistics, employment of biological scientists is projected to grow over the next ten years and beyond, as biotechnological research and development continue to drive job growth. The outlook for science-related jobs in sales, marketing, and research is also very good.

CBS majors prepare students for careers in many different fields of research. For example, CBS students can participate in research related to health issues such as AIDS, cancer, Alzheimer's disease, obesity, and heart disease. Students assist in the development of bio-based products and methods that help protect and improve the environment. Students learn about new industrial applications of biotechnology and how to improve agricultural products.

Many students study biology to prepare for professional training in the health sciences. Because entry requirements for the health sciences generally include courses similar to those required in CBS (mathematics, chemistry, physics, and biology), a CBS major provides a good foundation in pre-medicine, pre-pharmacy, pre-dentistry, and other health fields. In fact, nearly a third of CBS graduates each year continue their education in health fields including medicine, dentistry, pharmacy, veterinary medicine, and public health.

Some students combine their training in the biological sciences with other fields, such as engineering, graphic arts, law, business, or computer technology. Those graduates who choose to continue their study are regularly admitted to high-quality or highly ranked graduate schools and professional programs.

The Career Center for Science and Engineering provides resources and services for students at all levels to explore career options and prepare for professional success in the multitude of bioscience-related careers available to CBS and IT graduates. The Career Center provides assistance to undergraduates and alumni.

These resources include career advising, job search assistance, workshops on resume writing, professional networking, and interview preparation. The Career Center also provides employer and company information, publicizes current job openings, arranges on-campus interviews, and keeps updated information on salaries, employment outlook, and hiring trends

More information is available at www.ccse.umn.edu or by calling the Career Center for Science and Engineering at 612-624-4090.

Student Organizations

CBS student groups provide opportunities to learn more about research, careers, and leadership in the sciences. Participation is open to all University students. For more information, visit the Student Activities Office Web site at www.sao.umn.edu or call CBS Student Services at 612-624-9717.

AED—Alpha Epsilon Delta (AED), the pre-med honor society, is for anyone who is considering becoming a physician in the future. Members meet other pre-med students and learn about how to prepare for a career in medicine.

American Medical Student Association (AMSA) Pre-med Chapter—AMSA is a national pre-med student group that helps students connect with others who share their interests in the health sciences and helps prepare them for medical school and the MCAT.

Ambassador Program—Selected students have the opportunity to promote the opportunities available within the college and the University to other students and the community by participating in college-sponsored outreach activities and working with prospective students. This program provides leadership and skills development training.

Biochemistry Club—This club strengthens ties between biochemistry students and faculty, provides personalized career guidance, helps undergraduates identify biochemistry labs for directed research, and keep abreast of advances in biochemistry.

Biology Club—This organization promotes interest in undergraduate study in biology at the University. This club helps biology majors explore their options, the major, and learn about other CBS majors early in their academic careers. Fields of research, career possibilities, and unique educational experiences are also showcased at club meetings.

Biological Sciences Alumni Society (BSAS)—BSAS is a professional association for CBS graduates that fosters relationships among alumni, students, faculty, and the community. Enhancing student opportunities is a top priority of BSAS. Toward that end, BSAS sponsors scholarships, research and internship grants, and a mentor program. Additionally, alumni work with the CBS Career Center to develop the Career Network, an innovative program that enables students and graduates to explore career options. For more information, contact Kristen Denzer, alumni relations coordinator at 612-624-4770 or stop by 123 Snyder Hall.

Headwaters Ecology Club—The Headwaters Ecology Club promotes interest in undergraduate study in ecology, evolution, and animal behavior through social, educational, and volunteer events. An important focus of the Headwaters Ecology Club is to promote the unique educational opportunities available through the Itasca Biological Station and Laboratories, and other national and international field biology programs.

Forensic Science Club—This club organizes events, field trips, information, and guest speakers for members of the University community interested in forensic science.

Genetics, Cell Biology, and Development Club—Students formed this club to bring together students, faculty, and staff interested in these disciplines. Members enjoy speakers, educational experiences, and social activities.

Microbiology Club—This club provides a forum in which students and faculty can meet informally to share common interests in microbiology. Members are officially part of the Student Chapter of the American Society for Microbiology (ASM), which provides information on microbiology lectures, meetings, seminars, and local job listings. Activities include discussions of microbiological issues, social events, and visits to local employers.

Neuroscience Club—The Neuroscience Club promotes interest in undergraduate neuroscience study and research at the University of Minnesota. Club activities include lab tours, study groups, participation in Department of Neuroscience outreach projects—such as Brain Awareness Week—and faculty-student meetings. Club members meet informally every other week; undergraduates interested in neuroscience are encouraged to participate.

Pre-Dental Club—Students learn about preparing to become a dentist , the practice of dentistry, opportunities at the University and the American Student Dental Association, and meet other students with common interests.

Pre-Pharmacy Club—Students learn more about becoming a pharmacist and the practice of pharmacy. They are introduced to opportunities at the University and meet other students who share an interest in pharmacy.

Student Board—The CBS Student Board works collaboratively with the CBS administration, departments, and student organizations, builds community and connections among CBS students, and serves as the official student representation to the CBS Administration.

International Programs

CBS encourages all students to consider an international experience as part of their undergraduate program. Many unique opportunities exist for students to study abroad in the biological sciences. Study abroad can help students gain field experience in different ecosystems, learn international perspectives in biology, develop laboratory research skills in an academic setting, enhance communication and problem-solving skills, and prepare for a career in the ever expanding global market.

Internships, volunteer experiences, and academic programs are available to help students prepare for careers in health care, academic, industry, or the public sector. Students are also encouraged to consider how an experience abroad might enhance language learning or help them make progress toward liberal education or major requirements.

For more information, contact the Learning Abroad Center at 612-626-9000 or visit the Web site at www.UMabroad.umn.edu.

Graduation Requirements

To earn a B.S. degree from CBS, students must meet the following requirements:

- Be admitted to a CBS degree program or major and complete all campus, college and program requirements with a minimum GPA of 2.00 in the major and a cumulative GPA of 2.00 or higher in all University coursework.
- Complete at least 120 credits; grades of C- or better are required in the math, chemistry, physics, or biological sciences courses used to meet requirements for the major.
- S grades are not allowed in major courses unless the course is only offered S-N.
- Have at least 30 semester credits from the University.
- Earn at least 15 of their last 30 credits from courses offered by the University.

Students must apply for graduation by submitting an Application for Degree online. CBS students may apply to clear for graduation after fall, spring, May, or summer session. There is no fee to apply for the degree, and students need to apply for graduation only once and update their application online if graduation is delayed for any reason. Students are strongly encouraged to apply a few semesters in advance of the desired semester of graduation. Procedures and forms for submitting applications for degree can be found at www.onestop.umn.edu /onestop/graduating.html.

Research and Teaching Facilities

CBS has research and teaching facilities on the Minneapolis and St. Paul campuses, and operates two field stations.

Biodale, CBS's one-stop shopping center for research support services, houses $40 million in bioscience research equipment that is available to faculty, students, and industry scientists. Facilities include the Imaging Center, which provides low-cost printing for research posters. Biodale is located in Snyder Hall on the St. Paul campus.

The Biological Sciences Greenhouse is part of a new complex of plant growth facilities on the St. Paul campus that were completed in 2005. The CBS greenhouse is a teaching and research facility with four landscaped rooms that exhibit the flora of the tropics, subtropics, desert, and aquatic regions.

The Biotechnology Institute (BTI) in Gortner Laboratories on the St. Paul campus brings together faculty and students from CBS, Institute of Technology, and Medical School for interdisciplinary research and training in emerging areas of biotechnology such as biocatalysis, renewable energy and materials, bioremediation of toxic waste, and creation of new biological agents for use in medicine and industry. BTI promotes collaboration between University researchers and industry and trains students for Minnesota's growing biotechnology industry. Visit www.bti.umn.edu.

The Cargill Building for Microbial and Plant Genomics opened in 2003 and provides a hub for researchers from several schools. Faculty conduct basic research in functional genomics of microbes and crop plants to identify innovative ways to make crops more resistant to disease and drought, clean up the environment, and improve human health.

Cedar Creek Natural History Area is a 5,400-acre ecological research site located 30 miles north of the Twin Cities, at the convergence of three large North American biomes: grass prairies, evergreen forests, and deciduous forests. Discovered in 1930, it has been nationally known as an important site for ecology research since the early 1940s. Today, Cedar Creek is a living laboratory for David Tilman, Regents Professor of Ecology, who studies human impact on biodiversity in global ecosystems.

Long-term experiments at Cedar Creek examine three of the most significant human alterations to the biosphere: increased carbon dioxide in the air, increased nitrogen in land and water from fertilizers, and reduced biodiversity. All three factors affect the performance of global ecosystems.

The number of faculty and students who work at Cedar Creek has increased tenfold over the past 20 years. To accommodate this growth, a new 12,000-square-foot Science and Outreach Center is planned. The center will include new labs, classrooms, meeting space and an exhibit area. New housing for students and visiting faculty is also planned.

More information is available at www.lter.umn.edu.

Itasca Biological Station and Laboratories is a CBS field station within Itasca State Park, which is located at the headwaters of the Mississippi. The most visited park in the state, Itasca offers 50 square miles of pristine ecosystems populated with Minnesota's native flora and fauna and a spectacular collection of clear lakes, peat bogs, and old-growth forests.

The complex of 70 rustic buildings at the field station includes cabins, laboratories, a library, dining hall, and offices. In 2005, CBS launched "Habitat for Biologists" a fundraising campaign to restore historic cabins and build new laboratories and other facilities.

Nature of Life, CBS' annual class for incoming freshmen, is held at Itasca every year in July and August. Several graduate programs also offer orientation sessions at Itasca. Field biology classes are offered to students from the University of Minnesota and other schools. See http://biosci.cbs.umn.edu/itasca for a description of courses and facilities.

In addition, Itasca is training headquarters for the Science Education Program for Greater Minnesota, which provides programs to recruit and retain science teachers for secondary schools in greater Minnesota. Visit www.cbs.umn.edu/main /resources/ScienceEducation.htm.

Jane Goodall Institute's Center for Primate Studies is the University of Minnesota branch of Jane Goodall's worldwide organization, which is devoted to studying and protecting chimpanzees. Anne Pusey, a former student of Goodall's, is director of the center and of the JGI international research program. The center houses all of Goodall's notebooks and photos from her 38 years of research in Tanzania's Gombe National Park. Visit www.discoverchimpanzees.org.

The Molecular and Cellular Biology Building is a state-of-the-art facility for life sciences research and education shared by the College of Biological Sciences and the Medical School. This building opened in 2002 and has four floors of faculty research laboratories and two floors of biology classrooms and instructional laboratories.

University Enterprise Laboratories (UEL) is a nonprofit entity that provides lab space for biotech start-up companies. Located in the heart of the St. Paul Bioscience Zone, UEL celebrated its grand opening in October 2005. Sponsors include Xcel Energy, 3M, Allina, Medtronic, Boston Scientific, Dorsey & Whitney, Ecolab, Guidant Corporation, and Surmodics. Visit www.uelmn.org.

Directory

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Huber Warner, associate dean, warne033@umn.edu
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223 Snyder Hall (St. Paul)
612-624-9717
Jean M. Underwood, director, jmunder@umn.edu
Sarah Ihrig, sihrig@umn.edu
Sara Georgeson, ivers048@tc.umn.edu
Sara Johnson, john6461@umn.edu
Jessica Murra, murra044@umn.edu
Patrick Sherman, psherman@umn.edu

Biology Colloquium

305 Bell Museum of Natural History (Mpls.)
612- 626-1674
Kathryn Hanna, k-hann@umn.edu

Career Center for Science and Engineering

50 Lind Hall
612-624-4090
ccse@umn.edu

Honors Program

223 Snyder Hall (St. Paul)
612-624-9717
Sarah Corrigan, assistant director, hunta001@umn.edu

International Education

123 Snyder Hall (St. Paul)
612-624-2244
Judson Sheridan, sheri012@umn.edu

Internship Program

50 Lind Hall
612-624-4090
ccse@umn.edu

Multicultural Affairs

223 Snyder Hall (St. Paul)
612-625-8634
Catherina Kipper, wongx005@umn.edu

Nature of Life Program

223 Snyder Hall (St. Paul)
612-624-9717, nol@cbs.umn.edu

Science Education Partnership in Greater Minnesota

123 Snyder Hall (St. Paul)
612-625-4718
Ken Jeddeloh, jedde001@umn.edu

Departments, Institutes, and Programs

Alumni Relations

123 Snyder Hall (St. Paul)
612-624-4770
Kristen Denzer, denz0018@umn.edu

Biochemistry, Molecular Biology, and Biophysics

140 Gortner Laboratory of Biochemistry (St. Paul)
612-624-7755
6-155 Jackson Hall (Mpls.)
612-625-6100
David Bernlohr, head, bernl001@umn.edu

Master of Biological Sciences

123 Snyder Hall (St. Paul)
612-625-3133
James Fuchs, faculty adviser, fuchs001@umn.edu
Carol Gross, coordinator, gross008@umn.edu

BioTechnology Institute

240 Gortner Laboratory of Biochemistry
(St. Paul)
612-624-6774
Kenneth Valentas, director, valen004@umn.edu

CBS Computing Services

612-625-9284
Fred Dulles, director, dulles@umn.edu

Cedar Creek Natural History Area

509 Ecology Building (St. Paul)
612-625-5740
Cedar Creek area
763-434-5131
G. David Tilman, director, tilman@umn.edu
Jeff Corney, associate director, jcorney@umn.edu

Developmental Biology Center

4-122 Malcolm Moos Health Sciences Tower (Mpls.)
612-625-0642
Scott B. Selleck, director, selle011@umn.edu

Ecology, Evolution, and Behavior

100 Ecology Building (St. Paul)
612-625-5700
Claudia Neuhauser, head, neuha001@umn.edu

Electronic Instrument Services

25 Biological Sciences Center (St. Paul)
612-625-6745
Gary Newstrom, manager, eis@umn.edu

General Biology Program

3-140 Molecular Cellular Biology (Mpls.)
612-625-6636
Susan Wick, director, swick@umn.edu

Genetics, Cell Biology, and Development

250 Biological Sciences Center (St. Paul)
624-3003 and 6-160 Jackson Hall (Mpls.)
612-624-3110
gcd@umn.edu
Brian Van Ness, head, vanne001@umn.edu

Imaging Center

35 Snyder Hall, (St. Paul)
612-624-3454
Mark Sanders, director, msanders@umn.edu

Institute of Human Genetics

4-122 Malcolm Moos Health Sciences Tower (Mpls.)
612-625-1609
Harry Orr, director, orrxx002@umn.edu

Instructional Computing Center

406 Biological Sciences Center and 170 Ecology (St. Paul)
2-585 Moos Tower (Mpls.)
612-624-2789

Instructional Labs

123 Biological Sciences Center (St. Paul)
612-624-2789
Jane Phillips, coordinator, janep@umn.edu

Itasca Biology Program

720 Biological Sciences Center (St. Paul)
612-624-6743
David Biesboer, director, biesboer@umn.edu
Erin Fider, fider002@umn.edu

Microbiology (Medical School)

1460 Mayo Memorial Building (Mpls.)
612-624-6190
Ashley T. Haase, head, haase001@umn.edu

Neuroscience

6-145 Jackson Hall (Mpls.)
612-626-6800
Timothy J. Ebner, head, ebner001@umn.edu

Plant Biology

220 Biological Sciences Center (St. Paul)
612-625-1234
Peter Snustad, head, snust001@umn.edu

Microbial and Plant Genomics Institute

122 Cargill Building for Microbial and Plant Genomics (St. Paul)
612-624-6269
Neil Olszewski, co-director, neil@umn.edu
Michael Sadowsky, co-director, sadowsky@umn.edu

Directors of Undergraduate Studies

Biochemistry

158 Gortner Laboratory of Biochemistry
(St. Paul)
612-625-4928
Paul Siliciano, pauls@umn.edu

Biology

123 Snyder Hall (St. Paul)
612-624-2244
Robin L. Wright, wrightr@umn.edu

Ecology, Evolution, and Behavior

412 Ecology Building (St. Paul)
612-625-5296
Franklin Barnwell, fhb@umn.edu

Genetics, Cell Biology, and Development

250 Biological Sciences Center
(St. Paul)
612-624-5399
Michael Simmons, simmo004@umn.edu

Microbiology

1435 Mayo Memorial Building (Mpls.)
612-624-9933
Leslie Schiff, schif002@umn.edu

Neuroscience

6-145 Jackson Hall (Mpls.)
612-625-7623
Martha Flanders, fland001@umn.edu

Plant Biology

768 Biological Sciences Center
(St. Paul)
612-625-2761
D. Peter Snustad, snust001@umn.edu

Degree Programs and Minors

Biochemistry B.S.

Biochemistry, Molecular Biology, and Biophysics

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120

Required credits within the major: 70

This program requires summer terms

Degree: Bachelor of Science

Biochemists study molecules found in living organisms, particularly proteins, nucleic acids, lipids, and carbohydrates. Biochemistry majors focus their studies on the biosynthesis, metabolism, function, and regulation of these molecules of life. This information is essential to gain an understanding of many biological processes, including how diseases like cancer and diabetes develop, and to learn how genetic engineering and biotechnology can be used in ways that benefit society.

Earning a B.S. in biochemistry prepares majors for graduate study in biochemistry or other biological sciences; professional training programs in the health sciences; careers in teaching; and entry-level positions in industry, agencies, and universities.

Biochemistry is an experimental science, and majors, especially those planning to pursue graduate studies in the field, should become acquainted with laboratory research approaches beyond those in the formal lab courses. Research options are available through BIOC 4994 or BIOC 4794W. Students should consult early with their faculty mentor to begin planning the research component of their major.

Program Requirements

Introductory Biology

Choose either Sequence A or Sequence B to fulfill the General and Organismal Biology requirement. Sequence A is preferred. If Sequence A is chosen, take one organismal course or course pair. Sequence B has two options for completing the requirements.

Students are required to complete one of the following course groups.

Sequence A (Preferred)

BIOL 1001 - Introductory Biology I: Evolutionary and Ecological Perspectives, BIOL SCI/L, ENVT (4.0 cr)

BIOL 1002W - Introductory Biology II: Molecular, Cellular, and Developmental Perspectives, WI (5.0 cr)

-OR-

Sequence B

Take BIOL 1009 and choose from animal biology, plant biology, or microbiology course groups.

BIOL 1009 - General Biology, BIOL SCI/L (4.0 cr)

Animal Biology

BIOL 2012 - General Zoology (4.0 cr)

or

take the following course pair

BIOL 3211 - Animal Physiology (3.0 cr)

BIOL 2005 - Animal Diversity Laboratory (1.0 cr)

or

Botany or Plant Biology

BIOL 2022 - General Botany (3.0 cr)

or BIOL 3007W - Plant Biology: Diversity and Adaptation, WI (4.0 cr)

or

Take all of the following in the same term:

BIOL 3002 - Plant Biology: Function (2.0 cr)

BIOL 3005W - Plant Function Laboratory, WI (2.0 cr)

or

Microbiology

BIOL 2032 - General Microbiology with Laboratory (4.0 cr)

or MICB 3301 - Biology of Microorganisms (5.0 cr)

or VBS 2032 - General Microbiology with Laboratory (4.0 cr)

Required Courses

Physical Science and Mathematics

Chemistry

CHEM 1021 - Chemical Principles I, ENVT, PHYS SCI/L (4.0 cr)

CHEM 1022 - Chemical Principles II, ENVT, PHYS SCI/L (4.0 cr)

CHEM 2301 - Organic Chemistry I (3.0 cr)

CHEM 2302 - Organic Chemistry II (3.0 cr)

CHEM 2311 - Organic Lab (4.0 cr)

BIOC 4521 - Introduction to Physical Biochemistry (3.0 cr)

or

take the following course pair

CHEM 3501 - Physical Chemistry I (3.0 cr)

CHEM 3502 - Physical Chemistry II (3.0 cr)

Mathematics

MATH 1271 - Calculus I, MATH (4.0 cr)

or MATH 1281 - Calculus with Biological Emphasis I, MATH (4.0 cr)

MATH 1272 - Calculus II (4.0 cr)

or MATH 1282 - Calculus With Biological Emphasis II (4.0 cr)

Physics

PHYS 1201W - Introductory Physics for Biology and Pre-medicine I, PHYS SCI/L, WI (5.0 cr)

or PHYS 1301W - Introductory Physics for Science and Engineering I, PHYS SCI/L, WI (4.0 cr)

PHYS 1202W - Introductory Physics for Biology and Pre-medicine II, PHYS SCI/L, WI (5.0 cr)

or PHYS 1302W - Introductory Physics for Science and Engineering II, PHYS SCI/L, WI (4.0 cr)

Major Courses

Take BIOL 4003 and 4004, and choose one course or course pair from the remaining courses. MICB 3301 is preferred. Selected course(s) may not count towards the organismal requirement in Sequence B.

Biochemistry

BIOC 3960 - Research Topics in Biochemistry (1.0 cr)

BIOC 4025 - Laboratory in Biochemistry (2.0 cr)

BIOC 4331 - Biochemistry I: Structure, Catalysis, and Metabolism in Biological Systems (4.0 cr)

BIOC 4332 - Biochemistry II: Molecular Mechanisms of Signal Transduction and Gene Expression (4.0 cr)

BIOL 4003 - Genetics (3.0 cr)

BIOL 4004 - Cell Biology (3.0 cr)

MICB 3301 - Biology of Microorganisms (5.0 cr)

or BIOL 3007W - Plant Biology: Diversity and Adaptation, WI (4.0 cr)

or BIOL 3407 - Ecology, ENVT (3.0 cr)

or BIOL 3409 - Evolution (3.0 cr)

or BIOL 3411 - Introduction to Animal Behavior (3.0 cr)

or BIOL 3807 - Ecology, ENVT (4.0 cr)
or BIOL 3811 - Introduction to Animal Behavior (3.0 cr)
or

Animal Physiology
BIOL 3211 - Animal Physiology (3.0 cr)
BIOL 2005 - Animal Diversity Laboratory (1.0 cr)
or
PHSL 3051 - Human Physiology (4.0 cr)
BIOL 2005 - Animal Diversity Laboratory (1.0 cr)
or
BIOL 2005 - Animal Diversity Laboratory (1.0 cr)
PHSL 3061 - Principles of Physiology (4.0 cr)
or

Plant Biology
BIOL 3002 - Plant Biology: Function (2.0 cr)
BIOL 3005W - Plant Function Laboratory, WI (2.0 cr)
or BIOL 3007W - Plant Biology: Diversity and Adaptation, WI (4.0 cr)

Electives
Electives may not be used to fulfill other major requirements. One course must include an upper division CBS laboratory experience.

Take 6 or more credit(s) from the following:
BIOC 4125 - Laboratory in Molecular Biology and Biotechnology (3.0 cr)
BIOC 4794W - Directed Research: Writing Intensive, WI (1.0-7.0 cr)
BIOC 4994 - Directed Research (1.0-7.0 cr)
BIOL 3007W - Plant Biology: Diversity and Adaptation, WI (4.0 cr)
EEB 4014W - Ecology of Vegetation, WI (3.0 cr)
EEB 4016W - Ecological Biogeography, WI (3.0 cr)
EEB 4129 - Mammalogy (4.0 cr)
EEB 4134 - Introduction to Ornithology (4.0 cr)
EEB 4605 - Limnology Laboratory (1.0 cr)
EEB 4607 - Plankton Ecology (4.0 cr)
EEB 4794W - Directed Research: Writing Intensive, WI (1.0-7.0 cr)
EEB 4994 - Directed Research (1.0-7.0 cr)
FW 3136 - Ecology of Fishes (4.0 cr)
GCD 4015 - Genetics Laboratory (2.0 cr)
GCD 4025 - Cell Biology Laboratory (2.0 cr)
GCD 4111 - Histology: Cell and Tissue Organization (4.0 cr)
GCD 4794W - Directed Research: Writing Intensive, WI (1.0-7.0 cr)
GCD 4994 - Directed Research (1.0-7.0 cr)
MICB 3301 - Biology of Microorganisms (5.0 cr)
MICB 4215 - Advanced Laboratory: Microbial Physiology and Diversity (3.0 cr)
MICB 4235 - Advanced Laboratory: Virology, Immunology, and Microbial Genetics (3.0 cr)
MICB 4794W - Directed Research: Writing Intensive, WI (1.0-7.0 cr)
MICB 4994 - Directed Research (1.0-7.0 cr)
NSCI 4794W - Directed Research: Writing Intensive, WI (1.0-7.0 cr)
NSCI 4994 - Directed Research (1.0-7.0 cr)
PBIO 4321 - Taxonomy of Minnesota Flora (3.0 cr)
PBIO 4404 - Developmental Plant Anatomy (3.0 cr)
PBIO 4511 - Flowering Plant Diversity (3.0 cr)
PBIO 5416 - Plant Morphology, Development, and Evolution (4.0 cr)
PBIO 4794W - Directed Research: Writing Intensive, WI (1.0-7.0 cr)
PBIO 4994 - Directed Research (1.0-7.0 cr)

Animal Physiology
Take all of the following in the same term:
BIOL 2005 - Animal Diversity Laboratory (1.0 cr)
BIOL 3211 - Animal Physiology (3.0 cr)

Plant Biology
Take all of the following in the same term:
BIOL 3002 - Plant Biology: Function (2.0 cr)
BIOL 3005W - Plant Function Laboratory, WI (2.0 cr)

Take all of the following in the same term:
BIOL 2005 - Animal Diversity Laboratory (1.0 cr)
PHSL 3051 - Human Physiology (4.0 cr)

Take all of the following in the same term:
BIOL 2005 - Animal Diversity Laboratory (1.0 cr)
PHSL 3061 - Principles of Physiology (4.0 cr)

Biology or Biochemistry Elective
Take 0 - 6 credit(s) from the following:
BIOC 3xxx
BIOC 4xxx
BIOC 5xxx
BIOL 3xxx
BIOL 4xxx
BIOL 5xxx
EEB 4xxx
EEB 5xxx
GCD 3xxx
GCD 4xxx
GCD 5xxx
MICB 3xxx
MICB 4xxx
MICB 5xxx
NSCI 3xxx
NSCI 4xxx
NSCI 5xxx
PBIO 3xxx
PBIO 4xxx
PBIO 5xxx

Biochemistry Minor

Required credits in this minor: 10

Biochemists study molecules found in living organisms, particularly proteins, nucleic acids, lipids, and carbohydrates. Biochemistry minors focus their studies on the biosynthesis, metabolism, function, and regulation of these molecules of life. This information is essential to gain an understanding of many biological processes, including how diseases like cancer and diabetes develop, and how genetic engineering and biotechnology can be used in ways that benefit society.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Students who wish to declare a minor in biochemistry should call 612-624-9717 to schedule an appointment with an adviser.

Required Courses

Minor Courses
BIOC 4331 - Biochemistry I: Structure, Catalysis, and Metabolism in Biological Systems (4.0 cr)
BIOC 4332 - Biochemistry II: Molecular Mechanisms of Signal Transduction and Gene Expression (4.0 cr)
BIOC 4025 - Laboratory in Biochemistry (2.0 cr)

Biology B.S.

Biology

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 69.

This program requires summer terms.

Degree: Bachelor of Science

Students majoring in biology gain a broad understanding of the fundamental nature and characteristics of living things and the ways in which they interact. Their studies cover the full range of life sciences, from cancer genes to acid rain, from lichens to marine mammals.

The biology B.S. program prepares students for study in a broad spectrum of biological sciences; for professional training programs in the health sciences; careers in teaching; and entry-level scientist positions in industry, government agencies, and universities.

Program Requirements

Introductory Biology

Choose either Sequence A or Sequence B to fulfill the general and organismal biology requirement. Sequence A is preferred. If Sequence A is chosen, take one organismal course or course pair. If Sequence B is chosen, take two organismal courses or course pairs.

Students are required to complete one of the following course groups.

Sequence A (Preferred)

BIOL 1001 - Introductory Biology I: Evolutionary and Ecological Perspectives, BIOL SCI/L, ENVT (4.0 cr)

BIOL 1002W - Introductory Biology II: Molecular, Cellular, and Developmental Perspectives, WI (5.0 cr)

Animal Biology

BIOL 2012 - General Zoology (4.0 cr)

or

take the following course pair

BIOL 2005 - Animal Diversity Laboratory (1.0 cr)

BIOL 3211 - Animal Physiology (3.0 cr)

or

take the following course pair

BIOL 2005 - Animal Diversity Laboratory (1.0 cr)

PHSL 3051 - Human Physiology (4.0 cr)

or

Plant Biology

BIOL 2022 - General Botany (3.0 cr)

or BIOL 3007W - Plant Biology: Diversity and Adaptation, WI (4.0 cr)

or

take the following course pair

BIOL 3002 - Plant Biology: Function (2.0 cr)

BIOL 3005W - Plant Function Laboratory, WI (2.0 cr)

or

Microbiology

BIOL 2032 - General Microbiology with Laboratory (4.0 cr)

or MICB 3301 - Biology of Microorganisms (5.0 cr)

or VBS 2032 - General Microbiology With Laboratory (4.0 cr)

-OR-

Sequence B

BIOL 1009 - General Biology, BIOL SCI/L (4.0 cr)

Organismal Biology

Take 2 or more sub-requirement(s) from the following:

Animal Biology

BIOL 2012 - General Zoology (4.0 cr)

or

take the following course pair

BIOL 3211 - Animal Physiology (3.0 cr)

BIOL 2005 - Animal Diversity Laboratory (1.0 cr)

or

take the following course pair

BIOL 2005 - Animal Diversity Laboratory (1.0 cr)

PHSL 3051 - Human Physiology (4.0 cr)

or

Plant Biology

BIOL 2022 - General Botany (3.0 cr)

or BIOL 3007W - Plant Biology: Diversity and Adaptation, WI (4.0 cr)

or

take the following course pair

BIOL 3002 - Plant Biology: Function (2.0 cr)

BIOL 3005W - Plant Function Laboratory, WI (2.0 cr)

or

Microbiology

BIOL 2032 - General Microbiology with Laboratory (4.0 cr)

or MICB 3301 - Biology of Microorganisms (5.0 cr)

or VBS 2032 - General Microbiology With Laboratory (4.0 cr)

Required Courses

Math and Physical Sciences

CHEM 1021 - Chemical Principles I, ENVT, PHYS SCI/L (4.0 cr)

CHEM 1022 - Chemical Principles II, ENVT, PHYS SCI/L (4.0 cr)

CHEM 2301 - Organic Chemistry I (3.0 cr)

CHEM 2302 - Organic Chemistry II (3.0 cr)

CHEM 2311 - Organic Lab (4.0 cr)

MATH 1271 - Calculus I, MATH (4.0 cr)

or MATH 1281 - Calculus with Biological Emphasis I, MATH (4.0 cr)

MATH 1272 - Calculus II (4.0 cr)

or MATH 1282 - Calculus With Biological Emphasis II (4.0 cr)

PHYS 1201W - Introductory Physics for Biology and Pre-medicine I, PHYS SCI/L, WI (5.0 cr)

or PHYS 1301W - Introductory Physics for Science and Engineering I, PHYS SCI/L, WI (4.0 cr)

PHYS 1202W - Introductory Physics for Biology and Pre-medicine II, PHYS SCI/L, WI (5.0 cr)

or PHYS 1302W - Introductory Physics for Science and Engineering II, PHYS SCI/L, WI (4.0 cr)

Biology Core

BIOC 3021 - Biochemistry (3.0 cr)

or BIOC 4331 - Biochemistry I: Structure, Catalysis, and Metabolism in Biological Systems (4.0 cr)

BIOL 3407 - Ecology, ENVT (3.0 cr)

or BIOL 3409 - Evolution (3.0 cr)

or BIOL 3411 - Introduction to Animal Behavior (3.0 cr)

BIOL 4003 - Genetics (3.0 cr)

BIOL 4004 - Cell Biology (3.0 cr)

Electives

Electives may not be used to fulfill other requirements. Complete 11 additional upper division credits in elective courses. Two courses must be lab/field courses. Any 38xx or higher field course taken at the Lake Itasca Biological Station may be used toward the lab/field requirement. Remaining classes to meet the elective credit total may be: 3xxx or higher additional lab/field courses, non lab/field electives, or directed research. See your adviser for a list of possible courses.

Take at least one additional course in any of the biological sciences.

Take 2 or more course(s) from the following:

BIOC 4025 - Laboratory in Biochemistry (2.0 cr)
BIOC 4125 - Laboratory in Molecular Biology and Biotechnology (3.0 cr)
BIOC 4794W - Directed Research: Writing Intensive, WI (1.0-6.0 cr)
BIOC 4994 - Directed Research (1.0-6.0 cr)
BIOL 3007W - Plant Biology: Diversity and Adaptation, WI (4.0 cr)
EEB 4014 - Ecology of Vegetation (3.0 cr)
EEB 4016W - Ecological Biogeography, WI (3.0 cr)
EEB 4129 - Mammalogy (4.0 cr)
EEB 4134 - Introduction to Ornithology (4.0 cr)
EEB 4605 - Limnology Laboratory (1.0 cr)
EEB 4607 - Plankton Ecology (4.0 cr)
EEB 4794W - Directed Research: Writing Intensive, WI (1.0-6.0 cr)
EEB 4842 - Arctic Field Ecology (4.0 cr)
EEB 4994 - Directed Research (1.0-6.0 cr)
EEB 5013 - Quaternary Plant Macrofossils (2.0 cr)
GCD 4015 - Genetics Laboratory (2.0 cr)
GCD 4025 - Cell Biology Laboratory (2.0 cr)
GCD 4111 - Histology: Cell and Tissue Organization (4.0 cr)
GCD 4794W - Directed Research: Writing Intensive, WI (1.0-6.0 cr)
GCD 4994 - Directed Research (1.0-6.0 cr)
MICB 3301 - Biology of Microorganisms (5.0 cr)
MICB 4215 - Advanced Laboratory: Microbial Physiology and Diversity (3.0 cr)
MICB 4235 - Advanced Laboratory: Virology, Immunology, and Microbial Genetics (3.0 cr)
MICB 4794W - Directed Research: Writing Intensive, WI (1.0-7.0 cr)
MICB 4994 - Directed Research (1.0-7.0 cr)
NSCI 4794W - Directed Research: Writing Intensive, WI (1.0-7.0 cr)
NSCI 4994 - Directed Research (1.0-7.0 cr)
PBIO 4321 - Minnesota Flora (3.0 cr)
PBIO 4404 - Developmental Plant Anatomy (3.0 cr)
PBIO 4511 - Flowering Plant Diversity (3.0 cr)
PBIO 4794W - Directed Research: Writing Intensive, WI (1.0-6.0 cr)
PBIO 4994 - Directed Research (1.0-6.0 cr)
PBIO 5416 - Plant Morphology, Development, and Evolution (4.0 cr)

Take one of the following course pairs

BIOL 2005 – Animal Diversity Laboratory (1.0 cr)
BIOL 3211 – Animal Physiology (3.0 cr)
or
BIOL 2005 – Animal Diversity Laboratory (1.0 cr)
PHSL 3051 – Human Physiology (4.0 cr)
or
BIOL 2005 – Animal Diversity Laboratory (1.0 cr)
PHSL 3061 – Principles of Physiology (4.0 cr)
or
BIOL 3002 – Plant Biology: Function (2.0 cr)
BIOL 3005W - Plant Function Laboratory, WI (2.0 cr)

Biology Minor

Requirements for this program are current for Fall 2006.

Required credits in this minor: 20.

Biology minors gain a broad understanding of the fundamental nature and characteristics of living things and the ways in which they interact. Their studies cover the full range of life sciences, from cancer genes to acid rain, from lichens to marine mammals.

Admission Requirements

To declare a biology minor, students must make an appointment (and bring a transcript). Call 612-624-9717.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

All courses must be taken A-F with a grade of C- or better.

Required Courses

Minor Courses

BIOL 1001 - Introductory Biology I: Evolutionary and Ecological Perspectives, BIOL SCI/L, ENVT (4.0 cr)
or BIOL 1009 - General Biology, BIOL SCI/L (4.0 cr)
CHEM 1021 - Chemical Principles I, ENVT, PHYS SCI/L (4.0 cr)

Electives

All courses for the minor must have a CBS designator (BIOL, BIOC, GCD, EEB, MICB, NSCI, PBIO) or be cross listed with CBS designators.

Take 12 or more credit(s) from the following:

Take 0 - 9 credit(s) from the following:

BIOC 2xxx
BIOL 2xxx
EEB 2xxx
GCD 2xxx
MICB 2xxx
NSCI 2xxx
PBIO 2xxx

Take 3 or more credit(s) from the following:

BIOC 3xxx
BIOC 4xxx
BIOL 3xxx
BIOL 4xxx
EEB 3xxx
EEB 4xxx
GCD 3xxx
GCD 4xxx
MICB 3xxx
MICB 4xxx
NSCI 3xxx
NSCI 4xxx
PBIO 3xxx
PBIO 4xxx

Ecology, Evolution, and Behavior B.S.

Ecology, Evolution & Behavior

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 73.

This program requires summer terms.

Degree: Bachelor of Science

Students majoring in ecology, evolution, and behavior (EEB) focus on three related areas of biology. Ecology examines the growth and maintenance of populations and their interactions in communities, and relationships among organisms and physical events in terrestrial and aquatic ecosystems. Evolution investigates the origin and change of biological diversity by studying evolutionary patterns and processes at various temporal and spatial scales. Behavioral biology explores behavioral adaptations to the environment, mechanisms of behavior, and the evolution of social systems.

A B.S. in EEB prepares students for graduate study in integrative biology and related biological sciences; careers in teaching; and entry-level scientist positions in industry, government agencies, nonprofit agencies, and universities.

Program Requirements

Introductory Biology

Students are required to complete one of the following course groups.

Sequence A

BIOL 1001 - Introductory Biology I: Evolutionary and Ecological Perspectives, BIOL SCI/L, ENVT (4.0 cr)

BIOL 1002W - Introductory Biology II: Molecular, Cellular, and Developmental Perspectives, WI (5.0 cr)

Take 2 or more sub-requirement(s) from the following:

Animal Biology

BIOL 2012 - General Zoology (4.0 cr)

or

take the following course pair

BIOL 2005 – Animal Diversity Laboratory (1.0 cr)

BIOL 3211 – Animal Physiology (3.0 cr)

or

BIOL 2005 – Animal Diversity Laboratory (1.0 cr)

PHSL 3051 – Human Physiology (4.0 cr)

or

BIOL 2005 – Animal Diversity Laboratory (1.0 cr)

PHSL 3061 – Principles of Physiology (4.0 cr)

Plant Biology

BIOL 2022 – General Botany (3.0 cr)

or

take the following course pair

BIOL 3002 – Plant Biology : Function (2.0 cr)

BIOL 3005W - Plant Function Laboratory, WI (2.0 cr)

or BIOL 3007W – Plant Biology: Diversity and Adaptation, WI (4.0 cr)

Microbiology

BIOL 2032 – General Microbiology with Laboratory (4.0 cr)

or VBS 2032 - General Microbiology with Laboratory (4.0 cr)

or MICB 3301 – Biology of Microorganisms (5.0 cr)

-OR-

Sequence B

BIOL 1009 - General Biology, BIOL SCI/L (4.0 cr)

Take 3 or more sub-requirement(s) from the following:

Animal Biology

BIOL 2012 - General Zoology (4.0 cr)

or

take the following course pair

BIOL 2005 – Animal Diversity Laboratory (1.0 cr)

BIOL 3211 – Animal Physiology (3.0 cr)

or

BIOL 2005 – Animal Diversity Laboratory (1.0 cr)

PHSL 3051 – Human Physiology (4.0 cr)

or

BIOL 2005 – Animal Diversity Laboratory (1.0 cr)

PHSL 3061 – Principles of Physiology (4.0 cr)

Plant Biology

BIOL 2022 – General Botany (3.0 cr)

or

take the following course pair

BIOL 3002 – Plant Biology : Function (2.0 cr)

BIOL 3005W - Plant Function Laboratory, WI (2.0 cr)

or BIOL 3007W – Plant Biology: Diversity and Adaptation, WI (4.0 cr)

Microbiology

BIOL 2032 – General Microbiology with Laboratory (4.0 cr)

or VBS 2032 - General Microbiology with Laboratory (4.0 cr)

or MICB 3301 – Biology of Microorganisms (5.0 cr)

Required Courses

Math and Physical Sciences

CHEM 1021 - Chemical Principles I, ENVT, PHYS SCI/L (4.0 cr)

CHEM 1022 - Chemical Principles II, ENVT, PHYS SCI/L (4.0 cr)

CHEM 2301 - Organic Chemistry I (3.0 cr)

CHEM 2302 - Organic Chemistry II (3.0 cr)

or EEB 4611 - Biogeochemical Processes (3.0 cr)

MATH 1271 - Calculus I, MATH (4.0 cr)

or MATH 1281 - Calculus with Biological Emphasis I, MATH (4.0 cr)

MATH 1272 - Calculus II (4.0 cr)

or MATH 1282 - Calculus With Biological Emphasis II (4.0 cr)

STAT 3011 - Introduction to Statistical Analysis, MATH (4.0 cr)

or STAT 3021 - Introduction to Probability and Statistics (3.0 cr)

PHYS 1201W - Introductory Physics for Biology and Pre-medicine I, PHYS SCI/L, WI (5.0 cr)

or PHYS 1301W - Introductory Physics for Science and Engineering I, PHYS SCI/L, WI (4.0 cr)

PHYS 1202W - Introductory Physics for Biology and Pre-medicine II, PHYS SCI/L, WI (5.0 cr)

or PHYS 1302W - Introductory Physics for Science and Engineering II, PHYS SCI/L, WI (4.0 cr)

Biology Core

Students may take any 38xx course offered at the Lake Itasca Biological Station to count toward the ecology/animal behavior/evolution portion of the major core curriculum.

BIOC 3021 - Biochemistry (3.0 cr)

BIOL 4003 - Genetics (3.0 cr)

Take 2 or more course(s) from the following:

BIOL 3409 - Evolution (3.0 cr)

BIOL 3407 - Ecology, ENVT (3.0 cr)

or BIOL 3807 - Ecology, ENVT (4.0 cr)

BIOL 3411 - Introduction to Animal Behavior (3.0 cr)

or BIOL 3811 - Introduction to Animal Behavior (4.0 cr)

Major Electives
Take 13 additional 3xxx-5xxx upper division credits in the biological and physical sciences, including an ecology, evolution, or animal behavior field or lab experience. At least 4 credits of EEB directed research or coursework involving extensive field experience at the Itasca Biological Station and Laboratories. See your adviser for a list of possible courses. BIOL 3407, 3409, 3411, and EEB 4611 may be used as electives only if not used to fulfill other major requirements.

A lab/field course (38xx-58xx) may be used to fulfill the lab requirement
or EEB 4794W - Directed Research: Writing Intensive, WI (1.0-6.0 cr)
or EEB 4994 - Directed Research (1.0-6.0 cr)

Take 7 or more credit(s) from the following:
BIOL 3407 - Ecology, ENVT (3.0 cr)
BIOL 3409 - Evolution (3.0 cr)
BIOL 3411 - Introduction to Animal Behavior (3.0 cr)
EEB 4014 - Ecology of Vegetation (3.0 cr)
EEB 4016W - Ecological Biogeography, WI (3.0 cr)
EEB 4129 - Mammalogy (4.0 cr)
EEB 4134 - Introduction to Ornithology (4.0 cr)
EEB 4601 - Limnology (3.0 cr)
EEB 4605 - Limnology Laboratory (1.0 cr)
EEB 4607 - Plankton Ecology (4.0 cr)
EEB 4609W - Ecosystem Ecology, WI (3.0 cr)
EEB 4611 - Biogeochemical Processes (3.0 cr)
EEB 4814 - Plant Community Ecology (4.0 cr)
EEB 4817 - Vertebrate Ecology (4.0 cr)
EEB 4839 - Field Studies in Mammalogy (4.0 cr)
EEB 5009 - Quaternary Vegetation History and Climate (3.0 cr)
EEB 5011 - Pollen Morphology (2.0 cr)
EEB 5013 - Quaternary Plant Macrofossils (2.0 cr)
EEB 5033 - Quantitative Genetics (3.0 cr)
EEB 5053 - Ecology: Theory and Concepts (4.0 cr)
EEB 5122W - Plant Interactions with Animals and Microbes, WI (3.0 cr)
EEB 5146 - Science and Policy of Global Environmental Change (3.0 cr)
EEB 5221 - Molecular and Genomic Evolution (3.0 cr)
EEB 5321 - Evolution of Social Behavior (3.0 cr)
EEB 5327 - Behavioral Ecology (3.0 cr)
EEB 5371 - Principles of Systematics (3.0 cr)
EEB 5609 - Ecosystem Ecology (3.0 cr)
EEB 5961 - Decision Analysis and Modeling in Conservation Biology (3.0 cr)
EEB 5963 - Modeling Nature and the Nature of Modeling (3.0 cr)

Genetics, Cell Biology, and Development B.S.

Genetics, Cell Biology, and Development TCBS

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 77.

Degree: Bachelor of Science.

Genetics, cell biology, and development (GCD) students focus their studies on the mechanisms by which genetic information is used to specify cell structure and function, and how that information drives cellular interactions that convert a single cell to develop into a complete organism. GCD students learn about advances in the field by studying model organisms like plants, fruit flies, zebrafish, and mice.

A B.S. in GCD prepares students for graduate study in molecular biology or related biological sciences; for professional training programs in health sciences; careers in teaching; and entry-level positions in industry, government agencies, or universities.

Admission Requirements

A GPA above 2.00 is preferred for the following:

- 2.50 for students transferring from outside the University.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Introductory Biology

Students are required to complete one of the following course groups.

Sequence A
Take BIOL 1001 and 1002W and choose from animal biology, plant biology, or microbiology course groups.

BIOL 1001 - Introductory Biology I: Evolutionary and Ecological Perspectives, BIOL SCI/L, ENVT (4.0 cr)
BIOL 1002W - Introductory Biology II: Molecular, Cellular, and Developmental Perspectives, WI (5.0 cr)
or BIOL 1002V - Introductory Biology II: Molecular, Cellular, and Developmental Perspectives, WI, H (5.0 cr)

Animal Biology
BIOL 2012 - General Zoology (4.0 cr)
or
take the following course pair
BIOL 2005 – Animal Diversity Laboratory (1.0 cr)
BIOL 3211 – Animal Physiology (3.0 cr)
or
BIOL 2005 – Animal Diversity Laboratory (1.0 cr)
PHSL 3051 – Human Physiology (4.0 cr)
or
BIOL 2005 – Animal Diversity Laboratory (1.0 cr)
PHSL 3061 – Principles of Physiology (4.0 cr)

Plant Biology
BIOL 2022 – General Botany (3.0 cr)
or
take the following course pair
BIOL 3002 – Plant Biology : Function (2.0 cr)
BIOL 3005W - Plant Function Laboratory, WI (2.0 cr)
or BIOL 3007W – Plant Biology: Diversity and Adaptation, WI (4.0 cr)

Microbiology
BIOL 2032 – General Microbiology with Laboratory (4.0 cr)
or VBS 2032 - General Microbiology with Laboratory (4.0 cr)
or MICB 3301 – Biology of Microorganisms (5.0 cr)

-OR-

Sequence B
BIOL 1009 - General Biology, BIOL SCI/L (4.0 cr)
Take 2 or more sub-requirement(s) from the following:
Animal Biology
BIOL 2012 - General Zoology (4.0 cr)
or
take the following course pair
BIOL 2005 – Animal Diversity Laboratory (1.0 cr)
BIOL 3211 – Animal Physiology (3.0 cr)
or
BIOL 2005 – Animal Diversity Laboratory (1.0 cr)
PHSL 3051 – Human Physiology (4.0 cr)
or
BIOL 2005 – Animal Diversity Laboratory (1.0 cr)
PHSL 3061 – Principles of Physiology (4.0 cr)

Plant Biology
BIOL 2022 – General Botany (3.0 cr)
or

take the following course pair
BIOL 3002 – Plant Biology : Function (2.0 cr)
BIOL 3005W - Plant Function Laboratory, WI (2.0 cr)
or BIOL 3007W – Plant Biology: Diversity and Adaptation, WI (4.0 cr)

Microbiology
BIOL 2032 – General Microbiology with Laboratory (4.0 cr)
or VBS 2032 - General Microbiology with Laboratory (4.0 cr)
or MICB 3301 – Biology of Microorganisms (5.0 cr)

Required Courses

Physical Science and Mathematics
CHEM 1021 - Chemical Principles I, ENVT, PHYS SCI/L (4.0 cr)
CHEM 1022 - Chemical Principles II, ENVT, PHYS SCI/L (4.0 cr)
CHEM 2301 - Organic Chemistry I (3.0 cr)
CHEM 2302 - Organic Chemistry II (3.0 cr)
CHEM 2311 - Organic Lab (4.0 cr)
MATH 1271 - Calculus I, MATH (4.0 cr)
or MATH 1281 - Calculus with Biological Emphasis I, MATH (4.0 cr)
MATH 1272 - Calculus II (4.0 cr)
or MATH 1282 - Calculus With Biological Emphasis II (4.0 cr)
PHYS 1201W - Introductory Physics for Biology and Pre-medicine I, PHYS SCI/L, WI (5.0 cr)
or PHYS 1301W - Introductory Physics for Science and Engineering I, PHYS SCI/L, WI (4.0 cr)
PHYS 1202W - Introductory Physics for Biology and Pre-medicine II, PHYS SCI/L, WI (5.0 cr)
or PHYS 1302W - Introductory Physics for Science and Engineering II, PHYS SCI/L, WI (4.0 cr)

Major Courses
BIOL 4003 - Genetics (3.0 cr)
BIOL 4004 - Cell Biology (3.0 cr)
BIOC 3021 - Biochemistry (3.0 cr)
or BIOC 4331 - Biochemistry I: Structure, Catalysis, and Metabolism in Biological Systems (4.0 cr)
BIOL 3407 - Ecology, ENVT (3.0 cr)
or BIOL 3409 - Evolution (3.0 cr)
or BIOL 3411 - Introduction to Animal Behavior (3.0 cr)

Electives
Electives must include three courses from at least two of the following three course groups, as well as two courses from the elective labs course group. Consult your adviser on additional courses to total 18 credits. GCD 4151, 4161, and PBIO 5514 may be used in only one elective area.

Take 18 or more credit(s) including 3 or more sub-requirement(s) from the following:

Genetics
Take 0 - 3 course(s) from the following:
EEB 5033 - Population and Quantitative Genetics (4.0 cr)
GCD 4034 - Molecular Genetics (3.0 cr)
GCD 4143 - Human Genetics (3.0 cr)
GCD 4151 - Molecular Biology of Cancer (3.0 cr)

Cell Biology
Take 0 - 3 course(s) from the following:
GCD 4111 - Histology: Cell and Tissue Organization (4.0 cr)
GCD 4134 - Endocrinology (3.0 cr)
GCD 5036 - Molecular Cell Biology (3.0 cr)
MICB 4131 - Immunology (3.0 cr)
NSCI 3101 - Introduction to Neuroscience I: From Molecules to Madness (3.0 cr)
PBIO 4516W - Plant Cell Biology: Writing Intensive, WI (3.0 cr)

Developmental Biology
Take 0 - 3 course(s) from the following:
GCD 4151 - Molecular Biology of Cancer (3.0 cr)
GCD 4161 - Developmental Biology (3.0 cr)
PBIO 5514 - Plant Molecular Biology (3.0 cr)
PBIO 5416 - Plant Morphology, Development, and Evolution (4.0 cr)

Elective Labs
Take 3 - 7 credit(s) from the following:
GCD 4994 - Directed Research (1.0-7.0 cr)
GCD 4794W - Directed Research: Writing Intensive, WI (1.0-7.0 cr)
Take 1 or more course(s) from the following:
BIOC 4025 - Laboratory in Biochemistry (2.0 cr)
BIOC 4125 - Laboratory in Molecular Biology and Biotechnology (3.0 cr)
GCD 4015 - Genetics Laboratory (2.0 cr)
GCD 4025 - Cell Biology Laboratory (2.0 cr)
MICB 4235 - Advanced Laboratory: Virology, Immunology, and Microbial Genetics (3.0 cr)

Microbiology B.S.

Microbiology

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 71 to 76.

Degree: Bachelor of Science

Microbiologists study the structure, function, and interaction of microbes, which make up 60 percent of the earth's biomass. Regarded by many as the foundation of the biosphere, microbes were likely the first form of life on earth, predating plants and animals by more than three billion years. Microbiologists study the role of microbes, such as bacteria, fungi, and viruses, in our world. A key goal of microbiologists today is to find new ways to use microbes to our advantage, such as engineering bacteria to synthesize cancer drugs or clean up toxic waste sites.

The microbiology major prepares students for advanced work in graduate programs in microbiology and related fields, and serves as preparation for careers in the health sciences. Microbiologists find employment in a variety of governmental, industrial, and pharmaceutical fields.

Program Requirements

Introductory Biology

Students are required to complete one of the following course groups.

Sequence A (preferred)
BIOL 1001 - Introductory Biology I: Evolutionary and Ecological Perspectives, BIOL SCI/L, ENVT (4.0 cr)
BIOL 1002W - Introductory Biology II: Molecular, Cellular, and Developmental Perspectives, WI (5.0 cr)
or BIOL 1002V - Introductory Biology II: Molecular, Cellular, and Developmental Perspectives, WI, H (5.0 cr)

-OR-

Sequence B
BIOL 1009 - General Biology, BIOL SCI/L (4.0 cr)
Take 1 or more sub-requirement(s) from the following:
BIOL 2012 - General Zoology (4.0 cr)
or

Animal Physiology
BIOL 3211 - Animal Physiology (3.0 cr)
BIOL 2005 - Animal Diversity Laboratory (1.0 cr)

Plant Biology
BIOL 2022 - General Botany (3.0 cr)
or BIOL 3007W - Plant Biology: Diversity and Adaptation, WI (4.0 cr)
or

Take the following course pair
BIOL 3002 - Plant Biology: Function (2.0 cr)
BIOL 3005W - Plant Function Laboratory, WI (2.0 cr)

Required Courses

Physical Science and Mathematics

Chemistry
CHEM 1021 - Chemical Principles I, ENVT, PHYS SCI/L (4.0 cr)
CHEM 1022 - Chemical Principles II, ENVT, PHYS SCI/L (4.0 cr)
CHEM 2301 - Organic Chemistry I (3.0 cr)
CHEM 2302 - Organic Chemistry II (3.0 cr)
CHEM 2311 - Organic Lab (4.0 cr)

Mathematics
MATH 1271 - Calculus I, MATH (4.0 cr)
or MATH 1281 - Calculus with Biological Emphasis I, MATH (4.0 cr)
MATH 1272 - Calculus II (4.0 cr)
or MATH 1282 - Calculus With Biological Emphasis II (4.0 cr)

Physics
PHYS 1201W - Introductory Physics for Biology and Pre-medicine I, PHYS SCI/L, WI (5.0 cr)
or PHYS 1301W - Introductory Physics for Science and Engineering I, PHYS SCI/L, WI (4.0 cr)
PHYS 1202W - Introductory Physics for Biology and Pre-medicine II, PHYS SCI/L, WI (5.0 cr)
or PHYS 1302W - Introductory Physics for Science and Engineering II, PHYS SCI/L, WI (4.0 cr)

Major Courses
BIOL 4003 - Genetics (3.0 cr)
MICB 3301 - Biology of Microorganisms (5.0 cr)
BIOC 3021 - Biochemistry (3.0 cr)
or BIOC 4331 - Biochemistry I: Structure, Catalysis, and Metabolism in Biological Systems (4.0 cr)

Electives
These courses fulfill the microbiology elective requirement.

Take 4 or more course(s) from the following:
BIOC 5352 - Microbial Biochemistry and Biotechnology: Proteins (3.0 cr)
BIOC 5353 - Microbial Biochemistry and Biotechnology: Small Molecules (3.0 cr)
BIOC 5361 - Microbial Genomics and Bioinformatics (3.0 cr)
MICB 4111 - Microbial Physiology and Diversity (3.0 cr)
MICB 4121 - Microbial Ecology and Applied Microbiology (3.0 cr)
MICB 4131 - Immunology (3.0 cr)
MICB 4151 - Molecular and Genetic Bases for Microbial Diseases (3.0 cr)
MICB 4141W - Biology, Genetics, and Pathogenesis of Viruses: Writing Intensive, WI (4.0 cr)
or MICB 4171 - Biology, Genetics, and Pathogenesis of Viruses (3.0 cr)

Elective Labs
Choose Option A or B to fulfill the advanced laboratory requirement. If Option B is chosen, MICB 4794W/4994 must be taken for 6 credits.

Option A
MICB 4215 - Advanced Laboratory: Microbial Physiology and Diversity (3.0 cr)
MICB 4235 - Advanced Laboratory: Virology, Immunology, and Microbial Genetics (3.0 cr)
or

Option B
MICB 4215 - Advanced Laboratory: Microbial Physiology and Diversity (3.0 cr)
or MICB 4235 - Advanced Laboratory: Virology, Immunology, and Microbial Genetics (3.0 cr)

Take 6 or more credit(s) from the following:
MICB 4794W - Directed Research: Writing Intensive, WI (1.0-7.0 cr)
MICB 4994 - Directed Research (1.0-7.0 cr)

Neuroscience B.S.

Neuroscience

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 78 to 81.

Degree: Bachelor of Science

Neuroscience majors study the molecular and cellular building blocks that make up the brain and control its function. The study of neuroscience aims to understand how complex animals, including humans, see, hear, move, think, and feel. Neuroscientists also study abnormalities that cause diseases and mechanisms that underlie pain and addiction.

A B.S. in neuroscience prepares undergraduates to pursue advanced studies in neuroscience or related health careers; professional degrees in medicine or psychology; or careers in the pharmaceutical, medical, or biotechnology industries.

Program Requirements

Introductory Biology

Students are required to complete one of the following course groups.

Sequence A (preferred)
BIOL 1001 - Introductory Biology I: Evolutionary and Ecological Perspectives, BIOL SCI/L, ENVT (4.0 cr)
BIOL 1002W - Introductory Biology II: Molecular, Cellular, and Developmental Perspectives, WI (5.0 cr)

Animal Biology
BIOL 2012 - General Zoology (4.0 cr)
or
BIOL 3211 - Animal Physiology (3.0 cr)
BIOL 2005 - Animal Diversity Laboratory (1.0 cr)
or
BIOL 2005 - Animal Diversity Laboratory (1.0 cr)
PHSL 3051 - Human Physiology (4.0 cr)
or
BIOL 2005 - Animal Diversity Laboratory (1.0 cr)
PHSL 3061 - Principles of Physiology (4.0 cr)

-OR-

Sequence B
BIOL 1009 - General Biology, BIOL SCI/L (4.0 cr)
BIOL 2012 - General Zoology (4.0 cr)
or

Animal Biology
BIOL 3211 - Animal Physiology (3.0 cr)
BIOL 2005 - Animal Diversity Laboratory (1.0 cr)
or
BIOL 2005 - Animal Diversity Laboratory (1.0 cr)
PHSL 3051 - Human Physiology (4.0 cr)
or
BIOL 2005 - Animal Diversity Laboratory (1.0 cr)
PHSL 3061 - Principles of Physiology (4.0 cr)
BIOL 2022 - General Botany (3.0 cr)
or BIOL 2032 - General Microbiology with Laboratory (4.0 cr)
or VBS 2032 - General Microbiology with Laboratory (4.0 cr)
or BIOL 3007W - Plant Biology: Diversity and Adaptation, WI (4.0 cr)
or MICB 3301 - Biology of Microorganisms (5.0 cr)
or

take the following course pair
BIOL 3002 - Plant Biology: Function (2.0 cr)
BIOL 3005W - Plant Function Laboratory, WI (2.0 cr)

Required Courses

Physical Science and Mathematics

Chemistry

CHEM 1021 - Chemical Principles I, ENVT, PHYS SCI/L (4.0 cr)
CHEM 1022 - Chemical Principles II, ENVT, PHYS SCI/L (4.0 cr)
CHEM 2301 - Organic Chemistry I (3.0 cr)
CHEM 2302 - Organic Chemistry II (3.0 cr)
CHEM 2311 - Organic Lab (4.0 cr)

Mathematics

MATH 1271 - Calculus I, MATH (4.0 cr)
or MATH 1281 - Calculus with Biological Emphasis I, MATH (4.0 cr)
MATH 1272 - Calculus II (4.0 cr)
or MATH 1282 - Calculus With Biological Emphasis II (4.0 cr)

Physics

PHYS 1201W - Introductory Physics for Biology and Pre-medicine I, PHYS SCI/L, WI (5.0 cr)
or PHYS 1301W - Introductory Physics for Science and Engineering I, PHYS SCI/L, WI (4.0 cr)
PHYS 1202W - Introductory Physics for Biology and Pre-medicine II, PHYS SCI/L, WI (5.0 cr)
or PHYS 1302W - Introductory Physics for Science and Engineering II, PHYS SCI/L, WI (4.0 cr)

Major Courses

Students must complete a minimum of 2 credits of directed research.

BIOL 4003 - Genetics (3.0 cr)
BIOL 4004 - Cell Biology (3.0 cr)
NSCI 3101 - Introduction to Neuroscience I: From Molecules to Madness (3.0 cr)
NSCI 3102W - Introduction to Neuroscience II: Biological Basis of Behavior, WI (3.0 cr)
NSCI 4105 - Neurobiology Laboratory I (2.0 cr)
BIOC 3021 - Biochemistry (3.0 cr)
or BIOC 4331 - Biochemistry I: Structure, Catalysis, and Metabolism in Biological Systems (4.0 cr)
BIOL 3407 - Ecology, ENVT (3.0 cr)
or BIOL 3409 - Evolution (3.0 cr)
or BIOL 3411 - Introduction to Animal Behavior (3.0 cr)

Directed Research

NSCI 4167 - Neuroscience in the Community (1.0-3.0 cr)
or NSCI 4794W - Directed Research: Writing Intensive, WI (1.0-7.0 cr)
or NSCI 4994 - Directed Research (1.0-7.0 cr)

Electives

Take at least one course from each course group.

Take 9 or more credit(s) including 3 or more sub-requirement(s) from the following:

Group A: Cell and Molecular Biology

EEB 5221 - Molecular and Genomic Evolution (3.0 cr)
or GCD 4034 - Molecular Genetics (3.0 cr)
or GCD 5036 - Molecular Cell Biology (3.0 cr)
or NSC 5201 - Computational Neuroscience I: Membranes and Channels (3.0 cr)
or NSC 5461 - Cellular and Molecular Neuroscience (4.0 cr)

Group B: Neural Systems and Behavior

EEB 5321 - Evolution of Social Behavior (3.0 cr)
or EEB 5327 - Behavioral Ecology (3.0 cr)
or NSC 5202 - Theoretical Neuroscience: Systems and Information Processing (3.0 cr)
or NSC 5462 - Neuroscience Principles of Drug Abuse (2.0 cr)
or NSC 5561 - Systems Neuroscience (4.0 cr)
or NSC 5661 - Behavioral Neuroscience (3.0 cr)
or PSY 5036W - Computational Vision, WI (3.0 cr)
or PSY 5038W - Introduction to Neural Networks, WI (3.0 cr)

Group C: History and Philosophy of Science

HSCI 3211 - Biology and Culture in the 19th and 20th Centuries, HP (3.0 cr)
or HSCI 3242 - The Darwinian Revolution (3.0 cr)
or PHIL 3601W - Scientific Thought, OH, WI (4.0 cr)
or PHIL 4607 - Philosophy of the Biological Sciences, WI (3.0 cr)

Plant Biology B.S.

Plant Biology

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 68 to 77.

Degree: Bachelor of Science

Plant biologists study all aspects of biology as they pertain to plants or fungi and make important contributions to analyzing and preserving biodiversity worldwide. They work to enhance the nutritional value of crops as well as their resistance to disease, pests, and drought while working to reduce the need for pesticides, fertilizer, and irrigation.

Current faculty research interests include genomics, gene expression, chromosome structure, plant growth substances, signal transduction, plant responses to stress, the plant cytoskeleton and cell morphogenesis, metabolic activities during development, cellular structure and ultrastructure of vascular and nonvascular plants, aquatic biology, lichenology, molecular evolution and systematics, fungal/plant interactions, biological rhythms, and fungal diversity.

Plant biology majors follow one of two tracks. One track fits the need of students who are primarily interested in environmental biology, evolution, or other aspects of whole organisms; the other track is appropriate for students interested in molecular, cellular, and development biology. All plant biology majors are guaranteed experience in a research laboratory as long as they show satisfactory progress toward their degree and make arrangements by the middle of their junior year.

Program Requirements

Introductory Biology

Choose either Sequence A or Sequence B to fulfill the general and organismal biology requirement. Sequence A is preferred. If Sequence A is chosen, take one additional organismal course or course pair. Sequence B has two options for completing the requirements.

Students are required to complete one of the following course groups.

Sequence A (Preferred)

BIOL 1001 - Introductory Biology I: Evolutionary and Ecological Perspectives, BIOL SCI/L, ENVT (4.0 cr)
BIOL 1002W - Introductory Biology II: Molecular, Cellular, and Developmental Perspectives, WI (5.0 cr)

Plant Biology

BIOL 3007W - Plant Biology: Diversity and Adaptation, WI (4.0 cr)

Take all of the following in the same term:

BIOL 3002 - Plant Biology: Function (2.0 cr)
BIOL 3005W - Plant Function Laboratory, WI (2.0 cr)

-OR-

Sequence B Option 1

If Sequence A is not pursued, the following is the preferred path for Sequence B.

BIOL 1009 - General Biology, BIOL SCI/L (4.0 cr)
BIOL 3002 - Plant Biology: Function (2.0 cr)
BIOL 3005W - Plant Function Laboratory, WI (2.0 cr)
BIOL 3007W - Plant Biology: Diversity and Adaptation, WI (4.0 cr)

-OR-

Sequence B Option 2
BIOL 1009 - General Biology, BIOL SCI/L (4.0 cr)

Plant Biology
BIOL 3007W - Plant Biology: Diversity and Adaptation, WI (4.0 cr)
or

Take all of the following in the same term:
BIOL 3002 - Plant Biology: Function (2.0 cr)
BIOL 3005W - Plant Function Laboratory, WI (2.0 cr)

Other Organismal Biology
BIOL 2012 - General Zoology (4.0 cr)
or BIOL 2032 – General Microbiology with Laboratory (4.0 cr)
or VBS 2032 - General Microbiology with Laboratory (4.0 cr)
or MICB 3301 – Biology of Microorganisms (5.0 cr)
or

take one of the following course pairs
BIOL 2005 – Animal Diversity Laboratory (1.0 cr)
BIOL 3211 – Animal Physiology (3.0 cr)
or
BIOL 2005 – Animal Diversity Laboratory (1.0 cr)
PHSL 3051 – Human Physiology (4.0 cr)
or
BIOL 2005 – Animal Diversity Laboratory (1.0 cr)
PHSL 3061 – Principles of Physiology (4.0 cr)

Required Courses

Physical Science and Mathematics
CHEM 1021 - Chemical Principles I, ENVT, PHYS SCI/L (4.0 cr)
CHEM 1022 - Chemical Principles II, ENVT, PHYS SCI/L (4.0 cr)
CHEM 2301 - Organic Chemistry I (3.0 cr)
CHEM 2302 - Organic Chemistry II (3.0 cr)
BIOC 4025 - Laboratory in Biochemistry (2.0 cr)
or CHEM 2311 - Organic Lab (4.0 cr)
MATH 1271 - Calculus I, MATH (4.0 cr)
or MATH 1281 - Calculus with Biological Emphasis I, MATH (4.0 cr)
MATH 1272 - Calculus II (4.0 cr)
or MATH 1282 - Calculus With Biological Emphasis II (4.0 cr)
PHYS 1201W - Introductory Physics for Biology and Pre-medicine I, PHYS SCI/L, WI (5.0 cr)
or PHYS 1301W - Introductory Physics for Science and Engineering I, PHYS SCI/L, WI (4.0 cr)
PHYS 1202W - Introductory Physics for Biology and Pre-medicine II, PHYS SCI/L, WI (5.0 cr)
or PHYS 1302W - Introductory Physics for Science and Engineering II, PHYS SCI/L, WI (4.0 cr)

Biology Core
BIOC 3021 - Biochemistry (3.0 cr)
or BIOC 4331 - Biochemistry I: Structure, Catalysis, and Metabolism in Biological Systems (4.0 cr)
BIOL 3407 - Ecology, ENVT (3.0 cr)
or BIOL 3409 - Evolution (3.0 cr)
BIOL 4003 - Genetics (3.0 cr)
or BIOL 4004 - Cell Biology (3.0 cr)

Major Electives
Take at least one course from Group A and one course from Group B. Other appropriate courses may be substituted by petition.

Take 11 or more credit(s).

Take 1 or more course(s) from the following:
EEB 4014 - Ecology of Vegetation (3.0 cr)
EEB 4814 - Plant Community Ecology (4.0 cr)
EEB 4842 - Arctic Field Ecology (4.0 cr)
EEB 5122W - Plant Interactions with Animals and Microbes, WI (3.0 cr)
PBIO 4321 - Minnesota Flora (3.0 cr)
PBIO 4404 - Developmental Plant Anatomy (3.0 cr)
PBIO 4511 - Flowering Plant Diversity (3.0 cr)
PBIO 5416 - Plant Morphology, Development, and Evolution (4.0 cr)

Take 1 or more course(s) from the following:
BIOC 5401W - Advanced Metabolism and Its Regulation, WI (3.0 cr)
PBIO 4516W - Plant Cell Biology: Writing Intensive, WI (3.0 cr)
PBIO 5301 - Plant Genomics (3.0 cr)
PBIO 5412 - Plant Physiology (3.0 cr)
PBIO 5514 - Plant Molecular Biology (3.0 cr)
PBIO 5516 - Plant Cell Biology (3.0 cr)

Other statistics or mathematics electives must be approved by an adviser.

Take 1 or more course(s) from the following:
STAT 3011 - Introduction to Statistical Analysis, MATH (4.0 cr)
STAT 3021 - Introduction to Probability and Statistics (3.0 cr)

Elective Labs
Any 38xx or 48xx CBS plant or algal biology course offered at the Lake Itasca Forestry and Biological station may be used to fulfill the lab/field requirement. BIOL 3002 and 3005W or BIOL 3007W may be used to meet a laboratory/field requirement if not used for Sequence A or B. Lab courses taken for Sequence A or B may be used toward the lab/field requirement.

Take 2 or more course(s) from the following:
BIOC 4025 - Laboratory in Biochemistry (2.0 cr)
BIOC 4125 - Laboratory in Molecular Biology and Biotechnology (3.0 cr)
BIOC 4794W - Directed Research: Writing Intensive, WI (1.0-6.0 cr)
BIOC 4994 - Directed Research (1.0-6.0 cr)
EEB 4014 - Ecology of Vegetation (3.0 cr)
EEB 4016W - Ecological Biogeography, WI (3.0 cr)
EEB 4605 - Limnology Laboratory (1.0 cr)
EEB 4607 - Plankton Ecology (4.0 cr)
EEB 4794W - Directed Research: Writing Intensive, WI (1.0-6.0 cr)
EEB 4842 - Arctic Field Ecology (4.0 cr)
EEB 4994 - Directed Research (1.0-6.0 cr)
EEB 5013 - Quaternary Plant Macrofossils (2.0 cr)
GCD 4015 - Genetics Laboratory (2.0 cr)
GCD 4025 - Cell Biology Laboratory (2.0 cr)
GCD 4794W - Directed Research: Writing Intensive, WI (1.0-6.0 cr)
GCD 4994 - Directed Research (1.0-6.0 cr)
MICB 3301 - Biology of Microorganisms (5.0 cr)
MICB 4215 - Advanced Laboratory: Microbial Physiology and Diversity (3.0 cr)
MICB 4235 - Advanced Laboratory: Virology, Immunology, and Microbial Genetics (3.0 cr)
MICB 4794W - Directed Research: Writing Intensive, WI (1.0-7.0 cr)
MICB 4994 - Directed Research (1.0-7.0 cr)
NSCI 4794W - Directed Research: Writing Intensive, WI (1.0-7.0 cr)
NSCI 4994 - Directed Research (1.0-7.0 cr)
PBIO 4321 - Minnesota Flora (3.0 cr)
PBIO 4404 - Developmental Plant Anatomy (3.0 cr)
PBIO 4511 - Flowering Plant Diversity (3.0 cr)
PBIO 4794W - Directed Research: Writing Intensive, WI (1.0-6.0 cr)
PBIO 4994 - Directed Research (1.0-6.0 cr)
PBIO 5416 - Plant Morphology, Development, and Evolution (4.0 cr)

Plant Biology Minor

Requirements for this program are current for Fall 2006.

Required credits in this minor: 10.

Plant biologists study all aspects of biology as they pertain to plants or fungi and make important contributions to analyzing and preserving biodiversity worldwide. They work to enhance the nutritional value of crops as well as their resistance to disease, pests, and drought while working to reduce the need for pesticides, fertilizer, and irrigation.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

The plant biology minor is available to CBS students pursuing one of the other college majors. It is also available to non-CBS students. Students must take all courses A-F and earn at least a C- in all courses used for the minor.

Students who wish to declare a minor in plant biology should call the director of undergraduate studies for plant biology at 612-624-3499.

Required Courses

Minor Courses

Take 10 or more credit(s) from the following:

BIOL 3002 - Plant Biology: Function (2.0 cr)
BIOL 3005W - Plant Function Laboratory, WI (2.0 cr)
BIOL 3007W - Plant Biology: Diversity and Adaptation, WI (4.0 cr)
PBIO 4321 - Taxonomy of Minnesota Flora (3.0 cr)
PBIO 4404 - Developmental Plant Anatomy (3.0 cr)
PBIO 4511 - Flowering Plant Diversity (3.0 cr)
PBIO 4516W - Plant Cell Biology: Writing Intensive, WI (3.0 cr)
PBIO 4801 - Plains and Boreal Flora (4.0 cr)
PBIO 4811 - Flowering Plant Systematics (3.0 cr)
PBIO 5301 - Plant Genomics (3.0 cr)
PBIO 5412 - Plant Physiology (3.0 cr)
PBIO 5416 - Plant Morphology, Development, and Evolution (4.0 cr)
PBIO 5514 - Plant Molecular Biology (3.0 cr)
PBIO 5516 - Plant Cell Biology (3.0 cr)

This is the Continuing Education General Information and Degree Programs section of the 2006-2008 Undergraduate Catalog for the University of Minnesota, Twin Cities campus.

College of **Continuing Education**

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College of
Continuing Education

General Information

The College of Continuing Education (CCE) provides high-quality continuing education and lifelong learning opportunities for professional development, personal enrichment, career transition, and academic growth. Established in 1913, CCE has one of the most comprehensive continuing education units in the country and serves as the University's main access point for nontraditional students, particularly adult and part-time learners.

CCE offers a variety of degrees, certificates, and continuing professional education opportunities. With programs and services that cross the usual boundaries of time, place, mode of delivery, and academic discipline, CCE provides the knowledge and skills required in an information-based world and workplace. And, through CCE, non-admitted students can access University courses.

Advising

CCE Information Center—The CCE Information Center offers academic advising and financial aid advising to all students interested in CCE degrees and certificates. Advisers can help students select programs of study, determine prerequisites, interpret degree requirements, discuss transcripts of previous college work, and choose courses.

Students seeking a college degree through registration in CCE classes should consult an adviser early in their planning. For more information, contact CCE Information Center at info@cce.umn.edu or 612-624-4000.

Admission

Admission to CCE Degree and Certificate Programs—All CCE degree programs have their own admission policies and procedures and admit at the upper division only. For general questions about admission to CCE degree or certificate programs, contact CCE Information Center at 612-624-4000. For more information, go to the CCE Web site at www.cce.umn.edu and select the program of interest.

Liberal Education Requirements—Within CCE, the Inter-College Program (ICP) and the Program for Individualized Learning (PIL) follow the University's standardized set of liberal education requirements. The Bachelor of Applied Science has liberal education requirements unique to each major. See the BAS Web site at www.cce.umn.edu/bas or contact an Information Center adviser for requirement information.

Scholastic Committee, CCE

The CCE Scholastic Committee is charged with interpreting and enforcing College and University regulations relating to academic affairs for students admitted to CCE credit certificate and degree programs and non-admitted students assigned to CCE. The Committee handles registration exception request policies and procedures, certificate program admission standards, and certificate program credit transfer policies for these students.

The Committee seeks to maintain the spirit of the University's regulations and is empowered to make exceptions in extenuating circumstances. CCE nonadmitted and admitted degree and credit certificate students should contact a CCE adviser at 612-624-4000.

Degrees

Students have two broad options for earning baccalaureate degrees through CCE—an individualized degree or applied degree. For more information about these options, call 612-624-4000, or visit the CCE Web site at www.cce.umn.edu.

Individualized Degree Programs

Individualized degree programs open up educational opportunities for highly motivated students who need flexibility to earn their B.A. or B.S. degrees. Students develop degree programs tailored to their interests and talents.

CCE links the rich resources of the University's faculty and staff with the individual undergraduate. Students, faculty, and staff work together to take responsibility for the integrity of each degree program and the maintenance of high academic standards. As a result, our graduates gain a strong sense of ownership of their education and confidence in how that education is related to their lives.

CCE's individualized programs serve students by offering educational alternatives; the programs serve faculty by allowing them to develop and test innovative approaches to undergraduate education. Working together, the two groups help diversify learning experiences at the University.

Inter-College Program (ICP), founded in 1930, offers students a credit-based, individualized baccalaureate degree program drawing on the curricular offerings and other educational resources of the entire University community. This program provides an alternative to an already established major by giving students the flexibility to incorporate both day school and evening coursework from more than one college to achieve their educational goals. Call 612-624-4000 for more information or see www.cce.umn.edu/icp on the Web.

Program for Individualized Learning (PIL), founded in 1971, serves independent learners who wish to design and complete individualized study that incorporates a variety of learning resources and strategies, such as independent learning projects. PIL students work collaboratively with academic advisers and faculty throughout the University.

The program primarily serves students who live in the Twin Cities area, but also considers qualified students who can commute to campus for some learning activities. For more information, call 612-624-4000, or see www.cce.umn.edu/pil on the Web.

Bachelor of Applied Science (BAS) Degree Program

The Bachelor of Applied Science (BAS) program offers the opportunity for niche-focused professional growth in specializations tied to key economic drivers. Working adults and full-time students may augment credentials or begin career study. Courses combine theory and application, and are taught by industry professionals. Students may select an entire BAS major and receive a B.A.Sc. degree, incorporate BAS classes or a BAS minor into an existing degree program, elect a certificate in certain BAS areas or enroll in individual classes. For more information about any of these opportunities, visit the BAS Web site at www.cce.umn.edu/bas.

The B.A.Sc. with a major in clinical laboratory science is a course of study that provides the education clinical laboratory technicians/medical laboratory technicians (CLT/MLT) need for career advancement. Students receive a strong foundation in the sciences together with rich experiences in the clinical laboratory and are prepared to work as clinical laboratory scientists, technical specialists, laboratory managers, lab coordinators, and quality control technologists. Graduates may take the national certification examinations to practice as a clinical laboratory scientist/medical technologist (CLS/MT). Offered in partnership with MnSCU, students can complete a two-year CLT/MLT associate's degree before enrolling.

The B.A.Sc. with a major in construction management is offered in close collaboration with the construction industry. Construction management combines building design and engineering with management and business studies to equip students with the skills needed to deliver projects on time and within budget. The major offers experience and education leading directly to a professional management career in high demand areas in the construction industry.

A minor in construction management is also available to students who are either currently enrolled in or are graduates of an undergraduate degree program at the University of Minnesota.

The B.A.Sc. with a major in emergency health services is offered cooperatively with Regions Hospital in St. Paul. The program is designed to provide personnel working in pre-hospital medical care with the education and skills necessary to coordinate and direct the delivery of emergency health services in a variety of settings, ranging from out-of-hospital, first-responder situations to occupational health and safety programs in large organizations.

The B.A.Sc. with a major in information technology infrastructure is a course of study combining information technology infrastructure, math, science, and business curricula. Students may choose a network and systems administration or database administration concentration area. Graduates are able to design, construct, and manage technology operations. This major replaces the majors in information networking and network administration.

The B.A.Sc. with a major in manufacturing technology prepares students for career growth in the manufacturing industry. Students learn new skills in the areas of manufacturing systems and processes, computer technology, quality, operations, project management, business and finance, and interpersonal communication. Graduates are prepared to work as project managers, process engineers, materials managers, lead technicians, order process analysts, facilities engineers, and business analysts.

The B.A.Sc. with a major in radiation therapy provides leading-edge medical and technical courses and clinical experience in top-ranking radiation oncology departments. Radiation therapy graduates are prepared to meet the changing demands of new technologies and advancements in treatment techniques. Didactic and clinical experiences will sharpen critical thinking and problem solving skills, and provide the knowledge base in management and education that is crucial to future advancement. Graduates are ready to meet national certification requirements.

The major is offered in two locations: Rochester and the Twin Cities. In Rochester, the University of Minnesota partners with the Mayo School of Health Sciences. Classes and clinical experiences are offered at the Mayo Clinic and other facilities within the Mayo Health System. In the Twin Cities, this program is offered in partnership with University of Minnesota Medical Center, Fairview School of Radiation Therapy.

The B.A.Sc. with a major in respiratory care prepares students to become respiratory care practitioners with advanced-level clinical and professional skills. This program, offered in partnership with Mayo School of Health Sciences in Rochester, combines professional, medical, and technical courses. Courses and clinical experiences, with options for specialized clinical study, are offered at Mayo Clinic and other facilities within the Mayo Health System. Graduates will be ready to meet national certification requirements. Advanced practitioner respiratory therapists are prepared to serve as consultants to physicians and other medical staff.

Honors

All CCE degree programs recognize outstanding academic achievement by offering an honors and/or distinction option for graduating students.

Certificates

In addition to baccalaureate degrees, certificate programs offered through CCE provide an educational option for working adults. Certificates are short-term, focused college credentials that can supplement a student's experience and previously earned degree, or serve as a stepping stone to a degree. Certificates provide concentrated coursework related to occupational areas or general background to prepare students for further college work.

Coursework may be completed with evening classes, Independent and Distance Learning, day classes, summer session classes, or any combination of these. For more information, call the CCE Information Center at 612-624-4000 or e-mail info@cce.umn.edu.

College of Continuing Education Certificates

For information regarding the following certificates see www.cce.umn.edu/certificates.

Accounting

Accounting II

Addiction studies

Applied business

Computer science

Construction management

Direct marketing

Industrial relations

Information technology infrastructure

Interpreting

Ophthalmology technician

Organizational and professional communication

Paper science and engineering

Special Learning Opportunities and Resources

Independent and Distance Learning (IDL) courses use electronic technologies and mail to meet the needs of students who cannot or choose not to take courses on campus. Most courses are self-paced and give students up to nine months to complete the coursework. Other courses fit into the regular semester schedule. Credits are recorded on students' transcripts and can be used toward fulfilling distribution requirements in

most undergraduate programs. IDL courses can also satisfy residency requirements, with approval from the student's college. Check with an adviser about using these course credits toward a specific program.

Students register for IDL courses the same way as regular day and evening courses. Courses are either extended-term (to be completed in up to nine months) or term-based (to be completed within one semester term). For students receiving financial aid administered by the Office of Student Finance (OSF), term-based online courses are automatically counted. Extended-term courses (both online and correspondence) are not eligible for OSF-administered aid, with one exception. If students are eligible for a Minnesota State Grant, OSF counts all IDL courses enrolled in by the end of the second week of the semester. This includes both extended-term and term-based courses.

For information on courses, policies, and registration, visit www.cce.umn.edu/idl or request an *Independent and Distance Learning Catalog*. Contact CCE at 612-624-4000 or 800-234-6564, or e-mail info@cce.umn.edu.

Independent Study (ICP 3075)—CCE allows undergraduates, regardless of college affiliation, to pursue projects beyond the scope of a single department or college. Projects are interdisciplinary or are completed in departments that do not offer an appropriate independent study course. Students may take 3–5 credits of ICP 3075 - Independent Study. For more information, contact ICP at 612-624-4000.

Scholarships and Grants

The College of Continuing Education Information Center provides information about CCE scholarships and other financial aid options.

Students admitted to degree and eligible certificate programs who complete the Free Application for Federal Student Aid (FAFSA) will be considered for aid administered by the Office of Student Finance. CCE scholarships and grants are available for noncredit, non-admitted (Non Degree), and degree and certificate admits. Most scholarships and grants require Minnesota residence, financial need, and a delay or interruption in education of two years or more. Additional scholarships are available for students admitted to the Inter-College Program (ICP), Program for Individualized Learning (PIL), and Bachelor of Applied Science (BAS) Program; requirements vary by scholarship fund. Scholarships are awarded on the basis of academic ability and a statement of personal, educational, and career goals. They are supported by donations from CCE alumni and friends. CCE awards 150–200 scholarships per year; individual awards generally range from $2,200 to $5,000.

Directory

CCE Information Center

101 Wesbrook Hall
Minneapolis, MN 55455
612-624-4000
Fax: 612-625-1511
E-mail: info@cce.umn.edu

Administrative Offices

Office of the Dean

201 Coffey Hall
St. Paul, MN 55108
Mary Nichols, dean, 612-624-1751

Administrative Units

Academic Programs

612-624-8831

College in the Schools

612-625-1855

Compleat Scholar

612-625-7777

Continuing Professional Education

612-625-3100

Master of Liberal Studies

612-626-8724

Personal Enrichment Programs

612-625-5760

Departments and Programs

Bachelor of Applied Science (BAS)

- Clinical Laboratory Science
- Construction Management
- Emergency Health Services
- Information Technology Infrastructure
- Manufacturing Technology
- Radiation Therapy
- Radiation Therapy-Mayo
- Respiratory Care

206 Wesbrook Hall
Minneapolis, MN 55455
612-624-4000
E-mail: bas@cce.umn.edu

Certificates

- Accounting I and II
- Addiction Studies
- Applied Business
- Computer Science
- Construction Management
- Direct Marketing
- Industrial Relations
- Information Technology Infrastructure
- Interpreting
- Ophthalmology Technician
- Organizational and Professional Communication
- Paper Science and Engineering

202 Wesbrook Hall
Minneapolis, MN 55455
612-624-4000
E-mail: info@cce.umn.edu

Individualized Degrees

Inter-College Program (ICP) and Program for Individualized Learning (PIL)
101 Wesbrook Hall
Minneapolis, MN 55455
612-624-4000
E-mail: icp@cce.umn.edu
www.cce.umn.edu/icp
E-mail: pil@cce.umn.edu
www.cce.umn.edu/pil

Degree Programs

Clinical Laboratory Science B.A.Sc.

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 36.

This program requires summer terms.

Degree: Bachelor of Applied Science.

The B.A.Sc. with a major in clinical laboratory science (CLS) provides the education that clinical laboratory technicians/ medical laboratory technicians (CLT/MLT) need for career advancement. Students obtain a strong foundation in the sciences and rich clinical laboratory experiences, and are prepared to work as clinical laboratory scientists, technical specialists, laboratory managers, lab coordinators, and quality control technologists. Graduates may take the national certification examinations to practice as a clinical laboratory scientist/medical technologist (CLS/MT). In partnership with MnSCU, students must complete a two-year CLT/MLT associate's degree before enrolling. This work cannot be completed at the University of Minnesota.

Students admitted to the CLS major follow the upper division curriculum for the medical technology program along with the medical technology cohort. Most students are likely to need at total of more than four years (including associate degree work) or significant summer work to complete the program.

Admission Requirements

Students must complete 45 credits before admission to the program.

A GPA above 2.00 is preferred for the following:

- 2.50 for students transferring from another University of Minnesota college.
- 2.50 for students transferring from outside the University.

A transfer student must have completed the Medical Laboratory Technician (MLT) two-year degree program or be near completion before applying for official admission to the BAS-CLS degree program. The cumulative GPA for science courses will also be reviewed as part of the admission decision.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

There is no distinct and independent CLS upper division curriculum. CLS students join the medical technology cohort and folllow their exact curriculum.

Required Courses

General Education and Prerequisite Courses

Students should also take one upper division writing intensive course, and one humanities/fine arts course.

PHSL 3051 - Human Physiology (4.0 cr)
BIOL 1009 - General Biology, BIOL SCI/L (4.0 cr)
BIOL 2032 - General Microbiology with Laboratory (4.0 cr)
BIOC 3021 - Biochemistry (3.0 cr)
CHEM 1021 - Chemical Principles I, ENVT, PHYS SCI/L (4.0 cr)
CHEM 1022 - Chemical Principles II, ENVT, PHYS SCI/L (4.0 cr)
CHEM 2301 - Organic Chemistry I (3.0 cr)
CHEM 2302 - Organic Chemistry II (3.0 cr)
GCD 3022 - Genetics (3.0 cr)
or BIOL 4003 - Genetics (3.0 cr)

Take 2 or more course(s) from the following:

PSY 1001 - Introduction to Psychology, SSCI (4.0 cr)
SOC 1001 - Introduction to Sociology, CD, SSCI (4.0 cr)
GC 1281 - General Psychology, SSCI (4.0 cr)
GC 1211 - People and Problems, CD, SSCI (4.0 cr)

Prerequisite Mathematics Courses

Take 2 or more course(s) from the following:

MATH 1051 - Precalculus I (3.0 cr)
MATH 1142 - Short Calculus, MATH (4.0 cr)
MATH 1155 - Intensive Precalculus, MATH (5.0 cr)
MATH 1271 - Calculus I, MATH (4.0 cr)
MATH 1272 - Calculus II (4.0 cr)
STAT 3011 - Introduction to Statistical Analysis, MATH (4.0 cr)

Clinical Courses

These courses should be completed during the 22 weeks of clinical rotations in the summer and fall terms following the senior year, including six weeks of clinical chemistry, five weeks in hematology and coagulation, five weeks in immunohematology, five weeks in microbiology, and one week in a specialty laboratory area.

MEDT 4082 - Applied Clinical Chemistry (3.0 cr)
MEDT 4085 - Applied Clinical Hematology (2.0 cr)
MEDT 4086 - Applied Clinical Immunohematology (2.0 cr)
MEDT 4088 - Applied Diagnostic Microbiology (2.0 cr)
MEDT 4089 - Specialty Rotation (1.0 cr)

Senior Year Courses

MEDT 4064 - Introduction to Clinical Immunohematology (2.0 cr)
MEDT 4065 - Introduction to Clinical Immunohematology: Laboratory (2.0 cr)
MEDT 4100 - Virology, Mycology, and Parasitology for Medical Technologists (2.0 cr)
MEDT 4104 - Principles of Diagnostic Microbiology: Lecture (2.0 cr)
MEDT 4105 - Principles of Diagnostic Microbiology: Laboratory (2.0 cr)
MEDT 4127W - Introduction to Management and Education I, WI (1.0 cr)
MEDT 4253 - Hemostasis (1.0 cr)
MEDT 4310 - Clinical Chemistry I: Lecture (2.0 cr)
MEDT 4311 - Clinical Chemistry I: Laboratory Applications (2.0 cr)
MEDT 4320 - Clinical Chemistry II: Lecture (2.0 cr)
MEDT 4321 - Clinical Chemistry II: Laboratory Applications (2.0 cr)
MEDT 4400 - Immunological and Molecular Basis of Laboratory Testing (1.0 cr)
MEDT 4251 - Hematology I: Basic Techniques (3.0 cr)
MEDT 4252 - Hematology II: Morphology and Correlation (2.0 cr)

Construction Management B.A.Sc.

Requirements for this program are current for Summer 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 51.

This program requires summer terms.

Degree: Bachelor of Applied Science.

The B.A.Sc. with a major in construction management is offered in close collaboration with the construction industry. Construction management combines building design and engineering with management and business studies to equip students with the skills needed to deliver projects on time and within budget. The major offers experience and education leading directly to a professional management career in high demand areas in the construction industry. The construction management major was designed around the needs of working adults who are part-time students.

Admission Requirements

Students must complete 45 credits before admission to the program.

A GPA above 2.00 is preferred for the following:

- 2.50 for students already admitted to the degree-granting college.
- 2.50 for students transferring from another University of Minnesota college.
- 2.50 for students transferring from outside the University.

Students complete either 45 credits (including construction plan reading, physics, and calculus) or the A.S. in construction management before admission to the major.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Preparatory Coursework

Students may complete the preparatory coursework either through Option 1 (U of M coursework) or Option 2 (A.S. in construction management).

Students are required to complete one of the following course groups.

Option 1 (U of M Preparatory Courses)
Students complete construction plan reading, physics, and calculus before admission.

ACCT 2050 - Introduction to Financial Reporting (4.0 cr)
CMGT 2019 - AutoCAD for Construction Managers (2.0 cr)
CMGT 3001 - Introduction to Construction (3.0 cr)
CMGT 3011 - Construction Plan Reading (2.0 cr)
COMM 1101 - Introduction to Public Speaking (3.0 cr)
or COMM 3402 - Introduction to Interpersonal Communication, SSCI (3.0 cr)
or COMM 3605W - Persuasive Speaking and Speech Writing, WI (3.0 cr)
or RHET 1223 - Oral Presentations in Professional Settings (3.0 cr)
or GC 1461 - Oral Communication in the Public Sphere, C/PE (3.0 cr)
GC 1211 - People and Problems, CD, SSCI (4.0 cr)
or GC 1281 - General Psychology, SSCI (4.0 cr)
or PSY 1001 - Introduction to Psychology, SSCI (4.0 cr)
or SOC 1001 - Introduction to Sociology, CD, SSCI (4.0 cr)
MATH 1142 - Short Calculus, MATH (4.0 cr)
or MATH 1271 - Calculus I, MATH (4.0 cr)
PHYS 1101W - Introductory College Physics I, PHYS SCI/L, WI (4.0 cr)
or PHYS 1107 - Introductory Physics Online , PHYS SCI/L (4.0 cr)
or PHYS 1111 - Basic Physics I (3.0 cr)
or PHYS 1301W - Introductory Physics for Science and Engineering I, PHYS SCI/L, WI (4.0 cr)
APEC 1101 - Principles of Microeconomics, SSCI (3.0 cr)
or ECON 1101 - Principles of Microeconomics, IP, SSCI (4.0 cr)
BP 3101 - Introductory Statics and Structures for Construction Management (3.0 cr)
or AEM 2011 - Statics (3.0 cr)
or BP 3001 - Statics, Mechanics, and Structural Design (4.0 cr)
ABUS 4023W - Communicating for Results, WI (3.0 cr)
or RHET 3562W - Technical and Professional Writing, WI (4.0 cr)
ABUS 4022 - Management in Organizations (3.0 cr)
or MGMT 3001 - Fundamentals of Management (3.0 cr)

-OR-

Option 2 (A.S. in Construction Management)
Students may satisfy the prerequisites for the major by earning an A.S. in construction management at North Hennepin Community College or Inver Hills Community College.

Required Courses

Major Courses
ABUS 4101 - Accounting for Managers (3.0 cr)
ARCH 4542 - Building Energy Systems (3.0 cr)
ARCH 4552 - Integrated Design Processes (3.0 cr)
CE 3202 - Surveying and Mapping (2.0 cr)
CE 4101W - Project Management, WI (3.0 cr)
CMGT 4011 - Construction Documents and Contracts (3.0 cr)
CMGT 4012 - Risk Management, Bonds, and Insurance (2.0 cr)
CMGT 4013 - Legal and Ethical Issues in Construction (3.0 cr)
CMGT 4021 - Construction Planning and Scheduling (3.0 cr)
CMGT 4022 - Construction Estimating (3.0 cr)
CMGT 4031 - Construction Safety and Loss Control (3.0 cr)
CMGT 4041 - Specifications and Technical Writing for Construction Professionals (3.0 cr)
CMGT 4051 - Construction Materials for Managers (3.0 cr)
CMGT 4111 - Construction Productivity Management (2.0 cr)
CMGT 4196 - Construction Management Internship (1.0-4.0 cr)
CMGT 4201 - Construction Accounting (3.0 cr)
CMGT 4572 - Structural Frames and Building Design/Construction (3.0 cr)
ABUS 4103 - Marketing and Sales (3.0 cr)
or ABUS 4701 - Introduction to Marketing (3.0 cr)

Construction Management Minor

Required credits in this minor: 19.

A minor in construction management is available to students who are either currently enrolled in or are graduates of an undergraduate degree program at the University of Minnesota.

Admission Requirements

Students must complete 45 credits before admission to the program.

A GPA above 2.00 is preferred for the following:

- 2.50 for students already admitted to the degree-granting college.
- 2.50 for students transferring from another University of Minnesota college.
- 2.50 for students transferring from outside the University.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Sixty percent of credits in the minor must be completed at the University of Minnesota-Twin Cities. CMGT 3011 or equivalent experience is prerequisite for certain courses in the minor.

Required Courses

Construction Management Minor Requirements

CE 4101W - Project Management, WI (3.0 cr)
CMGT 3001 - Introduction to Construction (3.0 cr)
CMGT 4011 - Construction Documents and Contracts (3.0 cr)
CMGT 4021 - Construction Planning and Scheduling (3.0 cr)
CMGT 4022 - Construction Estimating (3.0 cr)
CMGT 4031 - Construction Safety and Loss Control (3.0 cr)
CMGT 3011 - Construction Plan Reading (2.0 cr)
or Upper-division elective approved by the Department

Emergency Health Services B.A.Sc.

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 52.

This program requires summer terms.

Degree: Bachelor of Applied Science.

The B.A.Sc. with a major in emergency health services is offered in partnership with Inver Hills Community College. The program is designed to provide personnel working in pre-hospital medical care with the education and skills necessary to coordinate and direct the delivery of emergency health services in a variety of settings, ranging from out-of-hospital, first-responder situations to occupational health and safety programs in large organizations. The emergency health services major was designed to meet the needs of working adults who are attending college part-time.

Admission Requirements

Students must complete 45 credits before admission to the program.

A GPA above 2.00 is preferred for the following:

- 2.50 for students already admitted to the degree-granting college.
- 2.50 for students transferring from another University of Minnesota college.
- 2.50 for students transferring from outside the University.

Students must have current EMT paramedic state certification or be registered nurses currently employed in an emergency medical setting. Before admission, students must complete a minimum of 45 semester credits transferable to the BAS major program, including the required prerequisite courses. Students must have these prerequisite courses completed or in progress before applying for official admission to the program.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Required Courses for Admission

Preparatory Courses

GC 1131 - Principles of Biological Science, BIOL SCI/L (4.0 cr)
GC 1166 - Principles of Chemistry (3.0 cr)
INMD 3001 - Human Anatomy (3.0 cr)
PHSL 3051 - Human Physiology (4.0 cr)
COMM 1101 - Introduction to Public Speaking (3.0 cr)
or COMM 3605W - Persuasive Speaking and Speech Writing, WI (3.0 cr)
or GC 1461 - Oral Communication in the Public Sphere, C/PE (3.0 cr)
or RHET 1223 - Oral Presentations in Professional Settings (3.0 cr)

General Requirements

Recommended freshman writing course(s) for this program: RHET 1101

Program Requirements

Students must complete 25 credits in either the management or education track. Both tracks include a practicum and elective courses.

Required Courses

Major Courses

ABUS 4023W - Communicating for Results, WI (3.0 cr)
ABUS 4031 - Accessing and Using Information Effectively (3.0 cr)
EDPA 5052 - Ethnic Groups and Communities: Families, Children, and Youth (3.0 cr)
EHS 4011 - Concepts of Emergency Health Service (3.0 cr)
EHS 4021 - EMS Planning and Fiscal Management (3.0 cr)
PHIL 3305 - Medical Ethics (4.0 cr)
PUBH 3102 - Issues in Environmental and Occupational Health, ENVT (3.0 cr)
EHS 5031 - Basic principles of research in emergency health services. (3.0 cr)
or HSM 3501 - Clinical Research Concepts and Practice (3.0 cr)
ABUS 4021 - Small Group Behavior and Teamwork (3.0 cr)
or EPSY 5152 - Psychology of Conflict Resolution (3.0 cr)
or HRD 5302 - Managing Work Teams in Business and Industry (3.0 cr)
or PA 5131 - Conflict Management: Readings in Theory and Practice (3.0 cr)

Program Sub-plans

Students are required to complete one of the following sub-plans. (Note: The honors sub-plan does not meet this requirement.) Honors students are required to complete one sub-plan plus the honors sub-plan.

Education Track

Complete 25 credits related to the track.

Required Courses for the Education Track sub-plan

ADED 5101 - Strategies for Teaching Adults (3.0 cr)
EDPA 5036 - Ethics, Morality, and Values in Education (3.0 cr)
EPSY 5115 - Psychology of Adult Learning and Instruction (3.0 cr)
EHS 4999 - Practicum (1.0-3.0 cr)

Individual electives to total 25 credits in the track.

EDPA 5021 - Historical Foundations of Modern Education (3.0 cr)
or EDPA 5032 - Comparative Philosophies of Education (3.0 cr)
or WHRE 5301 - Philosophy and Practice of Career and Technical Education (2.0 cr)
ADED 5103 - Designing the Adult Education Program (3.0 cr)

Management Track

Complete 25 credits related to this track.

Required Courses

ABUS 4101 - Accounting for Managers (3.0 cr)
ABUS 4104 - Management and Human Resource Practices (3.0 cr)
EHS 4999 - Practicum (1.0-3.0 cr)
HSM 4541 - Health Care Finance (3.0 cr)
OMS 3001 - Introduction to Operations Management (3.0 cr)
Individual electives to total 25 credits in the track.
ABUS 4022 - Management in Organizations (3.0 cr)
or MGMT 3001 - Fundamentals of Management (3.0 cr)
ABUS 4012 - Problem Solving in Complex Organizations (3.0 cr)
or OMS 3059 - Quality Management and Six Sigma (4.0 cr)

Information Technology Infrastructure B.A.Sc.

Requirements for this program are current for Summer 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 59.

This program requires summer terms.

Degree: Bachelor of Applied Science.

The B.A.Sc. with a major in information technology infrastructure is a course of study combining information technology infrastructure, math, science, and business curricula. Graduates are able to design, construct, and manage technology operations. Students choose a network and system administration, or database concentration area. They also choose one of four tracks: applied business, construction management, health systems management, or manufacturing technology.

Admission Requirements

Students must complete 45 credits before admission to the program.

A GPA above 2.00 is preferred for the following:

- 2.5 for students already admitted to the degree-granting college.
- 2.50 for students transferring from another University of Minnesota college.
- 2.50 for students transferring from outside the University.

Physics I & II, calculus, and computer science lower division coursework must be completed or in progress—see program foundation courses.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Required Courses

Lower Division Curriculum
Students who complete a physics sequence that is not designated as writing-intensive must also complete a research/technical writing course. Completing CSCI foundation courses at the U of M requires Calculus I & II.

Foundation Courses
Complete the following courses before admission to the major.
CSCI 1103 - Introduction to Computer Programming in Java (4.0 cr)
CSCI 1901 - Structure of Computer Programming I (4.0 cr)
CSCI 1902 - Structure of Computer Programming II (4.0 cr)
CSCI 2011 - Discrete Structures of Computer Science (4.0 cr)
CSCI 2021 - Machine Architecture and Organization (4.0 cr)
PHYS 1101W - Introductory College Physics I, PHYS SCI/L, WI (4.0 cr)
PHYS 1102W - Introductory College Physics II, PHYS SCI/L, WI (4.0 cr)
MATH 1142 - Short Calculus, MATH (4.0 cr)
or MATH 1271 - Calculus I, MATH (4.0 cr)

Other Required Courses
ACCT 2050 - Introduction to Financial Reporting (4.0 cr)
One course that meets the LE requirements for social sciences or historical perspectives.
One course that meets LE requirements in humanities or arts.
COMM 1101 - Introduction to Public Speaking (3.0 cr)
or COMM 1102 - Introduction to Communication (3.0 cr)
or COMM 3402 - Introduction to Interpersonal Communication, SSCI (3.0 cr)
or GC 1461 - Oral Communication in the Public Sphere, C/PE (3.0 cr)
or GC 1464 - Group Process and Discussion in a Multicultural Society, CD (3.0 cr)
or RHET 1223 - Oral Presentations in Professional Settings (3.0 cr)
or ABUS 4021 - Small Group Behavior and Teamwork (3.0 cr)
GC 1454 - Statistics, MATH (4.0 cr)
or OMS 2550 - Business Statistics: Data Sources, Presentation, and Analysis (4.0 cr)
or STAT 1001 - Introduction to the Ideas of Statistics, MATH (4.0 cr)
or STAT 3011 - Introduction to Statistical Analysis, MATH (4.0 cr)
ECON 1101 - Principles of Microeconomics, IP, SSCI (4.0 cr)
or APEC 1101 - Principles of Microeconomics, SSCI (3.0 cr)

Core Courses
ABUS 4022 - Management in Organizations (3.0 cr)
ABUS 4023W - Communicating for Results, WI (3.0 cr)
CSCI 4061 - Introduction to Operating Systems (4.0 cr)
CSCI 4211 - Introduction to Computer Networks (3.0 cr)
INET 4051 - IT Infrastructure Operations (Capstone) (3.0 cr)
INET 4081 - Introduction to Software Engineering (4.0 cr)
INET 4153 - Telecommunications: Domestic and International Policy and Regulation (3.0 cr)

Required Tracks

Students are required to complete one of the following course groups.

Applied Business
ABUS 4043 - Project Management in Practice (3.0 cr)
ABUS 4101 - Accounting for Managers (3.0 cr)
ABUS 4102 - Operations in Manufacturing and Service Businesses (3.0 cr)
Cognate electives - CSCI, IDSC, ABUS or INET (9 cr)
MT 4201 - Statistical Process Control (3.0 cr)
or ABUS 4032 - Quantitative Skills for Decision Making (3.0 cr)

-OR-

Construction Management
ABUS 4101 - Accounting for Managers (3.0 cr)
CE 4101W - Project Management, WI (3.0 cr)
CMGT 3001 - Introduction to Construction (3.0 cr)
CMGT 4011 - Construction Documents and Contracts (3.0 cr)
CMGT 4021 - Construction Planning and Scheduling (3.0 cr)
CMGT 4022 - Construction Estimating (3.0 cr)
MT 4201 - Statistical Process Control (3.0 cr)
or ABUS 4032 - Quantitative Skills for Decision Making (3.0 cr)

-OR-

Health Systems Management
ABUS 4043 - Project Management in Practice (3.0 cr)
ABUS 4102 - Operations in Manufacturing and Service Businesses (3.0 cr)
HSM 3501 - Clinical Research Concepts and Practice (3.0 cr)

HSM 3521 - Health Care Delivery Systems (3.0 cr)
HSM 4541 - Health Care Finance (3.0 cr)
HSM 4561 - Health Care Administration and Management (3.0 cr)
PHAR 3800 - Pharmacotherapy for the Health Professions (3.0 cr)

-OR-

Manufacturing Technology
ABUS 4043 - Project Management in Practice (3.0 cr)
ABUS 4102 - Operations in Manufacturing and Service Businesses (3.0 cr)
MT 4001 - Manufacturing Cost Accounting, Analysis, and Control (3.0 cr)
MT 4011 - Design of Manufacturing Systems and Simulation (3.0 cr)
MT 4012 - Manufacturing Processes (3.0 cr)
MT 4201 - Statistical Process Control (3.0 cr)
MT 4015 - Quality Engineering (3.0 cr)
or MT 4025 - Computer Integrated Manufacturing (3.0 cr)

Program Sub-plans

Students are required to complete one of the following sub-plans. (Note: The honors sub-plan does not meet this requirement.) Honors students are required to complete one sub-plan plus the honors sub-plan.

Database Administration Concentration

Required Courses

INET 4031 - Systems Administration (4.0 cr)
INET 4061 - Introduction to Data Warehousing (3.0 cr)
INET 4131 - Advanced Database Design (3.0 cr)
INET 4193 - Directed Study (1.0-4.0 cr)
CSCI 4707 - Practice of Database Systems (3.0 cr)
or INET 4707 - Practice of Database Systems (3.0 cr)

Network and Systems Administration Concentration

Required Courses

INET 4011 - Network Administration (4.0 cr)
INET 4021 - Network Programming (4.0 cr)
INET 4031 - Systems Administration (4.0 cr)
INET 4041 - Emerging Network Technologies and Applications (3.0 cr)

Inter-College Program B.A.

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 40 to 44.

Degree: Bachelor of Arts.

Founded in 1930, the Inter-College Program (ICP) embodies the University's commitment to individualized undergraduate education by providing cross-college, course/credit-based degree options. Drawing upon the curricular offerings of most of the University's colleges and departments, students design either a bachelor of arts (B.A.) or a bachelor of science (B.S.) degree incorporating a significant amount of coursework from at least two different colleges within the University system.

ICP is most appropriate for self-directed students whose educational backgrounds and career and intellectual interests require both a clear personal focus and a flexible interdisciplinary approach.

Interested students should attend a First Step meeting, small-group informational sessions held several times each week. Academic advisers provide a detailed introduction to the program and help students begin the planning process.

Admission Requirements

Students are considered for admission based on an individual review of their application, including key factors such as grade point average, grade trends, prerequisite course grades, and program match, as determined after consultation with an academic adviser. Preferred academic factors include an overall GPA that is 2.50 or higher, as well as the completions of 50 semester credits.

Students must develop a degree plan that includes:

- A description of academic and career goals
- An outline of courses proposed for the degree program
- Approval of the proposed degree plan from at least two designated faculty or departmental advisers

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Students are required to take 4 semester(s) of any second language or 2 semesters of a single second language and 8 credits of related culture coursework.

ICP Program Options

Students must complete one of the following course groups.

Two Area Cross-College Program
This plan combines courses from two area cross-college programs, such as business and history, or educational psychology and French.

- Complete 20 approved credits of upper division coursework in one area of concentration.
- Complete 20 approved credits of upper division coursework in a second area of concentration.
- Complete 10 credits of elective coursework at the upper division.

-OR-

Three Area Cross-College Program
This plan combines courses from three area cross-college program, such as applied business, speech communication, and psychology; or housing, child psychology, and public health.

In addition to completing 20 approved upper division credits in one area and 12 in each of the other two areas, students also take 6 upper division elective credits.

- Complete 20 approved credits of upper division coursework in one area of concentration.
- Complete 12 approved credits of upper division coursework in a second area of concentration.
- Complete 12 approved credits of upper division coursework in a third area of concentration.
- Complete a total of 50 upper division credits.

-OR-

Thematic Cross-College Program
A thematic cross-college program, such as aging studies, integrates coursework from several departments: sociology, public health, family education, and social work. Thematic programs are appropriate only when students' objectives are clearly focused on one topic that cannot be pursued in a two- or three-area program.

- Complete 40 upper division credits on a theme.

Inter-College Program B.S.

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 50.

Degree: Bachelor of Science.

Founded in 1930, the Inter-College Program (ICP) embodies the University of Minnesota's commitment to individualized undergraduate education by providing cross-college, course/credit-based degree options. Drawing upon the curricular offerings of most of the University's colleges and departments, students design either a bachelor of arts (B.A.) or a bachelor of science (B.S.) degree incorporating a significant amount of coursework from at least two different colleges within the University system.

ICP is most appropriate for self-directed students whose educational backgrounds and career and intellectual interests require both a clear personal focus and a flexible interdisciplinary approach.

Admission Requirements

Students are considered for admission based on an individual review of their application, including key factors such as grade point average, grade trends, prerequisite course grades, and program match, as determined after consultation with an academic adviser. Preferred academic factors include an overall GPA that is 2.50 or higher, as well as the completions of 50 semester credits.

Students must develop a degree plan that includes:

- A description of academic and career goals
- An outline of courses proposed for the degree program
- Approval of the proposed degree plan from at least two designated faculty or departmental advisers

Several times each week, ICP holds small-group informational sessions called First Step meetings. Academic advisers provide a detailed introduction to the program and help students begin the planning process.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

ICP Program Options

Students are required to complete one of the following course groups.

Two Area Cross-College Program
This plan combines courses from two area cross-college programs, such as business and history, or educational psychology and French.

- Complete 21 approved credits of upper division coursework in one area of concentration.
- Complete 21 approved credits of upper division coursework in a second area of concentration.
- Complete 8 supporting upper division credits.

-OR-

Three Area Cross-College Program
This plan combines courses from three area cross-college programs, such as applied business, speech communication, and psychology; or housing, child psychology, and public health.

- Complete 20 credits of upper division coursework in one area of concentration.
- Complete 15 credits of upper division coursework in a second area of concentration.
- Complete 15 credits of upper division coursework in a third area of concentration.

-OR-

Thematic Cross-College Program
A thematic cross-college program integrates coursework from several departments. Thematic programs are appropriate only when students' objectives are clearly focused on one topic that cannot be pursued in a two- or three-area program.

Complete 50 upper division credits with no more than 15 credits in any one department.

Joint Military Science Leadership Minor

Requirements for this program are current for Fall 2006.

Required credits in this minor: 18 to 20.

This minor provides students with basic concepts and principles of military science and the art of leadership. Areas of study include citizenship, military history, values, ethics, integrity, honor, responsibility, management, and leadership skills. Students gain practical leadership experience, develop self-discipline, and gain confidence—all of which are valuable qualities when applied to service in a military or civilian career. In consultation with the ROTC programs, this minor is now distinct from participation in ROTC, is open to all qualified students, and does not require physical training.

Admission Requirements

Significant practical leadership experience.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Students choose one of four program tracks: Aerospace Science, Military Science, Naval Science-Navy, or Naval Science-Marines.

Program Sub-plans

Students are required to complete one of the following sub-plans. (Note: The honors sub-plan does not meet this requirement.) Honors students are required to complete one sub-plan plus the honors sub-plan.

Aerospace Science

Required Courses

The history requirement can be satisfied by the completion of AIR 1204 and AIR 1205 or by the completion of Air Force ROTC Field Training.

AIR 1204 - History of Airpower and Communication Skills (1.0 cr)

AIR 1205 - Quality Air Force, Group Leadership Problems, and Presentation Techniques (1.0 cr)
AIR 3301 - Air Force Leadership, Quality, and Communication (3.0 cr)
AIR 3302 - Air Force Officership, Quality, and Communication (3.0 cr)
AIR 3401 - National Security Policy (3.0 cr)
AIR 3402 - Preparation for Active Duty (3.0 cr)
Complete a 4-credit philosophy, rhetoric, or leadership course approved by the Professor of Aerospace/Chair of the Department of Aerospace Science.

Military Science

Required Courses

HIST 3891 - American Military History (4.0 cr)
MIL 3130 - Leading Small Organizations I (3.0 cr)
MIL 3131 - Leading Small Organizations II (3.0 cr)
MIL 3140 - Leadership Challenges and Goal Setting (3.0 cr)
MIL 3141 - Transition to Lieutenant (3.0 cr)
Complete a 4-credit philosophy, rhetoric, or leadership course approved by the Professor of Military Science/Chair of the Department of Military Science.

Naval Science—Marines

Required Courses

NAV 1102 - Seapower and Maritime Affairs (3.0 cr)
NAV 3310 - Evolution of Warfare (3.0 cr)
NAV 4401W - Leadership and Management I, WI (3.0 cr)
NAV 4402W - Leadership and Ethics, C/PE, WI (3.0 cr)
NAV 4410 - Amphibious Warfare (3.0 cr)
Complete a 4-credit philosophy, rhetoric, or leadership course approved by the Professor of Military/Chair of the Department of Naval Science.

Naval Science—Navy

Required Courses

NAV 1102 - Seapower and Maritime Affairs (3.0 cr)
NAV 2201 - Ship Systems I: Naval Engineering (3.0 cr)
NAV 3301 - Navigation I: Piloting and Celestial Navigation (3.0 cr)
NAV 4401W - Leadership and Management I, WI (3.0 cr)
NAV 4402W - Leadership and Ethics, C/PE, WI (3.0 cr)
Complete a 4-credit philosophy, rhetoric, or leadership course approved by the Professor of Military Science/Chair of the Department of Naval Science.

Manufacturing Technology B.A.Sc.

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 51.

This program is 10 terms (5 years) long.

Degree: Bachelor of Applied Science.

The B.A.Sc. with a major in manufacturing technology prepares students for career growth in the manufacturing industry. Students learn new skills in the areas of manufacturing systems and processes, computer technology, quality, operations, project management, business and finance, and interpersonal communication. Graduates are prepared to work as project managers, process engineers, materials managers, lead technicians, order process analysts, facilities engineers, and business analysts. The manufacturing technology major was designed around the needs of working adults who are part-time students.

Admission Requirements

Students must complete 45 credits before admission to the program.

A GPA above 2.00 is preferred for the following:

- 2.50 for students already admitted to the degree-granting college.
- 2.50 for students transferring from another University of Minnesota college.
- 2.50 for students transferring from outside the University.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Required Courses for Admission

Preparatory Courses

CHEM 1011 - Introductory Chemistry: Lecture and Laboratory, PHYS SCI/L (4.0 cr)
or GC 1166 - Principles of Chemistry (3.0 cr)
ECON 1101 - Principles of Microeconomics, IP, SSCI (4.0 cr)
or ECON 1102 - Principles of Macroeconomics, IP, SSCI (4.0 cr)
MATH 1031 - College Algebra and Probability, MATH (3.0 cr)
or MATH 1051 - Precalculus I (3.0 cr)
MATH 1142 - Short Calculus, MATH (4.0 cr)
or MATH 1271 - Calculus I, MATH (4.0 cr)
PHYS 1101W - Introductory College Physics I, PHYS SCI/L, WI (4.0 cr)
or PHYS 1301W - Introductory Physics for Science and Engineering I, PHYS SCI/L, WI (4.0 cr)
PHYS 1102W - Introductory College Physics II, PHYS SCI/L, WI (4.0 cr)
or PHYS 1302W - Introductory Physics for Science and Engineering II, PHYS SCI/L, WI (4.0 cr)
GC 1454 - Statistics, MATH (4.0 cr)
or OMS 2550 - Business Statistics: Data Sources, Presentation, and Analysis (4.0 cr)
or STAT 1001 - Introduction to the Ideas of Statistics, MATH (4.0 cr)
or STAT 3011 - Introduction to Statistical Analysis, MATH (4.0 cr)

Program Requirements

Students are encouraged to complete an internship or directed study during their final year in the program.

Required Courses

Major Courses (Lower Division)

In addition to the courses listed below, manufacturing technology students must complete the University's freshman writing requirement.

ACCT 2050 - Introduction to Financial Reporting (4.0 cr)
COMM 1101 - Introduction to Public Speaking (3.0 cr)
or COMM 3402 - Introduction to Interpersonal Communication, SSCI (3.0 cr)
or COMM 3605W - Persuasive Speaking and Speech Writing, WI (3.0 cr)
or GC 1461 - Oral Communication in the Public Sphere, C/PE (3.0 cr)
AEM 2011 - Statics (3.0 cr)
or BP 3001 - Statics, Mechanics, and Structural Design (4.0 cr)
or BP 3101 - Introductory Statics and Structures for Construction Management (3.0 cr)

Major Courses (Upper Division)

ABUS 4022 - Management in Organizations (3.0 cr)
ABUS 4023W - Communicating for Results, WI (3.0 cr)
ABUS 4043 - Project Management in Practice (3.0 cr)
ABUS 4102 - Operations in Manufacturing and Service Businesses (3.0 cr)
MT 4001 - Manufacturing Cost Accounting, Analysis, and Control (3.0 cr)
MT 4011 - Design of Manufacturing Systems and Simulation (3.0 cr)
MT 4012 - Manufacturing Processes (3.0 cr)
MT 4015 - Quality Engineering (3.0 cr)

MT 4025 - Computer Integrated Manufacturing (3.0 cr)
MT 4201 - Statistical Process Control (3.0 cr)
MT 4501 - Manufacturing Product/System Design I (3.0 cr)

Electives

Take 18 or more credit(s) from the following:
BUS 3xxx
BUS 4xxx
MT 3xxx
MT 4xxx

Program for Individualized Learning B.A.

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 50 to 70.

Degree: Bachelor of Arts.

This program challenges students to think alternatively and holistically about learning. A set of standards, called graduation criteria, describes the basic academic structure of the bachelor's degree. These criteria, rather than number of credits, provide the framework for structuring the degree program and assessing its success.

Students use the graduation criteria to build their own degree programs. Students are encouraged to be creative and to use a variety of learning activities (courses and projects) to satisfy each criterion. Courses that have already been completed may be used to fulfill the graduation criteria; students can also demonstrate college-level learning achieved through work, experience, and independent study. New learning activities may explore untapped interests or build on prior learning. These activities may include independent projects, internships, work-based projects, and classroom and correspondence coursework.

A PIL degree requires achievement and excellence equal to other baccalaureate programs at the University of Minnesota. The graduation criteria require in-depth knowledge in an area of concentration (depth criteria) and broad learning in the liberal arts (breadth criteria). Regardless of the area of concentration, the B.S. emphasizes the student's field of study, while the B.A. emphasizes broader learning in the breadth criteria.

Admission Requirements

To be considered for admission, students must submit an application that documents their ability to undertake a self-directed, individualized degree program. The program seeks students who: know why they are seeking a bachelor's degree and why PIL is a sound choice for them; can describe their proposed academic area of study; and write well in English.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

The program serves students who want to develop an area of concentration with some or all of the following attributes:

- Focused on interdisciplinary or multidisciplinary studies, or a specialized study within a broader academic context
- Built on the academic strengths of the University
- Designed as a foundation for graduate or professional education
- Not readily available as a structured undergraduate degree program

The area of concentration, traditionally called a major, should reflect balance, depth, and quality in a field of study. The student's area of concentration must fulfill the following criteria:

- **Primary Area Studies:** Through learning activities in their primary area of study, students acquire familiarity with the basic literature and vocabulary of their field, knowledge of its main theories and methods of investigation, ability to use the skills of the field, and an awareness of its relationship to contemporary and future society.
- **Major Project:** As a culmination of study in their area of concentration, students complete a major project that reflects substantive understanding of their field of study.
- **Extended Studies in the Liberal Arts:** Studies involve acquiring in-depth and advanced understanding of a focused liberal arts area; an interdisciplinary approach may also be proposed. Learning should include critical and theoretical understanding and upper division knowledge. This work goes beyond the basic requirements reflected in the LE requirements, as interpreted in the Breadth and Learning Matrix requirements in PIL.

Required Courses

Major Registrations

The PIL program is not credit-based, but it uses credits to ensure that registrations are recognized within the University system and that students qualify for residency and financial aid requirements. Tuition credits attached to registrations are not the same as conventional coursework credits and are not used to measure progress in the program or readiness to graduate, nor are they necessarily transferable to other programs or colleges. Additional registrations in PIL 3251 may be required.

PIL 3211 - Degree Planning (5.0 cr)
PIL 3251 - Project Registration (5.0 cr)
PIL 3281 - Major Project (5.0 cr)
PIL 3291 - Graduation Preparation (5.0 cr)

Most students will also need to register multiple times in one or both of the folllowing:
PIL 3200 - Continuing Studies (1.0-2.0 cr)
PIL 3252 - Program Active (1.0-5.0 cr)

Program for Individualized Learning B.S.

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 50 to 70.

Degree: Bachelor of Science.

This program challenges students to think alternatively and holistically about learning. A set of standards, called graduation criteria, describes the basic academic structure of the bachelor's degree. These criteria, rather than number of credits, provide the framework for structuring the degree program and assessing its success.

Students use the graduation criteria to build their own degree programs. Students are encouraged to be creative and to use a variety of learning activities (courses and projects) to satisfy each criterion. Courses that have already been completed may be used to fulfill the graduation criteria; students can also demonstrate college-level learning achieved through work, experience, and independent study. New learning activities may explore untapped

interests or build on prior learning. These activities may include independent projects, internships, work-based projects, and classroom and correspondence coursework.

A PIL degree requires achievement and excellence equal to other baccalaureate programs at the University of Minnesota. The graduation criteria require in-depth knowledge in an area of concentration (depth criteria) and broad learning in the liberal arts (breadth criteria). Regardless of the area of concentration, the B.S. emphasizes the student's field of study, while the B.A. emphasizes broader learning in the breadth criteria.

Admission Requirements

To be considered for admission, students must submit an application that documents their ability to undertake a self-directed, individualized degree program. The program seeks students who know why they are seeking a bachelor's degree and why PIL is a sound choice for them; can describe their proposed academic area of study; and write well in English.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

The program serves students who want to develop an area of concentration with some or all of the following attributes:

- Focused on interdisciplinary or multidisciplinary studies, or a specialized study within a broader academic context.
- Built on the academic strengths of the University.
- Designed as a foundation for graduate or professional education.
- Not readily available as a structured undergraduate degree program.

The area of concentration, traditionally called a major, should reflect balance, depth, and quality in a field of study. The student's area of concentration must fulfill the following criteria:

Primary Area Studies: Through learning activities in their primary area of study, students acquire familiarity with the basic literature and vocabulary of their field, knowledge of its main theories and methods of investigation, ability to use the skills of the field, and an awareness of its relationship to contemporary and future society.

Major Project: As a culmination of study in their area of concentration, students complete a major project that reflects substantive understanding of their field of study.

Extended Studies in the Area of Concentration: Students complete learning activities that bring a broader perspective to their area of concentration. These studies add knowledge that complements and expands on the primary area studies.

Students also complete the University's liberal education requirements as reflected in the PIL Breadth and Learning Matrix requirements.

Required Courses

The PIL program is not credit-based, but it uses credits to ensure that registrations are recognized within the University system and that students qualify for residency and financial aid requirements. Tuition credits attached to registrations are not the same as conventional coursework credits and are not used to measure progress in the program or readiness to graduate, nor are they necessarily transferable to other programs or colleges. Additional registrations in PIL 3251 may be required.

PIL 3211 - Degree Planning (5.0 cr)
PIL 3251 - Project Registration (5.0 cr)
PIL 3281 - Major Project (5.0 cr)
PIL 3291 - Graduation Preparation (8.0 cr)

Students may be required to register one or more times for the following.
PIL 3200 - Continuing Studies (1.0-2.0 cr)

Radiation Therapy B.A.Sc.

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 69.

This program requires summer terms.

Degree: Bachelor of Applied Science

The B.A.Sc. with a major in radiation therapy provides leading-edge medical and technical courses and clinical experience in top-ranking radiation oncology departments. Radiation therapy graduates are prepared to meet the changing demands of new technologies and advancements in treatment techniques and meet national certification requirements. Didactic and clinical experiences will sharpen critical thinking and problem solving skills, and provide the knowledge base in management and education that is crucial to future advancement.

The major is offered in two locations: Rochester and the Twin Cities. In Rochester, the University of Minnesota partners with the Mayo School of Health Sciences (MSHS). Classes and clinical experiences are offered at the Mayo Clinic and other facilities within the Mayo Health System. In the Twin Cities, this program is offered in partnership with University of Minnesota Medical Center Fairview (UMMC) School of Radiation Therapy. Classes are conducted at UMMC with clinicals at UMMC and other health care sites in the Twin Cities.

Admission Requirements

Students must complete 45 credits before admission to the program.

A GPA above 2.00 is preferred for the following:

- 2.50 for students already admitted to the degree-granting college.
- 2.50 for students transferring from another University of Minnesota college.
- 2.50 for students transferring from outside the University.

Each partner program has additional specific requirements. All general education and prerequisite cousework must be completed or in progress at time of admission, including general education and prepratory courses (both locations) and partner-specific courses.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at admissions.tc.umn.edu.

Required Courses for Admission

Preparatory Courses (both locations)
These courses are part of the general education and prerequisite courses. They must be completed or in progress at the time of application for admission. Biology is only required if it is a prerequisite for other science courses; biology is not a prerequisite for the major. On the Twin Cities campus, COMM 3402 satisfies the Oral Communication requirement. Additional program-specific general education and prerequisite courses are listed under each sub-plan.

COMM 1101 - Introduction to Public Speaking (3.0 cr)

or COMM 3605W - Persuasive Speaking and Speech Writing, WI (3.0 cr)
or GC 1461 - Oral Communication in the Public Sphere, C/PE (3.0 cr)
or RHET 1223 - Oral Presentations in Professional Settings (3.0 cr)
MATH 1031 - College Algebra and Probability, MATH (3.0 cr)
or MATH 1051 - Precalculus I (3.0 cr)
MATH 1151 - Precalculus II, MATH (3.0 cr)
GC 1281 - General Psychology, SSCI (4.0 cr)
or PSY 1001 - Introduction to Psychology, SSCI (4.0 cr)
BIOL 1009 - General Biology, BIOL SCI/L (4.0 cr)
INMD 3001 - Human Anatomy (3.0 cr)
INMD 3002 - Human Anatomy Laboratory (1.0 cr)
PHSL 1001 - Human Physiology (3.0 cr)
PHSL 3051 - Human Physiology (4.0 cr)

Program Requirements

Major Courses
ABUS 4041 - Dynamics of Leadership (3.0 cr)
HSM 3501 - Clinical Research Concepts and Practice (3.0 cr)
HSM 3521 - Health Care Delivery Systems (3.0 cr)
HSM 4501 - Writing for the Health Professions (3.0 cr)
HSM 4541 - Health Care Finance (3.0 cr)
HSM 4561 - Health Care Administration and Management (3.0 cr)
HSM 4581 - Teaching in the Health Care Setting (3.0 cr)
PHAR 3800 - Pharmacotherapy for the Health Professions (3.0 cr)
RTT 3501 - Introduction to Radiation Therapy (2.0 cr)
RTT 3521 - Patient Care in Radiation Oncology (2.0 cr)
RTT 3541 - Pathology (1.0 cr)
RTT 3561 - Cross-Sectional Anatomy (2.0 cr)
RTT 3581 - Principles and Practices of Radiation Therapy I (4.0 cr)
RTT 3596 - Clinical Practicum I (3.0 cr)
RTT 3696 - Clinical Practicum II (3.0 cr)
RTT 4511 - Dosimetry and Treatment Planning (4.0 cr)
RTT 4581 - Principles and Practices of Radiation Therapy II (4.0 cr)
RTT 4596 - Clinical Practicum III (6.0 cr)
RTT 4601 - Project (1.0 cr)
RTT 4696 - Clinical Practicum IV (3.0 cr)
RTT 4796 - Clinical Practicum V (3.0 cr)

Program Sub-plans

Students are required to complete one of the following sub-plans. (Note: The honors sub-plan does not meet this requirement.) Honors students are required to complete one sub-plan plus the honors sub-plan.

University of Minnesota Medical Center Fairview

The following are required for admission to this program:

- Proof of immunization (records reviewed by UMMC Employee Health)
- CPR certification
- Medical physical
- Proof of health insurance
- FUMC School of Radiation Therapy application
- A minimum of 20 hours of documented shadowing/ observation in an approved radiation therapy department
- Interview with Admission Committee
- Vulnerable Adults Act Background Check
- A signed Essential Functions form indicating student understanding of the essential functions for successful completion of the Radiation Therapy program
- Computer proficiency

Required Courses

UMMC Courses
Students who have earned a radiographer certificate may not need to complete these courses, as determined by the UMMC program. Students should consult their University of Minnesota adviser. RTT 2001 and 2002 may be completed after admission to the major.

PHIL 1003W - Introduction to Ethics, OH, WI (4.0 cr)
or PHIL 3305 - Medical Ethics (4.0 cr)
CNES 1046 - Technical Terminology for the Health Professions (3.0 cr)
or PHAR 1002 - Health Sciences Terminology (2.0 cr)
or PHAR 5201 - Health Sciences Applied Terminology (2.0 cr)
PHYS 1101W - Introductory College Physics I, PHYS SCI/L, WI (4.0 cr)
or PHYS 1201W - Introductory Physics for Biology and Pre-medicine I, PHYS SCI/L, WI (5.0 cr)
or PHYS 1301W - Introductory Physics for Science and Engineering I, PHYS SCI/L, WI (4.0 cr)
RTT 2001 - Radiation Therapy: Radiation Exposure, Imaging, Safety, and Basic Care (1.0 cr)
RTT 2002 - Radiation Therapy: Radiation Exposure, Imaging, Safety, and Basic Care Lab (1.0 cr)

Major Courses
RTT 3120 - Radiation Physics I (3.0 cr)
RTT 3121 - Radiation Physics II (3.0 cr)
RTT 3140 - Radiation Therapy: Radiobiology (2.0 cr)

Mayo School of Health Sciences

The following are required for admission:

- Completion of an accredited program in radiography with a GPA of 3.00 or higher
- MSHS School of Radiation Therapy application
- Vulnerable Adults Act Background Check
- Documentation of radiation oncology observation experience
- Fluency in written and spoken English; if English is a second language, fluency must be demonstrated objectively through satisfactory peformance (within the last two years) on the TOEFL examination or the Michigan Test of English Language Proficiency
- Documentation of current health status and immunizations according to Mayo Clinic student policy
- Minnesota state law mandatory background checks

Required Courses

MSHS Courses
The general education requirement may be met by an ethics course approved by an adviser.

Major Courses
RTT 3601 - Clinical Quality Assurance and Computer Applications (1.0 cr)
RTT 3551 - Radiation Oncology Physics (3.0 cr)
RTT 3701 - Advanced Radiobiology and Radiation Protection (3.0 cr)

Respiratory Care B.A.Sc.

Requirements for this program are current for Summer 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 64.

This program requires summer terms.

Degree: Bachelor of Applied Science.

The B.A.Sc. with a major in respiratory care prepares students to become respiratory care practitioners with advanced clinical and professional skills. This program, offered in partnership with Mayo School of Health Sciences in Rochester, combines professional, medical, and technical courses. Courses and clinical experiences, with options for specialized clinical study, are offered at Mayo Clinic and other facilities within the Mayo Health System. Graduates will be ready to meet national certification requirements. Advanced practitioner respiratory therapists are prepared to serve as consultants to physicians, and other medical staff.

Admission Requirements

Students must complete 9 courses before admission to the program.

A GPA above 2.00 is preferred for the following:

- 2.50 for students already admitted to the degree-granting college.
- 2.50 for students transferring from another University of Minnesota college.
- 2.50 for students transferring from outside the University.

Students apply for admission to both the University of Minnesota and Mayo School of Health Sciences. The following items are required for admission to Mayo School of Health Sciences:

- No grade lower than C- in each preparatory course
- Overall GPA or 2.20 in all preparatory courses
- Proof of immunization (records reviewed by MSHS Employee Health)
- CPR certification
- Documentation of current health status and immunizations according to Mayo Clinic student policy
- Personal medical plan coverage
- Vulnerable Adults Act background check
- Complete the MSHS Respiratory Care application
- Interview with Admissions Committee
- Computer skills

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Required Courses for Admission

Foundation Courses I

See program requirements for additional foundation courses to be completed before admission.

BIOC 1001 - Elementary Biochemistry (3.0 cr)
CHEM 1011 - Introductory Chemistry: Lecture and Laboratory, PHYS SCI/L (4.0 cr)
BIOL 2032 - General Microbiology with Laboratory (4.0 cr)
or VBS 2032 - General Microbiology With Laboratory (4.0 cr)
PHSL 1001 - Human Physiology (3.0 cr)
or PHSL 3051 - Human Physiology (4.0 cr)
PHYS 1012 - Elementary Physics (4.0 cr)
or PHYS 1101W - Introductory College Physics I, PHYS SCI/L, WI (4.0 cr)
or PHYS 1111 - Basic Physics I (3.0 cr)

Take one of the following pairs of courses
INMD 3001 - Human Anatomy (3.0 cr)
INMD 3002 - Human Anatomy Laboratory (1.0 cr)
or
INMD 3301 - Human Anatomy (3.0 cr)
INMD 3302 - Human Anatomy Laboratory (1.0 cr)

Program Requirements

Required Courses

Foundation Courses II

These courses must also be completed before admission.

MATH 1031 - College Algebra and Probability, MATH (3.0 cr)
GC 1281 - General Psychology, SSCI (4.0 cr)
or PSY 1001 - Introduction to Psychology, SSCI (4.0 cr)
PHIL 1003W - Introduction to Ethics, OH, WI (4.0 cr)
or PHIL 1003V - Honors: Introduction to Ethics, OH, WI, H (4.0 cr)
or PHIL 3305 - Medical Ethics (4.0 cr)
COMM 1101 - Introduction to Public Speaking (3.0 cr)
or COMM 1101H - Honors: Introduction to Public Speaking, H (3.0 cr)
or GC 1461 - Oral Communication in the Public Sphere, C/PE (3.0 cr)
or RHET 1223 - Oral Presentations in Professional Settings (3.0 cr)
CNES 1046 - Technical Terminology for the Health Professions (3.0 cr)
or PHAR 1002 - Health Sciences Terminology (2.0 cr)
or PHAR 5201 - Health Sciences Applied Terminology (2.0 cr)

Major Courses

ABUS 4041 - Dynamics of Leadership (3.0 cr)
HSM 3501 - Clinical Research Concepts and Practice (3.0 cr)
HSM 3521 - Health Care Delivery Systems (3.0 cr)
HSM 4501 - Writing for the Health Professions (3.0 cr)
HSM 4541 - Health Care Finance (3.0 cr)
HSM 4561 - Health Care Administration and Management (3.0 cr)
HSM 4581 - Teaching in the Health Care Setting (3.0 cr)
HSM 4611 - Allied Health Grand Rounds (1.0 cr)
PHAR 3800 - Pharmacotherapy for the Health Professions (3.0 cr)
RC 2011 - Foundations for Clinical Practice of Respiratory Care (4.0 cr)
RC 2021 - Patient Care Techniques (2.0 cr)
RC 3101 - Respiratory Care Modalities and Equipment I (4.0 cr)
RC 3102 - Respiratory Care Modalities and Equipment II (4.0 cr)
RC 3201 - Cardiopulmonary Patient Assessment (4.0 cr)
RC 3301 - Clinical Practice I (4.0 cr)
RC 3302 - Clinical Practice II (4.0 cr)
RC 3401 - Seminar in Respiratory Care I: Case Reports and Fundamentals of Research (1.0 cr)
RC 3402 - Seminar in Respiratory Care II: Case Reports and Fundamentals of Research (1.0 cr)
RC 3501 - Advanced Cardiopulmonary Respiratory Physiology and Pathophysiology (3.0 cr)
RC 4111 - Advanced Adult Respiratory Critical Care Techniques (3.0 cr)
RC 4301 - Seminar: Research Project and Publication (1.0 cr)
RC 4496 - Subspecialty Clinical Practicum in Advanced Respiratory Care I (3.0 cr)
RC 4596 - Subspecialty Clinical Practicum in Advanced Respiratory Care II (3.0 cr)

Take exactly 2 course(s) from the following:
RC 4201 - Subspecialization in Respiratory Care: Advanced Perinatal and Pediatric Respiratory Care (2.0 cr)
RC 4202 - Subspecialization in Respiratory Care: Advanced Cardiopulmonary Diagnostics (2.0 cr)
RC 4203 - Subspecialization in Respiratory Care: Cardiopulmonary Rehabilitation, Disease Prevention, Case Mgmt (2.0 cr)

This is the Dental Hygiene section of the 2006-2008 Undergraduate Catalog for the University of Minnesota, Twin Cities campus.

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Dental Hygiene

General Information

The University of Minnesota School of Dentistry improves oral and craniofacial health by educating clinicians and scientists who translate knowledge and experience into clinical practice. The school is committed to

- graduating professionals who provide the highest quality care and service to the people of the state of Minnesota and the world
- discovering new knowledge through research, which will inspire innovation in the biomedical, behavioral, and clinical sciences
- providing oral health care to a diverse patient population in a variety of settings.

The School of Dentistry celebrated its centennial in 1988. In its long history, the school has developed an international reputation for education, research, and service. The School of Dentistry's professional program in dental hygiene, established in 1919, has an illustrious record of accomplishment and innovation and is one of the country's premiere programs. It is fully accredited by the Commission on Dental Accreditation and is the only dental hygiene program in Minnesota that grants a baccalaureate degree and is affiliated with a school of dentistry.

Dental hygienists are preventive oral health professionals who have graduated from an accredited dental hygiene program in an institution of higher education and are licensed by states to practice dental hygiene. They provide educational, clinical, research, administrative, consumer advocacy, change agent, and therapeutic services supporting total health through the promotion of optimal oral health.

Dental hygienists practice in settings such as private dental offices and clinics; federal, state, and local health departments or associated institutions; hospitals and long-term care facilities; school districts or departments of education; educational programs for dental, dental hygiene, and dental assisting students; private business or industry; correctional facilities; private and public centers for pediatric, geriatric, and other groups or individuals with special needs; and health maintenance organizations.

The dental hygiene curriculum seeks to train students in a variety of dental hygiene roles and health care settings.

The program has developed a new year-round calendar schedule, which will allow students to earn a bachelor of science degree in three years instead of four. It emphasizes a strong commitment to community outreach and service, and to intellectual development and critical thinking. Graduates complete a baccalaureate degree that blends a solid dental hygiene education with the biological, behavioral, and social sciences, and the liberal arts.

The Division of Dental Hygiene also offers a baccalaureate degree completion program for graduates of accredited associate degree programs in dental hygiene who wish to earn a baccalaureate degree.

Admission

The Division of Dental Hygiene sets its standards and requirements for admission. A strong interest in the natural sciences, and the social and behavioral sciences is required. The division recommends that applicants have a genuine interest in human services and promoting public health and welfare.

The dental hygiene curriculum consists of the preprofessional program in CLA or its equivalent at another regionally accredited institution and the professional program in the School of Dentistry, Division of Dental Hygiene.

Admission to the preprofessional program requires the student to meet the admissions criteria of individual colleges within the University and is subject to CLA's academic regulations or their equivalent at another institution. Admission to the preprofessional program does not guarantee admission to the professional program.

Admission to the professional program is competitive and occurs once a year for fall semester entry. Applications are accepted from September 15 until December 15. Applications received after the deadline are not considered.

Requirements for application include: high school graduate; ACT, PSAT, or SAT scores; transcripts of all high school and college courses; minimum 2.00 GPA (cumulative, preprofessional, and science coursework); and evidence of plans for completion of specified preprofessional coursework before proposed entry. Documentation indicating completion of all required preprofessional courses must be submitted to the Division of Dental Hygiene by August 15 of year of proposed entry.

Applicants must complete the University of Minnesota's high school preparation requirements prior to entry into the professional program. See Freshman Admission in the General Information section of this catalog.

The University's liberal education requirements must be completed prior to graduation from the program. If not completed prior to entry into the program, these requirements must be completed in conjunction with the curriculum while enrolled in the program.

Students enrolled at the University, Twin Cities campus or students transferring from the University of Minnesota coordinate campuses of Crookston, Duluth, or Morris, must complete an *Application for Undergraduate Change of College* form. This form is available from the Office of the Registrar, either on the Twin Cities campus or at the home campus. The form with instructions is also available as a PDF on the Web at http://onestop.umn.edu/onestop/forms.html. This form, along with any transcripts from schools outside the University system, must be turned in to the Office of the Registrar at the address given on the Change of College instruction sheet.

Students attending other regionally accredited colleges and universities apply by completing the Application for Undergraduate Admission at http://admissions.tc.umn.edu on the Web or from the Office of Admissions. Application forms are available from the Office of Admissions, University of Minnesota, 240 Williamson Hall, 231 Pillsbury Drive S.E., Minneapolis, MN 55455, or call 612-625-2008.

The Division of Dental Hygiene requires all applicants who are not native speakers of English to submit written evidence of a Test of English as a Foreign Language (TOEFL) score. A TOEFL score of at least 79 on the Internet-based version (550 on the written version or 213 on the computer-based exam) is required. The TOEFL must be administered within two years before the date of application to the Division of Dental Hygiene.

To register for the TOEFL, contact the agency that handles TOEFL registration in your country or write to the Educational Testing Service (Box 899, Princeton, NJ 08541) at least 10 weeks before any scheduled test date.

Students admitted to the Division of Dental Hygiene and who require accommodation for a disability should contact the Office of Disability Services at 612-626-7379 before the beginning of the semester of entry into the program.

Degrees

The School of Dentistry Division of Dental Hygiene offers two program tracks leading to a bachelor of science degree in dental hygiene.

The B.S. degree program track is designed for entry-level students; the B.S. degree-completion program track is tailored to students who have completed an associate degree program in dental hygiene at a regionally accredited institution and who want to earn a baccalaureate degree.

Policies

Students who have been admitted to the program must submit documentation of immunizations required by the University and are strongly encouraged to have completed a physical assessment examination. Students must provide evidence of completion of a Hepatitis B vaccination during the first semester in the program.

The American Dental Association Commission on Dental Accreditation requires that all students be able to perform basic life support procedures, including cardiopulmonary resuscitation, and manage other medical emergencies. In compliance with this standard, students are required to take an American Heart Association Basic Life Support Training Course provided by the University of Minnesota Life Support Program and scheduled during the sophomore and senior year orientation sessions.

Applicants to the program need to be aware of the Minnesota Dental Practice Act HIV and HbV Prevention Policy that affects applicants/students who are HIV and/or HbV positive. The Practice Act stipulates that:

- A licensed dental hygienist who is diagnosed as infected with HIV and/or HbV must report that information to the Commissioner of Health promptly and as soon as medically necessary for disease control purposes, but no later than 30 days after learning of the diagnosis or 30 days after becoming licensed in the state.
- The Minnesota Board of Dentistry may refuse to grant a license or may impose disciplinary or restrictive action against an HIV/HbV infected dental hygienist who fails to comply with any of the requirements of the Board or with any monitoring or reporting requirement.
- After receiving a report that a regulated person is infected with HIV and/or HbV, the Board of Dentistry or the Commissioner of health shall establish a monitoring plan for the infected dental hygienist. This plan may address the scope of practice of the individual, required submission of reports and other provisions that the Board deems reasonable.

Students in the professional program are subject to the regulations established by the Division of Dental Hygiene and must maintain satisfactory academic process.

Satisfactory performance is considered to be not only a passing level in scientific and clinical skills together with theoretical knowledge, but also ethical integrity and honesty.

Students not achieving satisfactory progress may be placed on scholastic probation upon recommendation of the Student Scholastic Standing Committee. Students' work is considered unsatisfactory when they earn less than a C- grade average (1.67 grade points for each credit) for any course in a given year or semester. If students achieve an unsatisfactory grade in a course, remedial work in the course may be provided, if possible; if not, students must repeat the course the next time it is offered. Unsatisfactory grades in two or more courses are sufficient basis for dismissal.

Dental hygiene students may be required to undergo a criminal background study (Criminal Background Study Under State Law, Minnesota Vulnerable Adult Act, as amended 1995 and 1996), in order to have direct contact with patients and residents in hospitals, extended care facilities, and other health care facilities licensed by the Minnesota Department of Health. Failure to pass this background study is grounds for dismissal from the program.

Graduation Requirements

The bachelor's degree will be recommended for students who have been formally admitted to the entry-level or the degree-completion program, who earn a minimum GPA of 2.00, and have completed all of the required work and the total number of credits specified for the curriculum.

Students with a minimum GPA of 3.75 in upper division courses are granted their degree "with distinction." Students with a minimum GPA of 3.90 in upper division courses are granted their degree "with high distinction."

Licensure and Placement

Graduates are eligible for licensure after successfully completing a written National Board Dental Hygiene Examination and a clinical examination, both of which are given on the University's Minneapolis campus. The licensed dental hygienist practices in accordance with the requirements of individual state dental practice acts. In many states, a dental hygienist must participate in continuing education courses for license renewal.

The School of Dentistry provides placement assistance to dental hygiene graduates through the Minnesota Dental Placement Service at 612-626-0171.

Advising

The Division of Dental Hygiene offers advising services to students currently enrolled or interested in dental hygiene. Group advising sessions are held the first Tuesday of each month, on an appointment basis. To schedule an appointment with a dental hygiene academic adviser, call 612-625-9121 or write 9-372 Malcolm Moos Health Sciences Tower, 515 Delaware Street S.E., Minneapolis, MN 55455; fax 612-625-1605, or e-mail krue0191@umn.edu.

The Division of Dental Hygiene provides a student support program to enhance the success of its students. Student performance is monitored and academic assistance is provided through tutoring and consultation. Counseling and advising are available through the division, University Counseling and Consulting Services, and faculty of the student's choosing.

Special Learning Opportunities and Resources

Community Outreach Clinics—Dental hygiene students participate in a number of off-campus Twin Cities and out-state Minnesota week-long community clinics providing dental hygiene care to populations who typically do not have sufficient access to dental care.

Summer Research Fellowships—The School of Dentistry Summer Research Fellowship Program provides research experiences for exceptional dental hygiene and dental students with an interest in research careers and postgraduate research training.

Sophomore and junior dental hygiene students are invited to apply for research fellowship positions in the spring of each year. If selected, they are assigned to work with a faculty mentor for the summer. During a ten-week period, students collect and analyze data, undertake a structured research project, and prepare a formal report. Research fellows attend a weekly research training seminar where they learn research methods. They also evaluate selected journal articles and review abstracts and oral presentations of former trainees. About 20 students receive stipends each summer.

Continuing Dental Hygiene Education—Students are encouraged to participate in selected continuing education courses during their senior year on a space-available basis. These courses expose seniors to a broad scope of information and technology from a variety of local and national speakers. Students gain by selecting their own educational experiences and interacting with practicing dental hygienists and dentists.

International Programs

Dental hygiene encourages students to participate in an international study experience as part of their degree program. See Learning Abroad in the General Information section of this catalog.

Scholarships and Awards

Several scholarships and awards are presented annually by division faculty to selected dental hygiene students. For more information, call 612-625-9121.

Student Organizations

School of Dentistry Student Council—Each year dental hygiene and dental students elect the School of Dentistry Council of Students, which discusses matters of mutual interest with faculty advisers and promotes many projects and activities.

Student Affairs Committee—This committee is composed of dental hygiene and dental students and faculty members and is responsible for students' concerns such as membership in local and national organizations, ethics, counseling, tutorial assistance, questions on educational programs, financial aid, publications, housing, and alumni relations.

Student American Dental Hygienists' Association—Dental hygiene students participate in the student chapter of the national association, which represents concerns and issues related to the dental hygiene profession. Membership fees entitle students to various journals and special services.

Council for Health Interdisciplinary Participation (CHIP)—Dental hygiene students are encouraged to participate in the activities of the Academic Health Center CHIP.

Directory

Administrative Offices

Office of the Director

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9-372 Malcolm Moos Health Sciences Tower
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School of Dentistry Web site

www.dentistry.umn.edu

Dental Hygiene

Degree Program

Dental Hygiene B.S.

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 95.

This program requires summer terms.

The program blends a solid dental hygiene education with study of the biological, behavioral, and social sciences, and liberal arts. Two program tracks are available, both leading to a B.S. degree in dental hygiene: B.S. degree program, for entry-level students; and B.S. degree completion program, for students who have completed an associate degree program in dental hygiene at a regionally accredited institution and who want to earn a baccalaureate degree.

Admission Requirements

Students must complete 32 credits before admission to the program.

Freshmen students are usually admitted to pre-major status before admission to this major.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Required Courses for Admission

Pre-Dental Hygiene Program

Students in the B.S. degree completion program who have not completed these requirements as part of their associate degree should contact a dental hygiene adviser.

BIOL 1009 - General Biology, BIOL SCI/L (4.0 cr)
CHEM 1021 - Chemical Principles I, ENVT, PHYS SCI/L (4.0 cr)
COMM 1101 - Introduction to Public Speaking (3.0 cr)
FSCN 1112 - Principles of Nutrition, ENVT (3.0 cr)
INMD 3001 - Human Anatomy (3.0 cr)
PSY 1001 - Introduction to Psychology, SSCI (4.0 cr)
SOC 1001 - Introduction to Sociology, CD, SSCI (4.0 cr)
STAT 1001 - Introduction to the Ideas of Statistics, MATH (4.0 cr)

Program Requirements

Required Courses

Sophomore Year Courses

DH 2235 and 3134 should be taken during May Term of the second year.

BIOC 1001 - Elementary Biochemistry (3.0 cr)
DH 2111 - Dental Anatomy (2.0 cr)
DH 2121 - The Dental Hygiene Care Process Clinical Application I (5.0 cr)
DH 2132 - Head and Neck Anatomy (1.0 cr)
DH 2210 - General and Oral Pathology (2.0 cr)
DH 2211 - Oral Histology and Embroyology (2.0 cr)
DH 2212 - Dental Hygienist-Patient Relationship (2.0 cr)
DH 2221 - Periodontology (3.0 cr)
DH 2222 - Dental Hygiene Care Process Clinical Application II (1.0-4.0 cr)
DH 2231 - Cariology (2.0 cr)
DH 2235 - Oral and Maxillofacial Radiology (2.0 cr)
DH 3134 - Dental Hygiene Care for Pediatric Patients (1.0 cr)
MICB 4001 - Microorganisms and Disease (2.0 cr)
PHSL 3051 - Human Physiology (4.0 cr)

Junior Year Courses

DH 3111 - Biomaterials and the Principles of Restorative Techniques I (5.0 cr)
DH 3123 - The Dental Hygiene Care Process Clinical Application III (4.0 cr)
DH 3126 - Oral and Maxillofacial Radiology Clinic I (0.0 cr)
DH 3131 - Periodontology I Lecture (1.0 cr)
DH 3132 - Applied Nutrition in Dental Hygiene Care (1.0 cr)
DH 3133 - Pharmacology (2.0 cr)
DH 3135 - Oral and Maxillofacial Radiology: Theory, Principles, and Radiographic Analysis (2.0 cr)
DH 3221 - Local Anesthesia and Pain Management (2.0 cr)
DH 3224W - The Dental Hygiene Care Process Clinical Application IV, WI (1.0-4.0 cr)
DH 3227 - Oral and Maxillofacial Radiology Clinic II (0.0 cr)
DH 3231W - Research Methods in Dental Hygiene, WI (3.0 cr)
DH 3235 - Dental Hygiene Care for the Geriatric Patient and the Patient With Special Needs (2.0 cr)
PUBH 3001 - Personal and Community Health (2.0 cr)
RHET 3562W - Technical and Professional Writing, WI (4.0 cr)

Senior Year Courses

DH 4125W - The Dental Hygiene Care Process Clinical Application V, WI (1.0-7.0 cr)
DH 4128 - Oral and Maxillofacial Radiology Clinic III (0.0 cr)
DH 4131 - Epidemiology, Prevention, Dental Public Health, and Community Outreach (3.0 cr)
DH 4132W - Ethics, Jurisprudence, and Principles of Practice, WI (2.0 cr)
DH 4137 - Patient Care Group III (PCGs) (1.0 cr)
DH 4226 - Dental Hygiene Care Process Clinical Application VI (1.0-5.0 cr)
DH 4229 - Oral and Maxillofacial Radiology Clinic IV (3.0 cr)
DH 4231 - Periodontology III Lecture (1.0 cr)
DH 4232 - Community Outreach (1.0 cr)
DH 4233 - Legislative, Social, Economic, and Practice Factors in Oral Health (2.0 cr)
DH 4238 - Patient Care Group IV (1.0 cr)

Electives

Students must take from 8 to 16 credits in electives to complete the 85 credits required for the major.

Take 8 or more credit(s) from the following:

DH 4211 - Principles of Restorative Techniques II (3.0 cr)
DH 4250 - Dental Hygiene Community Outreach Elective (0.0-8.0 cr)
DH 2191 - Independent Study (0.0-6.0 cr)
or DH 3191 - Independent Study (0.0-4.0 cr)
or DH 4191 - Independent Study (0.0-6.0 cr)
DH 4227 - Advanced Dental Hygiene Clinical Experience I (0.0-6.0 cr)
or DH 4228 - Advanced Dental Hygiene Clinical Experience II (0.0-6.0 cr)

Program Sub-plans

A sub-plan is not required for this program.

Degree Completion Program

This program is for students who have completed an associate degree program in dental hygiene at a regionally accredited institution and who want to earn a baccalaureate degree.

Students in the B.S. degree-completion program must fulfill the following requirements:

- Associate degree program in dental hygiene at an accredited institution (about 60-74 semester credits)
- University liberal education requirements for a B.S. degree (20-30 cr)
- Electives as needed to fulfill the 120-credit requirement
- Core dental hygiene courses:

DH 3231W- Research Methods in Dental Hygiene
DH 4292 - Curriculum Development in Dental Hygiene
DH 4293 - Course Development in Dental Hygiene
DH 4294W - Directed Research
DH 4295 - Instructional Methods in Dental Hygiene Education
DH 4296 - Issues in Dental Hygiene
DH 4297 - Dental Hygiene Education: Supervised Teaching
DH 4298W - Dental Hygiene Process of Care: Clinical Application

This is the College of Design General Information and Degree Programs section of the 2006-2008 Undergraduate Catalog for the University of Minnesota, Twin Cities campus.

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General Information

The College of Design encompasses the full range of design disciplines from graphic design, apparel design, and interior design to architecture, landscape architecture, and urban design. The college also includes programs in housing studies and retail merchandising. The faculty and students in the college seek to advance the quality and value of the natural, designed, and social environments, with a focus on the interaction of people and their world.

Through their design education, students develop creative powers of generalization and abstraction using analysis and synthesis. It also gives them a broad understanding of the arts, humanities, and sciences; a knowledge of technology, history, theory, and professional practice; the skills necessary to develop, explore, and describe design ideas; and a belief in the aesthetic, ethical, and environmental responsibilities of designers.

The college offers the only accredited degrees in architecture, landscape architecture, and interior design in Minnesota, as well as top-rated programs in the other design fields. The undergraduate programs offer both professional and pre-professional degrees, as well as degrees that have a liberal arts and general design focus. The graduate programs range from first-professional degrees to degrees with a creative-practice or research emphasis. Faculty members have close working relationships with industry professionals, who collaborate on discovery and outreach, participate in special programming, and serve as a network for students seeking internships and post-graduation opportunities.

Facilities—The college occupies primarily Rapson Hall on the Minneapolis campus and McNeal Hall on the St. Paul campus. These two buildings offer some of the best facilities in the country in which to study design, featuring dramatic interior spaces, new equipment and furnishings, and outdoor teaching areas. In addition to ample classroom, studio, and office space, the college has specialized facilities, including woodshops, computer labs, and photographic studios. The visual resources collection comprises approximately 100,000 slides to support student and faculty research and educational activities, and the library in Rapson Hall has a collection of more than 34,675 volumes.

The Goldstein Museum of Design, located in McNeal Hall, is an internationally recognized teaching museum and research center for interpreting the vital role of art in everyday life. The museum collects, preserves, documents, and exhibits clothing, textiles, and decorative and graphic arts, with an emphasis on objects of the late 19th and 20th centuries. It promotes the study and enjoyment of these objects within their social, cultural, aesthetic, and historic contexts.

The new Human Dimensioning Laboratory (HDL) provides an innovative research and learning facility for designing new methods of incorporating human dimensions in the development of wearable products. The National Science Foundation provided initial funding to establish the laboratory. HDL researchers use high-tech tools to measure the static and dynamic human form, map the body/product interface, and produce and test prototypes.

For more information on the college's resources, see the College of Design's Web site at www.cdes.umn.edu.

Admission

Application policies and deadlines vary by program. Policies are subject to change. For current information, contact the following offices:

Freshmen and transfer students from schools outside the University of Minnesota (or with work only completed through the College of Continuing Education at the University of Minnesota):

University of Minnesota Admissions Office
612-625-2008
www.admissions.tc.umn.edu

Transfer students from other University of Minnesota colleges (e.g., CLA, IT) or coordinate campuses:

College of Design
612-624-1717

Visiting the College of Design

The college strongly encourages prospective students to meet with an adviser for more information about the college's programs, tour the facilities, and discuss internship and career opportunities. To arrange a visit, students should call 612-624-1717.

Degrees/Majors

The College of Design offers the following degrees and majors.

- Bachelor of science (B.S.) degree with majors in clothing design, graphic design, housing studies, interior design, retail merchandising (through the Department of Design, Housing, and Apparel)
- Bachelor of science in architecture (B.S.Arch) through the Department of Architecture
- Bachelor of design in architecture (B.D.A.) through the Department of Architecture
- Bachelor of environmental design (B.E.D.) through the Department of Landscape Architecture
- In cooperation with the College of Liberal Arts (CLA), a bachelor of arts (B.A.) degree with a major in architecture

Majors in clothing design, graphic design, housing studies, interior design, and retail merchandising prepare students to understand human behavior and design to enhance the well-being of individuals and communities, as well as to prepare for advanced academic and professional work.

Majors in architecture or environmental design prepare students for advanced academic and professional degree work in design, but also establish a strong foundation for other careers that create and sustain the ecological, technological, cultural, and aesthetic well-being of built and conserved environments. These are nonprofessional degrees, and students who want to become licensed architects and landscape architects need to take a professional graduate degree in the College of Design—the M.Arch and the M.L.A. The B.S. program includes an accelerated status option to allow qualified undergraduates to complete the undergraduate and master of architecture (M.Arch.)

degrees in six years rather than seven. Qualified undergraduates may also complete the nonprofessional B.E.D. and the master of landscape architecture (M.L.A.) degrees in six years rather than seven.

Through the Graduate School, the College of Design offers both professional and post-professional, fully accredited graduate degree programs in architecture and landscape architecture. Students interested in the master of arts, master of fine arts, and doctor of philosophy degrees offered in the Department of Design, Housing, and Apparel will find information about these degrees through the Graduate School. Graduate-level certificates are also available in housing studies or metropolitan design.

Minors

The College of Design offers the following minors:

- Architecture
- Design
- Environmental design
- Housing studies
- Retail merchandising

See the Degree Programs section for details on these minors.

Commencement

The College of Design holds official commencement exercises once a year in the spring. Students who have applied to graduate are provided information about commencement.

Honors

Students who have an outstanding record of academic achievement and seek the challenge and special rewards of honors study may be eligible for admission to an honors program.

Honors opportunities and benefits include:

- special enrichment programs,
- personalized instruction,
- research partnerships with professors,
- participation in honor societies, and
- graduating with honors.

For more information, students should contact the honors adviser (612-624-1717) or check the Web site.

Professional Registration

The College of Design provides Minnesota's only accredited professional degree programs in interior design (a B.S), architecture (the M.Arch.), and landscape architecture (the M.L.A.).

In the United States, most state registration boards require a degree from an accredited professional degree program as a prerequisite for licensure. The National Architectural Accrediting Board (NAAB), which is the sole agency authorized to accredit U.S. professional degree programs in architecture, reaccredited The College of Design's M.Arch program for another four years without qualifications, and the Landscape Architectural Accreditation Board (LAAB) fully reaccredited the M.L.A. degree. The Council for Interior Design Accreditation (CIDA) has accredited the College of Design's interior design program—the only four year program in the state.

For more information concerning professional registration, contact the Minnesota Board of Architecture, Engineering, Land Surveying and Landscape Architecture, and Interior Design (651-296-2388).

Policies

College of Design students are responsible for complying with University policies. See the Policies section of this catalog.

Academic Integrity—College of Design students are expected to behave responsibly and ethically. College of Design students, faculty, and staff work together to create and sustain a climate of open and scholarly debate. College of Design faculty act on cases involving alleged academic dishonesty (cheating), which may result in modification of a course grade. Instructors must report any action to the college office, and the student is informed of the right to ask for a committee hearing.

Student Scholastic Standing Committee—The College of Design's Student Scholastic Standing Committee, composed of administrators and college office staff, interprets and enforces college and University regulations relating to academic affairs. It handles requests for exceptions to registration policies and procedures, transfer of credit policies, and some degree requirements. The committee administers the college probation system; monitors students' performance; and deals with questions of probation, suspension, and readmission.

The committee seeks to maintain the spirit of the College of Design's regulations as flexibly as possible and is empowered to make exceptions in cases in which regulations work to students' educational disadvantage.

Students are urged to consult a committee representative in the college office concerning almost any kind of problem, but especially those they think interfere with their ability to attain their academic objectives. Well-established petition and appeal procedures assure full review of student requests.

Computer Requirement—Architecture students in studio classes are required to have a laptop computer, and interior design students are required to have a laptop computer after portfolio review. For the most current information about computer requirements (and suggestions for students who, although are not required to purchase a computer, choose to), visit the College of Design's Web site.

Advising

Office of Student Services—This office serves students from their prospective visit through to graduation. It assists students with registration, course access, degree programs, declaring a major, petitions, graduation clearance, commencement, and other student issues for all majors. Student services also assists with access to the mentor program, internship information, and career opportunities.

Prospective student advising provides general information about degree programs; related professional fields in interior design, architecture, and landscape architecture; admission and program requirements; and college services, and refers prospective graduate students to the appropriate department director of graduate studies. Prospective students should call 612-624-1717.

Advisers are available by appointment or during drop-in hours for students admitted to the college. To make an appointment with an adviser, call 612-626-3690 (for architecture or landscape architecture majors) or 612-624-1717 (for Department of Design, Housing, and Apparel majors).

Special Learning Opportunities and Resources

Continuing Education—The College of Design offers continuing education courses for architecture, landscape architecture, and interior design professionals. Courses are designed to meet the content interests of the practitioner and are offered in short, convenient, seminar formats.

International Programs

The College of Design encourages students to participate in an international study experience as part of their degree program. Students may spend a semester, academic year, May session, or summer session enhancing their cross-cultural skills or acquiring professional experience. With careful planning, students can generally apply credits earned abroad toward their degree program. The college has a list of recommended locations for study abroad.

For more information about international programs, visit the Learning Abroad Center in 230 Heller Hall. Advisers there can assist with study and credit options, financial aid, and orientations. For a full listing of study abroad opportunities, see www.UMabroad.umn.edu.

Scholarships

Students are encouraged to apply for scholarships to further their studies; most awards are made on an annual basis. In addition to financial aid offered by the University, the college administers several scholarship programs of its own. Find out more about available scholarships, application materials, and instructions on the College of Design's Web site.

Career Information

Career services are available for all majors through campus career centers. Specialized services are also available for professional and preprofessional students in the college.

All programs in the Department of Design, Housing, and Apparel require students to participate in a preplanned internship experience and other programs strongly encourage it. Internship credits vary, depending on program area. The St. Paul Campus Career Center acts as a clearinghouse for internship information.

For questions concerning career planning, internships, and job opportunities, call the center at 612-624-2710.

Student Organizations

- College of Design Student Board
- American Institute of Architecture Students (AIAS)
- American Society of Interior Designers
- Design Institute Student Board
- Graphic Design Club
- Greenlight
- Housing Organization for University Students
- International Interior Design Association
- Minnesota Chapter of the American Society of Landscape Architecture Students (MASLAS)
- Students for New Urbanism

Directory

Dean's Office

101 Rapson Hall, Minneapolis
612-626-9068
Dean: Thomas Fisher

Student Services

Architecture and Landscape Architecture majors

107 Rapson Hall, Minneapolis
612-626-3690

Design, Housing, and Apparel majors

12 McNeal Hall, St. Paul
612-624-1717

Department of Architecture

145 Rapson Hall, Minneapolis
612-624-7866
Department head: Renee Cheng

Department of Design, Housing, and Apparel

240 McNeal Hall, St. Paul
612-624-9700
Department head: Becky Love Yust

Department of Landscape Architecture

144 Rapson Hall, Minneapolis
612-625-6860
Director: John Koepke

Degree Programs and Minors

Architecture B.S. Arch.

Architecture

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 47.

Degree: Bachelor of Science in Architecture.

The bachelor of science (B.S.Arch.) degree with a major in architecture provides instruction in history, representation, design, theory, and technology, emphasizing the development of architecture as a language of form, space, and order. The program requires an understanding of social, cultural, and physical contexts as a foundation for the examination of the methods, values, precedents, and material reality characteristic of the process of shaping natural and built environments. The major combines core prerequisites with a focused introduction to the discipline of architecture, including required courses in representation, history, theory, technology, and design processes.

Admission Requirements

Students must complete 10 courses (including freshman composition) before admission to the program. Freshmen and transfer students are usually admitted to pre-major status before admission to this major.

A GPA above 2.00 is preferred for the following:

- 2.80 for students already admitted to the degree-granting college.
- 2.80 for students transferring from another University of Minnesota college.
- 2.80 for students transferring from outside the University.

Prior to an application deadline, students must meet with an undergraduate adviser in 107 Rapson Hall (612-626-3690). For information about University of Minnesota admission requirements, visit http://admissions.tc.umn.edu.

Required Courses

Math and Physics

MATH 1142 - Short Calculus, MATH (4.0 cr)
or MATH 1271 - Calculus I, MATH (4.0 cr)
or MATH 1281 - Calculus with Biological Emphasis I, MATH (4.0 cr)
or MATH 1371 - IT Calculus I, MATH (4.0 cr)
PHYS 1101W - Introductory College Physics I, PHYS SCI/L, WI (4.0 cr)
or PHYS 1201W - Introductory Physics for Biology and Pre-medicine I, PHYS SCI/L, WI (5.0 cr)
or PHYS 1301W - Introductory Physics for Science and Engineering I, PHYS SCI/L, WI (4.0 cr)

Preparatory Courses

ARCH 3301 - Drawing for Design in Architecture, OH (3.0 cr)
ARCH 3401W - Environmental Design and the Sociocultural Context, C/PE, WI (3.0 cr)
ARCH 3411 - Architectural History to 1750, HP, IP (3.0 cr)
LA 3501 - Environmental Design and Its Biological and Physical Context, ENVT (3.0 cr)
ARCH 1301 - Introduction to Drawing in Architecture and Landscape Architecture, OH (4.0 cr)
or LA 1301 - Introduction to Drawing in Architecture and Landscape Architecture, OH (3.0 cr)
ARCH 1401 - The Designed Environment (3.0 cr)
or LA 1401 - The Designed Environment (3.0 cr)
ARCH 3412 - Architectural History since 1750, HP, IP (3.0 cr)
or ARCH 3422H - Honors: Architectural History Since 1750, HP, IP, H (3.0 cr)

General Requirements

Recommended freshman writing course(s) for this program: ENGC 1011

Program Requirements

Students should maintain a portfolio of originals or duplicates of all freehand drawings, projects, and architecture studio designs. A portfolio is required for application to the accelerated program and the graduate professional degree program.

All prerequisite courses including courses in math, physics, and English composition must be taken A-F with grades of C- or better to satisfy degree requirements and to progress in sequence courses.

Accelerated status in architecture is a competitive opportunity for qualified undergraduates to complete the B.A. or B.S. degree with a major in architecture and the M.Arch. degree in six years rather than seven. Talk to an adviser for more information.

Required Courses

Major Courses

In addition to the requirements below, students must complete 9 upper division credits outside the major.

ARCH 4281 - Undergraduate Architecture Studio I (6.0 cr)
ARCH 4282 - Undergraduate Architecture Studio II (6.0 cr)
ARCH 4283 - Undergraduate Architecture Studio III (6.0 cr)
ARCH 4284 - Undergraduate Architecture Studio IV (4.0 cr)
ARCH 4501 - Architecture and Ecology (4.0 cr)
ARCH 4511 - Building Systems I (3.0 cr)
ARCH 4571 - Introduction to Structures (3.0 cr)
Any ARCH 44xx course

Take 3 or more course(s) from the following:

ARCH 3xxx
ARCH 4xxx
ARCH 5xxx

Program Sub-plans

A sub-plan is not required for this program.

Accelerated Program

Accelerated status in architecture is a competitive opportunity for qualified undergraduates to complete the B.S. degree with a major in architecture and the M.Arch. degree in six years rather than seven. Accelerated status applicants must complete all but 14 credits of upper division architecture courses before their senior year.

Students complete the first year of the graduate professional degree program in their senior year; courses carry upper division credit and complete the B.S. degree.

To be considered for accelerated status, students must be enrolled at the University as a B.S. or B.A. major in architecture, have completed one year of architecture design studio (ARCH 5281, ARCH 5282), have completed 90 credits, and have earned an overall GPA of 3.50. Admission to accelerated status does not guarantee admission to the graduate professional program; separate requirements, such as the Graduate Record Examination (GRE) and other application documents, must be submitted in January of the year admission to the graduate program is sought. See an adviser in 107 Rapson Hall for additional criteria. Deadline for consideration is June 15.

Architecture Minor

Requirements for this program are current for Fall 2006.

Required credits in this minor: 18.

An undergraduate minor in architecture introduces the foundational ideas of the discipline as a social, cultural, historic, and environmental constructs.

Admission Requirements

For information about University of Minnesota admission requirements, visit http://admissions.tc.umn.edu.

Program Requirements

A maximum of 9 transfer credits may be used toward the minor. A maximum of three courses taken for a major may also be used toward the minor. Students must earn a C- or better in all minor coursework.

Required Courses

Minor Courses

ARCH 1401 - The Designed Environment (3.0 cr)

LA 3501 - Environmental Design and Its Biological and Physical Context, ENVT (3.0 cr)

ARCH 3401W - Environmental Design and the Sociocultural Context, C/PE, WI (3.0 cr)

or

ARCH 3401V - Honors: Environmental Design and the Sociocultural Context, WI, H (3.0 cr)

Take 9 or more credit(s) from the following:

ARCH 3xxx

ARCH 4xxx

ARCH 5xxx

Clothing Design B.S.

Design, Housing & Apparel

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 77 to 81.

Degree: Bachelor of Science

In the clothing design program students develop an understanding of the textile and clothing product development process, including design, production, and marketing. Students are challenged to integrate knowledge of the product with consumer needs and business constraints.

The program emphasizes and integrates creative thinking and technical skill. Students become proficient in manual and computer methods of pattern development and implement apparel structuring methods appropriate for custom design or industry production. Courses cover costume history, social and cultural meanings of apparel, the textile and apparel consumer, and aesthetics. Students take six sequential clothing design studio courses. A required internship ensures that students gain professional experience.

Students entering the program should have clothing construction/assembly competence and a working knowledge of microcomputers and software. Students are encouraged to use the liberal education categories to explore multicultural themes and to strengthen knowledge that supports their major coursework.

Graduates of the program work in various settings, including product development and quality assurance for large retail companies, product design for small and large manufacturers, theatre and film design, wearable art, and custom design.

Admission Requirements

Students must complete 6 courses before admission to the program. Freshmen and transfer students are usually admitted to pre-major status before admission to this major.

A GPA above 2.00 is preferred for the following:

- 2.50 for students already admitted to the degree-granting college.
- 2.50 for students transferring from another University of Minnesota college.
- 2.50 for students transferring from outside the University.

Admission to the pre-major status is done by a competitive holistic review. Students must maintain a GPA of 2.50 during pre-major coursework. In addition, students must receive a minimum grade of C- or better in the required pre-major classes before going through portfolio review (not just a 2.50 GPA). Once students have achieved major status, they must maintain a GPA of 2.00.

Students must pass a portfolio review to be admitted into the degree program. For information about University of Minnesota admission requirements, visit http://admissions.tc.umn.edu.

Required Courses for Admission

Pre-Clothing Design Courses

Students must demonstrate competence in basic clothing construction skills by either passing the DHA sewing proficiency examination or by successfully completing DHA 1221.

Note: Students must be admitted to a pre-major status to take most of these classes.

DHA 1101W - Introduction to Design Thinking, OH, WI (4.0 cr)

DHA 1201 - Clothing Design, Merchandising, and the Consumer, C/PE (3.0 cr)

DHA 1311 - Foundations: Drawing and Design in Two and Three Dimensions (4.0 cr)

DHA 1312 - Foundations: Color and Design in Two and Three Dimensions (4.0 cr)

DHA 2221 - Clothing Design Studio I (4.0 cr)

DHA 1221 - Clothing Assembly Fundamentals (3.0 cr)

or pass sewing proficiency exam

General Requirements

Recommended freshman writing course(s) for this program: RHET 1101

Program Requirements

Required Courses

Communication Courses

COMM 1101 - Introduction to Public Speaking (3.0 cr)

or PSTL 1461 - Oral Communication in the Public Sphere, C/PE (3.0 cr)

or RHET 1223 - Oral Presentations in Professional Settings (3.0 cr)

ENGC 3027W - Advanced Expository Writing, WI (4.0 cr)
or RHET 3562W - Technical and Professional Writing, WI (4.0 cr)

Major Courses
DHA 2211 - Illustration for Clothing Design (2.0 cr)
DHA 2213 - Textile Analysis (4.0 cr)
DHA 2222 - Clothing Design Studio II (4.0 cr)
DHA 3217 - Fashion Trends and Visual Analysis (3.0 cr)
DHA 3223 - Clothing Design Studio III (4.0 cr)
DHA 3224 - Clothing Design Studio IV (4.0 cr)
DHA 3312 - Color and Form in Surface Design (3.0 cr)
DHA 4121 - History of Costume (4.0 cr)
DHA 4196 - Internship in DHA (1.0-4.0 cr)
DHA 4212W - Dress, Society, and Culture, CD, WI (3.0 cr)
DHA 4225 - Clothing Design Studio V (4.0 cr)
DHA 4226 - Clothing Design Studio VI (4.0 cr)
DHA 5215 - Product Development: Softlines (4.0 cr)
DHA 4330 - Surface Fabric Design Workshop (4.0 cr)
or DHA 4340 - Woven, Knit, and Non-Woven Fiber Design Workshop (4.0 cr)
DHA 3245 - Multichannel Retailing (3.0 cr)
or DHA 4217 - International Developments in Textiles and Apparel, IP (3.0 cr)

Design Minor

Requirements for this program are current for Fall 2006.

Required credits in this minor: 18.

The interdisciplinary design minor is appropriate for students who would like a taste of design or those who want a renewed perspective on design. Traditional design courses and nontraditional views of design provide an integrated perspective. The minor includes core courses that provide a basis for design thinking as well as electives to allow students to explore their area of interest in design. As an interdisciplinary minor, 9 credits must be taken outside the student's major.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu/.

Program Requirements

Required Courses

Students majoring in architecture, clothing design, environmental design, graphic design, housing studies, interior design, or retail merchandising follow different requirements. See the design major adviser.

Foundation Courses
DHA 1101W - Introduction to Design Thinking, OH, WI (4.0 cr)
DESI 4001 - Design Minor Seminar (3.0 cr)

Minor Courses
Take 2 or more course(s) from the following:
ARCH 3311 - Design in the Digital Age (3.0 cr)
HUMF 3505 - Intro to Human-Centered Design (3.0 cr)
JOUR 4551 - New Media Culture (3.0 cr)
ME 2011 - Introduction to Engineering (4.0 cr)

Electives
Choose two additional approved electives for 6 to 8 credits. Approved elective course lists are available from the Design Institute or online at http://design.umn.edu.

Design in Architecture B.D.A.

Architecture

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 74.

Degree: Bachelor of Design in Architecture.

The bachelor of design in architecture (B.D.A.) is a flexible degree in design thinking through architecture. The program requires an understanding of social, cultural, and physical contexts as a foundation for the examination of the methods, values, precedents, and material reality characteristic of the process of shaping natural and built environments. It includes many architectural electives and priority access to design workshops. The B.D.A. is the best option for those interested in exploring the breadth of the architectural discipline.

Admission Requirements

Students must complete 30 credits before admission to the program.

A GPA above 2.00 is preferred for the following:

- 2.80 for students already admitted to the degree-granting college.
- 2.80 for students transferring from another University of Minnesota college.
- 2.80 for students transferring from outside the University.

For information about University of Minnesota admission requirements, visit http://admissions.tc.umn.edu.

Required Courses for Admission

Prerequisite Courses
ARCH 1281 - Design Fundamentals I (4.0 cr)
ARCH 1701 - The Designed Environment (3.0 cr)
or LA 1401 - The Designed Environment (3.0 cr)

General Requirements

Recommended freshman writing course(s) for this program: ENGC 1011

Program Requirements

Required Courses

Architecture Major Core
ARCH 1301 - Introduction to Drawing in Architecture, OH (4.0 cr)
ARCH 3401W - Environmental Design and the Sociocultural Context, C/PE, WI (3.0 cr)
ARCH 3411 - Architectural History to 1750, HP, IP (3.0 cr)
ARCH 3412 - Architectural History since 1750, HP, IP (3.0 cr)
ARCH 3611 - Design in the Digital Age (3.0 cr)
ARCH 4561 - Architecture and Ecology (4.0 cr)
ARCH 4701 - Introduction to Urban Form and Issues (3.0 cr)
LA 3501 - Environmental Design and Its Biological and Physical Context, ENVT (3.0 cr)
MATH 1142 - Short Calculus, MATH (4.0 cr)
PHYS 1101W - Introductory College Physics I, PHYS SCI/L, WI (4.0 cr)
ARCH 2281 - Design Fundamentals II (4.0 cr)
ARCH 4423 - Gothic Architecture (3.0 cr)
or ARCH 4424 - Renaissance Architecture (3.0 cr)
or ARCH 4432 - Modern Architecture (3.0 cr)
or ARCH 4431W - Eighteenth-Century Architecture and the Enlightenment, WI (3.0 cr)
or ARCH 4434 - Contemporary Architecture (3.0 cr)

or ARCH 4445W - Suburbia, WI (3.0 cr)
or ARCH 4446 - Architecture Since World War II: Post-War Experimentation; Aesthetics and Politics of Architecture (3.0 cr)

Architecture Electives
Take 15 or more credit(s) from the following:
ARCH 3xxx
ARCH 4xxx

Design Workshops
Take 12 or more credit(s) from the following:
ARCH 4xxx

Environmental Design B.E.D.

Landscape Architecture

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 73.

Degree: Bachelor of Environmental Design

Landscape architecture focuses on issues of land use and creating a future that provides a quality lifestyle in a quality environment for an ever-increasing human population. In dealing with these issues, landscape architects integrate the design, planning, and management of the landscape to create outdoor environments that sustain ecological function, fulfill human aspirations for community development, public health, and safety, and are artistically evocative and meaningful.

Admission Requirements

Students must complete 30 credits (including freshman composition) before admission to the program.Transfer students are usually admitted to pre-major status before admission to this major.

A GPA above 2.00 is preferred for the following:

- 2.50 for students already admitted to the degree-granting college.
- 2.50 for students transferring from another University of Minnesota college.
- 2.50 for students transferring from outside the University.

Students must have all high school preparation requirements completed before admission to the program is granted.

For information about University of Minnesota admission requirements, visit http://admissions.tc.umn.edu.

Program Requirements

Required Courses

Major Courses
ARCH 3301 - Drawing for Design in Architecture, OH (3.0 cr)
ARCH 3401W - Environmental Design and the Sociocultural Context, C/PE, WI (3.0 cr)
LA 1201 - Learning from the Landscape, CD (3.0 cr)
LA 1301 - Introduction to Drawing in Architecture and Landscape Architecture, OH (3.0 cr)
LA 1401 - The Designed Environment (3.0 cr)
LA 3001 - Understanding and Creating Landscape Space (3.0 cr)
LA 3002 - Informants of Creating Landscape Space (3.0 cr)
LA 3204 - Landscape Ecology (3.0 cr)
LA 3413 - Introduction to Landscape Architectural History, IP (3.0 cr)
LA 3501 - Environmental Design and Its Biological and Physical Context, ENVT (3.0 cr)
LA 3571 - Landscape Construction: Site Systems and Engineering (3.0 cr)
ARCH 3411 - Architectural History to 1750, HP, IP (3.0 cr)
or ARCH 3412 - Architectural History since 1750, HP, IP (3.0 cr)
or ARCH 3422H - Honors: Architectural History Since 1750, HP, IP, H (3.0 cr)
RHET 3562W - Technical and Professional Writing, WI (4.0 cr)
COMM 1101 - Introduction to Public Speaking (3.0 cr)
or RHET 1223 - Oral Presentations in Professional Settings (3.0 cr)

Program Sub-plans

Students are required to complete one of the following sub-plans. (Note: The honors sub-plan does not meet this requirement.) Honors students are required to complete one sub-plan plus the honors sub-plan.

Accelerated Program

This sub-plan is optional and does not fulfill the sub-plan requirement for this program.

The accelerated status option admits a limited number of students annually and allows qualified undergraduates to complete the B.E.D. and M.L.A. in six years rather than seven years.

Applicants for the accelerated status must complete the first three years of the B.E.D. degree requirements before their senior year. Students must complete the first year of the professional degree program in their undergraduate senior year. These courses carry upper division credit and satisfy senior year B.E.D. requirements.

Accelerated status is granted on a competitive basis and does not admit any student to the graduate professional program. Separate requirements, such as letters of recommendation, a letter of interest, and other application documents, must be submitted in January of the year that students are seeking admission to the graduate program. B.E.D. graduates who have completed the accelerated status option and applied to the M.L.A. professional degree program will receive advanced standing in the M.L.A. program upon acceptance by the Department of Landscape Architecture and the Graduate School.

Landscape Design

The design track prepares students for a career in landscape design at the residential and small-scale commercial level.

The landscape design track also requires students to take courses in biological science, plant materials, landscape management, and small business management.

Required Courses

Math and Science Courses
BIOL 1009 - General Biology, BIOL SCI/L (4.0 cr)
or BIOL 1009H - Honors: General Biology, BIOL SCI/L, H (4.0 cr)
CHEM 1011 - Introductory Chemistry: Lecture and Laboratory, PHYS SCI/L (4.0 cr)
or CHEM 1031H - Honors Chemistry I, ENVT, PHYS SCI/L, H (4.0 cr)
MATH 1031 - College Algebra and Probability, MATH (3.0 cr)
or MATH 1142 - Short Calculus, MATH (4.0 cr)

Landscape Design Core
APEC 1101 - Principles of Microeconomics, SSCI (3.0 cr)
BIOL 3002 - Plant Biology: Function (2.0 cr)
HORT 1001 - Plant Propagation, BIOL SCI/L (4.0 cr)
HORT 1015 - Woody and Herbaceous Plants (4.0 cr)
HORT 3005 - Environmental Effects on Horticultural Crops (2.0 cr)
HORT 4021 - Landscape Design and Implementation I (4.0 cr)
HORT 4061W - Turfgrass Management, WI (3.0 cr)
HORT 4096 - Professional Experience Program: Internship (1.0-3.0 cr)
HORT 5021 - Landscape Design and Implementation II (4.0 cr)
SOIL 2125 - Basic Soil Science, ENVT (4.0 cr)

Take 2 or more course(s) from the following:
ACCT 2050 - Introduction to Financial Reporting (4.0 cr)
APEC 1251 - Principles of Accounting (3.0 cr)
GC 1513 - Small Business Fundamentals With E-Business Applications (3.0 cr)
OMS 2550 - Business Statistics: Data Sources, Presentation, and Analysis (4.0 cr)

Landscape Planning

The landscape planning track prepares students for work in the field of urban and regional planning.

The landscape planning track requires additional courses in urban geography, urban and regional planning, natural resource planning and management, as well as biological and physical sciences. Students in this track should select GEOG 1502 to complete the mathematical thinking requirement.

Required Courses

Landscape Planning Core
ARCH 4701 - Introduction to Urban Form and Issues (3.0 cr)
FR 3131 - Geographical Information Systems (GIS) for Natural Resources (4.0 cr)
GEOG 3371W - Cities, Citizens, and Communities, CD, SSCI, WI (4.0 cr)
GEOG 3605W - Geographical Perspectives on Planning, C/PE, IP, WI (4.0 cr)
LA 1202 - Making the Mississippi, C/PE (3.0 cr)
PA 4200 - Urban and Regional Planning (3.0 cr)
ENR 3101 - Conservation of Plant Biodiversity, ENVT (3.0 cr)
or ENR 3245 - Sustainable Land Use Planning and Policy, ENVT (3.0 cr)
or FR 4501 - Urban Forest Management: Managing Greenspaces for People, C/PE (3.0 cr)
or GEOG 3355 - Environmental Quality, C/PE, ENVT (3.0 cr)
or GEOG 3361W - Land Use, Landscapes, and the Law, C/PE, ENVT, WI (3.0 cr)
or GEOG 3373 - Changing Form of the City, HP, IP (3.0 cr)
or GEOG 4393 - The Rural Landscape (4.0 cr)
or PA 5013 - Law and Urban Land Use (1.5 cr)
or PA 5251 - Strategic Planning and Management (3.0 cr)

Additional Science Courses
EEB 3001 - Ecology and Society, ENVT (3.0 cr)
Take 2 or more course(s) from the following:
EEB 4014W - Ecology of Vegetation, WI (3.0 cr)
EEB 4016W - Ecological Biogeography, WI (3.0 cr)
EEB 4601 - Limnology (3.0 cr)
EEB 4609W - Ecosystem Ecology, WI (3.0 cr)
ENR 3021 - Ecological Vegetation Management: a Consulting Approach, ENVT (3.0 cr)
ENR 3575 - Wetlands Conservation (3.0 cr)
ES 3221 - Soil Conservation and Land-Use Management (3.0 cr)
FR 3104 - Forest Ecology (4.0 cr)
FR 3114 - Hydrology and Watershed Management (3.0 cr)
FR 5153 - Forest and Wetland Hydrology (3.0 cr)
GEO 3003 - Geohazards, C/PE, ENVT (3.0 cr)
GEO 4701 - Geomorphology (3.0-4.0 cr)
GEO 4703 - Glacial Geology (4.0 cr)
GEO 5108 - Principles of Environmental Geology (3.0 cr)
GEOG 5441 - Quaternary Landscape Evolution (3.0 cr)
HORT 5071 - Restoration and Reclamation Ecology, ENVT (3.0 cr)
PBIO 4321 - Taxonomy of Minnesota Flora (3.0 cr)

Environmental Design Minor

Requirements for this program are current for Fall 2006.

Required credits in this minor: 21.

See the major description.

Admission Requirements

For information about University of Minnesota admission requirements, visit http://admissions.tc.umn.edu.

Program Requirements

A maximum of 9 transfer credits may be used for the minor and a maximum of three courses taken for a major degree may also be used toward the minor. A minimum grade of C- is required in all minor coursework.

Required Courses

Minor Courses
LA 3001 - Understanding and Creating Landscape Space (3.0 cr)
LA 3413 - Introduction to Landscape Architectural History, IP (3.0 cr)
ARCH 1401 - The Designed Environment (3.0 cr)
or LA 1401 - The Designed Environment (3.0 cr)

Electives
Take 12 or more credit(s) from the following:
ARCH 3301 - Drawing for Design in Architecture, OH (3.0 cr)
ARCH 3401W - Environmental Design and the Sociocultural Context, C/PE, WI (3.0 cr)
EEB 3001 - Ecology and Society, ENVT (3.0 cr)
LA 1101W - Introduction to Design Thinking, OH, WI (4.0 cr)
LA 1201 - Learning from the Landscape, CD (3.0 cr)
LA 1202 - Making the Mississippi, C/PE (3.0 cr)
LA 1301 - Introduction to Drawing in Architecture and Landscape Architecture, OH (3.0 cr)
LA 3002 - Informants of Creating Landscape Space (3.0 cr)
LA 3204 - Landscape Ecology (3.0 cr)
LA 3501 - Environmental Design and Its Biological and Physical Context, ENVT (3.0 cr)
LA 3571 - Landscape Construction: Site Systems and Engineering (3.0 cr)
LA 5712 - Infrastructure, Natural Systems and the Space of Inhabited Landscapes (3.0 cr)
LA 8302 - Professional Practice (3.0 cr)

Graphic Design B.S.

Design, Housing & Apparel

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 86 to 91.

Degree: Bachelor of Science.

The graphic design program educates students in design methods, design theory, creative problem solving, and visual and verbal literacy. An emphasis is placed on visual components: how humans communicate, perceive, interpret, and understand visual information. The program fosters flexibility, which enables graduates to adapt to social, cultural, and technological change in graphic design. The program's foundation is broadly based. Students begin with courses in fundamental aspects of visual studies. Upper division courses prepare them for graphic design positions in print and electronic media. An internship of 1-4 credits is required.

Admission Requirements

Students must complete 4 courses before admission to the program. Freshmen and transfer students are usually admitted to pre-major status before admission to this major.

A GPA above 2.00 is preferred for the following:

- 2.50 for students already admitted to the degree-granting college.
- 2.50 for students transferring from another University of Minnesota college.
- 2.50 for students transferring from outside the University.

Admission to the pre-major status is decided by a competitive holistic review. Students must maintain a GPA of 2.50 during pre-major coursework. In addition, students must receive a minimum grade of C- or better in the required pre-major courses before going through portfolio review (not just a 2.50 GPA). Once students have achieved major status, they must maintain a GPA of 2.00.

Students must be admitted to the pre-major status program to take most of the pre-graphic design coursework.

For information about University of Minnesota admission requirements, visit http://admissions.tc.umn.edu.

Required Courses for Admission

Pre-Graphic Design Courses

DHA 1101W - Introduction to Design Thinking, OH, WI (4.0 cr)
DHA 1311 - Foundations: Drawing and Design in Two and Three Dimensions (4.0 cr)
DHA 1312 - Foundations: Color and Design in Two and Three Dimensions (4.0 cr)
DHA 1315 - Foundations: The Graphic Studio (4.0 cr)

General Requirements

Recommended freshman writing course(s) for this program: RHET 1101

Program Requirements

Required Courses

Communication Courses

COMM 1101 - Introduction to Public Speaking (3.0 cr)
or PSTL 1461 - Oral Communication in the Public Sphere, C/PE (3.0 cr)
or RHET 1223 - Oral Presentations in Professional Settings (3.0 cr)
ENGC 3027W - Advanced Expository Writing, WI (4.0 cr)
or RHET 3562W - Technical and Professional Writing, WI (4.0 cr)

Art History Courses

ARCH 3411 - Architectural History to 1750, HP, IP (3.0 cr)
or ARCH 3412 - Architectural History since 1750, HP, IP (3.0 cr)
or ARTH 1xxx
or ARTH 2xxx
or ARTH 3xxx
or ARTH 4xxx
or ARTH 5xxx
or DHA 4121 - History of Costume (4.0 cr)
or DHA 4161 - History of Interiors and Furnishings: Ancient to 1750, IP (4.0 cr)

Business, Economics, or Marketing Courses

Students must select one course in either business, economics, or marketing.
ACCT 1xxx
or ACCT 2xxx
or ACCT 3xxx
or ACCT 4xxx
or ACCT 5xxx
or APEC 1101 - Principles of Microeconomics, SSCI (3.0 cr)
or APEC 1102 - Principles of Macroeconomics, IP, SSCI (3.0 cr)
or APEC 1251 - Principles of Accounting (3.0 cr)
or ECON 1xxx
or ECON 2xxx
or ECON 3xxx
or ECON 4xxx
or ECON 5xxx
or PSTL 1511 - Introduction to Business and Society, SSCI (4.0 cr)
or PSTL 1513 - Small Business Fundamentals With E-Business Applications (3.0 cr)
or MGMT 3xxx
or MKTG 3xxx

History Courses

AFRO 3204 - History of South Africa to 1910, HP, IP (3.0 cr)
or AFRO 3205 - History of South Africa from 1910, HP (3.0 cr)
or AFRO 3431 - Early Africa and Its Global Connections, HP, IP (4.0 cr)
or AFRO 3432 - Modern Africa in a Changing World, HP, IP (4.0 cr)
or AFRO 3864 - African American History: 1619 to 1865, CD, HP (4.0 cr)
or AFRO 3865 - African American History: 1865 to the Present, CD, HP (4.0 cr)
or AMIN 3871 - American Indian History: Pre-Contact to 1830, CD, HP (4.0 cr)
or AMIN 3872 - American Indian History: 1830 to the Present, CD, HP (4.0 cr)
or CNES 1043 - Introduction to Greek and Roman Archaeology, HP (4.0 cr)
or PSTL 1231 - Perspectives in American History, HP (4.0 cr)
or PSTL 1251 - World History: Since 1500, HP, IP (4.0 cr)
or HIST 1011V - Honors:World History, HP, IP, WI, H (4.0 cr)
or HIST 1011W - World History, HP, IP, WI (4.0 cr)
or HIST 1012V - Honors: World History, HP, IP, WI, H (4.0 cr)
or HIST 1012W - World History: The Age of Global Contact, HP, IP, WI (4.0 cr)
or HIST 1015W - Introduction to Global History Since 1950, HP, IP, WI (4.0 cr)
or HIST 1017 - World History, HP, IP (3.0 cr)
or HIST 1018 - World History: The Age of Global Contact, HP, IP (3.0 cr)
or HIST 1019 - Introduction to Global History Since 1950, HP, IP (3.0 cr)
or HIST 1026 - Western Civilization from its Origins to ca 1500, HP, IP (3.0 cr)or HIST 1027 - Western Civ From 1500 to Present, HP, IP (3.0 cr)
or HIST 1031V - Honors: Survey of Western Civilization From its Origins to ca 1500, HP, IP, WI, H (4.0 cr)
or HIST 1031W - Western Civilization, From Its Origins to ca 1500, HP, IP, WI (4.0 cr)
or HIST 1032V - Honors: Western Civilization, From 1500 to Present, HP, IP, WI, H (4.0 cr)
or HIST 1032W - Western Civilization, From 1500 to Present, HP, IP, WI (4.0 cr)
or HIST 1301V - Honors: U.S. History to 1877, CD, HP, WI, H (4.0 cr)
or HIST 1301W - U.S. History to 1877, CD, HP, WI (4.0 cr)
or HIST 1302V - Honors: U.S. History, From 1865 to Present, CD, HP, WI, H (4.0 cr)
or HIST 1302W - U.S. History, From 1865 to Present, CD, HP, WI (4.0 cr)
or HIST 1307 - American History to 1877, CD, HP (3.0 cr)
or HIST 1308 - U.S. History: From 1865 to Present, CD, HP (3.0 cr)
or HIST 3151W - British History to the 17th Century, C/PE, HP, WI (4.0 cr)
or HIST 3152 - British History From the Seventeenth Century, C/PE, HP (4.0 cr)
or HIST 3211 - History of Sexuality in Europe (3.0 cr)
or HIST 3347 - Women in Early and Victorian America: 1600-1890, CD, HP (3.0 cr)
or HIST 3348 - Women in Modern America, CD, HP (3.0-4.0 cr)
or HIST 3401W - Early Latin America to 1825, HP, IP, WI (4.0 cr)
or HIST 3402W - Modern Latin America 1825 to Present, HP, IP, WI (4.0 cr)
or HIST 3421 - The World and the West 1400-1900, HP, IP (3.0 cr)
or HIST 3431 - Early Africa and Its Global Connections, HP (4.0 cr)
or HIST 3432 - Modern Africa in a Changing World, HP, IP (4.0 cr)
or HIST 3461 - Introduction to East Asia I: The Imperial Age, HP, IP (3.0-4.0 cr)
or HIST 3462 - Introduction to East Asia II: 1600-2000, HP, IP (3.0-4.0 cr)
or HIST 3467W - State and Revolution in Modern China, HP, WI (3.0 cr)
or HIST 3468 - Social Change in Modern China, HP (3.0 cr)
or HIST 3471 - Modern Japan, Meiji to the Present (1868-2000), HP, IP (3.0 cr)
or HIST 3472 - Early Modern Japan (3.0 cr)
or HIST 3474 - The Rise of Modern Japan: 1850s to 1900s, HP, IP (3.0 cr)

or HIST 3608W - History of the Catholic Church in the Middle Ages, HP, WI (3.0 cr)
or HIST 3611 - Medieval Cities of Europe: 500-1500, HP, IP (3.0 cr)
or HIST 3615W - Women in European History: 1500 to the Present, HP, WI (3.0 cr)
or HIST 3616 - France in the Middle Ages, HP (3.0 cr)
or HIST 3621 - Renaissance Italy: 1200-1550, C/PE, HP (3.0 cr)
or HIST 3626 - France From the Late 16th Century Through Napoleon: 1594-1815 (3.0 cr)
or HIST 3703W - European Cities: 1300-1800, HP, IP, WI (3.0 cr)
or HIST 3704W - Daily Life in Europe: 1300-1800, HP, IP, WI (3.0 cr)
or HIST 3721 - 20th-Century Europe From the Turn of the Century to the End of World War II: 1900-1945, HP, IP (3.0 cr)
or HIST 3722 - 20th-Century Europe From the End of World War II to the End of the Cold War: 1945-1991, HP, IP (3.0 cr)
or HIST 3801 - The People of Early America: 16th to 18th Centuries, CD, HP (3.0 cr)
or HIST 3871 - American Indian History: Pre-Contact to 1830, CD, HP (4.0 cr)
or HIST 3872 - American Indian History: 1830 to the Present, CD, HP (4.0 cr)
or HSCI 1714 - Technology and Civilization: Stone Tools to Steam Engines, HP, IP (4.0 cr)
or HSCI 1715 - Technology and Civilization: Waterwheels to the Web, HP, IP (4.0 cr)
or HSCI 1814 - Revolutions in Science: The Babylonians to Newton, HP, IP (4.0 cr)
or HSCI 1815 - Revolutions in Science: Lavoisier, Darwin, and Einstein, HP, IP (4.0 cr)
or HSCI 3331 - Technology and American Culture, HP (3.0 cr)
or HSCI 3332 - Science and American Culture, CD, HP (3.0 cr)
or HSCI 3714 - Technology and Civilization: Stone Tools to Steam Engines, HP, IP (4.0 cr)
or HSCI 3715 - Technology and Civilization: Waterwheels to the Web, HP, IP (4.0 cr)
or HSCI 3814 - Revolutions in Science: The Babylonians to Newton, HP, IP (4.0 cr)
or HSCI 3815 - Revolutions in Science: Lavoisier, Darwin, and Einstein, HP, IP (4.0 cr)

Photography Courses
ARTS 1701 - Photography, OH (4.0 cr)
or DHA 4351 - Design Process: Photography (3.0 cr)
or PSTL 1485 - Creativity: Photography (4.0 cr)
or RHET 3101 - Functional Photography (3.0 cr)
or RHET 3102 - Digital Photography (2.0-3.0 cr)

Major Courses
DHA 2311 - Drawing and Illustration (3.0 cr)
DHA 2334 - Computer Applications I: Digital Composition for Design (3.0 cr)
DHA 2345 - Typographic Design (3.0 cr)
DHA 2351 - Graphic Design I: Text and Image (3.0 cr)
DHA 2385W - Design and Factors of Human Perception, WI (4.0 cr)
DHA 3312 - Color and Form in Surface Design (3.0 cr)
DHA 3352 - Graphic Design II: Identity and Symbols (3.0 cr)
DHA 3353 - Graphic Design III: Packaging and Display (3.0 cr)
DHA 4131W - History of Visual Communication, HP, WI (4.0 cr)
DHA 4196 - Internship in DHA (1.0-4.0 cr)
DHA 4334 - Computer Applications II: Design for the Digital Environment (3.0 cr)
DHA 4345 - Advanced Typographic Design (4.0 cr)
DHA 4355 - Graphic Design Portfolio (2.0 cr)
DHA 4354 - Graphic Design IV: Integrative Campaign (4.0 cr)
DHA 4365W - Graphic Design Senior Seminar, C/PE, WI (4.0 cr)

Emphasizing Materials Courses
Students must take one course emphasizing materials (DHA 4351 may be used if not taken for photography requirement). See an adviser for course options other than those in the list below.

DHA 4330 - Surface Fabric Design Workshop (4.0 cr)
or DHA 4340 - Woven, Knit, and Non-Woven Fiber Design Workshop (4.0 cr)
or DHA 4351 - Design Process: Photography (3.0 cr)
or DHA 4352 - Design Process: Bookmaking (3.0 cr)

Electives
See an adviser for course options other than those listed below.

Take 2 or more course(s) from the following:
DHA 5341 - Interactive Design I (3.0 cr)
DHA 5342 - Interactive Design 2: Interface Design (3.0 cr)
DHA 5382 - Digital Sound and Video (3.0 cr)
DHA 5383 - Digital Illustration and Animation (4.0 cr)
DHA 5386 - Fundamentals of Game Design (3.0 cr)

Housing Studies B.S.

Design, Housing & Apparel

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 71 to 74.

Degree: Bachelor of Science

The housing studies program allows students to study shelter in its multiple dimensions. Coursework in the program includes social and behavioral sciences, economics, public policy, planning, design, and technology.

After first acquiring a broad background of housing courses, students select one of four areas of concentration: community development and policy, housing technology, management and finance, or selected populations.

The housing studies program provides the academic background and professional preparation needed for graduate studies leading to college teaching, research, or planning/administrative positions.

Depending upon prior coursework, the housing studies major requirements can often be completed in two years. Students are encouraged to meet with an adviser to discuss their specific situations.

Admission Requirements

For information about University of Minnesota admission requirements, visit http://admissions.tc.umn.edu.

General Requirements

Recommended freshman writing course(s) for this program: RHET 1101

Program Requirements

Required Courses

Communication Courses
COMM 1101 - Introduction to Public Speaking (3.0 cr)
or PSTL 1461 - Oral Communication in the Public Sphere, C/PE (3.0 cr)
or RHET 1223 - Oral Presentations in Professional Settings (3.0 cr)
ENGC 3027W - Advanced Expository Writing, WI (4.0 cr)
or RHET 3562W - Technical and Professional Writing, WI (4.0 cr)

Required Major Coursework
An internship of at least 300 hours in a situation related to the student's area of specialization is required. Students must complete at least half of the required core program courses before enrolling in the internship (DHA 4196).

BP 3411 - Introduction to Residential Construction (2.0 cr)
DHA 1101W - Introduction to Design Thinking, OH, WI (4.0 cr)
DHA 2401 - Introduction to Housing (3.0 cr)
DHA 2402 - Residential Technology (3.0 cr)
DHA 2463 - Housing and Community Development, C/PE (3.0 cr)
DHA 4196 - Internship in DHA (1.0-4.0 cr)
DHA 4461 - Housing Development and Management (3.0 cr)
DHA 5463 - Housing Policy (3.0 cr)
DHA 5467W - Housing and the Social Environment, WI (4.0 cr)
DHA 4465 - Housing in a Global Perspective, IP (3.0 cr)
or DHA 5484 - Rural Housing Issues (3.0 cr)
DHA 5481 - Housing for the Elderly and Special Populations (3.0 cr)
DHA 3482 - Our Home, Our Environment (3.0 cr)
or ESPM 3601 - Our Home, Our Environment (3.0 cr)
APEC 1101 - Principles of Microeconomics, SSCI (3.0 cr)
or APEC 1102 - Principles of Macroeconomics, IP, SSCI (3.0 cr)
or ECON 1101 - Principles of Microeconomics, IP, SSCI (4.0 cr)
or ECON 1102 - Principles of Macroeconomics, IP, SSCI (4.0 cr)
or ECON 3701 - Money and Banking (3.0 cr)
or ECON 3801 - Elements of Public Economics (3.0 cr)
FSOS 3101 - Personal and Family Finances (3.0 cr)
or FSOS 3102 - Family Systems and Diversity, CD, SSCI (3.0 cr)
or FSOS 4106 - Family Resource Management (3.0 cr)
GEOG 3371W - Cities, Citizens, and Communities, CD, SSCI, WI (4.0 cr)
or GEOG 3605W - Geographical Perspectives on Planning, C/PE, IP, WI (4.0 cr)
or GEOG 5372W - American Cities II: Land Use, Transportation, and the Urban Economy, WI (4.0 cr)
or PA 4200 - Urban and Regional Planning (3.0 cr)
EPSY 3264 - Basic and Applied Statistics, MATH (3.0 cr)
or PSTL 1004 - Statistics, MATH (4.0 cr)
or OMS 2550 - Business Statistics: Data Sources, Presentation, and Analysis (4.0 cr)
or PSY 4801 - Introduction to Statistics (4.0 cr)
or STAT 1001 - Introduction to the Ideas of Statistics, MATH (4.0 cr)
or STAT 3011 - Introduction to Statistical Analysis, MATH (4.0 cr)

Program Sub-plans

Students are required to complete one of the following sub-plans. (Note: The honors sub-plan does not meet this requirement.) Honors students are required to complete one sub-plan plus the honorssub-plan.

Community Development and Policy

Courses in planning, geography, political science, and urban studies prepare students to work with housing and redevelopment authorities, city or regional planning departments, and nonprofit organizations in policy making, planning, and housing development.

DHA 5469 and 17 credits from a variety of courses are required.

Required Courses

Community Development and Policy Concentration
Courses listed below are suggested, but not inclusive. Students should consult with an adviser for other appropriate courses. Concentration courses must be primarily upper division and must be taken A-F. A minimum grade of C- is required. Note: a course may be used only once to satisfy program requirements.

DHA 5469 - Understanding Housing: Assessment and Analysis (3.0 cr)

Take 17 or more credit(s) from the following:

APEC 5581 - Human Capital and Household Economics (3.0 cr)
ARCH 5645 - Real Estate Development in Architecture (3.0 cr)
DHA 4465 - Housing in a Global Perspective, IP (3.0 cr)
DHA 3482 - Our Home, Our Environment (3.0 cr)
DHA 5471 - Housing Studies Certificate Seminar (2.0 cr)
DHA 5481 - Housing for the Elderly and Special Populations (3.0 cr)
DHA 5484 - Rural Housing Issues (3.0 cr)
FSOS 3102 - Family Systems and Diversity, CD, SSCI (3.0 cr)
GEOG 3361W - Land Use, Landscapes, and the Law, C/PE, ENVT, WI (3.0 cr)
GEOG 3371W - Cities, Citizens, and Communities, CD, SSCI, WI (4.0 cr)
GEOG 3373 - Changing Form of the City, HP, IP (3.0 cr)
GEOG 3605W - Geographical Perspectives on Planning, C/PE, IP, WI (4.0 cr)
GEOG 5361 - Geography and Real Estate (4.0 cr)
PA 5002 - Introduction to Policy Analysis (1.5 cr)
PA 5004 - Introduction to Planning (3.0 cr)
PA 5013 - Law and Urban Land Use (1.5 cr)
PA 5212 - Managing Urban Growth and Change (3.0 cr)
POL 1001 - American Democracy in a Changing World, C/PE, SSCI (4.0 cr)
RHET 4573W - Writing Proposals and Grant Management, WI (3.0 cr)
RHET 4258 - Information-Gathering Techniques in Scientific and Technical Communication (3.0 cr)
SOC 1001 - Introduction to Sociology, CD, SSCI (4.0 cr)
SOC 3201 - Inequality: Introduction to Stratification (3.0 cr)
SOC 3211W - American Race Relations, CD, SSCI, WI (3.0 cr)
SOC 3451W - Cities and Social Change, SSCI, WI (3.0 cr)
PA 4200 - Urban and Regional Planning (3.0 cr)
URBS 1001W - Introduction to Urban Studies: The Complexity of Metropolitan Life, C/PE, WI (3.0 cr)
URBS 3301W - American Cities As Settings for Cultural Diversity, CD, WI (3.0 cr)
URBS 3751 - Understanding the Urban Environment, ENVT (3.0 cr)
URBS 5101 - The City and the Metropolis: An Exploration (3.0 cr)
GEOG 5371W - American Cities I: Population and Housing, WI (4.0 cr)
or PA 5201W - American Cities I: Population and Housing, WI (4.0 cr)
GEOG 5372W - American Cities II: Land Use, Transportation, and the Urban Economy, WI (4.0 cr)
or PA 5202W - American Cities II: Land Use, Transportation, and the Urban Economy (4.0 cr)

Housing Technology

Courses in design, technology, architecture, and environmental studies prepare students to work in housing construction, renovation, and development firms; energy and housing inspection programs; and historic preservation organizations.

Students must complete at least 20 credits for the concentration.

Required Courses

Housing Technology Concentration
Courses listed below are suggested, but not inclusive. Students should consult with an adviser for other appropriate courses. Concentration courses must be primarily upper division and must be taken A-F. A minimum grade of C- is required. Note: a course may be used only once to satisfy program requirements.

Take 20 or more credit(s) from the following:
ARCH 3412 - Architectural History since 1750, HP, IP (3.0 cr)
ARCH 5671 - Historic Preservation (3.0 cr)
ARCH 5672 - Historic Building Conservation (3.0 cr)
ARCH 5673 - Historic Building Research and Documentation (3.0 cr)
ARTH 5546 - American Architecture: 1840 to 1914 (3.0 cr)
BP 4416 - Building Testing and Diagnostics (2.0 cr)
CE 4101W - Project Management, WI (3.0 cr)
DHA 1601 - Interior Design Studio I (4.0 cr)
DHA 1602 - Interior Design Studio II (4.0 cr)
DHA 2612 - Interior Materials and Specifications (4.0 cr)
DHA 2613 - Lighting Design and Life Safety Issues (4.0 cr)
DHA 2621 - Computer Aided Design: Interior Design (4.0 cr)
DHA 4465 - Housing in a Global Perspective, IP (3.0 cr)

DHA 3482 - Our Home, Our Environment (3.0 cr)
DHA 5469 - Understanding Housing: Assessment and Analysis (3.0 cr)
DHA 5481 - Housing for the Elderly and Special Populations (3.0 cr)
DHA 5484 - Rural Housing Issues (3.0 cr)
PUBH 6120 - Injury Prevention in the Workplace, Community, and Home (2.0 cr)
PUBH 6171 - Exposure Assessment for Air Contaminants (3.0 cr)
PUBH 6173 - Exposure to Physical Agents (2.0 cr)
PUBH 6101 - Environmental Health (2.0 cr)
RHET 4573W - Writing Proposals and Grant Management, WI (3.0 cr)
BP 4413 - Systems Approach to Residential Construction (3.0 cr)
BP 4414 - Advanced Residential Building Science, WI (3.0 cr)
BP 4415 - Advanced Residential Building Science Lab (1.0 cr)

Management/Finance

Courses in economics and business prepare students to work in public and private housing management, state finance agencies, commercial banks, and mortgage and title companies.

Students must complete at least 20 credits for the concentration.

Required Courses

Management and Finance Concentration

Courses listed below are suggested, but not inclusive. Students should consult with an adviser for other appropriate courses. Concentration courses must be primarily upper division and must be taken A-F. A minimum grade of C- is required. Note: a course may be used only once to satisfy program requirements.

Take 20 or more credit(s) from the following:

APEC 3001 - Applied Microeconomics: Consumers, Producers, and Markets, SSCI (4.0 cr)
APEC 3002 - Applied Microeconomics: Managerial Economics (4.0 cr)
APEC 3006 - Applied Macroeconomics: Government and the Economy (3.0 cr)
APEC 5341 - Public Finance (3.0 cr)
APEC 5581 - Human Capital and Household Economics (3.0 cr)
ARCH 5645 - Real Estate Development in Architecture (3.0 cr)
BLAW 3058 - The Law of Contracts and Agency (4.0 cr)
DHA 4465 - Housing in a Global Perspective, IP (3.0 cr)
DHA 3482 - Our Home, Our Environment (3.0 cr)
DHA 5469 - Understanding Housing: Assessment and Analysis (3.0 cr)
DHA 5481 - Housing for the Elderly and Special Populations (3.0 cr)
DHA 5484 - Rural Housing Issues (3.0 cr)
ECON 3701 - Money and Banking (3.0 cr)
ECON 3801 - Elements of Public Economics (3.0 cr)
FINA 3001 - Finance Fundamentals (3.0 cr)
FINA 4241 - Corporate Financing Decisions (4.0 cr)
GEOG 5361 - Geography and Real Estate (4.0 cr)
MGMT 3001 - Fundamentals of Management (3.0 cr)
MGMT 4002 - Managerial Psychology (4.0 cr)
MKTG 3001 - Principles of Marketing (3.0 cr)
MKTG 3010 - Marketing Research (4.0 cr)
MKTG 4040 - Buyer Behavior (4.0 cr)
RHET 3266 - Group Process, Team Building, and Leadership, C/PE (3.0 cr)
RHET 4165 - Managerial and Organizational Communication, Planning, and Change (3.0 cr)
RHET 4573W - Writing Proposals and Grant Management, WI (3.0 cr)
APEC 1101 - Principles of Microeconomics, SSCI (3.0 cr)or
ECON 1101 - Principles of Microeconomics, IP, SSCI (4.0 cr)
APEC 1102 - Principles of Macroeconomics, IP, SSCI (3.0 cr)or
ECON 1102 - Principles of Macroeconomics, IP, SSCI (4.0 cr)
APEC 1251 - Principles of Accounting (3.0 cr)or
ACCT 2050 - Introduction to Financial Reporting (4.0 cr)

Selected Populations

Courses (or a minor) in areas such as sociology, social work, gerontology, women's studies, African-American and African studies, American Indian studies, or Chicano studies prepare students to work in housing-related programs involving human relations, advocacy, and affirmative action or to work in housing programs for low-income families and for the elderly or disabled.

An area of concentration in selected populations may be fulfilled in two ways. Students are required to complete one of the following course groups.

Option One

Complete an appropriate minor along with additional credits in supporting courses. Under option one, a concentration can be done in such minors as African-American and African studies, American Indian studies, Chicano studies, global studies, Latin American studies, women's studies, or youth studies. For admission procedures and minor requirements, contact the department offering the minor.Minor and coursework to total 20 credits

Option Two

Concentrate on one or more special populations for which no specific undergraduate minor is offered. Choose courses from selected populations: the elderly; or selected populations: low income, minority, and households with children.

Selected Populations: the elderly

Take 20 or more credit(s) from the following:

DHA 5481 - Housing for the Elderly and Special Populations (3.0 cr)
DHA 5484 - Rural Housing Issues (3.0 cr)
FSOS 4154W - Families and Aging, WI (3.0 cr)
GERO 5105 - Multidisciplinary Perspectives on Aging (3.0 cr)
KIN 5385 - Exercise for Disease Prevention and Management (3.0 cr)
PA 5412 - Aging and Disability Policy (3.0 cr)
PSY 5138 - Psychology of Aging (3.0 cr)
PUBH 3001 - Personal and Community Health (2.0 cr)
PUBH 6904 - Nutrition: Adults and the Elderly (2.0 cr)
REC 5241 - Functional Intervention: Recreation Therapy in Geriatric Care (3.0 cr)
RHET 4573W - Writing Proposals and Grant Management, WI (3.0 cr)
RHET 4258 - Information-Gathering Techniques in Scientific and Technical Communication (3.0 cr)
SW 2001 - Introduction to Social Welfare and Community Services, C/PE (4.0 cr)
SW 5313 - Social Work with Older Adults (2.0 cr)
WOST 4201 - The Older Woman: A Feminist Perspective (3.0 cr)

Selected Populations: low income, minority, and households with children

Take 20 or more credit(s) from the following:

CPSY 2301 - Introductory Child Psychology, SSCI (4.0 cr)
DHA 5469 - Understanding Housing: Assessment and Analysis (3.0 cr)
DHA 5484 - Rural Housing Issues (3.0 cr)
FSOS 3101 - Personal and Family Finances (3.0 cr)
FSOS 3102 - Family Systems and Diversity, CD, SSCI (3.0 cr)
FSOS 3426 - Alcohol and Drugs: Families and Culture, CD, SSCI (3.0 cr)
FSOS 4106 - Family Resource Management (3.0 cr)
FSOS 4153 - Family Financial Counseling (3.0 cr)
FSOS 4156 - Legal-Economic Controversies in Families (3.0 cr)
GEOG 3375 - Minority Settlement in America, CD (3.0 cr)
GEOG 5371W - American Cities I: Population and Housing, WI (4.0 cr)
PA 5401 - Poverty, Inequality, and Public Policy (3.0 cr)
PA 5411 - Child Welfare Policy (3.0 cr)
PA 5421 - Racial Inequality and Public Policy (3.0 cr)
POL 1001 - American Democracy in a Changing World, C/PE, SSCI (4.0 cr)
POL 3051 - Power and Choice: Who Gets What, When, and Why, C/PE, SSCI (3.0 cr)
PUBH 3001 - Personal and Community Health (2.0 cr)
PUBH 3003 - Fundamentals of Alcohol and Drug Abuse (2.0 cr)
RHET 4573W - Writing Proposals and Grant Management, WI (3.0 cr)
RHET 4258 - Information-Gathering Techniques in Scientific and Technical Communication (3.0 cr)
SOC 1001 - Introduction to Sociology, CD, SSCI (4.0 cr)

SOC 3201 - Inequality: Introduction to Stratification (3.0 cr)
SOC 3211W - American Race Relations, CD, SSCI, WI (3.0 cr)
SOC 3251W - Sociological Perspectives on Race, Class, and Gender, CD, SSCI, WI (3.0 cr)
SOC 3451W - Cities and Social Change, SSCI, WI (3.0 cr)
SOC 3501 - Sociology of Families, CD, SSCI (3.0 cr)
SW 2001 - Introduction to Social Welfare and Community Services, C/PE (4.0 cr)
SW 3051 - Cultural Diversity and the Helping Process, CD (3.0 cr)
SW 3101 - Interventions in Community and Social Policy, C/PE (3.0 cr)
SW 3203 - Interventions with Individuals and Groups (3.0 cr)
SW 5101 - Historical Origins and Contemporary Policies and Programs in Social Welfare (3.0-4.0 cr)

Housing Studies Minor

Required credits in this minor: 15.

See major description for more information.

Admission Requirements

For information about University of Minnesota admission requirements, visit http://admissions.tc.umn.edu.

General Requirements

Required Courses

Minor Courses

DHA 2401 - Introduction to Housing (3.0 cr)
DHA 2463 - Housing and Community Development, C/PE (3.0 cr)

Take 3 or more course(s) from the following:

DHA 4461 - Housing Development and Management (3.0 cr)
DHA 4465 - Housing in a Global Perspective, IP (3.0 cr)
DHA 3482 - Our Home, Our Environment (3.0 cr)
DHA 5463 - Housing Policy (3.0 cr)
DHA 5467W - Housing and the Social Environment, WI (4.0 cr)
DHA 5469 - Understanding Housing: Assessment and Analysis (3.0 cr)
DHA 5481 - Housing for the Elderly and Special Populations (3.0 cr)
DHA 5484 - Rural Housing Issues (3.0 cr)

Interior Design B.S.

Design, Housing & Apparel

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 125.

Required credits within the major: 95.

This program requires summer terms.

Degree: Bachelor of Science.

Interior design is a professional program accredited by the Council for Interior Design Accreditation (CIDA). Its focus is on providing for human welfare by improving the quality of life and protecting human health and safety through design of the interior environment. Students study fundamentals, theory, process, communication, research, and technology to identify and solve problems related to people and their use of interior space. They analyze human behavior to determine clients' functional, aesthetic, social, and psychological needs, which prepares them to solve interior design problems. They design various types of interiors such as hospitals, offices, schools, residences, restaurants, hotels, and entertainment facilities. To do this, students acquire

- a foundation in basic design;
- understanding of the relationship between individuals and their environments;
- understanding of the contextual relationship of the site, the building, and its systems to the interior;
- knowledge of regulations that govern their practice of interior design;
- the ability to research users' needs and apply their findings to problem identification and solution;
- understanding of historical precedent and contemporary design theories;
- technical knowledge and communication skills;
- understanding of business issues and professional ethics; and
- a sense of responsibility to society, especially in the use of resources.

Admission Requirements

Students must complete seven courses before admission to the program. Freshmen and transfer students are usually admitted to pre-major status before admission to this major.

A GPA above 2.00 is preferred for the following:

- 2.50 for students already admitted to the degree-granting college.
- 2.50 for students transferring from another University of Minnesota college.
- 2.50 for students transferring from outside the University.

Admission to the pre-major status is done by a competitive holistic review. Students must maintain a GPA of 2.50 during pre-major coursework. In addition, students must receive a minimum grade of C- or better in the required pre-major courses before going through portfolio review (not just a 2.50 GPA). Once students have achieved major status, they must maintain a GPA of 2.00.

For information about University of Minnesota admission requirements, visit http://admissions.tc.umn.edu.

Required Courses for Admission

Pre-Interior Design Courses

Students must complete freshman composition and at least one additional liberal education course in addition to the required coursework below to be admitted to major status in the interior design program.

Note: Students must be admitted to a pre-major status to take most of these courses.

DHA 1101W - Introduction to Design Thinking, OH, WI (4.0 cr)
DHA 1311 - Foundations: Drawing and Design in Two and Three Dimensions (4.0 cr)
DHA 1312 - Foundations: Color and Design in Two and Three Dimensions (4.0 cr)
DHA 1601 - Interior Design Studio I (4.0 cr)
DHA 1602 - Interior Design Studio II (4.0 cr)General Requirements

Recommended freshman writing course(s) for this program: RHET 1101.

Program Requirements

Students must complete a 400-hour internship (DHA 4196) after completing DHA 3606 and DHA 3614.

Required Courses

Architectural History Courses

ARCH 3411 - Architectural History to 1750, HP, IP (3.0 cr)or
ARCH 3412 - Architectural History since 1750, HP, IP (3.0 cr)

Business Courses
MGMT 1350 - Introduction to Business and Business Careers (3.0 cr)or
MGMT 3001 - Fundamentals of Management (3.0 cr)

Communication Courses
COMM 1101 - Introduction to Public Speaking (3.0 cr)or
PSTL 1461 - Oral Communication in the Public Sphere, C/PE (3.0 cr)or
RHET 1223 - Oral Presentations in Professional Settings (3.0 cr)
ENGC 3027W - Advanced Expository Writing, WI (4.0 cr)or
RHET 3562W - Technical and Professional Writing, WI (4.0 cr)

Psychology Courses
PSY 1001 - Introduction to Psychology, SSCI (4.0 cr)or
PSTL 1281 - General Psychology, SSCI (4.0 cr)

Major Courses
Recommended courses to take if elective credits are needed:
DHA 4131, DHA 4330, DHA 4340, DHA 4165, DHA 5111, and DHA 5481.
DHA 2213 - Textile Analysis (4.0 cr)
DHA 2402 - Residential Technology (3.0 cr)
DHA 2603 - Interior Design Studio III (4.0 cr)
DHA 2604 - Interior Design Studio IV (4.0 cr)
DHA 2612 - Interior Materials and Specifications (4.0 cr)
DHA 2613 - Lighting Design and Life Safety Issues (4.0 cr)
DHA 2621 - Computer Aided Design: Interior Design (4.0 cr)
DHA 3605 - Interior Design Studio V (4.0 cr)
DHA 3606 - Interior Design Studio VI (4.0 cr)
DHA 3614 - Interior Design Ethics and Professional Practice, C/PE (4.0 cr)
DHA 4161 - History of Interiors and Furnishings: Ancient to 1750, IP (4.0 cr)
DHA 4162 - History of Interiors and Furnishings: 1750 to Present, IP (4.0 cr)
DHA 4196 - Internship in DHA (1.0-4.0 cr)
DHA 4607 - Interior Design Studio VII (4.0 cr)
DHA 4608 - Interior Design Thesis, WI (4.0 cr)
DHA 4615W - Interior Design Research, WI (2.0 cr)

Retail Merchandising B.S.

Design, Housing & Apparel

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 89 to 94.

Degree: Bachelor of Science.

The retail merchandising program offers a wide range of educational and career opportunities, including visits to international retailers, travel to foreign and domestic retail centers, and professional experiences such as study abroad and internships with national and international retailers. Program graduates begin their careers in store or corporate environments. Entry-level positions include merchandising, marketing, product development, distribution, store management, buying, advertising, sales promotion, and human resources.

Admission Requirements

For information about University of Minnesota admission requirements, visit http://admissions.tc.umn.edu.

General Requirements

Recommended freshman writing course(s) for this program: RHET 1101.

Program Requirements

Required Courses

Preparatory Courses
COMM 1101 - Introduction to Public Speaking (3.0 cr)or
PSTL 1461 - Oral Communication in the Public Sphere, C/PE (3.0 cr)
or RHET 1223 - Oral Presentations in Professional Settings (3.0 cr)
ENGC 3027W - Advanced Expository Writing, WI (4.0 cr)or
RHET 3562W - Technical and Professional Writing, WI (4.0 cr)
PSTL 1281 - General Psychology, SSCI (4.0 cr)or
PSY 1001 - Introduction to Psychology, SSCI (4.0 cr)
MATH 1031 - College Algebra and Probability, MATH (3.0 cr)
APEC 1101 - Principles of Microeconomics, SSCI (3.0 cr)or
ECON 1101 - Principles of Microeconomics, IP, SSCI (4.0 cr)
APEC 1102 - Principles of Macroeconomics, IP, SSCI (3.0 cr)or
ECON 1102 - Principles of Macroeconomics, IP, SSCI (4.0 cr)
PSTL 1571 - Computer Literacy and Problem Solving (4.0 cr)
ACCT 2050 - Introduction to Financial Reporting (4.0 cr)
or APEC 1251 - Principles of Accounting (3.0 cr)Major Courses
DHA 1101W - Introduction to Design Thinking, OH, WI (4.0 cr)
DHA 1201 - Clothing Design, Merchandising, and the Consumer, C/PE (3.0 cr)
DHA 2213 - Textile Analysis (4.0 cr)
DHA 2214 - Softlines Analysis (3.0 cr)
DHA 3242 - Retail Buying (3.0 cr)
DHA 3245 - Multichannel Retailing (3.0 cr)
DHA 4196 - Internship in DHA (1.0-4.0 cr)
DHA 4212W - Dress, Society, and Culture, CD, WI (3.0 cr)
DHA 4217 - International Developments in Textiles and Apparel, IP (3.0 cr)
DHA 5216 - Retail Promotion and Consumer Decision Making (4.0 cr)

Supporting Courses
DHA 3201 - Strategic Career Planning (1.0 cr)
HRIR 3021 - Human Resource Management and Industrial Relations (3.0 cr)
MGMT 3001 - Fundamentals of Management (3.0 cr)
MGMT 4002 - Managerial Psychology (4.0 cr)
MKTG 3001 - Principles of Marketing (3.0 cr)
MKTG 3010 - Marketing Research (4.0 cr)
OMS 2550 - Business Statistics: Data Sources, Presentation, and Analysis (4.0 cr)
or PSY 4801 - Introduction to Statistics (4.0 cr)
or SOC 3811 - Basic Social Statistics, MATH (4.0 cr)
or STAT 3011 - Introduction to Statistical Analysis, MATH (4.0 cr)
or STAT 3022 - Data Analysis (4.0 cr)
HRD 5624 - Sales Training (3.0 cr)
or HRD 5626 - Customer Service Training (3.0 cr)

Advanced Major Courses
Take 2 or more course(s) from the following:
DHA 3217 - Fashion Trends and Visual Analysis (3.0 cr)
DHA 3243 - Visual Merchandising (3.0 cr)
DHA 4121 - History of Costume (4.0 cr)
DHA 4247 - Advanced Buying and Sourcing (3.0 cr)
DHA 5215 - Product Development: Softlines (4.0 cr)

Retail Merchandising Minor

Required credits in this minor: 15 to 17.

See major description for more information.

Admission Requirements

For information about University of Minnesota admission requirements, visit http://admissions.tc.umn.edu.

General Requirements

Required Courses

Minor Courses

DHA 1201 - Clothing Design, Merchandising, and the Consumer, C/PE (3.0 cr)
DHA 3242 - Retail Buying (3.0 cr)

Take 3 or more course(s) from the following:

DHA 3243 - Visual Merchandising (3.0 cr)
DHA 3245 - Multichannel Retailing (3.0 cr)
DHA 4217 - International Developments in Textiles and Apparel, IP (3.0 cr)
DHA 4247 - Advanced Buying and Sourcing (3.0 cr)
DHA 5216 - Retail Promotion and Consumer Decision Making (4.0 cr)

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College of Education and Human Development

General Information

This information is subject to change. For the most current information, contact the college's office of Student & Professional Services (SPS), 612-625-3339, or visit the CEHD Web site at www.education.umn.edu.

In July 2006, the College of Education and Human Development (CEHD) begins a second century of teaching, research, and service for students and the citizens of Minnesota. It marks this milestone with dramatic changes as the Department of Family Social Science, the School of Social Work, and General College (now the Department of Postsecondary Teaching and Learning) come together with programs in the College of Education and Human Development to create a dynamic new college.

The new CEHD offers a unique blend of academic excellence and applied knowledge, allowing students to learn from faculty members conducting research on a wide spectrum of topics from early childhood development, to fitness and wellness, to family structures to human resource development to learning across the life span. Most programs require students to apply classroom and textbook knowledge to "real-world" situations of student teaching or internships.

CEHD's mission is to generate and apply knowledge about teaching, learning, and human development and to improve education for all individuals. The college prepares students to meet the challenges of teaching and leading in increasingly culturally diverse classrooms, schools, and society. Strongly committed to diversity, the college offers several financial and mentoring programs to support students of underrepresented populations. Because community outreach also plays an important role in its mission, the college has developed an extensive network of community ties allowing transfer of classroom and research knowledge to practice in schools and the workplace, and the incorporation of community viewpoints into the college's teaching and research missions.

The college includes the following:

- Institute of Child Development (ICD)
- Curriculum & Instruction (CI)
- Educational Policy and Administration (EdPA)
- Educational Psychology (EdPsych)
- Family Social Science (FSoS)
- Postsecondary Teaching and Learning (PSTL)
- School of Kinesiology (Kin)
- School of Social Work (SSW)
- Work and Human Resource Education (WHRE)

Admission

Application policies and deadlines vary by program. Policies are subject to change. For current information, contact the following offices:

Freshman students

University of Minnesota Admissions Office
612-625-2008
www.admissions.tc.umn.edu

Transfer students

Students transferring to CEHD from schools outside the University of Minnesota:

University of Minnesota Admissions Office
612-625-2008
www.admissions.tc.umn.edu

Students transferring to CEHD from other University of Minnesota colleges (e.g., CLA, IT):

CEHD Student & Professional Services (SPS)
612-625-3339
spsinfo@umn.edu
www.education.umn.edu

For information about individual academic programs, contact the department offering the program.

Orientation

The Office of Orientation and First-Year Programs is responsible for new student orientation programs for freshman and transfer students. The campus-wide program serves as the official welcome to the University of Minnesota. The program, planned with the college, introduces students to the opportunities and resources at the University. Information is sent to all students after admission to the University. Orientation programs are held throughout the summer and just prior to the beginning of each semester.

For more information, contact:

CEHD office of Student & Professional Services (SPS)

612-625-3339
spsinfo@umn.edu
www.education.umn.edu/sps

University of Minnesota Orientation and First-Year Programs

612-624-1979, 1-800-234-1979
ofyp@umn.edu
www.ofyp.umn.edu

Programs of Study

CEHD offers undergraduate and advanced study in a wide range of teaching and human development fields. Some programs prepare graduates for careers in business, government, and community settings, while others prepare students for preK-12 teaching licensure by the state of Minnesota.

In fall 2006, the college will admit freshman students to two areas, family social science and general studies.

- Family social science, formerly offered in the College of Human Ecology (CHE), is a multidisciplinary major for careers related to helping people, counseling, and understanding human relationships. Graduates are prepared to work with individuals, families, or in human service systems.

- General studies, formerly offered in General College, is designed for students who have strong academic potential but whose high-school records suggest they may benefit from additional tutoring, advising, and mentoring support during their first year of college. The curriculum is focused on providing each student with intensive learning experiences with faculty members in small-enrollment courses, freshman seminars, and interdisciplinary learning communities that promote academic and social integration.

With the exception of general studies, students can enter the college as transfer students. Most programs require students to be juniors (with at least 60 semester credits), but some will admit students beginning their sophomore year (with at least 30 semester credits).

In fall 2007, it is expected that the other majors in the college will begin admitting freshmen. Check the CEHD Web site for complete and current information.

Bachelor of Science (B.S.)

The college's undergraduate majors prepare students for careers as educators and human development professionals in varied settings. All University of Minnesota students, whatever their declared major, may complement their degree programs by taking a variety of elective courses available in CEHD.

The two main categories of CEHD undergraduate programs are described below.

- Human development programs—These programs can lead to careers in business and marketing education, human resource development, family science, social work, or sport and fitness industries.
- Teaching and teaching preparation programs—These programs prepare students to meet requirements for preK-12 teaching licensure in the state of Minnesota, in areas of early childhood education, elementary education, or business and technology education.

Some undergraduate programs appear in both categories because they offer teaching preparation and human development programs (e.g., agricultural education).

Human Development Programs

These programs prepare students for leadership, supervisory, or administrative positions by developing the leadership and communication skills needed for a career in business or fitness and recreation settings. Graduates work in areas ranging from sales and marketing, human resource development, coaching, health and fitness clubs, state parks, and youth and community recreation agencies.

- agricultural education
- business and marketing education
- child psychology—See College of Liberal Arts (CLA) section
- family social science
- general studies
- human resource development
- kinesiology
- recreation, park, and leisure studies
- sport studies

Teaching and Teaching Preparation Programs

These programs prepare students for preK-12 teaching licensure by the state of Minnesota. Other states may have different requirements. Contact state teaching licensure agencies for more information.

Some undergraduate programs in the following list offer a direct path to licensure (e.g, technology education). Others require further study in related master of education (M.Ed.)/initial licensure programs.

- agricultural education
- business and marketing education
- career and technical education
- foundations of education: early childhood education
- foundations of education: elementary
- kinesiology (pre-physical education)
- music education—See College of Liberal Arts (CLA) section
- technology education

For more information, contact a program adviser at Student and Professional Services, 612-625-6501, or spsinfo@umn.edu.

Minors

Several undergraduate minors are available. Minors offer shorter, concentrated areas of study, usually totaling 15-20 credits.

- coaching
- family violence prevention
- family social science
- leadership
- social justice
- youth studies

Honors

The college currently offers honors programs for students in family social science and kinesiology programs.

The family social science lower division honors program offers freshmen and sophomores an opportunity to form close relationships; to explore new ideas; and to share their ideas, interests, and academic lives on a daily basis. Students develop these relationships by participating in honors classes and by living in honors housing in residence halls on campus. Lower division honors students complete three honors learning experiences.

The upper division honors program offers juniors and seniors additional opportunities to achieve their academic and professional goals. Upper division students complete two honors learning experiences and carry out a capstone project, an in-depth exploration of a topic specifically related to their major. Students successfully completing the upper division honors program are eligible to graduate with Latin honors (cum laude, magna cum laude, or summa cum laude).

For more information, students should contact the family social sciences adviser, 290 McNeal Hall, St. Paul, or SPS, 110 Wulling Hall, Minneapolis.

The undergraduate kinesiology honors program offers rigorous academics and unique research opportunities. Participants graduate with one of the traditional honors designations: cum laude, magna cum laude, or summa cum laude. The honors program emphasizes directed research in the physical activities sciences, with students completing research that warrants publication in a professional journal. Program requirements include a kinesiology honors seminar (two semesters) and an undergraduate research symposium.

Students may apply to the honors program at the same time they apply for admission to the undergraduate kinesiology program. For more information, contact the School of Kinesiology, 612-625-5300, or visit the School of Kinesiology Web site at www.education.umn.edu/Kin.

Policies and Procedures

Students are responsible for complying with all University of Minnesota policies and CEHD and academic program requirements. See the "Policies" section of this catalog.

Graduation Requirements

Students are responsible for complying with all University of Minnesota policies and CEHD and academic program requirements. See the "Policies" section of this catalog and "Degree Program" section in the following text.

Teaching Licensure

To teach in a public school classroom, students must be licensed by the state. Several CEHD teacher licensure programs are offered at the undergraduate level: agricultural education; career and technical education; music education; and technology education. Other CEHD initial licensure programs are offered at the master's level; students must first complete an undergraduate degree with appropriate prerequisites.

The college offers initial licensure programs in adult basic education, agricultural education, art education, business and marketing education, early childhood education and early childhood special education, elementary education, English education, family education, industrial education (technology education), mathematics education, physical education, science education, second languages and cultures education (including English as a second language), social studies education, and special education. These licensure programs reflect the most current thinking and research in the field, with strong clinical experiences and special attention to multicultural education. CEHD licensure programs are approved by the Minnesota Board of Teaching and accredited by the National Council for the Accreditation of Teacher Education (NCATE).

Teaching licenses are awarded by the Minnesota Board of Teaching; CEHD is responsible for recommending eligible candidates to the state. The CEHD recommendation for licensure is based on successful completion of coursework that includes a standards-based curriculum, favorable faculty judgment regarding teaching competence, and meeting minimum standards on state-required examinations.

Minnesota state law and a Minnesota Board of Teaching regulation require teacher licensure candidates to meet specific competencies. This requirement is met through a combination of required and elective coursework at the graduate level. Candidates also must pass the Praxis Series tests, which assess basic skills of reading, writing, and mathematics; content knowledge; and pedagogy and teaching methods. Minnesota state law also requires all initial licensure applicants to be fingerprinted and pass criminal background checks.

Scholarships

Students are encouraged to apply for scholarships to further their studies; most awards are made on an annual basis. In addition to financial aid offered by the University, the college administers several scholarship programs of its own. Find out more about available scholarships, application materials and instructions at SPS, 110 Wulling Hall (612-625-6501; e-mail: spsinfo@umn.edu) or online at www.education.umn.edu or www.onestop.umn.edu.

Student Organizations

The college offers several undergraduate student groups, including:

The Association of Students in Education and Human Development (ASEHD) is open to all CEHD undergraduates as well as students in other University colleges who aspire to be educators or human development professionals. ASEHD has three subcommittees: intramurals, professional development, and community service. The intramural group participates in intramural sports organized by the University's Department of Recreational Sports. Students interested in learning more about their chosen careers participate in the professional development group. The community service group serves the college, University, and Twin Cities metropolitan area. For more information, contact SPS, 110 Wulling Hall (612-625-6501).

Family Social Science Roundtable was established to create a sense of identity within the Department of Family Social Science, provide networking opportunities, promote healthy relationships, provide hands-on experience in community service and involvement, and encourage socialization with peers and faculty. For more information, contact William Goodman, 612-625-1282, e-mail: wgoodman@umn.edu.

The Agricultural Education Club offers civic and social leadership activities and is open to all students interested in the field. The group promotes professional roles in agricultural education, and strengthens relationships with state and national FFA organizations (Future Farmers of America).

Directory

Administrative Offices

CEHD Dean's Office

104 Burton Hall, Minneapolis
612-626-9252

Departments

Curriculum and Instruction

145 Peik Hall, Minneapolis
612-625-4006
Chair: Ruth Thomas

Educational Policy and Administration

330 Wulling Hall, Minneapolis
612-624-1006
Chair: R. Michael Paige

Educational Psychology

204 Burton Hall, Minneapolis
612-624-6083
Chair: John Romano

Department of Family Social Science

290 McNeal Hall, St. Paul
612-625-1900
Department head: B. Jan McCulloch

Department of Postsecondary Teaching and Learning

240 Appleby Hall, Minneapolis
612-625-2880
Chair: Heidi Barajas

Institute of Child Development

180 Child Development Building, Minneapolis
612-624-0526
Director: Nicki Crick

School of Kinesiology

111 Cooke Hall, Minneapolis
612-625-5300
Director: Mary Jo Kane

School of Social Work

105 Peters Hall, St. Paul
612-625-1220
Director: Jean K. Quam

Work and Human Resource Education (WHRE)

210A Vocational and Technical Education Building, St. Paul
612-625-3757
Chair: Kenneth Bartlett

Degree Programs and Minors

Agricultural Education B.S.

Work and Human Resource Education

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120 to 128.

Required credits within the major: 88.

This program requires summer terms.

Degree: Bachelor of Science

The undergraduate agricultural education program is a collaborative partnership between the College of Education and Human Development and College of Food, Agricultural and Natural Resource Sciences (CFANS). Three specializations are available. The agricultural science and technology education specialization and natural and managed environmental education specialization prepare students for Minnesota state teaching licensure. The agricultural leadership, training, and development specialization prepares students for agricultural industry and leadership careers, focusing on development of interpersonal skills. It does not lead to teaching licensure.

Admission Requirements

Students must complete 60 credits before admission to the program.

A GPA above 2.00 is preferred for the following:

- 2.50 for students already admitted to the degree-granting college.
- 2.50 for students transferring from another University of Minnesota college.
- 2.50 for students transferring from outside the University.

Minimum GPAs are preferred for the following specializations:

- 2.50 for agricultural science and technology education or natural and managed environmental education
- 2.00 for agricultural leadership training and development

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

General Requirements

Recommended freshman writing course(s) for this program: RHET 1101

Program Requirements

Required Courses

Communications

RHET 3562W - Technical and Professional Writing, WI (4.0 cr)
PSTL 1461 - Oral Communication in the Public Sphere, C/PE (3.0 cr)
or RHET 1223 - Oral Presentations in Professional Settings (3.0 cr)

Social Sciences

PSTL 1281 - General Psychology, SSCI (4.0 cr)
or PSY 1001 - Introduction to Psychology, SSCI (4.0 cr)

Physical Sciences and Mathematics

BIOC 2011 - Biochemistry for the Agricultural and Health Sciences (3.0 cr)
CHEM 1011 - Introductory Chemistry: Lecture and Laboratory, PHYS SCI/L (4.0 cr)
MATH 1031 - College Algebra and Probability, MATH (3.0 cr)

Major Courses

AFEE 1001 - Introduction to Agricultural Education and Extension (1.0 cr)
AFEE 1002 - Principles of Career Planning for Agricultural Professionals (1.0 cr)
AFEE 2051 - Current Technical Competencies (3.0 cr)
AFEE 5111W - Agricultural Education: Methods of Teaching, WI (4.0 cr)
AGRI 3001 - Pests and Crop Protection (3.0 cr)

Program Sub-plans

Students are required to complete one of the following sub-plans.

Agricultural Leadership, Training, and Development

This specialization provides a unique, futuristic educational opportunity combining agricultural science, management, communication, leadership, education, business and industry, training, and development. It provides a general background in agriculture, with agribusiness and industry associations. Graduates have opportunities and flexibility in employment ranging from human resource development, sales and marketing, extension, and communications in statewide, national, and international situations. This specialization does not lead to teaching licensure.

Business experience is required along with completion of courses. Students must maintain an overall GPA of 2.00.

Required Courses

Physical and Biological Sciences

AGRI 1501 - Biotechnology, People, and the Environment, ENVT (3.0 cr)
AGRO 1101 - Biology of Plant Food Systems, BIOL SCI/L, ENVT (4.0 cr)
or BIOL 1009 - General Biology, BIOL SCI/L (4.0 cr)

Plant Science

Take 6 or more credit(s) from the following:
AGRO 1103 - Crops, Environment, and Society, ENVT (4.0 cr)
AGRO 2501 - Plant Identification for Urban and Rural Landscapes (2.0 cr)
AGRO 4005 - Applied Crop Physiology and Development (4.0 cr)
ANSC 3203W - Environment, Global Food Production, and the Citizen, C/PE, ENVT, WI (3.0 cr)
HORT 1001 - Plant Propagation, BIOL SCI/L (4.0 cr)
HORT 3005 - Environmental Effects on Horticultural Crops (2.0 cr)

Animal Science

ANSC 1101 - Introductory Animal Science (4.0 cr)
ANSC 1403 - Companion Animal Nutrition and Care (3.0 cr)
or ANSC 2401 - Animal Nutrition (3.0 cr)

Take 3 or more credit(s) from the following:
ANSC 1511 - Food Animal Products for Consumers (3.0 cr)
ANSC 2012 - Livestock and Carcass Evaluation (3.0 cr)
ANSC 3203W - Environment, Global Food Production, and the Citizen, C/PE, ENVT, WI (3.0 cr)

Soils
SOIL 1125 - The Soil Resource, ENVT, PHYS SCI/L (4.0 cr)
or SOIL 2125 - Basic Soil Science, ENVT (4.0 cr)

Applied Economics and Agribusiness
APEC 1101 - Principles of Microeconomics, SSCI (3.0 cr)
APEC 1251 - Principles of Accounting (3.0 cr)
APEC 3451 - Food and Agricultural Sales (3.0 cr)
or BIE 3061 - Professional Sales Management (3.0 cr)

Agricultural Leadership and Development
AFEE 2221 - People Skills for Leadership (3.0 cr)
AFEE 3221 - Presentations and Meeting Management for Agricultural Industry (3.0 cr)
AFEE 4221 - Rural Leadership Development, C/PE (3.0 cr)
AFEE 5361 - World Development Problems (3.0 cr)

Experiential Education
AFEE 2096 - Professional Practicum in Agricultural Education: Early Experience (1.0-3.0 cr)
AFEE 3096 - Experiential Learning: Production and Business (1.0-8.0 cr)

Human Resource Development
HRD 3001 - Introduction to Human Resource Development (3.0 cr)
HRD 3201 - Introduction to Training and Development (3.0 cr)

Human Resource Development/AFEE Electives
Students who complete the HRD focus (described below) must fulfill this 6 credit HRD/AFEE requirement by choosing courses from the AFEE, BIE, and WHRE designators.

Take 6 or more credit(s) from the following:
AFEE 5331 - History, Philosophy, and Systems of Extension (3.0 cr)
BIE 3061 - Professional Sales Management (3.0 cr)
WHRE 3105 - Introduction to Strategic Planning Through Human Resources (3.0 cr)
HRD 3301 - Introduction to Organization Development (3.0 cr)
HRD 5106 - Evaluation in Human Resource Development (3.0 cr)
HRD 5202 - Training on the Internet (3.0 cr)
HRD 5302 - Managing Work Teams in Business and Industry (3.0 cr)
HRD 5624 - Sales Training (3.0 cr)
WHRE 5121 - Principles of Supervisory Management (3.0 cr)

Agricultural Leadership, Training, and Development Focus

Students are required to complete one of the following course groups.

Agricultural Science
Take 10 or more credit(s) from the following:
AGRO 2501 - Plant Identification for Urban and Rural Landscapes (2.0 cr)
AGRO 3203W - Environment, Global Food Production, and the Citizen, C/PE, ENVT, WI (3.0 cr)
AGRO 4005 - Applied Crop Physiology and Development (4.0 cr)
ANSC 1511 - Food Animal Products for Consumers (3.0 cr)
ANSC 2012 - Livestock and Carcass Evaluation (3.0 cr)
ANSC 2211 - Biometrics for Livestock, MATH (3.0 cr)
ANSC 3301 - Systemic Physiology (4.0 cr)
FSCN 1102 - Food: Safety, Risks, and Technology, C/PE (3.0 cr)
PLPA 3002 - Air Pollution, People, and Plants: The Science and the Ethics, C/PE, ENVT (3.0 cr)

-OR-

Agricultural Business and Management
Take 10 or more credit(s) from the following:
APEC 3041W - Economic Development of U.S. Agriculture, HP, WI (3.0 cr)
APEC 3411 - Commodity Marketing (3.0 cr)
APEC 3811 - Principles of Farm Management (3.0 cr)
APEC 3xxx

-OR-

Communication
Take 10 or more credit(s) from the following:
RHET 1152W - Writing on Issues of Science and Technology, C/PE, WI (4.0 cr)
RHET 3221W - Theories of Human Communication, C/PE, SSCI, WI (4.0 cr)
RHET 3257 - Scientific and Technical Presentations (3.0 cr)
RHET 3266 - Group Process, Team Building, and Leadership, C/PE (3.0 cr)
RHET 3401 - Internet Communication: Tools and Issues (3.0 cr)

-OR-

Human Resource Development
Take 10 or more credit(s) from the following:
WHRE 3105 - Introduction to Strategic Planning Through Human Resources (3.0 cr)
HRD 3301 - Introduction to Organization Development (3.0 cr)
HRD 5106 - Evaluation in Human Resource Development (3.0 cr)
HRD 5202 - Training on the Internet (3.0 cr)
HRD 5302 - Managing Work Teams in Business and Industry (3.0 cr)
HRD 5624 - Sales Training (3.0 cr)

Agricultural Science and Technology Education

This specialization serves students preparing to teach agriscience, agribusiness, agriculture, horticulture, food systems, agrimechanics, and natural resource management under the licensure field of agricultural education in public schools at the 5-12 level. Its broad agricultural science and technology curriculum also prepares graduates for a wide range of agriculturally related positions in sales, management, finance, and production aspects of agriculture.

Students may graduate from this program with a minimum 2.00 overall GPA, but a minimum 2.50 overall GPA is required for recommendation for Minnesota teaching licensure. Major coursework (courses with AFEE, BIE, EDHD, HRD, and WHRE designators) must be completed with a minimum 2.00 GPA with no grade lower than C-. A minimum grade of C- is also required for general psychology.

The specialization requires a broad study of agriculture, including plant science (horticulture, agronomy, plant pathology, and entomology), animal science, natural resources, soils, economics and agribusiness, agricultural mechanization, food science, foundations of education, foundations of agricultural education, and a full-year student teaching experience.

Required Courses

Physical and Biological Sciences
AGRI 1501 - Biotechnology, People, and the Environment, ENVT (3.0 cr)
or PSTL 1163 - Physical Systems: Principles and Practices, PHYS SCI/L (4.0 cr)
AGRO 1101 - Biology of Plant Food Systems, BIOL SCI/L, ENVT (4.0 cr)
or BIOL 1009 - General Biology, BIOL SCI/L (4.0 cr)
or PSTL 1131 - Principles of Biological Science, BIOL SCI/L (4.0 cr)
FSCN 1021 - Introductory Microbiology, BIOL SCI/L (4.0 cr)
or VBS 2032 - General Microbiology With Laboratory (4.0 cr)
PHYS 1001W - Energy and the Environment, ENVT, PHYS SCI/L, WI (4.0 cr)
or PHYS 1101W - Introductory College Physics I, PHYS SCI/L, WI (4.0 cr)

Social Sciences
HSCI 1814 - Introduction to History of Science: Ancient Science to the Scientific Revolution, HP, IP (4.0 cr)
or HSCI 1815 - Introduction to History of Science: Modern Science, HP, IP (4.0 cr)
or any history course that meets HP or IP liberal education requirements

Plant Science

Take 3 or more credit(s) from the following:

AGRO 1103 - Crops, Environment, and Society, ENVT (4.0 cr)
HORT 1001 - Plant Propagation, BIOL SCI/L (4.0 cr)
HORT 1013 - Floral Design (2.0 cr)
HORT 3002W - Greenhouse Management, WI (3.0 cr)
AGRO 4401 - Plant Genetics and Breeding (4.0 cr)
or HORT 4401 - Plant Genetics and Breeding (4.0 cr)

Animal Science

ANSC 1403 - Companion Animal Nutrition and Care (3.0 cr)
or ANSC 2401 - Animal Nutrition (3.0 cr)

Take 1 or more course(s) from the following:

ANSC 1101 - Introductory Animal Science (4.0 cr)
ANSC 1511 - Food Animal Products for Consumers (3.0 cr)
ANSC 2012 - Livestock and Carcass Evaluation (3.0 cr)
ANSC 3221 - Animal Breeding (4.0 cr)

Natural Resources

Take 6 or more credit(s) from the following:

EEB 3001 - Ecology and Society, ENVT (3.0 cr)
ENR 1201 - Conservation and Management of Natural Resources, ENVT (3.0 cr)
ES 1011 - Issues in the Environment, C/PE, ENVT (3.0 cr)
ES 1051 - Introduction to Environmental Science, ENVT (3.0 cr)
FW 1002 - Wildlife: Ecology, Values, and Human Impact, ENVT, C/PE (3.0 cr)

Soils

SOIL 1125 - The Soil Resource, ENVT, PHYS SCI/L (4.0 cr)
or SOIL 2125 - Basic Soil Science, ENVT (4.0 cr)

Applied Economics and Agribusiness

APEC 1101 - Principles of Microeconomics, SSCI (3.0 cr)
APEC 3451 - Food and Agricultural Sales (3.0 cr)
APEC 1251 - Principles of Accounting (3.0 cr)
or APEC 3811 - Principles of Farm Management (3.0 cr)
or APEC 3821 - Retail Center Management (3.0 cr)

Additional Required Courses

FSCN 1102 - Food: Safety, Risks, and Technology, C/PE (3.0 cr)
AFEE 3112 - Technical Drawing and Production Technologies (3.0 cr)
or WHRE 3121 - Communication, Energy and Power, Transportation and Machinery Technologies (3.0 cr)

Foundations

CI 5452 - Reading in the Content Areas for Initial Licensure Candidates (1.0 cr)
EDHD 5001 - Learning, Cognition, and Assessment (3.0 cr)
EDHD 5003 - Developmental and Individual Differences in Educational Contexts (3.0 cr)
EDHD 5005 - School and Society (2.0 cr)
EDHD 5007 - Technology for Teaching and Learning (1.5 cr)
EDHD 5009 - Human Relations: Applied Skills for School and Society (1.0 cr)
EDPA 5341 - The American Middle School (3.0 cr)
PUBH 3003 - Fundamentals of Alcohol and Drug Abuse (2.0 cr)
or PUBH 3005 - Fundamentals of Alcohol and Drug Abuse for Teacher Education (1.0 cr)

Agricultural Education

AFEE 2096 - Professional Practicum in Agricultural Education: Early Experience (1.0-3.0 cr)
AFEE 5112 - Agricultural Education Program Organization and Curriculum for Youth (3.0 cr)
AFEE 5114 - Agricultural Education Teaching Seminar (1.0 cr)
AFEE 5116 - Coordination of SAE Programs: Work-based Learning (2.0 cr)
AFEE 5118 - Strategies for Managing and Advising the FFA Organization (2.0 cr)

Work and Human Resource Education

Take 8 credits from the following. Standard first aid and cardiopulmonary resuscitation (CPR) training are required for licensure.

WHRE 5697 - Teaching Internship: School and Classroom Settings (2.0 cr)
WHRE 5698 - Teaching Internship (3.0-8.0 cr)

Natural and Managed Environmental Education

This specialization serves students preparing to teach agriscience, agribusiness, agriculture, horticulture, food systems, agrimechanics, and natural resource management, all under the licensure field of agricultural education in public schools at the 5-12 level. In addition, graduates have an emphasis in natural resource management and education and are prepared for work in environmental learning centers.

Students may graduate from this program with a minimum 2.00 GPA, but a minimum 2.50 GPA is required for recommendation for a Minnesota teaching license.

The specialization requires a broad study in agriculture focused on the natural and managed environmental education areas. Areas of study include the environment, land, water, climate, economics, soil, plant science, animal science, and agricultural mechanization. It also includes foundations in education, foundations in agricultural education, and a full-year student teaching experience.

Required Courses

Physical and Biological Sciences

AGRI 1501 - Biotechnology, People, and the Environment, ENVT (3.0 cr)
or PSTL 1163 - Physical Systems: Principles and Practices, PHYS SCI/L (4.0 cr)
AGRO 1101 - Biology of Plant Food Systems, BIOL SCI/L, ENVT (4.0 cr)
or BIOL 1009 - General Biology, BIOL SCI/L (4.0 cr)
or PSTL 1131 - Principles of Biological Science, BIOL SCI/L (4.0 cr)
FSCN 1021 - Introductory Microbiology, BIOL SCI/L (4.0 cr)
or VBS 2032 - General Microbiology With Laboratory (4.0 cr)
PHYS 1001W - Energy and the Environment, ENVT, PHYS SCI/L, WI (4.0 cr)
or PHYS 1101W - Introductory College Physics I, PHYS SCI/L, WI (4.0 cr)

Social Sciences

HSCI 1814 - Introduction to History of Science: Ancient Science to the Scientific Revolution, HP, IP (4.0 cr)
or HSCI 1815 - Introduction to History of Science: Modern Science, HP, IP (4.0 cr)
or Any history course that meets HP or IP liberal education requirements

Natural Resources

ES 1011 - Issues in the Environment, C/PE, ENVT (3.0 cr)

Take 6 or more credit(s) from the following:

EEB 3001 - Ecology and Society, ENVT (3.0 cr)
ES 1051 - Introduction to Environmental Science, ENVT (3.0 cr)
FR 2104 - Measuring Forest Resources (1.0 cr)
FR 3104 - Forest Ecology (4.0 cr)
FW 1002 - Wildlife: Ecology, Values, and Human Impact, ENVT, C/PE (3.0 cr)
FW 2001 - Introduction to Fisheries, Wildlife, and Conservation Biology, ENVT (3.0 cr)

Land, Water, Atmosphere

SOIL 2125 - Basic Soil Science, ENVT (4.0 cr)
ENR 1201 - Conservation and Management of Natural Resources, ENVT (3.0 cr)
or ES 1425 - The Atmosphere, ENVT, PHYS SCI/L (4.0 cr)
or ES 3221 - Soil Conservation and Land-Use Management (3.0 cr)
or SOIL 3416 - Plant Nutrients in the Environment (3.0 cr)

Applied Economics and Agribusiness

APEC 1101 - Principles of Microeconomics, SSCI (3.0 cr)
or APEC 3451 - Food and Agricultural Sales (3.0 cr)

Animal Science
ANSC 2401 - Animal Nutrition (3.0 cr)
ANSC 1101 - Introductory Animal Science (4.0 cr)
or ANSC 1403 - Companion Animal Nutrition and Care (3.0 cr)
or ANSC 1511 - Food Animal Products for Consumers (3.0 cr)
or ANSC 2012 - Livestock and Carcass Evaluation (3.0 cr)
or ANSC 3203W - Environment, Global Food Production, and the Citizen, C/PE, ENVT, WI (3.0 cr)

Agricultural Mechanization
Take 1 or more course(s) from the following:
AFEE 3112 - Technical Drawing and Production Technologies (3.0 cr)
WHRE 3121 - Communication, Energy and Power, Transportation and Machinery Technologies (3.0 cr)

Plant Science
Take 3 or more credit(s) from the following:
AGRO 4401 - Plant Genetics and Breeding (4.0 cr)
HORT 4401 - Plant Genetics and Breeding (4.0 cr)
AGRO 4xxx
HORT 4xxx

Food Science
FSCN 1102 - Food: Safety, Risks, and Technology, C/PE (3.0 cr)

Foundations
CI 5452 - Reading in the Content Areas for Initial Licensure Candidates (1.0 cr)
EDHD 5001 - Learning, Cognition, and Assessment (3.0 cr)
EDHD 5003 - Developmental and Individual Differences in Educational Contexts (3.0 cr)
EDHD 5005 - School and Society (2.0 cr)
EDHD 5007 - Technology for Teaching and Learning (1.5 cr)
EDHD 5009 - Human Relations: Applied Skills for School and Society (1.0 cr)
EDPA 5341 - The American Middle School (3.0 cr)
PUBH 3003 - Fundamentals of Alcohol and Drug Abuse (2.0 cr)
or PUBH 3005 - Fundamentals of Alcohol and Drug Abuse for Teacher Education (1.0 cr)

Agricultural Education
AFEE 2096 - Professional Practicum in Agricultural Education: Early Experience (1.0-3.0 cr)
AFEE 5112 - Agricultural Education Program Organization and Curriculum for Youth (3.0 cr)
AFEE 5114 - Agricultural Education Teaching Seminar (1.0 cr)
AFEE 5116 - Coordination of SAE Programs: Work-based Learning (2.0 cr)
AFEE 5118 - Strategies for Managing and Advising the FFA Organization (2.0 cr)

Work and Human Resource Education
Take 8 credits from the following. Standard first aid and cardiopulmonary resuscitation (CPR) training are required for licensure.
WHRE 5697 - Teaching Internship: School and Classroom Settings (2.0 cr)
WHRE 5698 - Teaching Internship (3.0-8.0 cr)

Business and Marketing Education B.S.

Work and Human Resource Education

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 52 to 55.

Degree: Bachelor of Science

This undergraduate program focuses on business and marketing education, with a choice of computer or sales and marketing emphasis areas.

Coursework includes computer training, business communication, management, and marketing. The program prepares students to work as educators in business settings or to work in technical support and administration positions. This area of study can also prepare students for careers in office systems, accounting, marketing, sales, entrepreneurship, and international business.

Admission Requirements

Students must complete 30 credits before admission to the program.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

General Requirements

Recommended freshman writing course(s) for this program: ENGC 1011

Program Requirements

A minimum grade of C- for is required in major courses with BIE, EDHD, HRD, and WHRE designators. A minimum grade of C- is also required for general psychology. Students must complete at least 30 credits in the college, with at least 20 credits completed in the senior year. A minimum 2.80 GPA in undergraduate coursework and additional requirements are required for admission to the M.Ed./initial licensure program in business and marketing education and Minnesota state teaching licensure in 5-12 business education.

Required Courses

Major Courses
ECON 1101, ECON 1102, and BA 3033W are required for students seeking Minnesota teaching licensure.

ECON 1101 - Principles of Microeconomics, IP, SSCI (4.0 cr)
or ECON 1102 - Principles of Macroeconomics, IP, SSCI (4.0 cr)
or APEC 1101 - Principles of Microeconomics, SSCI (3.0 cr)
or APEC 1102 - Principles of Macroeconomics, IP, SSCI (3.0 cr)
BA 3033W - Business Communication, WI (3.0 cr)
or RHET 3562W - Technical and Professional Writing, WI (4.0 cr)
COMM 1101 - Introduction to Public Speaking (3.0 cr)
or RHET 1223 - Oral Presentations in Professional Settings (3.0 cr)
PSTL 1281 - General Psychology, SSCI (4.0 cr)
or PSY 1001 - Introduction to Psychology, SSCI (4.0 cr)
PSTL 1454 - Statistics, MATH (4.0 cr)
or MATH 1001 - Excursions in Mathematics, MATH (3.0 cr)
or MATH 1031 - College Algebra and Probability, MATH (3.0 cr)
or STAT 1001 - Introduction to the Ideas of Statistics, MATH (4.0 cr)
or A higher level math course may be taken to fulfill this requirement. Consult an adviser for course options.
WHRE 3011W - Introduction to Technology and Public Ethics, C/PE, WI (3.0 cr)

Supporting Program

Students must create a supporting program of at least 13 credits with a business content. Students may choose from one of the three following three options, but students seeking Minnesota teaching licensure for grades 5-12 business education must select from the licensure course group.

Programmatic
Students select at least 13 business-related credits, all of which have a common course designator.

or Thematic
Students select 13 credits that support a general business theme, regardless of course designator.

or Licensure
Courses should be selected with faculty adviser approval.

Take 13 or more credit(s) from the following:
ACCT 2050 - Introduction to Financial Reporting (4.0 cr)
BLAW 3058 - The Law of Contracts and Agency (4.0 cr)
HRIR 3021 - Human Resource Management and Industrial Relations (3.0 cr)
IDSC 3001 - Information Systems for Business Processes and Management (3.0 cr)
MGMT 3001 - Fundamentals of Management (3.0 cr)
MGMT 3014 - Topics in International Business, Government, and Society (4.0 cr)
MGMT 4008 - Entrepreneurial Management (4.0 cr)
MKTG 3001 - Principles of Marketing (3.0 cr)
MKTG 4xxx
FSOS 3101 - Personal and Family Finances (3.0 cr)
INS 4201 - Personal Financial Management (2.0 cr)

Program Focus Areas

Students seeking Minnesota teaching licensure for grades 5-12 business education must select the computer focus area.

Students are required to complete one of the following course groups.

Computer Focus
BIE 5011 - Introduction to Computer Applications (3.0 cr)
BIE 5012 - Advanced Word Processing (3.0 cr)
BIE 5013 - Spreadsheet Analysis Using Computers (3.0 cr)
BIE 5014 - Database Computer Applications (3.0 cr)
BIE 5015 - Integrated Computer Applications in Business and Marketing Education (3.0 cr)
WHRE 5628 - Multimedia Presentations in Business (3.0 cr)
Take 3 or more credit(s) from the following:
BIE 5597 - Internship: Business and Industry Education (1.0-8.0 cr)
HRD 3201 - Introduction to Training and Development (3.0 cr)
HRD 3301 - Introduction to Organization Development (3.0 cr)
HRD 5302 - Managing Work Teams in Business and Industry (3.0 cr)
WHRE 5121 - Principles of Supervisory Management (3.0 cr)
WHRE 5301 - Philosophy and Practice of Career and Technical Education (2.0 cr)
HRD 5627 - Management and Supervisory Development (3.0 cr)
BIE 5662 - Computer Training in School and Industry Settings (3.0 cr)
WHRE 5601 - Student and Trainee Assessment (2.0 cr)
WHRE 5629 - Course Development for Business and Industry (2.0 cr)
WHRE 5661 - Instructional Methods for Business and Industry (2.0 cr)

-OR-

Sales and Marketing Focus
BIE 3061 - Professional Sales Management (3.0 cr)
BIE 5001 - Teaching Marketing Promotion (3.0 cr)
BIE 5011 - Introduction to Computer Applications (3.0 cr)
HRD 5624 - Sales Training (3.0 cr)
HRD 5626 - Customer Service Training (3.0 cr)
Take 6 or more credit(s) from the following:
BIE 5597 - Internship: Business and Industry Education (1.0-8.0 cr)
HRD 3201 - Introduction to Training and Development (3.0 cr)
HRD 3301 - Introduction to Organization Development (3.0 cr)
HRD 5302 - Managing Work Teams in Business and Industry (3.0 cr)
WHRE 5121 - Principles of Supervisory Management (3.0 cr)
WHRE 5301 - Philosophy and Practice of Career and Technical Education (2.0 cr)
HRD 5627 - Management and Supervisory Development (3.0 cr)
BIE 5662 - Computer Training in School and Industry Settings (3.0 cr)
WHRE 5601 - Student and Trainee Assessment (2.0 cr)
WHRE 5629 - Course Development for Business and Industry (2.0 cr)
WHRE 5661 - Instructional Methods for Business and Industry (2.0 cr)

Career and Technical Education B.S.

Work and Human Resource Education

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 90.

Degree: Bachelor of Science

The major in career and technical education (CTE) is a professional development degree program offering professional preparation in the field. Students may select one of several program options.

The licensure program option prepares students for Minnesota teaching licensure for grades 9-12 in one of eight career and technical education fields:

- communication technology careers
- construction careers
- creative design careers
- early childhood careers
- hospitality service careers
- manufacturing careers
- medical careers
- transportation careers.

The general career and technical education option prepares students to teach in technical and community college CTE programs.

For more information on program and licensure requirements, contact the program adviser at 612-625-7250.

Admission Requirements

Students must complete 30 credits before admission to the program.

Students must have completed at least 30 semester credits or sufficient verified and approved technical work experience to be awarded 30 credits toward the degree. A minimum 2.50 overall GPA is recommended for applicants to the licensure program options. Applicants to the postsecondary general career and technical education option must have a minimum 2.00 GPA.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

General Requirements

Recommended freshman writing course(s) for this program: ENGC 1011

Program Requirements

A minimum 2.00 overall GPA with no grade lower than C- is required for major courses with the following designators: BIE, EDHD, HRD, and WHRE. A minimum grade of C- is also required for general psychology. A minimum 2.50 overall GPA is required for recommendation for Minnesota teaching licensure.

Electives to complete the 120 credits must be selected in consultation with an adviser.

Required Courses

Foundation Courses

BA 3033W - Business Communication, WI (3.0 cr)
or RHET 3562W - Technical and Professional Writing, WI (4.0 cr)
CI 5452 - Reading in the Content Areas for Initial Licensure Candidates (1.0 cr)
COMM 1101 - Introduction to Public Speaking (3.0 cr)
or RHET 1223 - Oral Presentations in Professional Settings (3.0 cr)
PSTL 1281 - General Psychology, SSCI (4.0 cr)
or PSY 1001 - Introduction to Psychology, SSCI (4.0 cr)
MATH 1001 - Excursions in Mathematics, MATH (3.0 cr)
or MATH 1031 - College Algebra and Probability, MATH (3.0 cr)

Pedagogical Studies

BIE 1396 - Supervised Career and Technical Education Teaching (4.0 cr)
EDHD 5001 - Learning, Cognition, and Assessment (3.0 cr)
WHRE 1301 - Introduction to Career and Technical Education Teaching (2.0 cr)
WHRE 3601 - Foundations of Student and Trainee Assessment (2.0 cr)
or WHRE 5601 - Student and Trainee Assessment (2.0 cr)
WHRE 3629 - Foundations of Course Development for Business and Industry (2.0 cr)
or WHRE 5629 - Course Development for Business and Industry (2.0 cr)
WHRE 3661 - Foundations of Instructional Methods for Business and Industry (2.0 cr)
or WHRE 5661 - Instructional Methods for Business and Industry (2.0 cr)
WHRE 3301 - Foundations of Philosophy and Practice of Career and Technical Education (2.0 cr)
or WHRE 5301 - Philosophy and Practice of Career and Technical Education (2.0 cr)

Career Content Proficiency

Up to 32 credits may be completed before enrollment in the CTE program. Credits may include occupational experience, formal technical college coursework, military or industry experience, or workshops related to the field. Credits will be evaluated for transfer to BIE 3151. The remainder of the credits in this requirement must be completed after enrollment.

Take 44 or more credit(s) from the following:

BIE 3151 - Technical Development: Advanced (1.0-32.0 cr)
BIE 5151 - Technical Development: Specialized (1.0-12.0 cr)
BIE 5596 - Occupational Experience in Business and Industry (1.0-10.0 cr)
BIE 5993 - Directed Study in Business and Industry (1.0-4.0 cr)
EDHD 5009 - Human Relations: Applied Skills for School and Society (1.0 cr)
PUBH 3005 - Fundamentals of Alcohol and Drug Abuse for Teacher Education (1.0 cr)
or PUBH 3003 - Fundamentals of Alcohol and Drug Abuse (2.0 cr)
WHRE 3011W - Introduction to Technology and Public Ethics, C/PE, WI (3.0 cr)
or WHRE 5011W - Technology and Public Ethics, C/PE, WI (3.0 cr)

Coaching Minor

Kinesiology, School of

Requirements for this program are current for Fall 2006.

Required credits in this minor: 21 to 42.

The coaching minor offers an in-depth study of the theoretical and practical nature of coaching through a planned and integrated series of courses. Completion of the coaching minor also will qualify the student for the University of Minnesota Coaching Certificate.

Additional program offerings also include a certificate in coaching.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Admission is open to all University students. A Coaching Program Application Form must be submitted. Students must also maintain a 2.50 GPA in courses submitted for the completion of the coaching minor.

Required Courses

Minor Courses

KIN 3113 - First Responder for Coaches and Athletic Trainers (3.0 cr)
or current American Red Cross Standard First Aid and CPR Certification
KIN 3114 - Prevention and Care of Athletic Injuries (3.0 cr)
KIN 3133 - Motor Control, Learning, and Development (3.0 cr)
KIN 3143 - Organization and Management of Sport (3.0 cr)
or KIN 5725 - Organization and Management of Physical Education and Sport (3.0 cr)

Take one KIN or two INMD courses in human anatomy.

KIN 3027 - Human Anatomy for Kinesiology Students (3.0 cr)
or KIN 3111 - Human Anatomy (2.0 cr)
or
take the following course pair
INMD 3001 - Human Anatomy (3.0 cr)
INMD 3002 - Human Anatomy Laboratory (1.0 cr)

Electives

In addition to the courses below, any program-related course approved by an adviser can be applied toward this minor.

Psychology and Physiology

Take 2 or more course(s) from the following:

KIN 3112 - Introduction to Biomechanics (3.0 cr)
KIN 4385 - Exercise Physiology (4.0 cr)
KIN 5126 - Sport Psychology (3.0 cr)
KIN 5136 - Psychology of Coaching (3.0 cr)
SPST 3621 - Applied Sport Psychology (2.0 cr)
SPST 3641 - Training and Conditioning for Sport (2.0 cr)

Coaching

Take 2 or more course(s) from the following:

KIN 3168 - Soccer Coaching (1.0 cr)
KIN 3169 - Volleyball Coaching (1.0 cr)
KIN 3171 - Baseball Coaching (1.0 cr)
KIN 3172 - Basketball Coaching (1.0 cr)
KIN 3173 - Football Coaching (1.0 cr)
KIN 3174 - Golf Coaching (1.0 cr)
KIN 3175 - Gymnastics Coaching (1.0 cr)
KIN 3176 - Ice Hockey Coaching (1.0 cr)
KIN 3177 - Swimming and Diving Coaching (1.0 cr)
KIN 3178 - Tennis Coaching (1.0 cr)
KIN 3179 - Track and Field Coaching (1.0 cr)
KIN 3181 - Wrestling Coaching (1.0 cr)
KIN 5720 - Special Topics in Kinesiology (1.0-8.0 cr)

Senior Project

KIN 5697 includes a coaching experience under the supervision of a head coach or athletic director generally in a 7-12 grade setting. Coinciding with the practicum is a class requiring three integrated papers incorporating a personal coaching philosophy, the role of sport in society, and the identification of challenges in coaching in today's society.

KIN 5697 - Student Teaching: Coaching (1.0-10.0 cr)

Family Social Science B.S.

School of Social Work

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 55 to 58.

Degree: Bachelor of Science.

Family social science is a multidisciplinary major for those who are interested in helping people, counseling, and understanding human relationships. This major prepares graduates for careers in working with individuals, families, or systems in human services. The major is enhanced by a required internship related to the student's specific program and career goals. Qualified graduates may continue their education through graduate study in family social science, child and human development, social work, or allied health disciplines.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

General Requirements

Recommended freshman writing course(s) for this program: RHET 1101

Program Requirements

Required Courses

Preparatory Courses

APEC 1101 - Principles of Microeconomics, SSCI (3.0 cr)
or APEC 1102 - Principles of Macroeconomics, IP, SSCI (3.0 cr)
or ECON 1101 - Principles of Microeconomics, IP, SSCI (4.0 cr)
or ECON 1102 - Principles of Macroeconomics, IP, SSCI (4.0 cr)
or ECON 1104 - Principles of Microeconomics, IP, SSCI (4.0 cr)
STAT 1001 - Introduction to the Ideas of Statistics, MATH (4.0 cr)
or PSTL 1004 - Statistics, MATH (4.0 cr)
or EPSY 3264 - Basic and Applied Statistics, MATH (3.0 cr)
or OMS 2550 - Business Statistics: Data Sources, Presentation, and Analysis (4.0 cr)
or PSY 4801 - Introduction to Statistics (4.0 cr)
or STAT 3011 - Introduction to Statistical Analysis, MATH (4.0 cr)
FSOS 1101 - Intimate Relationships, CD, SSCI (4.0 cr)
or FSOS 1201 - Human Development in Families: Lifespan, SSCI, CD (4.0 cr)
or PSTL 1285W - Introduction to Cultural Anthropology, IP, SSCI, WI (4.0 cr)
or SW 2001 - Introduction to Social Welfare and Community Services, C/PE (4.0 cr)
or choose a course from one of the following areas: anthropology, child psychology, human development, political science, psychology, social work, or sociology

Communication Courses

COMM 1101 - Introduction to Public Speaking (3.0 cr)
or PSTL 1461 - Oral Communication in the Public Sphere, C/PE (3.0 cr)
or RHET 1223 - Oral Presentations in Professional Settings (3.0 cr)
ENGC 3027W - Advanced Expository Writing, WI (4.0 cr)
or RHET 3562W - Technical and Professional Writing, WI (4.0 cr)

Major Courses

FSOS 2101 - Preparation for Working With Families (2.0 cr)
FSOS 2103 - Family Policy (3.0 cr)
FSOS 2105 - Methods in Family Research (3.0 cr)
FSOS 3101 - Personal and Family Finances (3.0 cr)
FSOS 3102 - Family Systems and Diversity, CD, SSCI (3.0 cr)
FSOS 3104 - Global and Diverse Families (3.0 cr)

Professional Core Courses

Take 18 or more credit(s) from the following:
FSOS 3426 - Alcohol and Drugs: Families and Culture, CD, SSCI (3.0 cr)
FSOS 3429 - Counseling Skills Practicum I (3.0 cr)
FSOS 4101 - Sexuality and Gender in Families and Close Relationships (3.0 cr)
FSOS 4104W - Family Psychology, WI (3.0 cr)
FSOS 4106 - Family Resource Management (3.0 cr)
FSOS 4150 - Special Topics in Family Social Science (1.0-4.0 cr)
FSOS 4152 - Gay, Lesbian, and Bisexual People in Families (3.0 cr)
FSOS 4153 - Family Financial Counseling (3.0 cr)
FSOS 4154W - Families and Aging, WI (3.0 cr)
FSOS 4155 - Parent-Child Relationships (3.0 cr)
FSOS 4156 - Legal-Economic Controversies in Families (3.0 cr)
FSOS 5150 - Special Topics in Family Social Science (1.0-4.0 cr)
FSOS 5426 - Alcohol and Drugs: Families and Culture (3.0 cr)

Advanced/Applied Skill Course

Students must take FSOS 4294 or FSOS 4296 for 4 credits.

Take 4 or more credit(s) from the following:
FSOS 4294 - Research Internship (1.0-4.0 cr)
FSOS 4296 - Field Study: Working With Families (1.0-12.0 cr)

Family Social Science Minor

Requirements for this program are current for Fall 2006.

Required credits in this minor: 15.

See major description for more information.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Required Courses

Minor Courses

FSOS 1101 - Intimate Relationships, CD, SSCI (4.0 cr)
FSOS 3102 - Family Systems and Diversity, CD, SSCI (3.0 cr)

Take 3 or more course(s) from the following:
FSOS 2103 - Family Policy (3.0 cr)
FSOS 3101 - Personal and Family Finances (3.0 cr)
FSOS 3104 - Global and Diverse Families (3.0 cr)
FSOS 3426 - Alcohol and Drugs: Families and Culture, CD, SSCI (3.0 cr)
FSOS 4101 - Sexuality and Gender in Families and Close Relationships (3.0 cr)
FSOS 4104W - Family Psychology, WI (3.0 cr)
FSOS 4106 - Family Resource Management (3.0 cr)
FSOS 4152 - Gay, Lesbian, and Bisexual People in Families (3.0 cr)
FSOS 4154W - Families and Aging, WI (3.0 cr)
FSOS 4155 - Parent-Child Relationships (3.0 cr)

Family Violence Prevention Minor

Family Social Science

Requirements for this program are current for Fall 2006.

Required credits in this minor: 15.

The family violence prevention minor is a 15-credit undergraduate program for students interested in strengthening their educational experience with a research base and a set of practical skills in family violence prevention. It is an intensive, interdisciplinary learning experience for students in all fields of study.

Courses are in fields related to social services, education, health care, and other direct services addressing issues related to child abuse and neglect, adult domestic violence, elder abuse, and intergenerational abuse. Students learn theories and research related to violent behavior, examine relationships between violence in society and violence within families, and explore different professional responses to violence. Elective courses provide the opportunity to integrate these concepts into further study within a major or in other fields of interest.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Required Courses

Minor Courses

SW 3701 - Introduction to Child Maltreatment and Family Violence, CD, WI (3.0 cr)

SW 3702 - Child Maltreatment and Family Violence: Intervention and Prevention, SSCI (3.0 cr)

SW 3705 - Gender Violence in Global Perspective, IP (3.0 cr)

Take 6 or more credit(s) from the following:

CAPY 5623 - Assessment and Treatment Interventions: Anxiety and Depression in Children and Adolescents (1.0 cr)

CAPY 5644 - Workshop: Child Abuse/Neglect and Childhood Psychopathology: Implications for Assessment/Treatment (1.0 cr)

CSPH 5211 - Peacemaking and Spirituality: A Journey Toward Healing and Strength (2.0-3.0 cr)

EPSY 5152 - Psychology of Conflict Resolution (3.0 cr)

FSOS 1101 - Intimate Relationships, CD, SSCI (4.0 cr)

FSOS 3104 - Global and Diverse Families (3.0 cr)

FSOS 3426 - Alcohol and Drugs: Families and Culture, CD, SSCI (3.0 cr)

JWST 3521W - History of the Holocaust, WI (3.0 cr)

SOC 3101 - Introduction to the American Criminal Justice System, C/PE, SSCI (3.0 cr)

SOC 3102 - Introduction to Criminal Behavior and Social Control (3.0 cr)

SOC 3501 - Sociology of Families, CD, SSCI (3.0 cr)

SOC 4461 - Sociology of Ethnic and Racial Conflict, CD, IP (3.0 cr)

SW 5519 - Mediation and Conflict Resolution (3.0 cr)

SW 5525 - Global Perspectives on Social Welfare, Peace, and Justice (3.0 cr)

SW 5706 - Issues and Interventions in Child Sexual Abuse (2.0 cr)

SW 5707 - Interventions with Battered Women and Their Families (2.0 cr)

SW 5708 - Substance Abuse and Social Work (3.0 cr)

YOST 5322 - Work with Youth--Families (2.0 cr)

AFRO 3072 - Racism: Social and Psychological Consequences for Black Americans, CD (3.0 cr)

or AFRO 5072 - Racism: Social and Psychological Consequences for Black Americans (3.0 cr)

Foundations of Education: Early Childhood B.S.

Institute of Child Development

Requirements for this program are current for Summer 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 60.

Degree: Bachelor of Science.

The undergraduate program in foundations of education: early childhood (FOE: EC) prepares upper division students to work with young children and their families and to work with both typically or atypically developing children. The curriculum includes an extensive core of liberal education courses that are central to early childhood teaching and child development.

The program prepares graduates to work in non-licensure educational settings (including daycare centers or youth community programs), pursue advanced degrees, or work in other settings where a strong liberal education base is useful.

In addition, the undergraduate degree program prepares students for entry into the master of education (M.Ed.)/initial licensure program in early childhood education and early childhood special education. M.Ed. admission requirements include successful completion of all requirements for the B.S. degree, and successful school practicum experiences. Preferred admission to the M.Ed. program requires a minimum 2.80 GPA.

Admission Requirements

Students must complete 60 credits before admission to the program.

A GPA above 2.00 is preferred for the following:

- 2.50 for students already admitted to the degree-granting college.
- 2.50 for students transferring from another University of Minnesota college.
- 2.50 for students transferring from outside the University.

Program admission is based on the following criteria:

- Minimum 2.50 overall GPA
- Completion of at least 60 credits, including credits in progress at the time of application. This includes completion of the two-course psychology requirement and at least half of the courses in content areas 2–6. After program admission, students must complete remaining courses in content areas 2–6 and all courses in content areas 7–8.
- Reflective essay. See the CEHD Undergraduate Application for Foundations of Education (FOE): Early Childhood for more information.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Required Courses for Admission

Basic Requirements (Content Area 1)

One year college-level spoken second language or American Sign Language (ASL) is highly recommended.

PSTL 1281 - General Psychology, SSCI (4.0 cr)

or PSY 1001 - Introduction to Psychology, SSCI (4.0 cr)

CPSY 2301 - Introductory Child Psychology, SSCI (4.0 cr)

or CPSY 3301 - Introductory Child Psychology for Social Sciences (4.0 cr)

or PSTL 2283W - Psychology of Human Development, SSCI, WI (4.0 cr)

Language and Communication (Content Area 2)
COMM 1101 - Introduction to Public Speaking (3.0 cr)
or COMM 3402 - Introduction to Interpersonal Communication, SSCI (3.0 cr)
or PSTL 1461 - Oral Communication in the Public Sphere, C/PE (3.0 cr)
or RHET 1223 - Oral Presentations in Professional Settings (3.0 cr)
CPSY 4345 - Language Development and Communication (4.0 cr)
or LING 5501 - Introduction to Language Acquisition (3.0 cr)
ENGL 3601 - Analysis of the English Language (4.0 cr)
or LING 1701 - Language and Society, CD (4.0 cr)
or LING 3001 - Introduction to Linguistics, SSCI (4.0 cr)

Mathematics (Content Area 3)
EPSY 3264 - Basic and Applied Statistics, MATH (3.0 cr)
or PSTL 1454 - Statistics, MATH (4.0 cr)
or PSY 4801 - Introduction to Statistics (4.0 cr)
or STAT 1001 - Introduction to the Ideas of Statistics, MATH (4.0 cr)
MATH 1031 - College Algebra and Probability, MATH (3.0 cr)
or MATH 1051 - Precalculus I (3.0 cr)
or MATH 1151 - Precalculus II, MATH (3.0 cr)
Logic/computer skills course approved by an adviser.

Science (Content Area 4)
Students must complete a biological science course with a lab, a physical science course with a lab, and one science course with or without a lab.

Select any course in the diversified core BIOL/L.
Select any course in the diversified core PHYS/L.
Select any course in the diversified cores BIOL, PHYS, or ENVT.

Social Studies (Content Area 5)
CSCL 3979 - Issues in Cultural Pluralism, C/PE, CD (3.0 cr)
or PSTL 1851 - Multicultural Relations, CD (3.0 cr)
or SOC 1001 - Introduction to Sociology, CD, SSCI (4.0 cr)
or SOC 3211W - American Race Relations, CD, SSCI, WI (3.0 cr)
PSTL 1231 - Perspectives in American History, HP (4.0 cr)
or HIST 1301W - U.S. History to 1877, CD, HP, WI (4.0 cr)
or HIST 1302W - U.S. History, From 1865 to Present, CD, HP, WI (4.0 cr)
or HIST 1307 - American History to 1877, CD, HP (3.0 cr)
or HIST 1308 - U.S. History: From 1865 to Present, CD, HP (3.0 cr)
GEOG 1301W - Introduction to Human Geography, IP, SSCI, WI (4.0 cr)
or GEOG 3381W - Population in an Interacting World, IP, SSCI, WI (4.0 cr)

Communication Arts and Literature (Content Area 6)
AMIN 3201W - American Indian Literature, CD, LIT, WI (3.0 cr)
or ENGL 1201W - Introduction to American Literature, CD, LIT, WI (4.0 cr)
or ENGL 1301W - Introduction to Multicultural American Literature, CD, LIT, WI (4.0 cr)
or ENGL 3005W - Survey of American Literatures and Cultures I, CD, LIT, WI (4.0 cr)
or ENGL 3006W - Survey of American Literatures and Cultures II, CD, LIT, WI (4.0 cr)
or ENGL 3591W - Introduction to African American Literature, CD, LIT, WI (4.0 cr)
or PSTL 1364 - Literature of the American Immigrant Experience, CD, LIT (3.0 cr)
or PSTL 1365W - Literatures of the United States, CD, LIT, WI (3.0 cr)
or PSTL 1816 - African-American Literature, CD, LIT (3.0 cr)
or PSTL 1836 - Asian-American Literature, CD, LIT (3.0 cr)
CI 3401 - Children's Literature: Pre-K Through Grade 5 (3.0 cr)
One elective from the following areas: music, art, dance, theater, philosophy, or an elective approved by an adviser.

General Requirements

Recommended freshman writing course(s) for this program: ENGC 1011

Program Requirements

Requirements include a minimum 2.00 GPA and no grade lower than C- for major courses with the following designators and numbers: CI, CPSY, EDHD, EPSY, and KIN 4132. Students seeking to pursue the M.Ed./initial licensure program in early childhood education and early childhood special education and Minnesota state teaching licensure must have a 2.80 GPA in the undergraduate program and meet other requirements. The Praxis I test must be completed before graduation and before entry into the M.Ed./initial licensure program.

Required Courses

Foundation Courses (Content Area 7)
CPSY 4331 - Social and Personality Development (4.0 cr)
CPSY 4343 - Cognitive Development (4.0 cr)
CPSY 4993 - Directed Instruction in Child Psychology (1.0-4.0 cr)
EDHD 5007 - Technology for Teaching and Learning (1.5 cr)
EDHD 5009 - Human Relations: Applied Skills for School and Society (1.0 cr)
PUBH 3003 - Fundamentals of Alcohol and Drug Abuse (2.0 cr)
or PUBH 3005 - Fundamentals of Alcohol and Drug Abuse for Teacher Education (1.0 cr)
KIN 4132 - Motor Development (3.0 cr)

Major Courses (Content Area 8)
Students must be admitted to the program before taking these classes. Many of the major courses have an experiential component.

CI 5111 - Introduction to Elementary School Teaching (3.0 cr)
CPSY 5251 - Social and Philosophical Foundations of Early Childhood Education (3.0 cr)
CPSY 5252 - Facilitating Social and Physical Learning in Early Childhood Education (3.0 cr)
CPSY 5253 - Facilitating Cognitive and Creative Learning in Early Childhood Education (3.0 cr)
CPSY 5281 - Student Teaching in Early Childhood Education (3.0-6.0 cr)
EPSY 5625 - Education of Infants, Toddlers, and Preschool Children with Disabilities: Introduction (2.0 cr)
EPSY 5681 - Education of Infants, Toddlers, and Preschool Children with Disabilities: Methods and Materials (3.0 cr)

Pre-Licensure or Non-Licensure Options

Students are required to complete one of the following course groups.

Preparation for M.Ed. Initial Licensure

Students planning to pursue the M.Ed./initial licensure program in early childhood education and early childhood special education must complete courses in Sections A and B. Coursework in Section A may be completed during the senior year of the undergraduate FOE: EC program or as part of the M.Ed./initial licensure program. Coursework in Section B must be taken after admission to the M.Ed. program.

Section A
CPSY 4334W - Children, Youth in Society, C/PE, WI (4.0 cr)
CPSY 4336W - Development and Interpersonal Relations, WI (4.0 cr)
EPSY 5609 - Family-Centered Services (2.0 cr)
EPSY 5616 - Behavior Analysis and Classroom Management (3.0 cr)

Section B
EPSY 5753 requires two, three-credit teaching experiences.

CI 5181 - Clinical Experience in Elementary School Teaching (3.0-8.0 cr)
CI 5415 - Literacy Development in the Primary Grades (3.0 cr)
CI 5504 - Elementary School Science: Materials and Resources (3.0 cr)
CI 5701 - Teaching Social Studies in the Elementary School (2.0 cr)
CI 5821 - Teaching Mathematics in the Elementary School (2.0 cr)
EPSY 5753 - Student Teaching: Early Childhood Special Education (1.0-6.0 cr)
EPSY 5849 - Observation and Assessment of the Preschool Child (3.0 cr)

-OR-

Non-Licensure Option

Students complete appropriate electives of interest for their program, in consultation with their adviser.

Foundations of Education: Elementary B.S.

Curriculum & Instruction

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 60.

Degree: Bachelor of Science

The B.S. degree program in foundations of education (FOE): elementary education prepares students to work with children, including those with special needs and in urban school settings.

The program does not lead directly to teaching licensure, but prepares students to enter the master of education (M.Ed.)/initial licensure program in elementary education, which leads to state of Minnesota teaching licensure. It also prepares graduates to work in non-licensure educational settings (daycare centers or youth community programs) or other settings where a strong liberal education base is useful. The curriculum includes an extensive core of liberal education coursework that is central to elementary school teaching.

Admission Requirements

Students must complete 60 credits before admission to the program.

A GPA above 2.00 is preferred for the following:

- 2.50 for students already admitted to the degree-granting college.
- 2.50 for students transferring from another University of Minnesota college.
- 2.50 for students transferring from outside the University.

Admission is based on the following criteria:

- Minimum 2.50 overall GPA; higher GPA is recommended.
- Completion of at least 60 credits, including credits in progress at the time of application. This includes general psychology coursework and at least half of the courses in each of the five content areas.
- At least 35 hours in a K-6 public classroom setting.
- Experience with diverse populations.

Completion of two semesters of language is recommended before admission.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Required Courses for Admission

Basic Requirements (Content Area 1)
MUS 1001 may be waived for students who have musical aptitude equivalent to five to six years study of an instrument, through high school. Contact a program adviser for more information.

CI 1001 - Introduction to the Elementary School (3.0 cr)
MUS 1001 - Fundamentals of Music, OH (3.0 cr)
ENGL 3601 - Analysis of the English Language (4.0 cr)
or LING 1701 - Language and Society, CD (4.0 cr)
or LING 3001 - Introduction to Linguistics, SSCI (4.0 cr)
or LING 5001 - Introduction to Linguistics (4.0 cr)
PSTL 1281 - General Psychology, SSCI (4.0 cr)
or PSY 1001 - Introduction to Psychology, SSCI (4.0 cr)

Mathematics (Content Area 2)
Students pursuing a middle school specialty in mathematics must complete one course in statistics and one course in calculus.

EPSY 3264 - Basic and Applied Statistics, MATH (3.0 cr)
or PSTL 1454 - Statistics, MATH (4.0 cr)
or PSTL 1456 - Functions and Problems of Logic, MATH (3.0 cr)
or MATH 1142 - Short Calculus, MATH (4.0 cr)
or MATH 1271 - Calculus I, MATH (4.0 cr)
or MATH 1272 - Calculus II (4.0 cr)
or MATH 1281 - Calculus with Biological Emphasis I, MATH (4.0 cr)
or MATH 1371 - IT Calculus I, MATH (4.0 cr)
or PHIL 1001 - Introduction to Logic, MATH (4.0 cr)
or STAT 1001 - Introduction to the Ideas of Statistics, MATH (4.0 cr)
or STAT 3011 - Introduction to Statistical Analysis, MATH (4.0 cr)
MATH 1031 - College Algebra and Probability, MATH (3.0 cr)
or MATH 1051 - Precalculus I (3.0 cr)
or MATH 1151 - Precalculus II, MATH (3.0 cr)

Complete one of the following course pairs.
MATH 3113 - Topics in Elementary Mathematics I (4.0 cr)
MATH 3118 - Topics in Elementary Mathematics II (4.0 cr)
or
MTHE 3101 - Mathematics and Pedagogy for Elementary Teachers I (4.0 cr)
MTHE 3102 - Mathematics and Pedagogy for Elementary Teachers II (4.0 cr)

Science (Content Area 3)
AGRO 2101 - Biology of Food, Land, People, and the Environment, BIOL SCI/L, ENVT (4.0 cr)
or BIOL 1001 - Introductory Biology I: Evolutionary and Ecological Perspectives, BIOL SCI/L, ENVT (4.0 cr)
or BIOL 1009 - General Biology, BIOL SCI/L (4.0 cr)
or PSTL 1131 - Principles of Biological Science, BIOL SCI/L (4.0 cr)
or GEOG 1403 - Biogeography of the Global Garden, BIOL SCI/L, ENVT (4.0 cr)
AST 1001 - Exploring the Universe, ENVT, PHYS SCI/L (4.0 cr)
or PSTL 1171 - Physical Geology, ENVT, PHYS SCI/L (4.0 cr)
or PSTL 1172 - Historical Geology, PHYS SCI/L (4.0 cr)
or PSTL 1173 - Geology of the National Parks, ENVT, PHYS SCI/L (4.0 cr)
or GEO 1001 - Earth and Its Environments, ENVT, PHYS SCI/L (4.0 cr)
or GEO 1002 - Earth History, ENVT, PHYS SCI/L (4.0 cr)
CHEM 1011 - Introductory Chemistry: Lecture and Laboratory, PHYS SCI/L (4.0 cr)
or CHEM 1021 - Chemical Principles I, ENVT, PHYS SCI/L (4.0 cr)
or CHEM 1022 - Chemical Principles II, ENVT, PHYS SCI/L (4.0 cr)
or PSTL 1163 - Physical Systems: Principles and Practices, PHYS SCI/L (4.0 cr)
or PHYS 3071W - Laboratory-Based Physics for Teachers, PHYS SCI/L, WI (4.0 cr)
or PHYS 1001W - Energy and the Environment, ENVT, PHYS SCI/L, WI (4.0 cr)
or PHYS 1101W - Introductory College Physics I, PHYS SCI/L, WI (4.0 cr)

or PHYS 1201W - Introductory Physics for Biology and Pre-medicine I, PHYS SCI/L, WI (5.0 cr)
FSCN 1112 - Principles of Nutrition, ENVT (3.0 cr)
or any science course elective with or without lab.

Social Studies (Content Area 4)
AMST 3113W - America's Diverse Cultures, CD, OH, WI (3.0 cr)
or CSCL 3979 - Issues in Cultural Pluralism, C/PE, CD (3.0 cr)
or ENGL 3741 - Literacy and American Cultural Diversity, C/PE, CD (4.0 cr)
or PSTL 1211 - People and Problems, CD, SSCI (4.0 cr)
or PSTL 1851 - Multicultural Relations, CD (3.0 cr)
or SOC 1001 - Introduction to Sociology, CD, SSCI (4.0 cr)
or SOC 3211W - American Race Relations, CD, SSCI, WI (3.0 cr)
PSTL 1231 - Perspectives in American History, HP (4.0 cr)
or HIST 1302W - U.S. History, From 1865 to Present, CD, HP, WI (4.0 cr)
or HIST 1308 - U.S. History: From 1865 to Present, CD, HP (3.0 cr)
GEOG 1301W - Introduction to Human Geography, IP, SSCI, WI (4.0 cr)
or GEOG 3381W - Population in an Interacting World, IP, SSCI, WI (4.0 cr)
Select any course that meets the Council on Liberal Education (CLE) requirements in both Historical Perspectives (HI) and International Perspectives (IP).

Communication and Literature (Content Area 5)
Students pursuing the middle school specialty in communication arts and literature are required to take one of the ENGW courses in creative writing listed below. Completion of a course with the designator ARTH, ARTS, COMM, DNCE, ENGL, HUM, PHIL, or TH will not fulfill the requirement for those with a middle school specialty.

AFRO 3594W - Introduction to Contemporary Black Fiction, WI (3.0 cr)
or AMIN 3201W - American Indian Literature, CD, LIT, WI (3.0 cr)
or CHIC 3507W - Introduction to Chicana/o Literature, LIT, CD, WI (3.0 cr)
or ENGL 1301W - Introduction to Multicultural American Literature, CD, LIT, WI (4.0 cr)
or ENGL 3300 - Multicultural American Literatures and Cultures (3.0 cr)
or PSTL 1364 - Literature of the American Immigrant Experience, CD, LIT (3.0 cr)
or PSTL 1816 - African-American Literature, CD, LIT (3.0 cr)
or PSTL 1836 - Asian-American Literature, CD, LIT (3.0 cr)
AFRO 3591W - Introduction to African American Literature, CD, LIT, WI (4.0 cr)
or ENGL 3591W - Introduction to African American Literature, CD, LIT, WI (4.0 cr)
or AFRO 3592W - Introduction to Black Women Writers in the United States, CD, LIT, WI (3.0 cr)
or ENGL 3592W - Introduction to Black Women Writers in the United States, CD, LIT, WI (3.0 cr)
AFRO 3601 - Introduction to African Literature, LIT, IP (3.0 cr)
or ENGL 1401W - Introduction to "Third World" Literatures in English, IP, LIT, WI (4.0 cr)
or ENGL 3004W - Historical Survey of British Literatures II, HP, WI (4.0 cr)
or ENGL 3171 - Modern British Literatures and Cultures (3.0 cr)
or ENGL 3180 - Contemporary Literatures and Cultures (3.0 cr)
or PSTL 1367W - Contemporary Literature: International Perspectives, IP, LIT, WI (4.0 cr)
ENGW 1101W - Introduction to Creative Writing, LIT, WI (4.0 cr)
or ENGW 1102 - Introduction to Fiction Writing (3.0 cr)
or ENGW 1103 - Introduction to Poetry Writing (3.0 cr)
or ENGW 1104 - Introduction to Literary Nonfiction Writing (3.0 cr)
or ENGW 3102 - Intermediate Fiction Writing (3.0 cr)
or ENGW 3104 - Intermediate Poetry Writing (3.0 cr)
or ENGW 3106 - Intermediate Literary Nonfiction Writing (3.0 cr)
or ENGW 3110 - Topics in Creative Writing (3.0 cr)
or PSTL 1311 - Art: General Art, IP, OH (3.0 cr)
or RHET 1223 - Oral Presentations in Professional Settings (3.0 cr)
or Any course from the following designators: ARTH, ARTS, COMM, DNCE, ENGL, HUM, PHIL, TH.

General Requirements

Recommended freshman writing course(s) for this program: ENGC 1011

Program Requirements

Students are required to take 2 semester(s) of any second language.

Required Courses

Introduction to Elementary Education
Take all of the following in the first semester of the program:
CI 5111 - Introduction to Elementary School Teaching (3.0 cr)
CI 5183 - Applying Instructional Methods in the Elementary Classroom (1.0-2.0 cr)
EDHD 5001 - Learning, Cognition, and Assessment (3.0 cr)

Special Education
These courses must be taken one year after the Introduction to Elementary Education courses.

Take all of the following in the same term:
CI 5183 - Applying Instructional Methods in the Elementary Classroom (1.0-2.0 cr)
EPSY 5613 - Foundations of Special Education I (3.0 cr)
EPSY 5616 - Behavior Analysis and Classroom Management (3.0 cr)

Foundation Courses
EDHD 5003 - Developmental and Individual Differences in Educational Contexts (3.0 cr)
EDHD 5005 - School and Society (2.0 cr)
EDHD 5007 - Technology for Teaching and Learning (1.5 cr)
EDHD 5009 - Human Relations: Applied Skills for School and Society (1.0 cr)
PUBH 3003 - Fundamentals of Alcohol and Drug Abuse (2.0 cr)
or PUBH 3005 - Fundamentals of Alcohol and Drug Abuse for Teacher Education (1.0 cr)

Specialty Areas

Students are required to complete one of the following course groups.

Middle School Specialty (Grades 5-8)
Students selecting a middle school specialty may be required to complete additional coursework in mathematics, science, social studies, or communication arts and literature. These additional requirements are noted in content areas above. Consult an adviser for more information.

CPSY 4303 - Adolescent Psychology (4.0 cr)

-OR-

Preprimary Specialty (Ages 3-4)
CPSY 4331 - Social and Personality Development (4.0 cr)
CPSY 4343 - Cognitive Development (4.0 cr)
CPSY 4993 - Directed Instruction in Child Psychology (1.0-4.0 cr)
CPSY 2301 - Introductory Child Psychology, SSCI (4.0 cr)
or CPSY 3301 - Introductory Child Psychology for Social Sciences (4.0 cr)
or PSTL 2283W - Psychology of Human Development, SSCI, WI (4.0 cr)

Human Resource Development B.S.

Work and Human Resource Education

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 40.

Degree: Bachelor of Science

The B.S. in human resource development prepares students for positions in training, career development, organization development, employee assistance, and workplace learning and development.

Undergraduate students prepare for entry-level employment in human resource development. Typical careers in the field include instructional designer, technical trainer, training coordinator, organization development specialist, performance consultant, training facilitator, or learning and development specialist.

Undergraduates can also develop a foundation for advanced study and the degrees (M.Ed., M.A., PhD., or Ed.D.) that are typically required for advancement in the field.

All students select a programmatic or thematic supporting program. Although there are few restrictions on the choice of supporting program, students usually choose to focus on fields of human resources and industrial relations, psychology, adult education, management, communication studies, or rhetoric.

The program core requires students to develop a baseline understanding of training and development, organization development, and adult education. Students who complete the B.S. degree in human resource development also earn a certificate in human resource development. For more information on the certificate, see the certificates section.

Admission Requirements

Students must complete 60 credits before admission to the program.

A GPA above 2.00 is preferred for the following:

- 2.50 for students already admitted to the degree-granting college
- 2.50 for students transferring from another University of Minnesota college.
- 2.50 for students transferring from outside the University.

Admission requirements include 60 credits, completed or in progress.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

General Requirements

Recommended freshman writing course(s) for this program: ENGC 1011

Program Requirements

A minimum 2.00 GPA with no grade lower than C- is required for major courses with the following designators: ADED, BIE, FE, HRD, and WHRE. A minimum grade of C- is also required for general psychology.

Required Courses

Foundation Courses

All students must have basic competence in computer applications. Students lacking such competence at the time of admission must take BIE 5011. Students with basic competence must take one advanced course, chosen in consultation with an adviser.

WHRE 3011W - Introduction to Technology and Public Ethics, C/PE, WI (3.0 cr)
BIE 5011 - Introduction to Computer Applications (3.0 cr)
or an advanced computer course, chosen in consultation with an adviser
COMM 1101 - Introduction to Public Speaking (3.0 cr)
or RHET 1223 - Oral Presentations in Professional Settings (3.0 cr)
ECON 1101 - Principles of Microeconomics, IP, SSCI (4.0 cr)
or ECON 1102 - Principles of Macroeconomics, IP, SSCI (4.0 cr)
PSTL 1281 - General Psychology, SSCI (4.0 cr)
or PSY 1001 - Introduction to Psychology, SSCI (4.0 cr)
MATH 1001 - Excursions in Mathematics, MATH (3.0 cr)
or MATH 1031 - College Algebra and Probability, MATH (3.0 cr)
or STAT 1001 - Introduction to the Ideas of Statistics, MATH (4.0 cr)
or one higher level math course
RHET 3562W - Technical and Professional Writing, WI (4.0 cr)
or one advanced composition course approved by an adviser.

Major Courses

HRD 3001 - Introduction to Human Resource Development (3.0 cr)
HRD 3196 - Profession and Practice of Human Resource Development (2.0 cr)
HRD 3201 - Introduction to Training and Development (3.0 cr)
HRD 3301 - Introduction to Organization Development (3.0 cr)
HRD 5196 - Internship: Human Resource Development (1.0-10.0 cr)
ADED 3101 - Introduction to Strategies for Teaching Adults (3.0 cr)

Take 5 or more credit(s) from the following:
WHRE 5121 - Principles of Supervisory Management (3.0 cr)
WHRE 5201 - Family and Work Relationships (3.0 cr)
HRD 3xxx
HRD 4xxx
HRD 5xxx

HRD Options

Students are required to complete one of the following course groups.

Programmatic

Students select 13 credits, all of which have a common course designator. Frequently selected programs include human resources/industrial relations (HRIR), speech communication (COMM), management (MGMT), adult education (ADED), and business and industry education (BIE). Choices are not limited to these designators.

-OR-

Thematic

Students select 13 credits that support a common theme, regardless of course designator. Sample themes include ethical perspectives, international education, work and family, and conflict management. Courses must be selected in consultation with the department adviser.

Kinesiology B.S.

Kinesiology, School of

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120 to 125.

Required credits within the major: 54 to 59.

Degree: Bachelor of Science

The bachelor of science (B.S.) program in kinesiology prepares individuals for roles in sports/health clubs or corporate fitness/exercise centers, or serves as background for exercise rehabilitation, exercise physiology, biomechanics, social psychology of sport, motor behavior, ergonomics, human factors, and other human performance contexts. Kinesiology is an appropriate major for students seeking careers in the fitness/wellness industries or the allied health sciences, such as physical and occupational therapy, medicine, and nursing. It can be used as preparation for the M.Ed./initial licensure program in physical education, which prepares students for Minnesota teaching licensure in K-12 physical education.

Admission Requirements

Students must complete 60 credits before admission to the program. Freshmen and transfer students are usually admitted to pre-major status before admission to this major.

A GPA above 2.00 is preferred for the following:

- 2.50 for students already admitted to the degree-granting college.
- 2.50 for students transferring from another University of Minnesota college.
- 2.50 for students transferring from outside the University.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Required Courses for Admission

Take one course from each of the following course groups. At least five of the six required prerequisite courses must be completed and/or in progress at the time of application.

Biology Course with Lab

BIOL 1001 - Introductory Biology I: Evolutionary and Ecological Perspectives, BIOL SCI/L, ENVT (4.0 cr)
or BIOL 1009 - General Biology, BIOL SCI/L (4.0 cr)
or BIOL 1009H - Honors: General Biology, BIOL SCI/L, H (4.0 cr)
or FSCN 1021 - Introductory Microbiology, BIOL SCI/L (4.0 cr)
or PSTL 1131 - Principles of Biological Science, BIOL SCI/L (4.0 cr)
or PSTL 1135 - Human Anatomy and Physiology, BIOL SCI/L (4.0 cr)

Chemistry Course with Lab

CHEM 1011 - Introductory Chemistry: Lecture and Laboratory, PHYS SCI/L (4.0 cr)
or CHEM 1021 - Chemical Principles I, ENVT, PHYS SCI/L (4.0 cr)
or CHEM 1022 - Chemical Principles II, ENVT, PHYS SCI/L (4.0 cr)
or CHEM 1031H - Honors Chemistry I, ENVT, PHYS SCI/L, H (4.0 cr)
or CHEM 1032H - Honors Chemistry II, ENVT, PHYS SCI/L, H (4.0 cr)

Physics Course with Lab

PHYS 1101W - Introductory College Physics I, PHYS SCI/L, WI (4.0 cr)
or PHYS 1201W - Introductory Physics for Biology and Pre-medicine I, PHYS SCI/L, WI (5.0 cr)
or PHYS 1301W - Introductory Physics for Science and Engineering I, PHYS SCI/L, WI (4.0 cr)
or PHYS 1401V - Honors Physics I, PHYS SCI/L, WI, H (4.0 cr)

Psychology

PSTL 1281 - General Psychology, SSCI (4.0 cr)
or PSY 1001 - Introduction to Psychology, SSCI (4.0 cr)

Speech Performance

COMM 1101 - Introduction to Public Speaking (3.0 cr)
or COMM 1101H - Honors: Introduction to Public Speaking, H (3.0 cr)
or COMM 1313W - Analysis of Argument, WI (3.0 cr)
or PSTL 1461 - Oral Communication in the Public Sphere, C/PE (3.0 cr)
or RHET 1223 - Oral Presentations in Professional Settings (3.0 cr)

Statistics

EPSY 3264 - Basic and Applied Statistics, MATH (3.0 cr)
or PSTL 1454 - Statistics, MATH (4.0 cr)
or STAT 1001 - Introduction to the Ideas of Statistics, MATH (4.0 cr)
or STAT 3011 - Introduction to Statistical Analysis, MATH (4.0 cr)

General Requirements

Recommended freshman writing course(s) for this program: ENGC 1011

Program Requirements

The following courses are strongly recommended, but not required, before admission to the program: KIN 3027 or INMD 3001, KIN 1871, and five physical activity courses (1 credit each) chosen from at least four of the following categories: aquatics, conditioning, weight training, dance, individual and dual sports/activities, team sports/activities. Students pursuing K-12 physical education licensure must complete additional requirements; consult with a faculty adviser.

Required Courses

Major Courses

KIN 1871 - Introduction to Kinesiology (2.0 cr)
KIN 3112 - Introduction to Biomechanics (3.0 cr)
KIN 3131W - History and Philosophy of Sport, WI (3.0 cr)
KIN 3133 - Motor Control, Learning, and Development (3.0 cr)
KIN 3151 - Measurement, Evaluation, and Research in Kinesiology (3.0 cr)
KIN 4385 - Exercise Physiology (4.0 cr)
INMD 3001 - Human Anatomy (3.0 cr)
or INMD 3301 - Human Anatomy (3.0 cr)
or KIN 3027 - Human Anatomy for Kinesiology Students (3.0 cr)
or KIN 3111 - Human Anatomy (2.0 cr)
KIN 3126W - Psychology and Sociology of Sport, WI (3.0 cr)
or KIN 5126 - Sport Psychology (3.0 cr)
KIN 3385 - Human Physiology for Kinesiology Students (3.0 cr)
or PHSL 3051 - Human Physiology (4.0 cr)

Electives

Students must complete 6 credits in one of the sub-requirements.

Take 15 or more credit(s) including 4 or more sub-requirement(s) from the following:

Human Performance

Take 0 - 2 course(s) from the following:
HUMF 5001 - Foundations of Human Factors/Ergonomics (3.0 cr)
HUMF 5722 - Human Factors Psychology (3.0 cr)
KIN 4132 - Motor Development (3.0 cr)
KIN 4135 - Motor Control and Learning (3.0 cr)

Sports Management

Take 0 - 2 course(s) from the following:
KIN 5111 - Sports Facilities (3.0 cr)
KIN 5115 - Event Management in Sport (3.0 cr)
KIN 5421 - Sport Finance (3.0 cr)

KIN 5461 - Foundations of Sport Management (3.0 cr)
KIN 5601 - Sport Management Ethics and Policy (3.0 cr)
KIN 5631 - Programming and Promotion in Sport (3.0 cr)
KIN 5725 - Organization and Management of Physical Education and Sport (3.0 cr)
KIN 5801 - Legal Aspects of Sport and Recreation (4.0 cr)

Exercise Science

Take 0 - 2 course(s) from the following:
KIN 5122 - Applied Exercise Physiology (3.0 cr)
KIN 5141 - Nutrition for Health and Physical Performance (3.0 cr)
KIN 5385 - Exercise for Disease Prevention and Management (3.0 cr)
KIN 5435 - Advanced Theory and Techniques of Exercise Science (3.0 cr)
KIN 5485 - Advanced Electrocardiogram, Graded Exercise Testing, and Prescription (3.0 cr)

Sports Sociology/Psychology

Take 0 - 2 course(s) from the following:
KIN 5126 - Sport Psychology (3.0 cr)
KIN 5136 - Psychology of Coaching (3.0 cr)
KIN 5371 - Sport and Society (3.0 cr)
KIN 5375 - Competitive Sport for Children and Youth (3.0 cr)
KIN 5511 - Women in Sport and Leisure (3.0 cr)
KIN 5723 - Psychology of Sport Injury (3.0 cr)

Motor Control

Take 0 - 2 course(s) from the following:
KIN 5235 - Advanced Biomechanics II: Kinetics (3.0 cr)
KIN 5941 - Neural Basis of Movement (3.0 cr)
RSC 5135 - Advanced Biomechanics I: Kinematics (3.0 cr)
RSC 5841 - Rehabilitation Science Instrumentation and Methodology (4.0 cr)

CPR Certification

Students must complete CPR certification within one year before their program graduation date.

KIN 3113 - First Responder for Coaches and Athletic Trainers (3.0 cr) or first aid and CPR certification.

Field Experience / Directed Study / Coaching

All upper division students are required to complete practical experiences, coaching, or directed study in the selected focus.

Take 10 or more credit(s) from the following:
KIN 3696 - Supervised Practical Experience (1.0-10.0 cr)
KIN 3993 - Directed Study in Kinesiology (1.0-10.0 cr)
KIN 3993H - Directed Study in Kinesiology, H (1.0-10.0 cr)
KIN 5196 - Practicum: Developmental/Adapted Physical Education (1.0-4.0 cr)
KIN 5697 - Student Teaching: Coaching (1.0-10.0 cr)

Program Sub-plans

Students are required to complete one of the following sub-plans. (Note: The honors sub-plan does not meet this requirement.) Honors students are required to complete one sub-plan plus the honors sub-plan.

Exercise Science

Complete 10-17 credits of KIN 1xxx-5xxx courses, approved by a faculty adviser.

Required Courses

Exercise Science

Students in non-teaching emphasis areas must complete 10-17 credits of KIN 1xxx-5xxx courses, approved by a faculty adviser.

Take 10 or more credit(s) from the following:
KIN 1xxx
KIN 2xxx
KIN 3xxx
KIN 4xxx
KIN 5xxx

Physical Education Activity Courses

Take 5 or more course(s) including 4 or more sub-requirement(s) from the following:

Dance

Take 0 - 2 course(s) from the following:
DNCE 1001 - Modern Dance Technique 1 (1.0 cr)
DNCE 1002 - Modern Dance Technique 2 (1.0 cr)
DNCE 1010 - Modern Dance Technique 3 (2.0 cr)
DNCE 1020 - Modern Dance Technique 4 (2.0 cr)
DNCE 1101 - Ballet Technique 1 (1.0 cr)
DNCE 1102 - Ballet Technique 2 (1.0 cr)
DNCE 1110 - Ballet Technique 3 (2.0 cr)
DNCE 1201 - Jazz Technique 1 (1.0 cr)
DNCE 1202 - Jazz Technique 2 (1.0 cr)
DNCE 1210 - Jazz Technique 3 (1.0 cr)
DNCE 1220 - Jazz Technique 4 (1.0 cr)
DNCE 1301 - Tap Technique 1 (1.0 cr)
DNCE 1302 - Tap Technique 2 (1.0 cr)
DNCE 1311 - International Folk Dance 1 (1.0 cr)
DNCE 1312 - International Folk Dance 2 (1.0 cr)
DNCE 1321 - Ballroom 1 (1.0 cr)
DNCE 1322 - Ballroom 2 (1.0 cr)
DNCE 1331 - Yoga (1.0 cr)
DNCE 1332 - Yoga for Dancers (1.0 cr)
DNCE 3110 - Ballet Technique 5 (2.0 cr)
DNCE 3120 - Ballet Technique 6 (2.0 cr)
DNCE 3210 - Jazz Technique 5 (1.0 cr)
DNCE 3220 - Jazz Technique 6 (1.0 cr)
DNCE 3301 - Tap Technique 3 (1.0 cr)
DNCE 3302 - Tap Technique 4 (1.0 cr)
DNCE 3337 - Body Mind Centering (2.0 cr)

Aquatics

Take 0 - 2 course(s) from the following:
PE 1004 - Diving: Springboard (1.0 cr)
PE 1007 - Beginning Swimming (1.0 cr)
PE 1107 - Intermediate Swimming (1.0 cr)
PE 1205 - Scuba and Skin Diving (1.0 cr)
PE 1305 - Scuba Stress Rescue and Accident Management (1.0 cr)
PE 1306 - Lifeguard Training (1.0 cr)
PE 1411 - Water Safety Instructor (2.0 cr)

Conditioning/Weight Training

Take 0 - 2 course(s) from the following:
PE 1014 - Conditioning (1.0 cr)
PE 1015 - Weight Training (1.0 cr)
PE 1415 - Advanced Weight Training and Conditioning (1.0 cr)

Individual Sports

Take 0 - 2 course(s) from the following:
PE 1016 - Posture and Individual Exercise (1.0 cr)
PE 1022 - Whitewater Kayaking (2.0 cr)
PE 1029 - Handball (1.0 cr)
PE 1031 - Sabre Fencing (1.0 cr)
PE 1032 - Badminton (1.0 cr)
PE 1033 - Foil Fencing (1.0 cr)
PE 1034 - Judo (1.0 cr)
PE 1035 - Karate (1.0 cr)
PE 1036 - Racquetball (1.0 cr)

PE 1037 - Squash Racquets (1.0 cr)
PE 1038 - Beginning Tennis (1.0 cr)
PE 1041 - Cycling (1.0 cr)
PE 1042 - Orienteering (1.0 cr)
PE 1043 - Beginning Horse Riding (1.0 cr)
PE 1044 - Self-Defense (1.0 cr)
PE 1045 - Rock Climbing (1.0 cr)
PE 1046 - Tae Kwon Do (1.0 cr)
PE 1047 - Backpacking (2.0 cr)
PE 1048 - Bowling (1.0 cr)
PE 1053 - Ice Skating (1.0 cr)
PE 1055 - Golf (1.0 cr)
PE 1056 - Nordic (Cross-Country) Skiing (1.0 cr)
PE 1057 - Beginning Skiing (1.0 cr)
PE 1058 - Snowboarding (1.0 cr)
PE 1059 - Track and Field (1.0 cr)
PE 1065 - Beginning Tumbling and Gymnastics (1.0 cr)
PE 1133 - Intermediate Foil Fencing (1.0 cr)
PE 1135 - Intermediate Karate (1.0 cr)
PE 1136 - Intermediate Racquetball (1.0 cr)
PE 1138 - Intermediate Tennis (1.0 cr)
PE 1154 - Figure Skating (1.0 cr)
PE 1157 - Intermediate Skiing (1.0 cr)
PE 1165 - Intermediate Tumbling and Gymnastics (1.0 cr)

Team Sports
Take 0 - 2 course(s) from the following:
PE 1067 - Basketball (1.0 cr)
PE 1071 - Beginning Cricket (1.0 cr)
PE 1072 - Soccer (1.0 cr)
PE 1073 - Softball (1.0 cr)
PE 1074 - Beginning Volleyball (1.0 cr)
PE 1075 - Ice Hockey (1.0 cr)
PE 1174 - Intermediate Volleyball (1.0 cr)

Pre-Licensure

This track is for students planning to pursue the pre-physical education teaching emphasis.

Required Courses

Education Courses
CPSY 4303 - Adolescent Psychology (4.0 cr)
EDHD 5001 - Learning, Cognition, and Assessment (3.0 cr)
EDHD 5005 - School and Society (2.0 cr)
EDHD 5009 - Human Relations: Applied Skills for School and Society (1.0 cr)
KIN 3143 - Organization and Management of Sport (3.0 cr)
CPSY 2301 - Introductory Child Psychology, SSCI (4.0 cr)
or CPSY 3301 - Introductory Child Psychology for Social Sciences (4.0 cr)
KIN 5103 - Developmental/Adapted Physical Education (3.0 cr)
or KIN 5104 - Physical Activities for Persons with Disabilities (3.0 cr)
PUBH 3004 - Basic Concepts in Personal and Community Health (4.0 cr)
or take the following course pair:
PUBH 3001 - Personal and Community Health (2.0 cr)
PUBH 3003 - Fundamentals of Alcohol and Drug Abuse (2.0 cr)

Physical Education Activity Courses
Take a minimum of 10 courses from the following:

Dance
DNCE 1xxx
or DNCE 2xxx
or DNCE 3xxx
or DNCE 4xxx
or DNCE 5xxx

Tumbling/Floor Exercise
KIN 3175 - Gymnastics Coaching (1.0 cr)
or PE 1065 - Beginning Tumbling and Gymnastics (1.0 cr)
or PE 1165 - Intermediate Tumbling and Gymnastics (1.0 cr)

Individual Sports
Take 2 or more course(s) from the following:
KIN 3177 - Swimming and Diving Coaching (1.0 cr)
PE 1029 - Handball (1.0 cr)
PE 1031 - Sabre Fencing (1.0 cr)
PE 1032 - Badminton (1.0 cr)
PE 1033 - Foil Fencing (1.0 cr)
PE 1034 - Judo (1.0 cr)
PE 1035 - Karate (1.0 cr)
PE 1036 - Racquetball (1.0 cr)
PE 1037 - Squash Racquets (1.0 cr)
PE 1044 - Self-Defense (1.0 cr)
PE 1048 - Bowling (1.0 cr)
PE 1058 - Snowboarding (1.0 cr)
KIN 3174 - Golf Coaching (1.0 cr)
or PE 1055 - Golf (1.0 cr)
KIN 3178 - Tennis Coaching (1.0 cr)
or PE 1038 - Beginning Tennis (1.0 cr)

Track and Field
KIN 3179 - Track and Field Coaching (1.0 cr)
or PE 1059 - Track and Field (1.0 cr)

Lifetime Activity
KIN 5726 - Physical Education--Teaming and Trekking (2.0 cr)
or KIN 5727 - Physical Education--An Adventure Experience (1.0 cr)
or PE 1007 - Beginning Swimming (1.0 cr)
or PE 1022 - Whitewater Kayaking (2.0 cr)
or PE 1041 - Cycling (1.0 cr)
or PE 1042 - Orienteering (1.0 cr)
or PE 1043 - Beginning Horse Riding (1.0 cr)
or PE 1045 - Rock Climbing (1.0 cr)
or PE 1047 - Backpacking (2.0 cr)
or PE 1053 - Ice Skating (1.0 cr)
or PE 1056 - Nordic (Cross-Country) Skiing (1.0 cr)
or PE 1057 - Beginning Skiing (1.0 cr)
or PE 1058 - Snowboarding (1.0 cr)
or PE 1107 - Intermediate Swimming (1.0 cr)
or PE 1154 - Figure Skating (1.0 cr)
or PE 1205 - Scuba and Skin Diving (1.0 cr)
or REC 2151 - Outdoor and Camp Leadership (3.0 cr)

Conditioning/Weight Training
PE 1014 - Conditioning (1.0 cr)
or PE 1015 - Weight Training (1.0 cr)

Team Sports
Take 3 or more course(s) from the following:
PE 1075 - Ice Hockey (1.0 cr)
KIN 3168 - Soccer Coaching (1.0 cr)
or PE 1072 - Soccer (1.0 cr)
KIN 3169 - Volleyball Coaching (1.0 cr)
or PE 1074 - Beginning Volleyball (1.0 cr)
or PE 1174 - Intermediate Volleyball (1.0 cr)
KIN 3171 - Baseball Coaching (1.0 cr)
or PE 1073 - Softball (1.0 cr)
KIN 3172 - Basketball Coaching (1.0 cr)
or PE 1067 - Basketball (1.0 cr)

Pre-Physical Therapy

Pre-physical therapy students must consult their adviser for appropriate cousework.

Students in all non-teaching emphasis areas must complete 10-17 credits of KIN 1xxx-5xxx courses, approved by a faculty adviser.

Required Courses

Electives
Consult a faculty adviser for appropriate coursework.

Take 10 or more credit(s) from the following:
KIN 1xxx
KIN 2xxx
KIN 3xxx
KIN 4xxx
KIN 5xxx

Physical Education Activity Courses
Take 5 or more course(s) including 4 or more sub-requirement(s) from the following:

Dance
Take 0 - 2 course(s) from the following:
DNCE 1001 - Modern Dance Technique 1 (1.0 cr)
DNCE 1002 - Modern Dance Technique 2 (1.0 cr)
DNCE 1010 - Modern Dance Technique 3 (2.0 cr)
DNCE 1020 - Modern Dance Technique 4 (2.0 cr)
DNCE 1101 - Ballet Technique 1 (1.0 cr)
DNCE 1102 - Ballet Technique 2 (1.0 cr)
DNCE 1110 - Ballet Technique 3 (2.0 cr)
DNCE 1201 - Jazz Technique 1 (1.0 cr)
DNCE 1202 - Jazz Technique 2 (1.0 cr)
DNCE 1210 - Jazz Technique 3 (1.0 cr)
DNCE 1220 - Jazz Technique 4 (1.0 cr)
DNCE 1301 - Tap Technique 1 (1.0 cr)
DNCE 1302 - Tap Technique 2 (1.0 cr)
DNCE 1311 - International Folk Dance 1 (1.0 cr)
DNCE 1312 - International Folk Dance 2 (1.0 cr)
DNCE 1321 - Ballroom 1 (1.0 cr)
DNCE 1322 - Ballroom 2 (1.0 cr)
DNCE 1331 - Yoga (1.0 cr)
DNCE 1332 - Yoga for Dancers (1.0 cr)
DNCE 3110 - Ballet Technique 5 (2.0 cr)
DNCE 3120 - Ballet Technique 6 (2.0 cr)
DNCE 3210 - Jazz Technique 5 (1.0 cr)
DNCE 3220 - Jazz Technique 6 (1.0 cr)
DNCE 3301 - Tap Technique 3 (1.0 cr)
DNCE 3302 - Tap Technique 4 (1.0 cr)
DNCE 3337 - Body Mind Centering (2.0 cr)

Aquatics
Take 0 - 2 course(s) from the following:
PE 1004 - Diving: Springboard (1.0 cr)
PE 1007 - Beginning Swimming (1.0 cr)
PE 1107 - Intermediate Swimming (1.0 cr)
PE 1205 - Scuba and Skin Diving (1.0 cr)
PE 1305 - Scuba Stress Rescue and Accident Management (1.0 cr)
PE 1306 - Lifeguard Training (1.0 cr)
PE 1411 - Water Safety Instructor (2.0 cr)

Conditioning/Weight Training
Take 0 - 2 course(s) from the following:
PE 1014 - Conditioning (1.0 cr)
PE 1015 - Weight Training (1.0 cr)
PE 1415 - Advanced Weight Training and Conditioning (1.0 cr)

Individual Sports
Take 0 - 2 course(s) from the following:
PE 1016 - Posture and Individual Exercise (1.0 cr)
PE 1022 - Whitewater Kayaking (2.0 cr)
PE 1029 - Handball (1.0 cr)
PE 1031 - Sabre Fencing (1.0 cr)
PE 1032 - Badminton (1.0 cr)
PE 1033 - Foil Fencing (1.0 cr)
PE 1034 - Judo (1.0 cr)
PE 1035 - Karate (1.0 cr)
PE 1036 - Racquetball (1.0 cr)
PE 1037 - Squash Racquets (1.0 cr)
PE 1038 - Beginning Tennis (1.0 cr)
PE 1041 - Cycling (1.0 cr)
PE 1042 - Orienteering (1.0 cr)
PE 1043 - Beginning Horse Riding (1.0 cr)
PE 1044 - Self-Defense (1.0 cr)
PE 1045 - Rock Climbing (1.0 cr)
PE 1046 - Tae Kwon Do (1.0 cr)
PE 1047 - Backpacking (2.0 cr)
PE 1048 - Bowling (1.0 cr)
PE 1053 - Ice Skating (1.0 cr)
PE 1055 - Golf (1.0 cr)
PE 1056 - Nordic (Cross-Country) Skiing (1.0 cr)
PE 1057 - Beginning Skiing (1.0 cr)
PE 1058 - Snowboarding (1.0 cr)
PE 1059 - Track and Field (1.0 cr)
PE 1065 - Beginning Tumbling and Gymnastics (1.0 cr)
PE 1133 - Intermediate Foil Fencing (1.0 cr)
PE 1135 - Intermediate Karate (1.0 cr)
PE 1136 - Intermediate Racquetball (1.0 cr)
PE 1138 - Intermediate Tennis (1.0 cr)
PE 1154 - Figure Skating (1.0 cr)
PE 1157 - Intermediate Skiing (1.0 cr)
PE 1165 - Intermediate Tumbling and Gymnastics (1.0 cr)

Team Sports
Take 0 - 2 course(s) from the following:
PE 1067 - Basketball (1.0 cr)
PE 1071 - Beginning Cricket (1.0 cr)
PE 1072 - Soccer (1.0 cr)
PE 1073 - Softball (1.0 cr)
PE 1074 - Beginning Volleyball (1.0 cr)
PE 1075 - Ice Hockey (1.0 cr)
PE 1174 - Intermediate Volleyball (1.0 cr)

Leadership Minor

Educational Policy & Administration

Requirements for this program are current for Fall 2006.

Required credits in this minor: 16.

The undergraduate leadership minor is a 16-credit interdisciplinary program that helps students gain understanding and experience in multiple frameworks of leadership. The program develops the leadership and social change skills of undergraduates for their roles as citizens on the University campus and in the larger global community. This minor is a collaborative effort of the college's department of Educational Policy and Administration (EDPA), the University's Hubert H. Humphrey Institute, and the Office for Student Affairs.

Admission Requirements

Students must complete 1 course before admission to the program.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Required Courses for Admission

Preparatory Courses

EDPA 1301W - Personal Leadership in the University, WI (3.0 cr)
or PA 1961W - Personal Leadership in the University, WI (3.0 cr)

Program Requirements

Required Courses

Minor Courses

EDPA 3302W - Leadership, You, and Your Community, WI (3.0 cr)
or PA 3961W - Leadership, You, and Your Community, WI (3.0 cr)
EDPA 4303W - Leadership in the World, WI (3.0 cr)
or PA 4961W - Self-developed Leadership in the World, WI (3.0 cr)

Field Experience

EDPA 3402 - Leadership Minor: Field Experience (2.0 cr)
or PA 3971 - Leadership Minor Field Experience (2.0 cr)

Electives

In consultation with the minor office, take at least 5 additional credits to complete the 16-credit requirement for the minor.

Recreation, Park and Leisure Studies B.S.

Kinesiology, School of

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 124 to 128.

Required credits within the major: 90.

Degree: Bachelor of Science.

The undergraduate program in recreation, park, and leisure studies prepares students to assume leadership, supervisory, or beginning administrative responsibilities in various park, recreation, leisure service, and sport management agencies, and for therapeutic recreation certification and practice. The program also prepares students for graduate study in outdoor recreation/education, park and recreation administration, sport management, and therapeutic recreation. Many students combine recreation, park, and leisure studies with coursework in other disciplines, such as management, social work, physical and occupational therapy, creative arts, human growth and development, special education, and psychology. Students pursuing a B.S. degree may choose one of two options: leisure services management emphasis areas (includes commercial parks and recreation, outdoor education and recreation, and public parks and recreation sub-plans) or therapeutic recreation emphasis areas.

Admission Requirements

Students must complete 30 credits before admission to the program.

Students must complete at least 30 credits of the University's liberal education requirements, including the freshman writing requirement; have earned a minimum overall GPA of 2.00, with preference given to applicants with a higher average; and have relevant education- or career-related experience, paid or volunteer. Appropriate related and major courses may be applied toward these requirements.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

General Requirements

Recommended freshman writing course(s) for this program: ENGC 1011

Program Requirements

Requirements include a minimum 2.00 GPA and no grade lower than C- for major courses with the REC designator. A minimum grade of C- is also required for general psychology.

Required Courses

Foundation Courses

For additional college requirements, consult with an SPS program adviser.

Take 3 or more course(s) from the following:

PE 1xxx
COMM 1101 - Introduction to Public Speaking (3.0 cr)
or COMM 1313W - Analysis of Argument, WI (3.0 cr)
or PSTL 1461 - Oral Communication in the Public Sphere, C/PE (3.0 cr)
or RHET 1223 - Oral Presentations in Professional Settings (3.0 cr)
PSTL 1211 - People and Problems, CD, SSCI (4.0 cr)
or SOC 1001 - Introduction to Sociology, CD, SSCI (4.0 cr)
PSTL 1281 - General Psychology, SSCI (4.0 cr)
or PSY 1001 - Introduction to Psychology, SSCI (4.0 cr)
PUBH 3004 - Basic Concepts in Personal and Community Health (4.0 cr)
or take the following course pair:
PUBH 3001 - Personal and Community Health (2.0 cr)
PUBH 3003 - Fundamentals of Alcohol and Drug Abuse (2.0 cr)

Major Courses

REC 1501 - Orientation to Leisure and Recreation (3.0 cr)
REC 3281 - Research and Evaluation in Recreation, Park, and Leisure Studies (4.0 cr)
REC 3541W - Recreation Programming, WI (3.0 cr)
REC 3551 - Administration and Finance of Leisure Services (4.0 cr)
REC 3601W - Leisure and Human Development, WI (3.0 cr)
REC 3796 - Senior Internship in Recreation, Park, and Leisure Studies (1.0-12.0 cr)
REC 5271 - Community Leisure Services for Persons with Disabilities (3.0 cr)

Program Sub-plans

Students are required to complete one of the following sub-plans.

Commercial Parks and Recreation

Required Courses

Additional Foundation Courses

For additional college requirements, consult with an SPS program adviser.

PSTL 1233 - U.S. Government and Politics, C/PE, SSCI (4.0 cr)
or POL 1001 - American Democracy in a Changing World, C/PE, SSCI (4.0 cr)
Complete 3 credits from ADED, ASL, BIE, CI, CPSY, EDHD, EDPA, EPSY, HRD, WHRE, YOST
ECON 1101 - Principles of Microeconomics, IP, SSCI (4.0 cr)
or APEC 1101 - Principles of Microeconomics, SSCI (3.0 cr)

Commercial Parks and Recreation Focus
Take 16 credits in recreation courses related to an emphasis area, selected in consultation with a major adviser.

REC 5191 - Commercial Recreation and Tourism (3.0 cr)
REC 5801 - Legal Aspects of Sport and Recreation (4.0 cr)

Take 9 or more credit(s) from the following:
REC 3xxx
REC 4xxx
REC 5xxx

Supporting Program
No more than three 1xxx courses, selected in consultation with an adviser, may count toward completing the sub-plan.

Take 24 or more credit(s) including 3 or more sub-requirement(s) from the following:

Marketing and Management
ACCT 2050 - Introduction to Financial Reporting (4.0 cr)
BIE 5011 - Introduction to Computer Applications (3.0 cr)
BLAW 3058 - The Law of Contracts and Agency (4.0 cr)
MGMT 3001 - Fundamentals of Management (3.0 cr)
MKTG 3001 - Principles of Marketing (3.0 cr)

Economics
APEC 1102 - Principles of Macroeconomics, IP, SSCI (3.0 cr)
or ECON 1102 - Principles of Macroeconomics, IP, SSCI (4.0 cr)

Electives
Take 3 or more credit(s) from the following:
BLAW 3xxx
MGMT 3xxx
MKTG 3xxx

Outdoor Education and Recreation

Required Courses

Additional Foundation Courses
For additional college requirements, consult with an SPS program adviser.

APEC 1101 - Principles of Microeconomics, SSCI (3.0 cr)
or ECON 1101 - Principles of Microeconomics, IP, SSCI (4.0 cr)
PSTL 1233 - U.S. Government and Politics, C/PE, SSCI (4.0 cr)
or POL 1001 - American Democracy in a Changing World, C/PE, SSCI (4.0 cr)
Complete 3 credits from ADED, ASL, BIE, CI, CPSY, EDHD, EDPA, EPSY, HRD, WHRE, YOST

Outdoor Education and Recreation Focus
REC 2151 - Outdoor and Camp Leadership (3.0 cr)
REC 5301 - Wilderness and Adventure Education (4.0 cr)
REC 5311 - Programming Outdoor and Environmental Education (3.0 cr)
REC 5161 - Recreation Land Policy (3.0 cr)
REC 5801 - Legal Aspects of Sport and Recreation (4.0 cr)

Supporting Program
Take 24 or more credit(s) including 2 or more sub-requirement(s) from the following:

Marketing and Management
BIE 5011 - Introduction to Computer Applications (3.0 cr)
BLAW 3058 - The Law of Contracts and Agency (4.0 cr)
MGMT 3001 - Fundamentals of Management (3.0 cr)
MKTG 3001 - Principles of Marketing (3.0 cr)

Electives
Take 11 or more credit(s) from the following:
ACCT 2050 - Introduction to Financial Reporting (4.0 cr)
APEC 4311 - Tourism Development: Principles, Processes, Policies (3.0 cr)
POL 3321 - Issues in American Public Policy, C/PE (3.0 cr)
RRM 4232W - Managing Recreational Lands, ENVT, WI (4.0 cr)

Public Parks and Recreation

Required Courses

Additional Foundation Courses
For additional college requirements, consult with an SPS program adviser.

PSTL 1233 - U.S. Government and Politics, C/PE, SSCI (4.0 cr)
or POL 1001 - American Democracy in a Changing World, C/PE, SSCI (4.0 cr)
Complete 3 credits from ADED, ASL, BIE, CI, CPSY, EDHD, EDPA, EPSY, HRD, WHRE, YOST
APEC 1101 - Principles of Microeconomics, SSCI (3.0 cr)
or ECON 1101 - Principles of Microeconomics, IP, SSCI (4.0 cr)

Public Parks and Recreation Focus
The electives listed below are only suggestions. Consult with an adviser for more course options to reach the 16 credit total.

REC 5161 - Recreation Land Policy (3.0 cr)
REC 5801 - Legal Aspects of Sport and Recreation (4.0 cr)

Take 9 or more credit(s) from the following:
REC 3993 - Directed Study in Recreation, Park, and Leisure Studies (1.0-9.0 cr)
REC 5191 - Commercial Recreation and Tourism (3.0 cr)
REC 5241 - Functional Intervention: Recreation Therapy in Geriatric Care (3.0 cr)
REC 5461 - Foundations of Sport Management (3.0 cr)
REC 5111 - Sports Facilities (3.0 cr)
REC 5511 - Women in Sport and Leisure (3.0 cr)

Supporting Program
Take 24 or more credit(s) including 3 or more sub-requirement(s) from the following:

Marketing and Management
BIE 5011 - Introduction to Computer Applications (3.0 cr)
BLAW 3058 - The Law of Contracts and Agency (4.0 cr)
HRIR 3021 - Human Resource Management and Industrial Relations (3.0 cr)
MGMT 3001 - Fundamentals of Management (3.0 cr)
MKTG 3001 - Principles of Marketing (3.0 cr)

Economics
APEC 1102 - Principles of Macroeconomics, IP, SSCI (3.0 cr)
or ECON 1102 - Principles of Macroeconomics, IP, SSCI (4.0 cr)

Electives
Take 4 or more credit(s) from the following:
ACCT 2050 - Introduction to Financial Reporting (4.0 cr)
APEC 4311 - Tourism Development: Principles, Processes, Policies (3.0 cr)
POL 3321 - Issues in American Public Policy, C/PE (3.0 cr)
RRM 4232W - Managing Recreational Lands, ENVT, WI (4.0 cr)

Therapeutic Recreation

Therapeutic recreation emphasis areas include community-based or clinical-based recreation. (Completion of this program meets the requirements for certification by the National Council on Therapeutic Recreation Certification.)

Additional offerings include a coaching certificate and a coaching minor.

To become professionally certified as a therapeutic recreation specialist, specific courses also are required in the therapeutic recreation option, including abnormal psychology, anatomy, and physiology.

Required Courses

Additional Foundation Courses

EPSY 5401 - Counseling Procedures (3.0 cr)
or CPSY 2301 - Introductory Child Psychology, SSCI (4.0 cr)
KIN 3027 - Human Anatomy for Kinesiology Students (3.0 cr)
PSY 3604 - Introduction to Abnormal Psychology (3.0 cr)
COMM 3411 - Introduction to Small Group Communication (3.0 cr)
or EPSY 5151 - Cooperative Learning (3.0 cr)
or EPSY 5434 - Counseling Adults in Transition (3.0 cr)
PHSL 1001 - Human Physiology (3.0 cr)
or PHSL 3051 - Human Physiology (4.0 cr)

Therapeutic Recreation Focus

Take 16 credits in recreation courses related to an emphasis area, selected in consultation with a major adviser.

REC 5211 - Introduction to Therapeutic Recreation (3.0 cr)
REC 5215 - Assess and Monitor Patient/Client Functioning in Recreation Therapy (3.0 cr)
REC 5221W - Comprehensive Therapeutic Recreation Services Development and Management, WI (4.0 cr)
REC 5231 - Therapeutic Recreation and Diagnostic Groups (3.0 cr)

Take 3 or more credit(s) from the following:

REC 3993 - Directed Study in Recreation, Park, and Leisure Studies (1.0-9.0 cr)
REC 5241 - Functional Intervention: Recreation Therapy in Geriatric Care (3.0 cr)
REC 5900 - Special Topics: Contemporary Issues in Leisure Services (1.0-12.0 cr)

Supporting Program

No more than three 1xxx courses, selected in consultation with an adviser, may count toward completing the sub-plan.

Take 24 or more credit(s) including 5 or more sub-requirement(s) from the following:

Facilitation and Communication

Take 1 or more course(s) from the following:

ASL 1701 - American Sign Language I (4.0 cr)
EPSY 5609 - Family-Centered Services (2.0 cr)
SOC 4102 - Criminology (3.0 cr)
SOC 4105 - Sociology of Punishment and Corrections (3.0 cr)

Development and Behavior

Take 1 or more course(s) from the following:

CPSY 4303 - Adolescent Psychology (4.0 cr)
CPSY 4343 - Cognitive Development (4.0 cr)
KIN 3133 - Motor Control, Learning, and Development (3.0 cr)
PSY 4501 - Psychology of Women (3.0 cr)
PSY 5206 - Social Psychology and Health Behavior (3.0 cr)

Child Development

Take 1 or more course(s) from the following:

CPSY 4311 - Behavioral and Emotional Problems of Children (4.0 cr)
CPSY 4313 - Disabilities and Development (4.0 cr)

Human Growth and Development

Take 1 or more course(s) from the following:

CPSY 4331 - Social and Personality Development (4.0 cr)
EPSY 5115 - Psychology of Adult Learning and Instruction (3.0 cr)
NURS 3690 - Life Span, Growth, and Development I (2.0 cr)
PUBH 6040 - Dying and Death in Contemporary Society: Implications for Intervention (2.0 cr)

Related Program Areas

Take 1 or more course(s) from the following:

EPSY 5674 - Techniques of Orientation, Mobility, and Independence for Students with Visual Disabilities (3.0 cr)
KIN 3113 - First Responder for Coaches and Athletic Trainers (3.0 cr)
KIN 3114 - Prevention and Care of Athletic Injuries (3.0 cr)
MUED 1801 - Introduction to Music Therapy (2.0 cr)
PHAR 5201 - Health Sciences Applied Terminology (2.0 cr)
OT 5313 - Therapeutic Occupation (4.0 cr)
REC 2151 - Outdoor and Camp Leadership (3.0 cr)
REC 5311 - Programming Outdoor and Environmental Education (3.0 cr)
RSC 5135 - Advanced Biomechanics I: Kinematics (3.0 cr)

Social Justice Minor

School of Social Work

Requirements for this program are current for Fall 2006.

Required credits in this minor: 18.

The social justice minor offers undergraduate students the opportunity to theorize about the meanings of social justice and practice "doing" social justice advocacy in community organizations. The minor is an interdisciplinary, cross-collegiate undergraduate program. Students create socially just communities and a respectful space for all opinions in the dialogue-based classrooms. Teaching faculty, students, and community groups become partners in creating and sharing in an authentic collective learning experience. The program is based on the belief in equity and fairness in every aspect of human experience and the importance of recognizing the struggles for liberation and the social movements of many peoples globally.

Admission Requirements

Minor Requirements

The social justice minor requires three core courses (12 credits), all of which include 30 hours of service learning in social justice organizations, and 6 credits of elective courses.

Required Courses

Core Courses

These courses include 30 hours of service learning in social justice organizations.

SW 2501W - Introduction to Social Justice, C/PE, WI (4.0 cr)
SW 3501 - Theories and Practices of Social Change Organizing, SSCI, C/PE (4.0 cr)
SW 4501 - Senior Seminar in Social Justice (4.0 cr)

Electives

Take 6 or more credit(s) from the following:

AFRO 3120 - Social and Intellectual Movements in the African Diaspora (3.0 cr)
AFRO 3251W - Sociological Perspectives on Race, Class, and Gender, CD, SSCI, WI (3.0 cr)
AFRO 3426 - African Americans, Social Policy, and the Welfare State, CD (3.0 cr)
AFRO 3866 - The Civil Rights and Black Power Movement, 1954-1984, C/PE, CD (3.0 cr)
AMIN 4501 - Law, Sovereignty, and Treaty Rights, C/PE (3.0 cr)
AMIN 4515 - Contemporary American Indian Movements (3.0 cr)
AMST 3001 - Contemporary Perspectives on Asian America, CD (3.0 cr)
AAS 1101 - Imagining Asian America, C/PE, CD (3.0 cr)
AAS 3501 - Asian America Through Arts and Culture, OH, CD (4.0 cr)
CHIC 1112 - Introduction to Chicana/o Studies: Critical Paradigms, CD, HP (3.0 cr)
CHIC 3212 - La Chicana, CD (3.0 cr)
CHIC 3374 - Migrant Farmworkers in the U.S.: Families, Work, and Advocacy, SSCI, CD (3.0 cr)
CHIC 4275 - Theory in Action: Community Engagement in a Social Justice Framework, C/PE (3.0 cr)

CI 1911 - Ethics, Wealth, and Education in a Democracy, C/PE (3.0 cr)
EDPA 3304 - Strategic Leadership for Future Societies (3.0 cr)
EPSY 3132 - Psychology of Multiculturalism in Education, CD (3.0 cr)
EPSY 3133 - Practicum: Service Learning, Psychology of Multiculturalism in Education (1.0 cr)
EPSY 3134W - Social Diversity and Deculturalization in Education, CD, SSCI, WI (3.0 cr)
FSOS 3104 - Global and Diverse Families (3.0 cr)
GLBT 3301 - Gay, Lesbian, Bisexual, and Transgender Social Movements in the United States (3.0 cr)
HIST 3877 - Asian American History, 1850-Present, CD, HP (3.0 cr)
PHIL 1004W - Introduction to Political Philosophy, C/PE, OH, WI (4.0 cr)
PHIL 1007 - Introduction to Political Philosophy Practicum, C/PE (1.0 cr)
PHIL 3301 - Environmental Ethics, C/PE, ENVT (4.0 cr)
PHIL 3302W - Moral Problems of Contemporary Society, C/PE, OH, WI (4.0 cr)
PHIL 3307 - Social Justice and Community Service, C/PE, CD (4.0 cr)
PHIL 3308 - Social Justice and Community Service, C/PE, CD (4.0 cr)
PHIL 4231 - Philosophy of Language, WI (3.0 cr)
PHIL 4324 - Ethics and Education, WI (3.0 cr)
PHIL 4325 - Education and Social Change, C/PE, CD (4.0 cr)
PHIL 4326 - Lives Worth Living: Questions of Self, Vocation, and Community, C/PE, OH (6.0 cr)
SOC 3003 - Social Problems (3.0 cr)
SOC 3201 - Inequality: Introduction to Stratification (3.0 cr)
SOC 3211W - American Race Relations, CD, SSCI, WI (3.0 cr)
SOC 3251W - Sociological Perspectives on Race, Class, and Gender, CD, SSCI, WI (3.0 cr)
SOC 3322W - Social Movements, Protests, and Change, C/PE, WI (3.0 cr)
SOC 4461 - Sociology of Ethnic and Racial Conflict, CD, IP (3.0 cr)
SPAN 3401 - Service Learning in the Chicano/Latino Community, C/PE, CD (3.0 cr)
SW 3301 - GLBT Social Movements (3.0 cr)
SW 3705 - Gender Violence in Global Perspective, IP (3.0 cr)
TH 5117 - Performance and Social Change (3.0 cr)
WOST 1002 - Politics of Sex, CD, SSCI (3.0-4.0 cr)
WOST 3003 - Gender and Global Politics, IP, SSCI (3.0-4.0 cr)
WHRE 3011W - Introduction to Technology and Public Ethics, C/PE, WI (3.0 cr)
YOST 2001 - The Everyday Lives of Youth, SSCI (4.0 cr)
YOST 3101 - Introduction to Youthwork (4.0 cr)
AAS 3409W - Asian American Women's Cultural Production, CD, WI (3.0 cr)
or WOST 3409W - Asian American Women's Cultural Production, CD, WI (3.0 cr)

Sport Studies B.S.

Kinesiology, School of

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 71.

This program requires summer terms.

Degree: Bachelor of Science.

The sport studies major focuses on contemporary sport as a product of social, psychological, and economic phenomena. Because of its prominent role in our culture, economy, and societal behavior, sport is a popular subject for academic inquiry. Graduates may find employment in sport marketing and management, coaching, sport administration, and sport or other fitness-related occupations. The program also prepares students for graduate study in sport management.

Coursework in sport studies addresses such topics as ethics and sport, psychology of sport performance, sport as a sociocultural phenomenon, sport management, sport marketing and promotion, and event management.

Features of the program include a 10-credit experiential course, a senior seminar, and a set of focused electives. Each student selects electives from one of the following three emphasis areas: coaching, sport management, or youth services/development.

Additional offerings include a coaching certificate and a coaching minor.

Admission Requirements

Students must complete 60 credits before admission to the program.

Admission preference is given to students who have completed liberal education requirements and have an overall GPA of 2.00 before the admission deadline. Because of a large number of applicants, a 2.50 GPA is recommended.

Completion of SPST 1701 is recommended before admission to the program.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Required Courses

Foundation Courses

Take a minimum of 24 credits from this group, including 6 credits of education and human development electives (excluding courses with KIN, REC, or SPST designators). With the guidance of an SPS advisor, choose from courses listed on the Web page http://www.education.umn.edu/catalogs/course-desc/default.html.

PE 1xxx
COMM 1101 - Introduction to Public Speaking (3.0 cr)
or COMM 1313W - Analysis of Argument, WI (3.0 cr)
or PSTL 1461 - Oral Communication in the Public Sphere, C/PE (3.0 cr)
or RHET 1223 - Oral Presentations in Professional Settings (3.0 cr)
PSTL 1211 - People and Problems, CD, SSCI (4.0 cr)
or SOC 1001 - Introduction to Sociology, CD, SSCI (4.0 cr)
PSTL 1281 - General Psychology, SSCI (4.0 cr)
or PSY 1001 - Introduction to Psychology, SSCI (4.0 cr)
PUBH 3004 - Basic Concepts in Personal and Community Health (4.0 cr)
or take the following course pair:
PUBH 3001 - Personal and Community Health (2.0 cr)
PUBH 3003 - Fundamentals of Alcohol and Drug Abuse (2.0 cr)

Take at least 6 credits from ADED, AFEE, AGED, ASL, BIE, CI, CPSY, EDHD, EDPA, EPSY, HRD, WHRE, YOST.

Major Courses

Completion of SPST 1701 is recommended before admission to the program. All other major core courses must be completed after program admission.

SPST 1701 - Introduction to Sport Studies (2.0 cr)
SPST 3143 - Organization and Management of Sport (3.0 cr)
SPST 3501 - Sport in a Diverse Society (3.0 cr)
SPST 3601 - Ethics and Values in Sport (2.0 cr)
SPST 3611 - Sport Psychology (2.0 cr)
SPST 3861 - Legal Aspects of Sport (2.0 cr)
SPST 3881W - Senior Seminar in Sport Studies, WI (3.0 cr)
SPST 3996 - Practicum: The Sport Experience (1.0-10.0 cr)

Program Sub-plans

Students are required to complete one of the following sub-plans.

Coaching

The coaching certification can be completed within this track.

Required Courses

Coaching

Take 20 or more credit(s) from the following:
FSCN 1112 - Principles of Nutrition, ENVT (3.0 cr)
SPST 3111 - Sports Facilities (2.0 cr)
SPST 3112 - Applied Sport Science (2.0 cr)
SPST 3621 - Applied Sport Psychology (2.0 cr)
SPST 3641 - Training and Conditioning for Sport (2.0 cr)
BIE 5011 - Introduction to Computer Applications (3.0 cr)
or PSTL 1571 - Introduction to Microcomputer Applications (4.0 cr)

Coaching Certification

Completion of the following courses meets requirements for coaching certification or coaching focus.

KIN 3113 - First Responder for Coaches and Athletic Trainers (3.0 cr)
KIN 3133 - Motor Control, Learning, and Development (3.0 cr)
KIN 5697 - Student Teaching: Coaching (1.0-10.0 cr)

Human Anatomy

INMD 3001 - Human Anatomy (3.0 cr)
or KIN 3027 - Human Anatomy for Kinesiology Students (3.0 cr)
or KIN 3111 - Human Anatomy (2.0 cr)

Coaching Certification 1

Take 2 or more course(s) from the following:
KIN 3112 - Introduction to Biomechanics (3.0 cr)
KIN 4385 - Exercise Physiology (4.0 cr)
KIN 5126 - Sport Psychology (3.0 cr)
KIN 5136 - Psychology of Coaching (3.0 cr)
SPST 3621 - Applied Sport Psychology (2.0 cr)
SPST 3641 - Training and Conditioning for Sport (2.0 cr)

Coaching Certification 2

Take 2 or more course(s) from the following:
KIN 3168 - Soccer Coaching (1.0 cr)
KIN 3169 - Volleyball Coaching (1.0 cr)
KIN 3171 - Baseball Coaching (1.0 cr)
KIN 3172 - Basketball Coaching (1.0 cr)
KIN 3173 - Football Coaching (1.0 cr)
KIN 3174 - Golf Coaching (1.0 cr)
KIN 3175 - Gymnastics Coaching (1.0 cr)
KIN 3176 - Ice Hockey Coaching (1.0 cr)
KIN 3177 - Swimming and Diving Coaching (1.0 cr)
KIN 3178 - Tennis Coaching (1.0 cr)
KIN 3179 - Track and Field Coaching (1.0 cr)
KIN 3181 - Wrestling Coaching (1.0 cr)
KIN 5720 - Special Topics in Kinesiology (1.0-8.0 cr)

Sport Management

Required Courses

Take 20 or more credit(s) from the following:
BIE 3061 - Professional Sales Management (3.0 cr)
BLAW 3058 - The Law of Contracts and Agency (4.0 cr)
BLAW 5078 - Partnerships and Corporations (2.0 cr)
COMM 3201 - Introduction to Electronic Media Production (4.0 cr)
COMM 3441 - Introduction to Organizational Communication (3.0 cr)
ECON 1102 - Principles of Macroeconomics, IP, SSCI (4.0 cr)
PSTL 1511 - Introduction to Business and Society, SSCI (4.0 cr)
PSTL 1513 - Small Business Fundamentals With E-Business Applications (3.0 cr)
HRD 5201 - Training and Development of Human Resources (3.0 cr)
HRIR 3021 - Human Resource Management and Industrial Relations (3.0 cr)
KIN 5115 - Event Management in Sport (3.0 cr)
MGMT 3001 - Fundamentals of Management (3.0 cr)
MKTG 3001 - Principles of Marketing (3.0 cr)
SPST 3111 - Sports Facilities (2.0 cr)
SPST 3421 - Business of Sport (2.0 cr)
SPST 3631 - Sport Promotion and Programming (3.0 cr)
ACCT 2050 - Introduction to Financial Reporting (4.0 cr)
or PSTL 1540 - Accounting Fundamentals I (3.0 cr)
BIE 5011 - Introduction to Computer Applications (3.0 cr)
or PSTL 1571 - Introduction to Microcomputer Applications (4.0 cr)

Youth Services/Development

Required Courses

Youth Services/Development List

Take 20 or more credit(s) from the following:
CPSY 4303 - Adolescent Psychology (4.0 cr)
CPSY 4331 - Social and Personality Development (4.0 cr)
CPSY 4334W - Children, Youth in Society, C/PE, WI (4.0 cr)
EDPA 5372 - Youth in Modern Society (3.0 cr)
FSOS 1101 - Intimate Relationships, CD, SSCI (4.0 cr)
KIN 1989 - Health and Society (3.0 cr)
KIN 5115 - Event Management in Sport (3.0 cr)
KIN 5375 - Competitive Sport for Children and Youth (3.0 cr)
REC 1501 - Orientation to Leisure and Recreation (3.0 cr)
REC 2151 - Outdoor and Camp Leadership (3.0 cr)
REC 3541W - Recreation Programming, WI (3.0 cr)
SPST 3112 - Applied Sport Science (2.0 cr)
SPST 3631 - Sport Promotion and Programming (3.0 cr)
SW 2001 - Introduction to Social Welfare and Community Services, C/PE (4.0 cr)
YOST 2001 - The Everyday Lives of Youth, SSCI (4.0 cr)
YOST 5031 - Youth in the World (3.0 cr)
YOST 5402 - Youth Policy: Enhancing Healthy Development in Everyday Life (4.0 cr)
BIE 5011 - Introduction to Computer Applications (3.0 cr)
or PSTL 1571 - Introduction to Microcomputer Applications (4.0 cr)
CPSY 2301 - Introductory Child Psychology, SSCI (4.0 cr)
or CPSY 3301 - Introductory Child Psychology for Social Sciences (4.0 cr)
or PSTL 2283W - Psychology of Human Development, SSCI, WI (4.0 cr)

Technology Education B.S.

Work and Human Resource Education

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 71.

This program requires summer terms.

Degree: Bachelor of Science.

This program prepares students to meet Minnesota state licensure requirements for teaching technology education to grades 5-12.

The curriculum surveys the broad range of technology use and application in the areas of manufacturing, construction, transportation, communication, energy, and power. Coursework includes liberal education, technology education, and professional/clinical experiences and student teaching.

Graduate study in this field is available. A career and technical education certificate is also available.

Admission Requirements

Students must complete 60 credits before admission to the program.

A GPA above 2.00 is preferred for the following:

- 2.50 for students already admitted to the degree-granting college.
- 2.50 for students transferring from another University of Minnesota college.
- 2.50 for students transferring from outside the University.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

General Requirements

Recommended freshman writing course(s) for this program: RHET 1101

Program Requirements

A minimum 2.00 GPA with no grade lower than C- is required for major courses with the following designators: BIE, EDHD, HRD, and WHRE. A minimum grade of C- is also required for general psychology. Students must have a minimum 2.50 GPA to meet state licensure requirements.

Required Courses

Major Courses

BA 3033W is a required course for students who are also completing a business minor through the University's Carlson School of Management.

BA 3033W - Business Communication, WI (3.0 cr)
or RHET 3562W - Technical and Professional Writing, WI (4.0 cr)
COMM 1101 - Introduction to Public Speaking (3.0 cr)
or PSTL 1461 - Oral Communication in the Public Sphere, C/PE (3.0 cr)
or RHET 1223 - Oral Presentations in Professional Settings (3.0 cr)
PSTL 1281 - General Psychology, SSCI (4.0 cr)
or PSY 1001 - Introduction to Psychology, SSCI (4.0 cr)
MATH 1001 - Excursions in Mathematics, MATH (3.0 cr)
or MATH 1031 - College Algebra and Probability, MATH (3.0 cr)
WHRE 3011W - Introduction to Technology and Public Ethics, C/PE, WI (3.0 cr)
or WHRE 5011W - Technology and Public Ethics, C/PE, WI (3.0 cr)

Technical Skills

A limited number of technical college credits can be applied to BIE 3151 or BIE 5151.

BIE 3111 - Exploring Technology Systems (3.0 cr)
BIE 3113 - Manufacturing Technology (3.0 cr)
BIE 3114 - Construction Technology (3.0 cr)
BIE 3122 - Communication and Information Technology (3.0 cr)
BIE 3123 - Energy, Power, and Transportation Technology (3.0 cr)
BIE 5101 - Technological Problem Solving (3.0 cr)
BIE 5344 - Facilities Management in Business and Industry (3.0 cr)
BIE 3112 - Technical Drawing and Production Technologies (3.0 cr)
or AFEE 3112 - Technical Drawing and Production Technologies (3.0 cr)
WHRE 3121 - Communication, Energy and Power, Transportation and Machinery Technologies (3.0 cr)

Take 1 or more course(s) totaling 9 or more credit(s) from the following:

BIE 3151 - Technical Development: Advanced (1.0-32.0 cr)
BIE 5151 - Technical Development: Specialized (1.0-12.0 cr)
BIE 5596 - Occupational Experience in Business and Industry (1.0-10.0 cr)

Technological Knowledge

An adviser-approved substitution may be taken in place of BIE 5011.

BIE 5011 - Introduction to Computer Applications (3.0 cr)
BIE 5365 - Curriculum Development in Technology Education (3.0 cr)
WHRE 5661 - Instructional Methods for Business and Industry (2.0 cr)

Professional/Clinical Studies

CI 5452 - Reading in the Content Areas for Initial Licensure Candidates (1.0 cr)
EDHD 5001 - Learning, Cognition, and Assessment (3.0 cr)
EDHD 5003 - Developmental and Individual Differences in Educational Contexts (3.0 cr)
EDHD 5005 - School and Society (2.0 cr)
EDHD 5007 - Technology for Teaching and Learning (1.5 cr)
EDHD 5009 - Human Relations: Applied Skills for School and Society (1.0 cr)
PUBH 3003 - Fundamentals of Alcohol and Drug Abuse (2.0 cr)
or PUBH 3005 - Fundamentals of Alcohol and Drug Abuse for Teacher Education (1.0 cr)
WHRE 5696 - Teaching Internship: Introduction (1.0 cr)
WHRE 5697 - Teaching Internship: School and Classroom Settings (2.0 cr)
WHRE 5698 - Teaching Internship (3.0-8.0 cr)

Youth Studies Minor

School of Social Work

Requirements for this program are current for Fall 2006.

Required credits in this minor: 16.

The youth studies minor is a 16-credit undergraduate minor that addresses youth as an idea, youth as young people, youthhood as the everyday lives of young people, and the responses of communities to this population.

Participants in the youth studies minor learn about and critically analyze at a beginning level the families of ideas, models, concepts, discourses, and ways of understanding, responding to, and working with young people. Participants craft their unique program from among the required designated courses to prepare for graduate training/education in the many scholarly and youth work professional fields. Participants do not become trained workers with youth nor receive any certification to do youth work in any participating field.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Required Courses

Minor Courses

YOST 2002W - Introduction to Youth Studies: Understanding Youth, Young People, Youthood, and Youth Work, WI (4.0 cr)
YOST 4002W - Constructing Personal Models of Youth Scholarship and Youth Work (4.0 cr)

Take 8 or more credit(s) from the following:

CPSY 4303 - Adolescent Psychology (4.0 cr)
CPSY 4329 - Biological Foundations of Development (4.0 cr)
CPSY 4331 - Social and Personality Development (4.0 cr)
CPSY 4334W - Children, Youth in Society, C/PE, WI (4.0 cr)
CPSY 4336W - Development and Interpersonal Relations, WI (4.0 cr)
FSOS 4155 - Parent-Child Relationships (3.0 cr)
REC 2151 - Outdoor and Camp Leadership (3.0 cr)
YOST 2001 - The Everyday Lives of Youth, SSCI (4.0 cr)
YOST 3001 - Introduction to History & Philosophy of Youthwork (4.0 cr)
YOST 3003 - Bridging Theories, Research, Practices, and Observations about Youth Development and Youth Work (1.0 cr)
YOST 3101 - Introduction to Youthwork (4.0 cr)

This is the Food, Agricultural, and Natural Resource Sciences General Information and Degree Programs section of the 2006-2008 Undergraduate Catalog for the University of Minnesota, Twin Cities campus

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Food, Agricultural and Natural Resource Sciences

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College of

Food, Agricultural and Natural Resource Sciences

General Information

Effective July 1, 2006, the College of Agricultural, Food and Environmental Sciences, the College of Natural Resources, and the Department of Food Science and Nutrition joined to create the College of Food, Agricultural and Natural Resource Sciences (CFANS). The mission of CFANS is to integrate these units to enhance the University's potential to become one of the premier research institutions in the world dedicated to food systems, environmental science, renewable resources, and policy, consistent with the University's goal to become one of the top three public research universities in the world. The focus of CFANS is to enhance the University's natural biological and social science contributions to the environment, production agriculture, human health, food systems, and natural resources. The college offers outstanding programs, provides exemplary teaching and student services, and constantly strives for continuous improvements in all aspects of the university educational experience.

The college is housed in many buildings on the St Paul Campus of the University of Minnesota's Twin Cities campus. The Dean's Office and Student Services Office are housed in Coffey Hall, 1420 Eckles Avenue. The Student Services Office provides admission, registration, academic advising, and other assistance to all undergraduates. Call 612-624-6768, or visit the CFANS Web site at www.cfans.umn.edu.

The college's 16 undergraduate majors and 4 premajors will be organized within 13 academic departments.

Admission

Guidelines for admission to the College of Food, Agricultural and Natural Resource Sciences for high school graduates, transfer students, transfers within the university system, and non-degree-seeking students are explained below. For more information, call CFANS admissions, 612-625-3284 (for new freshmen) or 612-624-3220 (for transfer students).

Students seeking admission as new freshmen or as transfers from outside the University of Minnesota system apply through the Office of Admissions, 240 Williamson Hall, 231 Pillsbury Drive S.E., Minneapolis, MN 55455 (612-625-2008).

For official and up-to-date information about the University's admissions policies, procedures, and deadlines, please see the latest edition of the Undergraduate Application Booklet available from the Office of Admissions or online at http://admissions.tc.umn.edu.

Deadlines—The Office of Admissions typically accepts applications for fall semester beginning October 1 of the preceding year and admits students as long as space is available. Freshman applicants who meet the admission guidelines and apply by December 15 are guaranteed space in the following fall semester's incoming class. Final deadlines are June 1 for fall semester and October 15 for spring semester.

High School Graduates—High school graduates need to complete the University's high school course preparation requirements. (See Freshman Admission in the General Information section of this catalog).

Transfer Students—Students may apply for admission to the College of Food, Agricultural and Natural Resource Sciences from other colleges or universities. Applicants may be accepted if they meet the entrance requirements of CFANS and of the major they wish to pursue. To be competitive for admission, transfer applicants who graduated from high school during 1987 or later should have completed the following:

- algebra with a grade of at least C (except for the Scientific and Technical Communications major);
- at least a C average in transfer coursework;
- a solid foundation in math and science;
- other high school preparation requirements, including foreign language. (See High School Course Preparation in the General Information section of this catalog.)

Applicants who did not complete this coursework during high school may substitute equivalent college coursework. CFANS may admit some students who have not met these guidelines. Students who are admitted but lack preparation requirements must complete all deficiencies before graduating.

After a transfer applicant is admitted, the Office of Admissions and CFANS evaluate all previous college coursework according to the standards of the University and CFANS. The student then receives a Transfer Credit Evaluation showing how previous coursework has been evaluated. Appropriate credits earned at other accredited colleges and universities or within other units of the University may be applied toward CFANS programs. Most students find they must transfer by their junior year to meet residence and upper division course requirements of CFANS.

Applicants who graduated from high school before 1987 must meet current entrance standards except for the high school preparation and second language requirements.

Transfer students must complete all specific course and area distribution requirements of CFANS regardless of the number of credits accepted for transfer. Therefore, students who begin degree work elsewhere and intend to transfer later should carefully plan pre-transfer courses to meet as many CFANS requirements as possible.

Note: A maximum of 3 internship or practical experience credits may be transferred into CFANS.

Change of College Within the University—To transfer to the College of Food, Agricultural and Natural Resource Sciences from another college within the University, students must meet CFANS entrance guidelines. Students must complete an Application for Undergraduate Change of College and apply for transfer at one of the One Stop Student Services Centers on campus. Application deadlines are consistent with posted University admission deadlines.

Non-degree-seeking—Non-degree-seeking admission is primarily for students pursuing coursework in CFANS departments but not seeking a degree, or for students preparing to apply to a graduate program offered by CFANS departments but have prerequisites to satisfy. Admission may be processed at any time before the first day of class. The non-degree-seeking category is also open to staff members in CFANS departments taking courses through the Regents Scholarship Program and CFANS graduates returning for coursework.

Students who enter CFANS as non-degree-seeking students with the intention of transferring later to the Graduate School should be aware of restrictions on the number of non-degree-seeking credits that may be transferred to a graduate program. See the *Graduate School Catalog*.

Degrees/Majors

The College of Food, Agricultural and Natural Resource Sciences offers 16 majors, and the major curricula all lead to the B.S. degree.

Agricultural and Food Business Management
- Business management
- Financial management
- Marketing, sales and food industry management

Agricultural Industries and Marketing
- Crops and soils industries
- Food industries

Animal Science
- Industry
- Production
- Science/Biotechnology/Pre-Veterinary Medicine

Applied Economics
- Management and finance
- Food retailing
- Marketing
- Regional and public economics
- Resources and environment
- Trade and development

Applied Plant Science
- Agroecology
- Plant Improvement
- Plant Utilization

Bio-Based Products
- Bio-based products marketing and management
- Residential building science and technology

Environmental Horticulture
- Floriculture/nursery productions and retail management
- Landscape design
- Landscape implementation and management
- Turfgrass science

Environmental Sciences, Policy and Management
- Conservation and resource management
- Corporate environmental management
- Environmental education and communication
- Environmental science
- Policy, planning, law and society

Fisheries and Wildlife
- Fisheries
- Wildlife
- Conservation biology

Food Science

Forest Resources
- Forest management and planning
- Forest conservation and ecosystem management

Nutrition
- Nutrition and Dietetics
- Nutrition Science

Recreation Resource Management
- Recreation resource management
- Resource based tourism

Scientific and Technical Communication
- Beginning fall semester 2007, the Department of Rhetoric and the scientific and technical communication major will be housed in the College of Liberal Arts.

Urban and Community Forestry

Because the first year of coursework is somewhat similar among many of these programs, students may transfer between majors at the end of their freshman or sophomore year with little or no credit loss.

Each CFANS major requires an orientation class for all incoming students that provides interaction with faculty and alumni in their chosen professional field, and exposure to career, learning abroad, and student life opportunities.

Pre-professional Opportunities

Students may prepare in CFANS for the following upper division/professional programs:

Pre-Agricultural Education
- Agricultural science and technology education
- Agricultural leadership, training, and development
- Natural and managed environmental education

Pre-biosystems and agricultural engineering
- (B.S. granted by the Institute of Technology)

Pre-Bio-based products engineering
- (B.S. granted by the Institute of Technology)

Pre-landscape architecture
- (B.E.D. granted by the College of Design)

Pre-medicine and pre-dentistry

Pre-veterinary medicine

Minors

The College of Food, Agricultural and Natural Resource Sciences offers the following minors:

Agronomy

Animal science

Applied economics

Bio-based products engineering

Climatology

Corporate environmental management

Designing documents with new and emerging technologies

Entomology

Environment and natural resources

Environmental horticulture

Fisheries and wildlife

Food science

Food systems and the environment

Forest resources

Integrated pest management in cropping systems

International agriculture

Internet, science, and society

Land, nature, and environmental values

Nutrition

Recreation resource management

Soil science

Sustainable agriculture

Technical communication

Urban and community forestry

Water science

CFANS students may also apply for a minor in any University department or program. Upon graduation, the minor is listed on the transcript with degree and major. For assistance in planning a minor, contact the Student Services Office. Detailed minor requirements are described in the CFANS Degree Programs and Minors section of this catalog.

Graduate Degrees—The master of science (M.S.) and the doctor of philosophy (Ph.D.) in sixteen areas of study are offered through the Graduate School in cooperation with The College of Food, Agricultural and Natural Resource Sciences. For more information, consult the Graduate School Catalog or CFANS Web site.

Honors

CFANS students may participate in honors at both the freshman/sophomore level and the junior/senior level.

At the freshman/sophomore level, students participate in specially designed honors courses and honors colloquia focusing on current issues in their chosen field. Students complete three honors courses in their first two years; one must be an honors colloquium (CFAN 1000H). Completion of the freshman/sophomore honors program is recognized by a certificate and by designation on a student's transcript.

The heart of the junior/senior level honors program is a research project supervised by a faculty mentor. Students also participate in other honors options designed to enhance their experiences. The last 60 credits of A-F registration (including transfer coursework) with the minimum GPAs specified below.

Transcripts of students graduating with honors show one of the following:

Cum laude (minimum GPA: 3.50)

Magna cum laude (minimum GPA: 3.66)

Summa cum laude (minimum GPA: 3.75)

Students also receive recognition during commencement.

To achieve the honors notation on their transcripts, students must meet the GPAs stated above and complete all honors program requirements, which for most students comprises one semester of the honors colloquium, an honors option, and honors research. The honors option provides an opportunity to explore honors classes from other programs, and is very flexible and can be adapted to many situations and contexts. Registration in honors courses requires admission to the Honors Program and college office approval.

Graduation With Distinction—See the Policies section of the catalog.

Dean's List—To be eligible for the Dean's List, a student must be a current CFANS student and have completed 12 credits (A-F registration) with a GPA of at least 3.667. Students on the Dean's List receive a letter from the dean and are publicly listed in the Honors and Recognition Web page of the college. There is a transcript notation for each term a student is on the Dean's List.

Policies

Grading—All required courses in the major must be taken A-F with grades of C- or better; students who receive a grade below C- in a major course must repeat the course.

Honor System—under an honor system adopted on the St. Paul campus, students accept responsibility for the supervision of student behavior during examinations and pledge not to give or receive aid. A student or faculty member who observes an act of dishonesty must report the incident to the college Student Scholastic Standing Committee. For more information about the honor system, contact the Student Services Office.

Directed Study—With instructor approval, students may take custom-designed courses through independent study. Contact the Student Services Office for more information.

Policy Waivers—Occasionally it may be to the educational advantage of both the student and the department to consider an alternative or substitution in an academic policy or curricular requirement, provided the basic spirit of the policy or requirement is maintained. A student may petition for a departure from normal procedure. Students must receive major adviser/departmental recommendation before the petition is routed to the Student Scholastic Standing Committee.

Repeating Courses—An undergraduate student may repeat a course once. When a student repeats a course, (a) both grades for the course shall appear on the official transcript, (b) the course credits may not be counted more than once toward degree and program requirements, and (c) only the last enrollment for the course shall count in the student's GPA. The preceding sentence of this policy shall not apply to courses using the same number but where students study different content each term of enrollment. If an undergraduate student repeats a course after his/her degree has been awarded, the original course grade will not be excluded from the degree GPA nor will the new grade be included in the degree GPA.

Special Examinations for Credit—Students who believe their knowledge of a subject is equal to that required to complete a particular course may request to take an examination for credit. If the Student Scholastic Standing Committee and the department approve, arrangements can be made with an appropriate instructor to take an examination. Usually no grade is assigned. A fee is assessed for each examination. Credit by special examination is not granted for language or mathematics courses taken in high school.

Suspension—to appeal a suspension (see Probation in the Policies section of this catalog), a student must obtain a Petition for Reinstatement from the Student Services Office. The petition must be completed and turned in to the Student Scholastic Standing Committee, along with any supporting documents. The final decision rests with the Student Scholastic Standing Committee, which informs the student of its decision in writing.

Graduation Requirements

To receive the B.S. degree, CFANS students must meet the following requirements.

- Complete the prescribed curriculum as listed in the student's degree program.
- Achieve a cumulative GPA of at least 2.00, with grades of C- or better in each course in the major. Major course work is defined as all required courses listed in each major program including specialization courses, track courses, concentration courses, professional courses, and writing courses. The only courses not included in this policy are free electives and courses taken beyond those in the major coursework to satisfy liberal education requirements.
- Satisfy liberal education requirements.
- Satisfy residence and other general University requirements.
- Officially apply for graduation.
- Meet all financial obligations to the University.

Liberal Education—Students must meet the University's liberal education requirements, including the diversified core and designated theme requirements. The diversified core requirements can be met by completing the core curriculum

listed in each degree program. To satisfy the designated theme requirements, at least 3 credits are required in each of the following areas: cultural diversity; international perspectives; environment; and citizenship and public ethics. The environment theme may be satisfied by completing the required courses in each degree program. The remaining themes may be satisfied by careful selection among core professional and elective courses. See individual degree programs for specific courses.

Field Session Requirements—Forest resources, urban and community forestry, and fisheries and wildlife majors are required to complete a three-week summer field session at the Cloquet Forestry Center in their sophomore or junior years. To attend, students must have completed 30 semester credits and attained a cumulative GPA of at least 2.00. Students enrolling in the forest resources session must complete the following courses with a grade of at least C-: BIOL 1009 or 1001, CHEN 1011 or 1021, FR 1101, and precalculus or college algebra. Students enrolling in the fisheries and wildlife session must have completed the following courses with a grade of at least C-: one year of introductory biology and BIOL 3407. Environmental sciences, policy and management majors are required to complete either a field session or complete ESPM 4096 - Professional Experience Program: Internship (1-3 cr).

Students in the forest resources major are required to complete an advanced field session at the Cloquet Forestry Center in their senior year. To attend, students must attain a cumulative GPA of at least 2.00, complete the introductory field session, FR 3218, 3262, 3411, and 3431. This four-week session is held during the May session and the first part of the summer session.

Advising

Advising services for both current and prospective students are provided by professional academic advisers and by departmental faculty.

Each CFANS student, with adviser assistance, is responsible for learning curricular and graduation requirements and developing a course program and timetable to meet them. All freshmen students are assigned a professional academic adviser for their first year and then assigned a faculty adviser within their major area of study at the beginning of their sophomore year. All transfer students are assigned immediately to a faculty adviser in their major area of study.

Special Learning Opportunities

Many majors in CFANS offer field trips, hands-on experiential learning, and other opportunities. Please speak with your adviser or major coordinator for more information.

Undergraduate Research Opportunities Program (UROP)— The University of Minnesota's UROP offers financial awards to undergraduates for research, scholarly, or creative projects undertaken in partnership with a faculty member. Applications are accepted in the fall and early spring each year.

For more information or an application packet, students should contact the CFANS Student Services Office, 190 Coffey Hall (612-624-6768).

Internships—CFANS juniors and seniors may participate in internships designed for students who wish to reinforce their academic experience by working in an area related to their course of study. Students work full time either fall or spring semester or during the summer. Students earn 1-3 credits for satisfactory completion of an internship. Students may enroll in two different internships, for a total of 6 credits. Salaries are paid by the cooperating businesses, industries, producers, and agencies participating in the program. For more information, students should consult their adviser or the St. Paul Campus Career Center in 198 McNeal Hall (612-624-2710).

Scholarships

CFANS has an extensive scholarship program for freshmen, transfer students, and continuing students. Scholarship information, applications, and deadlines are available online at www.cfans.umn.edu/scholarships.

International Programs

The College of Food, Agricultural and Natural Resource Sciences offers several types of study abroad that can especially enhance degree work, including field study, enrollment in international institutions, and integrated classroom study. International Programs coordinates international opportunities in CFANS (135 Skok Hall; 612-624-3221; www.cfans.umn.edu/international.html).

Some scholarships are available through CFANS to help defray costs of overseas study and travel. A written report is required. Preference is given to proposals from non-English speaking countries. Students must initiate and plan the project with the aid of a faculty adviser. For more information, contact the CFANS Student Services Office, 190 Coffey Hall (612-624-6768).

Students fluent in their host country's language can participate in integrated classroom study programs that permit students to take regular university courses alongside students from the host country. The University's student exchanges and consortium memberships provide access to universities in many countries. Conservation and resource management, agricultural, business and policy, plant, and animal science curricula are available throughout the world.

CFANS students need not always seek credit in their major. Study abroad is encouraged for language acquisition or cultural learning. The resulting credits can often be used as electives or to fulfill second language or liberal education requirements. The University and other institutions sponsor a broad range of intensive language and area studies programs.

MAST Experience Abroad—The MAST Experience Abroad program provides qualified individuals the opportunity to broaden their agricultural/horticultural skills and knowledge as well as develop or improve international language skills. Practical training programs of 3 to 12 months are available to individuals between the ages of 18 and 30. Participants gain a cross-cultural experience by living and working with a host family in Australia, Austria, Brazil, Denmark, Finland, France, Germany, Italy, the Netherlands, New Zealand, Sweden, Switzerland, or the United Kingdom. Departure dates are in January, April, June, and September. For more information, students should contact the MAST International office, 135 Skok Hall (612-624-3740).

Student Project for Amity among Nations (SPAN)—SPAN consists of summer overseas research on a topic of the student's choosing, preceded by a year's on-campus preparation and followed by project write-up in the fall. The SPAN destinations change from year to year.

More information for all of these opportunities is available from your adviser, International Programs in CFANS staff, or by going to the U of M's Learning Abroad Center's Web site at www.umabroad.umn.edu, 612-626-9000. If you are just beginning your exploration of international opportunities, there is an academic adviser in the Student Services Office in 190 Coffey Hall who can help identify your next steps.

Career Information

The St. Paul Campus Career Center, 198 McNeal Hall, offers assistance and advice to students seeking summer jobs and internships, as well as permanent employment after graduation. Job search assistance for all students is provided by career services staff and by department faculty. A series of workshops are provided by the center on topics such as résumé writing, interviewing, initiating internship and job searches, and summer/seasonal intern hiring updates. See www.stpaulcareers.umn.edu for more information.

Student Organizations

CFANS Student Board—The Student Board promotes student involvement in issues related to the quality and content of education both in and out of the classroom. The board creates channels of communication between the students, faculty, and administration of CFANS. Students may file for election to the board or may serve as a representative of one of the clubs or organizations affiliated with the college. More information is available in the Student Services Office in 190 Coffey Hall.

Ambassadors—The Ambassadors is a voluntary, honorary organization consisting of 30 CFANS undergraduates who assist in promoting the college to prospective students and their parents, alumni, potential donors, and the community. Ambassadors gain experience in public relations and recruitment, and develop communications skills through public speaking engagements and small group discussions with prospective students. More information is available in the Student Services Office in 190 Coffey Hall.

St. Paul Campus Board of Colleges—The St. Paul Campus Board of Colleges directs and coordinates student activities and encourages student leadership throughout the St. Paul campus. Its membership is drawn from the following colleges: Biological Sciences, The College of Food, Agricultural and Natural Resource Sciences , and Veterinary Medicine. The board cooperates with the Minnesota Student Association and the Assembly Committee on Student Affairs (ACSA). For more information, inquire at the Office for Student Affairs in 130 Coffey Hall.

The Twin Cities Student Unions Board of Governors—The Twin Cities Student Unions Board of Governors is an advisory board for the St. Paul Student Center and Coffman Memorial Union. Composed of students elected to represent various academic and student organizations on the Minneapolis and St. Paul campuses, the board formulates policies for operation of the student unions and establishes its budget. For more information, call 612-624-4738.

Student Representation on College and University Committees—All CFANS committees and most all-University committees have student representatives. For college committees, selection is made by the CFANS Student Board.

Governance—Students are encouraged to participate in governance activities at the department, college, or campus level. Within each department, several committees (including curriculum committees) have student representatives. Students serve on CFANS committees and on the Student Board, which advises the dean on student issues and concerns. Students may also participate in the St. Paul Campus Board of Colleges, which directs student activities and acts as a liaison between the student body and administration, and on the Twin Cities Unions Board of Governors, which establishes programs, operation policies, and budgets for the St. Paul Student Center and Coffman Union. Finally, CFANS student senators are elected to serve on the executive committee of the Minnesota Student Association and the University Senate.

Clubs—Student clubs in The College of Food, Agricultural and Natural Resource Sciences include:

- Agricultural Education Club
- Alpha Epsilon Delta (pre-med and pre-vet)
- Alpha Tau Alpha
- Alpha Zeta Fraternity (an honor and service fraternity)
- American Association of Bovine and Swine
- American Society of Agricultural Engineers, Student Branch
- Applied Economics Student Association
- Block and Bridle
- Collegiate Agri-Women
- Cornercopia Student Organic Farm
- Fisheries, Wildlife and Conservation Biology Club (with an affiliated student chapter of The Wildlife Society)
- Frenatar: Entomology Student Association
- Food Science Club
- Forestry Club
- Forest Products Society/Student Chapter
- Gopher Crops and Soils
- Gopher Dairy Club
- Horticulture Club
- Leaders of Environmental Science Students (LOESS)
- National Agri-Marketing Association (NAMA)
- National Society for Minorities in Agriculture, Natural Resources and Related Sciences (MANRRS)
- Natural and Environmental Defense Squad
- Pre-Vet Med Club
- Recreation Resource Management Club
- Residential Building Science and Technology Club
- Rhetoric's Association of Student Technical Communicators (R.A.S.T.E.C.)
- Sigma Pi Honor Society
- Student Chapter of the Institute of Packaging Professionals (IOPP)
- Student Chapter of the Paper Industry Management Association (PIMA)
- Student Chapter of the Society of American Foresters
- Student Chapter of the Technical Association of the Pulp and Paper Industry (TAPPI)
- Student Organization of Nutrition and Dietetics (SOND)
- Students in Honors
- The Sheep and Goat Club
- Turf Club (Golf Course Superintendent Association, U of M Student Chapter)
- Urban Forestry Club
- Water Resources Students in Action

Directory

CFANS Administration

Dean's Office

At the time this catalog went to print, the University was conducting a national search for a new dean. See the CFANS Web site for updated information.

Associate Dean for Faculty & Academic Affairs

Ann Hill Duin
277 Coffey Hall, 612-624-4212

Assiociate Dean for Undergraduate Programs

Mel Baughman
190 Coffey Hall, 612-625-1288

Associate Dean for Research

F. Abel Ponce de Leon
277 Coffey Hall, 612-624-2299

Associate Dean for Extension

Michael A. Schmitt
277 Coffey Hall, 612-625-7098

Associate Dean and Coordinator, Cloquet Forestry Center

Robert A. Stine
277 Coffey Hall, 612-624-9298

International Programs

Director of International Programs

John Vreyens
612-624-1774

Student Services

Director of Student Services

Bill Ganzlin
190 Coffey Hall, 612-624-3047

Admissions/Prospective Student Services

General Information
612-624-3045

Departments

Agricultural, Food, and Environmental Education

Darrell Hartle, interim coordinator
320 Vocational and Technical Education Building
612-624-4248

Agronomy and Plant Genetics

Nancy Ehlke, interim head
411 Borlaug Hall
612-625-1791

Animal Science

James Linn, interim head
205 Haecker Hall
612-624-1205

Applied Economics

Rob King, head
231 Classroom Office Building
612-625-0231

Bioproducts and Biosystems Engineering

Shri Ramaswamy, head
207 Kaufert Lab
612-624-8797

Entomology

Mark Ascerno, head
219 Hodson Hall
612-624-1299

Fisheries, Wildlife, and Conservation Biology

Francesca Cuthbert, interim head
320 Hodson Hall
612-624-1756

Food Science and Nutrition

Allen S. Levine, head
225 Food Science and Nutrition
612-624-3224

Forest Resources

Alan Ek, head
115 Green Hall
612-624-3400

Horticultural Science

Tom Michaels, head
305 Alderman Hall
612-624-7711

Plant Pathology

Carol Ishimaru, head
495 Borlaug Hall
612-625-9736

Rhetoric

Laura Gurak, head
64 Classroom Office Building
612-624-3773

Soil, Water, and Climate

Edward A. Nater, head
439 Borlaug Hall
612-625-9734

Outreach

Bell Museum of Natural History

Scott Lanyon
10 Church Street S.E.
612-624-7217

Cloquet Forestry Center

Robert A Stine
Cloquet, MN
218-726-6400

Minnesota Landscape Arboretum

Peter Olin, Director
Chanhassen, MN
952-443-1412

North Central Research and Outreach Center

Daniel L. Erkkila, interim head
Grand Rapids, MN
218-327-4361

Northwest Research and Outreach Center

Larry Smith, head
Crookston, MN
218-281-8602

Southern Research and Outreach Center

Forrest Izuno, head
Waseca, MN
507-837-5615

Southwest Research and Outreach Center

Pauline Nickel, head
Lamberton, MN
507-752-5068

UMore Park

Philip Larsen, director of operations
Rosemount, MN
651-423-2455

West Central Research and Outreach Center

Greg Cuomo, head
Morris, MN
320-589-1711

Degree Programs and Minors

Agricultural Industries and Marketing B.S.

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 108.

Degree: Bachelor of Science.

This major prepares students for careers in agricultural industries. Industries related to modern agriculture include manufacturers and distributors of farm production inputs (such as equipment, structures, health products, seeds, fertilizers, and crop protection products); assemblers, processors, manufacturers, and distributors of products originating from farms (products such as meat, milk, eggs, wool, grains, fruits, vegetables, nursery crops, flowers, and turf); and finance and insurance industries providing agricultural credit. Agribusinesses such as these, as well as state, federal, and marketing agencies, need individuals who have a broad education in the scientific (and technical) aspects of agriculture, effective work and communication skills, and quantitative and qualitative skills to solve business problems.

The scientific knowledge and technical skills necessary to become an effective agribusiness professional are provided through requirements in the basic and agricultural sciences and are strengthened by selection of one of three areas of emphasis: crops and soils industries, food industries, or an individualized emphasis.

With 21 free standing elective credits, all AIM majors are encouraged to pursue a CFANS or other minor. Only 6 credits in the AIM major may also be counted towards a minor. For students interested in preparing for the Certified Crop Advisor (CCA) exam or the certified professional agronomist (CPAg) programs, a minor in agronomy is highly recommended.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

General Requirements

Recommended freshman writing course(s) for this program: RHET 1101

Program Requirements

Students must complete at least 14 credits in their sub-plan emphasis plus an internship or a student project. All required courses must be taken A-F, and students must earn a grade of at least a C-.

Required Courses

Quantitative Foundations

MATH 1031 - College Algebra and Probability, MATH (3.0 cr)
or MATH 1131 - Finite Mathematics, MATH (3.0 cr)
or MATH 1142 - Short Calculus, MATH (4.0 cr)
AGRO 4101 - Agricultural Decision Making and Experimentation (3.0 cr)
or ANSC 2211 - Biometrics for Livestock, MATH (3.0 cr)
or STAT 3011 - Introduction to Statistical Analysis, MATH (4.0 cr)

Communication

RHET 1223 - Oral Presentations in Professional Settings (3.0 cr)
RHET 3257 - Scientific and Technical Presentations (3.0 cr)
RHET 3266 - Group Process, Team Building, and Leadership, C/PE (3.0 cr)
RHET 3562W - Technical and Professional Writing, WI (4.0 cr)
RHET 4165 - Managerial and Organizational Communication, Planning, and Change (3.0 cr)
or RHET 4258 - Information-Gathering Techniques in Scientific and Technical Communication (3.0 cr)

Business Management

APEC 1101 - Principles of Microeconomics, SSCI (3.0 cr)
APEC 1102 - Principles of Macroeconomics, IP, SSCI (3.0 cr)
APEC 1251 - Principles of Accounting (3.0 cr)
MKTG 3001 - Principles of Marketing (3.0 cr)
APEC 3411 - Commodity Marketing (3.0 cr)
or APEC 4451W - Food Marketing Economics, C/PE, WI (3.0 cr)
APEC 3451 - Food and Agricultural Sales (3.0 cr)
or MKTG 4030 - Selling and Sales Management (4.0 cr)
APEC 3811 - Principles of Farm Management (3.0 cr)
or APEC 3821 - Retail Center Management (3.0 cr)
or PSTL 1513 - Small Business Fundamentals With E-Business Applications (3.0 cr)
or MGMT 3001 - Fundamentals of Management (3.0 cr)

Program Sub-plans

Students are required to complete one of the following sub-plans. (Note: The honors sub-plan does not meet this requirement.) Honors students are required to complete one sub-plan plus the honors sub-plan.

Crops and Soils Industries

Students must complete at least 14 credits in their area of emphasis and an internship or a student project.

Required Courses

Science Foundations

CHEM 1011 - Introductory Chemistry: Lecture and Laboratory, PHYS SCI/L (4.0 cr)
SOIL 2125 - Basic Soil Science, ENVT (4.0 cr)
AGRO 1101 - Biology of Plant Food Systems, BIOL SCI/L, ENVT (4.0 cr)
or BIOL 1001 - Introductory Biology I: Evolutionary and Ecological Perspectives, BIOL SCI/L, ENVT (4.0 cr)
or BIOL 1009 - General Biology, BIOL SCI/L (4.0 cr)
BIOC 1001 - Elementary Biochemistry (3.0 cr)
or BIOC 2011 - Biochemistry for the Agricultural and Health Sciences (3.0 cr)

Agriculture
AGRO 1093 - Directed Studies (1.0-4.0 cr)
AGRO 1103 - Crops, Environment, and Society, ENVT (4.0 cr)
AGRO 1660 - First-Year Colloquium/Experience in Agroecosystems Analysis (2.0 cr)
AGRO 4660 - Senior Capstone: Leadership, Decision Making, and Problem Solving (2.0 cr)
AGRO 4096 - Professional Experience Program: Internship (1.0-3.0 cr)
or AIM 4011 - Student Project/Field Investigation (3.0 cr)

Crops and Soils Industries
CFAN 3001 - Pests and Crop Protection (3.0 cr)
SOIL 3416 - Plant Nutrients in the Environment (3.0 cr)
AGRO 4005 - Applied Crop Physiology and Development (4.0 cr)
or
BIOL 3002 - Plant Biology: Function (2.0 cr)
BIOL 3005W - Plant Function Laboratory, WI (2.0 cr)
and one course from the following:
AGRO 3203W - Environment, Global Food Production, and the Citizen, C/PE, ENVT, WI (3.0 cr)
or AGRO 4401 - Plant Genetics and Breeding (4.0 cr)
or AGRO 4505 - Biology, Ecology, and Management of Invasive Plants (3.0 cr)
or AGRO 4603 - Field Crop Scouting and Problem Diagnosis (3.0 cr)
or AGRO 4605 - Management Strategies for Crop Production (4.0 cr)
or ESPM 3221 - Soil Conservation and Land-Use Management (3.0 cr)

Food Industries

Students must complete at least 14 credits in the area of emphasis and an internship or a student project.

Required Courses

Science Foundations
CHEM 1021 - Chemical Principles I, ENVT, PHYS SCI/L (4.0 cr)
CHEM 1022 - Chemical Principles II, ENVT, PHYS SCI/L (4.0 cr)
AGRO 1101 - Biology of Plant Food Systems, BIOL SCI/L, ENVT (4.0 cr)
or BIOL 1001 - Introductory Biology I: Evolutionary and Ecological Perspectives, BIOL SCI/L, ENVT (4.0 cr)
or BIOL 1009 - General Biology, BIOL SCI/L (4.0 cr)

Agriculture
FSCN 1102 - Food: Safety, Risks, and Technology, C/PE (3.0 cr)
FSCN 1112 - Principles of Nutrition, ENVT (3.0 cr)
FSCN 1021 - Introductory Microbiology, BIOL SCI/L (4.0 cr)
or VBS 2032 - General Microbiology With Laboratory (4.0 cr)
AIM 4011 - Student Project/Field Investigation (3.0 cr)
or FSCN 4096 - Professional Experience Program: Internship (1.0-3.0 cr)

Food Industries
FSCN 3102 - Introduction to Food Science (3.0 cr)
FSCN 3731 - Food Service Operations Management Laboratory (2.0 cr)
FSCN 3732 - Food Service Operations Management (3.0 cr)
FSCN 4131 - Food Quality (3.0 cr)
ANSC 1511 - Food Animal Products for Consumers (3.0 cr)
or FSCN 3612 - Life Cycle Nutrition (3.0 cr)
or FSCN 3615 - Sociocultural Aspects of Food, Nutrition, and Health, CD, SSCI (3.0 cr)
or FSCN 4614 - Community Nutrition, CD (3.0 cr)
or MKTG 3010 - Marketing Research (4.0 cr)

Individualized

At least 14 credits must be selected in consultation with an adviser and with approval of the AIM major committee. The courses comprising the individualized emphasis must have a definite theme. A collection of unrelated courses is unacceptable.

Required Courses

Science Foundations
CHEM 1011 - Introductory Chemistry: Lecture and Laboratory, PHYS SCI/L (4.0 cr)
SOIL 2125 - Basic Soil Science, ENVT (4.0 cr)
AGRO 1101 - Biology of Plant Food Systems, BIOL SCI/L, ENVT (4.0 cr)
or BIOL 1001 - Introductory Biology I: Evolutionary and Ecological Perspectives, BIOL SCI/L, ENVT (4.0 cr)
or BIOL 1009 - General Biology, BIOL SCI/L (4.0 cr)
BIOC 1001 - Elementary Biochemistry (3.0 cr)
or BIOC 2011 - Biochemistry for the Agricultural and Health Sciences (3.0 cr)

Agriculture
AGRO 1093 - Directed Studies (1.0-4.0 cr)
AGRO 1103 - Crops, Environment, and Society, ENVT (4.0 cr)
AGRO 1660 - First-Year Colloquium/Experience in Agroecosystems Analysis (2.0 cr)
AGRO 4660 - Senior Capstone: Leadership, Decision Making, and Problem Solving (2.0 cr)
AGRO 4096 - Professional Experience Program: Internship (1.0-3.0 cr)
or AIM 4011 - Student Project/Field Investigation (3.0 cr)

Individualized Emphasis Electives
14 credits from individual electives

Agricultural and Food Business Management B.S.

Applied Economics

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 64.

Degree: Bachelor of Science.

The agricultural and food business management major is offered jointly by CFANS and the Carlson School of Management. The curriculum emphasizes concepts and methods from economics and business management and their use in identifying, analyzing, and solving management problems related to food, agriculture, natural resources, and economic development. The program provides a balance between applied economics and business management studies, with a limited amount of applied science. Students may elect a variety of courses in their junior and senior years to accommodate special interests and career goals.

Graduates of the curriculum are prepared for a wide range of employment opportunities in the food system and other agribusinesses. Examples of employment areas include finance and banking, management, input, commodity and food marketing, sales, administration, public and industrial relations, production management, economic and statistical analysis, managerial accounting, management information systems, and transportation.

Students completing the program may also pursue graduate studies in preparation for research, teaching, or continuing education positions in academic institutions, government agencies, or industry.

Admission Requirements

Students must complete 60 credits before admission to the program.

A GPA above 2.00 is preferred for the following:

- 2.80 for students already admitted to the degree-granting college.
- 2.80 for students transferring from another University of Minnesota college.
- 2.80 for students transferring from outside the University.

Students are admitted to the major after satisfactory completion of a pre-agricultural and food business management program. Admission standards are developed in conjunction with the Carlson School of Management. Application deadlines are April 15 for fall semester and October 15 for spring semester.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Required Courses for Admission

Management

Complete the following management "tool" courses on an A-F grading basis before entering the program. Students must earn a GPA of at least 2.50 in the "tool" courses.

Students contemplating graduate work in applied economics are encouraged to take both MATH 1271 and MATH 1272.

APEC 1101 and APEC 1102 are recommended courses.

ACCT 2050 - Introduction to Financial Reporting (4.0 cr)
APEC 1101 - Principles of Microeconomics, SSCI (3.0 cr)
or ECON 1101 - Principles of Microeconomics, IP, SSCI (4.0 cr)
APEC 1102 - Principles of Macroeconomics, IP, SSCI (3.0 cr)
or ECON 1102 - Principles of Macroeconomics, IP, SSCI (4.0 cr)
OMS 2550 - Business Statistics: Data Sources, Presentation, and Analysis (4.0 cr)
or STAT 3011 - Introduction to Statistical Analysis, MATH (4.0 cr)
MATH 1142 - Short Calculus, MATH (4.0 cr)
or MATH 1271 - Calculus I, MATH (4.0 cr)

General Requirements

Recommended freshman writing course(s) for this program: RHET 1101

Program Requirements

All required courses must be taken A-F, and students must earn a grade of at least a C-. Students may not major in both agricultural and food business management and applied economics.

Required Courses

Communication

RHET 1152W - Writing on Issues of Science and Technology, C/PE, WI (4.0 cr)
or RHET 3562W - Technical and Professional Writing, WI (4.0 cr)
COMM 1101 - Introduction to Public Speaking (3.0 cr)
or RHET 1223 - Oral Presentations in Professional Settings (3.0 cr)
BA 3033W - Business Communication, WI (3.0 cr)
or COMM 3441 - Introduction to Organizational Communication (3.0 cr)
or RHET 3257 - Scientific and Technical Presentations (3.0 cr)

Professional Courses

APEC 1001 - Orientation to Applied Economics (1.0 cr)
APEC 3001 - Applied Microeconomics: Consumers, Producers, and Markets, SSCI (4.0 cr)
APEC 3002 - Applied Microeconomics: Managerial Economics (4.0 cr)
APEC 3006 - Applied Macroeconomics: Government and the Economy (3.0 cr)
APEC 3007 - Applied Macroeconomics: Policy, Trade, and Development, IP (3.0 cr)
APEC 3501 - Agribusiness Finance (3.0 cr)
APEC 4821W - Agribusiness Management, WI (3.0 cr)
ACCT 3001 - Introduction to Management Accounting (3.0 cr)
MGMT 3001 - Fundamentals of Management (3.0 cr)
MKTG 3001 - Principles of Marketing (3.0 cr)
OMS 3001 - Operations Management (3.0 cr)

Ethics and Responsible Management

Student must take one course (3 credits) that fosters one or more of the following objectives: responsible judgment about the management of natural resources and the environment; responsible judgment regarding ethical and policy issues related to agriculture; application of global perspectives to agricultural, food, and environmental issues and decisions; application of a historical perspective to the role of science and technology.

CFAN 1501 - Biotechnology, People, and the Environment, ENVT (3.0 cr)
or AGRO 1103 - Crops, Environment, and Society, ENVT (4.0 cr)
or AGRO 3203W - Environment, Global Food Production, and the Citizen, C/PE, ENVT, WI (3.0 cr)
or ANSC 1011 - Domestic Animals and Society, C/PE, ENVT (3.0 cr)
or BAE 5212 - Safety and Environmental Health Issues in Plant and Animal Production and Processing, C/PE, ENVT, H (3.0 cr)
or BIOL 4501 - Social Uses of Biology, C/PE (3.0 cr)
or EE 1701W - Energy, Environment, and Society, C/PE, ENVT, WI (3.0 cr)
or EEB 3001 - Ecology and Society, ENVT (3.0 cr)
or ESPM 3011W - Ethics and Leadership in Resource Management, C/PE, ENVT, WI (3.0 cr)
or ESPM 4061W - Water Quality and Natural Resources, ENVT, WI (3.0 cr)
or ESPM 1011 - Issues in the Environment, C/PE, ENVT (3.0 cr)
or ESPM 1051 - Introduction to Environmental Science, ENVT (3.0 cr)
or FSCN 1102 - Food: Safety, Risks, and Technology, C/PE (3.0 cr)
or GEO 3005 - Earth Resources, C/PE, IP (3.0 cr)
or GEOG 3401 - Geography of Environmental Systems and Global Change, WI (4.0 cr)
or HSCI 3211 - Biology and Culture in the 19th and 20th Centuries, HP (3.0 cr)
or HSCI 3331 - Technology and American Culture, HP (3.0 cr)
or PBIO 1212 - Plants and Society, ENVT (3.0 cr)

Program Sub-plans

Students are required to complete one of the following sub-plans. (Note: The honors sub-plan does not meet this requirement.) Honors students are required to complete one sub-plan plus the honors sub-plan.

Business Management

Students must take a minimum of two courses (6-8 credits) in APEC or ECON and a minimum of two courses (6-8 credits) from CSOM or DHA 3242 or 3245 only.

Required Courses

Business Management

Take 2 or more course(s) from the following:

APEC 3451 - Food and Agricultural Sales (3.0 cr)
APEC 4096 - Professional Experience Program: Internship (1.0-3.0 cr)
APEC 4481 - Futures and Options Markets (3.0 cr)
APEC 5711 - U.S. Agricultural and Environmental Policy (3.0 cr)
APEC 5811 - Cooperative Organization (3.0 cr)

Take 2 or more course(s) from the following:
ACCT 3201 - Intermediate Management Accounting (2.0 cr)
ACCT 5100 - Corporate Financial Reporting (4.0 cr)
BLAW 3058 - The Law of Contracts and Agency (4.0 cr)
DHA 3245 - Multichannel Retailing (3.0 cr)
DHA 3242 - Retail Buying (3.0 cr)
FINA 4241 - Corporate Financing Decisions (4.0 cr)
FINA 4242 - Corporate Investment Decisions (4.0 cr)
HRIR 3021 - Human Resource Management and Industrial Relations (3.0 cr)
HRIR 3032 - Training and Development (2.0 cr)
HRIR 3042 - The Individual and Organizational Performance (2.0 cr)
MGMT 3010 - Introduction to Entrepreneurship (4.0 cr)
MGMT 4002 - Managerial Psychology (4.0 cr)
MGMT 4008 - Entrepreneurial Management (4.0 cr)

Financial Management

Students must take a minimum of two courses (6-8 credits) in APEC or ECON and a minimum of two courses (6-8 credits) from CSOM or DHA 3242, 3245 only.

Required Courses

Financial Management
Take 2 or more course(s) from the following:
APEC 4096 - Professional Experience Program: Internship (1.0-3.0 cr)
APEC 4481 - Futures and Options Markets (3.0 cr)
APEC 4501 - Financial Applications (3.0 cr)
APEC 5341 - Public Finance (3.0 cr)
APEC 5751 - Global Trade and Policy, IP (3.0 cr)
ECON 3701 - Money and Banking (3.0 cr)
ECON 4432W - International Finance, IP, WI (3.0 cr)
ECON 4721H - Honors Course: Money and Banking, H (4.0 cr)
ECON 4751 - Financial Economics (3.0 cr)
Take 2 or more course(s) from the following:
ACCT 5101 - Intermediate Accounting I (4.0 cr)
ACCT 5125 - Auditing Principles and Procedures (4.0 cr)
ACCT 5160 - Financial Statement Analysis (2.0 cr)
BLAW 3058 - The Law of Contracts and Agency (4.0 cr)
DHA 3242 - Retail Buying (3.0 cr)
DHA 3245 - Multichannel Retailing (3.0 cr)
FINA 4121 - Financial Markets and Interest Rates (2.0 cr)
FINA 4122 - Banking Institutions (2.0 cr)
FINA 4241 - Corporate Financing Decisions (4.0 cr)
FINA 4242 - Corporate Investment Decisions (4.0 cr)
FINA 4321 - Portfolio Management and Performance Evaluation (2.0 cr)
FINA 4322 - Security Analysis (2.0 cr)
FINA 4641 - International Finance and Risk Managment (4.0 cr)
INS 4100 - Corporate Risk Management (2.0 cr)

Individualized

Students preparing for career opportunities that emphasize skills such as accounting, communications, law, or information systems may use this alternative to design an area of emphasis. A program of study under the emphasis must be approved by the adviser and the major coordinator. At least 6 of the 12 credits must be completed after receiving approval.

Required Courses

Individualized Area
Select 12 credits from individual electives.

Marketing, Sales, & Food Industry Management

Students must take a minimum of two courses (6-8 cr) in APEC or ECON and a minimum of two courses (6-8 cr) from CSOM or DHA 3242, 3245 only.

Required Courses

Marketing, Sales and Food Industry Management
Take 2 or more course(s) from the following:
APEC 3411 - Commodity Marketing (3.0 cr)
APEC 3451 - Food and Agricultural Sales (3.0 cr)
APEC 3821 - Retail Center Management (3.0 cr)
APEC 4096 - Professional Experience Program: Internship (1.0-3.0 cr)
APEC 4103 - World Food Problems, C/PE, IP (3.0 cr)
APEC 4451W - Food Marketing Economics, C/PE, WI (3.0 cr)
APEC 4481 - Futures and Options Markets (3.0 cr)
APEC 5711 - U.S. Agricultural and Environmental Policy (3.0 cr)
APEC 5751 - Global Trade and Policy, IP (3.0 cr)
Take 2 or more course(s) from the following:
DHA 3242 - Retail Buying (3.0 cr)
DHA 3245 - Multichannel Retailing (3.0 cr)
MKTG 3010 - Marketing Research (4.0 cr)
MKTG 4020 - Advanced Logistics and Supply Chain Management (2.0 cr)
MKTG 4030 - Selling and Sales Management (4.0 cr)
MKTG 4040 - Buyer Behavior (4.0 cr)
MKTG 4050 - Integrated Marketing Communications (4.0 cr)
MKTG 4060 - Marketing and Distribution Channels (4.0 cr)
MKTG 4070 - International Marketing (2.0 cr)
MKTG 4080 - Marketing Strategy (4.0 cr)
OMS 3056 - Operations Planning and Control (4.0 cr)

Agronomy Minor

Agronomy and Plant Genetics

Requirements for this program are current for Fall 2006.

Required credits in this minor: 17.

This minor provides strong science-based courses emphasizing crop management in the context of sustainable ecosystems. It is well suited for students majoring in agriculture, food and environmental education; animal science; business and economics; environmental science, or for students seeking knowledge and principles of crop production. The minor allows students to complete coursework providing the minimal background needed to prepare for the Certified Crop Advisor (CCA) exams. Students must complete a minimum of 17 credits.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Required Courses

Minor Courses
CFAN 3001 - Pests and Crop Protection (3.0 cr)
AGRO 4005 - Applied Crop Physiology and Development (4.0 cr)
AGRO 4660 - Senior Capstone: Leadership, Decision Making, and Problem Solving (2.0 cr)
SOIL 3416 - Plant Nutrients in the Environment (3.0 cr)

Electives
Take 5 or more credit(s) from the following:
AGRO 2104 - Grain and Seed Technology (2.0 cr)
AGRO 2501 - Plant Identification for Urban and Rural Landscapes (2.0 cr)
AGRO 4093 - Directed Studies for Advanced Students (1.0-4.0 cr)
AGRO 4401 - Plant Genetics and Breeding (4.0 cr)
AGRO 4505 - Biology, Ecology, and Management of Invasive Plants (3.0 cr)
AGRO 4603 - Field Crop Scouting and Problem Diagnosis (3.0 cr)
AGRO 4605 - Management Strategies for Crop Production (4.0 cr)

Animal Science B.S.

Animal Science

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 93 to 103.

This program requires summer terms.

Degree: Bachelor of Science.

The animal science major prepares students for veterinary school, work as managers and technical advisers for animal production systems, various careers in animal industries or biotechnology, or graduate study in animal related specializations. Areas of emphasis include industry, production, or science/pre-vet. In addition, depending on the area of emphasis, students may select from the following areas of study: biotechnology, dairy, beef, sheep, swine, equine, companion animal, or poultry.

Animal Science/Doctor of Veterinary Medicine Joint Degree:

The animal science/doctor of veterinary medicine joint degree is a cooperative program between CFANS and the College of Veterinary Medicine (CVM). Students who are accepted into CVM and successfully complete one year (two semesters) of the veterinary medicine curriculum can earn the B.S. degree from CFANS. This program is available to students who satisfy the CFANS residency requirements and complete the CFANS portion in three academic years.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

General Requirements

Recommended freshman writing course(s) for this program: RHET 1101

Program Requirements

All required courses must be taken A-F, and students must earn a grade of at least a C-.

Required Courses

Foundation Courses

One semester of calculus is required for Biotechnology Option in the Science/Pre-Veterinary sub-plan.

APEC 1101 - Principles of Microeconomics, SSCI (3.0 cr)
BIOL 1009 - General Biology, BIOL SCI/L (4.0 cr)
RHET 1223 - Oral Presentations in Professional Settings (3.0 cr)
RHET 3562W - Technical and Professional Writing, WI (4.0 cr)
MATH 1031 - College Algebra and Probability, MATH (3.0 cr)
or MATH 1142 - Short Calculus, MATH (4.0 cr)
or MATH 1271 - Calculus I, MATH (4.0 cr)
or MATH 1281 - Calculus with Biological Emphasis I, MATH (4.0 cr)

Professional Courses

ANSC 1001 - Orientation to Animal Science (1.0 cr)
ANSC 1101 - Introductory Animal Science (4.0 cr)
ANSC 2211 - Biometrics for Livestock, MATH (3.0 cr)
ANSC 2401 - Animal Nutrition (3.0 cr)
ANSC 3221 - Animal Breeding (4.0 cr)
ANSC 3301 - Systemic Physiology (4.0 cr)

Take 6 or more credit(s) from the following:

CFAN 4009W - Undergraduate Senior Thesis: Science in Agriculture, WI (1.0-6.0 cr)

Take 3 or more credit(s) from the following:

ANSC 4096 - Professional Experience Program: Internship (1.0-3.0 cr)

Program Sub-plans

Students are required to complete one of the following sub-plans. (Note: The honors sub-plan does not meet this requirement.) Honors students are required to complete one sub-plan plus the honors sub-plan.

Animal Industry

Required Courses

Animal Industry Courses

APEC 1102 - Principles of Macroeconomics, IP, SSCI (3.0 cr)
APEC 1251 - Principles of Accounting (3.0 cr)
BIOC 2011 - Biochemistry for the Agricultural and Health Sciences (3.0 cr)
CHEM 1011 - Introductory Chemistry: Lecture and Laboratory, PHYS SCI/L (4.0 cr)
RHET 3266 - Group Process, Team Building, and Leadership, C/PE (3.0 cr)
RHET 1152W - Writing on Issues of Science and Technology, C/PE, WI (4.0 cr)
or RHET 3257 - Scientific and Technical Presentations (3.0 cr)

Take 3 or more course(s) from the following:

APEC 3001 - Applied Microeconomics: Consumers, Producers, and Markets, SSCI (4.0 cr)
APEC 3002 - Applied Microeconomics: Managerial Economics (4.0 cr)
APEC 3411 - Commodity Marketing (3.0 cr)
APEC 3811 - Principles of Farm Management (3.0 cr)
APEC 3821 - Retail Center Management (3.0 cr)
APEC 4451W - Food Marketing Economics, C/PE, WI (3.0 cr)
APEC 4821W - Agribusiness Management, WI (5.0 cr)

Take one course from the following:

APEC 3451 - Food and Agricultural Sales (3.0 cr)
APEC 3501 - Agribusiness Finance (3.0 cr)
BIE 3061 - Professional Sales Management (3.0 cr)
JOUR 3201 - Principles of Strategic Communication: Advertising (3.0 cr)

Animal Science Electives

Courses in this list cannot be used to fulfill requirements in other areas.

Take 12 or more credit(s) from the following:

CFAN 1501 - Biotechnology, People, and the Environment, ENVT (3.0 cr)
AGRO 1103 - Crops, Environment, and Society, ENVT (4.0 cr)
ANSC 1007 - Horse in Your Backyard (2.0 cr)
ANSC 1011 - Domestic Animals and Society, C/PE, ENVT (3.0 cr)
ANSC 1021 - Avian Sampler (1.0 cr)
ANSC 1403 - Companion Animal Nutrition and Care (3.0 cr)
ANSC 1511 - Food Animal Products for Consumers (3.0 cr)
ANSC 2012 - Livestock and Carcass Evaluation (3.0 cr)
ANSC 2013 - Beginning Livestock Judging (2.0 cr)
ANSC 3007 - Equine Nutrition (3.0 cr)
ANSC 3052 - Equine Anatomy and Exercise Physiology (4.0 cr)
ANSC 3142 - Advanced Livestock Judging (2.0 cr)
ANSC 3203W - Environment, Global Food Production, and the Citizen, C/PE, ENVT, WI (3.0 cr)
ANSC 3305 - Reproductive Biology in Health and Disease (4.0 cr)
ANSC 3501 - Farm Animal Environment (3.0 cr)
ANSC 3509 - Animal Biotechnology (3.0 cr)
ANSC 3511 - Animal Growth and Development (3.0 cr)
ANSC 3609 - Animal Production Systems (2.0 cr)
ANSC 4011 - Dairy Cattle Breeding (3.0 cr)
ANSC 4401 - Swine Nutrition (3.0 cr)
ANSC 4403 - Ruminant Nutrition (3.0 cr)
ANSC 4404 - Applied Dairy Nutrition (2.0 cr)
ANSC 4611 - Advanced Pork Production Systems Management (2.0 cr)
ANSC 4613 - Advanced Beef Production Systems Management (2.0 cr)
ANSC 4614 - Advanced Dairy Production Systems Management (2.0 cr)
ENT 4281 - Veterinary Entomology (3.0 cr)
FSCN 1102 - Food: Safety, Risks, and Technology, C/PE (3.0 cr)
SOIL 2125 - Basic Soil Science, ENVT (4.0 cr)
VCS 4600 - Small Animal and Equine Behavior (3.0 cr)

VPM 3502 - Animal Health & Disease (3.0 cr)
VPM 3700 - Equine Reproduction and Breeding Management (2.0 cr)

Animal Management

Take one course from the following:
ANSC 4102 - Equine Management (3.0 cr)
ANSC 4601 - Pork Production Systems Management (4.0 cr)
ANSC 4602 - Sheep Production Systems Management (4.0 cr)
ANSC 4603 - Beef Production Systems Management (4.0 cr)
ANSC 4604 - Dairy Production Systems Management (4.0 cr)
ANSC 4605 - Poultry Production Systems Management (4.0 cr)
VCS 4606 - Small Animal Management (3.0 cr)

Animal Production

Students take courses in their selected emphasis area: industry, production, or science/pre-veterinary medicine. In addition, students may select from the following areas of study: dairy, beef, sheep, swine, equine, companion animal, or poultry.

Required Courses

Production

ANSC 1511 - Food Animal Products for Consumers (3.0 cr)
ANSC 4609 - Animal Production Systems (2.0 cr)
BIOC 2011 - Biochemistry for the Agricultural and Health Sciences (3.0 cr)
CHEM 1011 - Introductory Chemistry: Lecture and Laboratory, PHYS SCI/L (4.0 cr)

Animal Science Electives

AGRO 1103 is required for dairy, beef, swine, sheep, and poultry options. Courses in this list cannot be used to fulfill requirements in other areas.

Take 22 or more credit(s) from the following:
AFEE 2051 - Current Technical Competencies (3.0 cr)
CFAN 1501 - Biotechnology, People, and the Environment, ENVT (3.0 cr)
AGRO 1103 - Crops, Environment, and Society, ENVT (4.0 cr)
ANSC 1007 - Horse in Your Backyard (2.0 cr)
ANSC 1011 - Domestic Animals and Society, C/PE, ENVT (3.0 cr)
ANSC 1021 - Avian Sampler (1.0 cr)
ANSC 1403 - Companion Animal Nutrition and Care (3.0 cr)
ANSC 1511 - Food Animal Products for Consumers (3.0 cr)
ANSC 2012 - Livestock and Carcass Evaluation (3.0 cr)
ANSC 2013 - Beginning Livestock Judging (2.0 cr)
APEC 1251 - Principles of Accounting (3.0 cr)
SOIL 2125 - Basic Soil Science, ENVT (4.0 cr)
VBS 2032 - General Microbiology With Laboratory (4.0 cr)
ANSC 3007 - Equine Nutrition (3.0 cr)
ANSC 3052 - Equine Anatomy and Exercise Physiology (4.0 cr)
ANSC 3142 - Advanced Livestock Judging (2.0 cr)
ANSC 3203W - Environment, Global Food Production, and the Citizen, C/PE, ENVT, WI (3.0 cr)
ANSC 3305 - Reproductive Biology in Health and Disease (4.0 cr)
ANSC 3501 - Farm Animal Environment (3.0 cr)
ANSC 3509 - Animal Biotechnology (3.0 cr)
ANSC 3511 - Animal Growth and Development (3.0 cr)
ANSC 3609 - Animal Production Systems (2.0 cr)
ANSC 4011 - Dairy Cattle Breeding (3.0 cr)
ANSC 4102 - Equine Management (3.0 cr)
ANSC 4401 - Swine Nutrition (3.0 cr)
ANSC 4403 - Ruminant Nutrition (3.0 cr)
ANSC 4404 - Applied Dairy Nutrition (2.0 cr)
ANSC 4601 - Pork Production Systems Management (4.0 cr)
ANSC 4602 - Sheep Production Systems Management (4.0 cr)
ANSC 4603 - Beef Production Systems Management (4.0 cr)
ANSC 4604 - Dairy Production Systems Management (4.0 cr)
ANSC 4605 - Poultry Production Systems Management (4.0 cr)
ANSC 4611 - Advanced Pork Production Systems Management (2.0 cr)
ANSC 4613 - Advanced Beef Production Systems Management (2.0 cr)
ANSC 4614 - Advanced Dairy Production Systems Management (2.0 cr)
APEC 3411 - Commodity Marketing (3.0 cr)
APEC 3451 - Food and Agricultural Sales (3.0 cr)
APEC 3811 - Principles of Farm Management (3.0 cr)
ENT 4281 - Veterinary Entomology (3.0 cr)
VCS 4600 - Small Animal and Equine Behavior (3.0 cr)
VCS 4606 - Small Animal Management (3.0 cr)
VPM 3502 - Animal Health & Disease (3.0 cr)
VPM 3700 - Equine Reproduction and Breeding Management (2.0 cr)

Animal Production Focus

Students are required to complete one of the following course groups.

Dairy

ANSC 4011 - Dairy Cattle Breeding (3.0 cr)
ANSC 4403 - Ruminant Nutrition (3.0 cr)
ANSC 4604 - Dairy Production Systems Management (4.0 cr)
ANSC 4614 - Advanced Dairy Production Systems Management (2.0 cr)

-OR-

Beef

ANSC 2012 - Livestock and Carcass Evaluation (3.0 cr)
ANSC 4403 - Ruminant Nutrition (3.0 cr)
ANSC 4603 - Beef Production Systems Management (4.0 cr)
ANSC 4613 - Advanced Beef Production Systems Management (2.0 cr)

-OR-

Sheep

ANSC 2012 - Livestock and Carcass Evaluation (3.0 cr)
ANSC 4403 - Ruminant Nutrition (3.0 cr)
ANSC 4602 - Sheep Production Systems Management (4.0 cr)

-OR-

Swine

ANSC 2012 - Livestock and Carcass Evaluation (3.0 cr)
ANSC 4401 - Swine Nutrition (3.0 cr)
ANSC 4601 - Pork Production Systems Management (4.0 cr)
ANSC 4611 - Advanced Pork Production Systems Management (2.0 cr)

-OR-

Equine

Take 11 or more credit(s) from the following:
ANSC 2055 - Horse Health Management (2.0 cr)
ANSC 3007 - Equine Nutrition (3.0 cr)
ANSC 3052 - Equine Anatomy and Exercise Physiology (4.0 cr)
ANSC 4102 - Equine Management (3.0 cr)
VPM 3700 - Equine Reproduction and Breeding Management (2.0 cr)

-OR-

Companion Animal

ANSC 1403 - Companion Animal Nutrition and Care (3.0 cr)
VCS 4600 - Small Animal and Equine Behavior (3.0 cr)
VCS 4606 - Small Animal Management (3.0 cr)
3 credits to be determined in consultation with an adviser

-OR-

Poultry

The three poultry courses must be taken from the Midwest Poultry Consortium (MPC) Summer Program at Madison, Wisconsin. Courses cannot count for requirements in this section and professional courses.

ANSC 4605 - Poultry Production Systems Management (4.0 cr)
Three MPC summer courses

-OR-

Individualized Option

Students select 12 credits in consultation with an adviser and with the approval of the Animal Production Systems Committee.

Science/Pre-Vet

Students in the Science/Pre-Veterinary emphasis must select either the Basic Science or Biotechnology Option.

Required Courses

Core Courses

BIOL 4003 is required for the Biotechnology Option.

BIOC 3021 - Biochemistry (3.0 cr)
CHEM 1021 - Chemical Principles I, ENVT, PHYS SCI/L (4.0 cr)
CHEM 1022 - Chemical Principles II, ENVT, PHYS SCI/L (4.0 cr)
CHEM 2301 - Organic Chemistry I (3.0 cr)
CHEM 2311 - Organic Lab (4.0 cr)
VBS 2032 - General Microbiology With Laboratory (4.0 cr)
BIOL 4003 - Genetics (3.0 cr)
or GCD 3022 - Genetics (3.0 cr)

Take one of the follow pairs of courses:
PHYS 1101W - Introductory College Physics I, PHYS SCI/L, WI (4.0 cr)
PHYS 1102W - Introductory College Physics II, PHYS SCI/L, WI (4.0 cr)
or
PHYS 1201W - Introductory Physics for Biology and Pre-medicine I, PHYS SCI/L, WI (5.0 cr)
PHYS 1202W - Introductory Physics for Biology and Pre-medicine II, PHYS SCI/L, WI (5.0 cr)

Science/Pre-Veterinary Options

Students are required to complete one of the following course groups.

Basic Science Option

Any animal science course not used to fulfill another requirement may also be used as a basic science elective.

Take 12 or more credit(s) from the following:
CFAN 1501 - Biotechnology, People, and the Environment, ENVT (3.0 cr)
ANSC 1011 - Domestic Animals and Society, C/PE, ENVT (3.0 cr)
ANSC 1403 - Companion Animal Nutrition and Care (3.0 cr)
ANSC 3203W - Environment, Global Food Production, and the Citizen, C/PE, ENVT, WI (3.0 cr)
ANSC 3305 - Reproductive Biology in Health and Disease (4.0 cr)
ANSC 3509 - Animal Biotechnology (3.0 cr)
ANSC 3511 - Animal Growth and Development (3.0 cr)
ANSC 4011 - Dairy Cattle Breeding (3.0 cr)
ANSC 4401 - Swine Nutrition (3.0 cr)
ANSC 4403 - Ruminant Nutrition (3.0 cr)
ENT 4281 - Veterinary Entomology (3.0 cr)
VPM 3502 - Animal Health & Disease (3.0 cr)

Take one course from the following:
ANSC 4102 - Equine Management (3.0 cr)
ANSC 4601 - Pork Production Systems Management (4.0 cr)
ANSC 4602 - Sheep Production Systems Management (4.0 cr)
ANSC 4603 - Beef Production Systems Management (4.0 cr)
ANSC 4604 - Dairy Production Systems Management (4.0 cr)
ANSC 4605 - Poultry Production Systems Management (4.0 cr)
VCS 4606 - Small Animal Management (3.0 cr)

-OR-

Biotechnology Option

CFAN 1501 - Biotechnology, People, and the Environment, ENVT (3.0 cr)
ANSC 3509 - Animal Biotechnology (3.0 cr)
BIOL 4003 - Genetics (3.0 cr)

Select at least 2 credits of a laboratory.

Take 11 or more credit(s) from the following:
ANSC 3511 - Animal Growth and Development (3.0 cr)
ANSC 3305 - Reproductive Biology in Health and Disease (4.0 cr)
BIOC 4025 - Laboratory in Biochemistry (2.0 cr)
BIOC 4125 - Laboratory in Molecular Biology and Biotechnology (3.0 cr)
BIOC 5001 - Biochemistry, Molecular and Cellular Biology (5.0 cr)
BIOL 4004 - Cell Biology (3.0 cr)
GCD 4015 - Genetics Laboratory (2.0 cr)
GCD 4025 - Cell Biology Laboratory (2.0 cr)
GCD 4034 - Molecular Genetics (3.0 cr)
GCD 4143 - Human Genetics (3.0 cr)
GCD 4151 - Molecular Biology of Cancer (3.0 cr)
GCD 4161 - Developmental Biology (3.0 cr)
GCD 5036 - Molecular Cell Biology (3.0 cr)
MICB 3301 - Biology of Microorganisms (5.0 cr)
MICB 4131 - Immunology (3.0 cr)
MICB 4141W - Biology, Genetics, and Pathogenesis of Viruses: Writing Intensive, WI (4.0 cr)
MICB 4151 - Molecular and Genetic Bases for Microbial Diseases (3.0 cr)
MICB 4235 - Advanced Laboratory: Virology, Immunology, and Microbial Genetics (3.0 cr)

Animal Science Minor

Animal Science

Requirements for this program are current for Fall 2006.

Required credits in this minor: 20.

The minor is for students who want to include animal science coursework to enhance or supplement their major program. Students have flexibility in choosing courses to meet the requirements. To complete the minor, students must complete at least 20 credits with an ANSC designator.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

To complete the minor, students must complete at least 20 credits with an ANSC designator.

Required Courses

Minor Courses

At least 10 credits must be 3xxx or higher.

Take no more than 10 credit(s) from the following:
ANSC 1xxx
ANSC 2xxx

Take 10 or more credit(s) from the following:
ANSC 3xxx
ANSC 4xxx
ANSC 5xxx

Applied Economics B.S.

Applied Economics

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 52.

Degree: Bachelor of Science.

The applied economics major prepares students for careers in private industry, government agencies, agribusiness, or graduate work. Students may choose one of six professional application clusters: management and finance; marketing; food retailing; trade and development; resources and environment; or regional and public economics. Students may also, in consultation with their adviser, develop an individualized application cluster.

The curriculum emphasizes fundamental written and oral communication skills and a strong foundation in mathematics, economic principles and their applications. Areas of employment for graduates include management, finance, marketing and international trade, domestic and international development, environmental impact assessment, resource management and use, and government-related work in planning, taxation, and development. Entry-level jobs are often in merchandising and sales, credit analysis, management, and other customer contact areas.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

General Requirements

Recommended freshman writing course(s) for this program: RHET 1101

Program Requirements

Every student's program is capped off with 12 credits of advanced-level coursework, called a professional application cluster. All required courses must be taken A-F, and students must earn a grade of at least a C-. Students may not major in both applied economics and agricultural and food business management.

Required Courses

Foundation Courses

Students considering graduate study in applied economics are encouraged to take MATH 1271 and MATH 1272

MATH 1142 - Short Calculus, MATH (4.0 cr)
or MATH 1271 - Calculus I, MATH (4.0 cr)

Writing Performance

RHET 3562W - Technical and Professional Writing, WI (4.0 cr)
COMM 1313W - Analysis of Argument, WI (3.0 cr)
or ENPSTL 1021W - Intermediate Expository Writing, WI (4.0 cr)
or RHET 1152W - Writing on Issues of Science and Technology, C/PE, WI (4.0 cr)
or RHET 3221W - Theories of Human Communication, C/PE, SSCI, WI (4.0 cr)

Speech Performance

COMM 1101 - Introduction to Public Speaking (3.0 cr)
or RHET 1223 - Oral Presentations in Professional Settings (3.0 cr)
COMM 3441 - Introduction to Organizational Communication (3.0 cr)
or RHET 3257 - Scientific and Technical Presentations (3.0 cr)
COMM 3411 - Introduction to Small Group Communication (3.0 cr)
or RHET 3266 - Group Process, Team Building, and Leadership, C/PE (3.0 cr)

Additional Social Science

Students majoring in applied economics must complete 3 credits in social sciences beyond the 6 credits required for liberal education. The 3 credits may not be in courses with the APEC or ECON designator.

Professional Courses

APEC 1001 - Orientation to Applied Economics (1.0 cr)
APEC 1101 - Principles of Microeconomics, SSCI (3.0 cr)
APEC 1102 - Principles of Macroeconomics, IP, SSCI (3.0 cr)
APEC 3001 - Applied Microeconomics: Consumers, Producers, and Markets, SSCI (4.0 cr)
APEC 3002 - Applied Microeconomics: Managerial Economics (4.0 cr)
APEC 3006 - Applied Macroeconomics: Government and the Economy (3.0 cr)
APEC 3007 - Applied Macroeconomics: Policy, Trade, and Development, IP (3.0 cr)
ACCT 2050 - Introduction to Financial Reporting (4.0 cr)
or APEC 1251 - Principles of Accounting (3.0 cr)
OMS 2550 - Business Statistics: Data Sources, Presentation, and Analysis (4.0 cr)
or STAT 3011 - Introduction to Statistical Analysis, MATH (4.0 cr)

Ethics and Responsible Management

Student must take one course (3 credits) from the list below that fosters one or more of the following objectives: responsible judgment about the management of natural resources and the environment; responsible judgment regarding ethical and policy issues related to agriculture; application of global perspectives to agricultural, food, and environmental issues and decisions; application of a historical perspective to the role of science and technology.

Take 1 or more course(s) from the following:

CFAN 1501 - Biotechnology, People, and the Environment, ENVT (3.0 cr)
AGRO 1103 - Crops, Environment, and Society, ENVT (4.0 cr)
AGRO 3203W - Environment, Global Food Production, and the Citizen, C/PE, ENVT, WI (3.0 cr)
ANSC 1011 - Domestic Animals and Society, C/PE, ENVT (3.0 cr)
BAE 5212 - Safety and Environmental Health Issues in Plant and Animal Production and Processing, C/PE, ENVT, H (3.0 cr)
BIOL 4501 - Social Uses of Biology, C/PE (3.0 cr)
EE 1701W - Energy, Environment, and Society, C/PE, ENVT, WI (3.0 cr)
EEB 3001 - Ecology and Society, ENVT (3.0 cr)
ESPM 1011 - Issues in the Environment, C/PE, ENVT (3.0 cr)
ESPM 1051 - Introduction to Environmental Science, ENVT (3.0 cr)
ESPM 3011W - Ethics and Leadership in Resource Management, C/PE, ENVT, WI (3.0 cr)
ESPM 4061W - Water Quality and Natural Resources, ENVT, WI (3.0 cr)
FSCN 1102 - Food: Safety, Risks, and Technology, C/PE (3.0 cr)
GEO 3005 - Earth Resources, C/PE, IP (3.0 cr)
GEOG 3401 - Geography of Environmental Systems and Global Change, WI (4.0 cr)
HSCI 3211 - Biology and Culture in the 19th and 20th Centuries, HP (3.0 cr)
HSCI 3331 - Technology and American Culture, HP (3.0 cr)
PBIO 1212 - Plants and Society, ENVT (3.0 cr)

Program Sub-plans

Students are required to complete one of the following sub-plans. (Note: The honors sub-plan does not meet this requirement.) Honors students are required to complete one sub-plan plus the honors sub-plan.

Food Retailing

Students take at least two upper division APEC courses (excluding 3991, 4096, 5891, 5991), plus two additional courses from APEC, ECON, Carlson School of Management, or other courses listed below for a total of 12 credits minimum. While students are encouraged to complete credits in one of the following areas, students may select courses across the categories in consultation with their adviser.

Required Courses

Food Retailing Core Courses
Take 12 or more credit(s) from the following:

Take 2 or more course(s) from the following:
APEC 3451 - Food and Agricultural Sales (3.0 cr)
APEC 3821 - Retail Center Management (3.0 cr)
APEC 4096 - Professional Experience Program: Internship (1.0-3.0 cr)
APEC 4451W - Food Marketing Economics, C/PE, WI (3.0 cr)
APEC 4481 - Futures and Options Markets (3.0 cr)

Take 2 or more course(s) from the following:
AIM 4011 - Student Project/Field Investigation (3.0 cr)
DHA 3242 - Retail Buying (3.0 cr)
DHA 3245 - Multichannel Retailing (3.0 cr)
HRIR 3032 - Training and Development (2.0 cr)
HRIR 3042 - The Individual and Organizational Performance (2.0 cr)
MKTG 4020 - Advanced Logistics and Supply Chain Management (2.0 cr)
MKTG 4040 - Buyer Behavior (4.0 cr)
MKTG 4060 - Marketing and Distribution Channels (4.0 cr)
MKTG 4080 - Marketing Strategy (4.0 cr)
OMS 3001 - Introduction to Operations Management (3.0 cr)
OMS 3056 - Operations Planning and Control (4.0 cr)

Individualized Professional

Students develop a program in consultation with an adviser. Students must take at least 12 credits.

Required Courses

Individualized Professional Application Courses
Courses listed here are suggestsions. All courses must be chosen in consultation with an adviser.

Take 12 or more credit(s) from the following:
APEC 1xxx
APEC 2xxx
APEC 3xxx
APEC 4xxx
HRIR 1xxx
HRIR 2xxx
HRIR 3xxx
HRIR 4xxx
MGMT 1xxx
MGMT 2xxx
MGMT 3xxx
MGMT 4xxx
MKTG 1xxx
MKTG 2xxx
MKTG 3xxx
MKTG 4xxx

Management and Finance

Students must take at least two upper division APEC courses (excluding 3991, 4096, 5891, 5991) plus two additional courses from APEC, ECON, Carlson School of Management, or other courses listed below, for a total of at least 12 credits. While students are encouraged to complete credits in one of the following areas, students may select courses across the categories in consultation with their adviser.

Required Courses

Management and Finance Core Courses
Take 12 or more credit(s) from the following:

Take 2 or more course(s) from the following:
APEC 3501 - Agribusiness Finance (3.0 cr)
APEC 3811 - Principles of Farm Management (3.0 cr)
APEC 4096 - Professional Experience Program: Internship (1.0-3.0 cr)
APEC 4481 - Futures and Options Markets (3.0 cr)
APEC 4501 - Financial Applications (3.0 cr)
APEC 4821W - Agribusiness Management, WI (3.0 cr)
APEC 5811 - Cooperative Organization (3.0 cr)

Take 2 or more course(s) from the following:
ACCT 3001 - Introduction to Management Accounting (3.0 cr)
ACCT 5100 - Corporate Financial Reporting (4.0 cr)
ACCT 5160 - Financial Statement Analysis (2.0 cr)
ECON 3701 - Money and Banking (3.0 cr)
or ECON 4721 - Money and Banking (3.0 cr)
ECON 4751 - Financial Economics (3.0 cr)
FINA 4241 - Corporate Financing Decisions (4.0 cr)
FINA 4242 - Corporate Investment Decisions (4.0 cr)
HRIR 3021 - Human Resource Management and Industrial Relations (3.0 cr)
MGMT 3001 - Fundamentals of Management (3.0 cr)

Marketing

Students must take least two upper division APEC courses (excluding 3991, 4096, 5891, 5991) plus two additional courses from APEC, ECON, Carlson School of Management, or other courses listed below, for a total of at least 12 credits. While students are encouraged to complete credits in one of the following areas, students may select courses across the categories in consultation with their adviser.

Required Courses

Marketing Core Courses
Take 12 or more credit(s) from the following:

Take 2 or more course(s) from the following:
APEC 3411 - Commodity Marketing (3.0 cr)
APEC 3451 - Food and Agricultural Sales (3.0 cr)
APEC 3821 - Retail Center Management (3.0 cr)
APEC 4096 - Professional Experience Program: Internship (1.0-3.0 cr)
APEC 4481 - Futures and Options Markets (3.0 cr)

Take 2 or more course(s) from the following:
AIM 4011 - Student Project/Field Investigation (3.0 cr)
DHA 3245 - Multichannel Retailing (3.0 cr)
MKTG 3001 - Principles of Marketing (3.0 cr)
MKTG 3010 - Marketing Research (4.0 cr)
MKTG 4030 - Selling and Sales Management (4.0 cr)
MKTG 4040 - Buyer Behavior (4.0 cr)
MKTG 4050 - Integrated Marketing Communications (4.0 cr)
MKTG 4060 - Marketing and Distribution Channels (4.0 cr)
MKTG 4080 - Marketing Strategy (4.0 cr)

Regional and Public Economics

Students must take least two upper division APEC courses (excluding 3991, 4096, 5891, 5991) plus two additional courses from APEC, ECON, Carlson School of Management, or other courses listed below, for a total of at least 12 credits. While students are encouraged to complete credits in one of the following areas, students may select courses across the categories in consultation with their adviser.

Required Courses

Regional and Public Economics Electives
Take 12 or more credit(s).

Take 2 or more course(s) from the following:
APEC 4096 - Professional Experience Program: Internship (1.0-3.0 cr)
APEC 4311 - Tourism Development: Principles, Processes, Policies (3.0 cr)
APEC 5321 - Regional Economic Analysis (3.0 cr)
APEC 5341 - Public Finance (3.0 cr)

Take 2 or more course(s) from the following:
ECON 3041 - Prospective World Economy (3.0 cr)
ECON 3501 - Labor Economics (3.0 cr)
ECON 3601 - Industrial Organization and Antitrust Policy (3.0 cr)
ECON 3801 - Elements of Public Economics (3.0 cr)
ECON 4307 - Comparative Economic Systems, IP (3.0 cr)
ECON 4337 - Comparative Economic Systems, IP (3.0 cr)
ECON 4531 - Labor Economics (3.0 cr)
ECON 4623 - Housing Markets and Public Policy (3.0 cr)
ECON 4631 - Industrial Organization and Antitrust Policy (3.0 cr)
ECON 4831 - Cost-Benefit Analysis, WI (3.0 cr)
URBS 1001W - Introduction to Urban Studies: The Complexity of Metropolitan Life, C/PE, WI (3.0 cr)

Resources and the Environment

Students must take at least two upper division APEC courses (excluding 3991, 4096, 5891, 5991) plus two additional courses from APEC, ECON, Carlson School of Management, or other courses listed below, for a total of at least 12 credits. While students are encouraged to complete credits in one of the following areas, students may select courses across the categories in consultation with their adviser.

Required Courses

Resources and Environment Electives
Take 12 or more credit(s) from the following:

Take 2 or more course(s) from the following:
APEC 3611 - Environmental and Natural Resource Economics, ENVT (3.0 cr)
APEC 4096 - Professional Experience Program: Internship (1.0-3.0 cr)
APEC 5651 - Economics of Natural Resource and Environmental Policy, ENVT (3.0 cr)
APEC 5711 - U.S. Agricultural and Environmental Policy (3.0 cr)

Take 2 or more course(s) from the following:
ECON 3611 - Environmental Economics, ENVT (3.0 cr)
ECON 4611H - Honors Course: Environmental Valuation, H (4.0 cr)
ECON 4831 - Cost-Benefit Analysis, WI (3.0 cr)
ESPM 3202W - Environmental Conflict Management, Leadership, and Planning, C/PE, WI (3.0 cr)
ESPM 3211 - Survey, Measurement, and Modeling for Environmental Analysis (3.0 cr)
ESPM 3241W - Natural Resource and Environmental Policy: History, Creation, and Implementation, C/PE, SSCI, WI (3.0 cr)
ESPM 3261W - Economics and Natural Resources Management, ENVT, SSCI, WI (4.0 cr)
GEOG 3331 - Geography of the World Economy, IP, SSCI (3.0 cr)
URBS 3751 - Understanding the Urban Environment, ENVT (3.0 cr)

Trade and Development

Students must take at least two upper division APEC courses (excluding 3991, 4096, 5891, 5991) plus two additional courses from APEC, ECON, Carlson School of Management, or other courses listed below, for a total of at least 12 credits. While students are encouraged to complete credits in one of the following areas, students may select courses across the categories in consultation with their adviser.

Required Courses

Trade and Development Electives
Take 12 or more credit(s) from the following:

Take 2 or more course(s) from the following:
APEC 3041W - Economic Development of U.S. Agriculture, HP, WI (3.0 cr)
APEC 3071 - Agriculture and Economic Growth in Developing Countries (3.0 cr)
APEC 4096 - Professional Experience Program: Internship (1.0-3.0 cr)
APEC 4103 - World Food Problems, C/PE, IP (3.0 cr)
APEC 5711 - U.S. Agricultural and Environmental Policy (3.0 cr)
APEC 5751 - Global Trade and Policy, IP (3.0 cr)

Take 2 or more course(s) from the following:
ECON 4041 - The Prospective World Economy (3.0 cr)
ECON 4301 - Economic Development, WI (3.0 cr)
ECON 4307 - Comparative Economic Systems, IP (3.0 cr)
ECON 4311 - Economy of Latin America (3.0 cr)
ECON 4313 - The Russian Economy (3.0 cr)
ECON 4315 - The Japanese Economy (3.0 cr)
ECON 4331W - Economic Development, WI (3.0 cr)
ECON 4337 - Comparative Economic Systems, IP (3.0 cr)
ECON 4421W - Economic Integration of the Americas, IP, WI (3.0 cr)
ECON 4432W - International Finance, IP, WI (3.0 cr)

Applied Economics Minor

Applied Economics

Requirements for this program are current for Fall 2006.

Required credits in this minor: 16.

This minor is for students who want to include a basic core of applied economics coursework to enhance or supplement their major program. Students have flexibility in choosing courses to meet the minor requirements. Students who wish to minor in applied economics should consult with the major coordinator for applied economics to obtain approval before completion of 9 credits in the minor. No more than 6 credits may be counted for both the major and the applied economics minor. Students must complete at least 16 credits for the minor.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Required Courses

Minor Courses
APEC 1101 - Principles of Microeconomics, SSCI (3.0 cr)
or ECON 1101 - Principles of Microeconomics, IP, SSCI (4.0 cr)
APEC 1102 - Principles of Macroeconomics, IP, SSCI (3.0 cr)
or ECON 1102 - Principles of Macroeconomics, IP, SSCI (4.0 cr)

Take 8 - 10 credit(s) from the following:
APEC 3xxx
APEC 4xxx
APEC 5xxx

Applied Plant Science B.S.

Agronomy and Plant Genetics

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 73 to 82.

This program requires summer terms.

Degree: Bachelor of Science.

The applied plant science major provides options for a broad course of study in plant sciences, as well as options to concentrate more specifically within an area of individual interest, such as genetics, biotechnology, sustainable agriculture, renewable energy, or healthy foods. It provides a solid science background and integrates knowledge of science, environment, production and industry in preparation for continuing study in graduate school or careers in improvement of the quality and benefits of plants and plant products; industry, government, and universities as research scientists; agencies and organizations concerned with natural resource management; advisory, inspection and certification services; bio-safety and food security; related fields of biology and agricultural education.

Students choose from three areas of emphasis: agroecology, plant improvement, and plant utilization.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

General Requirements

Recommended freshman writing course(s) for this program: RHET 1101

Program Requirements

All required courses must be taken A-F, and students must earn a grade of at least a C-.

Students develop a plan of study that fulfills the required science core (43-49 credits) and area electives (12-17 credits). Students enroll in a set of three common courses in their freshman year and a series of three integrative courses in each of the following three years. The last course in the series is the senior capstone course. After fulfilling CLE and major requirements, students should have between 15 and 22 credits available for electives.

Required Courses

Science Foundation Courses

BIOL 1009 is recommended.

BIOL 2022 - General Botany (3.0 cr)
CHEM 1021 - Chemical Principles I, ENVT, PHYS SCI/L (4.0 cr)
PHYS 1101W - Introductory College Physics I, PHYS SCI/L, WI (4.0 cr)
BIOL 1001 - Introductory Biology I: Evolutionary and Ecological Perspectives, BIOL SCI/L, ENVT (4.0 cr)
or BIOL 1009 - General Biology, BIOL SCI/L (4.0 cr)
AGRO 4005 - Applied Crop Physiology and Development (4.0 cr)
or
BIOL 3002 - Plant Biology: Function (2.0 cr)
BIOL 3005W - Plant Function Laboratory, WI (2.0 cr)
or HORT 3005 - Environmental Effects on Horticultural Crops (2.0 cr)

Major Courses

AGRO 1103 - Crops, Environment, and Society, ENVT (4.0 cr)
AGRO 1660 - First-Year Colloquium/Experience in Agroecosystems Analysis (2.0 cr)
AGRO 4660 - Senior Capstone: Leadership, Decision Making, and Problem Solving (2.0 cr)
AGRO 4093 - Directed Studies for Advanced Students (1.0-4.0 cr)
or AGRO 4096 - Professional Experience Program: Internship (1.0-3.0 cr)

Take 2 or more course(s) from the following:

CFAN 1501 - Biotechnology, People, and the Environment, ENVT (3.0 cr)
CFAN 3001 - Pests and Crop Protection (3.0 cr)
AGRO 3203W - Environment, Global Food Production, and the Citizen, C/PE, ENVT, WI (3.0 cr)
AGRO 4103 - World Food Problems, C/PE, IP (3.0 cr)

Program Sub-plans

Students are required to complete one of the following sub-plans. (Note: The honors sub-plan does not meet this requirement.) Honors students are required to complete one sub-plan plus the honors sub-plan.

Agroecology

Required Courses

Agroecology

SOIL 2125 - Basic Soil Science, ENVT (4.0 cr)
BIOC 2011 - Biochemistry for the Agricultural and Health Sciences (3.0 cr)
or BIOC 3021 - Biochemistry (3.0 cr)
BIOL 3407 - Ecology, ENVT (3.0 cr)
or ESPM 3021 - Ecological Vegetation Management: a Consulting Approach, ENVT (3.0 cr)
BIOL 4003 - Genetics (3.0 cr)
or GCD 3022 - Genetics (3.0 cr)
MATH 1031 - College Algebra and Probability, MATH (3.0 cr)
or MATH 1142 - Short Calculus, MATH (4.0 cr)
or STAT 3011 - Introduction to Statistical Analysis, MATH (4.0 cr)

Electives

Take 17 or more credit(s) including 4 or more sub-requirement(s) from the following:

Take 1 or more course(s) from the following:

AGRO 2501 - Plant Identification for Urban and Rural Landscapes (2.0 cr)
ENT 5021 - Insect Taxonomy and Phylogeny (4.0 cr)
ENT 5371 - Principles of Systematics (3.0 cr)
PBIO 4321 - Taxonomy of Minnesota Flora (3.0 cr)

Take 1 or more course(s) from the following:

AGRO 4505 - Biology, Ecology, and Management of Invasive Plants (3.0 cr)
EEB 5122W - Plant Interactions with Animals and Microbes, WI (3.0 cr)
ENT 3005 - Insect Biology (3.0 cr)
ENT 5211 - Insect Pest Management (3.0 cr)
ENT 5341 - Biological Control of Insects and Weeds (3.0-4.0 cr)
PLPA 5201 - Biology of Plant Diseases (4.0 cr)
PLPA 5204 - Plant Disease Management (3.0 cr)

Take 1 or more course(s) from the following:

AGRO 4605 - Management Strategies for Crop Production (4.0 cr)
ESPM 3021 - Ecological Vegetation Management: a Consulting Approach, ENVT (3.0 cr)
HORT 4072 - Growing Plants Organically: What It Means To Be Green (3.0 cr)
HORT 5052 - Specialty Greenhouse Crop Production (3.0 cr)
SOIL 3416 - Plant Nutrients in the Environment (3.0 cr)

Take 1 or more course(s) from the following:

AGRO 5321 - Ecology of Agricultural Systems, ENVT (3.0 cr)
ESPM 3221 - Soil Conservation and Land-Use Management (3.0 cr)
ESPM 3612W - Soil and Environmental Biology, WI (3.0 cr)
HORT 5031 - Sustainable Fruit Production Systems (2.0 cr)
HORT 5032 - Sustainable Commercial Vegetable Production Systems (3.0 cr)
HORT 5071 - Restoration and Reclamation Ecology, ENVT (3.0 cr)
PLPA 2001 - Introductory Plant Pathology (3.0 cr)

Plant Improvement

Required Courses

Plant Improvement

MATH 1142 is recommended.

BIOC 3021 - Biochemistry (3.0 cr)
BIOL 4003 - Genetics (3.0 cr)
CHEM 1022 - Chemical Principles II, ENVT, PHYS SCI/L (4.0 cr)
CHEM 2301 - Organic Chemistry I (3.0 cr)
HORT 4401 - Plant Genetics and Breeding (4.0 cr)
STAT 3011 - Introduction to Statistical Analysis, MATH (4.0 cr)
MATH 1031 - College Algebra and Probability, MATH (3.0 cr)
or MATH 1142 - Short Calculus, MATH (4.0 cr)

Electives

Take 12 or more credit(s) from the following:

BAE 3013 - Engineering Principles of Molecular and Cellular Processes (3.0 cr)
BIOC 4025 - Laboratory in Biochemistry (2.0 cr)
BIOC 4125 - Laboratory in Molecular Biology and Biotechnology (3.0 cr)
BIOL 2032 - General Microbiology with Laboratory (4.0 cr)
EEB 3001 - Ecology and Society, ENVT (3.0 cr)
EEB 5122W - Plant Interactions with Animals and Microbes, WI (3.0 cr)
HORT 4071W - Applications of Biotechnology to Plant Improvement, C/PE, WI (4.0 cr)
HORT 5031 - Sustainable Fruit Production Systems (2.0 cr)
HORT 5032 - Sustainable Commercial Vegetable Production Systems (3.0 cr)
HORT 5052 - Specialty Greenhouse Crop Production (3.0 cr)
PBIO 5301 - Plant Genomics (3.0 cr)
PBIO 5412 - Plant Physiology (3.0 cr)
PBIO 5514 - Plant Molecular Biology (3.0 cr)
PLPA 5103 - Plant-Microbe Interactions (3.0 cr)
PLPA 5300 - Current Topics in Molecular Plant Pathology (1.0 cr)
SOIL 2125 - Basic Soil Science, ENVT (4.0 cr)
PBIO 4516W - Plant Cell Biology: Writing Intensive, WI (3.0 cr)
or PBIO 5516 - Plant Cell Biology (3.0 cr)

Plant Utilization

Required Courses

Plant Utilization

BIOC 3021 - Biochemistry (3.0 cr)
CHEM 1022 - Chemical Principles II, ENVT, PHYS SCI/L (4.0 cr)
CHEM 2301 - Organic Chemistry I (3.0 cr)
FSCN 3102 - Introduction to Food Science (3.0 cr)
FSCN 4111 - Food Chemistry (3.0 cr)
STAT 3011 - Introduction to Statistical Analysis, MATH (4.0 cr)
MATH 1142 - Short Calculus, MATH (4.0 cr)
or MATH 1271 - Calculus I, MATH (4.0 cr)

Electives

Take 12 or more credit(s) from the following:

BAE 4744 - Engineering Principles for Biological Scientists (4.0 cr)
BIOL 3407 - Ecology, ENVT (3.0 cr)
EEB 3001 - Ecology and Society, ENVT (3.0 cr)
FSCN 1102 - Food: Safety, Risks, and Technology, C/PE (3.0 cr)
FSCN 1112 - Principles of Nutrition, ENVT (3.0 cr)
FSCN 3102 - Introduction to Food Science (3.0 cr)
FSCN 4121 - Food Microbiology and Fermentations (3.0 cr)
FSCN 4332 - Food Processing Operations (3.0 cr)
FSCN 4612 - Human Nutrition (3.0 cr)
FSCN 5411 - Food Biotechnology (2.0 cr)
FSCN 5441 - Introduction to New Product Development (2.0 cr)
FSCN 5531 - Grains: Introduction to Cereal Chemistry and Technology (2.0 cr)
HORT 4401 - Plant Genetics and Breeding (4.0 cr)
HORT 5031 - Sustainable Fruit Production Systems (2.0 cr)
HORT 5032 - Sustainable Commercial Vegetable Production Systems (3.0 cr)
HORT 5052 - Specialty Greenhouse Crop Production (3.0 cr)
PLPA 5201 - Biology of Plant Diseases (4.0 cr)
PBIO 4516W - Plant Cell Biology: Writing Intensive, WI (3.0 cr)
or PBIO 5516 - Plant Cell Biology (3.0 cr)

Bio-Based Products B.S.

Bio-Based Products

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120 to 128.

Required credits within the major: 120 to 128.

Degree: Bachelor of Science.

Bio-based products are materials, chemicals, and energy derived from renewable, bio-resources including forestry, agriculture and other biomass. Many of the commercial products and forms of energy that we use today and come from depleting fossil fuels can be derived from renewable, bio-resources. The molecular building blocks and components of biomass can be harnessed to heat our homes, run our cars, light our buildings, and provide industrial and consumer products. These products include fibers and fiber-based products, paper, board, engineered wood, structural panels, wood-based composites, renewable plastics, and bio-derived chemicals and fuels.

This major provides students with a strong foundation in the sustainable use of bio-resources while protecting the environment. The interdisciplinary bio-based products major combines coursework in science, engineering, technology, and business—all related to the manufacturing and end-use applications of materials, products, and energy from renewable resources.

Students choose one of the following three areas of specialization: pre-bio-based products engineering (joint program with the Institute of Technology; see major requirements listed in the Institute of Technology section of this catalog); bio-based products marketing and management; or residential building science and technology. In addition, the department also offers a minor in bio-based products engineering that enables students in any of the basic sciences and engineering majors to gain a better understanding of and appreciation for sustainable use of the renewable resources.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

General Requirements

Recommended freshman writing course(s) for this program: RHET 1101

Program Requirements

All required courses must be taken A-F, and students must earn a grade of at least a C-.

Required Courses

Communication Skills

COMM 1101 - Introduction to Public Speaking (3.0 cr)
or RHET 1223 - Oral Presentations in Professional Settings (3.0 cr)

Physical and Biological Sciences

BIOL 1001 - Introductory Biology I: Evolutionary and Ecological Perspectives, BIOL SCI/L, ENVT (4.0 cr)
or BIOL 1009 - General Biology, BIOL SCI/L (4.0 cr)

PHYS 1101W - Introductory College Physics I, PHYS SCI/L, WI (4.0 cr)
or PHYS 1301W - Introductory Physics for Science and Engineering I, PHYS SCI/L, WI (4.0 cr)

Social Sciences
PSY 1001 - Introduction to Psychology, SSCI (4.0 cr)
APEC 1101 - Principles of Microeconomics, SSCI (3.0 cr)
or ECON 1101 - Principles of Microeconomics, IP, SSCI (4.0 cr)
or ESPM 3261W - Economics and Natural Resources Management, ENVT, SSCI, WI (4.0 cr)

Major Courses
BP 1001 - Bio-based Products Orientation (1.0 cr)
BP 1002 - Wood and Fiber Science (3.0 cr)
BP 3001 - Statics, Mechanics, and Structural Design (4.0 cr)
BP 3411 - Introduction to Residential Construction (2.0 cr)
BP 3412 - Introduction to Residential Building Materials Estimating (1.0 cr)
BP 3503 - Marketing of Bio-based Products (4.0 cr)
BP 4302 - Organisms Impacting Bio-based Products (3.0 cr)
BP 4407 - Bio-based Products Manufacturing and Applications I (2.0 cr)
BP 4412W - Bio-based Products Manufacturing and Applications II, WI (3.0 cr)
BP 4504W - Bio-based Products Development and Management, WI (3.0 cr)

Program Sub-plans

Students are required to complete one of the following sub-plans. (Note: The honors sub-plan does not meet this requirement.) Honors students are required to complete one sub-plan plus the honors sub-plan.

Bio-Based Products Marketing and Management

The bio-based products marketing and management specialization combines coursework in liberal arts, basic sciences, communications, and business. Students learn about the physical and social aspects of renewable bio-based products and resources, and the combination of marketing and sales courses with technical bio-based products engineering coursework, which prepares them for the growing bio-based products industries.

Required Courses

Mathematical Thinking
MATH 1142 - Short Calculus, MATH (4.0 cr)
STAT 3011 - Introduction to Statistical Analysis, MATH (4.0 cr)

Physical and Biological Sciences
Take one of the following pairs of courses.
BIOC 2011 - Biochemistry for the Agricultural and Health Sciences (3.0 cr)
CHEM 1011 - Introductory Chemistry: Lecture and Laboratory, PHYS SCI/L (4.0 cr)
or
CHEM 1021 - Chemical Principles I, ENVT, PHYS SCI/L (4.0 cr)
CHEM 1022 - Chemical Principles II, ENVT, PHYS SCI/L (4.0 cr)

Macroeconomics
APEC 1102 - Principles of Macroeconomics, IP, SSCI (3.0 cr)
or ECON 1102 - Principles of Macroeconomics, IP, SSCI (4.0 cr)

Bio-Based Products
BP 1003 - Wood and Fiber Science Lab (1.0 cr)
BP 4413 - Systems Approach to Residential Construction (3.0 cr)

Bio-Based Marketing and Management
ACCT 2050 - Introduction to Financial Reporting (4.0 cr)
BLAW 3058 - The Law of Contracts and Agency (4.0 cr)
ESPM 2041 - Natural Resources Consumption and Sustainability, ENVT, IP (3.0 cr)
FINA 3001 - Finance Fundamentals (3.0 cr)
MGMT 3001 - Fundamentals of Management (3.0 cr)
MKTG 3001 - Principles of Marketing (3.0 cr)

Marketing and Management Focus

Students are required to complete one of the following course groups.

Marketing and Sales
Take 9 or more credit(s) from the following:
ESPM 3202W - Environmental Conflict Management, Leadership, and Planning, C/PE, WI (3.0 cr)
JOUR 4261 - Advertising: Media Strategy (3.0 cr)
JOUR 4272 - Interactive Advertising (3.0 cr)
MKTG 3010 - Marketing Research (4.0 cr)
MKTG 4030 - Selling and Sales Management (4.0 cr)

-OR-

Management
Take 9 or more credit(s) from the following:
ACCT 3001 - Introduction to Management Accounting (3.0 cr)
HRIR 3021 - Human Resource Management and Industrial Relations (3.0 cr)
IDSC 3001 - Information Systems for Business Processes and Management (3.0 cr)
IE 4521 - Statistics, Quality, and Reliability (4.0 cr)
IE 5522 - Quality Engineering and Reliability (4.0 cr)
OMS 3001 - Introduction to Operations Management (3.0 cr)
OMS 3056 - Operations Planning and Control (4.0 cr)

Residential Building Science and Technology

The residential building science and technology program is designed to investigate the important relationships between people, their homes, and the environment. From a solid scientific and engineering base, this interdisciplinary program builds critical thinking skills and helps students explore the opportunities that can enhance the performance of houses. The curriculum draws upon a wide range of resources across the University and includes physical science, social science, management, marketing, communications, material sciences, and engineering coursework.

The environment and international perspectives themes are satisfied automatically by completing required courses in the residential building science and technology specialization.

Required Courses

Mathematical Thinking
MATH 1271 - Calculus I, MATH (4.0 cr)
MATH 1272 - Calculus II (4.0 cr)
STAT 3011 - Introduction to Statistical Analysis, MATH (4.0 cr)
or STAT 3021 - Introduction to Probability and Statistics (3.0 cr)

Chemistry and Physics
CHEM 1021 - Chemical Principles I, ENVT, PHYS SCI/L (4.0 cr)
PHYS 1102W - Introductory College Physics II, PHYS SCI/L, WI (4.0 cr)
or PHYS 1302W - Introductory Physics for Science and Engineering II, PHYS SCI/L, WI (4.0 cr)

Residential Building Science and Technology
BP 4413 - Systems Approach to Residential Construction (3.0 cr)
BP 4414 - Advanced Residential Building Science, WI (3.0 cr)
BP 4415 - Advanced Residential Building Science Lab (1.0 cr)
BP 4416 - Building Testing and Diagnostics (2.0 cr)
CE 3402 - Construction Materials (3.0 cr)
CE 4101W - Project Management, WI (3.0 cr)
DHA 2463 - Housing and Community Development, C/PE (3.0 cr)
ESPM 2041 - Natural Resources Consumption and Sustainability, ENVT, IP (3.0 cr)
HRIR 3021 - Human Resource Management and Industrial Relations (3.0 cr)
OMS 3001 - Introduction to Operations Management (3.0 cr)
ARCH 1701 - The Designed Environment (3.0 cr)

or DHA 1101W - Introduction to Design Thinking, OH, WI (4.0 cr)
or LA 1101W - Introduction to Design Thinking, OH, WI (4.0 cr)

Electives
Course selections must be approved by RBST faculty adviser.

Take 12 or more credit(s) from the following:
BLAW 3058 - The Law of Contracts and Agency (4.0 cr)
CHEM 1022 - Chemical Principles II, ENVT, PHYS SCI/L (4.0 cr)
CMGT 4011 - Construction Documents and Contracts (3.0 cr)
CMGT 4021 - Construction Planning and Scheduling (3.0 cr)
CMGT 4022 - Construction Estimating (3.0 cr)
CMGT 4031 - Construction Safety and Loss Control (3.0 cr)
DHA 2402 - Residential Technology (3.0 cr)
IE 5531 - Engineering Optimization I, H (4.0 cr)
OMS 3059 - Quality Management and Six Sigma (4.0 cr)
APEC 1102 - Principles of Macroeconomics, IP, SSCI (3.0 cr)
or ECON 1102 - Principles of Macroeconomics, IP, SSCI (4.0 cr)
ARCH 5351 - AutoCAD I (3.0 cr)

Bio-Based Products Engineering Minor

Bio-Based Products

Requirements for this program are current for Fall 2006.

Required credits in this minor: 14.

This program provides students with a strong background in the basic sciences and engineering and their application to manufacturing and end-use applications of materials, chemicals, and energy from renewable resources.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Required Courses

Minor Courses
Take 14 or more credit(s) from the following:
BP 4001 - Chemistry of Plant Materials (4.0 cr)
BP 4301 - Surface and Colloid Science in Bio-based Products Manufacturing (3.0 cr)
BP 4302 - Organisms Impacting Bio-based Products (3.0 cr)
BP 4303 - Bio-Based Materials Science (3.0 cr)
BP 4305 - Pulp and Paper Technology (3.0 cr)
BP 4401 - Bio-based Products Engineering (4.0 cr)
BP 4404 - Bio-based Composites Engineering (3.0 cr)
BP 4501 - Process and Product Design I (2.0 cr)
BP 4502W - Process and Product Design II, WI (3.0 cr)

Climatology Minor

Agronomy and Plant Genetics

Requirements for this program are current for Fall 2006.

Required credits in this minor: 20.

The minor lets students broaden their expertise in weather and climate studies. Students who will be working for any industry or agency that depends on understanding weather and climate change will find the minor useful. Students take courses in meteorology, atmosphere, and biometeorology. Electives are in climate models, climate variations, climate change, and atmospheric boundary layer.

To complete the minor, students must complete at least 20 credits.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Required Courses for the Program

Minor Courses
ESPM 1425 - The Atmosphere, ENVT, PHYS SCI/L (4.0 cr)
ESPM 5211 - Environmental Biophysics and Ecology (3.0 cr)

Electives
Take 13 or more credit(s) from the following:
EEB 5008 - Forest Response to Quaternary Climate Change (2.0 cr)
EEB 5009 - Quaternary Vegetation History and Climate (3.0 cr)
GEOG 3401 - Geography of Environmental Systems and Global Change, WI (4.0 cr)
GEOG 5423 - Climate Models and Modeling (3.0 cr)
GEOG 5426 - Climatic Variations (3.0 cr)

Corporate Environmental Management Minor

Bio-Based Products

Requirements for this program are current for Fall 2006.

Required credits in this minor: 18.

The corporate environmental management (CEM) minor is designed to provide students with an excellent opportunity to gain a broad exposure to the strategic, analytical, and managerial processes associated with the environmental impact of companies' and other organizations' products and processes. Completion of the CEM minor enhances students' preparation for graduate school and for entering a career in the growing corporate functions of environmental management and regulatory compliance.

The CEM minor is available to students in good standing in all majors at the University of Minnesota, Twin Cities.

Admission Requirements

Students must complete 4 courses before admission to the program.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Required Courses for Admission

Preparatory Courses
APEC 1101 - Principles of Microeconomics, SSCI (3.0 cr)
or ECON 1101 - Principles of Microeconomics, IP, SSCI (4.0 cr)
or ESPM 3261W - Economics and Natural Resources Management, ENVT, SSCI, WI (4.0 cr)
BIOL 1001 - Introductory Biology I: Evolutionary and Ecological Perspectives, BIOL SCI/L, ENVT (4.0 cr)
or BIOL 1009 - General Biology, BIOL SCI/L (4.0 cr)

MATH 1142 - Short Calculus, MATH (4.0 cr)
or
Any first semester calculus
OMS 2550 - Business Statistics: Data Sources, Presentation, and Analysis (4.0 cr)
or STAT 3011 - Introduction to Statistical Analysis, MATH (4.0 cr)

Program Requirements

Required Courses

Minor Courses
ACCT 2050 - Introduction to Financial Reporting (4.0 cr)
ESPM 3603 - Environmental Life Cycle Analysis (3.0 cr)
ESPM 3604 - Environmental Management Systems and Strategy (3.0 cr)
ESPM 5019 - Business, Natural Environment, and Global Economy (2.0 cr)

Take 6 or more credit(s) from the following:
ESPM 3011W - Ethics and Leadership in Resource Management, C/PE, ENVT, WI (3.0 cr)
ESPM 3202W - Environmental Conflict Management, Leadership, and Planning, C/PE, WI (3.0 cr)
ESPM 3241W - Natural Resource and Environmental Policy: History, Creation, and Implementation, C/PE, SSCI, WI (3.0 cr)
ESPM 3602 - Regulatory and Ethical Frameworks for CEM (3.0 cr)
ESPM 3605 - Recycling: Extending Raw Materials (3.0 cr)
ESPM 3606 - Minimizing Industrial Emissions (3.0 cr)
ESPM 4061W - Water Quality and Natural Resources, ENVT, WI (3.0 cr)
ESPM 4607 - Industrial Biotechnology and the Environment (2.0 cr)
ESPM 4608 - Bioremediation (2.0 cr)
PLPA 3002 - Air Pollution, People, and Plants: The Science and the Ethics, C/PE, ENVT (3.0 cr)

Designing Documents with New and Emerging Technologies Minor

Rhetoric

Requirements for this program are current for Fall 2006.

Required credits in this minor: 16.

The minor focuses on designing effective communication products using both traditional and emerging technologies. Students learn to design written messages using computer technologies; visual messages using photography, digital imaging, and video; and online and Web messages using multimedia, World Wide Web technologies, and streaming audio and video. Message design components include audience analysis and rigorous evaluation of document usability. This minor differs from the technical communication minor by its focus on emerging technologies.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Required Courses

Minor Courses
RHET 3671 - Visual Rhetoric (3.0 cr)
RHET 3672 - Project Design and Development (3.0 cr)
RHET 4501 - Usability and Human Factors in Technical Communication (3.0 cr)
RHET 4662W - Emerging Technologies in Scientific and Technical Communication, WI (4.0 cr)
RHET 3101 - Functional Photography (3.0 cr)
or RHET 3257 - Scientific and Technical Presentations (3.0 cr)
or RHET 3401 - Internet Communication: Tools and Issues (3.0 cr)
or RHET 4105W - Corporate Video for Technical Communicators, WI (4.0 cr)

Entomology Minor

Entomology

Requirements for this program are current for Fall 2006.

Required credits in this minor: 12.

This minor provides a strong background in entomological principles and theory suitable for students interested in a variety of professions or advanced degree programs. Examples include programs in entomology, veterinary science, or public health; teaching biology in secondary educational institutions; or enhancing marketable skills for a variety of professional careers, such as forest health specialist, crop consultant, grounds manager, pest management specialist, agronomist, greenhouse or nursery technician, natural resource manager, or water quality specialist. Specific courses are selected based on students educational objectives, in consultation with a minor adviser.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu/.

Program Requirements

Required Courses

Minor Courses
CFAN 3001 - Pests and Crop Protection (3.0 cr)
or ENT 3005 - Insect Biology (3.0 cr)
or ENT 4015 - Ornamentals and Turf Entomolgy (3.0 cr)
or ENT 4251 - Forest and Shade Tree Entomology (3.0 cr)
or ENT 4281 - Veterinary Entomology (3.0 cr)

Electives
Take 9 or more credit(s). Courses must be completed for 3 credits each

Take 6 or more credit(s) from the following:
ENT 5910 - Special Problems in Entomology (1.0-6.0 cr)
ENT 5920 - Special Lectures in Entomology (1.0-3.0 cr)
Take 3 or more credit(s) from the following:
ENT 3xxx
ENT 4xxx
ENT 5xxx

Environment and Natural Resources Minor

Requirements for this program are current for Fall 2006.

Required credits in this minor: 16.

The environment and natural resources minor provides students in programs such as biology, education, journalism, political science, and others with the basic understanding to recognize, evaluate, and develop solutions to a range of environmental problems. Students interested in the minor should contact CFANS Student Services Office at 612-624-6768.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Required Courses

Minor Core

Take 2 or more course(s) from the following:

ESPM 1011 - Issues in the Environment, ENVT (3.0 cr)
ESPM 2041 - Natural Resources Consumption and Sustainability, ENVT, IP (3.0 cr)
FW 2001 - Introduction to Fisheries, Wildlife, and Conservation Biology, ENVT (3.0 cr)
SOIL 2125 - Basic Soil Science, ENVT (4.0 cr)
BIOL 3407 - Ecology, ENVT (3.0 cr)
or EEB 3001 - Ecology and Society, ENVT (3.0 cr)
or FR 3104 - Forest Ecology (4.0 cr)

Focus for ENR Minor

Students are required to complete one of the following course groups.

Environmental Management and Policy

Take 10 or more credit(s) from the following:

ESPM 3002 - Colloquium: Exotic Plants and Animals (1.0 cr)
ESPM 3011W - Ethics and Leadership in Resource Management, C/PE, ENVT, WI (3.0 cr)
ESPM 3021 - Ecological Vegetation Management: a Consulting Approach, ENVT (3.0 cr)
ESPM 3101 - Conservation of Plant Biodiversity, ENVT (3.0 cr)
ESPM 3202W - Environmental Conflict Management, Leadership, and Planning, C/PE, WI (3.0 cr)
ESPM 3241W - Natural Resource and Environmental Policy: History, Creation, and Implementation, C/PE, SSCI, WI (3.0 cr)
ESPM 3245 - Sustainable Land Use Planning and Policy, ENVT (3.0 cr)
ESPM 3261W - Economics and Natural Resources Management, ENVT, SSCI, WI (4.0 cr)
ESPM 3601 - Our Home, Our Environment (3.0 cr)
ESPM 4061W - Water Quality and Natural Resources, ENVT, WI (3.0 cr)
ESPM 4195W - Problem Solving and Planning in Natural Resources, WI (4.0 cr)
ESPM 4295W - GIS in Environmental Science and Management, WI (4.0 cr)
ESPM 4811 - Environmental Interpretation (3.0 cr)
ESPM 5601 - Principles of Waste Management (3.0 cr)
FR 3131 - Geographical Information Systems (GIS) for Natural Resources (4.0 cr)

-OR-

Environmental Science

Take 10 or more credit(s) from the following:

ESPM 3221 - Soil Conservation and Land-Use Management (3.0 cr)
ESPM 3612W - Soil and Environmental Biology, WI (3.0 cr)
ESPM 4216 - Contaminant Hydrology (2.0 cr)
ESPM 4601 - Soils and Pollution (3.0 cr)
ESPM 5555 - Wetland Soils (3.0 cr)
EEB 4611 - Biogeochemical Processes (3.0 cr)
ENT 3925 - Insects, Aquatic Habitats, and Pollution (3.0 cr)
ENT 5241 - Ecological Risk Assessment (3.0 cr)
FR 3114 - Hydrology and Watershed Management (3.0 cr)
FR 3131 - Geographical Information Systems (GIS) for Natural Resources (4.0 cr)
PLPA 3002 - Air Pollution, People, and Plants: The Science and the Ethics, C/PE, ENVT (3.0 cr)
SOIL 3416 - Plant Nutrients in the Environment (3.0 cr)

Environmental Horticulture B.S.

Horticultural Science

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 49.

Degree: Bachelor of Science.

The environmental horticulture major educates and prepares students in all phases of horticulture: crop and plant production; education (botanic gardens and arboreta); service oriented activities (landscaping and landscape maintenance); plant use and function (design, reclamation, and restoration); and recreation (golf courses and parks). Students gain experience in the use of plants to alter environments, restore damaged landscapes, improve the health and well-being of individuals, educate people about science and agriculture, improve community environments, and provide recreational and practical benefits to the public.

Students choose either a business or science option. Landscape design, a joint offering with the College of Design, combines architecture and landscape architecture courses available in College of Design with the plant-based design courses available in CFANS.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

General Requirements

Recommended freshman writing course(s) for this program: RHET 1101

Program Requirements

Applied courses in horticultural science, soil science, entomology, plant pathology, and applied economics vary depending on program. All required courses must be taken A-F, and students must earn a grade of at least a C-.

Required Courses

Foundation Courses

APEC 1101 - Principles of Microeconomics, SSCI (3.0 cr)
BIOL 1009 - General Biology, BIOL SCI/L (4.0 cr)
RHET 1223 - Oral Presentations in Professional Settings (3.0 cr)
CHEM 1011 - Introductory Chemistry: Lecture and Laboratory, PHYS SCI/L (4.0 cr)
or CHEM 1021 - Chemical Principles I, ENVT, PHYS SCI/L (4.0 cr)
MATH 1031 - College Algebra and Probability, MATH (3.0 cr)
or MATH 1142 - Short Calculus, MATH (4.0 cr)

Professional Courses

BIOL 3002 - Plant Biology: Function (2.0 cr)
HORT 1001 - Plant Propagation, BIOL SCI/L (4.0 cr)
HORT 1015 - Woody and Herbaceous Plants (4.0 cr)
HORT 3002W - Greenhouse Management, WI (3.0 cr)
HORT 3005 - Environmental Effects on Horticultural Crops (2.0 cr)
HORT 4096 - Professional Experience Program: Internship (1.0-3.0 cr)
PLPA 2001 - Introductory Plant Pathology (3.0 cr)
SOIL 2125 - Basic Soil Science, ENVT (4.0 cr)
ENT 3005 - Insect Biology (3.0 cr)
or ENT 4015 - Ornamentals and Turf Entomolgy (3.0 cr)
or ENT 4251 - Forest and Shade Tree Entomology (3.0 cr)

Environmental Horticulture Options

Students are required to complete one of the following course groups.

Business Option

Take 2 or more course(s) from the following:

ACCT 2050 - Introduction to Financial Reporting (4.0 cr)
APEC 1251 - Principles of Accounting (3.0 cr)
PSTL 1513 - Small Business Fundamentals With E-Business Applications (3.0 cr)
OMS 2550 - Business Statistics: Data Sources, Presentation, and Analysis (4.0 cr)

-OR-

Science Option

BIOC 3021 - Biochemistry (3.0 cr)
CHEM 1022 - Chemical Principles II, ENVT, PHYS SCI/L (4.0 cr)
CHEM 2301 - Organic Chemistry I (3.0 cr)
PHYS 1101W - Introductory College Physics I, PHYS SCI/L, WI (4.0 cr)
or PHYS 1111 - Basic Physics I (3.0 cr)

Program Sub-plans

Students are required to complete one of the following sub-plans. (Note: The honors sub-plan does not meet this requirement.) Honors students are required to complete one sub-plan plus the honors sub-plan.

Floriculture/Nursery Production and Retail Management

22 credits are required.

Required Courses

Floriculture/Nursery Production and Retail Mgmt

APEC 3821 - Retail Center Management (3.0 cr)
HORT 4015 - Advanced Woody and Herbaceous Plant Topic (1.0 cr)
HORT 5041W - Nursery Management, WI (4.0 cr)
HORT 5051 - Floriculture Crop Production (4.0 cr)
PLPA 4000 - Plant Pathology Practicum (1.0 cr)
HORT 4401 - Plant Genetics and Breeding (4.0 cr)
or HORT 4071W - Applications of Biotechnology to Plant Improvement, C/PE, WI (4.0 cr)

Take 6 or more credit(s) from the following:

HORT 1xxx
HORT 2xxx
HORT 3xxx
HORT 4xxx

Individualized

Students must submit a course of study to the Department of Horticultural Science Undergraduate Studies Committee at least three semesters before graduation.

Students choose two required courses plus 16 additional credits in consultation with an adviser to total at least 21 credits.

Required Courses

HORT 4401 - Plant Genetics and Breeding (4.0 cr)
or HORT 4071W - Applications of Plant Biotechnology to Plant Improvement (4.0 cr)
PLPA 4000 - Plant Pathology Practicum (1.0 cr)

Landscape Design

21 credits are required.

Required Courses

Landscape Design

Take 21 or more credit(s) from the following:

ARCH 3301 - Drawing for Design in Architecture, OH (3.0 cr)
ARCH 3711 - Environmental Design and the Sociocultural Context, C/PE, WI (3.0 cr)
HORT 4021 - Landscape Design and Implementation I (4.0 cr)
HORT 4022 - Applications in Computer-Aided Design for Landsapes (3.0 cr)
HORT 4061W - Turfgrass Management, WI (3.0 cr)
HORT 5018 - Landscape Operations and Management (3.0 cr)
HORT 5021 - Landscape Design and Implementation II (4.0 cr)
LA 1301 - Introduction to Drawing in Architecture and Landscape Architecture, OH (3.0 cr)
LA 3001 - Understanding and Creating Landscape Space (3.0 cr)
LA 3204 - Landscape Ecology (3.0 cr)
LA 3413 - Introduction to Landscape Architectural History, IP (3.0 cr)
LA 3501 - Environmental Design and Its Biological and Physical Context, ENVT (3.0 cr)
LA 3571 - Landscape Construction: Site Systems and Engineering (3.0 cr)
ARCH 3411 - Architectural History to 1750, HP, IP (3.0 cr)
or ARCH 3412 - Architectural History since 1750, HP, IP (3.0 cr)

Landscape Implementation and Management

21 credits are required.

Required Courses

Landscape Implementation and Management

HORT 4021 - Landscape Design and Implementation I (4.0 cr)
HORT 4061W - Turfgrass Management, WI (3.0 cr)
HORT 5009 - Pesticides in Horticulture: Their Use and Abuse (3.0 cr)
HORT 5018 - Landscape Operations and Management (3.0 cr)
PLPA 4000 - Plant Pathology Practicum (1.0 cr)
HORT 4401 - Plant Genetics and Breeding (4.0 cr)
or HORT 4071W - Applications of Biotechnology to Plant Improvement, C/PE, WI (4.0 cr)
FR 3501 - Arboriculture: Selection and Maintenance of Trees (3.0 cr)
or HORT 1xxx
or HORT 2xxx
or HORT 3xxx
or HORT 4xxx

Turfgrass Science

21 credits are required.

Required Courses

Turfgrass Science

HORT 4021 - Landscape Design and Implementation I (4.0 cr)
HORT 4061W - Turfgrass Management, WI (3.0 cr)
HORT 4062 - Turfgrass Weed and Disease Science (3.0 cr)
HORT 5061 - Turfgrass Science (3.0 cr)
PLPA 4000 - Plant Pathology Practicum (1.0 cr)
SOIL 3416 - Plant Nutrients in the Environment (3.0 cr)
HORT 4401 - Plant Genetics and Breeding (4.0 cr)
or HORT 4071W - Applications of Biotechnology to Plant Improvement, C/PE, WI (4.0 cr)

Take 3 or more credit(s) from the following:

HORT 1xxx
HORT 2xxx
HORT 3xxx
HORT 4xxx

Environmental Horticulture Minor

Horticultural Science

Requirements for this program are current for Fall 2006.

Required credits in this minor: 18.

Plants provide many practical and recreational benefits to society--whether it is the food we eat, the parks we play in, or the gardens we enjoy admiring. The horticultural science minor is geared toward students who want to learn more about plants and their many, diverse uses in the landscape. Coursework is flexible and can easily be tailored to specific horticultural interests, including floriculture and nursery production, turfgrass science, landscape design and maintenance, fruit and vegetable production, sustainable and organic production practices, therapeutic horticulture, plant physiology, and genetics. Students wishing to complete a minor in horticultural science should contact the Department of Horticultural Science, 305 Alderman Hall for assistance.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Required Courses

Minor Courses

HORT 1001 - Plant Propagation, BIOL SCI/L (4.0 cr)

Electives

At least 14 credits from courses with a HORT designator, of which one horticulture related course (SOILS, ENT, PLPA, or BIOL 3002) may be substituted. At least two HORT courses must be at 4xxx or 5xxx. A maximum of 3 credits of HORT 5090 - Directed Studies may be applied.

Environmental Sciences, Policy and Management B.S.

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 46.

This program requires summer terms.

Degree: Bachelor of Science

The environmental sciences, policy and management (ESPM) major is designed to address the needs posed by the complexity of environmental and renewable resource issues that are faced on a state, national and global level. This interdisciplinary, environmental major prepares graduates to solve environmental problems from an integrated knowledge base.

The mission of the ESPM major is to:

- improve the basis for environmental decision-making by integrating physical, biological, and social sciences with policy analysis and management;
- educate the next generation of environmental professionals and leaders;
- foster innovative approaches for the education of environmental professionals;
- facilitate science/social science/policy linkages within and beyond the University.

Students complete a set of common “integrated core” courses that focus on integrated problem solving using environmental sciences, policy, ethics, management models, and communication theory. Students also incorporate classroom and fieldwork.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site.

General Requirements

All students are required to complete general University and college requirements including writing and liberal education courses. For more information about University-wide requirements, see the liberal education requirements.

Recommended freshman writing course(s) for this program: RHET 1101

Program Requirements

All students complete Required Courses below and choose one of the following ESPM tracks: conservation and resource management (CRM); corporate environmental management (CEM); environmental education and communication (EEC); policy, planning, law and society (PPLS); and environmental science (ES).

Students are strongly encouraged to have an international experience before graduation. Courses completed during an international experience (study, work, volunteer, research) can meet program requirements, liberal education requirements, and/or electives. Discussion with an adviser prior to commencing an international experience is required to plan how courses meet requirements in the ESPM major.

All required courses must be taken A-F, and students must earn a grade of at least a C-.

Required Courses

Communication Skills

RHET 1223 - Oral Presentations in Professional Settings (3.0 cr)
or COMM 1101 - Introduction to Public Speaking (3.0 cr)

Mathematical Thinking

Students in policy, planning, law and society track or environmental education and communication track may select SOC 3811. Students in conservation and resource management must take ESPM 3012.

STAT 3011 - Introduction to Statistical Analysis, MATH (4.0 cr)
or SOC 3811 - Basic Social Statistics, MATH (4.0 cr)

Physical and Biological Sciences

CHEM 1021 is required for the environmental science track.

CHEM 1011 - Introductory Chemistry: Lecture and Laboratory, PHYS SCI/L (4.0 cr)
or CHEM 1021 - Chemical Principles I, ENVT, PHYS SCI/L (4.0 cr)
BIOL 1001 - Introductory Biology I: Evolutionary and Ecological Perspectives, BIOL SCI/L, ENVT (4.0 cr)
or BIOL 1009 - General Biology, BIOL SCI/L (4.0 cr)

Integrated ESPM Core

ESPM 1001 - Orientation to Environmental Sciences, Policy, and Management (1.0 cr)
ESPM 1011 - Issues in the Environment, C/PE, ENVT (3.0 cr)
ESPM 2021 - Environmental Sciences: Integrated Problem Solving (3.0 cr)
ESPM 3000 - Seminar on Current Issues for ESPM (1.0 cr)
ESPM 4041 - Problem Solving for Environmental Change (4.0 cr)

Program Sub-plans

Students are required to complete one of the following sub-plans. (Note: The honors sub-plan does not meet this requirement.) Honors students are required to complete one sub-plan plus the honors sub-plan.

Conservation and Resource Management

Students in the CRM track are involved in what Thoreau suggested was "environmental wisdom" or the ability to make effective decisions about the environment by synthesizing natural and human created facts and information. Students integrate this understanding with diverse economic and social insight to make effective decisions for the environment and society.

This track prepares students for technical support, operational, and managerial positions in diverse aspects of resource conservation and management with local, state, and federal agencies and the private sector. This track also prepares students for graduate study in a wide range of areas.

Students solve problems in field settings and communicate their understanding, synthesis, and decision-making to diverse audiences. They gain experience in the actual implementation of decisions. Students may also develop special skills through electives (e.g., geographic information systems, geospatial analysis).

Required Courses

Social Sciences

ESPM 3261W - Economics and Natural Resources Management, ENVT, SSCI, WI (4.0 cr)
or APEC 1101 - Principles of Microeconomics, SSCI (3.0 cr)
or ECON 1101 - Priciples of Microeconomics (4.0 cr)
ESPM 3241W - Natural Resource and Environmental Policy: History, Creation, and Implementation, C/PE, SSCI, WI (3.0 cr)
or ESPM 3271 - Human Environmental Behavior and Policy (3.0 cr)

CRM Core Courses

ESPM 1145 - Quantitative Methods for Environmental Scientists and Managers I (4.0 cr)
or MATH 1142 - Short Calculus, MATH (4.0 cr)
or MATH 1271 - Calculus I, MATH (4.0 cr)
ESPM 3012 - Quantitative Methods for Environmental Scientists II (4.0 cr)
BIOL 2012 - General Zoology (4.0 cr)
or BIOL 2022 - General Botany (3.0 cr)
or ESPM 3021 - Ecological Vegetation Management: a Consulting Approach, ENVT (3.0 cr)
or ESPM 3101 - Conservation of Plant Biodiversity, ENVT (3.0 cr)
or ESPM 3108 - Ecology of Managed Systems (4.0 cr)
or ESPM 3612W - Soil and Environmental Biology, WI (3.0 cr)
or FR 1101 - Dendrology: Identifying Forest Trees and Shrubs (3.0 cr)
or FR 3104 - Forest Ecology (4.0 cr)
CHEM 1022 - Chemical Principles II, ENVT, PHYS SCI/L (4.0 cr)
or BIOC 2011 - Biochemistry for the Agricultural and Health Sciences (3.0 cr)
or ESPM 4601 - Soils and Pollution (3.0 cr)
SOIL 1125 - The Soil Resource, ENVT, PHYS SCI/L (4.0 cr)
or SOIL 2125 - Basic Soil Science, ENVT (4.0 cr)

Requires approval by and supervision of faculty adviser from track.
ESPM 4096 - Professional Experience Program: Internship (1.0-3.0 cr)

CRM Contract Courses

Take 36 or more credit(s) including 4 or more sub-requirement(s) from the following:

Courses taken to meet other requirements cannot be double counted here, nor can courses count for multiple groups. Course selections from contract area must be made through a faculty adviser. A contract is required.

Take 10 or more credit(s) from the following:
EEB 4601 - Limnology (3.0 cr)
ESPM 3021 - Ecological Vegetation Management: a Consulting Approach, ENVT (3.0 cr)
ESPM 3101 - Conservation of Plant Biodiversity, ENVT (3.0 cr)
ESPM 3575 - Wetlands Conservation (3.0 cr)
ESPM 4061W - Water Quality and Natural Resources, ENVT, WI (3.0 cr)
ENT 3925 - Insects, Aquatic Habitats, and Pollution (3.0 cr)
ESPM 3108 - Ecology of Managed Systems (4.0 cr)
ESPM 3221 - Soil Conservation and Land-Use Management (3.0 cr)
ESPM 3612W - Soil and Environmental Biology, WI (3.0 cr)
ESPM 4216 - Contaminant Hydrology (2.0 cr)
ESPM 4601 - Soils and Pollution (3.0 cr)
FR 3104 - Forest Ecology (4.0 cr)
FR 3114 - Hydrology and Watershed Management (3.0 cr)
FR 3411 - Managing Forest Ecosystems: Silviculture (3.0 cr)
FR 5153 - Forest and Wetland Hydrology (3.0 cr)
FW 4102 - Principles of Conservation Biology (3.0 cr)
FW 4103 - Principles of Wildlife Management (3.0 cr)
FW 5411 - Aquatic Toxicology, ENVT (3.0 cr)
FW 5604W - Fisheries Ecology and Management, ENVT, WI (3.0 cr)
HORT 5071 - Restoration and Reclamation Ecology, ENVT (3.0 cr)
SOIL 3416 - Plant Nutrients in the Environment (3.0 cr)
SOIL 5555 - Wetland Soils (3.0 cr)
SOIL 5711 - Forest Soils (2.0 cr)

Take 7 or more credit(s) from the following:
ESPM 3211 - Survey, Measurement, and Modeling for Environmental Analysis (3.0 cr)
ESPM 4021W - Environmental Impact Statements, WI (3.0 cr)
FR 3131 - Geographical Information Systems (GIS) for Natural Resources (4.0 cr)
FR 3218 - Measuring & Modeling Forests (3.0 cr)
FR 3262 - Remote Sensing of Natural Resources and Environment (4.0 cr)
FR 5412 - Digital Remote Sensing (3.0 cr)
FW 5051 - Analysis of Populations (3.0 cr)
GEOG 3561 - Principles of Geographic Information Science (4.0 cr)
GIS 5571 - Introduction to Arc/Info (3.0 cr)

Take 1 or more course(s) totaling 2 - 3 credit(s) from the following:
ESPM 3031 - Applied Global Positioning Systems for Geographic Information Systems (3.0 cr)
ESPM 3111 - Hydrology and Water Quality Field Methods (3.0 cr)
PBIO 4321 - Minnesota Flora (3.0 cr)
SOIL 4093 - Directed Study (1.0-7.0 cr)
SOIL 4511 - Field Study of Soils (2.0 cr)
FR 2101 - Identifying Forest Plants (1.0 cr)
FR 2102 - Northern Forests: Field Ecology (2.0 cr)
FR 2104 - Measuring Forest Resources (1.0 cr)

Take 3 or more credit(s) from the following:
ESPM 3202W - Environmental Conflict Management, Leadership, and Planning, C/PE, WI (3.0 cr)
ESPM 3241W - Natural Resource and Environmental Policy: History, Creation, and Implementation, C/PE, SSCI, WI (3.0 cr)
ESPM 3271 - Human Environmental Behavior and Policy (3.0 cr)
ESPM 3602 - Regulatory and Ethical Frameworks for CEM (3.0 cr)
ESPM 3604 - Environmental Management Systems and Strategy (3.0 cr)
ESPM 4021W - Environmental Impact Statements, WI (3.0 cr)
ESPM 4242 - Methods for Environmental and Natural Resource Policy Analysis (3.0 cr)

Corporate Environmental Management

The CEM track provides graduates with the fundamental skills to systematically determine the environmental burdens associated with a firm's products or manufacturing processes and to identify opportunities that generate value from environmental risk reduction, regulatory compliance programs, and other alternatives for improving environmental performance. The CEM track prepares students for positions in growing environmental,

health, and safety organizations housed within private enterprises, consultancies, and governmental institutions, as well as for graduate study in business, public policy, environmental sciences, and industrial ecology.

Student experiences within this track focus on analytical tools; the business, legal, regulatory, and ethical framework in which industrial firms operate; physical, chemical, and biological mechanisms associated with industrial emissions; techniques used to reduce the environmental impacts of industrial activity; and effective communication.

Required Courses

Social Sciences

ESPM 3261W - Economics and Natural Resources Management, ENVT, SSCI, WI (4.0 cr)
or APEC 1101 - Principles of Microeconomics, SSCI (3.0 cr)
or ECON 1101 - Principles of Microeconomics (4.0 cr)
ESPM 3241W - Natural Resource and Environmental Policy: History, Creation, and Implementation, C/PE, SSCI, WI (3.0 cr)
or ESPM 3271 - Human Environmental Behavior and Policy (3.0 cr)

Prerequisite CEM Courses

ACCT 2050 - Introduction to Financial Reporting (4.0 cr)
MATH 1271 - Calculus I, MATH (4.0 cr)
MATH 1272 - Calculus II (4.0 cr)
MGMT 3001 - Fundamentals of Management (3.0 cr)
PHYS 1301W - Introductory Physics for Science and Engineering I, PHYS SCI/L, WI (4.0 cr)
PHYS 1302W - Introductory Physics for Science and Engineering II, PHYS SCI/L, WI (4.0 cr)
CHEM 1022 - Chemical Principles II, ENVT, PHYS SCI/L (4.0 cr)
or BIOC 2011 - Biochemistry for the Agricultural and Health Sciences (3.0 cr)

CEM Track Required Courses

CE 3501 - Environmental Engineering, C/PE, ENVT (3.0 cr)
ESPM 3602 - Regulatory and Ethical Frameworks for CEM (3.0 cr)
ESPM 3603 - Environmental Life Cycle Analysis (3.0 cr)
ESPM 3604 - Environmental Management Systems and Strategy (3.0 cr)
ESPM 3606 - Minimizing Industrial Emissions (3.0 cr)
ESPM 5019 - Business, Natural Environment, and Global Economy (2.0 cr)
ESPM 4096 - Professional Experience Program: Internship (1.0-3.0 cr)
or ESPM 3111 - Hydrology and Water Quality Field Methods (3.0 cr)
or appropriate study abroad
or FR 2101 - Identifying Forest Plants (1.0 cr)
and FR 2102 - Northern Forests: Field Ecology (2.0 cr)
and FR 2104 - Measuring Forest Resources (1.0 cr)

Track Contract Courses

Take 13 or more credit(s) from the following:

ESPM 2041 - Natural Resources Consumption and Sustainability, ENVT, IP (3.0 cr)
ESPM 3202W - Environmental Conflict Management, Leadership, and Planning, C/PE, WI (3.0 cr)
ESPM 3605 - Recycling: Extending Raw Materials (3.0 cr)
ESPM 4607 - Industrial Biotechnology and the Environment (2.0 cr)
ESPM 4608 - Bioremediation (2.0 cr)
ESPM 4216 - Contaminant Hydrology (2.0 cr)

Environmental Education and Communication

Students in the EEC track gain a solid base of knowledge in the environmental sciences, environmental ethics, and the social context of environmental issues, and they develop a practical set of skills for teaching effectively in informal settings and for communicating clearly in written, oral, and electronic forms. This track prepares students to work at government agencies, nature centers, parks, non-governmental organizations, and similar institutions, and is appropriate for students who wish to gain a broad understanding of environmental issues and the choices humans can make to mitigate unwanted impacts of human behavior on the environment.

Students may specialize in a content area through a minor, study abroad experience in ESPM topics, and/or a student designed content area. Students are encouraged to make choices that strengthen their expertise in an area and/or provide comparative understanding from another culture or discipline.

Courses listed in the track but not taken are good possibilities for use in a content area, as are courses listed below. ESPM students should see their adviser for a list of minors.

Required Courses

Social Sciences

ESPM 3261W - Economics and Natural Resources Management, ENVT, SSCI, WI (4.0 cr)
or APEC 1101 - Principles of Microeconomics, SSCI (3.0 cr)
or ECON 1101 - Principles of Microeconomics (4.0 cr)
ESPM 3241W - Natural Resource and Environmental Policy: History, Creation, and Implementation, C/PE, SSCI, WI (3.0 cr)
or ESPM 3271 - Human Environmental Behavior and Policy (3.0 cr)

Education and Communication

ESPM 2401 - Environmental Education/Naturalist (3.0 cr)
RHET 3404 - Environmental Communication (3.0 cr)
CI 5534 - Studies in Science Education (3.0 cr)
or CI 5537 - Principles of Environmental Education (3.0 cr)
or CI 5747 - Global and Environmental Education: Content and Practice (3.0 cr)
or EPSY 5243 - Principles and Methods of Evaluation (3.0 cr)
or REC 5301 - Wilderness and Adventure Education (4.0 cr)
or REC 5311 - Programming Outdoor and Environmental Education (3.0 cr)
or RRM 5259 - Visitor Behavior Analysis (3.0 cr)
COMM 3441 - Introduction to Organizational Communication (3.0 cr)
or COMM 3451W - Intercultural Communication: Theory and Practice, IP, WI (3.0 cr)
or ESPM 4811 - Environmental Interpretation (3.0 cr)
or RHET 1152W - Writing on Issues of Science and Technology, C/PE, WI (4.0 cr)
or RHET 3221W - Theories of Human Communication, C/PE, SSCI, WI (4.0 cr)
or RHET 3401 - Internet Communication: Tools and Issues (3.0 cr)
or RHET 5664 - Science Writing for Popular Audiences (3.0 cr)

Human Dimensions

ESPM 3011W - Ethics and Leadership in Resource Management, C/PE, ENVT, WI (3.0 cr)
or PHIL 3301 - Environmental Ethics, C/PE, ENVT (4.0 cr)
or RHET 3362 - Applied Environmental Ethics (3.0 cr)

Take 2 or more course(s) from the following:

CSCL 3366W - Landscape, Nature, Society, ENVT, WI (3.0 cr)
ESPM 2041 - Natural Resources Consumption and Sustainability, ENVT, IP (3.0 cr)
ESPM 3001 - Treaty Rights and Natural Resources, CD, HP (3.0 cr)
ESPM 3202W - Environmental Conflict Management, Leadership, and Planning, C/PE, WI (3.0 cr)
ESPM 3245 - Sustainable Land Use Planning and Policy, ENVT (3.0 cr)
GEOG 3376 - Political Ecology of North America, C/PE, ENVT (3.0 cr)
HIST 3452 - African Conservation Histories, HP, ENVT (3.0 cr)
HSCI 3244 - History of Ecology and Environmentalism (3.0 cr)
POL 4210 - Topics in Political Theory (3.0 cr)
RHET 1315 - The Land in American Experience, CD, OH (3.0 cr)
RHET 3302 - Science, Religion, and the Search for Human Nature, OH (3.0 cr)
RHET 3383 - In Search of Nature, ENVT, OH (3.0 cr)
CSCL 3361 - Visions of Nature: The Natural World and Political Thought, C/PE, ENVT (4.0 cr)
or EEB 3361 - Visions of Nature: The Natural World and Political Thought, C/PE, ENVT (4.0 cr)

Natural Sciences
BIOL 3407 - Ecology, ENVT (3.0 cr)
or EEB 3001 - Ecology and Society, ENVT (3.0 cr)
or FR 3104 - Forest Ecology (4.0 cr)
EEB 4601 - Limnology (3.0 cr)
or ESPM 4061W - Water Quality and Natural Resources, ENVT, WI (3.0 cr)
or FR 3114 - Hydrology and Watershed Management (3.0 cr)
or GEO 1001 - Earth and Its Environments, ENVT, PHYS SCI/L (4.0 cr)
or PHYS 1001W - Energy and the Environment, ENVT, PHYS SCI/L, WI (4.0 cr)
or PLPA 3002 - Air Pollution, People, and Plants: The Science and the Ethics, C/PE, ENVT (3.0 cr)
or SOIL 1125 - The Soil Resource, ENVT, PHYS SCI/L (4.0 cr)

Take 3 or more course(s) including 2 or more sub-requirement(s) from the following:

Take 1 or more course(s) from the following:
BIOL 2022 - General Botany (3.0 cr)
FR 1101 - Dendrology: Identifying Forest Trees and Shrubs (3.0 cr)
PBIO 4321 - Minnesota Flora (3.0 cr)
PBIO 4511 - Flowering Plant Diversity (3.0 cr)

Take 1 or more course(s) from the following:
BIOL 2012 - General Zoology (4.0 cr)
EEB 4134 - Introduction to Ornithology (4.0 cr)
EEB 4129 - Mammalogy (4.0 cr)
ENT 3005 - Insect Biology, BIOL SCI/L (3.0 cr)
FW 3136 - Biology of Fishes (4.0 cr)

Complex Human and Natural Systems
ESPM 3108 - Ecology of Managed Systems (4.0 cr)
or EEB 5146 - Science and Policy of Global Environmental Change (3.0 cr)
or FR 5146 - Science and Policy of Global Environmental Change, ENVT (3.0 cr)
or FW 4102 - Principles of Conservation Biology (3.0 cr)
or HORT 5071 - Restoration and Reclamation Ecology, ENVT (3.0 cr)

Field Experience
ESPM 4096 - Professional Experience Program: Internship (1.0-3.0 cr)
or FR 2101 - Identifying Forest Plants (1.0 cr)
and FR 2102 - Northern Forests: Field Ecology (2.0 cr)
and FR 2104 - Measuring Forest Resources (1.0 cr)

Environmental Science

The ES track focuses on the application and integration of basic and applied sciences to solve complex environmental problems. Students can earn professional licenses and certification in several areas and will be qualified to work as soil scientists, hydrologists, water quality and wetland ecology scientists, environmental remediation scientists, climatologists, and atmospheric scientist. Graduates find jobs with environmental regulatory agencies, private consulting firms, and nonprofit organizations. This track provides a diverse basic and applied science background that also prepares students for scientific research through advanced graduate studies.

Students in this track use an understanding of biology, chemistry, physics, and mathematics to develop a broad knowledge base in soil, hydrologic, atmospheric, and biological sciences. Students study the interaction between science and the functioning of urban, forested, and agricultural lands as well as hydrologic, atmospheric, soil, and wetland resources.

Required Courses

Social Sciences
ESPM 3261W - Economics and Natural Resources Management, ENVT, SSCI, WI (4.0 cr)
or APEC 1101 - Principles of Microeconomics, SSCI (3.0 cr)
or ECON 1101 - Principles of Microeconomics (4.0 cr)
ESPM 3241W - Natural Resource and Environmental Policy: History, Creation, and Implementation, C/PE, SSCI, WI (3.0 cr)
or ESPM 3271 - Human Environmental Behavior and Policy (3.0 cr)

Additional Basic Science and Math Courses
ESPM 3131 - Environmental Physics (3.0 cr)
CHEM 1022 - Chemical Principles II, ENVT, PHYS SCI/L (4.0 cr)
PHYS 1101W - Introductory College Physics I, PHYS SCI/L, WI (4.0 cr)
MATH 1142 - Short Calculus, MATH (4.0 cr)
or MATH 1271 - Calculus I, MATH (4.0 cr)
or MATH 1281 - Calculus with Biological Emphasis I, MATH (4.0 cr)
BIOC 2011 - Biochemistry for the Agricultural and Health Sciences (3.0 cr)
or BIOL 2012 - General Zoology (4.0 cr)
or BIOL 2022 - General Botany (3.0 cr)
or BIOL 2032 - General Microbiology with Laboratory (4.0 cr)

Applied Sciences and Technology Courses
ESPM 1425 - The Atmosphere, ENVT, PHYS SCI/L (4.0 cr)
ESPM 4096 - Professional Experience Program: Internship (1.0-3.0 cr)
FR 3114 - Hydrology and Watershed Management (3.0 cr)
GEO 1001 - Earth and Its Environments, ENVT, PHYS SCI/L (4.0 cr)
SOIL 2125 - Basic Soil Science, ENVT (4.0 cr)
FR 3131 - Geographical Information Systems (GIS) for Natural Resources (4.0 cr)
or GEOG 3561 - Principles of Geographic Information Science (4.0 cr)
BIOL 3407 - Ecology, ENVT (3.0 cr)
or ESPM 3108 - Ecology of Managed Systems (4.0 cr)
or FR 3104 - Forest Ecology (4.0 cr)

Take 2 or more credit(s) from the following:
ESPM 3031 - Applied Global Positioning Systems for Geographic Information Systems (3.0 cr)
ESPM 3111 - Hydrology and Water Quality Field Methods (3.0 cr)
PBIO 4321 - Minnesota Flora (3.0 cr)
SOIL 3521 - Soil Judging (1.0 cr)
SOIL 4093 - Directed Study (1.0-7.0 cr)
SOIL 4511 - Field Study of Soils (2.0 cr)
FR 2101 - Identifying Forest Plants (1.0 cr)
FR 2102 - Northern Forests: Field Ecology (2.0 cr)
FR 2104 - Measuring Forest Resources (1.0 cr)

ES Contract Courses
Take 15 - 21 credit(s) from the following:

Students must develop a contract with their faculty adviser to develop an area of specialization. All track electives must be upper division. Depending on the selected group of courses, students have the opportunity to become certified or licensed as a professional soil scientist, hydrologist, wetland delineator, erosion control specialist, or site evaluator for individual sewage treatment system.

Take 0 - 21 credit(s) from the following:
ESPM 3221 - Soil Conservation and Land-Use Management (3.0 cr)
GEO 4703 - Glacial Geology (4.0 cr)
GEO 5108 - Principles of Environmental Geology (3.0 cr)
GEOG 3441 - Quaternary Landscape Evolution (3.0 cr)
SOIL 3416 - Plant Nutrients in the Environment (3.0 cr)
SOIL 3521 - Soil Judging (1.0 cr)
SOIL 4511 - Field Study of Soils (2.0 cr)
SOIL 5515 - Soil Genesis and Landscape Relations (3.0 cr)
SOIL 5555 - Wetland Soils (3.0 cr)
SOIL 5711 - Forest Soils (2.0 cr)

Take 0 - 21 credit(s) from the following:
EEB 4601 - Limnology (3.0 cr)
EEB 4605 - Limnology Laboratory (1.0 cr)
ESPM 4216 - Contaminant Hydrology (2.0 cr)
FR 5153 - Forest and Wetland Hydrology (3.0 cr)
FW 5604W - Fisheries Ecology and Management, ENVT, WI (3.0 cr)
GEO 5701 - General Hydrogeology (3.0 cr)
WRS 5101 - Water Resources: Individuals and Institutions (3.0 cr)

Take 0 - 21 credit(s) from the following:
BIOL 3002 - Plant Biology: Function (2.0 cr)
BIOL 3005W - Plant Function Laboratory, WI (2.0 cr)
BIOL 3007W - Plant Biology: Diversity and Adaptation, WI (4.0 cr)
EEB 4611 - Biogeochemical Processes (3.0 cr)
EEB 5009 - Quaternary Vegetation History and Climate (3.0 cr)
EEB 5122W - Plant Interactions with Animals and Microbes, WI (3.0 cr)
ENT 5361 - Aquatic Insects (4.0 cr)
ESPM 5131 - Environmental Biophysics and Ecology (3.0 cr)
FR 5146 - Science and Policy of Global Environmental Change, ENVT (3.0 cr)
HORT 5071 - Restoration and Reclamation Ecology, ENVT (3.0 cr)
LA 3204 - Landscape Ecology (3.0 cr)
MICB 4121 - Microbial Ecology and Applied Microbiology (3.0 cr)

Take 0 - 21 credit(s) from the following:
AGRO 4605 - Management Strategies for Crop Production (4.0 cr)
AGRO 5321 - Ecology of Agricultural Systems, ENVT (3.0 cr)
BIOL 3407 - Ecology, ENVT (3.0 cr)
EEB 3963 - Modeling Nature and the Nature of Modeling (3.0 cr)
EEB 4611 - Biogeochemical Processes (3.0 cr)
EEB 4631 - Global Ecology (4.0 cr)
FR 3104 - Forest Ecology (4.0 cr)
FR 3203 - Forest Fire and Disturbance Ecology (3.0 cr)
FR 3204 - Landscape Ecology and Management (3.0 cr)
FR 3411 - Managing Forest Ecosystems: Silviculture (3.0 cr)
FR 4118 - Trees: Structure and Function (3.0 cr)
FR 5146 - Science and Policy of Global Environmental Change, ENVT (3.0 cr)
FW 4565 - Fisheries and Wildlife Ecology and Management: Field Trip (1.0 cr)

Take 0 - 21 credit(s) from the following:
ESPM 5131 - Environmental Biophysics and Ecology (3.0 cr)
ESPM 5402 - Biometeorology (3.0 cr)
GEO 3002 - Climate Change and Human History, ENVT (3.0 cr)
GEOG 5423 - Climate Models and Modeling (3.0 cr)
GEOG 5426 - Climatic Variations (3.0 cr)
GEOG 5565 - Geographical Analysis of Human-Environment Systems (3.0 cr)
ME 5115 - Air Quality and Air Pollution Control (4.0 cr)
PLPA 3002 - Air Pollution, People, and Plants: The Science and the Ethics, C/PE, ENVT (3.0 cr)

Take 0 - 21 credit(s) from the following:
CE 3501 - Environmental Engineering, C/PE, ENVT (3.0 cr)
CHEM 2301 - Organic Chemistry I (3.0 cr)
ESPM 3603 - Environmental Life Cycle Analysis (3.0 cr)
ENT 5241 - Ecological Risk Assessment (3.0 cr)
ESPM 4216 - Contaminant Hydrology (2.0 cr)
ESPM 4601 - Soils and Pollution (3.0 cr)
ESPM 5601 - Principles of Waste Management (3.0 cr)
FR 3262 - Remote Sensing of Natural Resources and Environment (4.0 cr)
FR 5412 - Digital Remote Sensing (3.0 cr)
GEOG 3401 - Geography of Environmental Systems and Global Change, WI (4.0 cr)
GEOG 3531 - Numerical Spatial Analysis (4.0 cr)
GEOG 5563 - Advanced Geographic Information Science (3.0 cr)

Policy, Planning, Law and Society

The PPLS track focuses on developing understanding and problem-solving skills germane to the interaction between human and natural systems. Students will be well prepared for policy development and analysis, strategy development, and decision-making in a range of positions and institutional settings. Example positions include those as a policy analyst, community planner, social researcher, or lawyer in public agencies, with legislative bodies, consulting firms, and conservation organizations. This track also prepares students for graduate study in policy, planning, and law programs.

Students study concepts, issues, and problem solving approaches that address the policy, legal, economic, political, planning and sociological aspects of environment and natural resource management. This study includes ethics and conflict management. The track further emphasizes an interdisciplinary approach for examining problems such as sustainable land use planning, resource conservation and management, law, and environmental protection at a range of political levels and spatial scales and developing effective and innovative solutions. Students develop skill in integrating knowledge from the physical, biological, and social sciences to develop policy and planning alternatives and appropriate strategies to provide real solutions to complex problems.

Required Courses

PPLS Core Courses
ESPM 3241W - Natural Resource and Environmental Policy: History, Creation, and Implementation, C/PE, SSCI, WI (3.0 cr)
ESPM 3261W - Economics and Natural Resources Management, ENVT, SSCI, WI (4.0 cr)
ESPM 3271 - Human Environmental Behavior and Policy (3.0 cr)
ESPM 3202W - Environmental Conflict Management, Leadership, and Planning, C/PE, WI (3.0 cr)
ESPM 3245 - Sustainable Land Use Planning and Policy, ENVT (3.0 cr)
ESPM 3251 - Natural Resources in Sustainable International Development, ENVT, IP (3.0 cr)
ESPM 4242 - Methods for Environmental and Natural Resource Policy Analysis (3.0 cr)
ESPM 4256 - Natural Resource Law and the Management of Public Lands and Waters (3.0 cr)
ESPM 4096 - Professional Experience Program: Internship (1.0-3.0 cr)
or FR 2101 - Identifying Forest Plants (1.0 cr)
and FR 2102 - Northern Forests: Field Ecology (2.0 cr)
and FR 2104 - Measuring Forest Resources (1.0 cr)
ESPM 3108 - Ecology of Managed Systems (4.0 cr)
ESPM 3211 - Survey, Measurement, and Modeling for Environmental Analysis (3.0 cr)
FR 3131 - Geographical Information Systems (GIS) for Natural Resources (4.0 cr)
RRM 4232W - Managing Recreational Lands, ENVT, WI (4.0 cr)
ESPM 3021 - Ecological Vegetation Management: a Consulting Approach, ENVT (3.0 cr)
or ESPM 3604 - Environmental Management Systems and Strategy (3.0 cr)
or ESPM 4021W - Environmental Impact Statements, WI (3.0 cr)
or ESPM 4061W - Water Quality and Natural Resources, ENVT, WI (3.0 cr)
or FR 3104 - Forest Ecology (4.0 cr)
or FR 3114 - Hydrology and Watershed Management (3.0 cr)
or FR 3411 - Managing Forest Ecosystems: Silviculture (3.0 cr)
or FR 5146 - Science and Policy of Global Environmental Change, ENVT (3.0 cr)
or SOIL 1125 - The Soil Resource, ENVT, PHYS SCI/L (4.0 cr)
or SOIL 2125 - Basic Soil Science, ENVT (4.0 cr)

PPLS Contract Courses
Take 12 or more credit(s) from the following:

Students may specialize in a content area through a minor, study abroad experience in ESPM topics, and/or a student designed content area. Students are encouraged to make choices that strengthen their expertise in an area and/or provide comparative understanding from another culture or discipline.

Courses listed in the track but not taken are good possibilities for use in a content area, as are courses listed below. PPLS students should see their adviser for a list of minors.

APEC 3xxx
BP 3xxx
COMM 3xxx
ECON 3xxx
FW 3xxx
FR 3xxx
GLOS 3xxx
GEOG 3xxx

MGMT 3xxx
POL 3xxx
RRM 3xxx
SAGR 3xxx
WRS 3xxx

Fisheries and Wildlife B.S.

Fisheries, Wildlife, and Conservation Biology

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 85 to 92.

This program requires one summer term.

Degree: Bachelor of Science.

The fisheries and wildlife curriculum gives students a broad science background emphasizing biological and environmental sciences and other coursework needed for careers in fisheries, wildlife, conservation biology, and other natural resource and environmental fields. Graduates are prepared to research, plan, and implement the management, protection, and enhancement of fisheries and aquatic resources, wildlife resources, and biological diversity. Graduates find employment as fisheries and wildlife scientists and managers, naturalists, zoo biologists, environmental biologists, environmental educators, and other natural resource professionals. The program also provides students with the fundamental science background needed to enter a wide variety of graduate programs in biological and natural resource sciences as well as professional programs in veterinary medicine, environmental law, and environmental education.

Students select an area of specialization, usually by the end of the sophomore year. Areas of specialization include conservation biology, fisheries, and wildlife. Although no computer course is required, students are expected to be computer literate and competent using word processing, spreadsheet, and e-mail software.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

General Requirements

Recommended freshman writing course(s) for this program: RHET 1101

Program Requirements

After completing a core curriculum that includes liberal education, communications, basic science, mathematics, and an orientation to the fields of fisheries, wildlife, and conservation biology, students complete additional credits in one of three areas of specialization: fisheries, wildlife, or conservation biology. Some of the core curriculum courses also fulfill diversified core and designated theme requirements. Electives to complete the required 120 credits are chosen in consultation with a program adviser.

Students may also fulfill the minimum requirements for admission to the University's College of Veterinary Medicine and other colleges of veterinary medicine by completing a bachelor's degree in fisheries and wildlife within any of the three areas of specialization.

All required courses must be taken A-F, and students must earn a grade of at least a C-.

Required Courses

Communication Skills
COMM 1101 - Introduction to Public Speaking (3.0 cr)
or RHET 1223 - Oral Presentations in Professional Settings (3.0 cr)

Mathematical Thinking
FW 4001 - Biometry, WI (4.0 cr)
MATH 1142 - Short Calculus, MATH (4.0 cr)
or MATH 1271 - Calculus I, MATH (4.0 cr)
or MATH 1281 - Calculus with Biological Emphasis I, MATH (4.0 cr)

Physical, Chemical, and Biological Sciences
BIOL 1009 - General Biology, BIOL SCI/L (4.0 cr)
BIOL 2012 - General Zoology (4.0 cr)
BIOL 3407 - Ecology, ENVT (3.0 cr)
CHEM 1021 - Chemical Principles I, ENVT, PHYS SCI/L (4.0 cr)
GCD 3022 - Genetics (3.0 cr)
FR 3114 - Hydrology and Watershed Management (3.0 cr)
or GEO 1001 - Earth and Its Environments, ENVT, PHYS SCI/L (4.0 cr)
or SOIL 2125 - Basic Soil Science, ENVT (4.0 cr)
or PHYS 1102W - Introductory College Physics II, PHYS SCI/L, WI (4.0 cr)
or PHYS 1202W - Introductory Physics for Biology and Pre-medicine II, PHYS SCI/L, WI (5.0 cr)
PHYS 1001W - Energy and the Environment, ENVT, PHYS SCI/L, WI (4.0 cr)
or PHYS 1101W - Introductory College Physics I, PHYS SCI/L, WI (4.0 cr)
or PHYS 1201W - Introductory Physics for Biology and Pre-medicine I, PHYS SCI/L, WI (5.0 cr)

Major Courses
FW 1001 - Orientation in Fisheries, Wildlife, and Conservation Biology (1.0 cr)

Problem Solving
FW 4701 - Fisheries and Wildlife Problem Solving (2.0 cr)
or CFAN 3100H - Honors Experience (2.0 - 3.0 cr)
and CFAN 3101H - Honors Seminar (1.0 - 3.0 cr)
and one additional honors seminar or honors course at 3xxx or 4xxx

Field Experience
Complete one of the following approved field experiences.

Cloquet Program
Take all of the following in the same summer term:
FW 4106 - Important Plants in Fisheries and Wildlife Habitats (1.0 cr)
FW 4108 - Field Methods in Research and Conservation of Vertebrate Populations (3.0 cr)
or

Alternative Field Course
Students not taking FW 4106/4108 (in Cloquet) must receive advance approval before enrolling in an alternate field course.

Economics
APEC 1101 - Principles of Microeconomics, SSCI (3.0 cr)
or APEC 1102 - Principles of Macroeconomics, IP, SSCI (3.0 cr)
or ECON 1101 - Principles of Microeconomics, IP, SSCI (4.0 cr)
or ECON 1102 - Principles of Macroeconomics, IP, SSCI (4.0 cr)
or ESPM 3261W - Economics and Natural Resources Management, ENVT, SSCI, WI (4.0 cr)

Program Sub-plans

Students are required to complete one of the following sub-plans. (Note: The honors sub-plan does not meet this requirement.) Honors students are required to complete one sub-plan plus the honors sub-plan.

Conservation Biology

The conservation biology specialization is for students interested in careers dealing with a broad range of conservation issues in aquatic or terrestrial habitats. Positions typically focus on protection of endangered species and management for biodiversity. Careers as environmental educators or naturalists are also options.

All required courses in the specialization must be taken A-F and completed with a grade of at least C-.

Required Courses

Human Dimensions

Take 3 or more course(s) from the following:

ESPM 3011W - Ethics and Leadership in Resource Management, C/PE, ENVT, WI (3.0 cr)
ESPM 3202W - Environmental Conflict Management, Leadership, and Planning, C/PE, WI (3.0 cr)
ESPM 3241W - Natural Resource and Environmental Policy: History, Creation, and Implementation, C/PE, SSCI, WI (3.0 cr)
ESPM 3245 - Sustainable Land Use Planning and Policy, ENVT (3.0 cr)
FW 5003 - Human Dimensions of Biological Conservation, C/PE, ENVT (3.0 cr)

Animals and Plants

BIOL 2022 - General Botany (3.0 cr)

Take 1 or more course(s) from the following:

EEB 4129 - Mammalogy (4.0 cr)
EEB 4134 - Introduction to Ornithology (4.0 cr)
ENT 5021 - Insect Taxonomy and Phylogeny (4.0 cr)
ENT 5361 - Aquatic Insects (4.0 cr)
FW 3136 - Biology of Fishes (4.0 cr)

Take 1 or more course(s) from the following:

BIOL 3007W - Plant Biology: Diversity and Adaptation, WI (4.0 cr)
FR 1101 - Dendrology: Identifying Forest Trees and Shrubs (3.0 cr)
PBIO 4321 - Minnesota Flora (3.0 cr)
PBIO 4511 - Flowering Plant Diversity (3.0 cr)

Community and Ecosystem Ecology

FR 3204 - Landscape Ecology and Management (3.0 cr)

Take 1 or more course(s) from the following:

EEB 4014 - Ecology of Vegetation (3.0 cr)
EEB 4016W - Ecological Biogeography, WI (3.0 cr)
EEB 4601 - Limnology (3.0 cr)
EEB 4609W - Ecosystem Ecology, WI (3.0 cr)
ESPM 3575 - Wetlands Conservation (3.0 cr)
FR 3104 - Forest Ecology (4.0 cr)

Conservation Biology

FR 3131 - Geographical Information Systems (GIS) for Natural Resources (4.0 cr)
FW 4102 - Principles of Conservation Biology (3.0 cr)
FW 4103 - Principles of Wildlife Management (3.0 cr)
or FW 5051 - Analysis of Populations (3.0 cr)
or FW 5601 - Fisheries Population Analysis (3.0 cr)
or FW 5603W - Habitats and Regulation of Wildlife, ENVT, WI (3.0 cr)
or FW 5604W - Fisheries Ecology and Management, ENVT, WI (3.0 cr)

Fisheries

The fisheries area of specialization is for students who wish to pursue careers in fisheries and aquatic resource science, management, and administration; fish hatchery management; and aquaculture, aquatic education, and aquatic environmental assessment. The curriculum meets the education criteria for the Certified Fisheries Professional designation established by the American Fisheries Society, the major professional organization for fisheries scientists and managers in North America.

Required Courses

Human Dimensions

Take 2 or more course(s) from the following:

ESPM 3011W - Ethics and Leadership in Resource Management, C/PE, ENVT, WI (3.0 cr)
ESPM 3202W - Environmental Conflict Management, Leadership, and Planning, C/PE, WI (3.0 cr)
ESPM 3241W - Natural Resource and Environmental Policy: History, Creation, and Implementation, C/PE, SSCI, WI (3.0 cr)
ESPM 3245 - Sustainable Land Use Planning and Policy, ENVT (3.0 cr)
FW 5003 - Human Dimensions of Biological Conservation, C/PE, ENVT (3.0 cr)

Animals and Plants

FW 3136 - Biology of Fishes (4.0 cr)
FW 4401 - Fish Physiology and Behavior (2.0 cr)

Take 1 or more course(s) from the following:

EEB 4129 - Mammalogy (4.0 cr)
EEB 4134 - Introduction to Ornithology (4.0 cr)
ENT 5021 - Insect Taxonomy and Phylogeny (4.0 cr)
ENT 5361 - Aquatic Insects (4.0 cr)
PBIO 4321 - Minnesota Flora (3.0 cr)
PBIO 4511 - Flowering Plant Diversity (3.0 cr)

Community and Ecosystem Ecology

EEB 4601 - Limnology (3.0 cr)

Take 1 or more course(s) from the following:

EEB 4609W - Ecosystem Ecology, WI (3.0 cr)
ESPM 3575 - Wetlands Conservation (3.0 cr)
ESPM 4061W - Water Quality and Natural Resources, ENVT, WI (3.0 cr)
FR 3204 - Landscape Ecology and Management (3.0 cr)

Fisheries

CHEM 1022 - Chemical Principles II, ENVT, PHYS SCI/L (4.0 cr)
FW 5601 - Fisheries Population Analysis (3.0 cr)
FW 5604W - Fisheries Ecology and Management, ENVT, WI (3.0 cr)

Take one of the following course pairs:

BIOC 2011 - Biochemistry for the Agricultural and Health Sciences (3.0 cr)
CHEM 2301 - Organic Chemistry I (3.0 cr)
or
CHEM 2101 - Introductory Analytical Chemistry Lecture (3.0 cr)
CHEM 2111 - Introductory Analytical Chemistry Lab (2.0 cr)
or
CHEM 2301 - Organic Chemistry I (3.0 cr)
CHEM 2302 - Organic Chemistry II (3.0 cr)

Wildlife

The wildlife specialization is for students who wish to pursue careers in wildlife science, management, and administration; zoo biology; terrestrial ecology; environmental assessment; and education. With proper selection of electives, students can meet the education criteria for the Certified Wildlife Biologist designation established by the Wildlife Society, the major professional organization for wildlife scientists and managers in North America.

Required Courses

Human Dimensions

Take 2 or more course(s) from the following:

ESPM 3011W - Ethics and Leadership in Resource Management, C/PE, ENVT, WI (3.0 cr)
ESPM 3202W - Environmental Conflict Management, Leadership, and Planning, C/PE, WI (3.0 cr)
ESPM 3241W - Natural Resource and Environmental Policy: History, Creation, and Implementation, C/PE, SSCI, WI (3.0 cr)
ESPM 3245 - Sustainable Land Use Planning and Policy, ENVT (3.0 cr)
FW 5003 - Human Dimensions of Biological Conservation, C/PE, ENVT (3.0 cr)

Animal and Plants
BIOL 2022 - General Botany (3.0 cr)
EEB 4129 - Mammalogy (4.0 cr)
EEB 4134 - Introduction to Ornithology (4.0 cr)
Take 2 or more course(s) from the following:
BIOL 3007W - Plant Biology: Diversity and Adaptation, WI (4.0 cr)
FR 1101 - Dendrology: Identifying Forest Trees and Shrubs (3.0 cr)
PBIO 4321 - Minnesota Flora (3.0 cr)
PBIO 4511 - Flowering Plant Diversity (3.0 cr)

Community and Ecosystem Ecology
EEB 4014 - Ecology of Vegetation (3.0 cr)
or EEB 4609W - Ecosystem Ecology, WI (3.0 cr)
or ESPM 3575 - Wetlands Conservation (3.0 cr)
or FR 3104 - Forest Ecology (4.0 cr)
or FR 3204 - Landscape Ecology and Management (3.0 cr)

Wildlife
ESPM 3211 - Survey, Measurement, and Modeling for Environmental Analysis (3.0 cr)
FR 3131 - Geographical Information Systems (GIS) for Natural Resources (4.0 cr)
FW 4103 - Principles of Wildlife Management (3.0 cr)
FW 5051 - Analysis of Populations (3.0 cr)
FW 5603W - Habitats and Regulation of Wildlife, ENVT, WI (3.0 cr)

Fisheries and Wildlife Minor

Fisheries, Wildlife, and Conservation Biology

Required credits in this minor: 23 to 25.

The fisheries and wildlife minor enables students in programs such as biology, communications, education, forestry, natural resources, environmental studies, and others to develop an understanding of the principles and practices of fisheries, wildlife, and conservation biology. An overview is provided of fish and wildlife biology and natural history and of the general principles applied to managing their populations and habitats. Students interested in the minor should contact the CFANS Student Services Office.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Required Courses

Preparatory Courses
BIOL 2012 - General Zoology (4.0 cr)
BIOL 3407 - Ecology, ENVT (3.0 cr)
or any ecology course

Minor Courses
FW 2001 - Introduction to Fisheries, Wildlife, and Conservation Biology, ENVT (3.0 cr)
FW 5603W - Habitats and Regulation of Wildlife, ENVT, WI (3.0 cr)
FW 5604W - Fisheries Ecology and Management, ENVT, WI (3.0 cr)
FW 1001 - Orientation in Fisheries, Wildlife, and Conservation Biology (1.0 cr)
or any natural resources orientation course
EEB 4129 - Mammalogy (4.0 cr)
or EEB 4134 - Introduction to Ornithology (4.0 cr)
or FW 3136 - Biology of Fishes (4.0 cr)
FW 5051 - Analysis of Populations (3.0 cr)
or FW 5455 - Sustainable Aquaculture, ENVT, IP (3.0 cr)
or FW 5571 - Avian Conservation and Management (3.0 cr)
or FW 5601 - Fisheries Population Analysis (3.0 cr)

Food Science B.S.

Food Science and Nutrition

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 93 to 98.

Degree: Bachelor of Science.

Food science applies chemistry, microbiology, and engineering to the science and technology of making foods. Chemistry—because foods undergo chemical reactions when they are heated, frozen, mixed with each other, and stored. Microbiology—because many foods are made by microorganisms (e.g., bread, cheese, yogurt, sauerkraut, tempeh) and because microorganisms cause extensive, rapid, and often dangerous spoilage. Physics and engineering—because foods must be constructed, moved through the factory, made safe, and distributed intact to the consumer.

Food science involves creating new food products and making current products more stable, nutritious, convenient, reliable, and safe.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

General Requirements

Recommended freshman writing course(s) for this program: RHET 1101

Program Requirements

All required courses must be taken A-F, and students must earn a grade of at least a C-.

Required Courses

Calculus
Take one of the following course pairs:
MATH 1271 - Calculus I, MATH (4.0 cr)
MATH 1272 - Calculus II (4.0 cr)
or
MATH 1571H - Honors Calculus I, MATH, H (4.0 cr)
MATH 1572H - Honors Calculus II, H (4.0 cr)

Biology and Chemistry
CHEM 1021 - Chemical Principles I, ENVT, PHYS SCI/L (4.0 cr)
CHEM 1022 - Chemical Principles II, ENVT, PHYS SCI/L (4.0 cr)
CHEM 2301 - Organic Chemistry I (3.0 cr)
CHEM 2302 - Organic Chemistry II (3.0 cr)
MICB 3301 - Biology of Microorganisms (5.0 cr)
STAT 3011 - Introduction to Statistical Analysis, MATH (4.0 cr)
BIOL 1009 - General Biology, BIOL SCI/L (4.0 cr)
or PSTL 1131 - Principles of Biological Science, BIOL SCI/L (4.0 cr)
BIOC 4025 - Laboratory in Biochemistry (2.0 cr)
or CHEM 2111 - Introductory Analytical Chemistry Lab (2.0 cr)
or CHEM 2311 - Organic Lab (4.0 cr)
or FSCN 4613 - Experimental Nutrition (2.0 cr)
BIOC 3021 - Biochemistry (3.0 cr)
or take the following course pair:
BIOC 4331 - Biochemistry I: Structure, Catalysis, and Metabolism in Biological Systems (4.0 cr)

BIOC 4332 - Biochemistry II: Molecular Mechanisms of Signal Transduction and Gene Expression (4.0 cr)

Physics
PHYS 1301W and 1302W are recommended.

Take the following course pair:
PHYS 1101W - Introductory College Physics I, PHYS SCI/L, WI (4.0 cr)
PHYS 1102W - Introductory College Physics II, PHYS SCI/L, WI (4.0 cr)

or take the following course pair:
PHYS 1201W - Introductory Physics for Biology and Pre-medicine I, PHYS SCI/L, WI (5.0 cr)
PHYS 1202W - Introductory Physics for Biology and Pre-medicine II, PHYS SCI/L, WI (5.0 cr)

or take the following course pair:
PHYS 1301W - Introductory Physics for Science and Engineering I, PHYS SCI/L, WI (4.0 cr)
PHYS 1302W - Introductory Physics for Science and Engineering II, PHYS SCI/L, WI (4.0 cr)

or take the following course pair:
PHYS 1401V - Honors Physics I, PHYS SCI/L, WI, H (4.0 cr)
PHYS 1402V - Honors Physics II, PHYS SCI/L, WI, H (4.0 cr)

Communication
COMM 1101 - Introduction to Public Speaking (3.0 cr)
or RHET 1223 - Oral Presentations in Professional Settings (3.0 cr)
ENGC 3027W - Advanced Expository Writing, WI (4.0 cr)
or RHET 3562W - Technical and Professional Writing, WI (4.0 cr)

Professional Courses
BAE 4744 - Engineering Principles for Biological Scientists (4.0 cr)
FSCN 1102 - Food: Safety, Risks, and Technology, C/PE (3.0 cr)
FSCN 1112 - Principles of Nutrition, ENVT (3.0 cr)
FSCN 3102 - Introduction to Food Science (3.0 cr)
FSCN 4111 - Food Chemistry (3.0 cr)
FSCN 4121 - Food Microbiology and Fermentations (3.0 cr)
FSCN 4122 - Laboratory Methods in Food Microbiology and Fermentations (2.0 cr)
FSCN 4312W - Food Analysis, WI (4.0 cr)
FSCN 4332 - Food Processing Operations (3.0 cr)

Food Science Capstone
FSCN 4342 - Properties of Water in Foods (4.0 cr)
or FSCN 4343 - Processing of Dairy Products (4.0 cr)
or FSCN 4345 - Flavor Technology (3.0 cr)
or FSCN 4346 - Functional Foods: Regulations and Technology (3.0 cr)
or FSCN 5481 - Sensory Evaluation of Food Quality (2.0 cr)

Food Science Minor

Food Science and Nutrition

Requirements for this program are current for Fall 2006.

Required credits in this minor: 20.

See major description for more information.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Required Courses

Minor Courses
Note: Many of the courses listed in the minor have prerequisites that do not count toward the 20 credits

Take 20 or more credit(s) from the following:
BAE 4744 - Engineering Principles for Biological Scientists (4.0 cr)
FSCN 1102 - Food: Safety, Risks, and Technology, C/PE (3.0 cr)
FSCN 3102 - Introduction to Food Science (3.0 cr)
FSCN 4121 - Food Microbiology and Fermentations (3.0 cr)
FSCN 4111 - Food Chemistry (3.0 cr)
FSCN 4122 - Laboratory Methods in Food Microbiology and Fermentations (2.0 cr)
FSCN 4131 - Food Quality (3.0 cr)
FSCN 4312W - Food Analysis, WI (4.0 cr)
FSCN 4332 - Food Processing Operations (3.0 cr)

Food Systems and the Environment Minor

Requirements for this program are current for Fall 2006.

Required credits in this minor: 15.

This interdisciplinary minor, based in CFANS, serves students from other colleges who have an interest in and a desire to acquire some breadth about food systems and the environment. Students completing this minor will be better prepared to understand the complexity of modern global food systems; understand the interdependence of rural and urban societies; understand the environmental impact of consumer driven food systems choices; manage natural resources used for food and fiber for the benefit of society; make more responsible personal and public decisions impacting food systems and the environment.

Admission Requirements

This minor is limited to non-CFANS majors. Interested students should contact the minor adviser at 612-625-6754 or the CFANS Student Services Office at 612-625-7254.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Required Courses

Minor Courses
Students may only choose one course from each designator, in consultation with the minor adviser.

Take 15 or more credit(s) from the following:
CFAN 1501 - Biotechnology, People, and the Environment, ENVT (3.0 cr)
CFAN 3001 - Pests and Crop Protection (3.0 cr)
CFAN 3500 - International Field Studies Seminar (3.0 cr)
AGRO 1103 - Crops, Environment, and Society, ENVT (4.0 cr)
ANSC 1011 - Domestic Animals and Society, C/PE, ENVT (3.0 cr)
ANSC 1101 - Introductory Animal Science (4.0 cr)
APEC 3041W - Economic Development of U.S. Agriculture, HP, WI (3.0 cr)
APEC 3611 - Environmental and Natural Resource Economics, ENVT (3.0 cr)
BAE 5203 - Environmental Impacts of Food Production (3.0 cr)
ENT 4015 - Ornamentals and Turf Entomolgy (3.0 cr)
ESPM 3221 - Soil Conservation and Land-Use Management (3.0 cr)
FSCN 1102 - Food: Safety, Risks, and Technology, C/PE (3.0 cr)

FSCN 1112 - Principles of Nutrition, ENVT (3.0 cr)
RHET 1315 - The Land in American Experience, CD, OH (3.0 cr)
RHET 3383 - In Search of Nature, ENVT, OH (3.0 cr)
SOIL 1125 - The Soil Resource, ENVT, PHYS SCI/L (4.0 cr)
AGRO 3203W - Environment, Global Food Production, and the Citizen, C/PE, ENVT, WI (3.0 cr)
or ANSC 3203W - Environment, Global Food Production, and the Citizen, C/PE, ENVT, WI (3.0 cr)
AGRO 4103 - World Food Problems, C/PE, IP (3.0 cr)
or APEC 4103 - World Food Problems, C/PE, IP (3.0 cr)

Forest Resources B.S.

Forest Resources

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 120.

This program requires summer terms.

Degree: Bachelor of Science.

The forest resources curriculum prepares students to plan, implement, and research the management, protection, and sustainable use of forest and related resources, including timber, water, wildlife, recreation, and aesthetic resources. Students select between two tracks: forest management and planning and forest conservation and ecosystem management. Students taking the forest management and planning track receive training in principles and techniques of resource management. Students taking the forest conservation and ecosystem management track focus on conservation issues and strategies and on a broader understanding of ecosystem structure and function. Students should choose one of these tracks as early as possible in their college careers. A minor is also available.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

General Requirements

Recommended freshman writing course(s) for this program: RHET 1101

Program Requirements

All required courses must be taken A-F, and students must earn a grade of at least a C-.

Required Courses

Communication Skills
COMM 1101 - Introduction to Public Speaking (3.0 cr)
or RHET 1223 - Oral Presentations in Professional Settings (3.0 cr)

Mathematical Thinking
ESPM 3012 - Quantitative Methods for Environmental Scientists and Managers II (4.0 cr)
or STAT 3011 - Introduction to Statistical Analysis, MATH (4.0 cr)
MATH 1142 - Short Calculus, MATH (4.0 cr)
or MATH 1271 - Calculus I, MATH (4.0 cr)
or ESPM 1145 - Quantitative Methods for Environmental Scientists and Managers I (4.0 cr)

Physical and Biological Sciences
BIOL 2022 - General Botany (3.0 cr)
BIOL 1001 - Introductory Biology I: Evolutionary and Ecological Perspectives, BIOL SCI/L, ENVT (4.0 cr)
or BIOL 1009 - General Biology, BIOL SCI/L (4.0 cr)
PHYS 1001W - Energy and the Environment, ENVT, PHYS SCI/L, WI (4.0 cr)
or "B" or better in high school physics
SOIL 1125 - The Soil Resource, ENVT, PHYS SCI/L (4.0 cr)
or SOIL 2125 - Basic Soil Science, ENVT (4.0 cr)

Social Sciences
ESPM 3241W - Natural Resource and Environmental Policy: History, Creation, and Implementation, C/PE, SSCI, WI (3.0 cr)
ESPM 3261W - Economics and Natural Resources Management, ENVT, SSCI, WI (4.0 cr)

Professional Courses
FW 2001 is recommended for sophomores and FW 5603W is recommended for juniors or seniors. Field training in assessment and biology of forests courses are taught at the Cloquet Forestry Center during the summer.

FR 1001 - Orientation and Information Systems (1.0 cr)
FR 3131 - Geographical Information Systems (GIS) for Natural Resources (4.0 cr)
FR 3218 - Measuring & Modeling Forests (3.0 cr)
FR 3262 - Remote Sensing of Natural Resources and Environment (4.0 cr)
FR 3471 - Forest Planning and Management (3.0 cr)
RRM 4232W - Managing Recreational Lands, ENVT, WI (4.0 cr)
ESPM 3011W - Ethics and Leadership in Resource Management, C/PE, ENVT, WI (3.0 cr)
ESPM 3202W - Environmental Conflict Management, Leadership, and Planning, C/PE, WI (3.0 cr)
FR 1101 - Dendrology: Identifying Forest Trees and Shrubs (3.0 cr)
FR 3104 - Forest Ecology (4.0 cr)
FR 3114 - Hydrology and Watershed Management (3.0 cr)
FR 3411 - Managing Forest Ecosystems: Silviculture (3.0 cr)
FR 5413 - Managing Forest Ecosystems: Silviculture Lab (1.0 cr)
FW 2001 - Introduction to Fisheries, Wildlife, and Conservation Biology, ENVT (3.0 cr)
or FW 5603W - Habitats and Regulation of Wildlife, ENVT, WI (3.0 cr)
ENT 4251 - Forest and Shade Tree Entomology (3.0 cr)
or PLPA 3003 - Diseases of Forest and Shade Trees (3.0 cr)

Cloquet Program
Take all of the following in the same summer term:
FR 2101 - Identifying Forest Plants (1.0 cr)
FR 2102 - Northern Forests: Field Ecology (2.0 cr)
FR 2104 - Measuring Forest Resources (1.0 cr)

Program Sub-plans

Students are required to complete one of the following sub-plans. (Note: The honors sub-plan does not meet this requirement.) Honors students are required to complete one sub-plan plus the honors sub-plan.

Forest Conservation/Ecosystem Management

This track is for students who wish to learn the fundamentals of forest resources management while gaining knowledge of conservation issues and strategies and in the structure and function of ecosystems. Graduates might pursue careers as forest managers and conservationists or seek careers in research, teaching, and technical support for forest and related resource management and conservation.

All required courses in this track must be taken A-F and completed with a grade of at least C-.

Required Courses

Physical and Biological Sciences
CHEM 1021 - Chemical Principles I, ENVT, PHYS SCI/L (4.0 cr)
CHEM 1022 - Chemical Principles II, ENVT, PHYS SCI/L (4.0 cr)

Forest Conservation and Management

Students select, with faculty adviser approval, a minimum of 12 additional credits in professional courses chosen from the list below. Courses used to satisfy other requirements may not be used to fill this 12-credit requirement.

Take 12 or more credit(s) from the following:

ESPM 2041 - Natural Resources Consumption and Sustainability, ENVT, IP (3.0 cr)
ESPM 3002 - Colloquium: Exotic Plants and Animals (1.0 cr)
ESPM 3101 - Conservation of Plant Biodiversity, ENVT (3.0 cr)
ESPM 3021 - Ecological Vegetation Management: a Consulting Approach, ENVT (3.0 cr)
ESPM 3031 - Applied Global Positioning Systems for Geographic Information Systems (3.0 cr)
ESPM 3245 - Sustainable Land Use Planning and Policy, ENVT (3.0 cr)
ESPM 3251 - Natural Resources in Sustainable International Development, ENVT, IP (3.0 cr)
ESPM 3703 - Agroforestry in Watershed Management (3.0 cr)
ESPM 4061W - Water Quality and Natural Resources, ENVT, WI (3.0 cr)
ENT 5241 - Ecological Risk Assessment (3.0 cr)
ESPM 5555 - Wetland Soils (3.0 cr)
FR 3203 - Forest Fire and Disturbance Ecology (3.0 cr)
FR 3204 - Landscape Ecology and Management (3.0 cr)
FR 3431 - Timber Harvesting and Road Planning (2.0 cr)
FR 3612 - Silviculture and Timber Harvesting Practices in Minnesota (1.0 cr)
FR 4118 - Trees: Structure and Function (3.0 cr)
FR 5142 - Tropical Forest Ecology, ENVT (3.0 cr)
FR 5153 - Forest and Wetland Hydrology (3.0 cr)
FR 5228 - Advanced Assessment and Modeling (3.0 cr)
FR 5264 - Advanced Forest Management Planning (3.0 cr)
FR 5611 - Field Silviculture (2.0 cr)
FR 5615 - Field Remote Sensing and Resource Survey (2.0 cr)
FW 5003 - Human Dimensions of Biological Conservation, C/PE, ENVT (3.0 cr)
FW 5603W - Habitats and Regulation of Wildlife, ENVT, WI (3.0 cr)
FW 5604W - Fisheries Ecology and Management, ENVT, WI (3.0 cr)
GEO 1001 - Earth and Its Environments, ENVT, PHYS SCI/L (4.0 cr)
HORT 5071 - Restoration and Reclamation Ecology, ENVT (3.0 cr)
LA 3501 - Environmental Design and Its Biological and Physical Context, ENVT (3.0 cr)
SOIL 3416 - Plant Nutrients in the Environment (3.0 cr)
BIOL 3407 - Ecology, ENVT (3.0 cr)
or EEB 4014 - Ecology of Vegetation (3.0 cr)
or EEB 4609W - Ecosystem Ecology, WI (3.0 cr)
ENT 4251 - Forest and Shade Tree Entomology (3.0 cr)
or PLPA 3003 - Diseases of Forest and Shade Trees (3.0 cr)
ESPM 3011W - Ethics and Leadership in Resource Management, C/PE, ENVT, WI (3.0 cr)
or ESPM 3202W - Environmental Conflict Management, Leadership, and Planning, C/PE, WI (3.0 cr)

Electives

Choose electives from courses listed above, or consult with your adviser about other options to reach the required 120 credits.

Forest Management and Planning

This track is for students who wish to become directly involved in forest land management or find positions in specialized areas such as resource analysis and planning, timber harvesting, forest protection, or policy development. Graduates may also pursue graduate study to become researchers and teachers or seek advanced positions in administering and managing forest and related natural resources.

All required courses in this track must be taken A-F and completed with a grade of at least C-.

Required Courses

Physical and Biological Sciences

Take one of the following pairs of courses:

BIOC 2011 - Biochemistry for the Agricultural and Health Sciences (3.0 cr)
CHEM 1011 - Introductory Chemistry: Lecture and Laboratory, PHYS SCI/L (4.0 cr)
or
CHEM 1021 - Chemical Principles I, ENVT, PHYS SCI/L (4.0 cr)
CHEM 1022 - Chemical Principles II, ENVT, PHYS SCI/L (4.0 cr)

Preparatory Courses

BP 1002 - Wood and Fiber Science (3.0 cr)
FR 3431 - Timber Harvesting and Road Planning (2.0 cr)
FR 3612 - Silviculture and Timber Harvesting Practices in Minnesota (1.0 cr)

Advanced Training in Assessment and Management of Forests

These courses are taught at the Cloquet Forestry Center during May session.

FR 5611 - Field Silviculture (2.0 cr)
FR 5615 - Field Remote Sensing and Resource Survey (2.0 cr)
FR 5621 - Field Timber Harvesting and Road Planning (2.0 cr)

Additional Professional Courses

With faculty adviser approval, students select additional professional courses from the list below. Courses used to satisfy other requirements may not be used to fill the 6-credit professional requirement.

Take 6 or more credit(s) from the following:

ESPM 3031 - Applied Global Positioning Systems for Geographic Information Systems (3.0 cr)
ESPM 3245 - Sustainable Land Use Planning and Policy, ENVT (3.0 cr)
ESPM 3251 - Natural Resources in Sustainable International Development, ENVT, IP (3.0 cr)
ESPM 4061W - Water Quality and Natural Resources, ENVT, WI (3.0 cr)
FR 3203 - Forest Fire and Disturbance Ecology (3.0 cr)
FR 3204 - Landscape Ecology and Management (3.0 cr)
FR 4118 - Trees: Structure and Function (3.0 cr)
FR 5142 - Tropical Forest Ecology, ENVT (3.0 cr)
FR 5153 - Forest and Wetland Hydrology (3.0 cr)
FR 5228 - Advanced Assessment and Modeling (3.0 cr)
FR 5264 - Advanced Forest Management Planning (3.0 cr)
FR 5412 - Digital Remote Sensing (3.0 cr)
FW 5603W - Habitats and Regulation of Wildlife, ENVT, WI (3.0 cr)
FW 5604W - Fisheries Ecology and Management, ENVT, WI (3.0 cr)
GEO 1001 - Earth and Its Environments, ENVT, PHYS SCI/L (4.0 cr)
ESPM 3011W - Ethics and Leadership in Resource Management, C/PE, ENVT, WI (3.0 cr)
or ESPM 3202W - Environmental Conflict Management, Leadership, and Planning, C/PE, WI (3.0 cr)
ENT 4251 - Forest and Shade Tree Entomology (3.0 cr)
or PLPA 3003 - Diseases of Forest and Shade Trees (3.0 cr)

Forest Resources Minor

Forest Resources

Requirements for this program are current for Fall 2006.

Required credits in this minor: 18.

The forest resources minor helps students in natural resources and other areas gain deeper understanding of the scientific foundations of forestry, the management of forest resources, and the importance of forest resources to society. Students select from an array of courses in forest assessment, forest biology and management, and forest economics and policy. Students

may include a three-week hands-on field session at the Cloquet Forestry Center as part of their minor. Students interested in the minor should contact the CFANS Student Services Office.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

The sequence of courses in the Cloquet Forestry Center may be used to either meet the minor courses requirement or as an elective, but they cannot be used to satisfy both requirements.

Required Courses

Minor Courses

FR 3104 - Forest Ecology (4.0 cr)

FR 3411 - Managing Forest Ecosystems: Silviculture (3.0 cr)

Take one of the following field experiences:

FR 1101 - Dendrology: Identifying Forest Trees and Shrubs (3.0 cr)

or

Cloquet Program

Take all of the following in the same term:

FR 2101 - Identifying Forest Plants (1.0 cr)

FR 2102 - Northern Forests: Field Ecology (2.0 cr)

FR 2104 - Measuring Forest Resources (1.0 cr)

Electives

Take 7 or more credit(s) from the following:

Forest Policy, Management, and Planning

Take 3 or more credit(s) from the following:

ESPM 3241W - Natural Resource and Environmental Policy: History, Creation, and Implementation, C/PE, SSCI, WI (3.0 cr)

ESPM 3261W - Economics and Natural Resources Management, ENVT, SSCI, WI (4.0 cr)

FR 3471 - Forest Planning and Management (3.0 cr)

FR 4501 - Urban Forest Management: Managing Greenspaces for People, C/PE (3.0 cr)

RRM 4232W - Managing Recreational Lands, ENVT, WI (4.0 cr)

Resource Assessment

Take 0 or more credit(s) from the following:

FR 3131 - Geographical Information Systems (GIS) for Natural Resources (4.0 cr)

FR 3218 - Measuring & Modeling Forests (3.0 cr)

FR 3262 - Remote Sensing of Natural Resources and Environment (4.0 cr)

Management of Vegetation, Wildlife, Water and Soil Resources

Take 0 or more credit(s) from the following:

ESPM 3703 - Agroforestry in Watershed Management (3.0 cr)

ENT 4251 - Forest and Shade Tree Entomology (3.0 cr)

FR 3501 - Arboriculture: Selection and Maintenance of Trees (3.0 cr)

FR 3114 - Hydrology and Watershed Management (3.0 cr)

FR 3431 - Timber Harvesting and Road Planning (2.0 cr)

FR 5142 - Tropical Forest Ecology, ENVT (3.0 cr)

FR 5413 - Managing Forest Ecosystems: Silviculture Lab (1.0 cr)

PLPA 3003 - Diseases of Forest and Shade Trees (3.0 cr)

Cloquet Program

Take all of the following in the same term:

FR 2101 - Identifying Forest Plants (1.0 cr)

FR 2102 - Northern Forests: Field Ecology (2.0 cr)

FR 2104 - Measuring Forest Resources (1.0 cr)

Integrated Pest Management in Cropping Systems Minor

Agronomy and Plant Genetics

Requirements for this program are current for Fall 2006.

Required credits in this minor: 20.

Students selecting this interdisciplinary minor learn how the environment and cropping systems interact with the biology of the major agronomic or horticultural crop pests. Students also learn to select and apply efficient, environmentally sound pest management procedures. Courses come from agronomy and plant genetics; entomology; horticultural science; plant pathology; and soil, water, and climate.

The minor provides sufficient knowledge and skills for employment in agricultural crop protection, product development and sales, crop management consultation, pest regulation, research, or application of agricultural crop protection materials. To complete the minor, students must complete at least 20 credits.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Required Courses

Minor Courses

AGRO 2501 - Plant Identification for Urban and Rural Landscapes (2.0 cr)

AGRO 4505 - Biology, Ecology, and Management of Invasive Plants (3.0 cr)

ENT 3005 - Insect Biology (3.0 cr)

PLPA 3002 - Air Pollution, People, and Plants: The Science and the Ethics, C/PE, ENVT (3.0 cr)

AGRO 4005 - Applied Crop Physiology and Development (4.0 cr)

or BIOL 3002 - Plant Biology: Function (2.0 cr)

and HORT 3005 - Environmental Effects on Horticultural Crops (2.0 cr)

Management

AGRO 4605 - Management Strategies for Crop Production (4.0 cr)

or ENT 5211 - Insect Pest Management (3.0 cr)

or HORT 4061W - Turfgrass Management, WI (3.0 cr)

or HORT 5032 - Sustainable Commercial Vegetable Production Systems (3.0 cr)

or HORT 5041W - Nursery Management, WI (4.0 cr)

or PLPA 5204 - Plant Disease Management (3.0 cr)

Applied Courses

AGRO 4603 - Field Crop Scouting and Problem Diagnosis (3.0 cr)

or AGRO 4888 - Issues in Sustainable Agriculture (2.0 cr)

or ES 3612W - Soil and Environmental Biology, WI (3.0 cr)

or PLPA 5202 - Field Plant Pathology (2.0 cr)

International Agriculture Minor

Requirements for this program are current for Fall 2006.

Required credits in this minor: 18.

Due to the international nature of food and agricultural systems, and the interdependence of environmental systems, CFANS students are strongly encouraged to incorporate an international experience during their academic degree program. Students with a particular interest in international agriculture can minor in international agriculture and choose between a self-contained block of courses or a series of courses integrated into the

degree program. The minor is structured to include a general overview of international agriculture, followed by area, culture, or language studies; expanded coursework in agriculture; and an international experience. Students are required to travel outside the United States for a minimum two-week academic experience.

The program for a minor in international agriculture must be developed in coordination with International Programs in the college. Students must complete 18 credits with a minimum GPA of 2.00.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

International Opportunities

The University of Minnesota is partnering with universities in Austria, Germany, and Italy to provide semester study abroad opportunities comparing U.S. and the European Union's biotechnology, food safety, and regulatory policies. The US-EU FIPSE Program offers courses taught in English, as well as the chosen country's language. Courses include agricultural economics, tropical agriculture, organic food chain management, and environmental and agricultural food production. German or Italian language studies are required for participants. Admitted students will receive financial support for language classes and a semester of study at one of the EU partner universities.

The Minnesota Studies in International Development program to Ecuador, Ghana, India, Kenya or Senegal offers courses in language training, grassroots development, area studies, and an internship.

Additional international practical or internship experiences may qualify for the minor. Arrangements can be made through MAST International or the CFANS Career Services office.

Travel grants for overseas experience are available through the Academic Enrichment Program. Students are also eligible for scholarships through the Learning Abroad Center.

Required Courses for the Program

Minor Courses

CFAN 3500 - International Field Studies Seminar (3.0 cr)

Take 6 credits 3xxx or 4xxx area culture or language studies

Take 2 - 4 credit(s) from the following:

CFAN 3000 - Directed Studies in International Agriculture (2.0-4.0 cr)

Take 7 or more credit(s) from the following:

AFEE 5331 - History, Philosophy, and Systems of Extension (3.0 cr)

AFEE 5361 - World Development Problems (3.0 cr)

AGRO 3203W - Environment, Global Food Production, and the Citizen, C/PE, ENVT, WI (3.0 cr)

APEC 3007 - Applied Macroeconomics: Policy, Trade, and Development, IP (3.0 cr)

APEC 3071 - Agriculture and Economic Growth in Developing Countries (3.0 cr)

APEC 5751 - Global Trade and Policy, IP (3.0 cr)

FSCN 3615 - Sociocultural Aspects of Food, Nutrition, and Health, CD, SSCI (3.0 cr)

PLPA 3001 - Plant Disease Biology and Management (1.0 cr)

PLPA 3002 - Air Pollution, People, and Plants: The Science and the Ethics, C/PE, ENVT (3.0 cr)

RHET 3384 - From Soil to Civilization: Agriculture and the Emergence of the Modern World, IP, SSCI (3.0 cr)

RHET 3376W - Terrorism, C/PE, IP, WI (3.0 cr)

AGRO 4103 - World Food Problems, C/PE, IP (3.0 cr)

or APEC 4103 - World Food Problems, C/PE, IP (3.0 cr)

or FSCN 4103 - World Food Problems, C/PE, IP (3.0 cr)

Internet, Science and Society Minor

Rhetoric

Requirements for this program are current for Fall 2006.

Required credits in this minor: 18.

This minor introduces students to the field of Internet studies and allows them to select from elective courses that focus on an area of interest. Areas of study might include legal or social issues, such as intellectual property on the Internet or ways in which gender stereotypes are both reinforced and modified online; how scientific and technical information is conveyed on the Internet and how the Internet is playing an important role in our ability to share cutting-edge information; or how controversies, such as current debates over genetically modified foods, are played out in cyberspace.

Several courses in the minor include guest speakers from the affiliated faculty of the Internet Studies Center. Students have the opportunity to publish their work on the Internet Studies Center Web site and to attend guest lectures by internationally known Internet studies scholars.

Students should work with the minor adviser in Rhetoric. Students must complete at least 18 credits for the minor.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Required Courses

Minor Courses

RHET 3371 - Technology, Self, and Society, C/PE, HP (3.0 cr)

RHET 3401 - Internet Communication: Tools and Issues (3.0 cr)

RHET 3577W - Rhetoric, Technology, and the Internet, C/PE, WI (3.0 cr)

Electives

Take 3 or more credit(s) from the following:

RHET 3108 - Gender and Ethnicity and the Rhetoric of Science and Technology, CD (3.0 cr)

RHET 3291 - Independent Study (1.0-3.0 cr)

RHET 4105W - Corporate Video for Technical Communicators, WI (4.0 cr)

RHET 4196 - Internship in Scientific and Technical Communication (3.0-6.0 cr)

Outside Electives

Take 6 credits of approved coursework outside the Department of Rhetoric, which complement the minor.

Land, Nature and Environmental Values Minor

Rhetoric

Requirements for this program are current for Fall 2006.

Required credits in this minor: 18.

This multidisciplinary minor based in the humanities complements professional and scientific degree programs in CFANS and serves students from other colleges who have an interest in cultural issues relating to the environment. Students are introduced to the historical development, philosophical assumptions, and imaginative expression of the human

relationship to nature and are asked to consider implications of issues involving our use of nature. Students write a senior integrative paper relating some aspect of their major field to social, cultural, or historical trends in the larger society.

For assistance in planning a minor in land, nature, and environmental values, see the humanities course coordinator in the Department of Rhetoric.

Students must complete at least 18 credits to complete the minor.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu/.

Program Requirements

Required Courses for the Program

Minor Courses

Take 3 or more course(s) from the following:
RHET 1152W - Writing on Issues of Science and Technology, C/PE, WI (4.0 cr)
RHET 1315 - The Land in American Experience, CD, OH (3.0 cr)
RHET 3302 - Science, Religion, and the Search for Human Nature, OH (3.0 cr)
RHET 3371 - Technology, Self, and Society, C/PE, HP (3.0 cr)
RHET 3383 - In Search of Nature, ENVT, OH (3.0 cr)

Take 3 or more credit(s) from the following:
RHET 3291 - Independent Study (1.0-3.0 cr)

Outside Electives
Take 5-6 credits of outside electives chosen with an adviser to complement minor requirements.

Nutrition B.S.

Food Science and Nutrition

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 89 to 111.

Degree: Bachelor of Science.

The nutrition major explores how nutrients and the foods from which they are derived aid the body in health, growth, and development. With major national and international concern for how food and nutrition affect health and disease, registered dietitians and nutritionists have many career opportunities. Students choose one of two options: nutrition and dietetics or nutrition science.

Students expecting to apply for an internship or graduate school should maintain a GPA of at least 2.80. A cumulative GPA of at least 3.00 is highly recommended, and is required for admission in the case of some graduate schools.

The Didactic Program in Dietetics (nutrition and dietetics option) is currently granted initial accreditation and the Coordinated Program in Dietetics is currently granted accreditation status by the Commission on Accreditation for Dietetics Education of the American Dietetic Association, 216 W. Jackson Blvd., Chicago, IL 60606-6995 (312-899-5400).

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

General Requirements

Recommended freshman writing course(s) for this program:
RHET 1101

Program Requirements

All required courses must be taken A-F, and students must earn a grade of at least a C-.

Required Courses

Foundation Courses
BIOC 3021 - Biochemistry (3.0 cr)
CHEM 1021 - Chemical Principles I, ENVT, PHYS SCI/L (4.0 cr)
CHEM 1022 - Chemical Principles II, ENVT, PHYS SCI/L (4.0 cr)
CHEM 2301 - Organic Chemistry I (3.0 cr)
COMM 1101 - Introduction to Public Speaking (3.0 cr)
or PSTL 1461 - Oral Communication in the Public Sphere, C/PE (3.0 cr)
or RHET 1223 - Oral Presentations in Professional Settings (3.0 cr)
ENGC 3027W - Advanced Expository Writing, WI (4.0 cr)
or RHET 3562W - Technical and Professional Writing, WI (4.0 cr)
BIOL 2032 - General Microbiology with Laboratory (4.0 cr)
or MICB 3301 - Biology of Microorganisms (5.0 cr)
or VBS 2032 - General Microbiology With Laboratory (4.0 cr)
BIOL 1009 - General Biology, BIOL SCI/L (4.0 cr)
or PSTL 1131 - Principles of Biological Science, BIOL SCI/L (4.0 cr)
ANSC 3301 - Systemic Physiology (4.0 cr)
or PHSL 3051 - Human Physiology (4.0 cr)

or take the following course pair
BIOL 2005 - Animal Diversity Laboratory (1.0 cr)
BIOL 3211 - Animal Physiology (3.0 cr)

Major Courses
FSCN 1001 - Orientation to Nutrition (1.0 cr)
FSCN 1102 - Food: Safety, Risks, and Technology, C/PE (3.0 cr)
FSCN 1112 - Principles of Nutrition, ENVT (3.0 cr)
FSCN 3102 - Introduction to Food Science (3.0 cr)
FSCN 3612 - Life Cycle Nutrition (3.0 cr)
FSCN 4612 - Human Nutrition (3.0 cr)
FSCN 4613 - Experimental Nutrition (2.0 cr)
FSCN 4621W - Nutrition and Metabolism, WI (4.0 cr)

Program Sub-plans

Students are required to complete one of the following sub-plans. (Note: The honors sub-plan does not meet this requirement.) Honors students are required to complete one sub-plan plus the honors sub-plan.

Nutrition and Dietetics

The nutrition and dietetics option (the Didactic Program in Dietetics) offers preparation in the basic sciences and liberal education, food science, and a focus on human needs related to nutrition. Students identify several areas of interest and develop a varied portfolio of competence. Work experience in nutrition, electives, and extracurricular activities develop communication and leadership skills. Graduates take positions in various food-related fields, including nutrition, industry, and community programs. Graduates with a cumulative GPA of 3.00, strong work experience in nutrition, demonstrated leadership skills, and are highly recommended, may apply for a postbaccalaureate dietetic internship.

Students who plan to become registered dietitians must meet the American Dietetic Association requirements.

Required Courses

Nutrition Courses

FSCN 3614 - Nutrition Education and Counseling (3.0 cr)
FSCN 3615 - Sociocultural Aspects of Food, Nutrition, and Health, CD, SSCI (3.0 cr)
FSCN 3731 - Food Service Operations Management Laboratory (2.0 cr)
FSCN 3732 - Food Service Operations Management (3.0 cr)
FSCN 4614 - Community Nutrition, CD (3.0 cr)
FSCN 4665 - Medical Nutrition Therapy I (3.0 cr)
FSCN 4666 - Medical Nutrition Therapy II (3.0 cr)
FSCN 4732 - Food and Nutrition Management, C/PE (3.0 cr)
MATH 1031 - College Algebra and Probability, MATH (3.0 cr)
MGMT 3001 - Fundamentals of Management (3.0 cr)
STAT 3011 - Introduction to Statistical Analysis, MATH (4.0 cr)

Electives

Select one course from the following:
FSCN 4111 - Food Chemistry (3.0 cr)
or FSCN 4121 - Food Microbiology and Fermentations (3.0 cr)

Nutrition Science

The nutrition science option is for students planning to do graduate work in nutrition, related sciences, or professional programs such as medicine or dentistry.

Required Courses

Nutrition Science Courses

CHEM 2302 - Organic Chemistry II (3.0 cr)
CHEM 2311 - Organic Lab (4.0 cr)
NUTR 5622 - Vitamin and Mineral Biochemistry (3.0 cr)
NUTR 5623W - Regulation of Energy Balance, WI (2.0 cr)
PHYS 1201W - Introductory Physics for Biology and Pre-medicine I, PHYS SCI/L, WI (5.0 cr)
PHYS 1202W - Introductory Physics for Biology and Pre-medicine II, PHYS SCI/L, WI (5.0 cr)
FSCN 4111 - Food Chemistry (3.0 cr)
or an advanced chemistry course may be approved to fulfill this requirement
BIOL 4003 - Genetics (3.0 cr)
or GCD 3022 - Genetics (3.0 cr)
MATH 1142 - Short Calculus, MATH (4.0 cr)
or MATH 1271 - Calculus I, MATH (4.0 cr)
and MATH 1272 - Calculus II (4.0 cr)
STAT 3011 - Introduction to Statistical Analysis, MATH (4.0 cr)
or STAT 3021 - Introduction to Probability and Statistics (3.0 cr)
or STAT 5021 - Statistical Analysis (4.0 cr)

Nutrition Minor

Food Science and Nutrition

Requirements for this program are current for Fall 2006.

Required credits in this minor: 14 to 16.

See major description for more information.

Admission Requirements

Students must complete 4 courses before admission to the program.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Required Courses for Admission

Preparatory Courses

BIOL 1009 - General Biology, BIOL SCI/L (4.0 cr)
CHEM 1021 - Chemical Principles I, ENVT, PHYS SCI/L (4.0 cr)
CHEM 1022 - Chemical Principles II, ENVT, PHYS SCI/L (4.0 cr)
PHSL 3051 - Human Physiology (4.0 cr)

Program Requirements

Required Courses

Minor Courses

FSCN 1112 - Principles of Nutrition, ENVT (3.0 cr)
FSCN 3612 - Life Cycle Nutrition (3.0 cr)
FSCN 4612 - Human Nutrition (3.0 cr)

Take 2 or more course(s) from the following:
FSCN 3614 - Nutrition Education and Counseling (3.0 cr)
FSCN 3615 - Sociocultural Aspects of Food, Nutrition, and Health, CD, SSCI (3.0 cr)
FSCN 4613 - Experimental Nutrition (2.0 cr)
FSCN 4614 - Community Nutrition, CD (3.0 cr)

Recreation Resource Management B.S.

Forest Resources

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 120.

This program requires summer terms.

Degree: Bachelor of Science.

The recreation resource management curriculum prepares students to plan and manage natural and non-urban recreational land and water, as well as manage the people and organizations that depend on these important resources. The curriculum emphasizes natural and managed non-urban areas; natural resources-oriented recreation programs in public and private sectors; social science aspects of natural resources use; and skills in communication, planning, and management. Students select between two tracks: recreation resource management and resource based tourism. Students taking the recreation resource management track receive training in principles and techniques of resource management; students taking the resource based tourism track receive training in organizational and visitor management, policy, and administration.

Graduates may become directly involved in recreation resource management and play specialized supporting roles in areas such as planning and public relations. Some find employment in fields such as environmental education and interpretation. Students pursuing graduate study may develop careers in teaching or research or seek advanced positions in recreation resource management and administration.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

General Requirements

Recommended freshman writing course(s) for this program: RHET 1101

Program Requirements

All required courses must be taken A-F, and students must earn a grade of at least a C-.

Required Courses

Communication Skills

COMM 1101 - Introduction to Public Speaking (3.0 cr)
or RHET 1223 - Oral Presentations in Professional Settings (3.0 cr)

Mathematical Thinking

MATH 1031 - College Algebra and Probability, MATH (3.0 cr)
or MATH 1051 - Precalculus I (3.0 cr)
or ESPM 1145 - Quantitative Methods for Environmental Scientists and Managers I (4.0 cr)
SOC 3811 - Basic Social Statistics, MATH (4.0 cr)
or STAT 3011 - Introduction to Statistical Analysis, MATH (4.0 cr)
or STAT 5021 - Statistical Analysis (4.0 cr)
or ESPM 3012 - Quantitative Methods for Environmental Scientists and Managers II (4.0 cr)

Social Sciences

ESPM 3261W - Economics and Natural Resources Management, ENVT, SSCI, WI (4.0 cr)
PSY 1001 - Introduction to Psychology, SSCI (4.0 cr)
or SOC 1001 - Introduction to Sociology, CD, SSCI (4.0 cr)
PSY 3201 - Introduction to Social Psychology (4.0 cr)
or SOC 3411W - Organizations and Society, WI (3.0 cr)
or SOC 3711 - Principles of Social Organization (3.0 cr)
or SOC 3721 - Principles of Social Psychology (3.0 cr)

Professional Orientation

RRM 1001 - Orientation and Information Systems (1.0 cr)

Program Sub-plans

Students are required to complete one of the following sub-plans. (Note: The honors sub-plan does not meet this requirement.) Honors students are required to complete one sub-plan plus the honors sub-plan.

Recreation Resource Management

This track is for students who wish to develop careers in planning or managing the use of recreational land and water, and for students who plan to pursue graduate study. Graduates may become directly involved in recreation resource management and play specialized supporting roles in areas such as planning and public relations. Graduates may also pursue graduate study to facilitate career advancement or develop a foundation for research and teaching in this area.

Required Courses

Physical and Biological Sciences

BIOL 2022 - General Botany (3.0 cr)
GEO 1001 - Earth and Its Environments, ENVT, PHYS SCI/L (4.0 cr)
BIOC 2011 - Biochemistry for the Agricultural and Health Sciences (3.0 cr)
or CHEM 1011 - Introductory Chemistry: Lecture and Laboratory, PHYS SCI/L (4.0 cr)
BIOL 1001 - Introductory Biology I: Evolutionary and Ecological Perspectives, BIOL SCI/L, ENVT (4.0 cr)
or BIOL 1009 - General Biology, BIOL SCI/L (4.0 cr)
SOIL 1125 - The Soil Resource, ENVT, PHYS SCI/L (4.0 cr)
or SOIL 2125 - Basic Soil Science, ENVT (4.0 cr)

Professional Courses

ESPM 3211 - Survey, Measurement, and Modeling for Environmental Analysis (3.0 cr)
FR 3131 - Geographical Information Systems (GIS) for Natural Resources (4.0 cr)
FR 1101 - Dendrology: Identifying Forest Trees and Shrubs (3.0 cr)
ESPM 3021 - Ecological Vegetation Management: a Consulting Approach, ENVT (3.0 cr)
or FR 3411 - Managing Forest Ecosystems: Silviculture (3.0 cr)
BIOL 3407 - Ecology, ENVT (3.0 cr)
or EEB 3001 - Ecology and Society, ENVT (3.0 cr)
or FR 3104 - Forest Ecology (4.0 cr)
ESPM 4061W - Water Quality and Natural Resources, ENVT, WI (3.0 cr)
or FR 3114 - Hydrology and Watershed Management (3.0 cr)
ESPM 3101 - Conservation of Plant Biodiversity, ENVT (3.0 cr)
or FW 2001 - Introduction to Fisheries, Wildlife, and Conservation Biology, ENVT (3.0 cr)
ESPM 3245 - Sustainable Land Use Planning and Policy, ENVT (3.0 cr)
ESPM 4195W - Problem Solving and Planning in Natural Resources, WI (4.0 cr)
RRM 4232W - Managing Recreational Lands, ENVT, WI (4.0 cr)
RRM 5259 - Visitor Behavior Analysis (3.0 cr)
ESPM 3011W - Ethics and Leadership in Resource Management, C/PE, ENVT, WI (3.0 cr)
or ESPM 3202W - Environmental Conflict Management, Leadership, and Planning, C/PE, WI (3.0 cr)
APEC 4311 - Tourism Development: Principles, Processes, Policies (3.0 cr)
or RRM 3201 - Introduction to Travel and Tourism (3.0 cr)

Additional Professional Courses

Take 9-10 credits, choosing one course from each of the three groups. RRM 3201 may be used only if it was not used to fulfill another requirement.

Social and Managerial Sciences

ANTH 3041 - Ecological Anthropology, C/PE, ENVT (3.0 cr)
or APEC 5321 - Regional Economic Analysis (3.0 cr)
or ESPM 3241W - Natural Resource and Environmental Policy: History, Creation, and Implementation, C/PE, SSCI, WI (3.0 cr)
or GEOG 3361W - Land Use, Landscapes, and the Law, C/PE, ENVT, WI (3.0 cr)
or GEOG 4393 - The Rural Landscape (4.0 cr)
or RHET 3266 - Group Process, Team Building, and Leadership, C/PE (3.0 cr)

Recreation Programming and Management Services

ESPM 4811 - Environmental Interpretation (3.0 cr)
or REC 3551 - Administration and Finance of Leisure Services (4.0 cr)
or REC 5191 - Commercial Recreation and Tourism (3.0 cr)
or REC 5301 - Wilderness and Adventure Education (4.0 cr)
or REC 5311 - Programming Outdoor and Environmental Education (3.0 cr)
or REC 5801 - Legal Aspects of Sport and Recreation (4.0 cr)
or RRM 3201 - Introduction to Travel and Tourism (3.0 cr)

Management of Vegetation, Soil, and Water Resources

FR 3204 - Landscape Ecology and Management (3.0 cr)
or FR 3262 - Remote Sensing of Natural Resources and Environment (4.0 cr)
or GEOG 5565 - Geographical Analysis of Human-Environment Systems (3.0 cr)
or HORT 5071 - Restoration and Reclamation Ecology, ENVT (3.0 cr)
or LA 3204 - Landscape Ecology (3.0 cr)
or LA 3501 - Environmental Design and Its Biological and Physical Context, ENVT (3.0 cr)
or

Cloquet Program

Take all of the following in the same term:

FR 2101 - Identifying Forest Plants (1.0 cr)
FR 2102 - Northern Forests: Field Ecology (2.0 cr)
FR 2104 - Measuring Forest Resources (1.0 cr)

Resource Based Tourism

This track is for students who wish to understand the fundamentals of resource management, but focus on managing the businesses and visitors who depend on these resources for recreation and revenue. Graduates are likely to pursue opportunities developing and managing resource based tourism operations, programs, and visitors in both domestic and international locations. Graduates may also pursue graduate study to facilitate career advancement or develop a foundation for research and teaching in this area.

Required Courses

Physical and Biological Sciences

BIOL 2022 - General Botany (3.0 cr)
BIOC 2011 - Biochemistry for the Agricultural and Health Sciences (3.0 cr)
or CHEM 1011 - Introductory Chemistry: Lecture and Laboratory, PHYS SCI/L (4.0 cr)
BIOL 1001 - Introductory Biology I: Evolutionary and Ecological Perspectives, BIOL SCI/L, ENVT (4.0 cr)
or BIOL 1009 - General Biology, BIOL SCI/L (4.0 cr)
GEO 1001 - Earth and Its Environments, ENVT, PHYS SCI/L (4.0 cr)
or SOIL 1125 - The Soil Resource, ENVT, PHYS SCI/L (4.0 cr)
or SOIL 2125 - Basic Soil Science, ENVT (4.0 cr)

Professional Courses

ESPM 3202W - Environmental Conflict Management, Leadership, and Planning, C/PE, WI (3.0 cr)
ESPM 3245 - Sustainable Land Use Planning and Policy, ENVT (3.0 cr)
REC 5191 - Commercial Recreation and Tourism (3.0 cr)
RRM 3101 - Nature and Heritage Based Tourism (3.0 cr)
RRM 3201 - Introduction to Travel and Tourism (3.0 cr)
RRM 4232W - Managing Recreational Lands, ENVT, WI (4.0 cr)
BLAW 3058 - The Law of Contracts and Agency (4.0 cr)
or REC 5801 - Legal Aspects of Sport and Recreation (4.0 cr)
ESPM 4811 - Environmental Interpretation (3.0 cr)
or REC 5311 - Programming Outdoor and Environmental Education (3.0 cr)
MKTG 3010 - Marketing Research (4.0 cr)
or RRM 5259 - Visitor Behavior Analysis (3.0 cr)
ESPM 3251 - Natural Resources in Sustainable International Development, ENVT, IP (3.0 cr)
BIOL 3407 - Ecology, ENVT (3.0 cr)
or EEB 3001 - Ecology and Society, ENVT (3.0 cr)
or FR 3104 - Forest Ecology (4.0 cr)
MGMT 3001 - Fundamentals of Management (3.0 cr)
MKTG 3001 - Principles of Marketing (3.0 cr)

Additional Professional Courses

Area of Concentration Contract required. Course selections must be made in consultation with a faculty adviser and have faculty adviser signature.

Take 15 or more credit(s) from the following:

COMM 5451W - Intercultural Communication Processes, IP, WI (3.0 cr)
ESPM 3011W - Ethics and Leadership in Resource Management, C/PE, ENVT, WI (3.0 cr)
ESPM 3241W - Natural Resource and Environmental Policy: History, Creation, and Implementation, C/PE, SSCI, WI (3.0 cr)
FINA 3001 - Finance Fundamentals (3.0 cr)
FR 3204 - Landscape Ecology and Management (3.0 cr)
FW 2001 - Introduction to Fisheries, Wildlife, and Conservation Biology, ENVT (3.0 cr)
FW 4104 - Hunting and Fishing Traditions: Field Sports Reflected in Arts, Literature, and Practice (3.0 cr)
FW 5003 - Human Dimensions of Biological Conservation, C/PE, ENVT (3.0 cr)
GEOG 3379 - Environment and Development in the Third World, ENVT, IP (3.0 cr)
GEOG 3361W - Land Use, Landscapes, and the Law, C/PE, ENVT, WI (3.0 cr)
JOUR 3201 - Principles of Strategic Communication: Advertising (3.0 cr)
LA 3501 - Environmental Design and Its Biological and Physical Context, ENVT (3.0 cr)
MGMT 4008 - Entrepreneurial Management (4.0 cr)
MKTG 4030 - Selling and Sales Management (4.0 cr)
MKTG 4040 - Buyer Behavior (4.0 cr)
MKTG 4050 - Integrated Marketing Communications (4.0 cr)
MKTG 4060 - Marketing and Distribution Channels (4.0 cr)
MKTG 4070 - International Marketing (2.0 cr)
MST 5011 - Museum History and Philosophy (3.0 cr)
MST 5012 - Museum Practices (3.0 cr)
PA 5531 - Strategies for Sustainable Development: Theory and Practice (2.0 cr)
REC 5301 - Wilderness and Adventure Education (4.0 cr)
SOC 4305 - Society and the Environment: A Growing Conflict, C/PE, ENVT (3.0 cr)

Recreation Resource Management Minor

Forest Resources

Requirements for this program are current for Fall 2006.

Required credits in this minor: 19 to 20.

Students may pursue a recreation resource management (RRM) minor in either one of two tracks: the resource based tourism (RBT) track or the standard RRM track. Students must complete the minor core courses and then choose either the RBT track or the RRM track.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Required Courses

Minor Courses

ESPM 3245 - Sustainable Land Use Planning and Policy, ENVT (3.0 cr)
RRM 4232W - Managing Recreational Lands, ENVT, WI (4.0 cr)
RRM 5259 - Visitor Behavior Analysis (3.0 cr)

Recreation Resource Management Options

Students are required to complete one of the following course groups.

Recreation Resource Management

Take 3 or more course(s) from the following:

ESPM 3021 - Ecological Vegetation Management: a Consulting Approach, ENVT (3.0 cr)
ESPM 3202W - Environmental Conflict Management, Leadership, and Planning, C/PE, WI (3.0 cr)
ESPM 3241W - Natural Resource and Environmental Policy: History, Creation, and Implementation, C/PE, SSCI, WI (3.0 cr)
FR 3104 - Forest Ecology (4.0 cr)
ESPM 4811 - Environmental Interpretation (3.0 cr)
or REC 5311 - Programming Outdoor and Environmental Education (3.0 cr)

-OR-

Resource Based Tourism

REC 5191 - Commercial Recreation and Tourism (3.0 cr)
RRM 3101 - Nature and Heritage Based Tourism (3.0 cr)
APEC 4311 - Tourism Development: Principles, Processes, Policies (3.0 cr)
or RRM 3201 - Introduction to Travel and Tourism (3.0 cr)

Scientific and Technical Communication B.S.

Rhetoric

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 46.

Degree: Bachelor of Science.

Scientific and technical communicators apply modern techniques and technologies to the distribution of knowledge in industry, business, education, and government. They write and design information for audiences ranging from scientists to management to consumers of technical products and services. To accomplish their objectives, scientific and technical communicators apply principles of audience analysis, writing and editing, oral communication, usability and testing, visual communication, communication technology, and communication and research theory with an emphasis on science and technology. The program offers an interdisciplinary curriculum that combines theory and practice in a program flexible enough to allow students to plan a course of study appropriate to their career goals.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

General Requirements

Recommended freshman writing course(s) for this program: RHET 1101

Program Requirements

All required courses must be taken A-F, (except for the internship, which is taken S-N) and students must earn a grade of at least a C-.

Equivalent transfer courses are accepted in all areas (except for required rhetoric courses). Students are strongly encouraged to pursue a minor in a technical or scientific field.

Required Courses

Foundation Courses

The grammar exemption test and RHET 3441 are waived for 2006–07.

RHET 1001 - Introduction to Scientific and Technical Communication (2.0 cr)
Pass grammar exemption test
or RHET 3441 - Essentials of Grammar, Punctuation, and Style (2.0 cr)

Written, Oral, and Visual Communication

RHET 1223 - Oral Presentations in Professional Settings (3.0 cr)
RHET 3257 - Scientific and Technical Presentations (3.0 cr)
RHET 3266 - Group Process, Team Building, and Leadership, C/PE (3.0 cr)
RHET 3562W - Technical and Professional Writing, WI (4.0 cr)
RHET 3671 - Visual Rhetoric (3.0 cr)
RHET 3672 - Project Design and Development (3.0 cr)
RHET 4561 - Editing and Style for Technical Communicators (3.0 cr)

Theory and Research

RHET 3221W - Theories of Human Communication, C/PE, SSCI, WI (4.0 cr)
RHET 3701W - Rhetorical Theory and Scientific and Technical Communication, WI (4.0 cr)
RHET 4501 - Usability and Human Factors in Technical Communication (3.0 cr)
or RHET 4258 - Information-Gathering Techniques in Scientific and Technical Communication (3.0 cr)

Science, Technology, and Society

Take 2 or more course(s) from the following:

RHET 3108 - Gender and Ethnicity and the Rhetoric of Science and Technology, CD (3.0 cr)
RHET 3302 - Science, Religion, and the Search for Human Nature, OH (3.0 cr)
RHET 3371 - Technology, Self, and Society, C/PE, HP (3.0 cr)
RHET 3383 - In Search of Nature, ENVT, OH (3.0 cr)

Internship

RHET 4196 - Internship in Scientific and Technical Communication (3.0 cr)

Electives

In addition to the courses listed below, students may also include courses they did not use to meet the Theory and Research and Science, Technology, and Society requirements.

Take 5 or more credit(s) from the following:

RHET 3270 - Special Topics (1.0-3.0 cr)
RHET 3291 - Independent Study (1.0-3.0 cr)
RHET 3361 - Literature of Social Movements in the United States: 1950 to 2000, C/PE, LIT (3.0 cr)
RHET 3376W - Terrorism, C/PE, IP, WI (3.0 cr)
RHET 3382W - War, C/PE, OH, WI (3.0 cr)
RHET 3401 - Internet Communication: Tools and Issues (3.0 cr)
RHET 3470 - Special Topics in Communication Skills (2.0 cr)
RHET 3577W - Rhetoric, Technology, and the Internet, C/PE, WI (3.0 cr)
RHET 4105W - Corporate Video for Technical Communicators, WI (4.0 cr)
RHET 4165 - Managerial and Organizational Communication, Planning, and Change (3.0 cr)
RHET 4562 - Theory and Practice in International Business Communication, IP (3.0 cr)
RHET 4573W - Writing Proposals and Grant Management (3.0 cr)
RHET 4662W - Emerging Technologies in Scientific and Technical Communication, WI (4.0 cr)

Soil Science Minor

Soil, Water, and Climate

Requirements for this program are current for Fall 2006.

Required credits in this minor: 20.

The minor provides a strong background in basic soil sciences, covering such topics as soil biology, conservation, contaminants, water movement, and land use. Students completing the minor meet the minimum requirements for employment with the Natural Resources Conservation Service as a soil conservationist. They are also prepared to take the Professional Soil Science Examination for geoscientists. Students must complete 20 credits for the minor.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Required Courses

Minor Courses

ESPM 3221 - Soil Conservation and Land-Use Management (3.0 cr)
ESPM 3612W - Soil and Environmental Biology, WI (3.0 cr)
ESPM 4601 - Soils and Pollution (3.0 cr)
SOIL 3416 - Plant Nutrients in the Environment (3.0 cr)
SOIL 4511 - Field Study of Soils (2.0 cr)
SOIL 1125 - The Soil Resource, ENVT, PHYS SCI/L (4.0 cr)
or SOIL 2125 - Basic Soil Science, ENVT (4.0 cr)

Electives
ESPM 4021W - Environmental Impact Statements, WI (3.0 cr)
or ESPM 4216 - Contaminant Hydrology (2.0 cr)
or ESPM 5555 - Wetland Soils (3.0 cr)
or SOIL 5515 - Soil Genesis and Landscape Relations (3.0 cr)

Sustainable Agriculture Minor

Requirements for this program are current for Fall 2006.

Required credits in this minor: 17.

This minor allows students to study the sustainability of agricultural food systems from an integrated perspective, including coursework, practical experience, and community reflection. Required courses and courses from the foundational clusters—land and public policy; agriculture, environment, and natural resources; and citizens, science, and society—define the students' minor curriculum. In addition, each student works with a minor adviser to design an individualized practical experience in some aspect of sustainable agriculture (i.e., an internship, experiential learning opportunity, etc.). Through the student-led seminar series, What's Up in Sustainable Agriculture (WUSA), and the senior capstone, students synthesize their learning about sustainability for local, national and global agricultural food systems. For this minor, students must complete 8-10 credits of required courses and a minimum of 9 credits of foundational coursework, for a total of at least 17 credits.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Required Courses

Minor Courses
AGRO 4660 should be taken concurrently with or after completion of the internship.
AGRO 4660 - Senior Capstone: Leadership, Decision Making, and Problem Solving (2.0 cr)
AGRO 4888 - Issues in Sustainable Agriculture (2.0 cr)
AGRO 3203W - Environment, Global Food Production, and the Citizen, C/PE, ENVT, WI (3.0 cr)
or ANSC 3203W - Environment, Global Food Production, and the Citizen, C/PE, ENVT, WI (3.0 cr)

Take 1 - 3 credit(s) from the following:
AFEE 3096 - Experiential Learning: Production and Business (1.0-8.0 cr)
AGRO 4096 - Professional Experience Program: Internship (1.0-3.0 cr)
ANSC 4096 - Professional Experience Program: Internship (1.0-3.0 cr)
APEC 4096 - Professional Experience Program: Internship (1.0-3.0 cr)
ESPM 4096 - Professional Experience Program: Internship (1.0-3.0 cr)
HORT 4096 - Professional Experience Program: Internship (1.0-3.0 cr)
FSCN 4096 - Professional Experience Program: Internship (1.0-3.0 cr)
PLPA 4096 - Professional Experience Program: Internship (1.0-3.0 cr)

Foundation Course Clusters
Select one course from each of the following clusters. Other courses may be substituted with approval of the minor adviser and coordinator.

Take 9 or more credit(s) including 3 or more sub-requirement(s) from the following:

Land and Public Policy
APEC 3041W - Economic Development of U.S. Agriculture, HP, WI (3.0 cr)
or GEOG 3361W - Land Use, Landscapes, and the Law, C/PE, ENVT, WI (3.0 cr)
or PA 5002 - Introduction to Policy Analysis (1.5 cr)
or RHET 1315 - The Land in American Experience, CD, OH (3.0 cr)
or AGRO 4103 - World Food Problems, C/PE, IP (3.0 cr)
or APEC 4103 - World Food Problems, C/PE, IP (3.0 cr)
or FSCN 4103 - World Food Problems, C/PE, IP (3.0 cr)

Agriculture/Environment and Natural Resources
CFAN 3001 - Pests and Crop Protection (3.0 cr)
or AGRO 1103 - Crops, Environment, and Society, ENVT (4.0 cr)
or AGRO 5999 - Special Topics: Workshop in Agronomy (1.0-6.0 cr)
or ANSC 1101 - Introductory Animal Science (4.0 cr)
or ESPM 3021 - Ecological Vegetation Management: a Consulting Approach, ENVT (3.0 cr)
or ESPM 3221 - Soil Conservation and Land-Use Management (3.0 cr)
or GEOG 3355 - Environmental Quality, C/PE, ENVT (3.0 cr)
or HORT 4072 - Growing Plants Organically: What It Means To Be Green (3.0 cr)
or SOIL 1125 - The Soil Resource, ENVT, PHYS SCI/L (4.0 cr)
or SOIL 2125 - Basic Soil Science, ENVT (4.0 cr)

Citizens/Science and Society
CFAN 1501 - Biotechnology, People, and the Environment, ENVT (3.0 cr)
or BAE 5212 - Safety and Environmental Health Issues in Plant and Animal Production and Processing, C/PE, ENVT, H (3.0 cr)
or GEOG 3371W - Cities, Citizens, and Communities, CD, SSCI, WI (4.0 cr)
or RHET 3371 - Technology, Self, and Society, C/PE, HP (3.0 cr)
or SOC 3451W - Cities and Social Change, SSCI, WI (3.0 cr)

Technical Communication Minor

Rhetoric

Requirements for this program are current for Fall 2006.

Required credits in this minor: 16.

The minor provides theoretical and practical information about how to communicate complex technical information to various audiences. Students take required courses in oral and written communication and in communication technologies. Additional courses (e.g., visual communication, project management, international communication) are selected to complement students' career plans. For help in planning the minor, contact the major coordinator of the Scientific and Technical Communication Program in the Department of Rhetoric.

Students must complete at least 16 credits for the minor.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Required Courses for the Program

Minor Courses
Independent study and internship couses cannot be used to satisfy the RHET 3xxx-5xxx requirement.

RHET 3257 - Scientific and Technical Presentations (3.0 cr)
RHET 3562W - Technical and Professional Writing, WI (4.0 cr)
RHET 4561 - Editing and Style for Technical Communicators (3.0 cr)

Take 2 or more course(s) from the following:
RHET 3xxx
RHET 4xxx
RHET 5xxx

Urban and Community Forestry B.S.

Forest Resources

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 120.

This program requires summer terms.

Degree: Bachelor of Science.

The urban and community forestry curriculum prepares students for careers in planning and managing vegetation and natural resources in or near urban communities, and for direct involvement in resource management or for specialized supporting roles in areas such as urban planning and environmental education.

Urban forests include areas along streets and in parks, private lands, greenbelts, and open spaces. Urban foresters help communities plan, design, or protect urban and peri-urban forests; supervise tree selection and planting; and design insect control/disease protection and plant health care programs.

Principle employers for graduates in urban and community forestry include city governments, private tree care and arboricultural consulting companies, state and federal forestry agencies, nurseries, and utility companies. Graduates may also be qualified for traditional forestry positions, including those in the federal government.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

General Requirements

Recommended freshman writing course(s) for this program: RHET 1101

Program Requirements

Students going into consulting or private business should choose courses in the forest health and cultural practices of urban forestry. Students interested in managing the urban landscape should concentrate on courses in the management and administration areas.

All required courses must be taken A-F, and students must earn a grade of at least a C-.

Required Courses

Communication Skills
COMM 1101 - Introduction to Public Speaking (3.0 cr)
or RHET 1223 - Oral Presentations in Professional Settings (3.0 cr)

Mathematical Thinking
ESPM 1145 - Quantitation Methods for Environmental Scientists and Managers I (4.0 cr)
or MATH 1142 - Short Calculus, MATH (4.0 cr)
or MATH 1271 - Calculus I, MATH (4.0 cr)
STAT 3011 - Introduction to Statistical Analysis, MATH (4.0 cr)
or STAT 5021 - Statistical Analysis (4.0 cr)
or ESPM 3012 - Quantitation Methods for Environmental Scientists and Managers II (4.0 cr)

Social Sciences
ESPM 3261W - Economics and Natural Resources Management, ENVT, SSCI, WI (4.0 cr)
POL 1001 - American Democracy in a Changing World, C/PE, SSCI (4.0 cr)

Physical and Biological Sciences
BIOL 2022 - General Botany (3.0 cr)
BIOL 1001 - Introductory Biology I: Evolutionary and Ecological Perspectives, BIOL SCI/L, ENVT (4.0 cr)
or BIOL 1009 - General Biology, BIOL SCI/L (4.0 cr)
SOIL 1125 - The Soil Resource, ENVT, PHYS SCI/L (4.0 cr)
or SOIL 2125 - Basic Soil Science, ENVT (4.0 cr)

Take one of the following pairs of courses.
BIOC 2011 - Biochemistry for the Agricultural and Health Sciences (3.0 cr)
CHEM 1011 - Introductory Chemistry: Lecture and Laboratory, PHYS SCI/L (4.0 cr)
or
CHEM 1021 - Chemical Principles I, ENVT, PHYS SCI/L (4.0 cr)
CHEM 1022 - Chemical Principles II, ENVT, PHYS SCI/L (4.0 cr)

Professional Courses
ESPM 3211 - Survey, Measurement, and Modeling for Environmental Analysis (3.0 cr)
FR 1001 - Orientation and Information Systems (1.0 cr)
FR 3131 - Geographical Information Systems (GIS) for Natural Resources (4.0 cr)
ESPM 3241W - Natural Resource and Environmental Policy: History, Creation, and Implementation, C/PE, SSCI, WI (3.0 cr)
RRM 4232W - Managing Recreational Lands, ENVT, WI (4.0 cr)
URBS 1001W - Introduction to Urban Studies: The Complexity of Metropolitan Life, C/PE, WI (3.0 cr)
ENT 4251 - Forest and Shade Tree Entomology (3.0 cr)
FR 1101 - Dendrology: Identifying Forest Trees and Shrubs (3.0 cr)
FR 3104 - Forest Ecology (4.0 cr)
FR 3411 - Managing Forest Ecosystems: Silviculture (3.0 cr)
FR 3501 - Arboriculture: Selection and Maintenance of Trees (3.0 cr)
FR 4501 - Urban Forest Management: Managing Greenspaces for People, C/PE (3.0 cr)
HORT 1015 - Woody and Herbaceous Plants (4.0 cr)
HORT 5041W - Nursery Management, WI (4.0 cr)
PLPA 3003 - Diseases of Forest and Shade Trees (3.0 cr)
BIOL 3002 - Plant Biology: Function (2.0 cr)
or FR 4118 - Trees: Structure and Function (3.0 cr)
ESPM 4061W - Water Quality and Natural Resources, ENVT, WI (3.0 cr)
or FR 3114 - Hydrology and Watershed Management (3.0 cr)

Cloquet Program
Take all of the following in the same summer term:
FR 2101 - Identifying Forest Plants (1.0 cr)
FR 2102 - Northern Forests: Field Ecology (2.0 cr)
FR 2104 - Measuring Forest Resources (1.0 cr)

Additional Professional Courses
Select courses from the list below in consultation with a faculty adviser.

Take 6 or more credit(s) from the following:
ANTH 3041 - Ecological Anthropology, C/PE, ENVT (3.0 cr)
BP 1002 - Wood and Fiber Science (3.0 cr)
ESPM 3021 - Ecological Vegetation Management: a Consulting Approach, ENVT (3.0 cr)
ESPM 3031 - Applied Global Positioning Systems for Geographic Information Systems (3.0 cr)

ESPM 3101 - Conservation of Plant Biodiversity, ENVT (3.0 cr)
ESPM 3202W - Environmental Conflict Management, Leadership, and Planning, C/PE, WI (3.0 cr)
ESPM 3703 - Agroforestry in Watershed Management (3.0 cr)
FR 3204 - Landscape Ecology and Management (3.0 cr)
FR 3262 - Remote Sensing of Natural Resources and Environment (4.0 cr)
FW 2001 - Introduction to Fisheries, Wildlife, and Conservation Biology, ENVT (3.0 cr)
FW 5603W - Habitats and Regulation of Wildlife, ENVT, WI (3.0 cr)
GEOG 3371W - Cities, Citizens, and Communities, CD, SSCI, WI (4.0 cr)
HORT 4021 - Landscape Design and Implementation I (4.0 cr)
LA 3501 - Environmental Design and Its Biological and Physical Context, ENVT (3.0 cr)
MGMT 3001 - Fundamentals of Management (3.0 cr)
RHET 3266 - Group Process, Team Building, and Leadership, C/PE (3.0 cr)
SOC 1001 - Introduction to Sociology, CD, SSCI (4.0 cr)
SOC 3451W - Cities and Social Change, SSCI, WI (3.0 cr)
SOIL 3416 - Plant Nutrients in the Environment (3.0 cr)

Urban and Community Forestry Minor

Forest Resources

Requirements for this program are current for Fall 2006.

Required credits in this minor: 16.

The urban and community forestry minor (16 credits) enables students in programs such as education, landscape architecture, horticultural sciences, natural resources, and related areas to understand the science and practice underlying the management of urban and community forests. The minor incorporates fundamental science, arboriculture, forest health, and resource management coursework. Students interested in the minor should contact the CFANS Student Services Office.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Required Courses

Minor Courses

ENT 4251 - Forest and Shade Tree Entomology (3.0 cr)
or PLPA 3003 - Diseases of Forest and Shade Trees (3.0 cr)
FR 3501 - Arboriculture: Selection and Maintenance of Trees (3.0 cr)
or FR 4501 - Urban Forest Management: Managing Greenspaces for People, C/PE (3.0 cr)

Electives

Take 10 or more credit(s) from the following:

ESPM 3211 - Survey, Measurement, and Modeling for Environmental Analysis (3.0 cr)
FR 3104 - Forest Ecology (4.0 cr)
FR 3218 - Measuring & Modeling Forests (3.0 cr)
FR 4118 - Trees: Structure and Function (3.0 cr)
HORT 1015 - Woody and Herbaceous Plants (4.0 cr)
RRM 4232W - Managing Recreational Lands, ENVT, WI (4.0 cr)

Cloquet Program

Take all of the following in the same term:

FR 2101 - Identifying Forest Plants (1.0 cr)
FR 2102 - Northern Forests: Field Ecology (2.0 cr)
FR 2104 - Measuring Forest Resources (1.0 cr)

Water Science Minor

Soil, Water, and Climate

Requirements for this program are current for Fall 2006.

Required credits in this minor: 20.

The minor provides students the opportunity to broaden their expertise in the area of water science. Students interested in qualifying as a hydrologist should determine the exact requirements for the Minnesota civil service position by checking the Hydrologist I (Hydrogeology) and Hydrologist I (Water Resources) position descriptions.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Required Courses

Minor Courses

FR 3114 - Hydrology and Watershed Management (3.0 cr)
EEB 4601 - Limnology (3.0 cr)
or GEO 5701 - General Hydrogeology (3.0 cr)
ESPM 5555 - Wetland Soils (3.0 cr)
or SOIL 5232 - Vadose Zone Hydrology (3.0 cr)

Electives

Courses used to fulfill requirements above cannot be chosen to fulfill electives.

Take 11 or more credit(s) from the following:

CE 5541 - Environmental Water Chemistry (3.0 cr)
EEB 4605 - Limnology Laboratory (1.0 cr)
ESPM 4061W - Water Quality and Natural Resources, ENVT, WI (3.0 cr)
ESPM 4216 - Contaminant Hydrology (2.0 cr)
ESPM 5211 - Environmental Biophysics and Ecology (3.0 cr)
GEOE 4351 - Groundwater Mechanics (3.0 cr)
WRS 5001 - Introduction to Field Research in Water Resources (2.0 cr)
FR 5153 - Forest and Wetland Hydrology (3.0 cr)
or GEO 5701 - General Hydrogeology (3.0 cr)
ESPM 5555 - Wetland Soils (3.0 cr)
or SOIL 5232 - Vadose Zone Hydrology (3.0 cr)

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College of Liberal Arts

General Information

At the heart of every great university is a college encompassing the fundamental disciplines of knowledge. That college at the University of Minnesota is the College of Liberal Arts (CLA). The college was formally established in 1868, 17 years after the founding of the University. CLA undergraduates study with faculty scholars and creative artists who are defining the future in their fields of study.

A CLA education provides not only breadth of knowledge, but depth and proficiency in a particular field, or discipline, of knowledge. CLA students develop habits of creative and critical thinking, develop analytical and problem-solving skills, and learn to communicate across cultures and media. Such skills and knowledge are an indispensable foundation for careers in industries and professions across all sectors of society, from banking and commerce to health care, education, law, public service, and the arts.

Study and research opportunities are available to undergraduates in more than 60 major areas in the social sciences, humanities, and fine arts. In addition to strong discipline-based programs, CLA offers interdisciplinary majors—including studies in cinema and media culture, urban studies, and Chicano studies—that draw on the strengths of disciplines and integrate them in new and exciting ways. CLA also offers B.A. degrees in some science programs housed in the Institute of Technology and the College of Biological Sciences. (See the list of majors for details.) The B.A. degree may be particularly appropriate for science students who wish to become high school teachers, who would like to pursue careers in scientific writing, or who wish to preserve more flexibility in their programs than the B.S. degree allows.

Nearly 14,400 undergraduate students and about 2,300 graduate students were enrolled in CLA programs fall 2005. Their professors are dedicated teachers and pathbreaking researchers, scholars, and creative artists who bring to their interactions with students the most current knowledge and ideas in their fields.

Degree requirements established by the college give students an education solidly and broadly based in the liberal arts. Courses that meet the Twin Cities campus-wide liberal education requirements introduce students to the modes of inquiry and subject matter of the major branches of knowledge, as well as four broad themes: international perspectives, cultural diversity, environmental issues, and citizenship and public ethics.

In recognition of the importance of written communication, students take several writing courses, including a formal first-year composition or rhetoric course and upper level intensive writing courses. The CLA language requirement helps students become proficient in a second language.

As the port of entry to the University for many students, CLA prides itself on its Student Communities, which offer academic and career advising and other services. Student Services staff help direct students to the many learning opportunities available within CLA and throughout the University—including internships and service learning.

Admission

Prospective Student Services

Prospective CLA students can find information about student life and academic programs at www.cla.umn.edu.

Preadmission advising and assistance are offered by the University's Office of Admissions. If students would like to visit the campus and talk about plans for study in CLA, they should contact the Office of Admissions, University of Minnesota, 240 Williamson Hall, 231 Pillsbury Drive S.E., Minneapolis, MN 55455 (612-625-2008), http://admissions.tc.umn.edu.

Enrollment Limits—The University of Minnesota has approved enrollment limits for the Twin Cities campus. To remain within those limits, CLA must limit the number of new students it admits. If the college exceeds its enrollment limit, there will be inadequate funding to meet the educational needs of its students. The college will admit as many qualified students as possible without exceeding its projected enrollment limit.

Application Procedures

Freshman Admission

Freshman applicants are high school graduates or high school seniors who will graduate before they enroll in CLA. These students are freshmen regardless of any college credits they may have completed while in high school such as postsecondary enrollment options credits. High school graduates who have enrolled in a postsecondary institution after graduation are considered transfer applicants for admission purposes, regardless of the number of credits completed.

For official and up-to-date information about the University's admissions policies, procedures, and deadlines, please see the latest edition of the Undergraduate Application Booklet available from the Office of Admissions or online.

In fall 2002, nearly three-fourths of CLA freshmen ranked in the top quarter of their class, and one fourth ranked in the top 10 percent. The mean ACT composite score was 25.2. The mean SAT verbal score was 599 and mean SAT math score was 600. Applicants are not guaranteed admission even if they match or exceed some or all of these score levels.

Transfer Admission

Students who have completed at least 26 (39 quarter) credits of transferable college coursework will be considered for admission based on college academic record. High school graduates who have completed less than a full year of college coursework at the time of admission will be considered for admission using a combination of transfer and freshman admission criteria. The key factors considered are cumulative grade point average, course completion patterns, grade trends in the most recent 24 credits, and residency status. See Transfer Admission in the General Information section of this catalog.

Students must indicate a CLA major on the admission application to be considered for admission to CLA. Pre-professional plans are not CLA majors. Students with 60 semester (90 quarter) credits or more must declare a major on their admission application. Some majors have additional requirements for admission to the major. See additional admission requirements

under individual majors in this catalog. Students are admitted in spring semester only if space is available.

Honors Program Admission

For admission to the honors program, students must be admitted to CLA through the regular application procedure described for new freshmen or new transfer students. Students applying for freshman admission to honors must also use the University of Minnesota Honors Programs Application for Freshmen. Admitted students typically rank in the top ten percent of their high school class with an ACT composite score of 28 or higher or an SAT combined math and verbal score of 1260 or higher. Transfer students may apply with grade point averages of 3.60 or higher. Students may be admitted to the honors program after they enroll in the college provided they have at least three semesters remaining before graduation (ordinarily before 75 credits are completed.) For information about program eligibility and application procedures, contact Honors College of Liberal Arts (HCLA), 20 Nicholson Hall, 216 Pillsbury Drive SE, University of Minnesota, Minneapolis, MN 55455 (612-624-5522) or see http://cla.umn.edu/honors.

Martin Luther King Program Admission

For admission to the Martin Luther King, Jr. (MLK) Program, students must be admitted to CLA through the regular application procedure described for new freshmen or new transfer students. Students should indicate interest in the MLK Program on their application. For currently enrolled or returning students, information regarding the MLK Program may be obtained in 19 Johnston Hall (612-625-2300) and at http://mlk.class.umn.edu.

Non-degree-seeking/Postbaccalaureate Admission

Students interested in enrolling in CLA courses but not in earning a CLA degree may wish to consider enrollment opportunities available through the College of Continuing Education, 101 Wesbrook Hall, 77 Pleasant Street S.E., Minneapolis, MN 55455 (612-624-4000).

Advising services for CLA non-degree-seeking students are available from the student communities. Please consult the Student Services Web site or call 612-625-2020 for more information. Advisers aid in planning programs to suit students' outside demands and in selecting coursework to take fullest advantage of the college's resources.

Orientation

New students must participate in a CLA orientation program before their first semester of enrollment. College faculty and staff, together with staff from the University's Orientation and First-Year Programs Office, introduce students to resources and services of the University and college. College advisers meet with students in groups and individually to explain degree requirements, answer questions, and work out initial registration for courses. Students also receive help using online registration. Orientations are scheduled up to three months before the start of the semester for which students are admitted.

New students receive their scheduled orientation date online, along with a variety of planning resources. Before students come to campus, they should use this information to identify various majors of interest, clarify their goals for the first semester, and consider which on-campus activities they may want to be involved in.

New students receive a *CLA New Student Handbook*. Transfer students with a declared major receive a CLA Graduation Handbook. Students who have questions about college procedures between the time they are admitted and when they enroll should contact the CLA Student Information Office, 49 Johnston Hall (612-625-2020) or visit http://iamnew.class.umn.edu.

Degrees/Majors

CLA offers five b1achelor's degrees—bachelor of arts (B.A.), bachelor of fine arts (B.F.A.), bachelor of science (B.S.), bachelor of individualized studies (B.I.S.), and bachelor of music (B.M.).

If students are making satisfactory academic progress, they generally are free to select the major and minor of their choice. Some programs, however, limit the number of majors admitted. See the program descriptions below for more information.

Bachelor of Arts Degree—This degree can be earned through majors in most CLA departments and programs. Its breadth and diversity in general education make it valuable as a base for many kinds of careers or advanced study. CLA offers several professional majors and specializations as well as interdepartmental programs for the B.A.

Bachelor of Fine Arts Degree—The Department of Art and the Department of Theatre Arts and Dance offer the B.F.A. for students who demonstrate superior professional promise. Information about program admission and degree requirements can be obtained from the appropriate department office.

Bachelor of Science Degree—The B.S. degree is offered in five areas: child psychology, economics, geography, sociology, and urban studies. The B.S. provides a more specialized concentration than the B.A.

Bachelor of Individualized Studies Degree—To earn this degree, students propose an individualized program of study composed of three areas of concentration based on their personal academic objectives. Proposals must be evaluated and approved by three faculty advisers.

Bachelor of Music Degree—The School of Music offers the B.M. degree for students who demonstrate superior professional promise in performance, music education, and music therapy.

CLA Degrees Earned Concurrently With Other University of Minnesota Degrees—Students may complete two undergraduate degrees concurrently by applying for dual degree status. Students should contact their college office for more information.

Second Degrees, Second Majors, Minors—If students have earned a bachelor's degree at another institution, they may earn a CLA bachelor's degree with a different major by completing all degree requirements, including 30 CLA semester credits. If students are CLA graduates or in the process of earning a CLA degree, they may earn a different CLA bachelor's degree by completing 30 additional CLA credits and meeting all requirements for the second degree. If students are CLA graduates and interested in completing requirements for a second major, but not for a second bachelor's degree in the college, they may complete requirements for another major and have that accomplishment recorded on their official transcript. In addition, students in other Twin Cities colleges may earn majors or minors in CLA.

Graduating with Distinction—CLA students may graduate with distinction, a recognition of a cumulative GPA of 3.75 or higher; with high distinction (traditional honors), a recognition of a cumulative GPA of 3.90 or higher; or both. Only University of Minnesota coursework is counted toward a student's GPA and students must have completed 60 or more semester credits at the University of Minnesota, Twin Cities.

CLA offers major and minor programs in the following subjects. (See Degree Programs for specific information about each program.)

Acting
African American and African studies
American Indian studies
American studies
Ancient Mediterranean studies (major only)
Anthropology
Architecture
Art
Art history
Asian languages and literatures
Astronomy
Biology, society, and environment
Chemistry
Chicano studies
Child psychology
Classical and Near Eastern archaeology
Classical civilization
Communication studies
Computer science
Cultural studies and comparative literature
Dance
Economics
English
French studies
French and Italian studies (major only)
Geography
Geology
German studies
Global studies
Greek
Hebrew
History
Individualized studies (major only)
Interdepartmental major (major only)
Italian studies
Jewish studies
Journalism
Latin
Linguistics
Mathematics
Microbiology (major only)
Music
Music education (major only)
Music performance (major only)
Music therapy (major only)
Philosophy
Physics
Physiology (major only)
Political science
Psychology
Religious studies
Russian
Scandinavian languages and Finnish
Sociology
Sociology of Law, Criminology, and Deviance
Spanish studies
Spanish and Portuguese studies
Speech-language-hearing sciences
Statistics
Studies in cinema and media culture
Theatre arts
Urban studies
Women's studies

CLA offers additional minor programs in the following subjects.

Asian American Studies
Austrian and Central European Studies
Biblical studies
Dutch
East Asian studies
English as a Second Language (ESL)
European area studies
Gay, Lesbian, Bi-sexual, Transgendered
History of medicine
History of science and technology
Humanities in the West
Latin American studies
Learning abroad
Medieval studies
New media studies
Russian area studies
South Asian and Middle Eastern studies

Students may prepare in CLA for the following professional programs (preparation for these involves one to four years of study in CLA).

Architecture
Dental hygiene
Dentistry
Education
Law
Management
Medical technology
Medicine
Mortuary science
Nursing
Occupational therapy
Pharmacy
Physical therapy
Public affairs
Public health
Recreation, park, and leisure studies
Veterinary studies

CLA Majors

Major Sequences—Candidates for all CLA degrees except the B.I.S. must complete a major to gain depth of understanding in an area of study. More than 60 majors are offered in the college. Requirements change from time to time. Check with the undergraduate studies office in the major department for current information.

Major Requirements

Major Status—Majors are programs of concentration. Each represents the judgment of its department about appropriate study of the discipline at the undergraduate level. The department or students' major advisers may modify individual major programs. Admission to major status in some CLA degree programs requires department permission. See Degree Programs for more information on specific degree programs.

Required Preparatory Courses—Most major programs require preparatory or background courses that qualify students to enter advanced major work. Many of these courses satisfy general education requirements. See individual program listings for required preparatory courses.

Major Project—CLA requires that students complete a major project. The project demonstrates analytic and conceptual skills as well as an understanding of the mode of inquiry characteristic of the discipline. For most majors, the format of the project is a paper.

Individually Designed Interdepartmental Major (IDIM)—The IDIM allows students to design a unique program with an interdisciplinary theme or focus tailored to their individual academic interests. It requires approval by the Individualized Programs Office, 345 Fraser Hall, and three faculty advisers. The major combines coursework from three or more CLA departments. A senior project is required to integrate the areas of concentration.

Bachelor of Individualized Studies—If students seek an even broader program of study than the IDIM, they may wish to consider the B.I.S. degree. For this degree, students design an individualized program made up of three concentrations totaling 50 credits. The program must be evaluated and approved by three faculty advisers. The program must have coherence based on stated academic objectives. This program has much in common with the IDIM—student initiative in proposing courses, close contact with faculty advisers, highly individualized programs. It differs from the IDIM in permitting multiple educational objectives rather than a single theme or concentration, and in allowing one concentration outside the college, provided it is relevant to students' objectives and approved by their advisers. The Bachelor of Individualized Studies Office is in 345 Fraser Hall (612-624-8006). For more information, see the Degree Programs section of this catalog.

Double Major—Students may earn a second major in CLA. Students interested in pursuing a double major should consult with a CLA advising office to learn what steps are necessary for their areas of interest. Students may also combine a CLA major with a major or minor from another college in the University.

Minor

A minor is an approved concentration of 14 or more 2xxx, 3xxx, 4xxx, and 5xxx courses. It is not a requirement for graduation, but is an option for all students at the University. CLA students may choose a minor from another college at the University; likewise, all CLA minors are open to students in other colleges.

Honors in CLA

20 Nicholson Hall (612-624-5522)

Honors in CLA (HCLA) offers freshman/sophomore and junior/senior honors programs to intellectually promising and highly motivated students. Its purpose is to broaden the scope of student learning, encourage full use of student potential, and recognize student accomplishments. Among its offerings are honors seminars with faculty for freshmen/sophomores and juniors/ seniors, special advisers, departmental honors plans, and opportunities for advanced research and individual study.

Graduation With Honors—Enrollment in the honors program is required for graduation with the traditional honors designations cum laude, magna cum laude, and summa cum laude. Other graduation criteria include University of Minnesota residence, a grade point average (GPA) of at least 3.50, participation in four honors opportunities, in some instances fulfillment of requirements designated for the major field, and an honors thesis or project. http://cla.umn.edu/honors/grad.htm

Departmental Honors Courses—Honors courses or special honors sections of regular courses are small in size and taught by selected teachers. Although grading standards are comparable to those of other courses, topics and materials are approached in greater depth. These courses are designated by an "H" or a "V" after the course number.

2xxx Honors Seminars—These seminars are led by faculty and are open to all honors freshmen and sophomores. Topics change each semester and vigorous student participation is the norm. Field trips and other special learning methods often characterize the seminars. They carry credit, but because new topics and hours are selected each semester, they are not listed in this catalog. A list of topics is available in the Honors Program Office.

3xxx Honors Seminars—These seminars are open to honors program students who have completed 60 credits (other applicants are sometimes admitted when class space permits). In contrast to departmental honors course offerings, which emphasize depth of learning within fields, honors seminars serve the interests of students of high ability but with little background in the subject field. The seminars cover a wide range of topics, often of an interdisciplinary character, and deal with problems and ideas not treated in the regular curricular offerings of the college. Topics are specified in the Class Schedule and descriptions are available in the Honors Program Office.

Freshman-Sophomore Honors Program—Honors students who have earned fewer than 60 credits may participate in a program that provides certain educational opportunities: honors seminars taught by faculty, advising for honors students by professional and peer advisers, special faculty advisers, and special library loan privileges. There are honors opportunities both for students who will seek a CLA degree and for preprofessional students who will complete their degrees outside of CLA. Freshmen and sophomores are strongly encouraged to complete at least two honors courses per year. Students who complete three honors opportunities and earn a 3.50 GPA in their freshman and sophomore years receive a certificate and a notation on their transcript.

Junior-Senior Honors Program—If students have completed 60 credits and declared their major, they may apply to the junior-senior program to pursue "Latin honors." They may participate in the honors curriculum in their major field as well as in a variety of academic opportunities, including honors seminars. Students are assisted in scholarship and fellowship matters, especially in preparation for graduate work, and have access to experienced counsel about graduate and professional study. Students are advised by both departmental honors faculty and their honors adviser. When undertaking a research project, they have special library privileges. Grants are available to help them meet project costs.

Continuation in Honors—The academic progress of honors students is reviewed annually. A 3.50 GPA is required to continue after the sophomore year.

Departmental Honors Curricula—Most CLA departments provide special honors opportunities for which students must meet special requirements. Information about these offerings as well as about graduation with honors may be obtained from department or program offices or from the Honors Program Office.

Honors Program Office—College records for honors students are kept in 20 Nicholson Hall. The office also provides academic advising, procedural information, and other college office services to honors students.

Policies

Scholastic Standing—The Student Scholastic Standing Committee, comprised of collegiate administrators and advisers, interprets and enforces college and University regulations relating to academic affairs. It handles requests for exceptions to registration policies and procedures as well as some degree requirements. The committee administers the college's probation system, monitoring students' performance and dealing with questions of probation, suspension, and readmission.

The committee seeks to maintain the spirit of the college's regulations as flexibly as possible and is empowered to make exceptions in cases in which regulations work to students' educational disadvantage.

Students are urged to consult a committee representative in their college office concerning almost any kind of problem, but especially those they think interfere with their ability to attain their academic objectives. Well-established petition and appeal procedures assure full review of student requests.

Late Cancellation—CLA students may receive one discretionary course cancellation after the cancellation deadline but before study day. This discretionary cancellation may be used only once during a student's enrollment at the University. Other late cancellations are approved by the Student Scholastic Standing Committee only when verified extenuating circumstances that prevent a student from completing a course arise after the cancellation deadline. Any cancellation, discretionary or otherwise, after the cancellation deadline must be requested by written petition in the student's college advising office.

Scholastic Conduct—All incidents of scholastic misconduct are reported to the Office for Student Academic Integrity/Student Judicial Affairs. Students will be informed of ways to resolve problems, sanctions that may be imposed, and appeal procedures. CLA students may contact CLA Student Services (612-625-3846) for more information.

Retention of Student Records—Official transcripts are maintained permanently by the Office of the Registrar. The college files of students who left CLA are retained for seven years; college files of students who applied for graduation but did not graduate are kept indefinitely. Student records of graduates are kept for two years following graduation.

In preparation for graduate school, students may store recommendations in permanent credential files, which are kept in the Career and Community Learning Center.

Graduation Requirements

General Credit Requirements

Credit Requirements—A minimum of 120 credits acceptable to the college are required for all CLA bachelor's degrees; 48 of these credits must be in 3xxx, 4xxx, and 5xxx courses.

To earn a University of Minnesota undergraduate degree, students must present at least 30 semester credits awarded by the campus from which they are seeking to graduate and must complete at least half of upper division major work, and at least 15 of the last 30 credits earned before graduation, on that campus. For students seeing an academic minor, students must take at least three upper division credits in the minor field at the campus from which they will receive their degree. All credit awarded by the University, regardless of the type of instruction, shall count toward the credit requirements for the degree.

Students must complete all campus, college, and program requirements with a minimum GPA of 2.00 in the major and a cumulative GPA of 2.00 or higher in all University coursework. All degree programs require a C- or better in each course in the major or minor.

A total of 6 semester credits in applied music, physical education, and study skills courses may be applied toward the degree. Credits from typing, word processing, shorthand, first aid, and courses clearly remedial or vocational in nature may not be applied toward any credit requirements.

Credit will not be awarded twice for the same course or for two substantially similar courses.

Degree Requirements After an Absence—Students who have not attended CLA for more than two years must fulfill current graduation requirements.

If less than two years have passed since students last attended CLA, they are under the requirements applicable to them before their absence. Students who plan to leave the University for more than one semester must request a leave of absence through their college advising office.

Liberal Education Requirements

The liberal education curriculum that applies to students' degree programs depends on the date they are admitted to CLA.

Twin Cities Campus Liberal Education Curriculum—The University of Minnesota, Twin Cities liberal education requirements apply to all students entering a baccalaureate degree program in fall 1996 and later. If students entered a degree program before fall 1996 and are uncertain whether or not the liberal education requirements apply, they should check with their academic adviser. See the Liberal Education Requirements section in this catalog for more information.

Second Language Requirement

The study of a second language is considered essential for a liberal education. CLA expects students to have begun second language study in high school or earlier.

In many cases, knowledge of a second language gained before entering CLA may be used to meet part or all of the language requirement. If students are unsure about their level of proficiency, they should consult their adviser or the language department for placement assistance. Normally, one to two years of high school language study equals one semester of college study.

Qualified students may meet part or all of the entrance and graduation requirements by passing examinations arranged with appropriate departments. (These proficiency examinations do not yield college credits.)

No credit is granted for first- or second-year courses in a student's primary language of secondary school instruction. Students who earn a C-, S, or better in a Twin Cities campus language sequence course may request to have preceding courses in the sequence (second-semester level or higher) posted retroactively if they have not already received college credit for equivalent courses at another institution. Students should contact their advising office for more information.

Students planning on the B.A. degree should study a language for three years in high school.

CLA Entrance Proficiency Test—All B.A., art B.F.A., and B.I.S. students who wish to register for French, German, or Spanish courses beyond the second semester must pass the appropriate entrance proficiency test. Students who meet the entrance requirement may continue their study at higher levels in the same language or may begin study in another language. Contact the CLA Language Testing Program (612-624-0862) or see the Web site for testing and placement information.

Graduation Requirement—Students have two options for completing the second language requirement for B.A., B.F.A. in art, and B.I.S. degrees:

1 A grade of C-, S, or better in a fourth-semester University of Minnesota language course. Transfer courses will fulfill this requirement if they are at least four semester credits.

2 A passing score on the Language Proficiency Exam (LPE), formerly the GPT, which tests at the fourth semester level. A transcript line will be added for those who pass the LPE.

Languages for which LPEs are available include Chinese, Danish, Finnish, French, German, Italian, Japanese, modern Hebrew, Norwegian, Portuguese, Russian, Spanish, and Swedish. Languages that do not have an LPE include Arabic, Dakota, Biblical Greek, Classical Greek, Biblical Hebrew, Hmong, Korean, Latin, and Ojibwe.

Advising

College advisers in academic departments and student communities offer students individual help in planning their studies and meeting other concerns they might have about college life. CLA student communities assist with course selection, registration, vocational and personal decisions, financial problems, and involvement in campus activities.

Based on their preferred interest or major, students are assigned to one of seven student communities (organized by groups of majors) or a special program where they remain throughout their CLA career. Students are also assigned to a specific team of advisers, including their academic adviser, peer adviser, major adviser, and a career services liaison. Basic services are designed to meet students' developmental needs, support students' search for fields of study appropriate to their visions and potential, monitor their academic progress, and help them to be more informed about their choices.

Wise use of the advising system can make students' college experience more satisfying and productive. Students should take pertinent records and materials to adviser appointments, and prepare for program planning sessions by giving careful thought to possible course selections, program schedules, and short- and long-term education and career goals, and reviewing their transcript or computerized degree audit. Students should expect both support and challenge from their adviser.

CLA Student Services Offices

Students' college records are kept in their assigned student community; this community provides advising services and procedural information. To contact a student community or to find a major and its communities, see the CLA Advising Web site at or call the assistant dean's office for CLA Student Services (612-625-3846).

Advising for Special Programs

CLA Honors—20 Nicholson Hall

(612-624-5522) http://cla.umn.edu/honors

Martin Luther King, Jr. Program—19 Johnston Hall

(612-625-2300) http://mlk.class.umn.edu

The Martin Luther King, Jr. Program is designed for students who are interested in a multicultural education. It provides advising, support services, and instruction through tutorials, introductory course sections, support groups, computerized instruction, study skills workshops, and career seminars. Students enrolled in the program are encouraged to maximize their potential through educationally enriching learning experiences.

Special Learning Opportunities and Resources

Career and Community Learning Center (CCLC)

www.cclc.umn.edu

345 Fraser Hall (service-learning and off-campus study for all U students), 612-626-2044

135 Johnston Hall (career services for CLA), 612-624-7577

The Career and Community Learning Center (CCLC) provides many unique services and programs. Its 345 Fraser Hall office serves all students on the U of M Twin Cities campus with its service-learning and community involvement opportunities, along with various off-campus study programs. CCLC's 135 Johnston Hall office provides career and internship services to College of Liberal Arts students, as well as pre-law advising to all U students.

Service-Learning and Community Involvement (345 Fraser Hall)—Students are encouraged to expand their education and experiences by taking service-learning classes and volunteering in the community. (CCLC oversees these opportunities for UMTC students, and facilitates service-learning classes with faculty.) CCLC's community-service programming goals includes deepening the understanding of social barriers and inequalities, teaching reflective leadership, contributing toward educational and personal growth, and enriching multicultural understanding. Community-based learning opportunities can be part of academic service-learning courses or done individually through CCLC to enrich an academic program. In 2005, CCLC launched the "Community Engagement Scholars Program," which allows students to receive official University recognition (transcript notation, special awards upon graduation) for service-learning and community projects. CCLC also provides the annual "Community Involvement Fair," which hosts almost 100 local community groups on campus. Students can choose to volunteer with various nonprofit and government groups working in many different fields, including direct service work, advocacy, education, community-building, health care, public policy, arts and culture, and more. Incoming first-year students interested in community work can choose to live in a service-learning house.

Off-Campus Study (345 Fraser Hall)—CCLC administers domestic off-campus study programs for all students on the Twin Cities campus. It coordinates the National Student Exchange (NSE) program, which allows students to study for a semester or year at a participating school in the United States or Canada. CLCC also administers HECUA programs, which offer off-campus study programs focused on social justice. These semester-long programs take place in the Twin Cities area and include internships, community projects, and individual and group study. HECUA's Twin Cities programs include City Arts, Environmental Sustainability, and Metro Urban Studies Term.

Internships—Internships are an important vehicle for exploring questions and issues raised in the classroom. They allow students to gain experience in a particular field and learn more about possible career alternatives. Internships are available in all fields of study; some are paid, others unpaid. Internships are available in government, business, human services, science and technology, health care, ecology, education, the arts, broadcasting, publishing, and many other fields.

Academic credit for learning acquired through internship experiences is available through several CLA departments, including some of the courses available under the Interdepartmental Study (ID) designator. Some financial support is available in the form of the "CLA Undergraduate Internship Grant," which funds students doing otherwise unpaid internships in the community. See a CCLC adviser for information on both credit and the grant program.

FLAC and FLIP

Foreign Languages Across the Curriculum (FLAC)—FLAC allows students to apply their knowledge of a second language to the study of a particular discipline. FLAC courses attach a one credit language "trailer" to an existing course. In addition to regular English language coursework, students participate in a section meeting conducted in a second language.

Foreign Language Immersion Program (FLIP)—FLIP gives students an opportunity to strengthen their language skills in French, German, or Spanish by offering courses taught entirely in a second language. FLIP students can experience immersion by carrying an entire semester course load (typically 15 credits) in French, German, or Spanish. Alternatively, students may elect to enroll in only a portion of the FLIP.

For further information about FLAC or FLIP, contact the Institute of Global Studies at 612-624-9007 or see http://igs.cla.umn.edu.

Special Achievement

Each semester, the college publicly recognizes superior academic performance through transcript memoranda, notices posted on the first floor of Johnston Hall, on the Web, and announcements to academic departments.

To appear on the Dean's List, students must complete at least 12 credits of A-F registration, with no N's, and earn a semester GPA of at least 3.67.

If students believe they qualify for the list but are not included, they should contact the CLA Assistant Dean for Student Services office in 106 Johnston Hall (612-625-3846).

International Programs

CLA credit for study abroad may be earned through independent study or a variety of formal programs. See information on international opportunities in the General Information section of this catalog or contact the Learning Abroad Center, 230 Heller Hall (612-626-9000).

Career Information

CLA Career Services

135 Johnston Hall (612-624-7577) www.cclc.umn.edu

Students get a tremendous head start by developing career management skills and experiences while they're in school. CCLC's Johnston Hall office helps CLA students relate their academic interests to major and career options as well as to specific career goals. CCLC provides this assistance in the form of individual advising and a resource room full of information for students to explore. These resources focus on majors, graduate school, job-search skills, job and internship opportunities (including on-campus recruiting events), and community involvement. CCLC provides 2-credit career classes as well as individual workshops on résumé writing, interviewing, job-hunting, networking, and law school exploration. CCLC sponsors an annual "Job and Internship Fair," and provides an online job database that enables students to post résumés and browse a wide variety of job, internship, and volunteer listings. Students are encouraged to use these services and resources throughout their college career.

Graduate and Professional School Assistance

Many CLA graduates choose to attend graduate or professional school. CCLC helps students explore graduate school options, provides workshops on how to apply, and offers the annual "Graduate and Professional School Day" event, in which some 100 graduate programs participate. To facilitate the graduate school application process, CCLC offers a "Recommendation Letter Files" service for students actively applying to schools. CCLC is also the pre-law advising office for all students on the Twin Cities campus, and can help them explore the legal profession and prepare for and apply to law school.

Student Organization

Student Board

12 Johnston Hall (612-626-0348, clasb@umn.edu, www.tc.umn.edu/~clasb/)

The College of Liberal Arts Student Board (CLA-SB) is the college's student governance body. The board is the official channel through which recommendations from the CLA student body are brought to the college.

CLA-SB also represents students with seats on many committees and deals with nomination or election of students to seats on many others. These governing councils and committees collectively deal with virtually all aspects of CLA policy.

One primary responsibility of CLA-SB is to maintain contact with department student organizations.

All students are encouraged to participate in the operations of the board and to contribute to decisions affecting the college. The board is composed of elected and appointed members. The board recognizes and practices affirmative action.

Directory

Department of African American & African Studies
808 Social Sciences Building
612-624-9847

Department of American Indian Studies
2 Scott Hall
612-624-1338

Department of American Studies
104 Scott Hall
612-624-4190

Department of Anthropology
395 Hubert H. Humphrey Center
612-625-3400

Department of Art
E201 Regis Center for Art
612-625-8096

Department of Art History
338 Heller Hall
612-624-4500

Asian American Studies
104 Scott Hall
612-626-2022

Department of Asian Languages and Literatures
453 Folwell Hall
612-625-6534

Center for Austrian Studies
314 Social Sciences Building
612-624-9811

Department of Chicano Studies
19 Scott Hall
612-624-6309

Classical Civilization Program
245 Nicholson Hall
612-625-7565

Department of Classical and Near Eastern Studies
245 Nicholson Hall
612-625-5353

Center for Cognitive Sciences
205 Elliott Hall
612-625-9367

Department of Communication Studies
225 Ford Hall
612-624-5800

Department of Cultural Studies and Comparative Literature
235 Nicholson Hall
612-624-8099

Center for Early Modern History
715 Social Sciences Building
612-625-6303

Department of Economics
1035 Heller Hall
612-625-6353

Department of English
207 Lind Hall
612-625-3363

European Studies Consortium
214 Social Sciences Building
612-625-1856

Center for Advanced Feminist Studies
425 Ford Hall
612-624-6310

Department of French and Italian
260 Folwell Hall
612-624-4308

Department of Geography
414 Social Sciences Building
612-625-6080

Department of German, Scandinavian, and Dutch
205 Folwell Hall
612-625-2080

Institute for Global Studies
214 Social Sciences Building
612-624-9007

> ***Center for German and European Studies***
> 309 Social Sciences Building
> 612-626-7705
>
> ***Modern Greek Studies***
> 325 Social Sciences Building
> 612-624-4526

Department of History
614 Social Sciences Building
612-624-2800

Center for Holocaust and Genocide Studies
100 Nolte Center for Continuing Education
612-626-2235

Humanities Program
831 Heller Hall
612-625-6365

Immigration History Research Center
311 Anderson Library
612-625-4800

Individualized Degree Programs
345 Fraser Hall
612-624-8006

Institute for Advanced Study
131 Nolte Center for Continuing Education
612-625-5054

> ***Humanities Institute***
> 131 Nolte Center for Continuing Education
> 612-625-5054
>
> ***Center for Jewish Studies***
> 202 Nolte Center for Continuing Education
> 612-624-4914
>
> ***Center for Medieval Studies***
> 302 Nolte Center for Continuing Education
> 612-625-0805

Center for Interdisciplinary Studies of Writing
227 Lind Hall
612-625-5355

School of Journalism and Mass Communication
111 Murphy Hall
612-625-9824

> ***Minnesota Journalism Center***
> 115 Murphy Hall
> 612-626-1723
>
> ***Silha Center for the Study of Media Ethics and Law***
> 421 Murphy Hall
> 612-625-3421
>
> ***Institute for New Media Studies***
> 313 Murphy Hall
> 612-625-0576

Center for Advanced Research on Language Acquisition
1313 5th Street S.E., Minneapolis
612-627-1870

Language Center
110 Jones Hall
612-625-3865

Institute of Linguistics, ESL, and Slavic Languages and Literatures
214 Nolte Center for Continuing Education
612-624-3331

MacArthur Interdisciplinary Program on Peace and International Cooperation
260 Social Sciences Building
612-624-0832

School of Music
200 Ferguson Hall
612-624-5093

Department of Philosophy
831 Heller Hall
612-625-6563

Minnesota Center for Philosophy of Science
746 Heller Hall
612-625-6635

Center for Political Psychology
1227 Social Sciences Building
612-624-0864

Department of Political Science
1414 Social Sciences Building
612-624-4144

Department of Psychology
N218 Elliott Hall
612-625-2818

Religious Studies Program
245 Nicholson Hall
612-625-2026

Social Science Research Facility
25 Blegen Hall
612-625-8556

Department of Sociology
909 Social Sciences Building
612-624-4300

> ***Life Course Center***
> 1014 Social Sciences Building
> 612-624-6333

Department of Spanish and Portuguese Studies
51 Folwell Hall
612-625-5858

Department of Speech-Language-Hearing Sciences
115 Shevlin Hall
612-624-3322

School of Statistics
313 Ford Hall
612-625-8046

> ***Statistical Consulting Services***
> 146 Classroom-Office Building
> 612-625-7030
>
> ***Statistical Clinic***
> 146 Classroom Office Building
> 612-625-3121

Department of Theatre Arts and Dance
580 Rarig Center
612-625-6699

> ***Dance Program***
> Barbara Barker Dance Center
> 612-624-5060
>
> ***University Theatre***
> 110 Rarig Center
> 612-625-5380

Urban Studies Program
348 Social Sciences Building
612-626-1626

Department of Women's Studies
425 Ford Hall
612-624-6006

Student Board
12 Johnston Hall
612-626-0348

Degree Programs and Minors

Acting B.F.A.

Theatre Arts and Dance

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 78.

Degree: Bachelor of Fine Arts.

The B.F.A. in acting is an intensive, individualized, actor training program that uses both faculty from theatre and dance as well as the Guthrie Theater's professional artistic staff to provide selected students with the physical, vocal, emotional, and intellectual skills to realize the dynamics of performing text of classic stature. Students are encouraged to design their individual paths toward artistic fulfillment. The goal is to provide the foundation that inspires students to begin life-long journeys of learning and artistic expression.

Admission Requirements

Entry into the B.F.A. acting program is by audition only and students are admitted only in fall semester.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Required Courses

Freshman Courses

TH 1391 - BFA Acting I (3.0 cr)
TH 1392 - BFA Voice and Speech I (2.0 cr)
TH 1393 - BFA Movement I (2.0 cr)
TH 3503 - Design and Technical Production I: BFA (3.0 cr)
or TH 3513 - Design and Technical Production I (4.0 cr)
TH 1395 - BFA Acting II (3.0 cr)
TH 1396 - BFA Voice and Speech II (2.0 cr)
TH 1397 - BFA Movement II (2.0 cr)
ENGL 1181W - Introduction to Shakespeare, LIT, WI (4.0 cr)
TH 3505 - Design and Technical Production II: BFA (3.0 cr)
or TH 3515 - Design and Technical Production II (4.0 cr)

Sophomore Courses

TH 2391 - BFA Acting III (3.0 cr)
TH 2392 - BFA Voice and Speech III (2.0 cr)
TH 2393 - BFA Movement III (2.0 cr)
TH 3171 - History of the Theatre: Ancient Greece Through Neo-Classicism (3.0 cr)
TH 2395 - BFA Acting IV (3.0 cr)
TH 2396 - BFA Voice and Speech IV (2.0 cr)
TH 2397 - BFA Movement IV (2.0 cr)
TH 3172 - History of the Theatre: Age of Enlightenment to Present (3.0 cr)

Junior Courses

Fall semester of the junior year is in the study abroad program.

TH 3391 - BFA Acting V (3.0 cr)
TH 3392 - BFA Voice and Speech V (2.0 cr)
TH 3393 - BFA Movement V (2.0 cr)
TH 3395 - BFA Intensive I (2.0 cr)
TH 3398 - BFA Rehearsal & Performance I (2.0 cr)
TH 3399 - BFA Rehearsal and Performance II (2.0 cr)
TH 4532 - Makeup for the Actor (2.0 cr)
Movement elective

Senior Courses

TH 4391 - BFA Intensive II (2.0 cr)
TH 4393 - BFA Rehearsal and Performance III (2.0 cr)
TH 4394 - BFA Rehearsal and Performance IV (2.0 cr)
Movement elective
TH 4395 - BFA Intensive III (2.0 cr)
TH 4398 - BFA Rehearsal and Performance V (2.0 cr)
TH 4399 - BFA Rehearsal and Performance VI (2.0 cr)
Movement elective
TH 4177W - Survey of Dramatic Literature I: Strategic Interpretation, WI (3.0 cr)
or TH 4178W - Survey of Dramatic Literature II: Representation and its Effects, WI (3.0 cr)
2 Theatre Department electives should be taken over the course of 4 years

African American and African Studies B.A.

African American/African Studies

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 30 to 36.

Degree: Bachelor of Arts.

The African American & African Studies major integrates the global study of African peoples by teaching students the tools of inquiry from the liberal arts disciplines. Majors can also take courses in the departmental curriculum that fulfill the University-wide Diversified Core Requriements and the Designatoed Theme Requiremens (see One Stop under registration for more inforamtion). Honors and Freshman Semianrs are also offered.The core requirement for the major is a combination of courses from one of three disciplianry clusters or two regional concentrations. These includee (1) the literatures and arts of the African world (2) the histories and historiography of the African world, and (3) social and behavioral science perspectives on the African world; (4) the african continent and (5) the African Diaspora.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Students are required to take 4 semester(s) of Arabic, French, German, Hausa, Dutch, Portuguese, Spanish or Swahili.

Students complete 9 credits in the following areas; one ways of knowing course, one history of the field course, and one 3xxx, 4xxx, or 5xxx statistics or field method course approved by the undergraduate adviser; 6-9 AFRO upper division credits in each

of the three areas of thematic concentration; literature and the arts, history, social and behavioral science; AFRO 3251W (3 credits); 3 credit capstone seminar AFRO 4573 or other 4xxx level seminar; 3 credit senior project thesis.

Required Courses

AFRO 1012 - Black Worlds in Global Perspective: Challenges and Changes (3.0 cr)

Major Requirements

The following 1xxx level courses are not required for upper division courses, but students are strongly encouraged to complete depending on their declared disciplinary focus: AFRO 1009, 1011, and 1021

AFRO 4105 - Ways of Knowing (3.0 cr)
AFRO 4557 - History of the Field (3.0 cr)

Statistics or Field Methods

AFRO 5551 - Methods: Use of Oral Traditions as Resources for History (3.0 cr)
or PSY 4801 - Introduction to Statistics (4.0 cr)
or SOC 3801W - Sociological Research Methods, WI (4.0 cr)
or SOC 3811 - Basic Social Statistics, MATH (4.0 cr)
or STAT 3011 - Introduction to Statistical Analysis, MATH (4.0 CR)

Gender Issues

AFRO 3251W - Sociological Perspectives on Race, Class and Gender, CD, SSCI, WI (3.0 cr)
or AFRO 3592W - Introduction to Black Women Writers in the United States, CD, LIT, WI (3.0 cr)
or AFRO 3625 - Black Women Writers in the Disapora (3.0 cr)
or AFRO 3626 - Literature of African American Men: Sex, Family, and Relationships (3.0 cr)

Senior Project

Students complete one AFRO 4xxx level capstone seminar and two senior thesis project courses. The senior thesis project courses cannot be taken concurrently.

AFRO 4991W - Thesis Research and Writing, WI (2.0 cr)
AFRO 4992 - Thesis (1.0 cr)
AFRO 4xxx

Disciplinary Clusters or Regional Concentrations

Depending on the specific focus students are encouraged to take the following 1xxx level courses: AFRO 1009, AFRO 1011, AFRO 1021.

History

Take 9 or more credit(s) from the following: AFRO 1009 is not required for upper level courses, but students are strongly encouraged to complete it if they are concentrating in History.

AFRO 1009 - History of Women in Africa: 1500 to the Present, HP (3.0 cr)
AFRO 3001 - West African History: Early Times to 1800, HP< IP (3.0 cr)
AFRO 3002 - West AFrican History: 1800 to Present, HP, IP (3.0 cr)
AFRO 3120 - Social and Intellectual Movements in the AFrican Diaspora (3.0 cr)
AFRO 3204 - History of South African to 1910, HP (3.0 cr)
AFRO 3205 - History of South Africa from 1910, HP (3.0 cr)
AFRO 3431 - Early Africa and Its Global Connections, HP, IP (4.0 cr)
AFRO 3432 - Modern AFrican in a Changing World, HP, IP (4.0 cr)
AFRO 3436 - Historical Background to Contemporary African Conflicts: Case Studies (3.0 cr)
AFRO 3437 - History of East Africa (3.0 cr)
AFRO 3439 - Popular Narratives of the African Past (3.0 cr)
AFRO 3511
AFRO 3756 - Social and Cultural History of Blacks in Sports (3.0 cr)
AFRO 3864 - African American History: 1619 to 1865, CD, HP (4.0 cr)
AFRO 3866 - The Civil Rights and Black Power Movement, 1954-1984, C/PE, CD (3.0 cr)
AFRO 4001 - Seminar: History of Women in South Africa (3.0 cr)
AFRO 5437 - History of East Africa (3.0 cr)

Literature and the Arts

Take 9 or more credit(s) from the following:

AFRO 3108 - Black Music: A History of Jazz, CD, OH (3.0 cr)
AFRO 3112 - In the Heart of the Beat: the Poetry of Rap (3.0 cr)
AFRO 3301 - The Music of Black Americans, CD, OH (3.0 cr)
AFRO 3578 - Arts of Africa (3.0 cr)
AFRO 3585 - African American Art, CD, OH (3.0 cr)
AFRO 3592W - Introduction to Black Women Writers in the United States, CD, LIT, WI (#.0 cr)
AFRO 3625 - Black Women Writers in the Diaspora (3.0 cr)
AFRO 3626 - Literature of African American Men: Sex, Family, and Relationships (3.0 cr)
AFRO 3601 - Introduction to African Literature
AFRO 3628 - Literature of Rebelliion: the Amistad and other Revolts (3.0 cr)
AFRO 3634 - Blues & Rhythm and Blues (3.0 cr)
AFRO 3654 - African Cinema, IP, OH (4.0 cr)
AFRO 4302H - Honors: Women's Personal Narratives, H (3.0 cr)
AFRO 5181 - Blacks in American Theatre (3.0 cr)
AFRO 5182 - Contemporary Black Theatre: 1960-Present (3.0 cr)
AFRO 5593 - The African American Novel (3.0 cr)
AFRO 5597 - Seminar: Harlem Renaissance (3.0 cr)
AFRO 5598 - Seminar: Black Arts Renaissance, 1960s and 1970s (3.0 cr)
AFRO 5655 - African American Cinema, CD, OH (3.0 cr)

Social and Behavioral Sciences, Public Policy/Development

Take 9 or more credit(s) from the following: AFRO 1011 and 1021 are not required for upper level courses, but students are strongly encouraged to complete one if they are concentrating in Social and Behavioral Sciences, Public Policy/Development.

AFRO 1011 - Introduction to African American Studies, C/PE, CD (4.0 cr)
AFRO 1021 - Introduction to Africa, IP (4.0 cr)
AFRO 3061 - The Black Family, CD, SSCI, (3.0 cr)
AFRO 3072 - Racism: Social and Psychological Consequences for Black Maericans, CD (3.0 cr)
AFRO 3141 - Africa, ENVT, IP (3.0 cr)
AFRO 4351W - Sociological Perspectives on Race, Class, and Gender, CD, SSCI, WI (3.0 cr)
AFRO 3334 - Black Women: Interdisciplinary Perspectives (4.0 cr)
AFRO 3543 - Psychology and the Black American Experiencee, CD (3.0 cr)
AFRO 3405 - The African American Child, CD (3.0 cr)
AFRO 4231 - The Color of Public Policy: African Americans, American Indians, and Chicanos in the United States (3.0 cr)
AFRO 5072 - Racism: Social and Psychological Consequences for Black Americans (3.0 cr)
AFRO 5405 - The AFrican American Child (3.0 cr)

Africa

Take 9 or more credit(s) from the following: AFRO 1009 and 1021 are not required for 3xxx level courses, but students are strongly encouraged to complet eone if they are concentrating in Africa and Development.

AFRO 1009 - History of Women in Africa: 1500 to the Present, HP (3.0 cr)
AFRO 1021 - Introduction to Africa, IP (4.0 cr)
AFRO 3001 - West AFrican HIstory: Early Times to 1800, HP, IP (3.0 cr)
AFRO 3002 - West African History: 1800 to Present, HP, IP (3.0 cr)
AFRO 3006 - Impact of African Migrations in the Atlatic World, IP (3.0 cr)
AFRO 3141 - Africa, ENVT, IP (3.0 cr)
AFRO 3204 - History of South Africa to 1910, HP, IP (3.0 cr)
AFRO 3205 - History of SOuth Africa from 1910, HP (3.0 cr)
AFRO 3431 - Early Africa and Its Global Connections, HP, IP (4.0 cr)
AFRO 3432 - Modern Africa in a Changing World, HP, IP (4.0 cr)
AFRO 3578 - Arts of Africa (3.0 cr)
AFRO 3654 - African Cinema, IP, OH (4.0 cr)
AFRO 4013 - Cities in Africa: African, Islamic, European Traditions, HP, IP (3.0 cr)

AFRO 5191 - Seminar: The African American Experiencee in South Africa (3.0 cr)
AFRO 5437 - History of East Africa (3.0 cr)
AFRO 5551 - Methods: Use of Oral Traditions as Resources for History (3.0 cr)
AFRO 5301 - The African Novel (3.0 cr)

African Diaspora

Take 9 or more credit(s) from the following:
AFRO 3006 - Impact of African Migrations in the Atlatic World, IP (3.0 cr)
AFRO 3120 - Social and INtellectual Movements in the AFrican Diaspora (3.0 cr)
AFRO 3251W - Sociological Perspectives on Race, Class, and Gender, CD, SSCI, WI (3.0 cr)
AFRO 3334 - Black Women: Interdisciplinary Perspectives (4.0 cr)
AFRO 3431 - Early Africa and Its Global Connections, HP, IP (4.0 cr)
AFRO 3432 - Modern African in a Changing World, HP, IP (4.0 cr)
AFRO 3543 - Psychology and the Black American Experience, CD (3.0cr)
AFRO 3597W - Introduction to AFrican American Literature and Culture I, LIT, CD, WI (4.0 cr)
AFRO 3625 - Black Women Writers in the Diaspora: Comparative Perspectives (3.0 cr)
AFRO 5597 - Seminar: Harlem Renaissance (3.0 cr)
AFRO 5598 - Seminar: Black Arts Renaissance, 1960s and 1970s (3.0 cr)
AFRO 5655 - African American Cinema, CD, OH (3.0 cr)
AFRO 5120 - Social and Intellectual Movements in the African Diaspora (3.0 cr)
AFRO 5191 - Seminar: The African American Experiencee in South Africa (3.0 cr)

African American and African Studies Minor

African American/African Studies

Requirements for this program are current for Fall 2006.

Required credits in this minor: 15.

The African American & African Studies (AA&AS) minor integrates the global study of African peoples by teaching students the tools of inquiry from the liberal arts disciplines. The minor is designed to be flexible and to meet the needs of students preparing for careers in both the public and private spheres.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Required Courses

Students must complete all required courses on an A-F grade basis and at least 15 credits with a cumulative 2.0 GPA in all minor courses. All courses must have the AFRO designator to count toward the minor requirements.

AFRO 1012 - Black Worlds in Global Perspective: Challenges and Changes (3.0 cr)

Minor Courses

Take 12 or more credit(s) from the following:
All courses must have the AFRO designator to count toward the major.

AFRO 3xxx
AFRO 4xxx
AFRO 5xxx

American Indian Studies B.A.

American Indian Studies

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 33.

Degree: Bachelor of Arts.

American Indian studies is dedicated to advancing awareness and understanding of the histories and contemporary experiences of American Indian people. The program focuses on the native peoples of the United States and Canada, but also draws on the experiences of indigenous peoples from other parts of the world. This multidisciplinary field looks at the histories, cultures, arts, languages, literatures, philosophies, religions, economies, politics, and legal status of indigenous peoples. The program also focuses on the many differences that have separated tribal nations as sovereign bodies and on the many similarities that unite them in common interests and causes. It gives special attention to the sovereignty of American Indian nations as this is expressed in all walks of life - from the preservation and revitalization of native languages to the protection and retention of native lands.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Students are required to take 4 semester(s) of any second language.

For the Language Track, the language must be Dakota or Ojibwe.

Required Courses

Preparatory Courses

AMIN 1001 - American Indian Peoples in the United States, CD, SSCI (3.0 cr)

Senior Project

AMIN 4990 - Topics in American Indian Studies (1.0-4.0 cr)
or AMIN 4991 - Independent Study (1.0-12.0 cr)

Program Sub-plans

Students are required to complete one of the following sub-plans. (Note: The honors sub-plan does not meet this requirement.) Honors students are required to complete one sub-plan plus the honors sub-plan.

General Track

The general track is intended for majors who do not wish to complete their second language requirement in Dakota or Ojibwe.

Required Courses

Major Courses

Take 33 or more credit(s) including 5 or more sub-requirement(s) from the following:
AMIN 1002 - Indigenous Peoples in Global Perspective, SSCI, IP (3.0 cr)
or AMIN 1003 - Indigenous Peoples: a Minnesota Perspective, CD, OH (3.0 cr)

Tribal Arts and Humanities (Group A)

Take 1 or more course(s) from the following:
AMIN 3201W/3203 - American Indian Literature, CD, LIT, WI (3.0 cr)
AMIN 3301 - American Indian Philosophies, CD, OH (4.0 cr)
AMIN 3401 - American Indian Art, CD (4.0 cr)
AMIN 3601 - American Indian Oral Traditions, CD, LIT (3.0 cr)

AMIN 4201 - Topics in American Indian Literature (3.0 cr)
AMIN 4301 - American Indian Intellectuals, CD (3.0 cr)
AMIN 3402 - American Indians and the Cinema, CD, OH (3.0 cr)
or AMIN 5402 - American Indians and the Cinema, CD (3.0 cr)
AMIN 5303 - American Indians and Photography (3.0 cr)
or AMIN 3303 - American Indians and Photography, CD, OH (3.0 cr)

Culture and History (Group B)

Take 1 or more course(s) from the following:
AMIN 3143 - Language in American Indian Culture and Society (3.0 cr)
AMIN 3701 - Ojibwe Culture and History, CD, HP (3.0 cr)
AMIN 3711 - Dakota Culture and History, CD, HP (3.0 cr)
AMIN 3713 - American Indian Communities of the Great Lakes (3.0 cr)
AMIN 3870 - Topics in American Indian History (3.0 cr)
AMIN 3871 - American Indian History: Pre-Contact to 1830, CD, HP (4.0 cr)
AMIN 3872 - American Indian History: 1830 to the Present, CD, HP (4.0 cr)
AMIN 3876 - American Indian Education (3.0 cr)
AMIN 3409 - American Indian Women: Ethnographic and Ethnohistorical Perspectives, CD, SSCI (3.0 cr)
or AMIN 5409 - American Indian Women: Ethnographic and Ethnohistorical Perspectives, CD (3.0 cr)

Political, Social, and Policy Issues (Group C)

Take 1 or more course(s) from the following:
AMIN 3501 - American Indian Tribal Governments and Politics, C/PE, SSCI (3.0 cr)
AMIN 3876 - American Indian Education (3.0 cr)
AMIN 4231 - The Color of Public Policy: African Americans, American Indians, and Chicanos in the United States (3.0 cr)
AMIN 4501 - Law, Sovereignty, and Treaty Rights, C/PE (3.0 cr)
AMIN 4511 - American Indian Political Economy, CD (3.0 cr)
AMIN 4515 - Contemporary American Indian Movements (3.0 cr)
AMIN 4525W - Federal Indian Policy, C/PE, WI (3.0 cr)
AMIN 3141 - American Indian Language Planning (3.0 cr)
or AMIN 5141 - American Indian Language Planning (3.0 cr)

The following courses may be taken to satisfy group requirements with the permission of the Director of Undergraduate Programs:

AMIN 4990 - Topics in American Indian Studies (1.0-4.0 cr)
AMIN 4991 - Independent Study (1.0-12.0 cr)
AMIN 4994 - Topics, Independent Study
AMIN 4996 - Directed Research or Field Study

Electives

Take 15 - 18 credit(s) from the following:
AMIN 3xxx
AMIN 4xxx
AMIN 5xxx
Students must take at least one credit of a course to fulfill their Senior Project requirement. This can be fulfilled by taking any of the following courses for credit(s) when designated to work on their senior project: 4990, 4991, 4994, 4996 or 5920.

Language Track

The language focus is designed for students who wish to deepen their understanding of the field by completing two years of either Dakota or Ojibwe.

Students must take four semesters of Dakota or Ojibwe. This will satisfy the CLA second language requirement.

Required Courses

Major Courses

Ojibwe Language Sequence
AMIN 1101 - Beginning Ojibwe I (5.0 cr)
AMIN 1102 - Beginning Ojibwe II (5.0 cr)
AMIN 3103 - Intermediate Ojibwe I (5.0 cr)
AMIN 3104 - Intermediate Ojibwe II (5.0 cr)
or

Dakota Language Sequence
AMIN 1121 - Beginning Dakota I (5.0 cr)
AMIN 1122 - Beginning Dakota II (5.0 cr)
AMIN 3123 - Intermediate Dakota I (5.0 cr)
AMIN 3124 - Intermediate Dakota II (5.0 cr)

Advanced Level Language Course

AMIN 3141 - American Indian Language Planning (3.0 cr)
or AMIN 3143 - Language in American Indian Culture and Society (3.0 cr)
AMIN 3107 - Structure of Anishinaabemowin, the Ojibwe Language (3.0 cr)
or AMIN 5107 - The Structure of Anishinaabemowin, the Ojibwe Language (3.0 cr)
AMIN 3108 - History of Anishinaabemowin, the Ojibwe Language (3.0 cr)
or AMIN 5108 - History of Anishinaabemowin, the Ojibwe Language (3.0 cr)
AMIN 3109 - Anishinaabe Literature (3.0 cr)
or AMIN 5109 - Anishinaabe Literature (3.0 cr)

Electives

Take 7 or more credit(s) from AMIN 3xxx, 4xxx, or 5xxx The senior project can be counted as part of those credits
AMIN 4991 - Independent Study (1.0-12.0 cr)

Take 1 or more course(s) from the following:
AMIN 3xxx
AMIN 4xxx
AMIN 5xxx

American Indian Studies Minor

American Indian Studies

Requirements for this program are current for Fall 2006.

Required credits in this minor: 18.

American Indian studies is dedicated to advancing awareness and understanding of the histories and contemporary experiences of American Indian people. The program focuses on the native peoples of the United States and Canada, but also draws on the experiences of indigenous peoples from other parts of the world.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Required Courses

Minor Courses

Take 18 or more credit(s) including 2 or more sub-requirement(s) from the following:
AMIN 1001 - American Indian Peoples in the United States, CD, SSCI (3.0 cr)
or AMIN 1002 - Indigenous Peoples in Global Perspective, SSCI, IP (3.0 cr)
or AMIN 1003 - Indigenous Peoples: a Minnesota Perspective, CD, OH (3.0 cr)

Take 15 or more credit(s) from the following:
AMIN 3xxx
AMIN 4xxx
AMIN 5xxx

American Studies B.A.

American Studies

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 33.

Degree: Bachelor of Arts.

American studies is an interdisciplinary and comparative study of the United States as the outcome of migration, labor accumulation, land acquisition, cultural dissemination, the implantation of U.S. laws and policies, and identity formations around gender, sexuality, and race.

As an interdisciplinary field, American studies brings the social sciences and humanities together. Students and faculty interact in a variety of academic areas, including literature, history, sociology, anthropology, geography, cultural studies, art history, urban studies, political science, and women's studies.

In addition, the Department of American Studies includes a minor in Asian American studies and cooperates with the Departments of African-American and African Studies, American Indian Studies, Chicano Studies, and Indian Studies, which makes it possible for students to concentrate their studies in one of those cultural areas.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Students are required to take 4 semester(s) of any second language.

Required Courses

Preparatory Courses

Take 2 or more course(s) from the following:

AMST 1xxx

Proseminar Sequence

AMST 4961 - Proseminar I (3.0 cr)

AMST 4962W - Second Proseminar in American Studies, WI (3.0 cr)

Major Courses

Complete seven upper division courses (21 credit minimum), including one course in world cultures. Up to three courses outside of AMST may be counted with the approval of the director of undergraduate studies.

World Cultures Courses

Take 6 or more course(s) from the following:

AMST 3xxx

AMST 4xxx

AMST 5xxx

American Studies Minor

American Studies

Requirements for this program are current for Fall 2006.

Required credits in this minor: 15.

American studies is an interdisciplinary and comparative study of the United States as the outcome of migration, labor accumulation, land acquisition, cultural dissemination, the implantation of U.S. laws and policies, and identity formations around gender, sexuality, and race.

As an interdisciplinary field, American studies brings the social sciences and humanities together.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Required Courses

Minor Courses

Take 15 or more credit(s) from the following:

AMST 3xxx

AMST 4xxx

AMST 5xxx

Ancient Mediterranean Studies B.A.

Classical and Near Eastern Studies

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 37 to 39.

Degree: Bachelor of Arts.

The program allows students to concentrate on literary and material remains from the Near East and the Mediterranean basin dating from ca. 3000 B.C.E. through 650 C.E. This long era of human history witnessed the development of the ancient civilizations of Mesopotamia, Israel, Egypt, Greece, and Rome—cultures, whose contributions remain fundamental to the modern western world. Students study the literature, history, and archaeology of these regions as a broad interconnected whole. They learn to evaluate and interpret a wide range of evidence from antiquity, as well as to appreciate the various methods by which meaning is extracted from the remains of other cultures and times.

Admission Requirements

Students are strongly encouraged to complete the "Preparatory Courses" requirement shown in program requirements prior to admission to the major.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Students are required to take 4 semester(s) of any second language.

Required Courses

Preparatory Courses

Another course may fulfill this requirement with the approval of the director of undergraduate studies.

CNES 1001 - World of the Bible: Introduction to the Bible and its Ancient Near Eastern Background, HP (3.0 cr)
or CNES 1002 - World of Greece, HP (3.0 cr)
or CNES 1003 - World of Rome, HP (3.0 cr)
or CNES 1042 - Greek and Roman Mythology, OH (4.0 cr)
or CNES 1042H - Honors Course: Greek and Roman Mythology, OH, H (4.0 cr)
or CNES 1043 - Introduction to Greek and Roman Archaeology, HP (4.0 cr)
or CNES 1044 - Introduction to Near Eastern Archaeology, HP (3.0 cr)
or CNES 1082 - Jesus in History, HP (3.0 cr)
or CNES 1082H - Honors Course: Jesus in History, HP, H (4.0 cr)
or CNES 1201 - The Bible: Context and Interpretation, LIT (3.0 cr)

Major Courses

At least 30 credits must be 3xxx courses or higher, with at least 9 credits from each of three groups. No course may be used to fulfill the credit requirement for more than one group.

Take 33 or more credit(s) from the following:

Take 9 or more credit(s) from the following:
CNES 1001 - World of the Bible: Introduction to the Bible and its Ancient Near Eastern Background, HP (3.0 cr)
CNES 1044 - Introduction to Near Eastern Archaeology, HP (3.0 cr)
CNES 1202 - Prophesy in Ancient Israel (3.0 cr)
CNES 3142 - Art of Egypt, HP (4.0 cr)
CNES 3172 - Archaeology of Israel (3.0 cr)
CNES 3202 - Prophecy in Ancient Israel, LIT (3.0 cr)
CNES 3203 - The Bible: Wisdom, Poetry, and Apocalyptic, LIT (3.0 cr)
CNES 4051 - Ancient Near East and Egypt: Neolithic to 1500 BCE (3.0 cr)
CNES 4052 - Ancient Near East and Egypt: 1500 to 323 BCE (3.0 cr)
CNES 5051 - Before Herodotus: History and Historiography of Mesopotamia and the Ancient Near East (3.0 cr)
CNES 5251 - Archaeology of Herodian Israel (3.0 cr)
RELA 5513 - Scripture and Interpretation (3.0 cr)
CNES 1082 - Jesus in History, HP (3.0 cr)
or CNES 1082H - Honors Course: Jesus in History, HP, H (4.0 cr)
CNES 1201 - The Bible: Context and Interpretation, LIT (3.0 cr)
or CNES 3201 - The Bible: Context and Interpretation, LIT (3.0 cr)
CNES 3072 - The New Testament, HP (3.0 cr)
or CNES 5072 - The New Testament (3.0 cr)
CNES 3502 - Ancient Israel: From Conquest to Exile, HP (3.0 cr)
or CNES 5502 - Ancient Israel: From Conquest to Exile (3.0 cr)

Take 9 or more credit(s) from the following:
CNES 1002 - World of Greece, HP (3.0 cr)
CNES 3008 - History of Ancient Art, IP, OH (4.0 cr)
CNES 3152 - Art and Archaeology of Ancient Greece, OH (4.0 cr)
CNES 3201 - The Bible: Context and Interpretation, LIT (3.0 cr)
CNES 3082W - Greek Tragedy (3.0 cr)
CNES 5083 - Ancient Comedy (3.0 cr)
CNES 5103 - Hellenistic and Early Roman Art and Archaeology (3.0 cr)
CNES 5108 - Greek Architecture (3.0 cr)
CNES 5111 - Prehistoric Art and Archaeology of Greece (3.0 cr)
CNES 5112 - Archaic and Classical Greek Art (3.0 cr)
CNES 3071 - Greek and Hellenistic Religions, HP (3.0 cr)
or CNES 5071 - Greek and Hellenistic Religions (3.0 cr)
CNES 3081W - Classical Epic in Translation, LIT, WI (3.0 cr)
or CNES 5081 - Classical Epic in Translation (3.0 cr)

Take 9 or more credit(s) from the following:
CNES 1003 - World of Rome, HP (3.0 cr)
CNES 3008 - History of Ancient Art, IP, OH (4.0 cr)
CNES 3104 - Ancient Rome: Kings and Consuls, HP (3.0 cr)
CNES 3105 - Ancient Rome: The Age of Augustus, HP (3.0 cr)
CNES 3107 - Age of Constantine the Great, HP, IP (3.0 cr)
CNES 3108 - Age of St. Augustine of Hippo, HP (3.0 cr)
CNES 3162 - Roman Art and Archaeology, OH (4.0 cr)
CNES 5013 - Introduction to Roman Law (3.0 cr)
CNES 5083 - Ancient Comedy (3.0 cr)
CNES 5172 - House, Villa, Tomb: Roman Art in the Private Sphere (3.0 cr)
CNES 5182 - Art and the State: Public Art in the Roman Empire (3.0 cr)
CNES 3073 - Roman Religion and Early Christianity, HP (3.0 cr)
or CNES 5073 - Roman Religion and Early Christianity (3.0 cr)
CNES 3081W - Classical Epic in Translation, LIT, WI (3.0 cr)
or CNES 5081 - Classical Epic in Translation (3.0 cr)

Senior Project

Students should get a copy of the departmental statement on major projects from the director of undergraduate studies or department office. Students who complete a major project for another CLA major are not required to complete one for ancient Mediterranean studies.

CNES 3951W - Major Project, WI (4.0 cr)

Anthropology B.A.

Anthropology

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 35.

Degree: Bachelor of Arts.

Anthropology is the study of human beings and cultures throughout the world and through history and prehistory. Our majors emerge with a complete liberal arts education, because Anthropology is partly a natural science, partly a social science, and partly a humanistic study. In addition, anthropology is comparative. It has no boundaries! The entire world is our interest. If you major in Anthropology, you will compare and contrast the biological, social, and cultural similarities and differences of humans and their societies and develop a sophisticated understanding of the biological unity of our species. You will take courses that look at people from evolutionary, historical and cultural perspectives. You will develop critical thinking in areas of globalization, politics, race and cultural diversity. At the U of M, Anthropology majors are therefore expected to take courses in cultural, biological, archaeological and linguistic anthropologies, and are encouraged to specialize in one of these subfields by his or her junior year.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Students are required to take 4 semester(s) of any second language.

Required Courses

Preparatory Courses

ANTH 1001 - Human Evolution, BIOL SCI/L (4.0 cr)
ANTH 1003W - Understanding Cultures, IP, SSCI, WI (4.0 cr)
or ANTH 1005W - Introduction to Cultural Diversity and the World System, CD, IP, WI (4.0 cr)

Major Courses

Take 2 or more course(s) from the following:

ANTH 3001 - Introduction to Archaeology (4.0 cr)

ANTH 3003 - Cultural Anthropology (3.0 cr)

ANTH 3005 - Language, Culture, and Power (4.0 cr)

Electives

Students must take five electives, at least three of which must be 4xxx or 5xxx. Students who do not pursue senior project research must take six electives. Directed studies, reading, and research courses can be used to satisfy part of the elective course requirement. The combined number of directed studies, reading, and research credits that can satisfy elective requirements is normally limited to six credits. Special topics courses can be used to satisfy part of the electives requirement.

Take 2 or more course(s) from the following:

ANTH 3xxx

ANTH 4xxx

ANTH 5xxx

Take 3 or more course(s) from the following:

ANTH 4xxx

ANTH 5xxx

Senior Project

Choose one of the following three options to complete the senior project requirement.

ANTH 4011 - Senior Seminar (3.0 cr)

ANTH 3913 - Senior Project Planning (1.0 cr)

ANTH 4013 - Senior Project (3.0 cr)

Take 3 or more credit(s) from the following:

ANTH 4xxx

ANTH 5xxx

Anthropology Minor

Anthropology

Requirements for this program are current for Fall 2006.

Required credits in this minor: 16.

Anthropologists study human communities, near and far, past and present, and explore how seemingly unrelated aspects of a society are connected and how societies are linked to one another.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Required Courses

Preparatory Courses

ANTH 1001 - Human Evolution, BIOL SCI/L (4.0 cr)

or ANTH 1003W - Understanding Cultures, IP, SSCI, WI (4.0 cr)

or ANTH 1005W - Introduction to Cultural Diversity and the World System, CD, IP, WI (4.0 cr)

Minor Courses

Four three-credit courses that have a common focus are required. All 3xxx or higher courses, including special topics courses, may be used to meet this requirement.

Take 12 or more credit(s) from the following:

ANTH 3xxx

ANTH 4xxx

ANTH 5xxx

Architecture B.A.

Architecture

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 42.

Degree: Bachelor of Arts.

Architecture encompasses the study and creation of the buildings and environment that we inhabit. The concerns of architecture involve a wide variety of areas of study including the art of representing existing environments and proposals through drawings and models; the technology of building structure, building materials, and natural and mechanical systems; the history, theory, and art of making, using, and understanding buildings as cultural artifacts for human use; and the practice of architecture in the context of urban form and society.

Admission Requirements

Students must complete 2 courses before admission to the program.

A GPA above 2.00 is preferred for the following:

- 2.80 for students already admitted to the degree-granting college.
- 2.80 for students transferring from another University of Minnesota college.
- 2.80 for students transferring from outside the University.

Students must complete a Pre-Architecture Planning Sheet with a CLA adviser (located in CLA Society & Culture Student Community, 122 Johnston Hall, 612-624-2549; Martin Luther King Program, 19 Johnston Hall, 612-625-2300; CLA Honors Program, 115 Johnston Hall, 612-624-5522). Students must meet with a College of Architecture and Landscape Architecture undergraduate adviser in the CALA Office of Student Services (612-626-1000). Bring a copy of the completed Pre-Architecture Planning Sheet to the appointment. Students should be prepared to state the courses they will take for their concentration or minor.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Required Courses for Admission

Preparatory Courses

ARCH 1281 - Design Fundamentals I (4.0 cr)

ARCH 1401 - The Designed Environment (3.0 cr)

Program Requirements

Students are required to take 4 semester(s) of any second language.

All courses in math, physics, and English composition must be taken A-F with grades of C- or better to satisfy degree requirements and to progress in sequence courses.

During their program, students should maintain a portfolio of originals or duplicates of all freehand drawings, projects, and architecture studio designs. A portfolio is required for application to the accelerated program and the graduate professional degree program.

The accelerated status option allows students to combine the B.A with M.Arch. in six years instead of seven. See an adviser for more information.

Required Courses

Math and Physics Courses

MATH 1142 - Short Calculus, MATH (4.0 cr)
or MATH 1271 - Calculus I, MATH (4.0 cr)
PHYS 1101W - Introductory College Physics I, PHYS SCI/L, WI (4.0 cr)
or PHYS 1201W - Introductory Physics for Biology and Pre-medicine I, PHYS SCI/L, WI (5.0 cr)

Concentration or Minor

B.A. majors complete a concentration (18-credit minimum) of 3xxx-5xxx courses outside the major, or a minor outside the major, as a means to broaden the social, cultural, and international aspects of their interest area. Any formal University minor will satisfy this requirement. Courses for a concentration are chosen from various disciplines that affect design decisions (for example, economics, geography, housing, natural resources, and urban studies).

Major Courses

In addition to the required courses, students must complete 13 or more elective credits, at least four of which must be ARCH 32xx.

ARCH 1301 - Introduction to Drawing in Architecture and Landscape Architecture, OH (4.0 cr)
ARCH 3281 - Design Fundamentals II (4.0 cr)
ARCH 3401W - Environmental Design and the Sociocultural Context, C/PE, WI (3.0 cr)
ARCH 3411 - Architectural History to 1750, HP, IP (3.0 cr)
ARCH 3412 - Architectural History since 1750, HP, IP (3.0 cr)
ARCH 3611 - Design in the Digital Age (3.0 cr)
ARCH 4501 - Architecture and Ecology (4.0 cr)
ARCH 4701 - Introduction to Urban Form and Issues (3.0 cr)
LA 3501 - Environmental Design and Its Biological and Physical Context, ENVT (3.0 cr)

Take 13 or more credit(s) from the following:
ARCH 3xxx
ARCH 4xxx
ARCH 5xxx

Art B.A.

Art

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 38.

Degree: Bachelor of Arts.

The program provides instruction in the visual arts by emphasizing the development of visual awareness and expression through hands-on involvement in the creative process. In the preparatory studio courses, students become familiar with the various materials and concepts used to understand the nature of the visual language. Students then choose additional courses from such areas as drawing, painting, ceramics, printmaking, photography, sculpture, time and interactivity, papermaking, and book arts.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Students are required to take 4 semester(s) of any second language.

Required Courses

Preparatory Courses
ARTS 1001W - Concepts in Visual Art, OH, WI (4.0 cr)
ARTS 1101 - Drawing, OH (4.0 cr)
ARTS 1301 - Sculpture, OH (4.0 cr)
or ARTS 1801 - Ceramics, OH (4.0 cr)
ARTS 1501 - Printmaking, OH (4.0 cr)
or ARTS 1601 - Electronic Art, OH (4.0 cr)
or ARTS 1701 - Photography, OH (4.0 cr)

Major Courses

Take 15 or more credit(s) from the following:
ARTS 3xxx
ARTS 4xxx
ARTS 5xxx

Take 2 or more course(s) totaling 6 or more credit(s) from the following:
ARTH 2xxx
ARTH 3xxx
ARTH 4xxx
ARTH 5xxx

Take no more than 3 credit(s) from the following:
ARTH 1xxx

Senior Project

ARTS 3444 - Major Project (1.0 cr)

Art B.F.A.

Art

Requirements for this program are current for Summer 2006.

Required credits to graduate with this degree: 126.

Required credits within the major: 68.

Degree: Bachelor of Fine Arts.

The program provides in-depth instruction in the visual arts through a high concentration of coursework in the Department of Art. Admission is based on portfolio evaluation. The program is oriented toward professional practice or admission to a master's degree program.

Admission Requirements

Students must complete 5 courses before applying to the program.

Art majors may apply to the B.F.A. degree program after completing the five preparatory core courses required in the major. Application is made by submitting a portfolio to a faculty committee for review. A faculty adviser is chosen upon admission to the B.F.A. program.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Required Courses for Admission

Preparatory Courses

ARTS 1001W - Concepts in Visual Art, OH, WI (4.0 cr)
ARTS 1101 - Drawing, OH (4.0 cr)
ARTS 1301 - Sculpture, OH (4.0 cr)

or ARTS 1801 - Ceramics, OH (4.0 cr)
ARTS 1501 - Printmaking, OH (4.0 cr)
or ARTS 1601 - Electronic Art, OH (4.0 cr)
or ARTS 1701 - Photography, OH (4.0 cr)

Take 4 or more credit(s) from the following:
ARTS 1xxx

Program Requirements

Students are required to take 4 semester(s) of any second language.

Students who wish to apply art courses from outside the University of Minnesota to the B.F.A. major requirements should contact the undergraduate adviser.

Required Courses

Major Courses
ARTS 5400 - Seminar: Concepts and Practices in Art (3.0 cr)
ARTS 3496 - Internship in the Arts (1.0-3.0 cr)
or ARTS 3499 - Internship at Katherine E. Nash Gallery (3.0 cr)

Take 1 or more course(s) from the following:
ARTS 3401W - Critical Theories and Their Construction From a Studio Perspective, WI (3.0 cr)
ARTH 5417 - Twentieth Century Theory and Criticism (3.0 cr)
CSDS 5301 - Society, Ideology, and the Production of Art (3.0 cr)
CSDS 5302 - Aesthetics and the Valuation of Art (3.0 cr)
CSCL 1001 - Introduction to Cultural Studies: Rhetoric, Power, Desire, CD, OH (4.0 cr)
CSCL 1201 - Introduction to Cinema and Media Culture, OH (4.0 cr)
CSCL 1301W - Reading Culture: Theory and Practice, OH, WI (4.0 cr)
CSCL 3115 - Cinema and Ideology, OH (4.0 cr)
CSCL 3321W - Theories of Culture, WI (3.0 cr)
CSCL 3458W - The Body and the Politics of Representation, HP, WI (3.0 cr)
PHIL 3502W - Introduction to Aesthetics, OH, WI (3.0 cr)

Take 3 or more course(s) totaling 9 or more credit(s) from the following:
ARTH 2xxx
ARTH 3xxx
ARTH 4xxx
ARTH 5xxx

Take no more than 1 course(s) from the following:
ARTH 1xxx

Take 30 or more credit(s) from the following:
ARTS 3xxx
ARTS 4xxx
ARTS 5xxx

Senior Project
B.F.A. candidates register with the faculty adviser and participate in a solo or small group exhibition at an adviser-approved gallery or exhibition space during the final semester.

ARTS 5444 - Bachelor of Fine Arts Exhibition (1.0 cr)

Art Minor

Art

Requirements for this program are current for Fall 2006.

Required credits in this minor: 20.

The minor introduces students to the creative process and visual thinking required in art.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Required Courses

Concepts in Visual Arts
ARTS 1001W - Concepts in Visual Art, OH, WI (4.0 cr)

Methods and Media
ARTS 1101 - Drawing, OH (4.0 cr)
or ARTS 1301 - Sculpture, OH (4.0 cr)
or ARTS 1501 - Printmaking, OH (4.0 cr)
or ARTS 1505 - Papermaking, OH (4.0 cr)
or ARTS 1601 - Electronic Art, OH (4.0 cr)
or ARTS 1701 - Photography, OH (4.0 cr)
or ARTS 1801 - Ceramics, OH (4.0 cr)

Art History
ARTH 3xxx
or ARTH 4xxx
or ARTH 5xxx

Electives
One course may be an additional 1xxx elective if a second media area is desired.

Take 3 or more course(s) from the following:
ARTS 3xxx
ARTS 4xxx
ARTS 5xxx

Art History B.A.

Art History

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 29.

Degree: Bachelor of Arts.

Using a wide variety of methodological approaches, art history faculty help students develop an awareness and knowledge of the visual environments from all periods of history. All 1xxx level courses and most 3xxx courses do not have prerequisites and are intended for general audiences. Students who intend to apply for graduate school are strongly encouraged to take as many 5xxx courses from as many different professors as possible.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Students are required to take 4 semester(s) of any second language.

The department urges majors to take courses that cover the history of art from the earliest periods through the current day, and from both western and non-western cultures. Students are also encouraged to take courses from a variety of instructors to ensure exposure to various approaches and methods.

Required Courses

Studio Art Course

This course must be a hands-on course such as sculpture, drawing, photography, or printmaking, rather than an art history course.

Take 4 or more credit(s) from the following:

ARTS 1xxx

Major Courses

The adviser and director of undergraduate studies work closely with majors to ensure that programs are not narrowly constructed. ARTH 3933/5993, ARTH 5994, ARTH 3975, and S-N credits may not be used to fulfill major requirements. One ARTH 1xxx course may be substituted for a 3xxx or 4xxx course.

Take 5 or more course(s) from the following:

ARTH 3xxx

ARTH 4xxx

Take 2 or more course(s) from the following:

ARTH 5xxx

Senior Project

Before the end of the junior year, students select a "project" course with permission from the course instructor. The student completes a research paper for the course. The next semester, the student registers in ARTH 3971W or ARTH 3971V and under the instructor's supervision develops the paper into the major project.

ARTH 3971W - Major Project, WI (1.0 cr)

ARTH 3971V-Honors Project, WI (3.0 cr)

Art History Minor

Requirements for this program are current for Fall 2006.

Required credits in this minor: 14.

Using a wide variety of methodological approaches, art history faculty help students develop an awareness and knowledge of the visual environments from all periods of history.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Required Courses

Minor Courses

Take at least three ARTH 3xxx courses. One ARTH 1xxx course may be substituted for a 3xxx course. ARTH 3933/5993, ARTH 5994, ARTH 3975, and S/N credits may not be used to fulfill minor requirements.

Electives

Take 1 or more course(s) from the following:

ARTH 5xxx

Asian American Studies Minor

Requirements for this program are current for Fall 2006.

Required credits in this minor: xx.

The Asian American Studies minor focuses on the history, politics, and culture of Americans of Asian descent. The courses are designed to help students explore the diversity of Asian American communities, and the history and present conditions of racial formation in the United States and other parts of the Americas. The minor draws from courses in a number of disciplines and academic approaches, and encourages social awareness, critical thinking, the development of new perspectives, and artistic appreciation.

Courses includeed in the minor allow students to develop their knowledge of Asian American issues in many different contexts. Some courses emphasize an in-depth study of Asian American history, literature and culture, social issues, politics, and psychology. Other courses include significant attention to Asian American Studies topics in the course of broader discussions.

Electives

Courses used to fulfill the minor courses requirement cannot also be used to fulfill the elective requirement. In addition to the required core course, four courses from a list of approved courses, which include the following: A maximum of eight credits of elective courses may be earned from a single department. NOTE: These courses will be approved for the minor only if they are taught by AAS faculty.

AAS/AFRO 4231 - The Color of Public Policy

AAS 3270/ALL 3270 - Service Learning in the Asian Community

AAS 3920/ALL 3900 - Topics in Asian Literature and Culture

ALL 3001 - Reading Asian Cultures (3.0 cr)

AMST 3113W: America's Diverse Cultures

AMST 3114 - America in International Perspective: Post-1965 Immigration (3.0 cr)

ANTH 4047 - Anthropology of American Culture (3.0 cr)

ENGL 4232 - American Drama by Writers of Color (3.0 cr)

HIST 3822 -20th Century U.S. History, 1945-present (3.0 cr)

HIST 3875 - Comparative Race and Ethnicity in U.S. History (3.0 cr)

LING 3707 - Ethnic Bilingualism in the United States, CD (3.0 cr)

SOC 3211W - American Race Relations, CD, SSCI, WI (3.0 cr)

SOC 3251W - Race, Class, and Gender, CD, SSCI, WI (3.0 cr)

WOST 4103 - International Feminist Theories (3.0 cr)

Asian Languages and Literatures B.A.

Asian Languages and Literatures

Requirements for this program are current for Summer 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 35.

Degree: Bachelor of Arts.

Asia is an increasingly important part of world politics, economics, and culture. The program prepares students to interact with the people and cultures of Asia.

Students in the program study an Asian language—Chinese, Hindi, Hmong, Japanese, Korean—as well as methods of literary and cultural analysis. The language study provides advanced spoken and written skills that allow students direct access to the people and cultures of Asia, where over half the world's population lives. The analytical courses give a theoretically

sophisticated understanding of the rich literary and cultural texts, from the accepted literary canon to popular culture and film.

The major has sixconcentrations—Chinese, Hindi, Hmong, Japanese, Korean—each of which introduces a broad range of language, literary, and cultural texts. Along with concentration courses, students may take related electives outside the department and during study abroad. The concentrated study in upper level courses, leads to the senior project. Study abroad is strongly encouraged and can contribute credit to the major.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Students are required to take a total of 6 semester(s) of Chinese, Hindu/Urdu, Japanese, or Korean. Two semesters must be advanced language courses.

Students choosing a classical track do so in consultation with the director of undergraduate studies. Students with advanced ability in the language may substitute 5xxx ALL courses to meet this requirement.

Chinese
CHN 3031 - Advanced Modern Chinese (4.0 cr)
CHN 3032 - Advanced Modern Chinese (4.0 cr)
or
Hindi/Urdu
HNDI 4161 - Advanced Hindi (4.0 cr)
HNDI 4162 - Advanced Hindi (4.0 cr)
or
Japanese
JPN 3031 - Third-Year Japanese (4.0 cr)
JPN 3032 - Third-Year Japanese (4.0 cr)
or
Korean
KOR 3031 - Third Year Korean (4.0 cr)
KOR 3032 - Third Year Korean (4.0 cr)

Major Courses
One course must be a 5xxx course. Only one course must be modern. One course muist be classical. One course must be ALL 3001, one 1xxx ALL course may be applied.

Take 4or more course(s) from the following:
ALL 1xxx
ALL 2xxx
ALL 3xxx
ALL 4xxx
ALL 5xxx

Electives
Courses in the arts, humanities, or social sciences may include ALL courses, non-ALL courses, study abroad courses, and transfer courses. Courses may not include 2-credit classes, with the exception of 1- or 2-credit study abroad courses approved by the director of undergraduate studies. Consult an adviser for appropriate course options.

Two courses in the arts, humanities or social sciences.

Senior Project
Undertaken with a faculty adviser. Registration must be with instructor permission. May be taken alone or with an upper division ALL course in the senior year. May be a 20-25 page paper, a creative project, or a translation conceived in consultation with a faculty adviser. If taken with an upper division course, the project is 1 credit. If taken as a stand-alone course, the project is 2 credits.

ALL 4900W - Major Project, WI ()(1.0-2.0 cr)

Program Sub-plans

Students are required to complete one of the following sub-plans. (Note: The honors sub-plan does not meet this requirement.) Honors students are required to complete one sub-plan plus the honors sub-plan.

Chinese Literature, Culture, and Media
If a 5xxx ALL course has not otherwise been used to meet major requirements, it must be completed as part of this track.

Classical
Take 1 or more course(s) from the following:
ALL 1335W - Chinese Ways of Living: Philosophical and Literary Approaches, OH, C/PE, WI (3.0 cr)
ALL 3232W - "Short" Poetry in China and Japan, LIT, IP, WI (3.0 cr)
ALL 3265W - The Fantastic in East Asia: Ghosts, Foxes, and the Alien, OH, WI (3.0 cr)
ALL 3333 - Gender and Sexuality in Traditional Chinese Literature (3.0 cr)
ALL 3363 - Imagined Worlds in Ming Qing China (3.0 cr)
ALL 3373 - Religion and Society in Imperial China, HP (3.0 cr)
ALL 5265 - Traditional Poetics and Aesthetics in East Asia (4.0 cr)
ALL 5343 - Lovers, Clowns, and Acrobats: An Introduction to Chinese Drama (4.0 cr)
ALL 5900 - Topics in Asian Literature (1.0-4.0 cr)

Modern
Take 1 or more course(s) from the following:
ALL 3300 - Topics in Chinese Literature (1.0-3.0 cr)
ALL 3337 - Chinese Literature and Popular Culture Today (3.0 cr)
ALL 3356W - Chinese Film, IP, OH, WI (3.0 cr)
ALL 3361W - Maps, Pictures, and Writing in the Representation of Taiwan, OH, IP, WI (3.0 cr)
ALL 3371 - History of Chinese Cities and Urban Life (3.0 cr)
ALL 5357 - Chinese Cinematic Realisms (4.0 cr)
ALL 5366 - The Nation in Modern Chinese Film and Literature (4.0 cr)

Japanese Literature, Culture, and Media
If a 5xxx ALL course has not otherwise been used to meet major requirements, it must be completed as part of this track.

Classical
Take 1 or more course(s) from the following:
ALL 3232W - "Short" Poetry in China and Japan, LIT, IP, WI (3.0 cr)
ALL 3265W - The Fantastic in East Asia: Ghosts, Foxes, and the Alien, OH, WI (3.0 cr)
ALL 3433W - Traditional Japanese Literature in Translation, LIT, WI (3.0 cr)
ALL 3441W - Japanese Theater, OH, WI (3.0 cr)
ALL 5265 - Traditional Poetics and Aesthetics in East Asia (4.0 cr)
ALL 5433 - Women's Writing in Premodern Japan in Translation (4.0 cr)
ALL 3920 - Topics in Asian Culture (1.0-4.0 cr)
or ALL 5920 - Topics in Asian Culture (1.0-4.0 cr)

Modern
Take 1 or more course(s) from the following:
ALL 1441 - Popular Music and Media in Modern Japan, OH, IP (3.0 cr)
ALL 3436 - Postwar Japanese Literature in Translation (3.0 cr)
ALL 3437 - Early 20th Century Japanese Literature in Translation, LIT (3.0 cr)
ALL 3456 - Japanese Film, OH (3.0 cr)
ALL 3457 - War and Peace in Japan Through Popular Culture (4.0 cr)
ALL 5436 - Literature by 20th-Century Japanese Women in Translation (4.0 cr)
ALL 5466 - Japanese Popular Culture in a Global Context (4.0 cr)
ALL 5476 - Japanese Minority Literatures (4.0 cr)
ALL 5477 - Kurosawa, Masculinity, and Cold War (4.0 cr)

ALL 5920 - Topics in Asian Culture (1.0-4.0 cr)
ALL 3920 - Topics in Asian Culture (1.0-4.0 cr)
or ALL 5920 - Topics in Asian Culture (1.0-4.0 cr)

South Asian Literature, Culture, and Media

If a 5xxx ALL course has not otherwise been used to meet major requirements, it must be completed as part of this track.

Take 3 or more course(s) from the following:

Classical

Take 1 or more course(s) from the following:
ALL 3014W - Art of India, IP, OH, WI (4.0 cr)

Modern

Take 1 or more course(s) from the following:
ALL 3900 - Topics in Asian Literature (1.0-4.0 cr)
ALL 3920 - Topics in Asian Culture (1.0-4.0 cr)
ALL 3637W - Modern South Asian Literature, LIT, WI (3.0 cr)
ALL 3676 - Culture and Society of India, IP, SSCI (3.0 cr)
ALL 5636 - South Asian Women Writers (4.0 cr)
ALL 5900 - Topics in Asian Literature (1.0-4.0 cr)
ALL 5920 - Topics in Asian Culture (1.0-4.0 cr)

Social Formations in Asia

If a 5xxx ALL course has not otherwise been used to meet major requirements, it must be completed as part of this track. ALL 3920 may be classical or modern depending on the topic.

Classical

Take 1 or more course(s) from the following:
ALL 3265W - The Fantastic in East Asia: Ghosts, Foxes, and the Alien, OH, WI (3.0 cr)
ALL 3363 - Imagined Worlds in Ming Qing China (3.0 cr)
ALL 3373 - Religion and Society in Imperial China, HP (3.0 cr)
ALL 5433 - Women's Writing in Premodern Japan in Translation (4.0 cr)

Modern

Take 1 or more course(s) from the following:
ALL 1275 - Buddhism in East Asia (3.0 cr)
ALL 1335W - Chinese Ways of Living: Philosophical and Literary Approaches, OH, C/PE, WI (3.0 cr)
ALL 3001 - Reading Asian Cultures (3.0 cr)
ALL 3333 - Gender and Sexuality in Traditional Chinese Literature (3.0 cr)
ALL 3371 - History of Chinese Cities and Urban Life (3.0 cr)
ALL 3457 - War and Peace in Japan Through Popular Culture (4.0 cr)
ALL 5466 - Japanese Popular Culture in a Global Context (4.0 cr)
ALL 5476 - Japanese Minority Literatures (4.0 cr)
ALL 5477 - Kurosawa, Masculinity, and Cold War (4.0 cr)
ALL 5636 - South Asian Women Writers (4.0 cr)
ALL 3920 - Topics in Asian Culture (1.0-4.0 cr)
or ALL 5920 - Topics in Asian Culture (1.0-4.0 cr)

Visual and Aural Cultures in Asia

If a 5xxx ALL course has not otherwise been used to meet major requirements, it must be completed as part of this track.

Take 3 or more course(s) from the following:

Classical

Take 1 or more course(s) from the following:
ALL 3014W - Art of India, IP, OH, WI (4.0 cr)
ALL 5343 - Lovers, Clowns, and Acrobats: An Introduction to Chinese Drama (4.0 cr)

Modern

Take 1 or more course(s) from the following:
ALL 1001 - Asian Film and Animation (3.0 cr)
ALL 1441 - Popular Music and Media in Modern Japan, OH, IP (3.0 cr)
ALL 3356W - Chinese Film, IP, OH, WI (3.0 cr)
ALL 3361W - Maps, Pictures, and Writing in the Representation of Taiwan, OH, IP, WI (3.0 cr)
ALL 3441W - Japanese Theater, OH, WI (3.0 cr)
ALL 3456 - Japanese Film, OH (3.0 cr)
ALL 3457 - War and Peace in Japan Through Popular Culture (4.0 cr)
ALL 3920 - Topics in Asian Culture (1.0-4.0 cr)
ALL 5357 - Chinese Cinematic Realisms (4.0 cr)
ALL 5366 - The Nation in Modern Chinese Film and Literature (4.0 cr)
ALL 5477 - Kurosawa, Masculinity, and Cold War (4.0 cr)

Written Cultures in Asia

If a 5xxx ALL course has not otherwise been used to meet major requirements, it must be completed as part of this track. ALL 3900 may be classical or modern depending on the topic.

Classical

Take 1 or more course(s) from the following:
ALL 1335W - Chinese Ways of Living: Philosophical and Literary Approaches, OH, C/PE, WI (3.0 cr)
ALL 3232W - "Short" Poetry in China and Japan, LIT, IP, WI (3.0 cr)
ALL 3265W - The Fantastic in East Asia: Ghosts, Foxes, and the Alien, OH, WI (3.0 cr)
ALL 3333 - Gender and Sexuality in Traditional Chinese Literature (3.0 cr)
ALL 3363 - Imagined Worlds in Ming Qing China (3.0 cr)
ALL 3433W - Traditional Japanese Literature in Translation, LIT, WI (3.0 cr)
ALL 5265 - Traditional Poetics and Aesthetics in East Asia (4.0 cr)
ALL 5374W - Representing the Past: Chinese Myth, Legend, and Ideology, WI (4.0 cr)
ALL 5433 - Women's Writing in Premodern Japan in Translation (4.0 cr)
ALL 3920 - Topics in Asian Culture (1.0-4.0 cr)
or ALL 5920 - Topics in Asian Culture (1.0-4.0 cr)

Modern

Take 1 or more course(s) from the following:
ALL 3001 - Reading Asian Cultures (3.0 cr)
ALL 3337 - Chinese Literature and Popular Culture Today (3.0 cr)
ALL 3361W - Maps, Pictures, and Writing in the Representation of Taiwan, OH, IP, WI (3.0 cr)
ALL 3436 - Postwar Japanese Literature in Translation (3.0 cr)
ALL 3437 - Early 20th Century Japanese Literature in Translation, LIT (3.0 cr)
ALL 3500 - Topics in Korean Literature (1.0-3.0 cr)
ALL 3637W - Modern South Asian Literature, LIT, WI (3.0 cr)
ALL 3900 - Topics in Asian Literature (1.0-4.0 cr)
ALL 5366 - The Nation in Modern Chinese Film and Literature (4.0 cr)
ALL 5436 - Literature by 20th-Century Japanese Women in Translation (4.0 cr)
ALL 5636 - South Asian Women Writers (4.0 cr)
ALL 5900 - Topics in Asian Literature (1.0-4.0 cr)

Asian Languages and Literatures Minor

Asian Languages and Literatures

Requirements for this program are current for Fall 2006.

Required credits in this minor: 28 to 30.

Asia is an increasingly important part of world politics, economics, and culture. The minor prepares students to interact with the people and cultures of Asia.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Students are required to take 4 semester(s) of Chinese, Hindi, Japanese, or Korean and 2 courses which must be upper division ALL designator, 6 to 8 credits total, related to the area of concentration.

Program Sub-plans

Students are required to complete one of the following sub-plans. (Note: The honors sub-plan does not meet this requirement.) Honors students are required to complete one sub-plan plus the honors sub-plan.

Chinese Languages and Literatures

Required Courses

Chinese Language

CHN 1011 - Beginning Modern Chinese (6.0 cr)
CHN 1012 - Beginning Modern Chinese (6.0 cr)
CHN 3021 - Intermediate Modern Chinese (5.0 cr)
CHN 3022 - Intermediate Modern Chinese (5.0 cr)

Take 2 or more course(s) from the following:
ALL 3xxx
ALL 4xxx
ALL 5xxx

Japanese Languages and Literatures

Required Courses

Japanese Language

JPN 1011 - Beginning Japanese (6.0 cr)
JPN 1012 - Beginning Japanese (6.0 cr)
JPN 3021 - Intermediate Japanese (5.0 cr)
JPN 3022 - Intermediate Japanese (5.0 cr)

Korean Languages and Literatures

Required Courses

Korean Language

KOR 1011 - Beginning Korean (5.0 cr)
KOR 1012 - Beginning Korean (5.0 cr)
KOR 3021 - Intermediate Korean (5.0 cr)
KOR 3022 - Intermediate Korean (5.0 cr)

Astronomy B.A.

Astronomy

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 41.

Degree: Bachelor of Arts.

The program in astronomy develops the skills necessary to tackle complex and ill-defined problems within the physical sciences and prepares students for careers in several broad areas. The program is aimed primarily at students interested in secondary education in the physical sciences, science policy, and science and technical writing. The program can also prepare students for graduate study in astronomy.

Admission Requirements

Students must complete 7 courses before admission to the program.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Required Courses for Admission

Mathematics

Complete one of the following course pairs.

Calculus Sequence I
MATH 1271 - Calculus I, MATH (4.0 cr)
MATH 1272 - Calculus II (4.0 cr)
or
Calculus Sequence II
MATH 1371 - IT Calculus I, MATH (4.0 cr)
MATH 1372 - IT Calculus II (4.0 cr)
or
Calculus Honors Sequence
MATH 1571H - Honors Calculus I, MATH, H (4.0 cr)
MATH 1572H - Honors Calculus II, H (4.0 cr)

Complete one of the following course pairs.

Option I
MATH 2243 - Linear Algebra and Differential Equations (4.0 cr)
MATH 2263 - Multivariable Calculus (4.0 cr)
or
Option II
MATH 2373 - IT Linear Algebra and Differential Equations (4.0 cr)
MATH 2374 - IT Multivariable Calculus and Vector Analysis (4.0 cr)
or
Honors Option
MATH 2573H - Honors Calculus III, H (4.0 cr)
MATH 2574H - Honors Calculus IV, H (4.0 cr)

Preparatory Physics

Complete one of the following sequences.

Physics Sequence
PHYS 1301W - Introductory Physics for Science and Engineering I, PHYS SCI/L, WI (4.0 cr)
PHYS 1302W - Introductory Physics for Science and Engineering II, PHYS SCI/L, WI (4.0 cr)
PHYS 2503 - Physics III: Foundations of Modern Physics (4.0 cr)
or
Physics Honors Sequence
PHYS 1401V - Honors Physics I, PHYS SCI/L, WI, H (4.0 cr)
PHYS 1402V - Honors Physics II, PHYS SCI/L, WI, H (4.0 cr)
PHYS 2403H - Honors Phys III, H (4.0 cr)

Program Requirements

Students are required to take 4 semester(s) of any second language.

AST 1011H is recommended but not required. The number of credits in the major varies by specialization but is at least 15 credits of AST courses.

Required Courses

Major Courses

Each specialization track has the same core math, physics, and astrophysics requirements. Tracks include secondary education, science writing, science policy, and scientist.

AST 2001 - Introduction to Astrophysics (4.0 cr)

PHYS 2601 - Quantum Physics (4.0 cr)
PHYS 2605 - Quantum Physics Laboratory (3.0 cr)
PHYS 4001 - Analytical Mechanics (4.0 cr)
PHYS 4002 - Electricity and Magnetism (4.0 cr)

Electives
AST 4001 - Astrophysics I (4.0 cr)
AST 4002 - Astrophysics II (4.0 cr)
MATH 3283W - Sequences, Series, and Foundations: Writing Intensive, WI (4.0 cr)
Take 12 or more credit(s) from the following:
AST 4xxx
AST 5xxx

Senior Project
This requirement can be met with directed research in astronomy or a project tailored to the specific track.

AST 4994W - Directed Research, WI (3.0-5.0 cr)

Astronomy Minor

Astronomy

Requirements for this program are current for Fall 2006.

Required credits in this minor: 24.

Students in the minor learn the physical principles underlying study of the solar system, stars, galaxy, and universe and the methodology behind observations and conclusions.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu. Program Requirements:

Required Courses

Math
MATH 1271 - Calculus I, MATH (4.0 cr)
or MATH 1281 - Calculus with Biological Emphasis I, MATH (4.0 cr)
or MATH 1371 - IT Calculus I, MATH (4.0 cr)
or MATH 1571H - Honors Calculus I, MATH, H (4.0 cr)
MATH 1272 - Calculus II (4.0 cr)
or MATH 1282 - Calculus With Biological Emphasis II (4.0 cr)
or MATH 1372 - IT Calculus II (4.0 cr)
or MATH 1572H - Honors Calculus II, H (4.0 cr)

Physics
PHYS 1301W - Introductory Physics for Science and Engineering I, PHYS SCI/L, WI (4.0 cr)
or PHYS 1401V - Honors Physics I, PHYS SCI/L, WI, H (4.0 cr)
PHYS 1302W - Introductory Physics for Science and Engineering II, PHYS SCI/L, WI (4.0 cr)
or PHYS 1402V - Honors Physics II, PHYS SCI/L, WI, H (4.0 cr)
PHYS 2303 - Physics III: Physics of Matter (4.0 cr)
or PHYS 2503 - Physics III: Foundations of Modern Physics (4.0 cr)
or PHYS 2403H - Honors Phys III, H (4.0 cr)

Minor Courses
AST 1001 or AST 1011H is recommended but not required.
AST 2001 - Introduction to Astrophysics (4.0 cr)

Austrian and Central European Studies Minor

German, Scandinavian, and Dutch

Requirements for this program are current for Fall 2006.

Required credits in this minor: 16.

The minor allows students to focus a group of electives on the study of Austrian and Central European culture, history, and society. Courses address specific social and political circumstances, cultural traditions, and shared history of Austria and the other countries of Central Europe. The minor is supported by the Center for Austrian Studies; student exchange programs with universities in Vienna, Salzburg, and Graz; and visiting Austrian scholars sponsored by the Austrian-American Education Commission.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Credits must be completed in 3xxx, 4xxx, and 5xxx courses. No more than one course may be directed or independent study. all courses in the minor must be taken on A-F grading and must be completed with a grade of C- or better. At least one course must be taken in the German program of the University of Minnesota. Students majoring in German studies may elect an ACES minor but no courses may count for both the German studies major and the Austrian studies minor. Therefore, students majoring in German studies must take one additional course to substitute for GER 3011W, which is a core requirement for both the German studies major and Austrian studies minor. The minor program must be approved by the director of undergraduate studies.

Required Courses

Minor Courses
GER 3011W - Conversation and Composition, WI (4.0 cr)
GER 3520 - Topics in Austrian and Central European Culture (3.0 cr)
Two courses in the art, culture, or literature of Austria and Central Europe.
One course in the history, politics, and society of Austria and Central Europe.

Bachelor of Individualized Studies B.I.S.

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 50.

Degree: Bachelor of Individualized Studies.

The program provides flexibility not available in B.A. and B.S. programs. Rather than complete a major in a single field, students focus their coursework on three areas, one of which may consist of courses from outside CLA. The areas do not have to be related to each other, but the program proposal must explain the student's overall educational goals.

Working closely with an adviser, students develop program proposals that explain why their academic needs are best met by an individualized program and list the courses to be included. The proposal must be approved by faculty or department advisers with expertise in the areas of concentration.

Some departments and colleges have prerequisite or required courses for students who want to include in their B.I.S. program concentration areas based in those departments and colleges. For specific information on proposal procedures and on department and college guidelines, see the Individualized Degree Programs Web site http://idp.class.umn.edu.

Admission Requirements

For certain concentration areas, prerequisite courses must be completed before submitting a program proposal. For certain concentrations, a minimum overall GPA or a minimum tool course GPA is required before a student can submit a program proposal.

Students can declare the degree after attending an information session (held two to three times a week). Students are not approved for the degree until they have submitted a program proposal (the submission deadline is once per semester) and the proposal has been approved by a committee and faculty or department advisers.

See a BIS adviser for more information.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Students are required to take 4 semester(s) of any second language.

Students must complete at least 50 approved credits at or above 3xxx, distributed among the three concentration areas. The concentration areas may be departmental or thematic in composition, and each must include at least 15 credits. Up to 21 credits in the program may be from outside CLA.

At least 20 credits in the concentration areas must be completed after admission to the program. A maximum of 12 credits of directed studies may be included. The CLA requirement of 18 credits at or above 3xxx outside the major does not apply.

Biblical Studies Minor

Classical & Near Eastern Studies

Requirements for this program are current for Fall 2006.

Required credits in this minor: 15.

The academic study of the Bible is an extraordinarily broad interdisciplinary field. Research in the field can involve many disciplines including a number of ancient and modern languages, archaeology, history, various social sciences (including comparative religion), and literary studies. Biblical studies focuses on the Hebrew Bible and the New Testament in terms of their formation, cultural settings, and the history of their interpretation. The minor lets students who might not have the linguistic foundation to read the biblical texts in their original languages pursue more advanced biblical studies.

Admission Requirements

Students must complete 2 courses before admission to the program.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Required Courses for Admission

Preparatory Courses

Students must complete the first year Greek or Hebrew to study original texts in one of those languages.

Complete either pair of courses.

GRK 1001 - Beginning Classical Greek I (5.0 cr)
GRK 1002 - Beginning Classical Greek II (5.0 cr)
or
HEBR 1001 - Beginning Hebrew I (5.0 cr)
HEBR 1002 - Beginning Hebrew II (5.0 cr)

Program Requirements

Students are required to take 2 semester(s) of Greek or Hebrew.

Required Courses

Minor Courses

CNES 3072 - The New Testament, HP (3.0 cr)

Take 4 or more course(s) from the following:

CNES 3172 - Archaeology of Israel (3.0 cr)
CNES 3502 - Ancient Israel: From Conquest to Exile, HP (3.0 cr)
RELA 3201 - The Bible: Context and Interpretation, LIT (3.0 cr)
RELA 3202 - Prophecy in Ancient Israel, LIT (3.0 cr)
RELA 3203 - The Bible: Wisdom, Poetry, and Apocalyptic, LIT (3.0 cr)
CNES 5080
RELA 5513
GRK 3120

Biology, Society, and Environment B.A.

Geography

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 68.

Degree: Bachelor of Arts.

Students in the program receive comprehensive training in biology combined with an in-depth examination of the relevance of biology to social and environmental problems. Students complete coursework in the biological sciences, social sciences, and the humanities.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Students are required to take 4 semester(s) of any second language.

Biology Preparatory Sequences

Choose one sequence of biology courses.

Sequence A

BIOL 1001 - Introductory Biology I: Evolutionary and Ecological Perspectives, BIOL SCI/L, ENVT (4.0 cr)
BIOL 1002W - Introductory Biology II: Molecular, Cellular, and Developmental Perspectives, WI (5.0 cr)

-OR-

Sequence B

BIOL 1009 - General Biology, BIOL SCI/L (4.0 cr)
ANTH 1001 - Human Evolution, BIOL SCI/L (4.0 cr)

or BIOL 2012 - General Zoology (4.0 cr)
or BIOL 2022 - General Botany (3.0 cr)
or PHSL 3051 - Human Physiology (4.0 cr)
or VBS 2032 - General Microbiology With Laboratory (4.0 cr)
or

take one of the following pairs of courses
BIOL 2005 - Animal Diversity Laboratory (1.0 cr)
BIOL 3211 - Animal Physiology (3.0 cr)
or
BIOL 3002 - Plant Biology: Function (2.0 cr)
BIOL 3005W - Plant Function Laboratory, WI (2.0 cr)

Required Courses

BIOL 1105 - Introduction to Biology, Society, and the Environment (2.0 cr)

Take 2 or more course(s) from the following:
PHIL 1004W - Introduction to Political Philosophy, C/PE, OH, WI (4.0 cr)
PHIL 1005 - Scientific Reasoning (4.0 cr)
PHIL 3301 - Environmental Ethics, C/PE, ENVT (4.0 cr)
PHIL 3302W - Moral Problems of Contemporary Society, C/PE, OH, WI (4.0 cr)
PHIL 3304 - Law and Morality, C/PE (4.0 cr)
PHIL 1003W - Introduction to Ethics, OH, WI (4.0 cr)
or PHIL 1103 - Introduction to Ethics, OH (4.0 cr)

Chemistry, Math, and Physics
CHEM 1021 - Chemical Principles I, ENVT, PHYS SCI/L (4.0 cr)
CHEM 1022 - Chemical Principles II, ENVT, PHYS SCI/L (4.0 cr)
CHEM 2301 - Organic Chemistry I (3.0 cr)
MATH 1271 - Calculus I, MATH (4.0 cr)
PHYS 1201W - Introductory Physics for Biology and Pre-medicine I, PHYS SCI/L, WI (5.0 cr)

Major Courses
Take three courses from the upper division biology core list, and take two additional upper level courses in biology, psychology, anthropology, geography, mathematics, statistics, computer science, chemistry, or physics, chosen in consultation with an adviser.

Take 3 or more course(s) from the following:
BIOC 3021 - Biochemistry (3.0 cr)
BIOL 3407 - Ecology, ENVT (3.0 cr)
BIOL 4004 - Cell Biology (3.0 cr)
BIOL 4003 - Genetics (3.0 cr)
or GCD 3022 - Genetics (3.0 cr)

Take 2 or more course(s) from the following:
ANTH 3310 - Topics in Biological and Physical Anthropology (3.0-6.0 cr)
BIOC 3021 - Biochemistry (3.0 cr)
BIOL 3407 - Ecology, ENVT (3.0 cr)
BIOL 3409 - Evolution (3.0 cr)
BIOL 4004 - Cell Biology (3.0 cr)
CHEM 2302 - Organic Chemistry II (3.0 cr)
CHEM 2311 - Organic Lab (4.0 cr)
EEB 4609W - Ecosystem Ecology, WI (3.0 cr)
GCD 3022 - Genetics (3.0 cr)
GCD 4143 - Human Genetics (3.0 cr)
GEOG 3401 - Geography of Environmental Systems and Global Change, WI (4.0 cr)
INMD 3001 - Human Anatomy (3.0 cr)
MICB 3301 - Biology of Microorganisms (5.0 cr)
PHSL 3051 - Human Physiology (4.0 cr)

Theme Requirements
Some examples of thematic concentrations might be: ethics, economics and the politics of health care; the global environment; biology and the U.S. government; communicating biology to the public.

Take 5 or more course(s) from the following:
BIOL 4501 - Social Uses of Biology, C/PE (3.0 cr)
ECON 3611 - Environmental Economics, ENVT (3.0 cr)
GEOG 3381W - Population in an Interacting World, IP, SSCI, WI (4.0 cr)
GEOG 3411W - Geography of Health and Health Care, ENVT, IP, WI (4.0 cr)
HIST 1012W - World History: The Age of Global Contact, HP, IP, WI (4.0 cr)
HIST 1015W - Introduction to Global History Since 1950, HP, IP, WI (4.0 cr)
HSCI 3211 - Biology and Culture in the 19th and 20th Centuries, HP (3.0 cr)
HSCI 3332 - Science and American Culture, CD, HP (3.0 cr)
JOUR 3745 - Mass Media and Popular Culture, CD, SSCI (3.0 cr)
PHIL 1004W - Introduction to Political Philosophy, C/PE, OH, WI (4.0 cr)
PHIL 3234 - Knowledge and Society, CD (4.0 cr)
PHIL 3301 - Environmental Ethics, C/PE, ENVT (4.0 cr)
PHIL 3302W - Moral Problems of Contemporary Society, C/PE, OH, WI (4.0 cr)
PHIL 3304 - Law and Morality, C/PE (4.0 cr)
PHIL 3305 - Medical Ethics (4.0 cr)
PHIL 3601W - Scientific Thought, OH, WI (4.0 cr)
PHIL 3602 - Science, Technology, and Society, C/PE (3.0 cr)
PHIL 3607 - Philosophy of Psychology (4.0 cr)
POL 1065 - Government and Medicine, C/PE, SSCI (3.0 cr)
POL 3441 - Politics of Environmental Protection, ENVT (3.0 cr)
POL 3872W - Global Environmental Cooperation, ENVT, IP, WI (4.0 cr)
PSY 5061 - Neurobiology of Behavior (3.0 cr)
PSY 5135 - Psychology of Individual Differences (3.0 cr)
PSY 5137 - Introduction to Behavioral Genetics (3.0 cr)
RHET 1152W - Writing on Issues of Science and Technology, C/PE, WI (4.0 cr)
SOC 4305 - Society and the Environment: A Growing Conflict, C/PE, ENVT (3.0 cr)
STAT 3011 - Introduction to Statistical Analysis, MATH (4.0 cr)

Senior Project
The Senior Project may be fufilled in one of three ways:

1. Register for 2 additional credits in any upper divison course taken,
2. Register for 3 credits of directed research with a faculty member having special expertise in the subject of the proposed project,
3. Register for 3 credits of directed research (GEOG 3994) with the BSE Director of Undergraduate Studies.

Chemistry B.A.

Chemistry

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 51 to 67.

Degree: Bachelor of Arts.

An active, modern program of chemical education at the undergraduate level must do more than simply train professional chemists. Chemistry, the central science, is an important component of many disciplines and should be accessible to all students seeking a liberal education. The chemistry department contributes actively to increasing the level of scientific literacy of all students. The program serves all students by recognizing different needs, interests, and career goals.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Students are required to take 4 semester(s) of any second language.

Required Courses

Mathematics

MATH 1271 - Calculus I, MATH (4.0 cr)
or MATH 1371 - IT Calculus I, MATH (4.0 cr)
or MATH 1571H - Honors Calculus I, MATH, H (4.0 cr)
MATH 1272 - Calculus II (4.0 cr)
or MATH 1372 - IT Calculus II (4.0 cr)
or MATH 1572H - Honors Calculus II, H (4.0 cr)
MATH 2263 - Multivariable Calculus (4.0 cr)
or MATH 2374 - IT Multivariable Calculus and Vector Analysis (4.0 cr)
or MATH 2573H - Honors Calculus III, H (4.0 cr)

Physics

PHYS 1301W - Introductory Physics for Science and Engineering I, PHYS SCI/L, WI (4.0 cr)
or PHYS 1401V - Honors Physics I, PHYS SCI/L, WI, H (4.0 cr)
PHYS 1302W - Introductory Physics for Science and Engineering II, PHYS SCI/L, WI (4.0 cr)
or PHYS 1402V - Honors Physics II, PHYS SCI/L, WI, H (4.0 cr)

Preparatory Courses

CHEM 2101 - Introductory Analytical Chemistry Lecture (3.0 cr)
CHEM 2111 - Introductory Analytical Chemistry Lab (2.0 cr)
CHEM 1021 - Chemical Principles I, ENVT, PHYS SCI/L (4.0 cr)
or CHEM 1031H - Honors Chemistry I, ENVT, PHYS SCI/L, H (4.0 cr)
CHEM 1022 - Chemical Principles II, ENVT, PHYS SCI/L (4.0 cr)
or CHEM 1032H - Honors Chemistry II, ENVT, PHYS SCI/L, H (4.0 cr)

Major Courses

CHEM 2301 - Organic Chemistry I (3.0 cr)
CHEM 2302 - Organic Chemistry II (3.0 cr)
CHEM 3501 - Physical Chemistry I (3.0 cr)
CHEM 3502 - Physical Chemistry II (3.0 cr)
CHEM 4701 - Inorganic Chemistry (3.0 cr)
CHEM 2311 - Organic Lab (4.0 cr)
or CHEM 2312 - Honors Organic Lab, H (5.0 cr)
CHEM 4094W - Directed Research, WI (1.0-5.0 cr)
or CHEM 2094 - Directed Research (1.0-3.0 cr)
CHEM 4111W - Intermediate Analytical Chemistry Lab, WI (2.0 cr)
or CHEM 4311W - Advanced Organic Chemistry Lab, WI (2.0 cr)
or CHEM 4511W - Advanced Physical Chemistry Lab, WI (2.0 cr)
or CHEM 4711W - Advanced Inorganic Chemistry Lab, WI (2.0 cr)
or CHEM 5223W - Polymer Laboratory, WI (2.0 cr)

Electives

Select at least three credits from 3xxx-5xxx courses in chemistry, biology, biochemistry, genetics, cell biology, chemical engineering, materials science, math, physics, public health, or statistics.

Chemistry Minor

Chemistry

Requirements for this program are current for Fall 2006.

Required credits in this minor: 15.

Chemistry probes the fundamental concepts of nature and helps us understand the world around us. It deals with all substances at the molecular level: their composition, their properties, and how they are transformed into new substances. Chemistry is a central science of great importance to society. It provides a broad range of opportunities in many specialized fields, including biotechnology, polymer chemistry, environmental chemistry, materials chemistry, and medicine.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Credits from seminars or special topics courses may not be applied toward the minor. A maximum of two credits of directed study may be applied. All coursework must be taken A-F with grades of at least C-. At least five credits (two courses) must be completed at the University of Minnesota, Twin Cities.

Required Courses

Minor Courses

CHEM 2301 - Organic Chemistry I (3.0 cr)
CHEM 2302 - Organic Chemistry II (3.0 cr)
CHEM 2311 - Organic Lab (4.0 cr)
Take 5 or more credit(s) from the following:
CHEM 2xxx
CHEM 3xxx
CHEM 4xxx
CHEM 5xxx

Chicano Studies B.A.

Chicano Studies

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 36.

Degree: Bachelor of Arts.

The program's curriculum explores the dimensions of race, ethnicity, culture and identity, gender, and class in the United States, both historically and in contemporary times. Chicano studies majors take courses offered in two broadly defined fields of study, humanities and social science. Humanities content includes courses designed to increase the student's awareness of Chicana/o culture, as well as intellectual, aesthetic, literary, historical, ethical, and human values. Social science content includes courses that analyze social institutions and how they affect the individual and also emphasize contemporary Chicana/o issues as they relate to the larger society. Areas of study include political science, anthropology, economics, sociology, and history. The bachelor of arts degree in Chicano studies is designed to meet the needs of students preparing for careers serving Chicana/o-Latina/o constituencies and to prepare students for graduate and advanced professional study in programs in which a minority affairs focus would be an asset. The program allows students the flexibility of pursuing work in related fields such as Latin American studies, Spanish studies, women's studies, and American studies. Double majors are encouraged.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Students are required to take 4 semester(s) of Spanish.

Students must complete at least 120 credits to graduate, including 36 credits in the major. The 36 credits required to complet the major include 18 credits of major core requirements. Students must complete at least 15 upper division elective credits in Chicano studies. Students should confer with faculty and their major adviser to select courses intended to meet their professional goals and intellectual interests. With approval of the major adviser, three upper division credits related to the discipline may be taken outside the department and counted towards the major. CHIC 1112 is foundational and should be completed during the first or second year. Courses at 3xxx offer more focused opportunities to examine history, society, culture, literature, and gender. Majors must also complete a senior paper.

Required Courses

Major Courses

CHIC 1112 - Introduction to Chicano Studies: Critical Paradigms and Methodologies CD, HP(3.0 cr)

CHIC 3212 - Chicana Studies: La Chicana In Contemporary Society, CD, SSCI (3.0 cr)

CHIC 3446 - Chicana and Chicano History II: WWII, El Movimiento, and the New MilleniumCD, HP (3.0 cr)

CHIC 4900W - Proseminar: Senior Project, WI (1.0 cr)

CHIC 4901W - Senior Project, WI (2.0 cr)

CHIC XXXX - One Community Studies Theme course (3.0 cr)

CHIC XXXX - One Literary and Cultural Studies Theme course (3.0 cr)

Community Studies Theme

CHIC 3275 - Service Learning in the Chicano/Latino Community, CD, C/PE (3.0 cr)

or CHIC 3374/5574 - Migrant Farmworkers in the U.S.: Families, Work, and Advocacy, SSCI, CD (3.0 cr)

or CHIC 3672 - Chicana/o Experience in the Midwest, CD (3.0 cr)

or CHIC 3712 - Chicanas/os): Psychological Perspectives, CD, SSCI (3.0 cr)

or CHIC 3752 - Chicanas and Chicanos in Contemporary Society, SSCL, CD (3.0)

or CHIC 4275 - Theory in Action: Community Engagement in a Social Justice Framework, C/PE (3.0 cr)

Gender and Sexuality Theme

CHIC 4232 - Chicana/o Latina/o Gender and Sexuality Studies, CD (3.0 cr)

History and PoliticsTheme

CHIC 3444 - Chicana and Chicano History; 1821-1945, CD, HP (3.0 cr)

or CHIC 3352 - Transnational Chicana/o Theory: Global Views/Borderland Spaces, SCCI, IP (3.0 cr)

or CHIC 3452 - Xicana/Indigena Studies: History, Culture, and Politics, SSCI, CD (3.0 cr)

or CHIC 3852 - Chicana/o Politics, SSCI, CD (3.0 cr)

or CHIC 4231 - The Color of Public Policy, (3.0 cr)

or CHIC 4310/5310 - Chicanas/os and the Law, (3.0 cr)

Literary and Cultural Studies Theme

CHIC 3213 - Chicana/o Music and Art, CD, OH (3.0 cr)

or CHIC 3221 - Chicano Cultural Studies: Barrio Aesthetics and the Aesthetics of Everyday Life, OH, CD (3.0 cr)

or CHIC 3223 - Chicana/o and Latina/o Representation in Film, OH, CD (3.0 cr)

or CHIC 3375 - Folklore of Greater Mexico, CD (3.0 cr)

or CHIC 3507 Introduction to Chicana/o Literature, CD, LIT,WI (3.0 cr)

or CHIC 4401 - Advanced Seminar in Chicana/Latina Cultural Studies, CD (3.0 cr)

Electives

Take 15 or more credit(s) from the following:

CHIC 1102 - Latinos In the U.S.: Culture and Citizenship, CD, HP (3.o cr)

CHIC 3xxx

CHIC 4xxx

CHIC 5xxx

Chicano Studies Minor

Chicano Studies

Requirements for this program are current for Fall 2006.

Required credits in this minor: 18.

Degree: Bachelor of Arts

The program's curriculum explores the dimensions of race and ethnicity, class, culture and identity, and gender and sexuality both historically and in contemporary times, as they shape and influence the lived experiencee of people of Mexican descent in the United States. Chicano studies courses are offered in two broadly defined fields of study, Humanities and Social Science. Humanities content includees courses designed to increase the student's awareness of Chicana/o culture, as well as intellectual, aesthetic, literary, historical, ehtical, and human values. Social Science content includees coures whichh analyze social institutions and how they affect the individual and also emphasize contemporary Chicana/o issues as they relate to inter- and intracultural relationships.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Required Courses

The minor requires 18 credits: 9 credits of core requirements and nine additional elective credits.

Core Requirements

CHIC 1112 - Introduction to Chicana/o Studies: Critical Paradigms, CD, HP (3.0 cr)

CHIC 3212 - La Chicana, CD (3.0 cr)

CHIC 3446 - Chicana/o History II: WWII, El Movimiento, and the New Millenium, CD, HP (3.0 cr)

Additional Requirements: nine credits distributed as follows: three credits from Literary and Cultural Studies Theme, three credits from Community Studies Theme, and three additional credits of your own choosing.Community Studies Theme

CHIC 3275 - Service Learning in the Chicano/Latino Community CD, C/PE (3.0 cr)

or CHIC 3374/5574 - Migrant Farmworkers in the U.S.: Families, Work, and Advocacy, SSCI, CD (3.0 cr)

or CHIC 3672 - Chicana/o Experience in the Midwest, CD, SSCI (3.0 cr)

or CHIC 3712 - Chicanas(os): Psychological Perspectives, CD, SSCI (3.0 cr)

or CHIC 4275 - Theory in Action: Community Engagement in Social Justice, C/PE (3.0 cr)

Gender and Sexuality Theme

CHIC 4232 - Chicana/o Latina/o Gender and Sexuality Studies, CD (3.0 cr)

History and PoliticsTheme

CHIC 3444 - Chicana and Chicano History; 1821-1945, CD, HP (3.0 cr)

or CHIC 3352 - Transnational Chicana/o Theory: Global Views/Borderland Spaces, SCCI, IP (3.0 cr)

or CHIC 3452 - Xicana/Indigena Studies: History, Culture, and Politics, SSCI, CD (3.0 cr)

or CHIC 3852 - Chicana/o Politics, SSCI, CD (3.0 cr)

or CHIC 4231 - The Color of Public Policy, (3.0 cr)

or CHIC 4310/5310 - Chicanas/os and the Law, (3.0 cr)

Literary and Cultural Studies
CHIC 3213 - Chicana/o Music & Art, CD, OH (3.0)
CHIC 3221 - Chicano Cultural Studies: Barrio Aesthetics and the Aesthetics of Everyday Life, CD, OH (3.0 cr)
or CHIC 3223 - Chicana/o and Latina/o Representation in Film, OH, CD (3.0 cr)
or CHIC 3375 - Folklore of Greater Mexico, CD (3.0)
or CHIC 3507- Introduction to Chicana/o Literature, CD, LIT, WI (3.0 cr)
or CHIC 4401 - Advanced Seminar inChicana/Latina Cultural Studies, CD (3.0 cr)

Child Psychology B.A.

Institute of Child Development

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 33 to 35.

Degree: Bachelor of Arts.

Child psychology deals with behavioral development from the prenatal period to maturity in the areas of cognition, ethology, genetics, language, learning, perception, and social behavior. The Institute of Child Development, housed in the College of Education and Human Development, offers a bachelor of arts, a bachelor of science, and a minor in child psychology through the College of Liberal Arts. All undergraduate child psychology courses are considered CLA courses and count toward the CLA graduation requirements.

The program prepares students for graduate study in psychology, education, medicine, law, sociology, and other behavioral sciences. Majors may not receive a second major or degree in psychology nor apply psychology, educational psychology, or child and adolescent psychiatry credits to the minimum 18 upper-level credits required outside the major. These credits fall neither inside or outside the major.

Admission Requirements

Students must complete 2 courses before admission to the program.

An introduction to psychology course must be completed before admission into the major. Students may formally declare the major with CPSY 2301 or CPSY 3301 in progress.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Required Courses for Admission

Preparatory Courses
CPSY 2301 - Introductory Child Psychology, SSCI (4.0 cr)
or CPSY 3301 - Introductory Child Psychology for Social Sciences (4.0 cr)
GC 1281 - General Psychology, SSCI (4.0 cr)
or PSY 1001 - Introduction to Psychology, SSCI (4.0 cr)

Program Requirements

Students are required to take 4 semester(s) of any second language.

Required Courses

Research and Statistical Methods
CPSY 3308 - Introduction to Research Methods in Child Psychology (4.0 cr)
EPSY 3264 - Basic and Applied Statistics, MATH (3.0 cr)
or SOC 3811 - Basic Social Statistics, MATH (4.0 cr)
or STAT 3011 - Introduction to Statistical Analysis, MATH (4.0 cr)

Social/Personality and Cognitive Development
CPSY 4331 - Social and Personality Development (4.0 cr)
CPSY 4343 - Cognitive Development (4.0 cr)

Electives
CPSY 3301 may not be used to fulfill the elective requirement.

Take 4 or more course(s) totaling 16 or more credit(s) from the following:
CPSY 3xxx
CPSY 4xxx
CPSY 5xxx

Final Project
CPSY 4347W - Senior Project, WI (2.0 cr)

Child Psychology B.S.

Institute of Child Development

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 40 to 42.

Degree: Bachelor of Science.

Child Psychology deals with behavioral development from the prenatal period to maturity in the areas of cognition, ethology, genetics, language, learning, perception, and social behavior. The Institute of Child Development, housed in the College of Education and Human Development, offers a bachelor of arts, a bachelor of science, and a minor in child psychology through the College of Liberal Arts.

With a combination of intensive training in developmental psychology and in-depth field experience, the program prepares students for careers and additional training in such areas as early childhood education, counseling, and human service programs. Students completing a degree program in child psychology may not receive a second major or degree in psychology.

Admission Requirements

Students must complete 2 courses before admission to the program.

Students may formally declare the major with CPSY 2301 or CPSY 3301 in progress.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Required Courses for Admission

Preparatory Courses
CPSY 2301 - Introductory Child Psychology, SSCI (4.0 cr)
or CPSY 3301 - Introductory Child Psychology for Social Sciences (4.0 cr)
GC 1281 - General Psychology, SSCI (4.0 cr)
or PSY 1001 - Introduction to Psychology, SSCI (4.0 cr)

Program Requirements

Required Courses

Research, Statistical, and Evaluation Methods
CPSY 3308 - Introduction to Research Methods in Child Psychology (4.0 cr)
EPSY 3264 - Basic and Applied Statistics, MATH (3.0 cr)
or SOC 3811 - Basic Social Statistics, MATH (4.0 cr)
or STAT 3011 - Introduction to Statistical Analysis, MATH (4.0 cr)

EPSY 5243 - Principles and Methods of Evaluation (3.0 cr)
or EPSY 5849 - Observation and Assessment of the Preschool Child (3.0 cr)

Major Courses
CPSY 4329 - Biological Foundations of Development (4.0 cr)
CPSY 4331 - Social and Personality Development (4.0 cr)
CPSY 4334W - Children, Youth in Society, C/PE, WI (4.0 cr)
CPSY 4343 - Cognitive Development (4.0 cr)
CPSY 4311 - Behavioral and Emotional Problems of Children (4.0 cr)
or CPSY 4313 - Disabilities and Development (4.0 cr)

Take 4 or more credit(s) from the following:
CPSY 4994 - Directed Research in Child Psychology (1.0-4.0 cr)
CPSY 4996 - Field Study in Child Psychology (1.0-4.0 cr)
CPSY 3301 may not be used for this requirement.

Take 4 or more credit(s) from the following:
CPSY 3xxx
CPSY 4xxx
CPSY 5xxx

Senior Project
CPSY 4347W - Senior Project, WI (2.0 cr)

Child Psychology Minor

Requirements for this program are current for Fall 2006.

Required credits in this minor: 16.

Child psychology deals with behavioral development from the prenatal period to maturity in the areas of cognition, ethology, genetics, language, learning, perception, and social behavior.

Admission Requirements

Students must complete 1 course before admission to the program.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Required Courses for Admission

Preparatory Courses
GC 1281 - General Psychology, SSCI (4.0 cr)
or PSY 1001 - Introduction to Psychology, SSCI (4.0 cr)
CPSY 2301 - Introductory Child Psychology, SSCI (4.0 cr)
or CPSY 3301 - Introductory Child Psychology for Social Sciences (4.0 cr)

Program Requirements

Required Courses

Minor Courses
CPSY 3308 - Introduction to Research Methods in Child Psychology (4.0 cr)

Take 2 or more course(s) from the following:
CPSY 4329 - Biological Foundations of Development (4.0 cr)
CPSY 4331 - Social and Personality Development (4.0 cr)
CPSY 4343 - Cognitive Development (4.0 cr)

Take 4 or more credit(s) from the following:
CPSY 3xxx
CPSY 4xxx
CPSY 5xxx

Classical and Near Eastern Archaeology B.A.

Classical and Near Eastern Studies

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 36.

This program requires summer terms.

Degree: Bachelor of Arts.

This major allows students to concentrate their studies on the material remains from the ancient civilizations of Greece, Rome, Egypt, and Biblical lands from ca. 3000 B.C.E. though 650 C.E. The program includes courses from classical and near eastern studies, anthropology, art history, geography, geology, and history.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Students are required to take 4 semester(s) of Greek, Hebrew, or Latin.

Required Courses

Preparatory Courses
CNES 3152 - Art and Archaeology of Ancient Greece, OH (4.0 cr)
CNES 3162 - Roman Art and Archaeology, OH (4.0 cr)
CNES 1043 - Introduction to Greek and Roman Archaeology, HP (4.0 cr)
or CNES 3008 - History of Ancient Art, IP, OH (4.0 cr)
CNES 3104 - Ancient Rome: Kings and Consuls, HP (3.0 cr)
or CNES 3105 - Ancient Rome: The Age of Augustus, HP (3.0 cr)
or CNES 3107 - Age of Constantine the Great, HP, IP (3.0 cr)
or CNES 3108 - Age of St. Augustine of Hippo, HP (3.0 cr)
or HIST 3051 - Ancient Civilization: Near East and Egypt (3.0 cr)
or HIST 3052 - Ancient Civilization: Greece (3.0 cr)
or HIST 3053 - Ancient Civilization: Rome (3.0 cr)
or HIST 3061 - "Bread and Circuses": Spectacles and Mass Culture in Antiquity (3.0 cr)
or HIST 3502 - Ancient Israel: From Conquest to Exile, HP (3.0 cr)
or HIST 3930 - Topics in Ancient History (3.0 cr)
or HIST 4051 - Ancient Near East and Egypt: Neolithic to 1500 BCE (3.0 cr)
or HIST 4052 - Ancient Near East and Egypt: 1500 to 323 BCE (3.0 cr)
or HIST 4061 - History of the Greek World from Earliest Times to 400 B.C. (3.0 cr)
or HIST 4062 - History of the Greek World: 400 to 30 B.C. (3.0 cr)
or HIST 4071 - History of Rome to 78 B.C. (3.0 cr)
or HIST 4072 - History of Rome: 78 B.C. to A.D. 117 (3.0 cr)
or HIST 4073 - History of Rome: A.D. 117 to 641 (3.0 cr)
or HIST 5051 - Before Herodotus: History and Historiography of Mesopotamia and the Ancient Near East (3.0 cr)
or HIST 5053 - Doing Roman History: Sources, Methods, and Trends (3.0 cr)
or HIST 5930 - Topics in Ancient History (1.0-4.0 cr)
or HIST 5933 - Seminar in Ancient History (3.0 cr)

Major Courses
Five courses must be taken from Groups 1-3, with at least one course from each group. Remaining courses may be selected from courses in Groups 1-3 not used to fulfill the five-course requirement, from courses in the preparatory course list that are not used to fill that requirement, from selected courses in anthropology, or from any 3xxx-5xxx course in CNES or RELA. Course selections are subject to the approval of the director of undergraduate studies.

Take 8 or more course(s) totaling 24 or more credit(s).

Take 5 or more course(s) including 3 or more sub-requirement(s) from the following:

Group 1 - The Classical World

Take 1 or more course(s) from the following:

CNES 5111 - Prehistoric Art and Archaeology of Greece (3.0 cr)
CNES 5112 - Archaic and Classical Greek Art (3.0 cr)
CNES 5103 - Hellenistic and Early Roman Art and Archaeology (3.0 cr)
CNES 5108 - Greek Architecture (3.0 cr)
CNES 5172 - House, Villa, Tomb: Roman Art in the Private Sphere (3.0 cr)
CNES 5182 - Art and the State: Public Art in the Roman Empire (3.0 cr)

Group 2 - The Near East

Take 1 or more course(s) from the following:

CNES 3142 - Art of Egypt, HP (4.0 cr)
CNES 3172 - Archaeology of Israel (3.0 cr)

Group 3 - Field/Lab Work

Take 1 or more course(s) from the following:

ANTH 4069 - Environmental Archaeology, SSCI, ENVT (3.0 cr)
CNES 3340 - Practicum in Archaeological Field and Computer Techniques (3.0 cr)
CNES 5120 - Field Research in Archaeology (3.0-6.0 cr)
CNES 5340 - Practicum in Archaeological Field and Computer Techniques (3.0 cr)

Electives

Take 0 - 3 course(s) from the following:

ANTH 3009 - Rise of Civilization, IP, SSCI (3.0 cr)
ANTH 3027W - Archaeology of Prehistoric Europe, WI (3.0 cr)
ANTH 3028 - Introduction to Historical Archaeology (3.0 cr)
ANTH 4043 - Archaeology of Northern Europe (3.0 cr)
ANTH 4069 - Environmental Archaeology, SSCI, ENVT (3.0 cr)
ANTH 5027W - Origins of European Civilization, WI (3.0 cr)
CNES 3xxx
CNES 4xxx
CNES 5xxx
RELA 3xxx
RELA 4xxx
RELA 5xxx

Senior Project

Students who complete another CLA major may substitute 4 credits of appropriate coursework at 3xxx or above for the CNES senior project.

CNES 3951W - Major Project, WI (4.0 cr)

Classical and Near Eastern Archaeology Minor

Classical and Near Eastern Studies

Requirements for this program are current for Fall 2006.

Required credits in this minor: 16.

The minor allows students to concentrate their studies on the material remains from the ancient civilizations of Greece, Rome, Egypt, and Biblical lands from ca. 3000 B.C.E through 650 C.E. The minor includes courses from the Departments of Classical and Near Eastern Studies, Anthropology, Art History, Geography, Geology, and History.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Required Courses

Preparatory Courses

CNES 1043 - Introduction to Greek and Roman Archaeology, HP (4.0 cr)
or CNES 3008 - History of Ancient Art, IP, OH (4.0 cr)

Minor Courses

Take at least four courses, with one course each from groups 1-3. The remaining course may be selected from those in groups 1-3 not used to fulfill the three-course requirement, selected courses in anthropology or history, or any 3xxx-5xxx course in CNES or RELA. Course selections are subject to the approval of the director of undergraduate studies.

Take 4 or more course(s) totaling 12 or more credit(s).

Take 3 or more course(s) including 3 or more sub-requirement(s) from the following:

Group 1 - The Classical World

Take 1 or more course(s) from the following:

CNES 5103 - Hellenistic and Early Roman Art and Archaeology (3.0 cr)
CNES 5108 - Greek Architecture (3.0 cr)
CNES 5111 - Prehistoric Art and Archaeology of Greece (3.0 cr)
CNES 5112 - Archaic and Classical Greek Art (3.0 cr)
CNES 5172 - House, Villa, Tomb: Roman Art in the Private Sphere (3.0 cr)
CNES 5182 - Art and the State: Public Art in the Roman Empire (3.0 cr)

Group 2 - The Near East

Take 1 or more course(s) from the following:

CNES 3142 - Art of Egypt, HP (4.0 cr)
CNES 3172 - Archaeology of Israel (3.0 cr)

Group 3 - Field/Lab Work

Take 1 or more course(s) from the following:

ANTH 4069 - Environmental Archaeology, SSCI, ENVT (3.0 cr)
CNES 3340 - Practicum in Archaeological Field and Computer Techniques (3.0 cr)
CNES 5120 - Field Research in Archaeology (3.0-6.0 cr)
CNES 5340 - Practicum in Archaeological Field and Computer Techniques (3.0 cr)

Electives

Take 0 - 1 course(s) from the following:

ANTH 3009 - Rise of Civilization, IP, SSCI (3.0 cr)
ANTH 3027W - Archaeology of Prehistoric Europe, WI (3.0 cr)
ANTH 3028 - Introduction to Historical Archaeology (3.0 cr)
ANTH 4043 - Archaeology of Northern Europe (3.0 cr)
ANTH 4069 - Environmental Archaeology, SSCI, ENVT (3.0 cr)
ANTH 5027W - Origins of European Civilization, WI (3.0 cr)
CNES 3xxx
CNES 4xxx
CNES 5xxx
RELA 3xxx
RELA 4xxx
RELA 5xxx

Classical Civilization B.A.

Classical and Near Eastern Studies

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 36.

Degree: Bachelor of Arts.

This interdisciplinary program encompasses the study of Greek and Roman cultures and their influence on Western civilization, and encourages study of related or parallel cultures such as those of Islam and the Indian subcontinent. It provides a comprehensive alternative to more specialized majors that focus primarily on one aspect or subject matter of classical antiquity and the spheres of its influence, such as art, archaeology, history, philosophy, or literature, or a narrower span of historical periods. The program enables students to investigate classical civilization and its heritage from several perspectives and become acquainted with the aims and methods of several disciplines.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Students are required to take 4 semester(s) of Greek or Latin.

Eight of the twelve approved courses (24 of 36 credits in the major) must be 3xxx or higher. Two of the courses must have the CLCV designator. All courses must be chosen in consultation with an adviser and approved by the department.

Required Courses

Language and Literature
Take three courses in the language and literature of the classical world.

Art, Art History, and Archaeology
Take 3 courses focusing on the art, art history, and archaeology of the classical world.

Thought and Religion
Take 3 courses on the thought and religions of the classical world.

Classical Traditions
Take 3 courses on classical traditions.

Electives
Take 2 to 4 related elective courses.

Senior Project
The senior project is defined by the student in consultation with an adviser. Students may register for one to three credits of directed study while working on the project, but they are not required to do so.

Classical Civilization Minor

Classical and Near Eastern Studies

Requirements for this program are current for Fall 2006.

Required credits in this minor: 15.

This interdisciplinary program encompasses the study of Greek and Roman cultures and their influence on Western civilization and encourages study of related or parallel cultures such as those of Islam and the Indian subcontinent.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Students are required to take 2 semester(s) of Greek, Latin.

Required Courses

Preparatory Courses
Complete one year of courses (or the equivalent) plus one culture course) in either Greek or Latin.

Greek
GRK 1001 - Beginning Classical Greek I (5.0 cr)
GRK 1002 - Beginning Classical Greek II (5.0 cr)
or
Latin
LAT 1001 - Beginning Latin I (5.0 cr)
LAT 1002 - Beginning Latin II (5.0 cr)

Minor Courses
One course in the culture of the country or countries that used the chosen language.
One classical language and literature course, chosen with the guidance of a faculty adviser.
One course in classical art, art history, and archaeology, chosen with the guidance of a faculty adviser.
One course in classical thought and religion, chosen with the guidance of a faculty adviser.
One course in classical traditions, chosen with the guidance of a faculty adviser.

Communication Studies B.A.

Communication Studies

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 34.

Degree: Bachelor of Arts.

This program examines human communication using humanistic and social -scientific methods. Fields of study include speechmaking, rhetorical criticism, ethics, interpersonal, small group, organizational, intercultural, and electronic (broadcasting, cable, satellite, Internet) forms of communication. Students intending to declare a major must meet with a communication studies adviser in 278 Ford Hall. Students are strongly encouraged to declare their major during the first or second year.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Students are required to take 4 semesters of any second language.

Required Courses

Required Introductory Courses
COMM 1101 - Introduction to Public Speaking (3.0 cr)
COMM 1313W - Analysis of Argument, WI (3.0 cr)

Required Core Courses
Take 2 or more course(s) from the following:
COMM 3211 - Introduction to U.S. Electronic Media (3.0 cr)
COMM 3401 - Introduction to Communication Theory (3.0 cr)
COMM 3601 - Introduction to Rhetorical Theory, C/PE (3.0 cr)

Required Performative Elective
COMM 3201 - Introduction to Electronic Media Production (4.0 cr)
or COMM 3411 - Introduction to Small Group Communication (3.0 cr)
or COMM 3422 - Interviewing and Communication (3.0 cr)
or COMM 3605W - Persuasive Speaking and Speech Writing, WI (3.0 cr)
or COMM 3990 - Research Practicum (1.0-3.0 cr)
or COMM 4452W - Intercultural Interaction: Theory and Application, WI (3.0 cr)
Required 4xxx or 5xxx Communication Studies Elective (3.0 cr)

Required Senior Paper
The senior paper can be written in any 4xxx or 5xxx communication studies course. COMM 3995W, an S-N only, senior paper credit must be taken during the same semester in which the senior paper is written.

COMM 3995W - Major Project, WI (1.0 cr)

Communication Studies Electives
In addition to the above requirements, take any other 3xxx, 4xxx, or 5xxx communication studies electives to reach the 34 total credits required to complete the major.

Communication Studies Minor

Communication Studies

Requirements for this program are current for Fall 2006.

Required credits in this minor: 18.

The minor's courses examine human communication, using humanistic and social -scientific methods. Fields of study include speechmaking, rhetorical criticism, ethics, and interpersonal, small group, organizational, intercultural, and electronic (broadcasting, cable, satellite, Internet) forms of communication. Students intending to declare a minor must meet with a communication studies adviser in 278 Ford Hall.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Required Introductory Course
COMM 1101 - Introduction to Public Speaking (3.0 cr)
or-COMM 1313W - Analysis of Argument, WI (3.0 cr)

Required Core Courses
Take 2 or more course (s) from the following:
COMM 3211 - Introduction to U.S. Electronic Media (3.0 cr)
COMM 3401 - Introduction to Communication Theory (3.0 cr)
COMM 3601 - Introduction to Rhetorical Theory, C/PE (3.0 cr)
Required 4xxx or 5xxx Communication Studies Elective (3.0 cr)

Communication Studies Electives (6.0 cr)
In addition to the above requirements, take any other 3xxx, 4xxx, or 5xxx communication studies electives to reach the 18 total credits required to complete the minor.

Computer Science B.A.

Computer Science and Engineering

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 41.

Degree: Bachelor of Arts.

Computer science concerns the study of the hardware, software, and theoretical aspects of high-speed computing devices and the application of these devices to a broad spectrum of scientific, technological, and business problems. The curriculum gives students a basic understanding of computer science. After completing a required set of fundamental courses, students can arrange their subsequent work around one of several emphases within computer science. The program prepares student for a variety of industrial, governmental, and business positions involving the use of computers or for graduate work in the field.

Admission Requirements

Students must complete 6 courses before admission to the program.

Freshmen and transfer students are usually admitted to pre-major status before admission to this major.

A GPA above 2.00 is preferred for the following:

- 2.40 for students already admitted to the degree-granting college.
- 2.40 for students transferring from another University of Minnesota college.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Required Courses for Admission

Mathematics and Computer Science
CSCI 1901 - Structure of Computer Programming I (4.0 cr)
CSCI 1902 - Structure of Computer Programming II (4.0 cr)
CSCI 2011 - Discrete Structures of Computer Science (4.0 cr)
MATH 1271 - Calculus I, MATH (4.0 cr)
or MATH 1371 - IT Calculus I, MATH (4.0 cr)
or MATH 1571H - Honors Calculus I, MATH, H (4.0 cr)
MATH 1272 - Calculus II (4.0 cr)
or MATH 1372 - IT Calculus II (4.0 cr)
or MATH 1572H - Honors Calculus II, H (4.0 cr)
MATH 2243 - Linear Algebra and Differential Equations (4.0 cr)
or MATH 2373 - IT Linear Algebra and Differential Equations (4.0 cr)
or MATH 2573H - Honors Calculus III, H (4.0 cr)

Program Requirements

Students are required to take 4 semester(s) of any second language.

Required Courses

Major Courses
The computer science senior project can be fulfilled by completing CSCI 3081W.

CSCI 2021 - Machine Architecture and Organization (4.0 cr)
CSCI 3081W - Program Design and Development, WI (4.0 cr)
CSCI 4011 - Formal Languages and Automata Theory (4.0 cr)
CSCI 4041 - Algorithms and Data Structures (4.0 cr)
CSCI 4061 - Introduction to Operating Systems (4.0 cr)
STAT 3021 - Introduction to Probability and Statistics (3.0 cr)

Electives
No more than three credits from CSCI 4970 or 59xx courses can be used to fulfill the elective requirement of nine credits.

Take 9 or more credit(s) from the following:
CSCI 4xxx
CSCI 5xxx

Computer Science Minor

Requirements for this program are current for Fall 2006.

Required credits in this minor: 15 to 20.

The minor consists of at least five three- or four-credit approved computer science courses, with three taken at the University with the CSCI designator.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

At least one course must be 5xxx. All courses must be taken A-F, and only courses completed with a grade of at least C- count toward the minor. Cumulative GPA for all University CSCI courses must be at least 2.00; this includes CSCI courses not used for the minor. Only computer science courses listed for the major are acceptable.

Cultural Studies and Comparative Literature B.A.

Cultural Studies and Comparative Literature

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 32.

Degree: Bachelor of Arts.

Courses in the Department of Cultural Studies and Comparative Literature (CSCL) pursue questions and ways of knowing that cross traditional disciplinary boundaries. Students study culture as a set of complex connections and interrelations: between texts and everyday life, ideas and the material world, discourse and power. Students may choose between two tracks, cultural studies and comparative literature, each of which explores these overarching concerns with specific emphasis.

Both tracks strive for a broad, international scope, ranging widely across history and geography. The central focus is on the cultural mechanisms through which a society's ways of knowing, value systems, and individual and collective identities are generated, disseminated, challenged, and reinvented. The goal of the program is to produce critical and self-critical readers prepared to actively participate in the intellectual conversations and social struggles that shape global culture in our time.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Students are required to take 4 semester(s) of any second language.

Students select either the comparative literature or cultural studies track and complete a minimum of ten courses for the major: two introductory (1xxx) courses plus seven at upper division levels. To allow for flexibility, the tenth course may be taken at any level. A senior project requirement may be satisfied by completing any 4xxx or 5xxx course. CSCL, CSDS, CLIT topics courses and independent/directed study courses may be used to meet stated 3xxx-5xxx requirements with adviser approval. Courses from other units may be substituted (on an ad hoc basis) for department major courses if approved by the student's adviser or the director of undergraduate studies. Grades in the major must be C- or better.

Program Sub-plans

Students are required to complete one of the following sub-plans. (Note: The honors sub-plan does not meet this requirement.) Honors students are required to complete one sub-plan plus the honors sub-plan.

Comparative Literature

The comparative literature track engages primarily verbal texts, "literature" in its broadest sense (novels, plays, poetry, prose, and expository writing of various kinds), and in a historical and global context.

Required Courses

Preparatory Courses
CSCL 1101 - Literature, IP, LIT (4.0 cr)
or CSCL 1401W - Reading Literature: Theory and Practice, IP, LIT, WI (4.0 cr)
CSCL 1201 - Introduction to Cinema and Media Culture, OH (4.0 cr)
or CSCL 1501W - Reading History: Theory and Practice, HP, WI (4.0 cr)
or CSCL 1921 - Introduction to Film Study, OH (4.0 cr)

Major Courses
Take five 3xxx courses, including at least one from either Subjectivity and History or Ideologies and Disciplines.

CSCL 3179 - Reading Literary Movements, LIT (3.0 cr)
CSCL 3557 - Close Reading (3.0 cr)
CSCL 3771 - Basic Concepts of Literary Study, LIT (3.0 cr)
CSCL 3xxx

Take 1 or more course(s) including 1 or more sub-requirement(s) from the following:

Subjectivity and History

Take 0 or more course(s) from the following:
CSCL 3421 - Culture and the Production of Modern Identity I: 1600-1750, HP (3.0 cr)
CSCL 3422 - Culture and the Production of Modern Identity II: 1750-1900, HP (3.0 cr)
CSCL 3456W - Sexuality and Culture, CD, WI (3.0 cr)
CSCL 3458W - The Body and the Politics of Representation, HP, WI (3.0 cr)
CSCL 3461 - Monsters, Robots, Cyborgs, LIT (3.0 cr)
CSCL 3472 - Gay Men and Homophobia in American Culture, CD, HP (3.0 cr)
GER 3631 - Jewish Writers and Rebels in German, Austrian, and American Culture, IP, LIT (3.0 cr)

Ideologies and Disciplines

Take 0 or more course(s) from the following:
CSCL 3115 - Cinema and Ideology, OH (4.0 cr)

CSCL 3176 - Oppositional Cinemas, IP, OH (4.0 cr)
CSCL 3361 - Visions of Nature: The Natural World and Political Thought, C/PE, ENVT (4.0 cr)
CSCL 3366W - Landscape, Nature, Society, ENVT, WI (3.0 cr)
CSCL 3979 - Issues in Cultural Pluralism, C/PE, CD (3.0 cr)

Electives

Take 1 or more course(s) from the following:
CSCL 1xxx
CSCL 2xxx
CSCL 3xxx
CSCL 4xxx
CSCL 5xxx

Take 2 or more course(s) from the following:
CSCL 4xxx
CSCL 5xxx

Cultural Studies

The cultural studies track investigates practices in all available media, including the visual-spatial (painting, sculpture, architecture, landscape, the built environment), the sonoric (music, noise, soundscape), and combinations (film, TV, multimedia events, festivals, riots).

Required Courses

Preparatory Courses

CSCL 1201 - Introduction to Cinema and Media Culture, OH (4.0 cr)
or CSCL 1501W - Reading History: Theory and Practice, HP, WI (4.0 cr)
or CSCL 1921 - Introduction to Film Study, OH (4.0 cr)
CSCL 1301W - Reading Culture: Theory and Practice, OH, WI (4.0 cr)
or CSCL 1001 - Introduction to Cultural Studies: Rhetoric, Power, Desire, CD, OH (4.0 cr)

Major Courses

Take 5 or more course(s) including 3 or more sub-requirement(s) from the following:

Discursive Practices and Genres

Take 0 or more course(s) from the following:
CSCL 3172 - Music as Discourse, OH (3.0 cr)
CSCL 3173W - The Rhetoric of Everyday Life, C/PE, OH, WI (3.0 cr)
CSCL 3174 - Poetry as Cultural Critique (3.0 cr)
CSCL 3175 - Comedy: Text and Theory, OH (3.0 cr)
CSCL 3177 - On Television (4.0 cr)
CSCL 3179 - Reading Literary Movements, LIT (3.0 cr)

Subjectivity and History

Take 0 or more course(s) from the following:
CSCL 3421 - Culture and the Production of Modern Identity I: 1600-1750, HP (3.0 cr)
CSCL 3422 - Culture and the Production of Modern Identity II: 1750-1900, HP (3.0 cr)
CSCL 3456W - Sexuality and Culture, CD, WI (3.0 cr)
CSCL 3458W - The Body and the Politics of Representation, HP, WI (3.0 cr)
CSCL 3461 - Monsters, Robots, Cyborgs, LIT (3.0 cr)
CSCL 3472 - Gay Men and Homophobia in American Culture, CD, HP (3.0 cr)
GER 3631 - Jewish Writers and Rebels in German, Austrian, and American Culture, IP, LIT (3.0 cr)

Ideologies and Disciplines

Take 0 or more course(s) from the following:
CSCL 3115 - Cinema and Ideology, OH (4.0 cr)
CSCL 3176 - Oppositional Cinemas, IP, OH (4.0 cr)
CSCL 3361 - Visions of Nature: The Natural World and Political Thought, C/PE, ENVT (4.0 cr)
CSCL 3366W - Landscape, Nature, Society, ENVT, WI (3.0 cr)
CSCL 3979 - Issues in Cultural Pluralism, C/PE, CD (3.0 cr)

Critical Theories and Methods

Take 0 or more course(s) from the following:
CSCL 3321W - Theories of Culture, WI (3.0 cr)
CSCL 3331 - Science and the Humanities, C/PE, OH (3.0 cr)
CSCL 3412W - Psychoanalysis and Literature Part I: The Essential Freud, WI (3.0 cr)
CSCL 3413W - Psychoanalysis and Literature Part II: Post Freudian Criticism, WI (3.0 cr)
CSCL 3557 - Close Reading (3.0 cr)
CSCL 3771 - Basic Concepts of Literary Study, LIT (3.0 cr)

Electives

Take 1 or more course(s) from the following:
CSCL 1xxx
CSCL 2xxx
CSCL 3xxx
CSCL 4xxx
CSCL 5xxx

Take 2 or more course(s) from the following:
CSCL 4xxx
CSCL 5xxx

Cultural Studies and Comparative Literature Minor

Cultural Studies and Comparative Literature

Requirements for this program are current for Fall 2006.

Required credits in this minor: 17 to 18.

Courses in the Department of Cultural Studies and Comparative Literature (CSCL) pursue questions and ways of knowing that cross traditional disciplinary boundaries. Students study culture as a set of complex connections and interrelations: between texts and everyday life, ideas and the material world, discourse and power.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Required Courses

Preparatory Courses

CSCL 1001 - Introduction to Cultural Studies: Rhetoric, Power, Desire, CD, OH (4.0 cr)
or CSCL 1101 - Literature, IP, LIT (4.0 cr)
or CSCL 1201 - Introduction to Cinema and Media Culture, OH (4.0 cr)
or CSCL 1301W - Reading Culture: Theory and Practice, OH, WI (4.0 cr)
or CSCL 1401W - Reading Literature: Theory and Practice, IP, LIT, WI (4.0 cr)
or CSCL 1501W - Reading History: Theory and Practice, HP, WI (4.0 cr)
or CSCL 1921 - Introduction to Film Study, OH (4.0 cr)

Minor Courses

Take 14 or more credit(s) from the following:
CSCL 3xxx
CSCL 4xxx
CSCL 5xxx

Dance B.A.

Theatre Arts and Dance

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 45.

Degree: Bachelor of Arts.

Admission into the B.A. program is by audition only.

The B.A. in dance emphasizes general dance studies. This degree prepares the student for further studies in such areas of dance as performance, choreography, dance history, criticism, ethnology, pedagogy, movement analysis, and kinesiology.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Students are required to take 4 semester(s) of any second language.

Required Courses

Major Core

Students must take 2 credits (two courses at 1 credit each) of DNCE 3700 or 5700.

DNCE 1601 - Dance Improvisation (1.0 cr)
DNCE 1626 - Music for Dance (3.0 cr)
DNCE 3010 - Modern Dance Technique 5 (2.0 cr)
DNCE 3020 - Modern Dance Technique 6 (2.0 cr)
DNCE 3401W - Dance History 1, OH, WI (3.0 cr)
DNCE 3402W - Dance History 2, IP, OH, WI (3.0 cr)
DNCE 3601 - Dance Composition 1 (3.0 cr)
DNCE 3602 - Dance Composition 2 (3.0 cr)
DNCE 3901 - Survival Strategies in Dance (3.0 cr)
DNCE 4443 - Philosophy and Aesthetics (3.0 cr)
DNCE 4601 - Dance Composition 3 (3.0 cr)

Take 2 or more course(s) from the following:
DNCE 3700 - Performance (1.0 cr)
DNCE 5700 - Performance (1.0 cr)

Electives

Electives may be fulfilled by courses in such areas as dance, music, theatre, art history, kinesiology, cultural studies, speech communications, women's studies, as agreed upon between the student and dance adviser. No more than 3 credits in technique may be counted.

Take 12 or more credit(s) from the following:
DNCE 3xxx
DNCE 4xxx
DNCE 5xxx

Senior Seminar

DNCE 4901 - Senior Seminar (2.0 cr)

Dance B.F.A.

Theatre Arts and Dance

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 78.

Degree: Bachelor of Fine Arts.

The B.F.A. in dance emphasizes technical, compositional, and performance training in modern dance. The program seeks to prepare the gifted student for a performance or creative career.

Admission Requirements

Admission into the B.F.A. program is by audition only.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Required Courses

Major Core

Students must take 4 credits of DNCE 3700/5700. All students (except those who have completed the CLA second language requirement) must complete the dance ethnology sequence.

DNCE 1601 - Dance Improvisation (1.0 cr)
DNCE 1626 - Music for Dance (3.0 cr)
DNCE 3010 - Modern Dance Technique 5 (2.0 cr)
DNCE 3020 - Modern Dance Technique 6 (2.0 cr)
DNCE 3110 - Ballet Technique 5 (2.0 cr)
DNCE 3120 - Ballet Technique 6 (2.0 cr)
DNCE 3210 - Jazz Technique 5 (1.0 cr)
DNCE 3220 - Jazz Technique 6 (1.0 cr)
DNCE 3401W - Dance History 1, OH, WI (3.0 cr)
DNCE 3402W - Dance History 2, IP, OH, WI (3.0 cr)
DNCE 3433 - Articulate Body (3.0 cr)
DNCE 3601 - Dance Composition 1 (3.0 cr)
DNCE 3602 - Dance Composition 2 (3.0 cr)
DNCE 3621 - Dance Production I (2.0 cr)
DNCE 3622 - Dance Production II (2.0 cr)
DNCE 3901 - Survival Strategies in Dance (3.0 cr)
DNCE 4443 - Philosophy and Aesthetics (3.0 cr)
DNCE 4601 - Dance Composition 3 (3.0 cr)
DNCE 4602 - Dance Composition 4 (3.0 cr)
DNCE 5010 - Modern Dance Technique 7 (2.0 cr)
DNCE 5020 - Modern Dance Technique 8 (2.0 cr)
DNCE 5601 - Dance Composition 5 (1.0 cr)
DNCE 5858 - Teaching Dance (4.0 cr)

Take 4 or more credit(s) from the following:
DNCE 3700 - Performance (1.0 cr)
DNCE 5700 - Performance (1.0 cr)

Complete a 2 credit world dance technique elective in consultation with an adviser.
DNCE 3487W - Ethnic Dance Traditions in American Society, CD, WI (3.0 cr)
or DNCE 3488W - Dance as Cultural Practice, IP, OH, WI (3.0 cr)

Electives

18 credits fulfilled by courses in such areas as music, theatre, art history, kinesiology, cultural studies, speech communications, and women's studies, as agreed upon between students and their dance advisers. No more than 6 credits should be in technique.

Senior Seminar

DNCE 4901 - Senior Seminar (2.0 cr)

Dutch Minor

German, Scandinavian, and Dutch

Requirements for this program are current for Fall 2006.

Required credits in this minor: 15.

The minor includes study of the spoken language, literature, culture, and civilization.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Take at least 15 credits in 3xxx, 4xxx beyond 4004, and 5xxx courses. Only one course may be directed or independent study. All courses in the minor must be taken A-F and be completed with a grade of at least C-. At least one course must be taken at the University of Minnesota Dutch studies program. The program must be approved by the director of undergraduate studies and may include courses in other departments (e.g., Art History, History).

Required Courses

Minor Courses

DTCH 3011 - Conversation and Composition (3.0 cr)
DTCH 3012 - Conversation and Composition (3.0 cr)

Take 9 or more credit(s) from the following:

DTCH 3xxx
DTCH 4xxx
DTCH 5xxx

East Asian Studies Minor

Institute for Global Studies

Requirements for this program are current for Fall 2006.

Required credits in this minor: 19 to 23.

Students take four semesters of an East Asian language and four East Asian culture courses. Additional information may be found at http://igs.cla.umn.edu.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Students are required to take 4 semester(s) of Chinese, Japanese, or Korean.

Courses must be drawn from at least three different departments. A maximum of 3 credits may be in directed studies or directed research. All courses must be taken A-F, with a grade of at least C. The program must be approved by the global studies adviser.

Required Courses

Preparatory Courses

Chinese

CHN 1011 - Beginning Modern Chinese (6.0 cr)
CHN 1012 - Beginning Modern Chinese (6.0 cr)
CHN 3021 - Intermediate Modern Chinese (5.0 cr)
CHN 3022 - Intermediate Modern Chinese (5.0 cr)

or

Japanese

JPN 1011 - Beginning Japanese (6.0 cr)
JPN 1012 - Beginning Japanese (6.0 cr)
JPN 3021 - Intermediate Japanese (5.0 cr)
JPN 3022 - Intermediate Japanese (5.0 cr)

or

Korean

KOR 1011 - Beginning Korean (5.0 cr)
KOR 1012 - Beginning Korean (5.0 cr)
KOR 3021 - Intermediate Korean (5.0 cr)
KOR 3022 - Intermediate Korean (5.0 cr)

Minor Courses

Students must complete five courses. GEOG/EAS 3211 may be replaced by an approved substitute.

GEOG 3211 - East Asia, IP (3.0 cr)

Take two 3xxx-5xxx courses in the humanities dealing with East Asia or a single East Asian society.

Take one 3xxx-5xxx course in social sciences or history dealing with East Asia or a single East Asian society.

EAS 3461 - Introduction to East Asia I: The Imperial Age, HP, IP (4.0 cr)
or EAS 3462 - Introduction to East Asia II: 1600-2000, HP, IP (3.0-4.0 cr)

Economics - Quantitative Emphasis B.A.

Economics

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 26.

Degree: Bachelor of Arts.

Economics emphasizes critical thinking and the understanding of basic economic principles. The B.A. - quantitative emphasis adds basic quantitative training (in calculus, linear algebra, and econometrics) and best suits students considering graduate work in business administration.

Students choose from courses in comparative economic systems; economic theory; econometrics; economic development; game theory; industrial organization; cost-benefit analysis; environmental, financial, international, mathematical, monetary, public, and labor economics. For more information, visit www.econ.umn.edu.

Admission Requirements

Students must complete 4 courses before admission to the program.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Required Courses for Admission

Preparatory Coursework

ECON 1101 - Principles of Microeconomics, IP, SSCI (4.0 cr)
ECON 1102 - Principles of Macroeconomics, IP, SSCI (4.0 cr)
MATH 1271 - Calculus I, MATH (4.0 cr)
MATH 1272 - Calculus II (4.0 cr)

Program Requirements

Students are required to take 4 semester(s) of any second language.

Required Courses

Major Core

ECON 3101 - Intermediate Microeconomics (4.0 cr)
ECON 3102 - Intermediate Macroeconomics (4.0 cr)
ECON 4211 - Principles of Econometrics (4.0 cr)
STAT 3021 - Introduction to Probability and Statistics (3.0 cr)
STAT 3022 - Data Analysis (4.0 cr)
MATH 2243 - Linear Algebra and Differential Equations (4.0 cr)

Major Elective Courses

One 3xxx-5xxx course must be writing intensive. ACCT 5100 or APEC 4821 can be applied toward the six total courses with adviser approval. Only one country/area study can count towards the major requirement.

Take 12 or more credit(s) from the following:
ECON 3xxx
ECON 4xxx
ECON 5xxx

Final Project

ECON 3951 - Major Project Seminar (2.0 cr)
or ECON 3991 - Independent Study (1.0-3.0 cr)
or
The final project requirement may be fulfilled with a term paper from an upper division writing intensive (WI) course with a minimum grade of A-.
or
The final project requirement may be fulfilled with an acceptable honors projects or a thesis (up to 6 cr.).

Economics B.A.

Economics

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 28.

Degree: Bachelor of Arts.

Economics emphasizes critical thinking and the understanding of basic economic principles. The B.A. gives students a solid background in economics, is the least quantitative of the three economics majors, and provides excellent preparation for students interested in working immediately after graduation or considering law school.

Students choose from courses in comparative economic systems; economic theory; econometrics; economic development; game theory; industrial organization; cost-benefit analysis; environmental, financial, internation, mathematical, monetary, public, and labor economics.

For more information, visit www.econ.umn.edu.

Admission Requirements

Students must complete 3 courses before admission to the program.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Required Courses for Admission

Preparatory Coursework

ECON 1101 - Principles of Microeconomics, IP, SSCI (4.0 cr)
ECON 1102 - Principles of Macroeconomics, IP, SSCI (4.0 cr)
MATH 1271 - Calculus I, MATH (4.0 cr)

Program Requirements

Students are required to take 4 semester(s) of any second language.

Required Courses

Major Core

ECON 3101 - Intermediate Microeconomics (4.0 cr)
ECON 3102 - Intermediate Macroeconomics (4.0 cr)
STAT 3011 - Introduction to Statistical Analysis, MATH (4.0 cr)
STAT 3022 - Data Analysis (4.0 cr)

Electives

At least one 3xxx-5xxx course must be writing intensive.

Take 6 or more course(s) totaling 18 or more credit(s).

Take 1 or more course(s) from the following:
ECON 3xxx
ECON 4xxx
ECON 5xxx

Take 0 - 1 course(s) from the following:
ECON 3960 - Topics in Economics (3.0 cr)
ECON 4311 - Economy of Latin America (3.0 cr)
ECON 4313 - The Russian Economy (3.0 cr)
ECON 4315 - The Japanese Economy (3.0 cr)

One of the courses below may be used with major adviser approval.

Take 0 - 1 course(s) from the following:
ACCT 5100 - Corporate Financial Reporting (4.0 cr)
APEC 4821W - Agribusiness Management, WI (5.0 cr)

Final Project

ECON 3951 - Major Project Seminar (2.0 cr)
or ECON 3991 - Independent Study (1.0-3.0 cr)
or
The final project requirement may be fulfilled with a term paper from an upper division writing intensive (WI) course with a minimum grade of A-.
or
The final project requirement may be fulfilled with an acceptable honors projects or a thesis (up to 6 cr.)

Economics B.S.

Economics

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 32.

Degree: Bachelor of Science.

Economics emphasizes critical thinking and the understanding of basic economic principles. The B.S. is for students interested in graduate study in economics or in a career where quantitative economic analysis plays a significant role. The strong quantitative component in this degree emphasizes multivariate calculus, linear algebra, and econometrics.

Students choose from courses in comparative economic systems; economic theory; econometrics; economic development; game theory; industrial organization; cost-benefit analysis; environmental, financial, international, mathematical, monetary, public, and labor economics.

For more information, visit www.econ.umn.edu.

Admission Requirements

Students must complete 4 courses before admission to the program.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Required Courses for Admission

Preparatory Coursework
ECON 1101 - Principles of Microeconomics, IP, SSCI (4.0 cr)
ECON 1102 - Principles of Macroeconomics, IP, SSCI (4.0 cr)
MATH 1271 - Calculus I, MATH (4.0 cr)
MATH 1272 - Calculus II (4.0 cr)

Program Requirements

Required Courses

Major Core
ECON 3101 - Intermediate Microeconomics (4.0 cr)
ECON 3102 - Intermediate Macroeconomics (4.0 cr)
ECON 4261 - Introduction to Econometrics (4.0 cr)
MATH 2243 - Linear Algebra and Differential Equations (4.0 cr)
MATH 2263 - Multivariable Calculus (4.0 cr)

Take one of the following course pairs:
STAT 4101 - Theory of Statistics I (4.0 cr)
STAT 4102 - Theory of Statistics II (4.0 cr)
STAT 5101 - Theory of Statistics I (4.0 cr)
STAT 5102 - Theory of Statistics II (4.0 cr)

Electives
Choose a minimum of four approved economics electives (12 cr.) and two economics honors courses (8 cr.). One 3xxx-5xxx course must be writing intensive. ACCT 5100, APEC 4821 or 5xxx, MATH 4065, MATH 4606, MATH 5615 can be applied toward the six total courses. Only one country/area study can count towards the major requirement.

Two economics honors courses (8 credits).

Take 12 or more credit(s) from the following:
ECON 3xxx
ECON 4xxx
ECON 5xxx

Economics Minor

Economics

Requirements for this program are current for Fall 2006.

Required credits in this minor: 13 to 30.

Economics is a useful minor for students majoring in business, engineering, statistics, computer science, mathematics, and all of the social sciences. Minors are available in six subfields designed to complement study in other majors. Minors require 13-30 credits of upper-level work, depending on the subfield. This includes a minimum of three or more upper-level economics courses and supporting work in mathematics and/or statistics, as needed for the subfield. Students must complete at least 9 upper division economics credits at the University of Minnesota, Twin Cities.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Required Courses for Admission

Preparatory Courses
ECON 1101 - Principles of Microeconomics, IP, SSCI (4.0 cr)
ECON 1102 - Principles of Macroeconomics, IP, SSCI (4.0 cr)

Program Requirements

Program Sub-plans

Students are required to complete one of the following sub-plans. (Note: The honors sub-plan does not meet this requirement.) Honors students are required to complete one sub-plan plus the honors sub-plan.

Applied Microeconomics

Required Courses

Requirements
ECON 4211 is also recommended.

ECON 3101 - Intermediate Microeconomics (4.0 cr)
MATH 1271 - Calculus I, MATH (4.0 cr)

Labor Economics
ECON 3501 - Labor Economics (3.0 cr)
or ECON 4531 - Labor Economics (3.0 cr)

Industrial Organization and Antitrust Policy
ECON 3601 - Industrial Organization and Antitrust Policy (3.0 cr)
or ECON 4631 - Industrial Organization and Antitrust Policy (3.0 cr)

Valuation
ECON 4611H - Honors Course: Environmental Valuation, H (4.0 cr)
or ECON 4623 - Housing Markets and Public Policy (3.0 cr)

Electives
ECON 3801 - Elements of Public Economics (3.0 cr)
or ECON 4821 - Public Economics (3.0 cr)
or ECON 4831 - Cost-Benefit Analysis, WI (3.0 cr)

Econometrics

Required Courses

Requirements
ECON 3101 - Intermediate Microeconomics (4.0 cr)
ECON 3102 - Intermediate Macroeconomics (4.0 cr)
ECON 4261 - Introduction to Econometrics (4.0 cr)
MATH 1271 - Calculus I, MATH (4.0 cr)
MATH 1272 - Calculus II (4.0 cr)
MATH 2243 - Linear Algebra and Differential Equations (4.0 cr)

Take one of the following course pairs:
STAT 4101 - Theory of Statistics I (4.0 cr)
STAT 4102 - Theory of Statistics II (4.0 cr)
or
STAT 5101 - Theory of Statistics I (4.0 cr)
STAT 5102 - Theory of Statistics II (4.0 cr)

Directed Study
Take 3 or more credit(s) from the following:
ECON 3993 - Directed Studies (1.0-3.0 cr)

Economic Theory

Required Courses

Requirements
ECON 3101 - Intermediate Microeconomics (4.0 cr)
ECON 3102 - Intermediate Macroeconomics (4.0 cr)
MATH 1271 - Calculus I, MATH (4.0 cr)
MATH 1272 - Calculus II (4.0 cr)
MATH 2243 - Linear Algebra and Differential Equations (4.0 cr)
MATH 2263 - Multivariable Calculus (4.0 cr)
ECON 4109H - Honors Course: Game Theory and Applications, H (4.0 cr)
or ECON 4113 - Introduction to Mathematical Economics (4.0 cr)
or ECON 4731 - Macroeconomic Policy (3.0 cr)
or ECON 4741 - Quantitative Analysis of the Macroeconomy (3.0 cr)

General

Required Courses

Requirements
ECON 3101 - Intermediate Microeconomics (4.0 cr)
or ECON 3105 - Managerial Economics (4.0 cr)
MATH 1142 - Short Calculus, MATH (4.0 cr)
or MATH 1271 - Calculus I, MATH (4.0 cr)

Electives
Take 3 or more course(s) totaling 9 or more credit(s) from the following:
ECON 3xxx
ECON 4xxx

International Trade and Development

Required Courses

Requirements
ECON 3101 - Intermediate Microeconomics (4.0 cr)
ECON 4301 - Economic Development, WI (3.0 cr)
or ECON 4331W - Economic Development, WI (3.0 cr)
ECON 4307 - Comparative Economic Systems, IP (3.0 cr)
or ECON 4337 - Comparative Economic Systems, IP (3.0 cr)
MATH 1142 - Short Calculus, MATH (4.0 cr)
or MATH 1271 - Calculus I, MATH (4.0 cr)
ECON 4311 - Economy of Latin America (3.0 cr)
or ECON 4313 - The Russian Economy (3.0 cr)
or ECON 4315 - The Japanese Economy (3.0 cr)
or ECON 3960 - Topics in Economics (3.0 cr)
Take the following course or course pair:
ECON 4401 - International Economics, IP (3.0 cr)
ECON 4431W - International Trade, IP, WI (3.0 cr)
ECON 4432W - International Finance, IP, WI (3.0 cr)

Monetary Theory

Required Courses

Requirements
ECON 3101 - Intermediate Microeconomics (4.0 cr)
ECON 3102 - Intermediate Macroeconomics (4.0 cr)
ECON 4751 - Financial Economics (3.0 cr)
STAT 3011 - Introduction to Statistical Analysis, MATH (4.0 cr)
ECON 3701 - Money and Banking (3.0 cr)
or ECON 4721 - Money and Banking (3.0 cr)
ECON 4731 - Macroeconomic Policy (3.0 cr)
or ECON 4741 - Quantitative Analysis of the Macroeconomy (3.0 cr)
MATH 1142 - Short Calculus, MATH (4.0 cr)
or MATH 1271 - Calculus I, MATH (4.0 cr)

English B.A.

English Language and Literature

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 35.

Degree: Bachelor of Arts.

Students who major in English study literature and other forms of verbal expression, literary history and criticism, critical theory, linguistics, and creative writing. Courses offered by the department explore a wide range of discourses written in English—from around the globe, as well as from Britain and America—including poetry, drama, fiction, film, popular culture, and electronic media. Students examine the cultural, social, political, and economic contexts that condition a variety of texts. Majors write extensively and learn to express themselves effectively, both orally and in writing. They gain practical insight into the words that they speak, read, and write.

Students transferring courses from other colleges and universities must complete five University of Minnesota 3- or 4-credit English courses in residence. These courses must include ENGL or ENGW 3960W, the senior project, and at least three other upper division courses (3xxx or higher).

Students wishing to transfer English courses from outside the University of Minnesota and apply them to the English major requirements should discuss this with the undergraduate adviser. Note: All English courses completed at two-year community colleges are accepted as equivalent to University lower division (1xxx) courses, regardless of content. Advanced Placement (AP) and International Baccalaureate (IB) credits are not included in the major.

Admission Requirements

Prospective majors are encouraged to complete an introductory course in literature, creative writing, and/or English language, choosen from ENGL 1001-1701 and ENGW 1101-1104, before officially declaring the major. To declare a major, a student schedules an appointment with the Undergraduate Studies Office 227 Lind Hall; 612-625-4592; englmaj@umn.edu), and completes a Major Program form which is filed in CLA, the department, and with the student.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Students are required to take 4 semester(s) of any second language.

English majors are encouraged to study in other countries before their senior year, to increase understanding of English language and literatures from diverse cultural perspectives. Advanced planning facilitates academic success and progress. See the Learning Abroad Center Web site at www.UMabroad.umn.edu for more information.

The English department supports an engaged, civic-oriented curriculum and teaches the critical skills of reading and writing in the context of community involvement and real public spheres by incorporating community and service-learning components into literature and composition classes.

Students can work as interns at local organizations, neighborhood houses, alternative schools, after-school programs, and in the grassroots/nonprofit sector of the greater Twin Cities area. While underscoring the relevance of literary studies to contemporary life, these hands-on experiences prepare students not only for

careers and professions, but also for an ongoing engagement in the civic life of their communities. Students can learn more from the University of Minnesota Literacy Lab Web site and from their major adviser.

Note: Independent study is limited to a maximum of 12 credits at any number level, directed study, directed instruction, or independent and distance learning (IDL) courses.

Required Courses

Major Courses

The methods course provides majors with skills in close and critical reading, background in history and culture, and multiple approaches to literary works. Shakespeare and the British and American literature surveys situate literary works in historical, cultural, and theoretical perspectives.

ENGL 3001W - Textual Analysis: Methods, WI (4.0 cr)
ENGL 3007 - Shakespeare, LIT (3.0 cr)
or
A department-approved 3xxx Shakespeare in London course.

Take 3 or more course(s) from the following:

British Literature

Take 1 or more course(s) from the following:
ENGL 3003W - Historical Survey of British Literatures I, HP, WI (4.0 cr)
ENGL 3004W - Historical Survey of British Literatures II, HP, WI (4.0 cr)

American Literature

Take 1 or more course(s) from the following:
ENGL 3005W - Survey of American Literatures and Cultures I, CD, LIT, WI (4.0 cr)
ENGL 3006W - Survey of American Literatures and Cultures II, CD, LIT, WI (4.0 cr)

English Language or Literary Theory

This requirement allows students to deepen their understanding of the English language or to concentrate on theoretical questions that shape readers' understanding of texts.

ENGL 3002 - Modern Literary Criticism and Theory (3.0 cr)
or ENGL 3601 - Analysis of the English Language (4.0 cr)
or ENGL 3741 - Literacy and American Cultural Diversity, C/PE, CD (4.0 cr)
or ENGL 4003 - History of Literary Theory (3.0 cr)
or ENGL 4602W - Gender and the English Language, CD, WI (4.0 cr)
or ENGL 4603W - World Englishes, IP, WI (4.0 cr)
or ENGL 4605 - Social Variation in American English, CD (4.0 cr)
or ENGL 4612 - Old English I (3.0 cr)
or ENGL 4613 - Old English II (3.0 cr)
or ENGL 4722 - Alphabet to Internet: History of Writing Technologies (4.0 cr)
or

Take both of the following internship courses.
ENGL 3505 - Community Learning Internships I (3.0 cr)
ENGL 3506 - Learning Internships II (4.0 cr)

Electives

Electives are generally devoted to in-depth studies of particular authors, topics, periods, or genres. Creative writing electives enable students to explore the intricacies and intimacies of the creative process and see for themselves some of the ways in which prose and poetry are created and read.

Take 3 or more course(s) from the following:

Take 2 or more course(s) from the following:
ENGC 3xxx
ENGL 3xxx
ENGL 4xxx
ENGL 5xxx
ENGW 3xxx
ENGW 5xxx

Take no more than 1 course(s) from the following:
ENGL 1xxx
ENGW 1xxx

Senior Project

The program of study culminates in a writing project (4 credits), completed either in a rigorous and intensive seminar in which students produce an extended, scholarly essay (ENGL 3960W), or in an advanced creative writing workshop (ENGW 3960W) in which students produce a substantial manuscript of poetry, literary fiction, or literary nonfiction.

ENGL 3883V - Honors Thesis, WI, H (1.0-4.0 cr)
or ENGL 3960W - Senior Seminar, WI (4.0 cr)
or ENGW 3960W - Writing Workshop for Majors, WI (4.0 cr)

English Minor

English Language and Literature

Requirements for this program are current for Fall 2006.

Required credits in this minor: 18.

Students who minor in English study literature and other forms of verbal expression, literary history and criticism, critical theory, linguistics, and creative writing. Courses offered by the department explore a wide range of discourses written in English—from around the globe, as well as from Britain and America—including poetry, drama, fiction, film, popular culture, and electronic media.

Students in any degree program complete at least 18 credits in the minor, all in 3xxx or higher courses, as part of the minimum credits for their baccalaureate degree program.

Students begin their studies, ideally in their sophomore year, with the department's methods course (ENGL 3001W), progress to taking Shakespeare (ENGL 3007 or a department-approved Shakespeare in London course), and two surveys in British and American literature (selected from ENGL 3003W, 3004W, 3005W, and 3006W). In addition, students choose at least one English elective course (3 to 4 credits of 3xxx or higher in ENGL, ENGC, or ENGW). The methods course—ENGL 3001W—provides minors with skills in close and critical reading, the background in history and culture, and multiple approaches to literary works that will guide their continued studies. Shakespeare and the British and American literature surveys situate literary works in historical, cultural, and theoretical perspective.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

At least four of the five English minor courses must be taken A-F and completed with grades C- or better. The equivalent of one course in independent study work may be applied to the minor. Coursework completed elsewhere may be counted toward the minor only with department approval. Students must take at least two of the 3xxx minor courses in the University of Minnesota, Twin Cities English department.

Required Courses

Minor Courses

ENGL 3001W - Textual Analysis: Methods, WI (4.0 cr)
ENGL 3007 - Shakespeare, LIT (3.0 cr)
ENGC 3xxx
or
ENGL 3xxx
or
ENGL 4xxx
or
ENGL 5xxx
or
ENGW 3xxx

Take 2 or more course(s) from the following:

ENGL 3003W - Historical Survey of British Literatures I, HP, WI (4.0 cr)
ENGL 3004W - Historical Survey of British Literatures II, HP, WI (4.0 cr)
ENGL 3005W - Survey of American Literatures and Cultures I, CD, LIT, WI (4.0 cr)
ENGL 3006W - Survey of American Literatures and Cultures II, CD, LIT, WI (4.0 cr)

English as a Second Language Minor

Inst of Ling, Engl as Sec Lang, and Slavic Lang and Lit

Requirements for this program are current for Fall 2006.

Required credits in this minor: 15.

The minor requires four courses.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Required Courses

Minor Courses

LING 3001 - Introduction to Linguistics, SSCI (4.0 cr)
TESL 3001 - Basics in Teaching English as a Second Language, C/PE, CD (4.0 cr)
TESL 3501 - Practical Language Learning for International Communication (3.0 cr)
TESL 5401 - Language Analysis for Teachers of English as a Second Language (4.0 cr)

European Area Studies Minor

Institute for Global Studies

Requirements for this program are current for Fall 2006.

Required credits in this minor: 15.

Students must complete the CLA second language requirement in a European language and take five courses (at least 15 credits) of 3xxx-5xxx coursework focusing on a particular topic in European area studies (excluding language courses).

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Students are required to take 4 semester(s) of Any European language.

A maximum of 3 credits may be in directed studies or directed research and courses must be from a minimum of three different departments. All courses must be taken A-F with a grade of C- or better. The minor program must be approved by the global studies adviser.

Required Courses

Minor Courses

GEOG 3161 - Europe: A Geographic Perspective, IP, SSCI (3.0 cr)
HIST 3722 - 20th-Century Europe From the End of World War II to the End of the Cold War: 1945-1991, HP, IP (3.0 cr)
At least 6 credits of humanities from any department with approval of a global studies adviser.
After completing GEOG 3161, HIST 3722, and six credits in humanities, take any course in any discipline focusing on some aspect of Europe, with the approval of a global studies adviser.

French Studies B.A.

French and Italian

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 35.

Degree: Bachelor of Arts.

The French studies major includes courses in three areas of concentration: linguistics, literature, and culture. Courses in language and linguistics include history of the French language, structure of the language, sociolinguistics, phonetics, conversation, and business French. Courses in literature and culture focus on topics and problems in three broad historical periods: the Middle Ages and Renaissance, early modern France, and modern and contemporary France. A number of courses focus on Francophone literature from Africa, the Caribbean, and Quebec. Courses in French cinema are also offered.

Many students combine a French studies major with another major. The department offers selected courses in English for students who have mastered French but want to study France and the French-speaking world.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Students are required to take 4 semester(s) of French.

At least four upper division courses must be completed in the French department at the University of Minnesota, Twin Cities campus.

Required Courses

Major Courses

FREN 3014 - French Phonetics (2.0 cr)
FREN 3015 - Advanced French Grammar and Communication (4.0 cr)
FREN 3016 - Advanced French Composition and Communication (4.0 cr)
FREN 3101W - Introduction to French Literature, LIT, WI (4.0 cr)
FREN 3111 - Medieval Stories (3.0 cr)
or FREN 3140 - Topics in Medieval and Renaissance Literature (3.0 cr)
or FREN 3170 - The Unruly Subject(s) of Classicism: Writing, History, Power in Ancien Régime France (3.0 cr)

or FREN 3172 - The Court Society: Literature, Culture, Spectacle (3.0 cr)
or FREN 3181 - Mapping Enlightenment in 17th- and 18th-Century French Prose (3.0 cr)
or FREN 3240 - Topics in Ancien Regime Literature (3.0 cr)
or FREN 3250 - French Poetry (3.0 cr)
or FREN 3260 - Dramas of Culture: 20th-Century French and Francophone Theater (3.0 cr)
or FREN 3310 - Literature of Revolution and Upheaval (3.0 cr)
or FREN 3321 - Producing the Bourgeois Subject: The Sense of Self in 18th-Century French Literature (3.0 cr)
or FREN 3330 - Literature and the Making of Modern France: 20th-Century Perspectives (3.0 cr)
or FREN 3340 - Topics in Modern French Literature (3.0 cr)
or FREN 3350 - Topics in Literature (3.0 cr)
or FREN 3360 - Coming of Age (3.0 cr)
or FREN 3371 - Writing Crisis in (Post) Modern Times (3.0 cr)
or FREN 3380 - Modern Times: Literature of the 19th and 20th Centuries (3.0 cr)
or FREN 3410 - Quebecois Literature (3.0 cr)
or FREN 3479 - Francophone Writers of the African Diaspora, IP (3.0 cr)
or FREN 5250 - Promenades Poetiques: The Subject in Motion (3.0 cr)
or FREN 5260 - The Returns of Tragedy (3.0 cr)
or FREN 5270 - "To Change or not to Change?": Speculations on (Post) Modern French Texts (3.0 cr)
or FREN 5350 - Topics in Literature and Culture (3.0 cr)
or FREN 5470 - Post/Colonial Francophone Literatures (3.0 cr)
FREN 3601 - French Civilization and Culture I, IP (3.0 cr)
or FREN 3602 - French Civilization and Culture II, IP (3.0 cr)
or FREN 3650 - Topics in French/Francophone Cultures (3.0 cr)

Electives
FREN 3010 is repeatable for a total of nine credits. LING 3001 is a prerequisite for most French linguistics courses. Elective credits may not include FREN 3705, 3706, 3710, 3750, or 3019.

Take 12 or more credit(s) from the following:
FREN 3xxx
FREN 4xxx
FREN 5xxx

Senior Project
The course focuses on contemporary issues in French studies; students complete a lengthy research paper.

FREN 4101W - Seminar in French Studies, WI (3.0 cr)

French Studies Minor

French and Italian

Requirements for this program are current for Fall 2006.

Required credits in this minor: 17.

The French studies minor includes courses in three areas of concentration: language, literature, and culture.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Students are required to take 4 semester(s) of French.

At least two upper division courses must be completed in the French department at the University of Minnesota, Twin Cities.

Required Courses

Minor Courses
FREN 3015 - Advanced French Grammar and Communication (4.0 cr)
FREN 3101W - Introduction to French Literature, LIT, WI (4.0 cr)

Take 3 or more course(s) from the following:
FREN 3xxx
FREN 4xxx
FREN 5xxx

French and Italian Studies B.A.

French and Italian

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 36.

Degree: Bachelor of Arts.

The French and Italian studies major allows students interested in both cultures and languages to pursue a combined major. Students study specific works in each national literature while also exploring the interrelations and cross-cultural exchanges that have contributed to Italian and French literature and culture. This comparative perspective introduces students to a broad range of issues and cultural practices.

Admission Requirements

Students must formally declare a major within the department before completing the majority of the major elective requirements.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Students are required to take 4 semester(s) of French and Italian.

The French and Italian major requires students to take at least five to six semesters of language, including advanced study, which goes above and beyond the length of the CLA second language requirement.

Required Courses

Preparatory Courses
FREN 1001 - Beginning French (5.0 cr)
FREN 1002 - Beginning French (5.0 cr)
FREN 1003 - Intermediate French (5.0 cr)
FREN 1004 - Intermediate French (5.0 cr)
ITAL 1001 - Beginning Italian (5.0 cr)
ITAL 1002 - Beginning Italian (5.0 cr)
ITAL 1003 - Intermediate Italian (5.0 cr)
ITAL 1004 - Intermediate Italian (5.0 cr)

Upper Division Language Courses
FREN 3015 - Advanced French Grammar and Communication (4.0 cr)
ITAL 3015 - Reading, Conversation, and Composition (4.0 cr)

Literature and Culture Courses
FRIT 5999 may not be used to satisfy this requirement.

FREN 3101W - Introduction to French Literature, LIT, WI (4.0 cr)

Take 6 or more credit(s) from the following:
FREN 3xxx
FREN 4xxx
FREN 5xxx

Take 9 or more credit(s) from the following:
ITAL 3xxx
ITAL 4xxx
ITAL 5xxx
Take 6 or more credit(s) from the following:
FRIT 3xxx
FRIT 4xxx
FRIT 5xxx

Senior Project
The senior project is completed in FREN 4101 or in an appropriate Italian course selected in consultation with an adviser.

FREN 4101W - Seminar in French Studies, WI (3.0 cr)
A senior project that is acceptable for an honors project for cum laude and magna cum laude. For summa cum laude, students must complete a thesis which must be approved unanimously by a committee of three faculty members, two from the major department and one from outside the major.

Gay, Lesbian, Bi-sexual, Transgendered Minor

Women's Studies

Requirements for this program are current for Fall 2006.

Required credits in this minor: 18.

The minor focuses on the history, politics, and cultures of gay, lesbian, bisexual and transgendered persons. Courses explore the diversity of GLBT communities, the history and present conditions of sexual identity formation, and the functioning and institutionalization of ideologies of sexuality in a democratic society. Core courses focus on issues related to the history, culture, social, and political formations; experiences of GLBT people; and GLBT/queer theory. Elective courses are drawn from lists of GLBT-focused courses (emphasizing GLBT issues/experiences) and of GLBT-component courses (having at least one-quarter of their content related to GLBT/queer theory or the history, culture, social, political formations, and experiences of GLBT people).

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Required Courses

Minor Courses
GLBT 1001 - Introduction to GLBT Studies (3.0 cr)
GLBT 3301 - Gay, Lesbian, Bisexual, and Transgender Social Movements in the United States (3.0 cr)
CSCL 3456W - Sexuality and Culture, CD, WI (3.0 cr)
or CSCL 3472 - Gay Men and Homophobia in American Culture, CD, HP (3.0 cr)
or WOST 3404 - International Lesbian and Queer Studies (3.0 cr)
or WOST 4403 - Queering Theory (3.0 cr)

Electives
Other courses may be used to meet this requirement with permission from the department. SOC 4090 meets the requirement only if the topic is sociology of sexuality.

Take 3 or more course(s) from the following:
AMST 4101 - Gender, Sexuality, and Politics in America, CD, HP (3.0 cr)
ARTH 3411 - Gender and Sexuality in Art since 1863 (3.0 cr)
ENGL 3330 - Gay, Lesbian, Bisexual, and Transgendered Literature (3.0 cr)
ENGL 3880 - Joy Boys and the Invention of Modern Sexuality (3.0 cr)
FSOS 4152 - Gay, Lesbian, and Bisexual People in Families (3.0 cr)
GLBT 3610 - Topics in GLBT Studies (3.0 cr)
HIST 3212 - Dissident Sexualities in U.S. History (3.0 cr)
PUBH 3010 - Public Health Approaches to HIV/AIDS (2.0 cr)
SOC 4090 - Topics in Sociology (3.0 cr)
SOC 4521 - Love, Sex, and Marriage (3.0 cr)

Geography B.A.

Geography

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 32.

Degree: Bachelor of Arts.

Geography is an academic and practical field that studies the manner in which human-made places and natural systems interact and change. Geographers study these interactions at all scales: neighborhoods and cities; regions and nations; single or multiple biophysical systems; and even the world as a whole. Geography attempts to explain not only these interactions and changes, but in many instances how they are perceived and what meanings they hold.

Depending on their specific interests, geographers will emply one or more of a variety of methods and techniques: fieldwork, mapping, conventional narrative, ethnography, spatial statistics and modeling, and textual analysis. Many geographers are also interested in the intersections of science, technology, and information, such as the impact of geographic information science (GIS) on decision making. Geography's integrative perspective on regional and global change provides students with unparalleled understanding of today's complex world.

The B.A. provides students with a broad background in the discipline with emphasis on one of four tracks: city systems; regional analysis and development; environmental systems; and geographic information science.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Students are required to take 4 semester(s) of any second language.

Required Courses

Major Courses
Take 3 or more course(s) from the following:
GEOG 1301W - Introduction to Human Geography, IP, SSCI, WI (4.0 cr)
GEOG 3371W - Cities, Citizens, and Communities, CD, SSCI, WI (4.0 cr)
GEOG 3401 - Geography of Environmental Systems and Global Change, WI (4.0 cr)
GEOG 3561 - Principles of Geographic Information Science (4.0 cr)

Modes of Geographic Inquiry
GEOG 4001 - Modes of Geographic Inquiry (4.0 cr)
or GEOG 4002W - Social Theory and the Environment, WI (3.0 cr)

Senior Project

GEOG 3985W - Senior Project Seminar, WI (4.0 cr)
or GEOG 3994 - Directed Research (1.0-8.0 cr)
or GEOG 4700 - Community Service Learning
or GEOG 3411 - Geography of Health and Health Care
or GEOG 4121 - Latin America
or
The final project requirement may be fulfilled with a course with extra credits from the geography major.

Program Sub-plans

Students are required to complete one of the following sub-plans. (Note: The honors sub-plan does not meet this requirement.) Honors students are required to complete one sub-plan plus the honors sub-plan.

City Systems

The city systems track examines urban phenomena on two scales. In cities as systems, students learn about the internal structure of cities, including their morphology, land-use patterns, social geography, and meaning. In systems of cities, the interconnections among cities at regional, national, and global scales are emphasized. The track examines cities and city systems in diverse settings - North American cities, European cities, cities in the developing world - and from different perspectives, including historical, social, political, economic, and other approaches.

Students must take five courses, or a minimum of 15 credits, in this track.

Required Courses

Required Courses

Take 5 or more course(s) from the following:

GEOG 3331 - Geography of the World Economy, IP, SSCI (3.0 cr)
GEOG 3355 - Environmental Quality, C/PE, ENVT (3.0 cr)
GEOG 3361W - Land Use, Landscapes, and the Law, C/PE, ENVT, WI (3.0 cr)
GEOG 3371W - Cities, Citizens, and Communities, CD, SSCI, WI (4.0 cr)
GEOG 3373 - Changing Form of the City, HP, IP (3.0 cr)
GEOG 3374W - The City in Film, IP, OH, WI (4.0 cr)
GEOG 3375 - Minority Settlement in America, CD (3.0 cr)
GEOG 3605W - Geographical Perspectives on Planning, C/PE, IP, WI (4.0 cr)
GEOG 3973 - Geography of the Twin Cities, C/PE, CD (3.0 cr)
GEOG 4382 - Contemporary Immigrant America, C/PE, CD (3.0-5.0 cr)
GEOG 5361 - Geography and Real Estate (4.0 cr)
GEOG 5371W - American Cities I: Population and Housing, WI (4.0 cr)
GEOG 5372W - American Cities II: Land Use, Transportation, and the Urban Economy, WI (4.0 cr)
GEOG 5374W - The City in Film, IP, WI (4.0 cr)
GEOG 5385 - Globalization and Development: Political Economy (4.0 cr)
GEOG 5605W - Geographical Perspectives on Planning, C/PE, IP, WI (4.0 cr)
GEOG 5775 - Geographic Education (3.0 cr)

Environmental Systems

The environmental systems track examines the natural environments and resources that sustain human life and activity. Students explore the local and global patterns of climate, soils, vegetation, and surface land form; changes over time, both naturally occurring and caused by humans, in the the natural environment; and ways of analyzing and predicting both human-caused and naturally occurring environmental change.

Students must take five courses, or a minimum of 15 credits, in this track.

Required Courses

Required Courses

Take 5 or more course(s) from the following:

GEO 4701 - Geomorphology (3.0-4.0 cr)
GEOG 3355 - Environmental Quality, C/PE, ENVT (3.0 cr)
GEOG 3361W - Land Use, Landscapes, and the Law, C/PE, ENVT, WI (3.0 cr)
GEOG 3379 - Environment and Development in the Third World, ENVT, IP (3.0 cr)
GEOG 3381W - Population in an Interacting World, IP, SSCI, WI (4.0 cr)
GEOG 3401 - Geography of Environmental Systems and Global Change, WI (4.0 cr)
GEOG 3411W - Geography of Health and Health Care, ENVT, IP, WI (4.0 cr)
GEOG 3431 - Plant and Animal Geography, ENVT (3.0 cr)
GEOG 4121W - Latin America, ENVT, IP, WI (4.0 cr)
GEOG 5361 - Geography and Real Estate (4.0 cr)
GEOG 5411 - Geography of Health and Health Care, ENVT, IP, WI (4.0 cr)
GEOG 5421 - Introduction to Atmospheric Science (3.0 cr)
GEOG 5423 - Climate Models and Modeling (3.0 cr)
GEOG 5426 - Climatic Variations (3.0 cr)
GEOG 5441 - Quaternary Landscape Evolution (3.0 cr)
GEOG 5565 - Geographical Analysis of Environmental Systems and Global Change (3.0 cr)
GEOG 5775 - Geographic Education (3.0 cr)
SOIL 2125 - Basic Soil Science, ENVT (4.0 cr)

Geographic Information Science

The geographic information science track is concerned with all aspects of geographical information, including collection, storage, manipulation, analysis, and visualization. This track encompasses geographical information science (GIS), cartography, remote sensing, spatial analysis, and numerical modeling. The track is also concerned with the relationship between geographic information science, systems, and society.

Students must take five courses, or a minimum of 15 credits, in this track.

Required Courses

Required Courses

Take 5 or more course(s) from the following:

GEOG 3511 - Principles of Cartography (4.0 cr)
GEOG 3531 - Numerical Spatial Analysis (4.0 cr)
GEOG 3561 - Principles of Geographic Information Science (4.0 cr)
GEOG 5511 - Advanced Cartography (3.0 cr)
GEOG 5512 - Cartography: Topics (3.0 cr)
GEOG 5530 - Cartography Internship (2.0-7.0 cr)
GEOG 5561 - Principles of Geographic Information Science (4.0 cr)
GEOG 5562 - Geographic Information Science and Analytical Cartography (3.0 cr)
GEOG 5563 - Advanced Geographic Information Science (3.0 cr)
GEOG 5564 - Urban Geographic Information Science and Analysis (3.0 cr)
GEOG 5565 - Geographical Analysis of Environmental Systems and Global Change (3.0 cr)
GEOG 5588 - Multimedia Cartography (3.0 cr)
GEOG 5775 - Geographic Education (3.0 cr)

Regional Analysis and Development

In the regional analysis and development track, students learn to think critically about different ways of life and livelihood strategies, as well as different conceptions and practices of development in different geographic contexts. They also learn about the connectedness of societal and environmental processes from the local scale to the global.

Students must take five courses, or a minimum of 15 credits, in this track.

Required Courses

Required Courses

Take 5 or more course(s) from the following:

GEOG 3101 - Geography of the United States and Canada, CD, SSCI (4.0 cr)
GEOG 3111 - Geography of Minnesota, C/PE, ENVT (3.0 cr)
GEOG 3141 - Africa, ENVT, IP (3.0 cr)
GEOG 3161 - Europe: A Geographic Perspective, IP, SSCI (3.0 cr)
GEOG 3181 - Russia and Environs, IP, SSCI (3.0 cr)
GEOG 3211 - East Asia, IP (3.0 cr)
GEOG 3331 - Geography of the World Economy, IP, SSCI (3.0 cr)
GEOG 3355 - Environmental Quality, C/PE, ENVT (3.0 cr)
GEOG 3361W - Land Use, Landscapes, and the Law, C/PE, ENVT, WI (3.0 cr)
GEOG 3378 - Third World Underdevelopment and Modernization (3.0 cr)
GEOG 3379 - Environment and Development in the Third World, ENVT, IP (3.0 cr)
GEOG 3381W - Population in an Interacting World, IP, SSCI, WI (4.0 cr)
GEOG 3411W - Geography of Health and Health Care, ENVT, IP, WI (4.0 cr)
GEOG 4121W - Latin America, ENVT, IP, WI (4.0 cr)
GEOG 4382 - Contemporary Immigrant America, C/PE, CD (3.0-5.0 cr)
GEOG 4393 - The Rural Landscape (4.0 cr)
GEOG 5181 - Russia and Environs, IP (3.0 cr)
GEOG 5361 - Geography and Real Estate (4.0 cr)
GEOG 5385 - Globalization and Development: Political Economy (4.0 cr)
GEOG 5775 - Geographic Education (3.0 cr)

Geography B.S.

Geography

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 38.

Degree: Bachelor of Science.

Geography is an academic and practical field that studies the manner in which human-made places and natural systems interact and change. Geographers study these interactions at all scales: neighborhoods and cities; regions and nations; single or multiple biological systems, and even the world as a whole. Geography attempts to explain not only these interactions and changes, but in many instances how they are perceived and what meanings they hold.

Depending on their specific interests, geographers will employ one or more of a variety of methods and techniques: fieldwork, mapping, conventional narrative, ethnography, spatial statistics and modeling, and textual analysis. Many geographers are also interested in the intersections of science, techology, and information, such as the impact of geographic information systems (GIS) on decision making. Geography's integrative perspective on regional and global change provides students with unparalleled understanding of today's complex world.

The B.S. offers a solid foundation in the science of geography in either the environmental systems or geographic information science track.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Required Courses

Major Courses

GEOG 3401 - Geography of Environmental Systems and Global Change, WI (4.0 cr)
GEOG 3561 - Principles of Geographic Information Science (4.0 cr)
GEOG 1301W - Introduction to Human Geography, IP, SSCI, WI (4.0 cr)
or GEOG 3371W - Cities, Citizens, and Communities, CD, SSCI, WI (4.0 cr)
GEOG 4001 - Modes of Geographic Inquiry (4.0 cr)
or GEOG 4002W - Social Theory and the Environment, WI (3.0 cr)

Quantitative Courses

Take one of the following course pairs:

CSCI 1107 - Introduction to FORTRAN Programming for Scientists and Engineers (3.0 cr)
CSCI 1113 - Introduction to C/C++ Programming for Scientists and Engineers (4.0 cr)
or
MATH 1271 - Calculus I, MATH (4.0 cr)
MATH 1272 - Calculus II (4.0 cr)
or
MATH 1371 - IT Calculus I, MATH (4.0 cr)
MATH 1372 - IT Calculus II (4.0 cr)
or
STAT 3011 - Introduction to Statistical Analysis, MATH (4.0 cr)
STAT 3022 - Data Analysis (4.0 cr)

Senior Project

GEOG 3985W - Senior Project Seminar, WI (4.0 cr)
or GEOG 3994 - Directed Research
or GEOG 4700 - Community Service Learning and
GEOG 3411 - Geography of Health and Health Care
or GEOG 4121 - Latin America
The final project requirement may be fulfilled with a course with extra credits from the geography major.

Program Sub-plans

Students are required to complete one of the following sub-plans. (Note: The honors sub-plan does not meet this requirement.) Honors students are required to complete one sub-plan plus the honors sub-plan.

Environmental Systems

The environmental systems track examines the natural environments and resources that sustain human life and activity. Students explore the local and global patterns of climate, soils, vegetation, and surface land form; changes over time, both naturally occurring and caused by humans, in the natural environment; and ways of analyzing and predicting both human-caused and naturally occurring environmental change.

Students must complete four to five courses in this track, for a minimum of 15 credits.

Required Courses

Take 5 or more course(s) from the following:

GEOG 3355 - Environmental Quality, C/PE, ENVT (3.0 cr)
GEOG 3361W - Land Use, Landscapes, and the Law, C/PE, ENVT, WI (3.0 cr)
GEOG 3379 - Environment and Development in the Third World, ENVT, IP (3.0 cr)
GEOG 3381W - Population in an Interacting World, IP, SSCI, WI (4.0 cr)
GEOG 3411W - Geography of Health and Health Care, ENVT, IP, WI (4.0 cr)
GEOG 3431 - Plant and Animal Geography, ENVT (3.0 cr)
GEOG 4121W - Latin America, ENVT, IP, WI (4.0 cr)

GEOG 5361 - Geography and Real Estate (4.0 cr)
GEOG 5411 - Geography of Health and Health Care, ENVT, IP, WI (4.0 cr)
GEOG 5421 - Introduction to Atmospheric Science (3.0 cr)
GEOG 5423 - Climate Models and Modeling (3.0 cr)
GEOG 5426 - Climatic Variations (3.0 cr)
GEOG 5441 - Quaternary Landscape Evolution (3.0 cr)
GEOG 5565 - Geographical Analysis of Environmental Systems and Global Change (3.0 cr)
GEOG 5775 - Geographic Education (3.0 cr)
GEO 4701 - Geomorphology (3.0-4.0 cr)
SOIL 2125 - Basic Soil Science, ENVT (4.0 cr)

Geographic Information Science

The geographic information science track is concerned with all aspects of geographical information, including collection, storage, manipulation, analysis, and visualization. This track encompasses geographical information science (GIS), cartography, remote sensing, spatial analysis, and numerical modeling. The track is also concerned with the relationship between geographic information science, systems, and society.

Students must take four to five courses in this track, for a minimum of 15 credits.

Required Courses

Take 5 or more course(s) from the following:
GEOG 3511 - Principles of Cartography (4.0 cr)
GEOG 3531 - Numerical Spatial Analysis (4.0 cr)
GEOG 5511 - Advanced Cartography (3.0 cr)
GEOG 5512 - Cartography: Topics (3.0 cr)
GEOG 5530 - Cartography Internship (2.0-7.0 cr)
GEOG 5561 - Principles of Geographic Information Science (4.0 cr)
GEOG 5562 - Geographic Information Science and Analytical Cartography (3.0 cr)
GEOG 5563 - Advanced Geographic Information Science (3.0 cr)
GEOG 5564 - Urban Geographic Information Science and Analysis (3.0 cr)
GEOG 5565 - Geographical Analysis of Environmental Systems and Global Change (3.0 cr)
GEOG 5588 - Multimedia Cartography (3.0 cr)
GEOG 5775 - Geographic Education (3.0 cr)

Geography Minor

Geography

Requirements for this program are current for Fall 2006.

Required credits in this minor: 14.

Geography is an academic and practical field that studies the manner in which human-made places and natural systems interact and change. Geographers study these interactions at all scales: neighborhoods and cities; regions and nations; single or multiple biophysical systems, and even the world as a whole.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Minor courses must be completed with a grade of at least C-.

Required Courses

Minor Courses

Take 14 or more credit(s) from the following:
GEOG 3xxx
GEOG 4xxx
GEOG 5xxx

Geology B.A.

Geology and Geophysics

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 41.

This program requires summer terms.

Degree: Bachelor of Arts.

Geology is the study of the composition, structure, and history of the Earth and of the processes that operate on and within it, with emphasis on the crust, oceans, and atmosphere. The B.A. prepares students for graduate study or professional employment.

Geologists are employed in a wide range of fields, including exploration for and development of natural resources, environmental science, urban planning, education, oceanography, and other areas related to natural science. Potential employers include the oil, gas, and minerals industries, environmental consultants, federal and private research institutions, universities, schools, and government agencies. An advanced degree is usually required for a career in research or teaching.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Students are required to take 4 semester(s) of any second language.

Required Courses

Mathematics
Take either the calculus sequence (two courses) or the honors sequence (two courses).

MATH 1271 - Calculus I, MATH (4.0 cr)
or MATH 1371 - IT Calculus I, MATH (4.0 cr)

Take one of the following course pairs:
MATH 1272 - Calculus II (4.0 cr)
MATH 1372 - IT Calculus II (4.0 cr)
or
MATH 1571H - Honors Calculus I, MATH, H (4.0 cr)
MATH 1572H - Honors Calculus II, H (4.0 cr)

Physics
PHYS 1301W - Introductory Physics for Science and Engineering I, PHYS SCI/L, WI (4.0 cr)
or PHYS 1401V - Honors Physics I, PHYS SCI/L, WI, H (4.0 cr)
PHYS 1302W - Introductory Physics for Science and Engineering II, PHYS SCI/L, WI (4.0 cr)
or PHYS 1402V - Honors Physics II, PHYS SCI/L, WI, H (4.0 cr)

Chemistry
CHEM 1021 - Chemical Principles I, ENVT, PHYS SCI/L (4.0 cr)
or CHEM 1031H - Honors Chemistry I, ENVT, PHYS SCI/L, H (4.0 cr)

CHEM 1022 - Chemical Principles II, ENVT, PHYS SCI/L (4.0 cr)
or CHEM 1032H - Honors Chemistry II, ENVT, PHYS SCI/L, H (4.0 cr)

Major Courses
GEO 2201 - Geodynamics I: The Solid Earth (3.0 cr)
GEO 2301 - Mineralogy (3.0 cr)
GEO 2302 - Petrology (3.0 cr)
GEO 2303W - Geochemical Principles, WI (3.0 cr)
GEO 3202 - Geodynamics II: The Fluid Earth (3.0 cr)
GEO 3401 - Geochronology and Earth History (3.0 cr)
GEO 3911 - Introductory Field Geology (4.0 cr)
GEO 4501 - Structural Geology (3.0 cr)
GEO 4602 - Sedimentology and Stratigraphy (3.0 cr)
GEO 4631W - Earth Systems: Geosphere/Biosphere Interactions, WI (3.0 cr)

Workshop Courses
Take 2 or more course(s) from the following:
GEO 3870 - Modeling Workshop (1.0 cr)
GEO 3880 - Laboratory Workshop (1.0 cr)
GEO 3890 - Field Workshop (1.0 cr)

Field Course
GEO 4911 - Advanced Field Geology (4.0 cr)
or GEO 4971 - Field Hydrogeology (4.0 cr)

Electives
Take 4 or more credit(s) from the following:
GEO 1xxx
GEO 2xxx
GEO 3xxx
GEO 4xxx
GEO 5xxx

Geology Minor

Requirements for this program are current for Fall 2006.

Required credits in this minor: 18.

Geology is the study of the composition, structure, and history of the Earth and of the processes that operate on and within it, with emphasis on the crust, oceans, and atmosphere.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Required Courses

Minor Courses
GEO 1001 - Earth and Its Environments, ENVT, PHYS SCI/L (4.0 cr)
Take 14 or more credit(s) from the following:
GEO 2xxx
GEO 3xxx
GEO 4xxx
GEO 5xxx

German Studies B.A.

German, Scandinavian, and Dutch

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 35.

Degree: Bachelor of Arts.

The German studies program teaches and conducts research in the language, literature, and culture of the German-speaking nations of Europe, primarily Germany, Austria, and Switzerland. The major in German studies and minor in German include the study of the spoken language, as well as of literature, philology, culture, and civilization. The department also offers majors and minors in Scandinavian languages, a minor in Dutch, and a minor in Austrian and Central European studies.

The department recommends study abroad in a German-speaking country for at least six months in order to acquire cultural familiarity and language fluency. Students may apply appropriate coursework to a German studies major or a German minor. The University is affiliated with exchange programs in Berlin and Freiburg for both one and two-semester stays. There are also possibilities for study at many other German, Austrian, and Swiss universities. Visit the Learning Abroad Center Web site at www.umabroad.umn.edu for more information.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

The major in German studies consists of a minimum of 35 credits in 3xxx, 4xxx, and 5xxx courses. All courses in the major must be taken A-F and completed with a C- or better. At least two courses must be taken in the German program at the University of Minnesota. The major program must be approved by the Director of Undergraduate Studies.

Required Courses

Major Core
GER 3011W - Conversation and Composition, WI (4.0 cr)
GER 3104W - Reading and Analysis of German Literature, LIT, WI (4.0 cr)
GER 3511W - German Civilization and Culture: Middle Ages to 1700, WI (4.0 cr)
GER 3512W - German Civilization and Culture: 1700 to the Present, WI (4.0 cr)

Senior Project
The major project is a substantial paper of approximately 20 typed pages. The paper is prepared in the Major Project Seminar with the guidance and supervision of a faculty member.
GSD 3451W - Major Project Seminar, WI (4.0 cr) or
GSD 3451V - Honors Major Project Seminar

Emphasis Areas
Students are required to complete one of the following course groups.

Literature, Culture, and Society Emphasis
Up to two courses in this emphasis may be Ger 36xx, 46xx, or 56xx courses if taken in translation if substantial work in German is done by the student, as directed by the instructors of the courses or by the Director of Undergraduate Studies. One elective can be a course outside the German department, as long as the course includes sufficient coverage of German-speaking areas.

Take 15 or more credit(s) from the following:
GER 3xxx
GER 4xxx
GER 5xxx

Linguistics and Philology Emphasis
Take 5 or more course(s).

Take 1 or more course(s) from the following:
LING 3001 - Introduction to Linguistics, SSCI (4.0 cr)
LING 3001H - Honors: Introduction to Linguistics, SSCI, H (4.0 cr)
LING 3601 - Historical Linguistics (3.0 cr)
LING 5001 - Introduction to Linguistics (4.0 cr)
LING 5601 - Historical Linguistics (3.0 cr)

Take 4 or more course(s) from the following:
GER 3701 - History of the German Language (3.0 cr)
GER 3702 - Beginning Middle High German (3.0 cr)
GER 3704 - German Dialects (3.0 cr)
GER 5101 - Analysis of German (3.0 cr)
GER 5711 - History of the German Language I (3.0 cr)
GER 5712 - History of the German Language II (3.0 cr)
GER 5722 - Middle High German: Advanced Readings (3.0 cr)
GER 5731 - Old High German I (3.0 cr)
GER 5732 - Old High German II (3.0 cr)
GER 5734 - Old Saxon (3.0 cr)
GER 5740 - Readings in Philology (3.0 cr)

German Minor

German, Scandinavian, and Dutch

Requirements for this program are current for Fall 2006.

Required credits in this minor: 17.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

The minor consists of a minimum of 17 credits with no more than one course taken as directed or independent study. All courses must be taken A-F and completed with a grade of C- or better. Ger 36xx, 46xx or 56xx course may be used for the minor if substantial work is done in German, as directed by the instructor of the course or by the director of Undergraduate Studies. At least one course must be taken from the German program at the University of Minnesota, Twin Cities. The minor program must be approved by the director of undergraduate studies

Required Courses

Minor Core
GER 3011W - Conversation and Composition, WI (4.0 cr)
GER 3104W - Reading and Analysis of German Literature, LIT, WI (4.0 cr)

Take 9 or more credit(s) from the following:
GER 3xxx
GER 4xxx
GER 5xxx

Global Studies B.A.

Institute for Global Studies

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 35.

Degree: Bachelor of Arts.

This program offers students the opportunity to study the interrelated processes shaping today's increasingly interdependent world. Students examine political, economic, cultural, and social processes of local communities, nation states, transnational businesses, and social movements around the globe. The program requires students to integrate theoretical knowledge about broad global processes with regionally focused detailed knowledge of social and cultural systems and language. Students complete a common set of core courses providing a broad overview of issues and approaches to global studies. Each student then chooses a thematic and regional concentration. Coursework is completed by selecting from relevant courses offered by a broad range of departments.

Admission Requirements

As preparation for the major, students are encouraged to take 6 credits of related coursework as shown in "Preparatory Courses" listed in the program requirements. Students must formally enroll in the major at the advising office, 232A Social Sciences Tower. Students must meet with an adviser to develop a program that meets major guidelines.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Students are required to take 4 semester(s) of second language appropriate to regional concentration..

Detailed information about concentrations is available in the Global Studies Handbook or on-line at http://igs.cla.umn.edu.

Required Courses

Preparatory Courses
Take 6 or more credit(s) from the following:
CSCL 1001 - Introduction to Cultural Studies: Rhetoric, Power, Desire, CD, OH (4.0 cr)
CSCL 1301W - Reading Culture: Theory and Practice, OH, WI (4.0 cr)
GEOG 1301W - Introduction to Human Geography, IP, SSCI, WI (4.0 cr)
BULLETGLOS 1015W - Introduction to Global History Since 1950, HP, IP, WI (4.0 cr)
HIST 1012W - World History: The Age of Global Contact, HP, IP, WI (4.0 cr)
HIST 1018 - World History: The Age of Global Contact, HP, IP (3.0 cr)
POL 1025 - Global Politics, IP, SSCI (4.0 cr)
GLOS 1112 Globalization and Social Justice

Major Courses
GLOS 3144 - Knowledge, Power, and the Politics of Representation in Global Studies, IP, SSCI (4.0 cr)
GLOS 3145- Theoretical Approaches to Global Studies (4.0 cr)

Thematic Concentration
Choose a thematic concentration from the following options: Culture, Power, Place; Environment and Sustainable Development; Governance, Peace and Justice in a Global Context; International Political Economy; Population, Migration,

and Identity. Courses must be chosen in consultation with a global studies adviser.

One breadth course, (3 tcredits).

Ways of knowing course (at least 3 credits) appropriate for theme.

tThree elective courses (9 credits).

Regional Concentration

Choose a regional concentration from: Africa, East Asia, Europe, Middle East, Latin America, Russia, or South Asia. Courses must be chosen in consultation with a global studies adviser.

At least one regional breadth course.

At least three additional regional elective courses.

Experiential Learning and Senior Project

Students must participate in a relevant experiential learning opportunity through study abroad, the foreign language immersion program, an internship, or a service learning experience. Work completed in meeting these requirements may count towards the thematic or regional concentrations when approved by an adviser. Students must also complete a major project integrating their regional and thematic concentrations.

GLOS 3981W - Major Project Seminar, WI (3.0 cr)

Global Studies Minor

Institute for Global Studies

Requirements for this program are current for Fall 2006.

Required credits in this minor: 17.

The minor offers students the opportunity to study the interrelated processes shaping today's increasingly interdependent world. Students examine political, economic, cultural, and social processes of local communities, nation states, transnational businesses, and social movements across the globe.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Students declare a thematic and regional concentration and complete an additional 9 credits, includingone regional breadth course (3.0 cr), one theme breadth course (3.0 cr), and one elective course (3.0 cr)

Required Courses

Minor Courses

GLOS 3144 - Knowledge, Power, and the Politics of Representation in Global Studies, IP, SSCI (4.0 cr)

GLOS 3145 - Theoretical Approaches to Global Studies (4.0 cr)

In consultation with a Global Studies adviser, students take one thematic and one regional breadth course. Students also choose one elective from either their theme or region (3.0 cr)

Greek B.A.

Classical and Near Eastern Studies

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 30.

Degree: Bachelor of Arts.

Greek is the Western language with the longest continuous history, from the poetry of Homer in the first millennium B.C. to the present. This program focuses on literature, philosophy, religion, archaeology, and art associated with the Greek language from its earliest appearance through the golden age of the Greek city-state in the 5th century B.C. and the Roman Empire into the medieval Byzantine Empire. Greek majors who intend to continue in classics graduate studies are strongly advised to study Latin as well.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Required Courses for Admission

Preparatory Courses

Students take either beginning, honors, or intensive classical Greek, or they must have four years high school Greek and students must take one course from CNES 1002, 1042, 1043 (or another appropriate course with the approval of director of undergraduate studies).

GRK 1001 - Beginning Classical Greek I (5.0 cr)

GRK 1002 - Beginning Classical Greek II (5.0 cr)

or

GRK 1111H - Honors Course: Beginning Classical Greek, H (3.0 cr)

GRK 1112H - Honors Course: Classical Greek, Recitation, H (3.0 cr)

or

GRK 3111 - Intensive Classical Greek (3.0 cr)

GRK 3112 - Intensive Classical Greek, Recitation (3.0 cr)

and

CNES 1002 - World of Greece, HP (3.0 cr)

or CNES 1042 - Greek and Roman Mythology, OH (4.0 cr)

or CNES 1043 - Introduction to Greek and Roman Archaeology, HP (4.0 cr)

Program Requirements

Students are required to take 4 semester(s) of Greek.

Students take a total of four semesters of language, with two semesters of formal Greek language instruction and two semesters of applied readings in Greek texts.

Required Courses

Major Courses

GRK 3111 and 3112 may not be used to meet this requirement.

Take 14 or more credit(s) from the following:

GRK 3xxx

GRK 5xxx

Electives

At least one course from this group must be in ancient culture at 3xxx or above; other courses may be substituted with approval of the director of undergraduate studies. GRK 3111-3112 and LAT 3111-3112 may not be used to meet this requirement. GRK credits taken for the major cannot be used to meet this requirement.

Take 12 or more credit(s) from the following:

CNES 3xxx

CNES 4xxx

CNES 5xxx

GRK 3xxx

GRK 5xxx

LAT 3xxx

LAT 5xxx

Senior Project
Students can get a copy of the departmental statement on major projects from the director of undergraduate studies or department office. Students who complete a major project for another CLA major must substitute four credits of Greek (3113 or above) or other appropriate coursework at 3xxx-5xxx for the senior project in this major.

Greek Minor

Classical and Near Eastern Studies

Requirements for this program are current for Fall 2006.

Required credits in this minor: 14.

The Greek minor allows students who have satisfied the language requirement in Greek to read ancient authors and to expand their knowledge of ancient civilization.

Admission Requirements

Students must complete 2 courses before admission to the program.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Required Courses for Admission

Preparatory Courses
Students take either GRK 1001-1002 or 1111-1112 or 3111-3112 or must have four years high school Greek, and one course from CNES 1002, 1042, 1043 (or other appropriate course with approval of director of undergraduate studies).

GRK 1001 - Beginning Classical Greek I (5.0 cr)
GRK 1002 - Beginning Classical Greek II (5.0 cr)
or
GRK 1111H - Honors Course: Beginning Classical Greek, H (3.0 cr)
GRK 1112H - Honors Course: Classical Greek, Recitation, H (3.0 cr)
or
GRK 3111 - Intensive Classical Greek (3.0 cr)
GRK 3112 - Intensive Classical Greek, Recitation (3.0 cr)
and
CNES 1002 - World of Greece, HP (3.0 cr)
or CNES 1042 - Greek and Roman Mythology, OH (4.0 cr)
or CNES 1043 - Introduction to Greek and Roman Archaeology, HP (4.0 cr)

Program Requirements

Required Courses

Minor Courses
Courses must be at 3113 or above.

Take 11 or more credit(s) from the following:
GRK 3xxx
GRK 4xxx
GRK 5xxx
A course on ancient culture, of at least 3 credits, chosen in consultation with an adviser.

Take 3 or more credit(s) from the following:
CNES 3xxx
CNES 4xxx
CNES 5xxx
GRK 3xxx
GRK 4xxx
GRK 5xxx
LAT 3xxx
LAT 4xxx
LAT 5xxx

Hebrew B.A.

Classical and Near Eastern Studies

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 27 to 29.

Degree: Bachelor of Arts.

This program enables students to study the various periods of the Hebrew language covering a span of 3,000 years, from biblical times to the present. The program gives students the tools for work in the fields of literature, social sciences, religious studies, linguistics, and law. Hebrew equips the student for cross-disciplinary learning in several fields - ancient, medieval, and contemporary. Related areas include Jewish studies, religious studies, Arabic, Greek, and the extinct languages of the Near East. Students are encouraged to incorporate study in Israel in one of the many exchange programs involving archaeology, the social sciences, or the humanities (consult the Learning Abroad Center for more information).

Hebrew majors often use their major to complement a second major in another field such as political science, sociology, journalism, history, religious studies, business, speech communications, and linguistics.

Admission Requirements

Students must complete 3 courses before admission to the program.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Required Courses for Admission

Preparatory Courses
Note that each HEBR course below requires completion of a prerequisite HEBR course.

CNES 1001 - World of the Bible: Introduction to the Bible and its Ancient Near Eastern Background, HP (3.0 cr)
or CNES 1044 - Introduction to Near Eastern Archaeology, HP (3.0 cr)
or CNES 1201 - The Bible: Context and Interpretation, LIT (3.0 cr)
CNES 1082 - Jesus in History, HP (3.0 cr)
or CNES 1082H - Honors Course: Jesus in History, HP, H (4.0 cr)
or RELA 1082 - Jesus in History, HP (3.0 cr)
JWST 1034 - Introduction to Jewish History and Civilization, HP (3.0 cr)
or RELA 1034 - Introduction to Jewish History and Civilization, HP (3.0 cr)
HEBR 1002 - Beginning Hebrew II (5.0 cr)
or HEBR 1102 - Beginning Biblical Hebrew II (5.0 cr)
or HEBR 4002 - Beginning Hebrew II (3.0 cr)
or HEBR 4105 - Basics of Biblical Hebrew II (3.0 cr)

Program Requirements

Students are required to take 4 semester(s) of Hebrew.

Required Courses

Major Courses
Take 6 or more credit(s) from the following:
HEBR 3090 - Advanced Modern Hebrew (3.0 cr)
HEBR 3200 - Advanced Classical Hebrew, H (3.0 cr)

HEBR 3300 - Post-Biblical Hebrew: Second Temple Period (3.0 cr)
HEBR 3400 - Rabbinic Texts (3.0 cr)
HEBR 3990 - Topics in Hebrew Studies (1.0-4.0 cr)
HEBR 3993 - Directed Studies (1.0-4.0 cr)
HEBR 5090 - Advanced Modern Hebrew (3.0 cr)
HEBR 5200 - Advanced Classical Hebrew (3.0 cr)
HEBR 5300 - Post-Biblical Hebrew: Second Temple Period (3.0 cr)
HEBR 5400 - Rabbinic Texts (3.0 cr)
HEBR 5992 - Directed Readings (1.0-4.0 cr)
Take one of the following course pairs:
HEBR 3011 - Intermediate Hebrew I (5.0 cr)
HEBR 3012 - Intermediate Hebrew II (5.0 cr)
or
HEBR 3101 - Intermediate Biblical Hebrew I (4.0 cr)
HEBR 3102 - Intermediate Biblical Hebrew II (4.0 cr)

Electives
Student primarily studying Modern Hebrew must take a minimum of two courses in Classical Hebrew (HEBR 4101 and 4105). Students primarily studying Classical Hebrew must take a minimum of two courses in Modern Hebrew (HEBR 4001 and 4002).

Complete 9 credits of relevant coursework with the approval of the director of undergraduate studies.

Senior Project
Students who complete a major project for another CLA major may substitute four credits of HEBR or related coursework with the approval of the director of undergraduate studies. Students who double major in Hebrew and RELST, JWST, or any CNES major, are especially encouraged to integrate their programs by preparing a senior project that includes a significant Hebrew component.

HEBR 3951W - Major Project, WI (4.0 cr)

Hebrew Minor

Classical and Near Eastern Studies

Requirements for this program are current for Fall 2006.

Required credits in this minor: 14.

The Hebrew minor permits students who have satisfied the language requirement with Hebrew to use their knowledge to read more widely in sources of antiquity and the middle ages and the modern period and to add to their knowledge of Hebrew civilization and culture.

Admission Requirements

Students must complete 3 courses before admission to the program.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Required Courses for Admission

Preparatory Courses
Complete two semesters of introductory Hebrew (note that each HEBR course below requires completion of a prerequisite HEBR course), and take at least three credits of related non-language work (in CNES, RELA, or JWST).

CNES 1001 - World of the Bible: Introduction to the Bible and its Ancient Near Eastern Background, HP (3.0 cr)
or CNES 1044 - Introduction to Near Eastern Archaeology, HP (3.0 cr)
or CNES 1201 - The Bible: Context and Interpretation, LIT (3.0 cr)
CNES 1082 - Jesus in History, HP (3.0 cr)
or CNES 1082H - Honors Course: Jesus in History, HP, H (4.0 cr)
or RELA 1082 - Jesus in History, HP (3.0 cr)
JWST 1034 - Introduction to Jewish History and Civilization, HP (3.0 cr)
or RELA 1034 - Introduction to Jewish History and Civilization, HP (3.0 cr)
HEBR 1002 - Beginning Hebrew II (5.0 cr)
or HEBR 1102 - Beginning Biblical Hebrew II (5.0 cr)
or HEBR 4002 - Beginning Hebrew II (3.0 cr)
or HEBR 4105 - Basics of Biblical Hebrew II (3.0 cr)

Program Requirements

Required Courses

Minor Courses
Take three credits of related coursework, which may include Hebrew.

Take 11 or more credit(s) from the following:
HEBR 3xxx

History B.A.

History

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 32.

Degree: Bachelor of Arts.

History examines the past, seeking to understand the development and changes in the human experience from its origins to the present. Historians are interested in documenting and interpreting the past from its diverse theoretical, ideological, and methodological approaches and at all levels from local history to comparative and global history.

Courses range from surveys to research and intensive seminars, and focus on a rich array of topics - various regions (Europe, Africa, Asia, Latin America, United States), time periods (ancient, medieval, early modern, and modern), methods (social, cultural, economic, quantitative), and comparative themes (gender and sexuality, imperialism, race and ethnicity). Interdisciplinary programs incorporate history into a variety of other programs (history of medicine, global studies, medieval studies, American studies, women's studies).

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Students are required to take 4 semester(s) of any second language.

History majors must fulfill two distribution requirements with 1xxx-5xxx courses:

1. Chronological - At least two courses must be pre-modern (roughly pre-1750) in focus, and two courses must be from the modern era (roughly post-1750).
2. Geographic - At least one course in each of two different geographic areas and one of the following courses in world history: HIST 1011W, 1012W, 1015W, 1017, 1018, 1019, 3421, 3419, 3728, 3797, 5500.

Required Courses

Survey Courses

At least one of the three survey courses must be writing intensive.

Take 3 or more course(s) from the following:

HIST 1017 - World History, HP, IP (3.0 cr)
or HIST 1018 - World History: The Age of Global Contact, HP, IP (3.0 cr)
or HIST 1019 - Introduction to Global History Since 1950, HP, IP (3.0 cr)
HIST 1011W - World History, HP, IP, WI (4.0 cr)
or HIST 1011V - Honors:World History, HP, IP, WI, H (4.0 cr)
HIST 1012W - World History: The Age of Global Contact, HP, IP, WI (4.0 cr)
or HIST 1012V - Honors: World History, HP, IP, WI, H (4.0 cr)
HIST 1015W - Introduction to Global History Since 1950, HP, IP, WI (4.0 cr)
or HIST 1015V - Introduction to Global History Since 1950, HP, IP, WI, H (4.0 cr)
HIST 1026 - Western Civilization from its Origins to ca 1500, HP, IP (3.0 cr)
or HIST 1027 - Western Civ From 1500 to Present, HP, IP (3.0 cr)
HIST 1031W - Western Civilization, From Its Origins to ca 1500, HP, IP, WI (4.0 cr)
or HIST 1031V - Honors: Survey of Western Civilization From its Origins to ca 1500, HP, IP, WI, H (4.0 cr)
HIST 1032W - Western Civilization, From 1500 to Present, HP, IP, WI (4.0 cr)
or HIST 1032V - Honors: Western Civilization, From 1500 to Present, HP, IP, WI, H (4.0 cr)
HIST 1301W - U.S. History to 1877, CD, HP, WI (4.0 cr)
or HIST 1301V - Honors: U.S. History to 1877, CD, HP, WI, H (4.0 cr)
HIST 1302W - U.S. History, From 1865 to Present, CD, HP, WI (4.0 cr)
or HIST 1302V - Honors: U.S. History, From 1865 to Present, CD, HP, WI, H (4.0 cr)
HIST 1307 - American History to 1877, CD, HP (3.0 cr)
or HIST 1308 - U.S. History: From 1865 to Present, CD, HP (3.0 cr)
HIST 3051 - Ancient Civilization: Near East and Egypt (3.0 cr)
or HIST 3052 - Ancient Civilization: Greece (3.0 cr)
or HIST 3053 - Ancient Civilization: Rome (3.0 cr)
HIST 3101 - Introduction to Medieval History
HIST 3542 - Medieval Islam, HP (3.0 cr)
or HIST 3151W - British History to the 17th Century, C/PE, HP, WI (4.0 cr)
or HIST 3152 - British History From the Seventeenth Century, C/PE, HP (4.0 cr)
or HIST 3401W - Early Latin America to 1825, HP, IP, WI (4.0 cr)
or HIST 3402W - Modern Latin America 1825 to Present, HP, IP, WI (4.0 cr)
or HIST 3431 - Early Africa and Its Global Connections, HP, IP (4.0 cr)
or HIST 3432 - Modern Africa in a Changing World, HP, IP (4.0 cr)
or HIST 3461 - Introduction to East Asia I: The Imperial Age, HP, IP (3.0-4.0 cr)
or HIST 3462 - Introduction to East Asia II: 1600-2000, HP, IP (3.0-4.0 cr)
or HIST 3485 - History of Southeast Asia (3.0 cr)
or HIST 3505 - Survey of the Middle East, IP (3.0 cr)
or HIST 3541 - Islam in the Catholic Age: Arab Phase 600 A.D. to 900 A.D., HP (3.0 cr)
HIST 3542 - Medieval Islam
or HIST 3543 - Arabs Under Mamluks and Ottomans: 1300-1920, HP, IP (3.0 cr)

Major Courses

Three courses must be in an area of concentration as approved by the undergraduate studies office.

Take 6 or more course(s) from the following:

HIST 3xxx
HIST 4xxx
HIST 5xxx

Senior Project

Students must pre-register for the senior paper course (HIST 4961W) with the undergraduate studies office at least two semesters in advance.

HIST 4961W - Major Paper, WI (4.0 cr)
or HIST 5xxx

History Minor

History

Requirements for this program are current for Fall 2006.

Required credits in this minor: 14.

History examines the past, seeking to understand the development and changes in the human experience from its origins to the present. Historians are interested in documenting and interpreting the past from diverse theoretical, ideological, and methodological approaches and at all levels from local history to comparative and global history.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Students take a minimum of five history courses with at least 14 upper division credits. These courses must be in at least two different cultural/geographic areas and be taken A-F. Students must receive a grade of C-or better.

Required Courses

Minor Courses

Take 5 courses with at least 14 upper division credits, in at least two different cultural/geographic areas.

Take 5 or more course(s) from the following:

HIST 1xxx
HIST 3xxx
HIST 4xxx
HIST 5xxx

History of Medicine Minor

College of Liberal Arts - Adm

Requirements for this program are current for Fall 2006.

Required credits in this minor: 14.

History of medicine courses explore the development of medical knowledge, institutions, and practices; the history of diseases; and the place of medicine in Western intellectual and social history.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Required Courses

Minor Courses

Take either pair of courses.

Health Care in History

HMED 3001W - Health Care in History I, HP, IP, WI (3.0 cr)
HMED 3002W - Health Care in History II, HP, IP, WI (3.0 cr)
or

History of Medicine

HMED 5200 - Early History of Medicine to 1700 (3.0 cr)
HMED 5201 - History of Medicine from 1700 to 1900 (3.0 cr)

Electives

Take 8 or more credit(s) from the following:

MED 3xxx
MED 4xxx
MED 5xxx

History of Science and Technology Minor

Requirements for this program are current for Fall 2006.

Required credits in this minor: 14.

Courses for this minor address the history of science and technology, including the cultural and social contexts of their development.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Required Courses

Minor Courses

Take 11 or more credit(s) from the following:

HSCI 3xxx
HSCI 4xxx
HSCI 5xxx

Take 3 or more credit(s) from the following:

HSCI 4xxx
HSCI 5xxx

Humanities in the West Minor

Requirements for this program are current for Fall 2006.

Required credits in this minor: 18.

Humanities offers integrated study of areas of civilization and major humanistic problems, drawing mainly on primary sources in literature, philosophy, history, and the arts and on relevant aspects of the human and natural sciences. This breadth of perspective provides an understanding of men and women as heirs to and creators of civilization, concerned with values and the development of the whole person.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

The minor program must be approved by the humanities program coordinator. No more than one 3xxx-4xxx course in the program may be taken directed study, directed instruction, or independent study. No more than one course may be taken S-N. All other courses must be completed with a grade of at least C.

Required Courses

Minor Courses

Take at least 10 credits from the humanities in the west sequence. Only one 1xxx HUM course may be taken.

HUM 1001 - Humanities in the West I, OH (4.0 cr)
or HUM 1002 - Humanities in the West II, IP, OH (4.0 cr)
or HUM 1003 - Humanities in the West III, IP, OH (4.0 cr)
or HUM 1004 - Humanities in the West IV, IP, OH (4.0 cr)
or HUM 1005 - Humanities in the West V, IP, OH (4.0 cr)
or HUM 1006 - Humanities in the West VI, IP, OH (4.0 cr)
or HUM 3001 - Humanities in the West I, OH (4.0 cr)
or HUM 3002 - Humanities in the West II, IP, OH (4.0 cr)
or HUM 3003 - Humanities in the West III, IP, OH (4.0 cr)
or HUM 3004 - Humanities in the West IV, IP, OH (4.0 cr)

Electives

Take 8 or more credit(s) from the following:

HUM 3xxx
HUM 4xxx

Individually Designed Interdepartmental B.A.

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 50.

Degree: Bachelor of Arts.

The Individually Designed Interdepartmental Major (IDIM) enables students to fulfill program requirements for the B.A. degree by completing an interdepartmental program of coursework focused on a theme of their own choosing, designed in consultation with faculty and staff advisers.

IDIM programs consist of three or four areas of concentration, integrated in such a way that the major has strong thematic unity and coherence.

Working closely with an IDIM adviser, students develop program proposals that explain their academic goals and list a set of courses appropriate for meeting those goals. IDIM program proposals must be approved by three faculty or department advisers with expertise in the areas of concentration. Some departments have established guidelines for students who wish to include in their majors concentration areas based in those departments.

For specific information on proposal approval procedures and department guidelines, see the individualized degree programs Web site at http://idp.class.umn.edu.

Admission Requirements

For certain concentration areas, prerequisite courses must be completed before submitting a program proposal.

For certain concentrations a minimum overall GPA or a minimum tool course GPA is required before a student can submit a program proposal.

Students can declare the major after attending an information session (held two to three times a week). Students are not approved for the degree until they have submitted a program proposal (the submission deadline is once per semester) and the proposal has been approved by a committee and faculty or department advisers.

See the IDIM adviser for more information.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Students are required to take 4 semester(s) of any second language.

The 50 major credits must be distributed among three or four concentration areas, with at least 11 credits at 3xxx or above in each area. The concentrations may be departmental or thematic in composition. At least 40 of the 50 credits must be 3xxx or above.

At least 20 credits in the major must be completed after the program has been approved. No more than 12 credits of directed studies may be applied toward the major. The CLA requirement of 18 credits at or above 3xxx outside the major does not apply.

Consult an adviser for the approval of courses in the concentration areas.

Required Courses

Major Courses
Complete the required courses from the approved IDIM courses.

Senior project proposals must be approved by faculty and staff advisers the semester before the project is begun. Projects may vary widely in form, depending on a student's major. The project proposal and the project itself must be reviewed and approved by one faculty adviser and two faculty readers.

Take 50 credits, with at least 40 credits at 3xxx or above in area(s) of concentration, in consultation with an adviser.

Students must complete an integrating senior project, earning at least 2 credits in conjunction with the project.

Italian Studies B.A.

French and Italian

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 34.

Degree: Bachelor of Arts.

The Italian studies undergraduate program examines Italian and Italian-American literature, culture, society, and history. Courses offered provide a historical perspective from the Middle Ages to the present. Students explore a variety of themes ranging from nation-building and national identity to emigration and travel, to gender relations and feminist discourses, to the study of different narrative forms and representations of Italian and Italian-American culture. Students are encouraged to take courses in other departments when these are related to Italian and Italian-American culture. For further information and updates, see the department Web site at www.cla.umn.edu/frit.

Admission Requirements

Complete the introductory Italian courses (ITAL 1001-1004).

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Students are required to take 4 semester(s) of Italian.

The senior project can be based on a paper written in one of the elective courses. A senior project clearance form must be signed.

Required Courses

Major Courses
ITAL 3015 - Reading, Conversation, and Composition (4.0 cr)

Electives
Some courses from other departments can count towards the major with the approval of the undergraduate adviser.

Take 30 or more credit(s) from the following:
ITAL 3xxx
ITAL 4xxx
ITAL 5xxx

Italian Studies Minor

French and Italian

Requirements for this program are current for Fall 2006.

Required credits in this minor: 16.

The Italian studies undergraduate minor program examines Italian and Italian American literature, culture, society, and history.

Admission Requirements

Students must complete 4 courses before admission to the program.

Students must complete language study equivalent to four semesters (intermediate level) before beginning the minor.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Students are required to take 4 semester(s) of Italian.

Required Courses

Minor Courses
ITAL 3015 - Reading, Conversation, and Composition (4.0 cr)

Take 12 or more credit(s) from the following:
ITAL 3xxx
ITAL 4xxx
ITAL 5xxx

Jewish Studies B.A.

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 30.

Degree: Bachelor of Arts.

This broad, interdisciplinary field studies the civilization of the Jewish people from its beginning in biblical antiquity to the present. The diverse quality of Jewish civilization and the unifying forces of its religion and language offer ample material for the study of continuity, adaptation, and change.

The undergraduate program offers courses in the Bible, Jewish history, Jewish literature, midrash, Jewish philosophy, medieval and modern Jewish studies, Talmud, and rabbinics. The program has links with the Departments of American Studies, Sociology, History, English, German, Music, and Political Science. The University's Center for Holocaust and Genocide Studies offers courses related to the Nazi Holocaust and its aftermath.

Study abroad in Israel or Europe is encouraged as a valuable augment to the major; consult the Learning Abroad Center at 612-626-9000 for more information.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Students are required to take 4 semester(s) of Hebrew.

Students complete one of two tracks, focusing on either the diversity of Jewish civilization or the the Bible and foundations of ancient Judaism. Either biblical or modern Hebrew may be required, depending on the track chosen.

Required Courses

Preparatory Courses

Choose one course from either of the two groups of courses.

Jewish History and Civilization

JWST 1034 - Introduction to Jewish History and Civilization, HP (3.0 cr)
or JWST 3034 - Introduction to Jewish History and Civilization, HP (3.0 cr)
or RELA 1034 - Introduction to Jewish History and Civilization, HP (3.0 cr)
or RELA 3034 - Introduction to Jewish History and Civilization, HP (3.0 cr)
or

The Bible

CNES 1201 - The Bible: Context and Interpretation, LIT (3.0 cr)
or CNES 3201 - The Bible: Context and Interpretation, LIT (3.0 cr)
or JWST 1201 - The Bible: Context and Interpretation, LIT (3.0 cr)
or JWST 3201 - The Bible: Context and Interpretation, LIT (3.0 cr)
or RELA 3201 - The Bible: Context and Interpretation, LIT (3.0 cr)

Senior Project

Students prepare a senior project in an appropriate area of interest. Consult a faculty adviser.

JWST 4000W - Final Project, Writing Intensive, WI (4.0 cr)
or JWST 4001W - Final Project, Writing Intensive, WI (1.0 cr)

Program Sub-plans

Students are required to complete one of the following sub-plans. (Note: The honors sub-plan does not meet this requirement.) Honors students are required to complete one sub-plan plus the honors sub-plan.

The Bible and the Foundations of Ancient Judaism

Required Courses

Biblical Hebrew

Take one of the following course pairs:

HEBR 1101 - Beginning Biblical Hebrew I (5.0 cr)
HEBR 1102 - Beginning Biblical Hebrew II (5.0 cr)
or
HEBR 4104 - Basics of Biblical Hebrew I (3.0 cr)
HEBR 4105 - Basics of Biblical Hebrew II (3.0 cr)

Biblical and Religious Perspectives

Complete a minimum of 9 credits. Consult an adviser for appropriate coursework.

At least one course in Hebrew Bible/ancient Israel.
At least one course in classical/post-biblical Judaism.
One additional adviser-approved course.

History and Material Culture

The focus of these courses is on the use of history, archaeology, and material culture as ways of contextualizing, challenging, and supplementing the textual record. Appropriate courses include the history and archaeology of the ancient Near East, Israel, or Syro-Palestine.

Complete a minimum of two courses for 6 credits.

Comparative Perspectives

Courses include studies of other cultures and civilizations that are chronologically or geographically contiguous with Israelite/ Jewish society through the Rabbinic period.

Complete a minimum of two courses for 6 credits.

Intermediate Biblical Hebrew

Students demonstrating intermediate proficiency (or higher) in biblical Hebrew without formal Hebrew language credits will be asked to complete 8 additional elective credits in lieu of these courses, chosen in consultation with the director of undergraduate studies.

HEBR 3101 - Intermediate Biblical Hebrew I (4.0 cr)
HEBR 3102 - Intermediate Biblical Hebrew II (4.0 cr)

The Diversity of Jewish Civilization-Religion, History, and Culture

Required Courses

Biblical or Modern Hebrew

Take one of the following course pairs:

HEBR 1001 - Beginning Hebrew I (5.0 cr)
HEBR 1002 - Beginning Hebrew II (5.0 cr)
or
HEBR 1101 - Beginning Biblical Hebrew I (5.0 cr)
HEBR 1002 - Beginning Hebrew II (5.0 cr)
or
HEBR 4001 - Beginning Hebrew I (3.0 cr)
HEBR 4002 - Beginning Hebrew II (3.0 cr)
or
HEBR 4104 - Basics of Biblical Hebrew I (3.0 cr)
HEBR 4105 - Basics of Biblical Hebrew II (3.0 cr)

Religious Foundations

The focus of these courses is on biblical and other classical Jewish religious texts, so that students become familiar with the idea of scripture, of authoritative texts and traditions, and of ritual practice. Appropriate topics include Bible, Rabbinics, religious thought and philosophy, ritual studies, history of interpretation, comparative religion, and religion and law. Consult an adviser for specific coursework.

Complete a minimum of two courses for 6 credits.

Historical, Material, and Social Perspectives

Courses may use a range of methodologies to investigate the social construction of Jewish identity in relation to broader categories of gender, ethnicity, race, class, politics, community boundaries, and society. Consult an adviser for appropriate coursework.

Complete a minimum of two courses for 6 credits.

Jewish Creativity and Cultural Production: Commenting on the World

Topics may include: Jewish adaptation of forms and idioms from surrounding cultures; ritual and liturgical expressions of personal and communal religious experience; the image of the Jew in literature, music, or popular culture (whether written by Jews

or not); and the development of a distinctive diaspora poetics in Jewish culture. Consult an adviser for appropriate coursework.

Complete a minimum of two courses for 6 credits.

Intermediate Modern or Biblical Hebrew
Students demonstrating intermediate proficiency (or higher) in modern or biblical Hebrew without formal Hebrew language credits will be asked to complete 8 additional elective credits in lieu of these courses, chosen in consultation with the director of undergraduate studies.

Take one of the following course pairs:
HEBR 3011 - Intermediate Hebrew I (5.0 cr)
HEBR 3012 - Intermediate Hebrew II (5.0 cr)
or
HEBR 3101 - Intermediate Biblical Hebrew I (4.0 cr)
HEBR 3102 - Intermediate Biblical Hebrew II (4.0 cr)

Electives
Complete one additional course chosen in consultation with an adviser.

Jewish Studies Minor

Classical and Near Eastern Studies

Requirements for this program are current for Fall 2006.

Required credits in this minor: 14.

The Jewish studies minor allows students to develop an additional concentration in the academic study of Jewish culture and civilization throughout history. The minor, which recognizes the diversity and international aspect of the Jewish experience, reinforces any disciplinary specialization and contributes a comparative focus. Students choose from among the full range of JWST courses in biblical studies, archaeology, ancient Judaism, Hebrew, Jewish history (including Holocaust studies), German-Jewish literature, and the American Jewish experience.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Students must take a total of five JWST courses (at least 14 credits of 3xxx or above), including one course in antiquity (ancient /medieval) and one in the modern period. Courses must be taken A-F, with grades of C- or better and a 2.00 GPA.

Up to 10 credits of biblical and/or modern Hebrew courses (3xxx or higher) may count toward the minor.

If students wish to study a second language in addition to completing four semesters of study in one language, introductory courses (1xxx or 2xxx) in an additional language may count towards the minor if relevant to Jewish studies, and with the approval of the director of undergraduate studies. This provision applies to students who have studied modern Hebrew but wish to add biblical Hebrew, or vice versa.

Required Courses

Minor Courses
At least one course at 3xxx or above that covers any aspect of Jewish civilization since 1492.

Ancient and Medieval Foundations of Judaism
JWST 1034 - Introduction to Jewish History and Civilization, HP (3.0 cr)
or JWST 3013W - Biblical Law and Jewish Ethics, WI (3.0 cr)
JWST 3xxx-5xxx

Take 2 or more course(s) from the following:
JWST 3xxx
JWST 4xxx
JWST 5xxx

Journalism B.A.

School of Journalism and Mass Communication

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 36 to 40.

Degree: Bachelor of Arts.

The School of Journalism and Mass Communication offers three tracks focused on distinct areas of study within the discipline.

The professional journalism track prepares students for careers such as news reporting, editing, and producing. The professional strategic communication track prepares students for careers in advertising and public relations. The two professional tracks are based on a liberal arts foundation, knowledge of the social context in which the professions are practiced, and the skills and experiences needed to succeed in the marketplace.

The mass communication track is for students who wish to study the economic, political, legal, and social aspects of mass communication. Students may develop a program emphasis in areas such as history, law, media effects, media industry studies, international communication, or other aspects of mass communication studies represented in the school.

About two-thirds of the coursework for the B.A. degree is outside of journalism in the social sciences, humanities, and other liberal arts. The 120-credit requirement must include at least 80 non-journalism credits, including 65 CLA credits

Admission Requirements

Students must complete 30 credits before admission to the program.

Freshmen and transfer students are usually admitted to pre-major status before admission to this major.

A GPA above 2.00 is preferred for the following:

- 3.00 for students already admitted to the degree-granting college.
- 3.00 for students transferring from another University of Minnesota college.
- 3.00 for students transferring from outside the University.

The school admits a limited number of undergraduates annually. Students who are admitted usually have a 3.0 or higher overall grade point average. To apply, students must have completed JOUR 1001 with a C or higher grade and at least 30 graded (A-F) credits, including at least one semester of study (13 credits) in CLA. Students must write a statement of intent for the major application. The statement of intent provides a writing sample for the Admissions Committee and should include information about academic interests, professional goals, and mass communication or related experience.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Required Courses for Admission

Preparatory Course
JOUR 1001 - Introduction to Mass Communication, SSCI, C/PE (3.0 cr)

Program Requirements

Students are required to take 4 semester(s) of any second language.

Majors are expected to have typing skills before enrolling in JOUR 3101. Students also must take 12 credits at 3xxx, 4xxx, or 5xxx from other departments chosen in consultation with a faculty adviser.

Required Courses

Major Courses

JOUR 3004W - Information for Mass Communication, WI (3.0 cr)
or JOUR 3004V - Honors: Information for Mass Communication, WI, H (3.0 cr)

Electives

Take 12 credits of 3xxx, 4xxx, or 5xxx courses from other departments, chosen in consultation with a faculty adviser.

Program Sub-plans

Students are required to complete one of the following sub-plans. (Note: The honors sub-plan does not meet this requirement.) Honors students are required to complete one sub-plan plus the honors sub-plan.

Mass Communication Track

This track is for students who wish to study the economic, political, legal, and social aspects of mass communication. Students may develop a program emphasis in areas such as history, law, media effects, media industry studies, international communication, or other aspects of mass communication studies represented in the School of Journalism and Mass Communication.

Include one visual communication course in either the professional or context area of the program. Take either JOUR 3006 (context course) or JOUR 3102, JOUR 3321, or JOUR 3451(professional courses). Include two 4xxx or 5xxx level context courses to complete the CLA major project requirement.

Required Courses

Professional Courses

Take 12 or more credit(s) including 4 or more sub-requirement(s).

History

Take 1 or more course(s) from the following:

JOUR 3007 - The Media in American History and Law: Case Studies, HP (3.0 cr)
JOUR 3614 - History of Media Communication, HP (3.0 cr)
JOUR 5601W - History of Journalism, WI (3.0 cr)
JOUR 5606W - Literary Aspects of Journalism, WI (3.0 cr)
JOUR 5615 - History of the Documentary (3.0 cr)

International/Multicultural

Take 1 or more course(s) from the following:

JOUR 3552 - Internet and Global Society, IP (3.0 cr)
JOUR 3741 - People of Color and the Mass Media, CD (3.0 cr)
JOUR 4801 - Global Communication, IP (3.0 cr)
JOUR 5825 - World Communication Systems (3.0 cr)

Media Effects

Take 1 or more course(s) from the following:

JOUR 3006 - Visual Communication (3.0 cr)
JOUR 3008 - Mass Communication Processes and Structure (3.0 cr)
JOUR 4272 - Interactive Advertising (3.0 cr)
JOUR 5251 - Psychology of Advertising (3.0 cr)
JOUR 5316 - Theories of Visual Communication (3.0 cr)
JOUR 5501 - Communication and Public Opinion (3.0 cr)
JOUR 5541 - Mass Communication and Public Health (3.0 cr)

Media and Society

Take 1 or more course(s) from the following:

JOUR 3551 - Economics of New Media (3.0 cr)
JOUR 3745 - Mass Media and Popular Culture, CD, SSCI (3.0 cr)
JOUR 3771 - Mass Media Ethics: Moral Reasoning and Case Studies, C/PE (3.0 cr)
JOUR 3776 - Mass Communication Law (3.0 cr)
JOUR 3796 - Mass Media and Politics, C/PE (3.0 cr)
JOUR 4274W - Advertising in Society, WI (3.0 cr)
JOUR 4551 - New Media Culture (3.0 cr)
JOUR 4721 - Mass Media and U.S. Society (3.0 cr)
JOUR 5552 - Law of Internet Communications (3.0 cr)
JOUR 5725 - Management of Media Organizations (3.0 cr)
JOUR 5771 - Media Ethics: Principles and Practice, C/PE (3.0 cr)
JOUR 5777 - Contemporary Problems in Freedom of Speech and Press (3.0 cr)

Context Courses

Courses must be chosen in consultation with a faculty adviser. Directed study and specialized topics courses may be used to meet this requirement. With adviser approval, one to three professional (skills) courses are permitted, but not required.

Take 18 or more credit(s) from the following:

JOUR 3xxx
JOUR 4xxx
JOUR 5xxx

Professional Journalism Track

This track prepares students for careers in areas such as news reporting, editing, and producing.

Include one visual communication course in either the professional or context area of the program. Take either JOUR 3006 (context course) or JOUR 3102, JOUR 3321, or JOUR 3451 (professional courses). The capstone course and the required 4xxx or 5xxx professional course fulfill the CLA major project requirement.

Required Courses

Journalism Courses

JOUR 3101 - News Reporting and Writing (3.0 cr)

Capstone Course

JOUR 4171 - Capstone: Covering the Arts (3.0 cr)
or JOUR 4193 - Walter H Brovald and John Cameron Sim Community Newspaper Practicum (3.0 cr)
or JOUR 4451 - Capstone: Advanced Electronic News Writing and Reporting (3.0 cr)
or JOUR 4452 - Capstone: Electronic Newscast Producing (3.0 cr)
or JOUR 4992 - Capstone: Field Based Practicum (3.0 cr)
or JOUR 5131 - Capstone: In-Depth Reporting (3.0 cr)
or JOUR 5155 - Capstone: Advanced Reporting Methods (3.0 cr)
or JOUR 5174 - Capstone: Magazine Editing and Production (4.0 cr)

Professional Courses

Courses must be chosen in consultation with a faculty adviser. Professional courses from the strategic communication track may also be used (prerequisites must be met).

Take 12 or more credit(s) from the following:

JOUR 3102 - Visual Journalism (3.0 cr)
JOUR 3121 - Public Affairs Reporting (3.0 cr)
JOUR 3155 - Publications Editing (3.0 cr)
JOUR 3173W - Magazine Writing, WI (3.0 cr)
JOUR 3321 - Basic Media Graphics (3.0 cr)
JOUR 3451 - Electronic News Writing and Reporting (3.0 cr)
JOUR 3990 - Special Topics in Mass Communication: Professional (3.0 cr)

Take 3 or more credit(s) from the following:
JOUR 4171 - Capstone: Covering the Arts (3.0 cr)
JOUR 4193 - Walter H Brovald and John Cameron Sim Community Newspaper Practicum (3.0 cr)
JOUR 4302 - Electronic Photojournalism (3.0 cr)
JOUR 4451 - Capstone: Advanced Electronic News Writing and Reporting (3.0 cr)
JOUR 4452 - Capstone: Electronic Newscast Producing (3.0 cr)
JOUR 4992 - Capstone: Field Based Practicum (3.0 cr)
JOUR 5131 - Capstone: In-Depth Reporting (3.0 cr)
JOUR 5155 - Capstone: Advanced Reporting Methods (3.0 cr)
JOUR 5174 - Capstone: Magazine Editing and Production (4.0 cr)
JOUR 4990 - Special Topics in Mass Communication: Professional (3.0 cr)
JOUR 5990 - Special Topics in Mass Communication: Professional (3.0 cr)

Context Courses
Courses must be chosen in consultation with a faculty adviser. Directed study and specialized topics courses may be used to meet this requirement.

Take 9 or more credit(s) from the following:
JOUR 3xxx
JOUR 4xxx
JOUR 5xxx

Take 3 or more credit(s) from the following:
JOUR 4xxx
JOUR 5xxx

Professional Strategic Communication Track

This track prepares students for careers in advertising and public relations.

Include one visual communication course in either the professional or context area of the program. Take either JOUR 3006 (context course) or JOUR 3102, JOUR 3321, or JOUR 3451 (professional courses). JOUR 4259 and 4263 fulfill the CLA major project requirement.

Required Courses

Strategic Communication Courses
JOUR 3201 or JOUR 3202 are prerequisites for JOUR 3251 and JOUR 4259 and JOUR 4263

JOUR 3251 - Strategic Communication Research (3.0 cr)
JOUR 4259 - Cases in Strategic Planning and Thinking (3.0 cr)
JOUR 4263 - Strategic Communication Campaigns (4.0 cr)
JOUR 3201 - Principles of Strategic Communication: Advertising (3.0 cr)
or JOUR 3202 - Principles of Strategic Communication: Public Relations (3.0 cr)

Professional Courses
Courses must be chosen in consultation with a faculty adviser. Professional courses from the journalism track may also be used (prerequisites must be met).

Take 6 or more credit(s) from the following:
JOUR 3241 - Creative Strategy and Copywriting (3.0 cr)
JOUR 3279W - Public Relations Writing and Campaign Tactics, WI (3.0 cr)
JOUR 3321 - Basic Media Graphics (3.0 cr)
JOUR 4193 - Walter H Brovald and John Cameron Sim Community Newspaper Practicum (3.0 cr)
JOUR 4261 - Advertising: Media Strategy (3.0 cr)
JOUR 3990 - Special Topics in Mass Communication: Professional (3.0 cr)
JOUR 4990 - Special Topics in Mass Communication: Professional (3.0 cr)
JOUR 5990 - Special Topics in Mass Communication: Professional (3.0 cr)

Context Courses
Courses must be chosen in consultation with a faculty adviser. Directed study and specialized topics courses may be used to meet this requirement.

Take 9 or more credit(s) from the following:
JOUR 3xxx
JOUR 4xxx
JOUR 5xxx

Take 3 or more credit(s) from the following:
JOUR 4xxx
JOUR 5xxx

Latin B.A.

Classical and Near Eastern Studies

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 30.

Degree: Bachelor of Arts.

Modern "Romance" languages (French, Italian, Spanish, and Portugese) are derived from Latin, as is much English vocabulary. The Latin major allows students to enjoy a large range of literature written over more than a millennium and a half. It is concerned with the language and literature of the Roman Republic and Empire and later Latin literature from the Middle Ages to the Renaissance, as well as with Roman religion, history, archaeology, and art. It is in its essence interdisciplinary; it also has connections with the study of Greek and other ancient languages and cultures, as well as with the majors in classical civilization and religious studies, and minors such as medieval studies. Latin majors who intend to continue in classics graduate studies are encouraged to study Greek as well.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Required Courses for Admission

Preparatory Courses
Take one of the following course pairs:
LAT 1001 - Beginning Latin I (5.0 cr)
LAT 1002 - Beginning Latin II (5.0 cr)
or
LAT 1111H - Honors Course: Beginning Latin, H (3.0 cr)
LAT 1112H - Honors Course: Beginning Latin, Recitation, H (3.0 cr)
or
LAT 3111 - Intensive Latin (3.0 cr)
LAT 3112 - Intensive Latin, Recitation (3.0 cr)
or
Students with four years high school Latin should choose one of the following:
CNES 1003 - World of Rome, HP (3.0 cr)
or CNES 1042 - Greek and Roman Mythology, OH (4.0 cr)

Program Requirements

Students are required to take 4 semester(s) of Latin.

Required Courses

Major Courses
Courses must be at 3113 or above.

Take 14 or more credit(s) from the following:
LAT 3xxx
LAT 5xxx

Electives
Take at least one course in ancient culture at 3xxx or above. The remaining credits may be from any Latin or Greek courses at 3113 or above (excluding those used to fulfill the major courses requirement); any CNES course at 3xxx or above; or other courses in history, art, medieval studies, or other appropriate area, with the approval of the director of undergraduate studies.

Take 12 or more credit(s) from the following:
CNES 3xxx
CNES 4xxx
CNES 5xxx
GRK 3xxx
GRK 5xxx
LAT 3xxx
LAT 5xxx

Senior Project
Students who complete a major project for another CLA major must substitute 4 credits of Latin (3113 or above) or other appropriate coursework at 3xxx or above for the senior project.

LAT 3951W - Major Project, WI (4.0 cr)

Latin Minor

Classical and Near Eastern Studies

Requirements for this program are current for Fall 2006.

Required credits in this minor: 14.

The minor program permits those who have satisfied the language requirement with Latin to more widely read Latin authors of antiquity and the Middle Ages and to add to their knowledge of Roman and medieval civilization.

Admission Requirements

Students must complete 2 courses before admission to the program.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Required Courses for Admission

Preparatory Courses
Take one of the following course pairs:
LAT 1001 - Beginning Latin I (5.0 cr)
LAT 1002 - Beginning Latin II (5.0 cr)
or
LAT 1111H - Honors Course: Beginning Latin, H (3.0 cr)
LAT 1112H - Honors Course: Beginning Latin, Recitation, H (3.0 cr)
or
LAT 3111 - Intensive Latin (3.0 cr)
LAT 3112 - Intensive Latin, Recitation (3.0 cr)
and
CNES 1003 - World of Rome, HP (3.0 cr)
or CNES 1042 - Greek and Roman Mythology, OH (4.0 cr)
or CNES 1043

Program Requirements

Required Courses

Minor Courses
Students must take 11 credits in Latin courses at 3113 or above and 3 credits of related coursework at 3xxx or above, which may include courses in Latin, Greek, other ancient languages, classics courses, and other courses in ancient culture.

Take 11 or more credit(s) from the following:
LAT 3xxx
LAT 4xxx
LAT 5xxx
One ancient culture course of at least 3 credits, chosen in consultation with an adviser.

Take 3 or more credit(s) from the following:
CNES 3xxx
CNES 4xxx
CNES 5xxx
GRK 3xxx
GRK 4xxx
GRK 5xxx
HEBR 3xxx
HEBR 4xxx
HEBR 5xxx
LAT 3xxx
LAT 4xxx
LAT 5xxx

Latin American Studies Minor

Institute for Global Studies

Requirements for this program are current for Fall 2006.

Required credits in this minor: 15.

The minor requires successful completion of SPAN 1004 or PORT 1104 (or equivalent), plus five 3xxx-5xxx courses (totaling at least 15 credits) related to Latin America. Additional information may be found at http://igs.cla.umn.edu.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Students are required to take 4 semester(s) of Spanish, Portuguese.

Courses must be drawn from a minimum of three different departments. Courses must be taken A-F, with a grade of C- or better. The minor program must be approved by a global studies adviser.

Required Courses

Minor Courses
GEOG 4121W - Latin America, ENVT, IP, WI (4.0 cr)
HIST 3401W - Early Latin America to 1825, HP, IP, WI (4.0 cr)
or HIST 3402W - Modern Latin America 1825 to Present, HP, IP, WI (4.0 cr)
Two courses (6 cr) in the humanities related to Latin America as a region or a specific Latin American country, chosen in consultation with a global studies adviser.
One course (3 cr) focusing on any aspect of Latin America, chosen in consultation with a global studies adviser.

Learning Abroad Minor

Requirements for this program are current for Fall 2006.

Required credits in this minor: 12.

The minor helps students integrate their study abroad with supporting University coursework from a variety of disciplines. Since some of the required courses must be taken before departure, careful advance planning is essential. A detailed

explanation of requirements and guidance concerning course selection is available from the academic advisers at the Learning Abroad Center in 230 Heller Hall. For more information call 612-626-9000 or 888-700-UOFM, e-mail UMabroad@umn.edu, or visit www.UMabroad.umn.edu.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Students are required to take 4 semester(s) appropriate to country of study.

Required Courses

Minor Courses

COMM 3451 must be taken before departure to study abroad, and COMM 3452 must be taken upon return.

COMM 3451W - Intercultural Communication: Theory and Practice, IP, WI (3.0 cr)

COMM 3452W - Communication and the Intercultural Reentry, WI (3.0 cr)

Students must take at least 6 credits of 3xxx-5xxx courses focusing on the region or country of study.

Linguistics B.A.

Institute of Linguistics, ESL, and Slavic Languages and Literatures

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 35.

Degree: Bachelor of Arts.

Linguistics is the scientific study of human language. Courses explore the principles governing the structure of natural languages, how languages are acquired by children and adults, the role of language in human cognition and social interaction, and how languages change over time.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Students are required to take 4 semester(s) of any second language.

Required Courses

Major Courses

LING 4002 - Linguistic Analysis (3.0 cr)
LING 5201 - Syntax I (3.0 cr)
LING 5302 - Phonology I (3.0 cr)
LING 3001 - Introduction to Linguistics, SSCI (4.0 cr)
or LING 5001 - Introduction to Linguistics (4.0 cr)
LING 3601 - Historical Linguistics (3.0 cr)
or LING 5601 - Historical Linguistics (3.0 cr)
or complete one course in the history and/or structure of a language.

Electives

Any class with a LING designator that is not in Group A may be used to complete the 9 required credits for Group B, provided no more than 3 such credits are from a 1xxx class.

Up to 6 of the minimum 9 credits in Group B may be taken in an allied discipline, subject to the approval of the director of undergraduate studies.

Group A

Take 9 or more credit(s) from the following:

LING 5105 - Field Methods in Linguistics I (4.0 cr)
LING 5106 - Field Methods in Linguistics II (4.0 cr)
LING 5202 - Syntax II (3.0 cr)
LING 5205 - Semantics (3.0 cr)
LING 5206 - Linguistic Pragmatics (3.0 cr)
LING 5303 - Phonology II (3.0 cr)

Group B

Take 9 or more credit(s) from the following:

LING 1xxx
LING 2xxx
LING 3xxx
LING 4xxx
LING 5xxx

Senior Project

Complete LING 4901 with at least a grade of S. The usual requirement for this course is the revision and expansion of a paper written for another linguistics course, but it may involve an original research paper. Student complete this paper under the supervision of a professor. The paper must be approved by the director of undergraduate studies.

LING 4901W - Senior Project, WI (1.0 cr)

Linguistics Minor

Institute of Linguistics, ESL, and Slavic Languages and Literatures

Requirements for this program are current for Fall 2006.

Required credits in this minor: 16.

Linguistics is the scientific study of human language. Courses explore the principles governing the structure of natural languages, how languages are acquired by children and adults, the role of language in human cognition and social interaction, and how languages change over time.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

The minor program must by approved by the director of undergraduate studies.

Required Courses

Minor Courses

LING 3001 - Introduction to Linguistics, SSCI (4.0 cr)
LING 4002 - Linguistic Analysis (3.0 cr)
LING 5201 - Syntax I (3.0 cr)
or LING 5302 - Phonology I (3.0 cr)

Take 6 or more credit(s) from the following:

LING 3xxx
LING 4xxx
LING 5xxx

Mathematics B.A.

School of Mathematics

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 41.

Degree: Bachelor of Arts.

The School of Mathematics offers a program in the College of Liberal Arts leading to a bachelor of arts degree. The course of study is flexible and may be adapted to satisfy a wide variety of interests and needs. Students may prepare for graduate study in mathematics or may emphasize various fields of interest, such as preparation for secondary school teaching; actuarial science; or programs in applied mathematics including industrial mathematics, biology, mathematics applicable to computer science, and numerical analysis. Programs for the actuarial science, secondary school teaching, and computer science specializations earn a designation that appears on the diploma.

Admission Requirements

Students must complete 1 courses before admission to the program.

One 2xxx mathematics course must be completed before admission to the major.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Students are required to take 4 semester(s) of any second language.

Required Courses

Major Courses
Students in the honors program should substitute the honors calculus sequence (Math 1571H, 1572H, 2573H and 2574H) for these courses.

Calculus Sequence
MATH 1271 - Calculus I, MATH (4.0 cr)
or MATH 1371 - IT Calculus I, MATH (4.0 cr)
MATH 1272 - Calculus II (4.0 cr)
or MATH 1372 - IT Calculus II (4.0 cr)
MATH 2243 - Linear Algebra and Differential Equations (4.0 cr)
or MATH 2373 - IT Linear Algebra and Differential Equations (4.0 cr)
MATH 2263 - Multivariable Calculus (4.0 cr)
or MATH 2374 - IT Multivariable Calculus and Vector Analysis (4.0 cr)
MATH 2283 - Sequences, Series, and Foundations (3.0 cr)
or MATH 3283W - Sequences, Series, and Foundations: Writing Intensive, WI (4.0 cr)

Senior Project
Students should consult with a mathematics adviser prior to beginning the senior year.

MATH 4997W - Senior project (Writing Intensive), WI (1.0 cr)
or MATH 4995 - Senior Project for CLA (1.0 cr)
or Senior Project

Mathematics Options

Students are required to complete one of the following course groups.

Mathematics (No Specialization)
Students who do not choose one of the other specializations must complete the basic requirements listed here.

Take 6 or more course(s) including 2 or more sub-requirement(s) from the following:

Algebra Sequence
Take 2 or more course(s) from the following:
Take 1 or more course(s) from the following:
MATH 4281 - Introduction to Modern Algebra (4.0 cr)
MATH 5248 - Cryptology and Number Theory (4.0 cr)
MATH 5251 - Error-Correcting Codes, Finite Fields, Algebraic Curves (4.0 cr)
MATH 5285H - Honors: Fundamental Structures of Algebra I, H (4.0 cr)
MATH 5286H - Honors: Fundamental Structures of Algebra II, H (4.0 cr)
MATH 5385 - Introduction to Computational Algebraic Geometry (4.0 cr)
Take 0 or more course(s) from the following:
MATH 4242 - Applied Linear Algebra (4.0 cr)
MATH 5705 - Enumerative Combinatorics (4.0 cr)
MATH 5707 - Graph Theory and Non-enumerative Combinatorics (4.0 cr)
MATH 5711 - Linear Programming and Combinatorial Optimization (4.0 cr)
MATH 5485 - Introduction to Numerical Methods I (4.0 cr)

Analysis Sequence
Take 2 or more course(s) from the following:
MATH 4606 - Advanced Calculus (4.0 cr)
MATH 5486 - Introduction To Numerical Methods II (4.0 cr)
MATH 5525 - Introduction to Ordinary Differential Equations (4.0 cr)
MATH 5535 - Dynamical Systems and Chaos (4.0 cr)
MATH 5583 - Complex Analysis (4.0 cr)
MATH 5587 - Elementary Partial Differential Equations I (4.0 cr)
MATH 5588 - Elementary Partial Differential Equations II (4.0 cr)
MATH 5652 - Introduction to Stochastic Processes (4.0 cr)
MATH 5654 - Prediction and Filtering (4.0 cr)
MATH 5615H - Honors: Introduction to Analysis I, H (4.0 cr)
MATH 5616H - Honors: Introduction to Analysis II, H (4.0 cr)
MATH 5651 - Basic Theory of Probability and Statistics (4.0 cr)
or STAT 5101 - Theory of Statistics I (4.0 cr)

Additional Electives
Take 0 or more course(s) from the following:
MATH 4xxx
MATH 5xxx

-OR-

Actuarial Science Specialization
Complete the requirements for the Actuarial Science subplan.

-OR-

Mathematics Education Specialization
Complete the requirements for the Education subplan.

-OR-

Computer Applications Specialization
Complete the requirements for the Computer Applications subplan.

Program Sub-plans

A sub-plan is not required for this program.

Actuarial Science

Required Courses

Math and Computer Science

MATH 4065 - Theory of Interest (3.0 cr)
MATH 5067 - Actuarial Mathematics I (4.0 cr)
MATH 5068 - Actuarial Mathematics II (4.0 cr)
CSCI 1103 - Introduction to Computer Programming in Java (4.0 cr)
or CSCI 1113 - Introduction to C/C++ Programming for Scientists and Engineers (4.0 cr)
MATH 5651 - Basic Theory of Probability and Statistics (4.0 cr)
or STAT 5101 - Theory of Statistics I (4.0 cr)
MATH 5652 - Introduction to Stochastic Processes (4.0 cr)
or STAT 5102 - Theory of Statistics II (4.0 cr)
MATH 4242 - Applied Linear Algebra (4.0 cr)

Take 1 or more course(s) from the following:

MATH 4281 - Introduction to Modern Algebra (4.0 cr)
MATH 5248 - Cryptology and Number Theory (4.0 cr)
MATH 5251 - Error-Correcting Codes, Finite Fields, Algebraic Curves (4.0 cr)
MATH 5285H - Honors: Fundamental Structures of Algebra I, H (4.0 cr)
MATH 5286H - Honors: Fundamental Structures of Algebra II, H (4.0 cr)
MATH 5385 - Introduction to Computational Algebraic Geometry (4.0 cr)
MATH 5711 - Linear Programming and Combinatorial Optimization (4.0 cr)

Economics and Business

ACCT 2050 - Introduction to Financial Reporting (4.0 cr)
ECON 3101 - Intermediate Microeconomics (4.0 cr)
FINA 3001 - Finance Fundamentals (3.0 cr)
ECON 4751 - Financial Economics (3.0 cr)
or FINA 4241 - Corporate Financing Decisions (4.0 cr)

Take one of the following pairs of courses.

ECON 1101 - Principles of Microeconomics, IP, SSCI (4.0 cr)
ECON 1102 - Principles of Macroeconomics, IP, SSCI (4.0 cr)
or
ECON 1104 - Principles of Microeconomics, IP, SSCI (4.0 cr)
ECON 1105 - Principles of Macroeconomics, IP, SSCI (4.0 cr)

Take 2 or more course(s) from the following:

INS 4100 - Corporate Risk Management (2.0 cr)
INS 4101 - Employee Benefits (2.0 cr)
INS 4200 - Insurance Theory and Practice (2.0 cr)

Computer Applications

Required Courses

Computing Applications

MATH 5486 may be used to count towards the analysis distribution requirement and MATH 5485 towards the algebra requirement.

CSCI 2011 - Discrete Structures of Computer Science (4.0 cr)
MATH 5165 - Mathematical Logic I (4.0 cr)
MATH 5485 - Introduction to Numerical Methods I (4.0 cr)
MATH 5486 - Introduction To Numerical Methods II (4.0 cr)
CSCI 1103 - Introduction to Computer Programming in Java (4.0 cr)
or CSCI 1113 - Introduction to C/C++ Programming for Scientists and Engineers (4.0 cr)
or CSCI 1901 - Structure of Computer Programming I (4.0 cr)

Additional Mathematics

Take 3 or more course(s) from the following:

Additional Algebra Course

Take 1 or more course(s) from the following:

MATH 4281 - Introduction to Modern Algebra (4.0 cr)
MATH 5248 - Cryptology and Number Theory (4.0 cr)
MATH 5251 - Error-Correcting Codes, Finite Fields, Algebraic Curves (4.0 cr)
MATH 5285H - Honors: Fundamental Structures of Algebra I, H (4.0 cr)
MATH 5286H - Honors: Fundamental Structures of Algebra II, H (4.0 cr)
MATH 5385 - Introduction to Computational Algebraic Geometry (4.0 cr)

Additional Analysis Course

Take 1 or more course(s) from the following:

MATH 4606 - Advanced Calculus (4.0 cr)
MATH 5525 - Introduction to Ordinary Differential Equations (4.0 cr)
MATH 5535 - Dynamical Systems and Chaos (4.0 cr)
MATH 5583 - Complex Analysis (4.0 cr)
MATH 5587 - Elementary Partial Differential Equations I (4.0 cr)
MATH 5588 - Elementary Partial Differential Equations II (4.0 cr)
MATH 5652 - Introduction to Stochastic Processes (4.0 cr)
MATH 5654 - Prediction and Filtering (4.0 cr)
MATH 5615H - Honors: Introduction to Analysis I, H (4.0 cr)
MATH 5616H - Honors: Introduction to Analysis II, H (4.0 cr)
MATH 5651 - Basic Theory of Probability and Statistics (4.0 cr)
or STAT 5101 - Theory of Statistics I (4.0 cr)

Upper Division Computer Science

Take 3 or more course(s) from the following:

CSCI 4041 - Algorithms and Data Structures (4.0 cr)
CSCI 5107 - Fundamentals of Computer Graphics 1 (3.0 cr)
CSCI 5108 - Fundamentals of Computer Graphics II (3.0 cr)
CSCI 5403 - Computational Complexity (3.0 cr)
CSCI 5421 - Advanced Algorithms and Data Structures (3.0 cr)
CSCI 5511 - Artificial Intelligence I (3.0 cr)
CSCI 5521 - Pattern Recognition (3.0 cr)
CSCI 8442 - Computational Geometry and Applications (3.0 cr)
CSCI 5512W - Artificial Intelligence II, WI (3.0 cr)
or CSCI 5519 - Artificial Intelligence II (non-WI) (3.0 cr)

Education

Seven math courses are chosen specifically for preparation to teach in secondary education, including two courses from the algebra list and two courses from the analysis list. MATH 4707 will be accepted as an algebra course only for students completing this specialization.

Required Courses

Mathematics

These courses fulfill the both the algebra and analysis requirements.

MATH 5335 - Geometry I (4.0 cr)
MATH 4242 - Applied Linear Algebra (4.0 cr)
or MATH 4281 - Introduction to Modern Algebra (4.0 cr)
or MATH 5285H - Honors: Fundamental Structures of Algebra I, H (4.0 cr)
MATH 4707 - Introduction to Combinatorics and Graph Theory (4.0 cr)
or MATH 5705 - Enumerative Combinatorics (4.0 cr)
or MATH 5707 - Graph Theory and Non-enumerative Combinatorics (4.0 cr)
MATH 5651 - Basic Theory of Probability and Statistics (4.0 cr)
or STAT 5101 - Theory of Statistics I (4.0 cr)

Take 3 or more course(s) from the following:

MATH 4xxx
MATH 5xxx

Mathematics Minor

Requirements for this program are current for Fall 2006.

Required credits in this minor: 20 to 26.

Students complete all the lower division requirements in the mathematics major, plus two upper division electives. See the mathematics major description for information on the utility of a mathematics degree.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Required Courses

Minor Courses

MATH 1371 - IT Calculus I, MATH (4.0 cr)
or MATH 1271 - Calculus I, MATH (4.0 cr)
or MATH 1281 - Calculus with Biological Emphasis I, MATH (4.0 cr)
MATH 1372 - IT Calculus II (4.0 cr)
or MATH 1272 - Calculus II (4.0 cr)
or MATH 1282 - Calculus With Biological Emphasis II (4.0 cr)
MATH 2373 - IT Linear Algebra and Differential Equations (4.0 cr)
or MATH 2243 - Linear Algebra and Differential Equations (4.0 cr)
MATH 2374 - IT Multivariable Calculus and Vector Analysis (4.0 cr)
or MATH 2263 - Multivariable Calculus (4.0 cr)
MATH 2283 - Sequences, Series, and Foundations (3.0 cr)
or MATH 3283W - Sequences, Series, and Foundations: Writing Intensive, WI (4.0 cr)

or

Honors Sequence

MATH 1571H - Honors Calculus I, MATH, H (4.0 cr)
MATH 1572H - Honors Calculus II, H (4.0 cr)
MATH 2573H - Honors Calculus III, H (4.0 cr)
MATH 2574H - Honors Calculus IV, H (4.0 cr)

Electives

Complete two MATH courses or STAT 5101 and 5102.

Take 2 or more course(s) from the following:

MATH 3xxx
MATH 4xxx
MATH 5xxx
STAT 5101 - Theory of Statistics I (4.0 cr)
STAT 5102 - Theory of Statistics II (4.0 cr)

Medieval Studies Minor

Center for Medieval Studies

Requirements for this program are current for Fall 2006.

Required credits in this minor: 15.

The minor covers the period of roughly between 300 and 1500 B.C.E. It includes the history, art history, theater and music history, literature, and languages of the period, including Latin, French, Italian, English, Old English, Scandinavian, and German.

The program allows students with an interest in the medieval period or who are planning to pursue graduate work in one of the related areas to concentrate their studies as a coherent whole.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Required Courses

Minor Courses

Courses must be 3xxx, 4xxx, or 5xxx, chosen from approved course lists in consultation with the director of undergraduate studies of CLA's Center for Medieval Studies. All applicable courses originate in other departments. Many of these are cross-listed as MEST 3610, MEST 4610, and MEST 5610. A list of appropriate courses is available at the Center for Medieval Studies.

Microbiology B.A.

Microbiology

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 66.

Degree: Bachelor of Arts.

Microbiology examines the nature and activities of microorganisms, the distinctive micropscopic life forms that recycle the elements in aquatic, atmospheric, and soil environments. The field has applications for fields of industry, agriculture, and medicine. As remarkably useful model systems for research, microorganisms play a key role in the development of modern biology. The program prepares students for graduate study or professional work in microbiology as well as in related biological fields.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Students are required to take 4 semester(s) of any second language.

Required Courses

General and Organismal Biology

Choose either sequence A or B or C.

Sequence A

BIOL 1001 - Introductory Biology I: Evolutionary and Ecological Perspectives, BIOL SCI/L, ENVT (4.0 cr)
BIOL 1002W - Introductory Biology II: Molecular, Cellular, and Developmental Perspectives, WI (5.0 cr)

or

Sequence B

BIOL 1009 - General Biology, BIOL SCI/L (4.0 cr)

Take the following course or course pair:

BIOL 2012 - General Zoology (4.0 cr)

or

BIOL 3211 - Animal Physiology (3.0 cr)
BIOL 2005 - Animal Diversity Laboratory (1.0 cr)

or

Sequence C

BIOL 1009 - General Biology, BIOL SCI/L (4.0 cr)

Take either BIOL 2022 or 3007W, or both BIOL 3002 and 3005W.
BIOL 2022 - General Botany (3.0 cr)
or BIOL 3007W - Plant Biology: Diversity and Adaptation, WI (4.0 cr)
or
BIOL 3002 - Plant Biology: Function (2.0 cr)
BIOL 3005W - Plant Function Laboratory, WI (2.0 cr)

Mathematics
MATH 1271 - Calculus I, MATH (4.0 cr)
or MATH 1281 - Calculus with Biological Emphasis I, MATH (4.0 cr)
MATH 1272 - Calculus II (4.0 cr)
or MATH 1282 - Calculus With Biological Emphasis II (4.0 cr)

Chemistry
CHEM 1021 - Chemical Principles I, ENVT, PHYS SCI/L (4.0 cr)
CHEM 1022 - Chemical Principles II, ENVT, PHYS SCI/L (4.0 cr)
CHEM 2301 - Organic Chemistry I (3.0 cr)
CHEM 2302 - Organic Chemistry II (3.0 cr)
CHEM 2311 - Organic Lab (4.0 cr)

Physics
PHYS 1201W - Introductory Physics for Biology and Pre-medicine I, PHYS SCI/L, WI (5.0 cr)
or PHYS 1301W - Introductory Physics for Science and Engineering I, PHYS SCI/L, WI (4.0 cr)
PHYS 1202W - Introductory Physics for Biology and Pre-medicine II, PHYS SCI/L, WI (5.0 cr)
or PHYS 1302W - Introductory Physics for Science and Engineering II, PHYS SCI/L, WI (4.0 cr)

Major Core Curriculum
BIOL 4003 - Genetics (3.0 cr)
MICB 3301 - Biology of Microorganisms (5.0 cr)
BIOC 3021 - Biochemistry (3.0 cr)
or BIOC 4331 - Biochemistry I: Structure, Catalysis, and Metabolism in Biological Systems (4.0 cr)

Electives
Take 4 or more course(s) from the following:
MICB 4111 - Microbial Physiology and Diversity (3.0 cr)
MICB 4121 - Microbial Ecology and Applied Microbiology (3.0 cr)
MICB 4131 - Immunology (3.0 cr)
MICB 4151 - Molecular and Genetic Bases for Microbial Diseases (3.0 cr)
MICB 4141W - Biology, Genetics, and Pathogenesis of Viruses: Writing Intensive, WI (4.0 cr)
or MICB 4171 - Biology, Genetics, and Pathogenesis of Viruses (3.0 cr)

Lab Electives
Choose Option A or B. If Option B is chosen, MICB 4794W/4994 must be taken for 6 credits.

Option A
MICB 4215 - Advanced Laboratory: Microbial Physiology and Diversity (3.0 cr)
MICB 4235 - Advanced Laboratory: Virology, Immunology, and Microbial Genetics (3.0 cr)
Take 6 or more credit(s) from the following:
MICB 4993 - Directed Studies (1.0-7.0 cr)
MICB 4994 - Directed Research (1.0-7.0 cr)
or

Option B
MICB 4994 - Directed Research (1.0-7.0 cr)
MICB 4215 - Advanced Laboratory: Microbial Physiology and Diversity (3.0 cr)
or MICB 4235 - Advanced Laboratory: Virology, Immunology, and Microbial Genetics (3.0 cr)

Final Project
Complete 6 credits in one of the following:
MICB 4993 - Directed Studies (1.0-7.0 cr)
or MICB 4994 - Directed Research (1.0-7.0 cr)

Music B.Mus.

School of Music

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 78.

Degree: Bachelor of Music.

The B.Mus. in performance is a professional degree in which music courses comprise approximately 75 percent of the program.

Admission Requirements

Admission to a music program is contingent on passing an audition. Auditions are highly competitive with students normally having studied for a number of years: a minimum of three to four years in voice, guitar, or on an orchestral or band instrument, eight to twelve years on piano. Auditions are held throughout the academic year. Incoming freshmen normally take the audition during the winter of their senior year of high school; transfer students, one semester prior to the term in which they plan to enroll.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Required Courses

Music Theory and Ear Training
MUS 1501 - Musical Theory I (3.0 cr)
MUS 1502 - Musical Theory II (3.0 cr)
MUS 1511 - Ear Training 1 (1.0 cr)
MUS 1512 - Ear Training II (1.0 cr)
MUS 3501 - Theory and Analysis of Tonal Music III (3.0 cr)
MUS 3502 - Theory and Analysis of Tonal Music IV (3.0 cr)
MUS 3511 - Ear Training III (1.0 cr)
MUS 3512 - Ear Training IV (1.0 cr)
MUS 4504 - Intensive Theory and Analysis of 20th-Century Music (4.0 cr)
or MUS 4502 - 18th-Century Counterpoint (3.0 cr)
or MUS 4503 - Theory and Analysis of Tonal Music V (3.0 cr)
or MUS 4505 - Jazz Theory (3.0 cr)
MUS 5541 - 16th Century Counterpoint (3.0 cr)

Musicology/Ethnomusicology
MUS 1801W - Music, Society, and Cultures, IP, WI (3.0 cr)
MUS 3601W - History of Western Music I, WI (3.0 cr)
MUS 3602W - History of Western Music II, WI (3.0 cr)
MUS 3603W - History of Western Music III, WI (3.0 cr)

Conducting
MUS 3401 - Basic Conducting (2.0 cr)

Recital
MUS 901 - Junior Recital (0.0 cr)
MUS 951 - Senior Recital (0.0 cr)

Instrumental/Vocal Specializations

Students are required to complete one of the following course groups.

Classical Guitar

Credit requirements in each course group must be satisfied by taking the courses for multiple semesters.

Keyboard

Take either MUS 1155 or both MUS 1151-1152.
MUS 1155 - Keyboard Skills I (2.0 cr)
MUS 1151 - Piano: Class Lessons I (2.0 cr)
MUS 1152 - Piano: Class Lessons II (2.0 cr)

Applied Music

Take 32 or more credit(s).

Take 8 or more credit(s) from the following:
MUSA 1323 - Guitar—Major (2.0-4.0 cr)

Take 8 or more credit(s) from the following:
MUSA 2323 - Guitar-Performance Major (2.0-4.0 cr)

Take 16 or more credit(s) from the following:
MUSA 3323 - Guitar—Major (2.0-4.0 cr)

Ensemble

Take 2 or more course(s) from the following:
MUS 3410 - University Wind Bands (1.0 cr)
MUS 3420 - Orchestra (1.0 cr)
MUS 3230 - Chorus (1.0 cr)
MUS 5240 - Chamber Singers (1.0 cr)
MUS 5280 - Opera Theatre (2.0 cr)

Take 2 or more course(s) from the following:
MUS 3440 - Chamber Ensemble (1.0 cr)

Electives

Take 1 or more credit(s) from the following:
MUS 1xxx
MUS 2xxx
MUS 3xxx

-OR-

Harp

Credit requirements in each course group must be satisfied by taking the courses for multiple semesters.

Keyboard

Take either MUS 1155 or both MUS 1151-1152.
MUS 1155 - Keyboard Skills I (2.0 cr)
MUS 1151 - Piano: Class Lessons I (2.0 cr)
MUS 1152 - Piano: Class Lessons II (2.0 cr)

Applied Music

Take 32 or more credit(s) from the following:

Take 8 or more credit(s) from the following:
MUSA 1322 - Harp—Major (2.0-4.0 cr)

Take 8 or more credit(s) from the following:
MUSA 2322 - Harp-Performance Major (2.0-4.0 cr)

Take 16 or more credit(s) from the following:
MUSA 3322 - Harp—Major (2.0-4.0 cr)

Ensemble

Take 2 or more course(s) from the following:
MUS 3410 - University Wind Bands (1.0 cr)
MUS 3420 - Orchestra (1.0 cr)

Electives

Take 1 or more credit(s) from the following:
MUS 1xxx
MUS 2xxx
MUS 3xxx

-OR-

Organ

Credit requirements in each course group must be satisfied by taking the courses for multiple semesters.

Keyboard

MUS 1151 - Piano: Class Lessons I (2.0 cr)
MUS 1152 - Piano: Class Lessons II (2.0 cr)
MUS 5151 - Organ Literature I (3.0 cr)
MUS 5152 - Organ Literature II (3.0 cr)

Applied Music

Take 32 or more credit(s) from the following:

Take 8 or more credit(s) from the following:
MUSA 1303 - Organ—Major (2.0-4.0 cr)

Take 8 or more credit(s) from the following:
MUSA 2303 - Organ—Performance Major (2.0-4.0 cr)

Take 16 or more credit(s) from the following:
MUSA 3303 - Organ—Major (2.0-4.0 cr)

Ensemble

Take 6 or more course(s) from the following:
MUS 3230 - Chorus (1.0 cr)
MUS 5240 - Chamber Singers (1.0 cr)

-OR-

Piano

Credit requirements in each course group must be satisfied by taking the courses for multiple semesters.

Keyboard

MUS 1155 - Keyboard Skills I (2.0 cr)
MUS 1156 - Keyboard Skills II (2.0 cr)
MUS 5101 - Piano Pedagogy I (2.0 cr)
MUS 5181 - Advanced Piano Literature I (2.0 cr)
or MUS 5182 - Advanced Piano Literature II (2.0 cr)

Applied Music

Take 32 or more credit(s) from the following:

Take 8 or more credit(s) from the following:
MUSA 1301 - Piano—Major (2.0-4.0 cr)

Take 8 or more credit(s) from the following:
MUSA 2301 - Piano-Performance Major (2.0-4.0 cr)

Take 16 or more credit(s) from the following:
MUSA 3301 - Piano—Major (2.0-4.0 cr)

Ensemble

Take 4 or more course(s) from the following:
MUS 3150 - Accompanying Skills (1.0 cr)
MUS 3440 - Chamber Ensemble (1.0 cr)

Electives

Take 1 or more credit(s) from the following:
MUS 1xxx
MUS 2xxx
MUS 3xxx
-OR-

String, Woodwind, Brass, Percussion

Credit requirements in each course group must be satisfied by taking the courses for multiple semesters.

Keyboard

Take either MUS 1155 or both MUS 1151-1152.
MUS 1155 - Keyboard Skills I (2.0 cr)
MUS 1151 - Piano: Class Lessons I (2.0 cr)
MUS 1152 - Piano: Class Lessons II (2.0 cr)

Applied Music

Take 32 or more credit(s) from the following:

Take 8 or more credit(s) from the following:
MUSA 1305 - Violin—Major (2.0-4.0 cr)
MUSA 1306 - Viola—Major (2.0-4.0 cr)
MUSA 1307 - Cello—Major (2.0-4.0 cr)
MUSA 1308 - Double Bass—Major (2.0-4.0 cr)
MUSA 1309 - Flute-Major (2.0-4.0 cr)
MUSA 1311 - Oboe—Major (2.0-4.0 cr)
MUSA 1312 - Clarinet—Major (2.0-4.0 cr)
MUSA 1313 - Saxophone—Major (2.0-4.0 cr)
MUSA 1314 - Bassoon—Major (2.0-4.0 cr)
MUSA 1315 - French Horn—Major (2.0-4.0 cr)
MUSA 1316 - Trumpet—Major (2.0-4.0 cr)
MUSA 1317 - Trombone—Major (2.0-4.0 cr)
MUSA 1318 - Euphonium—Major (2.0-4.0 cr)
MUSA 1319 - Tuba—Major (2.0-4.0 cr)
MUSA 1321 - Percussion—Major (2.0-4.0 cr)

Take 8 or more credit(s) from the following:
MUSA 2305 - Violin-Performance Major (2.0-4.0 cr)
MUSA 2306 - Viola-Performance Major (2.0-4.0 cr)
MUSA 2307 - Cello-Performance Major (2.0-4.0 cr)
MUSA 2308 - Double Bass—Performance Major (2.0-4.0 cr)
MUSA 2309 - Flute-Performance Major (2.0-4.0 cr)
MUSA 2311 - Oboe—Performance Major (2.0-4.0 cr)
MUSA 2312 - Clarinet-Performance Major (2.0-4.0 cr)
MUSA 2313 - Saxophone-Performance Major (2.0-4.0 cr)
MUSA 2314 - Bassoon-Performance Major (2.0-4.0 cr)
MUSA 2315 - French Horn-Performance Major (2.0-4.0 cr)
MUSA 2316 - Trumpet-Performance Major (2.0-4.0 cr)
MUSA 2317 - Trombone-Performance Major (2.0-4.0 cr)
MUSA 2318 - Euphonium—Performance Major (2.0-4.0 cr)
MUSA 2319 - Tuba-Performance Major (2.0-4.0 cr)
MUSA 2321 - Percussion—Performance Major (2.0-4.0 cr)

Take 16 or more credit(s) from the following:
MUSA 3305 - Violin—Major (2.0-4.0 cr)
MUSA 3306 - Viola—Major (2.0-4.0 cr)
MUSA 3307 - Cello—Major (2.0-4.0 cr)
MUSA 3308 - Double Bass—Major (2.0-4.0 cr)
MUSA 3309 - Flute—Major (2.0-4.0 cr)
MUSA 3311 - Oboe—Major (2.0-4.0 cr)
MUSA 3312 - Clarinet—Major (2.0-4.0 cr)
MUSA 3313 - Saxophone—Major (2.0-4.0 cr)
MUSA 3314 - Bassoon—Major (2.0-4.0 cr)
MUSA 3315 - French Horn—Major (2.0-4.0 cr)
MUSA 3316 - Trumpet—Major (2.0-4.0 cr)
MUSA 3317 - Trombone—Major (2.0-4.0 cr)
MUSA 3318 - Euphonium—Major (2.0-4.0 cr)
MUSA 3319 - Tuba—Major (2.0-4.0 cr)
MUSA 3321 - Percussion—Major (2.0-4.0 cr)

Band or Orchestra

Take 8 or more course(s) from the following:
MUS 3410 - University Wind Bands (1.0 cr)
MUS 3420 - Orchestra (1.0 cr)

Chamber Ensemble

Take 4 or more course(s) from the following:
MUS 3340 - Jazz Ensemble (1.0 cr)
MUS 3350 - Jazz Combo (1.0 cr)
MUS 3440 - Chamber Ensemble (1.0 cr)
MUS 5430 - New Music Ensemble (1.0 cr)
MUS 5470 - Woodwind Chamber Ensemble (1.0 cr)
MUS 5480 - University Brass Choir (1.0 cr)
MUS 5490 - Percussion Ensemble (1.0 cr)

-OR-

Voice

Credit requirements in each course group must be satisfied by taking the courses for multiple semesters.

Keyboard

Take either MUS 1155 or both MUS 1151-1152.
MUS 1155 - Keyboard Skills I (2.0 cr)
MUS 1151 - Piano: Class Lessons I (2.0 cr)
MUS 1152 - Piano: Class Lessons II (2.0 cr)

Ensemble

Take 8 or more course(s) from the following including 4 semesters of 3230 or 5240:
MUS 3230 - Chorus (1.0 cr)
MUS 5240 - Chamber Singers (1.0 cr)
MUS 5250 - Opera Workshop and Ensemble (1.0 cr)
MUS 5280 - Opera Theatre (2.0 cr)

Applied Music

Take 32 or more credit(s) from the following:

Take 8 or more credit(s) from the following:
MUSA 1304 - Voice—Major (2.0-4.0 cr)

Take 8 or more credit(s) from the following:
MUSA 2304 - Voice-Performance Major (2.0-4.0 cr)

Take 16 or more credit(s) from the following:
MUSA 3304 - Voice—Major (2.0-4.0 cr)

Diction and Vocal Literature

MUS 3241 - Vocal Literature (German Lieder) and Pedagogy (1.0 cr)
MUS 3242 - Vocal Literature (French Melodie) and Pedagogy (1.0 cr)
MUS 3261 - Italian Diction for Singers (1.0 cr)
MUS 3262 - English Diction for Singers (1.0 cr)
MUS 3263 - German Diction for Singers (1.0 cr)
MUS 3264 - French Diction for Singers (1.0 cr)

Language

FREN 1001 - Beginning French (5.0 cr)
GER 1001 - Beginning German (5.0 cr)
ITAL 1001 - Beginning Italian (5.0 cr)

Music B.A.

School of Music

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 53.

Degree: Bachelor of Arts.

The B.A. program is for students who wish to major in music within a broad liberal arts degree program.

Admission Requirements

Admission to a music program is contingent on passing an audition. Auditions are highly competitive with students normally having studied for a number of years: a minimum of

three to four years in voice, guitar, or on an orchestral or band instrument, eight to twelve years on piano. Auditions are held throughout the academic year. Incoming freshmen normally take the audition during the winter of their senior year of high school; transfer students, one semester prior to the term in which they plan to enroll.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Students are required to take 4 semester(s) of any second language.

Required Courses

Music Theory and Ear Training
MUS 1501 - Musical Theory I (3.0 cr)
MUS 1502 - Musical Theory II, (3.0 cr)
MUS 1511 - Ear Training 1 (1.0 cr)
MUS 1512 - Ear Training II (1.0 cr)
MUS 3501 - Theory and Analysis of Tonal Music III (3.0 cr)
MUS 3502 - Theory and Analysis of Tonal Music IV (3.0 cr)
MUS 3511 - Ear Training III (1.0 cr)
MUS 3512 - Ear Training IV (1.0 cr)
MUS 4504 - Intensive Theory and Analysis of 20th-Century Music (4.0 cr)
MUS 4501 - 16th-Century Counterpoint (3.0 cr)
or MUS 4502 - 18th-Century Counterpoint (3.0 cr)
or MUS 4503 - Theory and Analysis of Tonal Music V (3.0 cr)
or MUS 4505 - Jazz Theory (3.0 cr)

Musicology/Ethnomusicology
MUS 1801W - Music, Society, and Cultures, IP, WI (3.0 cr)
MUS 3601W - History of Western Music I, WI (3.0 cr)
MUS 3602W - History of Western Music II, WI (3.0 cr)
MUS 3603W - History of Western Music III, WI (3.0 cr)

Keyboard
For non-keyboard majors, MUS 1155 may be substituted for MUS 1151-1152. Keyboard majors take 1155-1156.

MUS 1155 - Keyboard Skills I (2.0 cr)
MUS 1151 - Piano: Class Lessons I (2.0 cr)
MUS 1152 - Piano: Class Lessons II (2.0 cr)
MUS 1155 - Keyboard Skills I (2.0 cr)
MUS 1156 - Keyboard Skills II (2.0 cr)

Applied Music
MUSA 13xx (major instrument or voice) fulfills this requirement. Students must take four semesters at 2 credits per term (8 credits).

Take 8 or more credit(s) from the following:
MUSA 1301 - Piano—Major (2.0-4.0 cr)
MUSA 1302 - Harpsichord—Major (2.0-4.0 cr)
MUSA 1303 - Organ—Major (2.0-4.0 cr)
MUSA 1304 - Voice—Major (2.0-4.0 cr)
MUSA 1305 - Violin—Major (2.0-4.0 cr)
MUSA 1306 - Viola—Major (2.0-4.0 cr)
MUSA 1307 - Cello—Major (2.0-4.0 cr)
MUSA 1308 - Double Bass—Major (2.0-4.0 cr)
MUSA 1309 - Flute-Major (2.0-4.0 cr)
MUSA 1311 - Oboe—Major (2.0-4.0 cr)
MUSA 1312 - Clarinet—Major (2.0-4.0 cr)
MUSA 1313 - Saxophone—Major (2.0-4.0 cr)
MUSA 1314 - Bassoon—Major (2.0-4.0 cr)
MUSA 1315 - French Horn—Major (2.0-4.0 cr)
MUSA 1316 - Trumpet—Major (2.0-4.0 cr)
MUSA 1317 - Trombone—Major (2.0-4.0 cr)
MUSA 1318 - Euphonium—Major (2.0-4.0 cr)
MUSA 1319 - Tuba—Major (2.0-4.0 cr)
MUSA 1321 - Percussion—Major (2.0-4.0 cr)
MUSA 1322 - Harp—Major (2.0-4.0 cr)

Ensembles
Students must participate in four semesters, two of which must be band, chorus, or orchestra.

Take 4 or more course(s) from the following:
MUS 5240 - Chamber Singers (1.0 cr)
MUS 5280 - Opera Theatre (2.0 cr)
Take 2 or more course(s) from the following:
MUS 3410 - University Wind Bands (1.0 cr)
MUS 3230 - Chorus (1.0 cr)
MUS 3420 - Orchestra (1.0 cr)

Electives
Courses from MUS 55xx, 56xx,or 58xx fulfill this requirement.

Take 2 or more credit(s) from the following:
MUS 5xxx

Research and Senior Project
MUS 3995 - Major Project (1.0 cr)
MUS 5611 - Resources for Music Research (3.0 cr)

Music Minor

School of Music

Requirements for this program are current for Fall 2006.

Required credits in this minor: 23.

A minor in music is available for students majoring in other fields.

Admission Requirements

An entrance audition identical to that for a music major is required.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Required Courses

Music Theory and Ear Training
MUS 1501 - Musical Theory I (3.0 cr)
MUS 1502 - Musical Theory II, (3.0 cr)

Musicology/Ethnomusicology
Take 2 or more course(s) from the following:
MUS 1801W - Music, Society, and Cultures, IP, WI (3.0 cr)
MUS 3601W - History of Western Music I, WI (3.0 cr)
MUS 3602W - History of Western Music II, WI (3.0 cr)
MUS 3603W - History of Western Music III, WI (3.0 cr)

Keyboard
For non-keyboard minors, MUS 1155 may be substituted for MUS 1151-1152. Keyboard minors take 1155-1156.

MUS 1155 - Keyboard Skills I (2.0 cr)
MUS 1151 - Piano: Class Lessons I (2.0 cr)
MUS 1152 - Piano: Class Lessons II (2.0 cr)

MUS 1155 - Keyboard Skills I (2.0 cr)
MUS 1156 - Keyboard Skills II (2.0 cr)

Applied Music
Students must take two semesters at 2 credits per term.

Take 4 or more credit(s) from the following:
MUSA 1301 - Piano—Major (2.0-4.0 cr)
MUSA 1302 - Harpsichord—Major (2.0-4.0 cr)
MUSA 1303 - Organ—Major (2.0-4.0 cr)
MUSA 1304 - Voice—Major (2.0-4.0 cr)
MUSA 1305 - Violin—Major (2.0-4.0 cr)
MUSA 1306 - Viola—Major (2.0-4.0 cr)
MUSA 1307 - Cello—Major (2.0-4.0 cr)
MUSA 1308 - Double Bass—Major (2.0-4.0 cr)
MUSA 1309 - Flute-Major (2.0-4.0 cr)
MUSA 1311 - Oboe—Major (2.0-4.0 cr)
MUSA 1312 - Clarinet—Major (2.0-4.0 cr)
MUSA 1313 - Saxophone—Major (2.0-4.0 cr)
MUSA 1314 - Bassoon—Major (2.0-4.0 cr)
MUSA 1315 - French Horn—Major (2.0-4.0 cr)
MUSA 1316 - Trumpet—Major (2.0-4.0 cr)
MUSA 1317 - Trombone—Major (2.0-4.0 cr)
MUSA 1318 - Euphonium—Major (2.0-4.0 cr)
MUSA 1319 - Tuba—Major (2.0-4.0 cr)
MUSA 1321 - Percussion—Major (2.0-4.0 cr)
MUSA 1322 - Harp—Major (2.0-4.0 cr)

Ensembles
Take 2 or more course(s) from the following:
MUS 3230 - Chorus (1.0 cr)
MUS 3410 - University Wind Bands (1.0 cr)
MUS 3420 - Orchestra (1.0 cr)
MUS 3440 - Chamber Ensemble (1.0 cr)
MUS 5240 - Chamber Singers (1.0 cr)
MUS 5280 - Opera Theatre (2.0 cr)

Music Education B.Mus

School of Music

College of Liberal Arts

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 92.

Degree: Bachelor of Music.

The degree in music education is offered with two concentrations: instrumental/general music K-12 and choral/general. The instrumental/general concentration requires that a student be admitted via the audition on an orchestral or band instrument; the choral/general concentration requires that a student be admitted in voice, piano, organ, or classical guitar. Completion of the degree in music education culminates in eligibility for state licensure in the concentration area.

Admission Requirements

Admission to a music program is contingent on passing an audition. Auditions are highly competitive with students normally having studied for a number of years: a minimum of three to four years in voice, guitar, or on an orchestral or band instrument, eight to twelve years on piano. Auditions are held throughout the academic year. Incoming freshmen normally take the audition during the winter of their senior year of high school; transfer students, one semester prior to the term in which they plan to enroll. Students applying for the program in music education are also required to pass an interview with the music education faculty.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Required Courses

Music Theory and Ear Training
MUS 1501 - Musical Theory I (3.0 cr)
MUS 1502 - Musical Theory II, (3.0 cr)
MUS 1511 - Ear Training I (1.0 cr)
MUS 1512 - Ear Training II (1.0 cr)
MUS 3501 - Theory and Analysis of Tonal Music III (3.0 cr)
MUS 3502 - Theory and Analysis of Tonal Music IV (3.0 cr)
MUS 3511 - Ear Training III (1.0 cr)
MUS 3512 - Ear Training IV (1.0 cr)
MUS 4502 - 18th-Century Counterpoint (3.0 cr)
or MUS 4503 - Tonal Theory IV (3.0 cr)
or MUS 4504 - Intensive Theory and Analysis of 20th-Century Music (4.0 cr)
or MUS 4505 - Jazz Theory (3.0 cr)
MUS 5541 - 16th Cenutry Counterpoint (3.0 cr)

Musicology/Ethnomusicology
MUS 1801W - Music, Society, and Cultures, IP, WI (3.0 cr)
MUS 3601W - History of Western Music I, WI (3.0 cr)
MUS 3602W - History of Western Music II, WI (3.0 cr)
MUS 3603W - History of Western Music III, WI (3.0 cr)

Keyboard
For non-keyboard majors, MUS 1155 may be substituted for MUS 1151-1152. Keyboard majors take 1155-1156.

MUS 1155 - Keyboard Skills I (2.0 cr)
MUS 1151 - Piano: Class Lessons I (2.0 cr)
MUS 1152 - Piano: Class Lessons II (2.0 cr)
MUS 1155 - Keyboard Skills I (2.0 cr)
MUS 1156 - Keyboard Skills II (2.0 cr)

Professional Education
CI 5452 - Reading in Content Areas for Initial Licensure Candidates (1.0 cr)
EDHD 5001 - Learning, Cognition, and Assessment (3.0 cr)
EDHD 5003 - Developmental and Individual Differences in Educational Contexts (3.0 cr)
EDHD 5005 - School and Society (2.0 cr)
EDHD 5009 - Human Relations: Applied Skills for School and Society (1.0 cr)
PUBH 3003 - Fundamentals of Alcohol and Drug Abuse (2.0 cr)
or PUBH 3005 - Fundamentals of Alcohol and Drug Abuse for Teacher Education (1.0 cr)

Program Sub-plans

Students are required to complete one of the following sub-plans. (Note: The honors sub-plan does not meet this requirement.) Honors students are required to complete one sub-plan plus the honors sub-plan.

Choral/General Music Education

This program is for students majoring in voice, piano, organ, or classical guitar who want to teach choral and classroom music in the elementary and secondary schools. Students successfully completing the program will meet licensure requirements to teach choral and general classroom music in grades K-12 in Minnesota.

Required Courses

Major Courses
MUED 1201 - Introduction to Music Education (1.0 cr)
MUED 3301 - Teaching Elementary Vocal and General Music (3.0 cr)
MUED 3350 - Student Teaching in Classroom Music (4.0-8.0 cr)
MUED 3415 - Choral Conducting and Methods I (4.0 cr)
MUED 3416 - Choral Conducting and Methods II (4.0 cr)
MUED 3450 - Student Teaching in Vocal Music (4.0-8.0 cr)
MUED 3650 - Student Teaching Seminar (2.0 cr)

Ensemble Requirements
MUS 3230 or MUS 5240 is required for a minimum of seven semesters (1 credit each semester), selected in consultation with an adviser.

Take 7 or more credit(s) from the following:
MUS 3230 - Chorus (1.0 cr)
MUS 5240 - Chamber Singers (1.0 cr)

Instrument Focus

Students are required to complete one of the following course groups.

Voice
Each chosen course should be taken for 2 credits per term, for the number of semesters needed to reach the stated minimum credit requirement. (For example, Voice 1xxx should be taken for four semesters at 2 credits per term to meet the 8 credit requirement.)

MUS 3401 - Basic Conducting (2.0 cr)

Applied Voice
Take 8 or more credit(s) from the following:
MUSA 1304 - Voice—Major (2.0-4.0 cr)
Voice 3xxx

Take 6 or more credit(s) from the following:
MUSA 3304 - Voice—Major (2.0-4.0 cr)

Applied Piano
Take 4 or more credit(s) from the following:
MUSA 1401 - Piano—Secondary (2.0-4.0 cr)
MUS 3401 - Basic Conducting (2.0 cr)
-OR-

Piano
Each chosen course should be taken for 2 credits per term, for the number of semesters needed to reach the stated minimum credit requirement. (For example, Piano 1xxx should be taken for four semesters at 2 credits per term to meet the 8 credit requirement.)

Applied Piano
Take 8 or more credit(s) from the following:
MUSA 1301 - Piano—Major (2.0-4.0 cr)
Piano 3xxx

Take 6 or more credit(s) from the following:
MUSA 3301 - Piano—Major (2.0-4.0 cr)
MUS 3401 - Basic Conducting (2.0 cr)

Applied Voice
Take 4 or more credit(s) from the following:
MUSA 1404 - Voice—Secondary (2.0-4.0 cr)

-OR-

Guitar
Each chosen course should be taken for 2 credits per term, for the number of semesters needed to reach the stated minimum credit requirement. (For example, Guitar 1xxx should be taken for four semesters at 2 credits per term to meet the 8 credit requirement.)

MUS 3401 - Basic Conducting (2.0 cr)

Applied Guitar
Take 8 or more credit(s) from the following:
MUSA 1323 - Guitar—Major (2.0-4.0 cr)
Guitar 3xxx

Take 6 or more credit(s) from the following:
MUSA 3323 - Guitar—Major (2.0-4.0 cr)
MUS 3401 - Basic Conducting (2.0 cr)

Applied Piano
Take 4 or more credit(s) from the following:
MUSA 1401 - Piano—Secondary (2.0-4.0 cr)

Instrumental/General Music Education

Students successfully completing the program will meet licensure requirements to teach band, orchestra, and general classroom music in grades K-12 in Minnesota.

Required Courses

Major Courses
MUED 1201 - Introduction to Music Education (1.0 cr)
MUED 3301 - Teaching Elementary Vocal and General Music (3.0 cr)
MUED 3350 - Student Teaching in Classroom Music (4.0-8.0 cr)
MUED 3502 - String Techniques and Teaching (2.0 cr)
MUED 3503 - Woodwind Techniques and Teaching (2.0 cr)
MUED 3504 - Brass Techniques and Teaching (2.0 cr)
MUED 3505 - Percussion Techniques and Teaching (2.0 cr)
MUED 3516 - Instrumental Methods and Conducting I (3.0 cr)
MUED 3517 - Beginning Instrumental Methods and Materials (3.0 cr)
MUED 3518 - Instrumental Methods and Conducting II (3.0 cr)
MUED 3550 - Student Teaching in Instrumental Music (4.0-8.0 cr)
MUED 3650 - Student Teaching Seminar (2.0 cr)

Applied Music
Students must complete four semesters at 2 credits per term of 13xx courses, and two semesters at 2 credits per term of 33xx courses.

MUS 1260 - Voice Class (2.0 cr)
or MUSA 1404 - Voice—Secondary (2.0-4.0 cr)

Take 8 or more credit(s) from the following:
MUSA 1301 - Piano—Major (2.0-4.0 cr)
MUSA 1302 - Harpsichord—Major (2.0-4.0 cr)
MUSA 1303 - Organ—Major (2.0-4.0 cr)
MUSA 1304 - Voice—Major (2.0-4.0 cr)
MUSA 1305 - Violin—Major (2.0-4.0 cr)
MUSA 1306 - Viola—Major (2.0-4.0 cr)
MUSA 1307 - Cello—Major (2.0-4.0 cr)
MUSA 1308 - Double Bass—Major (2.0-4.0 cr)
MUSA 1309 - Flute-Major (2.0-4.0 cr)
MUSA 1311 - Oboe—Major (2.0-4.0 cr)
MUSA 1312 - Clarinet—Major (2.0-4.0 cr)
MUSA 1313 - Saxophone—Major (2.0-4.0 cr)
MUSA 1314 - Bassoon—Major (2.0-4.0 cr)
MUSA 1315 - French Horn—Major (2.0-4.0 cr)
MUSA 1316 - Trumpet—Major (2.0-4.0 cr)
MUSA 1317 - Trombone—Major (2.0-4.0 cr)
MUSA 1318 - Euphonium—Major (2.0-4.0 cr)
MUSA 1319 - Tuba—Major (2.0-4.0 cr)

MUSA 1321 - Percussion—Major (2.0-4.0 cr)
MUSA 1322 - Harp—Major (2.0-4.0 cr)

Take 4 or more credit(s) from the following:
MUSA 3301 - Piano—Major (2.0-4.0 cr)
MUSA 3302 - Harpsichord—Major (2.0-4.0 cr)
MUSA 3303 - Organ—Major (2.0-4.0 cr)
MUSA 3304 - Voice—Major (2.0-4.0 cr)
MUSA 3305 - Violin—Major (2.0-4.0 cr)
MUSA 3306 - Viola—Major (2.0-4.0 cr)
MUSA 3307 - Cello—Major (2.0-4.0 cr)
MUSA 3308 - Double Bass—Major (2.0-4.0 cr)
MUSA 3309 - Flute—Major (2.0-4.0 cr)
MUSA 3311 - Oboe—Major (2.0-4.0 cr)
MUSA 3312 - Clarinet—Major (2.0-4.0 cr)
MUSA 3313 - Saxophone—Major (2.0-4.0 cr)
MUSA 3314 - Bassoon—Major (2.0-4.0 cr)
MUSA 3315 - French Horn—Major (2.0-4.0 cr)
MUSA 3316 - Trumpet—Major (2.0-4.0 cr)
MUSA 3317 - Trombone—Major (2.0-4.0 cr)
MUSA 3318 - Euphonium—Major (2.0-4.0 cr)
MUSA 3319 - Tuba—Major (2.0-4.0 cr)
MUSA 3321 - Percussion—Major (2.0-4.0 cr)
MUSA 3322 - Harp—Major (2.0-4.0 cr)

Ensemble Requirement
Complete 7 credits total. Band or orchestra is required for a minimum of six semesters, to be selected in consultation with an adviser. An ensemble course is required for a minimum of one semester.

Take 6 or more credit(s) from the following:
MUS 3410 - University Wind Bands (1.0 cr)
MUS 3420 - Orchestra (1.0 cr)

Ensemble
MUS 3340 - Jazz Ensemble (1.0 cr)
or MUS 3350 - Jazz Combo (1.0 cr)
or MUS 3440 - Chamber Ensemble (1.0 cr)
or MUS 5430 - New Music Ensemble (1.0 cr)
or MUS 5470 - Woodwind Chamber Ensemble (1.0 cr)
or MUS 5480 - University Brass Choir (1.0 cr)
or MUS 5490 - Percussion Ensemble (1.0 cr)

Conducting
MUS 3401 - Basic Conducting (2.0 cr)

Music Therapy B.Mus.

School of Music

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 78.

Degree: Bachelor of Music.

This program prepares students for a profession in music therapy, using music to influence behavioral changes in people, from pre-school through geriatrics, in a variety of educational and health-related environments.

Admission Requirements

Admission to a music program is contingent on passing an audition. Auditions are highly competitive with students normally having studied for a number of years: a minimum of three to four years in voice, guitar, or on an orchestral or band instrument, eight to twelve years on piano. Auditions are held throughout the academic year. Incoming freshmen normally take the audition during the winter of their senior year of high school; transfer students, one semester prior to the term in which they plan to enroll. Students applying for the program in music therapy are required to pass an interview with music education/ therapy faculty.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Required Courses

Music Theory and Ear Training
MUS 1501 - Musical Theory I (3.0 cr)
MUS 1502 - Musical Theory II, (3.0 cr)
MUS 1511 - Ear Training I (1.0 cr)
MUS 1512 - Ear Training II (1.0 c)
MUS 3501 - Theory and Analysis of Tonal Music III (3.0 cr)
MUS 3502 - Theory and Analysis of Tonal Music IV (3.0 cr)
MUS 3511 - Ear Training III (1.0 cr)
MUS 3512 - Ear Training IV (1.0 cr)

Musicology/Ethnomusicology
MUS 1801W - Music, Society, and Cultures, IP, WI (3.0 cr)
MUS 3601W - History of Western Music I, WI (3.0 cr)
MUS 3602W - History of Western Music II, WI (3.0 cr)
MUS 3603W - History of Western Music III, WI (3.0 cr)

Keyboard
Take one of the following course pairs:
MUS 1151 - Piano: Class Lessons I (2.0 cr)
MUS 1152 - Piano: Class Lessons II (2.0 cr)
or
MUS 1155 - Keyboard Skills I (2.0 cr)
MUS 1156 - Keyboard Skills II (2.0 cr)

Conducting
MUS 3401 - Basic Conducting (2.0 cr)

Major Courses
MUED 1801 - Introduction to Music Therapy (2.0 cr)
MUED 3415 - Choral Conducting and Methods I (4.0 cr)
MUED 3800 - Introduction to Clinical Music Therapy Practice (4.0 cr)
MUED 3804 - Applications of Music Therapy I: Music Therapy for Children in Rehabilitative Settings (4.0 cr)
MUED 3805 - Applications of Music Therapy II: Music Therapy in Long Term Care and Psychiatric Care (4.0 cr)
MUED 3806 - Preparing for a Music Therapy Career (4.0 cr)
MUED 5669 - Psychology of Music (3.0 cr)

Electives
Take 2 or more course(s) from the following:
MUED 3502 - String Techniques and Teaching (2.0 cr)
MUED 3503 - Woodwind Techniques and Teaching (2.0 cr)
MUED 3504 - Brass Techniques and Teaching (2.0 cr)
MUED 3505 - Percussion Techniques and Teaching (2.0 cr)

Applied Music
A minimum six semesters is needed to complete the applied music requirement (12 credits). This includes four to 6 credits of lower division major lessons (13xx) and 4 to 6 credits of secondary lessons (14xx).

Take 12 or more credit(s) from the following:
MUSA 1xxx

Ensembles
A minimum of six semesters (1 credit each) selected in consultation with an adviser. Some options are listed below.

Take 6 or more credit(s) from the following:
MUS 3410 - University Wind Bands (1.0 cr)
MUS 3420 - Orchestra (1.0 cr)
MUS 3430 - Campus Orchestra (1.0 cr)
MUS 3480 - Marching Band (1.0 cr)
MUS 5240 - Chamber Singers (1.0 cr)
MUS 5250 - Opera Workshop and Ensemble (1.0 cr)
MUS 5280 - Opera Theatre (2.0 cr)

Special Needs Courses
EDHD 5003 - Developmental and Individual Differences in Educational Contexts (3.0 cr)
KIN 3027 - Human Anatomy for Kinesiology Students (3.0 cr)
PSY 1001 - Introduction to Psychology, SSCI (4.0 cr)
PSY 3604 - Introduction to Abnormal Psychology (3.0 cr)

Internship
A six-month internship is required upon completion of all coursework.

MUED 3855 - Music Therapy Internship (6.0 cr)

New Media Studies Minor

Requirements for this program are current for Fall 2006.

Required credits in this minor: 15.

This interdisciplinary minor explores from multiple perspectives how information or content is created and shaped in new and emerging media, as well as the role and impact of those media on human communication. New media refers to the emerging digital technologies that enable information to be produced, stored, transmitted, and displayed in various ways. The minor includes courses from the Colleges of Liberal Arts, Human Ecology, and Agricultural, Food and Environmental Sciences.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Required Courses

Minor Courses
At least one course must be 4xxx or above. No more than eight credits of elective courses (courses without the JOUR designator) may be earned from a single department. Other electives may be chosen with adviser permission.

Take 15 or more credit(s).

Take 2 or more course(s) totaling 6 or more credit(s) from the following:
JOUR 3551 - Economics of New Media (3.0 cr)
JOUR 3552 - Internet and Global Society, IP (3.0 cr)
JOUR 4551 - New Media Culture (3.0 cr)
JOUR 5552 - Law of Internet Communications (3.0 cr)

Take 2 or more course(s) totaling 6 or more credit(s) from the following:
DHA 5399W - Theory of Electronic Design, WI (3.0 cr)
GEOG 3561 - Principles of Geographic Information Science (4.0 cr)
HSCI 3331 - Technology and American Culture, HP (3.0 cr)
HSCI 4321 - History of Computing (3.0 cr)
MUS 5591 - Electronic Music: History, Literature, Principles (3.0 cr)
MUS 5592 - Digital Music Synthesis and Processing Techniques (3.0 cr)
RHET 3371 - Technology, Self, and Society, C/PE, HP (3.0 cr)
RHET 3577W - Rhetoric, Technology, and the Internet, C/PE, WI (3.0 cr)
SCMC 3001 - History of Cinema and Media Culture (4.0 cr)

Philosophy B.A.

Philosophy

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 30.

Degree: Bachelor of Arts.

Philosophy examines and analyzes the presuppositions of our thought in both ordinary life and in the arts and sciences. Fields within philosophy are moral and political philosophy, history of philosophy, logic (including philosophy of mathematics), philosophy of language, philosophy of religion, philosophy of science (including philosophy of physics, of biology, and of the social sciences), metaphysics, epistemology, and aesthetics.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Students are required to take 4 semester(s) of any second language.

Required Courses

Area Requirements

History Area Requirements
PHIL 3001W - General History of Western Philosophy: Ancient Period, OH, WI (4.0 cr)
or PHIL 3005W - General History of Western Philosophy: Modern Period, OH, WI (4.0 cr)

Logic Area Requirements
PHIL 1001 - Introduction to Logic, MATH (4.0 cr)
or PHIL 5201 - Symbolic Logic I (4.0 cr)

Epistemology Area Requirements
PHIL 3601W - Scientific Thought, OH, WI (4.0 cr)
or PHIL 4105W - Epistemology, WI (3.0 cr)

Theoretical Ethics Area Requirements
PHIL 3311W - Introduction to Ethical Theory, WI (4.0 cr)
or PHIL 4310W - History of Moral Theories, WI (3.0 cr)
or PHIL 4320W - Intensive Study of an Historical Moral Theory, WI (3.0 cr)
or PHIL 4321W - Theories of Justice, WI (3.0 cr)

High-Level Course Requirement
At least 8 credits of the 30 required for the major must be in 4xxx courses higher

Electives
It is strongly recommended that one of these be a second course in the history of philosophy.

Senior Project
A senior project is required and is typically a paper of about 15 pages in length.

PHIL 3910W - Major Seminar, WI (3.0 cr)
or PHIL 3993 - Directed Studies (1.0-3.0 cr)
or PHIL 4993 - Directed Studies (1.0-3.0 cr)

Program Sub-plans

A sub-plan is not required for this program.

Ethics and Civic Life

The Department of Philosophy's optional concentration in ethics and civic life is an opportunity for students who are interested in ethics and community service to relate their experiences in the classroom to their work in the community, and vice versa. Students who complete the concentration will receive acknowledgement on their transcripts.

Required Courses

Core Courses

Take 3 or more course(s) from the following:
PHIL 1004W - Introduction to Political Philosophy, C/PE, OH, WI (4.0 cr)
PHIL 1006W - Philosophy and Cultural Diversity, CD, OH, WI (4.0 cr)
PHIL 1303 - Business Ethics, C/PE, IP, (4.0 cr)
PHIL 3234 - Knowledge and Society, CD (4.0 cr)
PHIL 3301 - Environmental Ethics, C/PE, ENVT (4.0 cr)
PHIL 3302W - Moral Problems of Contemporary Society, C/PE, OH, WI (4.0 cr)
PHIL 3304 - Law and Morality, C/PE (4.0 cr)
PHIL 3305 - Medical Ethics (4.0 cr)
PHIL 3307 - Social Justice and Community Service, C/PE, CD (4.0 cr)
PHIL 3308 - Social Justice and Community Service, C/PE, CD (4.0 cr)
PHIL 3602 - Science, Technology, and Society, C/PE (3.0 cr)
PHIL 4324 - Ethics and Education, (3.0 cr)
PHIL 4325 - Education and Social Change, C/PE, CD (4.0 cr)
PHIL 4326 - Lives Worth Living: Questions of Self, Vocation, and Community, C/PE, OH (4.0 cr)
PHIL 4414 - Political Philosophy, (3.0 cr)
PHIL 4622 - Philosophy and Feminist Theory (3.0 cr)

Community Service

The community service component may be completed by taking a practicum course in philosophy (for example, PHIL 1007 in conjunction with 1004W); a community service component of one of the above courses; or a directed study in philosophy with a community service component.

Philosophy Minor

Philosophy

Requirements for this program are current for Fall 2006.

Required credits in this minor: 14.

See the major description for more information.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

The minor consists of 14 semester credits of PHIL courses at 3xxx or above. All courses must have grades of at least C-. At least 8 credits must be taken at the University of Minnesota, Twin Cities campus.

Physics B.A.

School of Physics and Astronomy

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 37.

Degree: Bachelor of Arts.

The undergraduate physics program prepares students for employment, often in industrial or governmental laboratories, or for further study at graduate or professional schools in physics, engineering, biophysics, medicine, education, law, or business.

The program integrates a broad foundation in physics that can be flexibly combined with coursework in other technical disciplines or used to specialize in physics. Students should consult a physics adviser to help formulate objectives for undergraduate study.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Students are required to take 4 semester(s) of any second language.

Required Courses

Mathematics

Complete four courses from either the calculus or honors calculus sequence.

Calculus Sequence

MATH 1271 - Calculus I, MATH (4.0 cr)
or MATH 1371 - IT Calculus I, MATH (4.0 cr)
MATH 1272 - Calculus II (4.0 cr)
or MATH 1372 - IT Calculus II (4.0 cr)
MATH 2243 - Linear Algebra and Differential Equations (4.0 cr)
or MATH 2373 - IT Linear Algebra and Differential Equations (4.0 cr)
MATH 2374 - IT Multivariable Calculus and Vector Analysis (4.0 cr)
or MATH 2263 - Multivariable Calculus (4.0 cr)
or

Honors Sequence

MATH 1571H - Honors Calculus I, MATH, H (4.0 cr)
MATH 1572H - Honors Calculus II, H (4.0 cr)
MATH 2573H - Honors Calculus III, H (4.0 cr)
MATH 2574H - Honors Calculus IV, H (4.0 cr)

Major Courses

PHYS 2601 - Quantum Physics (4.0 cr)
PHYS 2605 - Quantum Physics Laboratory (3.0 cr)
PHYS 1301W - Introductory Physics for Science and Engineering I, PHYS SCI/L, WI (4.0 cr)
or PHYS 1401V - Honors Physics I, PHYS SCI/L, WI, H (4.0 cr)
PHYS 1302W - Introductory Physics for Science and Engineering II, PHYS SCI/L, WI (4.0 cr)
or PHYS 1402V - Honors Physics II, PHYS SCI/L, WI, H (4.0 cr)
PHYS 2403H - Honors Phys III, H (4.0 cr)
or PHYS 2503 - Physics III: Foundations of Modern Physics (4.0 cr)

Electives

Take 18 or more credit(s) from the following:
PHYS 4xxx

Take 2 or more course(s) from the following:
PHYS 4001 - Analytical Mechanics (4.0 cr)

PHYS 4002 - Electricity and Magnetism (4.0 cr)
PHYS 4101 - Quantum Mechanics (4.0 cr)
PHYS 4201 - Statistical and Thermal Physics (3.0 cr)

Senior Project
The senior project can be satisfied by completion of PHYS 4051 and 4052W; 5 credits may be counted towards the 18-credit elective requirement. Other ways of satisfying the physics project requirement must be approved by the physics department.

PHYS 4051 - Methods of Experimental Physics I (5.0 cr)
PHYS 4052W - Methods of Experimental Physics II, WI (5.0 cr)

Physics Minor

School of Physics and Astronomy

Requirements for this program are current for Fall 2006.

Required credits in this minor: 34.

See the major description for more information.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

The minor in physics requires 22 credits in physics and 12 credits in math. Physics minors must take all required physics and mathematics courses A-F and must earn a grade of C- or better in all physics, mathematics, and technical elective courses (except those offered S-N only).

Required Courses

Mathematics
MATH 1371 - IT Calculus I, MATH (4.0 cr)
or MATH 1271 - Calculus I, MATH (4.0 cr)
or MATH 1281 - Calculus with Biological Emphasis I, MATH (4.0 cr)
or MATH 1471H - Honors Calculus I for Secondary Students, MATH, H (5.0 cr)
MATH 1372 - IT Calculus II (4.0 cr)
or MATH 1272 - Calculus II (4.0 cr)
or MATH 1282 - Calculus With Biological Emphasis II (4.0 cr)
or MATH 1472H - Honors Calculus II for Secondary Students, H (5.0 cr)
MATH 2373 - IT Linear Algebra and Differential Equations (4.0 cr)
or MATH 2243 - Linear Algebra and Differential Equations (4.0 cr)
or

Honors Sequence
MATH 1571H - Honors Calculus I, MATH, H (4.0 cr)
MATH 1572H - Honors Calculus II, H (4.0 cr)
MATH 2573H - Honors Calculus III, H (4.0 cr)

Physics
PHYS 1301W - Introductory Physics for Science and Engineering I, PHYS SCI/L, WI (4.0 cr)
or PHYS 1401V - Honors Physics I, PHYS SCI/L, WI, H (4.0 cr)
PHYS 1302W - Introductory Physics for Science and Engineering II, PHYS SCI/L, WI (4.0 cr)
or PHYS 1402V - Honors Physics II, PHYS SCI/L, WI, H (4.0 cr)
PHYS 2503 - Physics III: Foundations of Modern Physics (4.0 cr)
or PHYS 2403H - Honors Phys III, H (4.0 cr)
PHYS 2601 - Quantum Physics (4.0 cr)
PHYS 2605 - Quantum Physics Laboratory (3.0 cr)

Take 3 or more credit(s) from the following:
PHYS 3xxx
PHYS 4xxx
PHYS 5xxx

Take 3 or more credit(s) from the following:
AST 3xxx
AST 4xxx
AST 5xxx

Physiology B.A.

Physiology

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 27.

Degree: Bachelor of Arts.

The physiology major concentrates on understanding the functions of the human body from individual cells to organ systems. The program is based upon principles from a variety of physical and biological sciences.

This major is particularly appropriate for students who intend to enter medical school or graduate study in any of a variety of biological, health, or biomedical sciences. The required courses form a strong core in biomedical science. Many of the required courses are identical to those required for admission to medical school. Students may tailor the overall degree program to specific needs and may choose additional science courses in preparation for medical school, other health sciences professional schools, or graduate school. Students may also take advantage of the freedom to pursue a more diverse undergraduate experience in CLA. Others may benefit from an opportunity to pursue a double major.

Admission Requirements

Students must complete 6 courses before admission to the program.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Required Courses for Admission

Preparatory Coursework
These courses are prerequisites for future physiology coursework.

MATH 1271 - Calculus I, MATH (4.0 cr)
or MATH 1281 - Calculus with Biological Emphasis I, MATH (4.0 cr)
MATH 1272 - Calculus II (4.0 cr)
or MATH 1282 - Calculus With Biological Emphasis II (4.0 cr)
CHEM 1021 - Chemical Principles I, ENVT, PHYS SCI/L (4.0 cr)
CHEM 1022 - Chemical Principles II, ENVT, PHYS SCI/L (4.0 cr)

Take one of the following course pairs:
PHYS 1201W - Introductory Physics for Biology and Pre-medicine I, PHYS SCI/L, WI (5.0 cr)
PHYS 1202W - Introductory Physics for Biology and Pre-medicine II, PHYS SCI/L, WI (5.0 cr)
or
PHYS 1301W - Introductory Physics for Science and Engineering I, PHYS SCI/L, WI (4.0 cr)
PHYS 1302W - Introductory Physics for Science and Engineering II, PHYS SCI/L, WI (4.0 cr)

Program Requirements

Students are required to take 4 semester(s) of any second language.

Required Courses

Major Core Curriculum

BIOL 4003 - Genetics (3.0 cr)
BIOL 4004 - Cell Biology (3.0 cr)
CHEM 2301 - Organic Chemistry I (3.0 cr)
CHEM 2302 - Organic Chemistry II (3.0 cr)
CHEM 2311 - Organic Lab (4.0 cr)
PHSL 3061 - Principles of Physiology (4.0 cr)
PHSL 3062W - Research Paper for Physiology Majors, WI (1.0 cr)
PHSL 3701 - Physiology Laboratory (2.0 cr)
BIOC 3021 - Biochemistry (3.0 cr)
or BIOC 4331 - Biochemistry I: Structure, Catalysis, and Metabolism in Biological Systems (4.0 cr)
A MATH 22xx course may satisfy this requirement.

Take 2 or more course(s) from the following:
MICB 3301 - Biology of Microorganisms (5.0 cr)
CHEM 4311W - Advanced Organic Chemistry Lab, WI (2.0 cr)
GCD 4111 - Histology: Cell and Tissue Organization (4.0 cr)
GCD 4161 - Developmental Biology (3.0 cr)
GCD 4034 - Molecular Genetics (3.0 cr)
GCD 5036 - Molecular Cell Biology (3.0 cr)
GCD 4025 - Cell Biology Laboratory (2.0 cr)
MICB 4131 - Immunology (3.0 cr)
BIOC 4xxx
CHEM 4xxx
CSCI 3xxx
CSCI 4xxx

Political Science B.A.

Political Science

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 32.

Degree: Bachelor of Arts.

Political scientists study topics such as the exercise of power and influence; sources and resolution of conflicts; the relation of politics to the economy, culture, and other aspects of society; the adoption and implementation of public policies; and the development of political systems. These topics are studied at all levels, from local communities to the global community.

The scope of the discipline is reflected in the main areas of specialization that make up the undergraduate curriculum: political theory, comparative government and politics, international relations, and American governmental systems and processes. In addition, undergraduates may choose from several optional concentrations: business and politics; campaigns and elections; citizenship and civic action; global politics; law and politics; democratization and development; political psychology, beliefs, and behavior; and public affairs.

Admission Requirements

It is strongly recommended that students complete one 1xxx course prior to admission to the major. See “Preparatory Courses” under program requirements for suggested courses.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Students are required to take 4 semester(s) of any second language.

Students may choose to do an optional concentration to count toward the 24 upper division credits. If not, remaining courses not taken from the list for major courses below may be used to satisfy the upper division requirement. In addition, POL 3070, POL 3080, POL 3085 and POL 4970, POL 3085H may be used to meet the 24 credit requirement.

Required Courses

Preparatory Courses

Only 8 credits of 1xxx will apply toward the 32 credits required for the major.

POL 1001 - American Democracy in a Changing World, C/PE, SSCI (4.0 cr)
or POL 1001H - Honors Course: American Democracy in a Changing World, C/PE, SSCI, H (4.0 cr)
or POL 1015 - Mass Politics in a Media Age, C/PE (3.0 cr)
or POL 1019 - Indigenous Peoples: A Global Perspective, IP, SSCI (3.0 cr)
or POL 1025 - Global Politics, IP, SSCI (4.0 cr)
or POL 1026 - We and They: U.S. Foreign Policy, IP (4.0 cr)
or POL 1054 - Repression and Democracy Around the World, IP, SSCI (4.0 cr)
or POL 1054H -Honors
or POL 1065 - Government and Medicine, C/PE, SSCI (3.0 cr)
or POL 1201 - Political Ideas and Ideologies, C/PE, SSCI (4.0 cr)
or freshman seminar in political science

Major Courses

Take 1 or more course(s) from 3 of the 4 following subfields:

Political Theory

Take 0 or more course(s) from the following:
POL 3210 - Practicum, C/PE (1.0-3.0 cr)
POL 3225 - American Political Thought, C/PE (3.0 cr)
POL 3235W - Democracy and Citizenship, C/PE, WI (3.0-4.0 cr)
POL 3251 - Greeks, Romans, and Christians: Ancient and Medieval Political Thought, C/PE (3.0-4.0 cr)
POL 3252 - Renaissance, Reformation, and Revolution: Early Modern Political Thought, C/PE (3.0-4.0 cr)
POL 4210 - Topics in Political Theory (3.0-4.0 cr)
POL 4225 - Politics & Education, CPE, (3.0, 4.0 cr)
POL 4253 - Modernity and Its Discontents: Late Modern Political Thought, C/PE (3.0-4.0 cr)
POL 4275 - Contemporary Political Thought (3.0 cr)

Comparative Government

Take 0 or more course(s) from the following:
POL 3441 - Politics of Environmental Protection, ENVT (3.0 cr)
POL 3451W - Politics and Society in the New Europe, WI (3.0 cr)
POL 3477 - Political Development, SSCI (3.0-4.0 cr)
POL 3491 - Film and Latin American Politics (3.0 cr)
POL 4410 - Topics in Comparative Politics, IP (3.0 cr)
POL 4461W - European Government and Politics, WI (4.0 cr)
POL 4473 - Chinese Politics, IP (3.0 cr)
POL 4477 - Struggles and Issues in the Middle East, IP (4.0 cr)
POL 4478 - Contemporary Politics in Africa and the Colonial Legacy, IP (4.0 cr)
POL 4479 - Latin American Politics (3.0 cr)
POL 4481 - Governments and Markets (3.0-4.0 cr)
POL 4485 - Human Rights and Democracy in the World (3.0 cr)
POL 4487 - The Struggle for Democratization and Citizenship, C/PE (4.0 cr)
POL 4489W

International Relations

Take 0 or more course(s) from the following:
POL 3835 - International Relations, IP, SSCI (3.0 cr)
POL 3872W - Global Environmental Cooperation, ENVT, IP, WI (4.0 cr)
POL 3873W - Global Citizenship and International Ethics, C/PE, IP, WI (3.0 cr)
POL 4810 - Topics in International Politics and Foreign Policy (3.0-4.0 cr)
POL 4833 - The U.S. in the Global Economy (3.0-4.0 cr)
POL 4881 - International Law, IP (3.0 cr)
POL 4883 - Global Governance, IP (3.0 cr)
POL 4885 - International Conflict and Security, IP (3.0-4.0 cr)

POL 4887 - Thinking Strategically in International Politics, SSCI (3.0 cr)
POL 4889 - Governments and Global Trade and Money (3.0-4.0 cr)

American Government

Take 0 or more course(s) from the following:
POL 3319 - Education and the American Dream, C/PE, SSCI (3.0 cr)
POL 3321 - Issues in American Public Policy, C/PE (3.0 cr)
POL 3323 - Political Tolerance in the United States, C/PE, CD (3.0-4.0 cr)
POL 3701 - American Indian Tribal Government and Politics (3.0 cr)
POL 3739 - Politics of Race, Class, and Ethnicity, CD, IP (3.0 cr)
POL 3766 - Political Psychology of Mass Behavior, C/PE (3.0 cr)
POL 3767 - Political Psychology of Elite Behavior (3.0 cr)
POL 3785 - Persuasion and Political Propaganda (3.0 cr)
POL 4303 - American Democracy in Crisis, C/PE (3.0 cr)
POL 4306 - Presidential Leadership and American Democracy (3.0-4.0 cr)
POL 4308 - Congressional Politics and Institutions (3.0-4.0 cr)
POL 4309 - Justice in America (3.0 cr)
POL 4310 - Topics in American Politics (3.0 cr)
POL 4315W - State Governments: Laboratories of Democracy, WI (4.0 cr)
POL 4322 - Rethinking the Welfare State, C/PE (3.0-4.0 cr)
POL 4331 - Thinking Strategically in Domestic Politics, C/PE (3.0-4.0 cr)
POL 4501 - The Supreme Court and Constitutional Interpretation, C/PE (3.0 cr)
POL 4502 - The Supreme Court, Civil Liberties, and Civil Rights, C/PE (3.0 cr)
POL 4525W - Federal Indian Policy (3.0 cr)
POL 4737 - American Political Parties, C/PE (3.0-4.0 cr)
POL 4766 - American Political Culture and Values, C/PE (3.0-4.0 cr)
POL 4767 - Public Opinion and Voting Behavior (3.0 cr)
POL 4771 - Racial Attitudes and Intergroup Conflict (3.0 cr)

Senior Project
POL 4900W - Senior Paper, WI (1.0 cr)
or POL 4900V - Honors: Senior Paper, H (1.0 cr)
or POL 3110H - Honors Thesis Credits, H (1.0-4.0 cr)

Program Sub-plans

A sub-plan is not required for this program.

Business and Politics

Required Courses

Take 4 or more course(s) from the following:
POL 3085 - Quantitative Analysis in Political Science, MATH (4.0 cr)
POL 4308 - Congressional Politics and Institutions (3.0-4.0 cr)
POL 4315W - State Governments: Laboratories of Democracy, WI (4.0 cr)
POL 4331 - Thinking Strategically in Domestic Politics, C/PE (3.0-4.0 cr)
POL 4481 - Governments and Markets (3.0-4.0 cr)
POL 4889 - Governments and Global Trade and Money (3.0-4.0 cr)

Campaigns and Elections

Required Courses

Take 4 or more course(s) from the following:
POL 3085 - Quantitative Analysis in Political Science, MATH (4.0 cr)
POL 3225 - American Political Thought, C/PE (3.0 cr)
POL 3766 - Political Psychology of Mass Behavior, C/PE (3.0 cr)
POL 4306 - Presidential Leadership and American Democracy (3.0-4.0 cr)
POL 4308 - Congressional Politics and Institutions (3.0-4.0 cr)
POL 4331 - Thinking Strategically in Domestic Politics, C/PE (3.0-4.0 cr)
POL 4461W - European Government and Politics, WI (4.0 cr)
POL 4737 - American Political Parties, C/PE (3.0-4.0 cr)
POL 4767 - Public Opinion and Voting Behavior (3.0 cr)

Citizenship and Civic Action

Required Courses

Take 4 or more course(s) from the following:
POL 3210 - Practicum, C/PE (1.0-3.0 cr)
POL 3225 - American Political Thought, C/PE (3.0 cr)
POL 3235W - Democracy and Citizenship, C/PE, WI (3.0-4.0 cr)
POL 3251 - Greeks, Romans, and Christians: Ancient and Medieval Political Thought, C/PE (3.0-4.0 cr)
POL 3252 - Renaissance, Reformation, and Revolution: Early Modern Political Thought, C/PE (3.0-4.0 cr)
POL 3319 - Education and the American Dream (3.0 cr)
POL 3323 - Political Tolerance in the United States, C/PE, CD (3.0-4.0 cr)
POL 3739 - Politics of Race, Class, and Ethnicity, CD, IP (3.0 cr)
POL 3873W - Global Citizenship and International Ethics, C/PE, IP, WI (3.0 cr)
POL 4253 - Modernity and Its Discontents: Late Modern Political Thought, C/PE (3.0-4.0 cr)
POL 4275 - Contemporary Political Thought (3.0 cr)
POL 4303 - American Democracy in Crisis, C/PE (3.0 cr)
POL 4322 - Rethinking the Welfare State, C/PE (3.0-4.0 cr)
POL 4485 - Human Rights and Democracy in the World (3.0 cr)
POL 4487 - The Struggle for Democratization and Citizenship, C/PE (4.0 cr)
POL 4502 - The Supreme Court, Civil Liberties, and Civil Rights, C/PE (3.0 cr)
POL 4766 - American Political Culture and Values, C/PE (3.0-4.0 cr)

Democratization and Development

Required Courses

Take 4 or more course(s) from the following:
POL 3210 - Practicum, C/PE (1.0-3.0 cr)
POL 3235W - Democracy and Citizenship, C/PE, WI (3.0-4.0 cr)
POL 3323 - Political Tolerance in the United States, C/PE, CD (3.0-4.0 cr)
POL 3441 - Politics of Environmental Protection, ENVT (3.0 cr)
POL 3477 - Political Development, SSCI (3.0-4.0 cr)
POL 3739 - Politics of Race, Class, and Ethnicity, CD, IP (3.0 cr)
POL 4210 - Topics in Political Theory (3.0-4.0 cr)
POL 4225 - Politics and Education (3.0-4.0 cr)
POL 4253 - Modernity and Its Discontents: Late Modern Political Thought, C/PE (3.0-4.0 cr)
POL 4275 - Contemporary Political Thought (3.0 cr)
POL 4303 - American Democracy in Crisis, C/PE (3.0 cr)
POL 4322 - Rethinking the Welfare State, C/PE (3.0-4.0 cr)
POL 4473 - Chinese Politics (3.0 cr)
POL 4477 - Struggles and Issues in the Middle East, IP (4.0 cr)
POL 4478 - Contemporary Politics in Africa and the Colonial Legacy, IP (4.0 cr)
POL 4479 - Latin American Politics (3.0 cr)
POL 4487 - The Struggle for Democratization and Citizenship, C/PE (4.0 cr)
POL 4561 - Comparative Legal Systems, IP (3.0 cr)
POL 4766 - American Political Culture and Values, C/PE (3.0-4.0 cr)
POL 4885 - International Conflict and Security, IP (3.0-4.0 cr)
POL 4889 - Governments and Global Trade and Money (3.0-4.0 cr)
POL 5253 - Modernity and its Discontents: Late Modern Political Thought (4.0 cr)

Global Politics

Required Courses

Take 4 or more course(s) from the following:
POL 3235W - Democracy and Citizenship, C/PE, WI (3.0-4.0 cr)
POL 3441 - Politics of Environmental Protection, ENVT (3.0 cr)
POL 3451W - Politics and Society in the New Europe, WI (3.0 cr)
POL 3477 - Political Development, SSCI (3.0-4.0 cr)
POL 3835 - International Relations, IP, SSCI (3.0 cr)
POL 3872W - Global Environmental Cooperation, ENVT, IP, WI (4.0 cr)
POL 3873W - Global Citizenship and International Ethics, C/PE, IP, WI (3.0 cr)
POL 4461W - European Government and Politics, WI (4.0 cr)

POL 4473 - Chinese Politics, IP (3.0 cr)
POL 4477 - Struggles and Issues in the Middle East, IP (4.0 cr)
POL 4478 - Contemporary Politics in Africa and the Colonial Legacy, IP (4.0 cr)
POL 4479 - Latin American Politics (3.0 cr)
POL 4485 - Human Rights and Democracy in the World (3.0 cr)
POL 4833 - The U.S. in the Global Economy (3.0-4.0 cr)
POL 4881 - International Law, IP (3.0 cr)
POL 4883 - Global Governance, IP (3.0 cr)
POL 4885 - International Conflict and Security, IP (3.0-4.0 cr)
POL 4889 - Governments and Global Trade and Money (3.0-4.0 cr)

Law and Politics

Required Courses

Take 4 or more course(s) from the following:
POL 3225 - American Political Thought, C/PE (3.0 cr)
POL 3252 - Renaissance, Reformation, and Revolution: Early Modern Political Thought, C/PE (3.0-4.0 cr)
POL 3323 - Political Tolerance in the United States, C/PE, CD (3.0-4.0 cr)
POL 3872W - Global Environmental Cooperation, ENVT, IP, WI (4.0 cr)
POL 4253 - Modernity and Its Discontents: Late Modern Political Thought, C/PE (3.0-4.0 cr)
POL 4275 - Contemporary Political Thought (3.0 cr)
POL 4309 - Justice in America (3.0 cr)
POL 4501 - The Supreme Court and Constitutional Interpretation, C/PE (3.0 cr)
POL 4502 - The Supreme Court, Civil Liberties, and Civil Rights, C/PE (3.0 cr)
POL 4561 - Comparative Legal Systems, IP (3.0 cr)
POL 4881 - International Law, IP (3.0 cr)
POL 4883 - Global Governance, IP (3.0 cr)

Political Psychology, Beliefs, and Behavior

Required Courses

Take 4 or more course(s) from the following:
POL 3085 - Quantitative Analysis in Political Science, MATH (4.0 cr)
POL 3323 - Political Tolerance in the United States, C/PE, CD (3.0-4.0 cr)
POL 3739 - Politics of Race, Class, and Ethnicity, CD, IP (3.0 cr)
POL 3766 - Political Psychology of Mass Behavior, C/PE (3.0 cr)
POL 3767 - Political Psychology of Elite Behavior
POL 4253 - Modernity and Its Discontents: Late Modern Political Thought, C/PE (3.0-4.0 cr)
POL 4275 - Contemporary Political Thought (3.0 cr)
POL 4306 - Presidential Leadership and American Democracy (3.0-4.0 cr)
POL 4308 - Congressional Politics and Institutions (3.0-4.0 cr)
POL 4331 - Thinking Strategically in Domestic Politics, C/PE (3.0-4.0 cr)
POL 4485 - Human Rights and Democracy in the World (3.0 cr)
POL 4766 - American Political Culture and Values, C/PE (3.0-4.0 cr)

Public Affairs

Required Courses

Take 4 or more course(s) from the following:
POL 3085 - Quantitative Analysis in Political Science, MATH (4.0 cr)
POL 3235W - Democracy and Citizenship, C/PE, WI (3.0-4.0 cr)
POL 3319 - Education & the American Dream (3.0 cr)
POL 3321 - Issues in American Public Policy, C/PE (3.0 cr)
POL 4306 - Presidential Leadership and American Democracy (3.0-4.0 cr)
POL 4308 - Congressional Politics and Institutions (3.0-4.0 cr)
POL 4309 - Justice in America (3.0 cr)
POL 4315W - State Governments: Laboratories of Democracy, WI (4.0 cr)
POL 4322 - Rethinking the Welfare State, C/PE (3.0-4.0 cr)
POL 4327 - The Politics of American Cities and Suburbs (3.0 cr)
POL 4481 - Governments and Markets (3.0-4.0 cr)
POL 4501 - The Supreme Court and Constitutional Interpretation, C/PE (3.0 cr)
POL 4833 - The U.S. in the Global Economy (3.0-4.0 cr)
POL 4881 - International Law, IP (3.0 cr)

Political Science Minor

Political Science

Requirements for this program are current for Fall 2006.

Required credits in this minor: 16.

See the major description for more information.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Complete at least four courses, totaling at least 16 credits. Students must take at least one course in two out of four subfields: political theory, comparative government, American government, and international relations. POL 3070 and 4970 cannot count toward minor requirements.

Political science minors who major in global studies must complete at least two upper division courses outside of the comparative government and global studies subfields. International relations majors must take at least two upper division courses from political theory or American government.

Required Courses

Minor Courses

Take 0 - 8 credit(s) from the following:
POL 1001 - American Democracy in a Changing World, C/PE, SSCI (4.0 cr)
POL 1015 - Mass Politics in a Media Age, C/PE (3.0 cr)
POL 1019 Indigenous Peoples: A Global Perspective (3.0 cr)
POL 1025 - Global Politics, IP, SSCI (4.0 cr)
POL 1026 - We and They: U.S. Foreign Policy, IP (4.0 cr)
POL 1054 - Repression and Democracy Around the World, IP, SSCI (4.0 cr)
POL 1065 - Government and Medicine, C/PE, SSCI (3.0 cr)
POL 1201 - Political Ideas and Ideologies, C/PE, SSCI (4.0 cr)
or Freshman Seminar in Political Science

Take 12 - 16 credit(s) from the following:
POL 3xxx
POL 4xxx

Psychology B.A.

Psychology

Requirements for this program are current for Summer 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 36.

Degree: Bachelor of Arts.

Psychology examines human behavior through environmental, genetic, physiological, and social determinants and correlates. The department strives to train students with a strong general background in psychology and an ability to think clearly and critically in a wide variety of settings. Students must fulfill distribution requirements in a variety of psychological topics.

Faculty and students work with related University units, including the Institute of Child Development, the Department of Computer Science and Engineering, the Carlson School of Management, the Departments of Psychiatry and Educational Psychology, the Department of Neuroscience, and affiliated research units within the department, such as the Center for Cognitive Sciences, the Center for Interest Measurement Research, and the Minnesota Center for Twin and Family Research. While a B.A. in psychology has proved to be a valuable and useful background for a wide variety of careers, a professional career as a psychologist requires further training.

Students completing the degree program in psychology may not receive a second degree or a second major in child psychology.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Students are required to take 4 semester(s) of any second language.

Transfer students must complete a minimum of 16 upper division credits in the psychology department at the University of Minnesota to be awarded a major in psychology.

Required Courses

Preparatory Courses

PSY 1001 - Introduction to Psychology, SSCI (4.0 cr)
PSY 2801 - Introduction to Psychological Measurement and Data Analysis (3.0 cr)
PSY 3001W - Research Methods (3.0 cr)

Major Courses

Cognitive and Biological Psychology

Take 2 or more course(s) from the following:

PSY 3011 - Introduction to Learning and Behavior (3.0 cr)
PSY 3031 - Introduction to Sensation and Perception (3.0 cr)
PSY 3051 - Introduction to Cognitive Psychology, SSCI (3.0 cr)
PSY 4011 - Applied Behavioral Psychology (3.0 cr)
PSY 4036 - Perceptual Issues in Visual Impairment (3.0 cr)
PSY 5012 - Learning and Cognition in Animals (4.0 cr)
PSY 5014 - Psychology of Human Learning and Memory (3.0 cr)
PSY 5015 - Cognition, Computation, and Brain (3.0 cr)
PSY 5031W - Perception, WI (3.0 cr)
PSY 5034 - Psychobiology of Vision (3.0 cr)
PSY 5036W - Computational Vision, WI (3.0 cr)
PSY 5037 - Psychology of Hearing (3.0 cr)
PSY 5038W - Introduction to Neural Networks, WI (3.0 cr)
PSY 5051W - Psychology of Human-Machine Interaction, WI (3.0 cr)
PSY 5054 - Psychology of Language (3.0 cr)
PSY 5062 - Cognitive Neuropsychology (3.0 cr)
PSY 5064 - Brain and Emotion (3.0 cr)
PSY 3061 - Introduction to Biological Psychology (3.0 cr)
or PSY 5061 - Neurobiology of Behavior (3.0 cr)

Clinical, Personality, and Social Psychology

Take 2 or more course(s) from the following:

PSY 3201 - Introduction to Social Psychology (4.0 cr)
PSY 3301 - Introduction to Cultural Psychology, SSCI (3.0 cr)
PSY 3617 - Introduction to Clinical Psychology (3.0 cr)
PSY 3666 - Human Sexuality (3.0 cr)
PSY 5202 - Attitudes and Social Behavior (3.0 cr)
PSY 5204 - Psychology of Interpersonal Relationships (3.0 cr)
PSY 5205 - Applied Social Psychology (3.0 cr)
PSY 5206 - Social Psychology and Health Behavior (3.0 cr)
PSY 5207 - Personality and Social Behavior (3.0 cr)
PSY 5606 - Clinical Psychophysiology (3.0 cr)
CPSY 3301 - Introductory Child Psychology for Social Sciences (4.0 cr)
CPSY 4303 - Adolescent Psychology (4.0 cr)
PSY 3101 - Introduction to Personality (3.0 cr)
or PSY 5101 - Personality Psychology (3.0 cr)
PSY 3604 - Introduction to Abnormal Psychology (3.0 cr)
or PSY 5604H - Abnormal Psychology, H (3.0 cr)

Individual Differences, Quantitative, and Applied Psychology

Take 1 or more course(s) from the following:

PSY 3511 - Introduction to Counseling Psychology (3.0 cr)
PSY 3711 - Introduction to Industrial and Organizational Psychology (3.0 cr)
PSY 4133 - Psychological Testing and Assessment (3.0 cr)
PSY 4501 - Psychology of Women (3.0 cr)
PSY 4801 - Introduction to Statistics (4.0 cr)
PSY 5137 - Introduction to Behavioral Genetics (3.0 cr)
PSY 5138 - Psychology of Aging (3.0 cr)
PSY 5501 - Vocational and Occupational Health Psychology (3.0 cr)
PSY 5707 - Personnel Psychology (4.0 cr)
PSY 5708 - Organizational Psychology (4.0 cr)
PSY 5862 - Psychological Measurement: Theory and Methods (3.0 cr)
PSY 5865 - Advanced Psychological and Educational Measurement (4.0 cr)
PSY 3135 - Introduction to Individual Differences (3.0 cr)
or PSY 5135 - Psychology of Individual Differences (3.0 cr)

Electives

Electives from 3xxx, 4xxx or 5xxx level psychology courese not used to fulfill distribution requirements listed above.

Take 4 - 8 credit(s) from the following:

PSY 3xxx
PSY 4xxx
PSY 5xxx

Take no more than 6 credit(s) from the following:

PSY 3960 - Undergraduate Seminar (1.0-5.0 cr)
PSY 3993 - Directed Study (1.0-6.0 cr)
PSY 3996 - Undergraduate Fieldwork and Internship in Psychology (1.0-6.0 cr)
PSY 4993 - Directed Research: Special Areas of Psychology and Related Sciences (1.0-6.0 cr)
PSY 4960 - Seminar in Psychology (1.0-4.0 cr)
PSY 5960 - Topics in Psychology (1.0-4.0 cr)

Senior Project

PSY 3902W - Major Project in Psychology, WI (4.0 cr)

Honors Sequence

PSY 1001 or equivalent
PSY 2801 - Introduction to Psychological Measurement & Data Analysis (3.0 cr)
PSY 3001W/PSY 3001V - Research Methods (3.0 cr)
PSY 4994V - Honors Research Practicum
PSY 4902V - Honors Thesis Project (3.0-6.0 cr)

Psychology Minor

Psychology

Requirements for this program are current for Summer 2006.

Required credits in this minor: 19.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

No courses without a PSY designator can be used to fulfill minor requirements without departmental approval. Transfer students must complete a minimum of 10 upper division credits in the psychology department at the University of Minnesota in order to be awarded a minor in psychology.

Required Courses

Preparatory Courses
PSY 1001 - Introduction to Psychology, SSCI (4.0 cr)
PSY 2801 - Introduction to Psychological Measurement & Data Analysis (3.0 cr)
PSY 3001W - Research Methods (3.0 cr)

Required Courses

Preparatory Courses
PSY 1001 - Introduction to Psychology, SSCI (4.0 cr)
PSY 2801 - Introduction to Psychological Measurement & Data Analysis (3.0 cr)
PSY 3001W - Research Methods (3.0 cr)

Take 9 or more credit(s) from the following:

Cognitive and Biological Curriculum
PSY 3011 - Introduction to Learning and Behavior (3.0 cr)
PSY 3031 - Introduction to Sensation and Perception (3.0 cr)
PSY 3051 - Introduction to Cognitive Psychology, SSCI (3.0 cr)
PSY 5012 - Learning and Cognition in Animals (4.0 cr)
PSY 5014 - Psychology of Human Learning and Memory (3.0 cr)
PSY 5015 - Cognition, Computation, and Brain (3.0 cr)
PSY 5031W - Perception, WI (3.0 cr)
PSY 5034 - Psychobiology of Vision (3.0 cr)
PSY 5036W - Computational Vision, WI (3.0 cr)
PSY 5037 - Psychology of Hearing (3.0 cr)
PSY 5038W - Introduction to Neural Networks, WI (3.0 cr)
PSY 5051W - Psychology of Human-Machine Interaction, WI (3.0 cr)
PSY 5054 - Psychology of Language (3.0 cr)
PSY 5062 - Cognitive Neuropsychology (3.0 cr)
PSY 5064 - Brain and Emotion (3.0 cr)
PSY 3061 - Introduction to Biological Psychology (3.0 cr)
or PSY 5061 - Neurobiology of Behavior (3.0 cr)

Clinical, Personality, and Social Areas
PSY 3201 - Introduction to Social Psychology (4.0 cr)
PSY 3301 - Introduction to Cultural Psychology, SSCI (3.0 cr)
PSY 3617 - Introduction to Clinical Psychology (3.0 cr)
PSY 3666 - Human Sexuality (3.0 cr)
PSY 5202 - Attitudes and Social Behavior (3.0 cr)
PSY 5204 - Psychology of Interpersonal Relationships (3.0 cr)
PSY 5205 - Applied Social Psychology (3.0 cr)
PSY 5206 - Social Psychology and Health Behavior (3.0 cr)
PSY 5207 - Personality and Social Behavior (3.0 cr)
PSY 3101 - Introduction to Personality (3.0 cr)
or PSY 5101 - Personality Psychology (3.0 cr)
PSY 3604 - Introduction to Abnormal Psychology (3.0 cr)
or PSY 5604H - Abnormal Psychology, H (3.0 cr)

Individual Differences, Quantitative, & Applied Areas
PSY 3511 - Introduction to Counseling Psychology (3.0 cr)
PSY 3711 - Introduction to Industrial and Organizational Psychology (3.0 cr)
PSY 4133 - Psychological Testing and Assessment (3.0 cr)
PSY 4501 - Psychology of Women (3.0 cr)
PSY 4801 - Introduction to Statistics (4.0 cr)
PSY 5137 - Introduction to Behavioral Genetics (3.0 cr)
PSY 5138 - Psychology of Aging (3.0 cr)
PSY 5501 - Vocational and Occupational Health Psychology (3.0 cr)
PSY 5707 - Personnel Psychology (4.0 cr)
PSY 5708 - Organizational Psychology (4.0 cr)
PSY 5862 - Psychological Measurement: Theory and Methods (3.0 cr)
PSY 5865 - Advanced Psychological and Educational Measurement (4.0 cr)
PSY 3135 - Introduction to Individual Differences (3.0 cr)
or PSY 5135 - Psychology of Individual Differences (3.0 cr)

Religious Studies B.A.

Classical and Near Eastern Studies

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 30.

Degree: Bachelor of Arts.

This program introduces students to the critical study of religions, particularly the religions of antiquity. To ensure direct experience of the central texts of at least one religious tradition there is a strong element of language study. Advanced courses are required in Judaism, classical paganism and Christianity, and ancient philosophy. Concentration on the religious thought and practice of the distant past makes possible a longer perspective on religious issues and a balanced understanding of this important aspect of human behavior.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Required Courses for Admission

Preparatory Language Coursework
Complete one of the five language groups below before enrolling in the major.

Latin
LAT 1001 - Beginning Latin I (5.0 cr)
LAT 1002 - Beginning Latin II (5.0 cr)
LAT 3113 - Intermediate Latin Prose (4.0 cr)
or

Greek
GRK 1001 - Beginning Classical Greek I (5.0 cr)
GRK 1002 - Beginning Classical Greek II (5.0 cr)
GRK 3113 - Intermediate Greek Prose (4.0 cr)
or

Hebrew Option 1
HEBR 1001 - Beginning Hebrew I (5.0 cr)
HEBR 1002 - Beginning Hebrew II (5.0 cr)
HEBR 3011 - Intermediate Hebrew I (5.0 cr)
or

Hebrew Option 2
HEBR 1001 - Beginning Hebrew I (5.0 cr)
HEBR 1002 - Beginning Hebrew II (5.0 cr)
or

Sanskrit
SKT 5001 - Beginning Sanskrit (3.0 cr)
SKT 5002 - Beginning Sanskrit (3.0 cr)
SKT 5201 - Intermediate Sanskrit (3.0 cr)

Program Requirements

Students are required to take 4 semester(s) of any second language.

Required Courses

Core Curriculum
CNES 3201 - The Bible: Context and Interpretation, LIT (3.0 cr)
or CNES 3202 - Prophecy in Ancient Israel, LIT (3.0 cr)

or RELA 3201 - The Bible: Context and Interpretation, LIT (3.0 cr)
or RELA 3202 - Prophecy in Ancient Israel, LIT (3.0 cr)
CNES 3072 - The New Testament, HP (3.0 cr)
or CNES 5072 - The New Testament (3.0 cr)
or RELA 3072 - The New Testament, HP (3.0 cr)
or RELA 5072 - The New Testament (3.0 cr)
CNES 3071 - Greek and Hellenistic Religions, HP (3.0 cr)
or CNES 3073 - Roman Religion and Early Christianity, HP (3.0 cr)
or CNES 5071 - Greek and Hellenistic Religions (3.0 cr)
or CNES 5073 - Roman Religion and Early Christianity (3.0 cr)
or RELA 3073 - Roman Religion and Early Christianity (3.0 cr)
or RELA 5071 - Greek and Hellenistic Religions (3.0 cr)
or RELA 5073 - Roman Religion and Early Christianity (3.0 cr)

Another appropriate philosophy course may be substituted
PHIL 3001W - General History of Western Philosophy: Ancient Period, OH, WI (4.0 cr)

Advanced Language Study
The language requirement for the major is equivalent to two years or four semesters of college study, usually certified by the completion of one of the following courses.

LAT 3300 - Intermediate Latin Poetry (4.0 cr)
or GRK 3120 - Greek New Testament (3.0 cr)
or GRK 3300 - Intermediate Greek Poetry (4.0 cr)
or HEBR 3012 - Intermediate Hebrew II (5.0 cr)
or HEBR 3102 - Intermediate Biblical Hebrew II (4.0 cr)
or SKT 5202 - Intermediate Sanskrit (3.0 cr)

Electives
One comparative course on another religious tradition approved by the director of undergraduate studies.
6 credits of electives with the approval of director of undergraduate studies (language courses on religious texts may be included).

Major Project
Students who complete a major project for another CLA major may substitute 4 credits of appropriate coursework at 3xxx or above for the major project in this major.

CNES 3951W - Major Project, WI (4.0 cr)

Religious Studies Minor

Classical and Near Eastern Studies

Requirements for this program are current for Fall 2006.

Required credits in this minor: 14.

The minor in religious studies allows those in other majors to acquire some of the means needed for the critical study of religion.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Only one directed study course may be used in the minor. Grades of D may not be applied to the minor.

Required Courses

Minor Core
Four or the five required courses must be upper division (3xxx to 5xxx), for a total of at least 14 upper division credits.

Take 5 or more course(s) including 2 or more sub-requirement(s) from the following:

Comparative Study
Take 0 - 3 course(s) from the following:
RELS 1xxx
RELS 2xxx
RELS 3xxx
RELS 4xxx

Methodology and Philosophy
Take 0 - 3 course(s) from the following:
RELS 1xxx
RELS 2xxx
RELS 3xxx
RELS 4xxx

Bible and Religion in Antiquity
Take 0 - 3 course(s) from the following:
RELA 1xxx
RELA 2xxx
RELA 3xxx
RELA 4xxx

Russian B.A.

Institute of Linguistics, ESL, and Slavic Languages and Literatures

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 30.

Degree: Bachelor of Arts.

The Slavic and Central Asian Languages and Literatures unit offers study of the Russian, Polish, and Iranic and Turkic languages of Central Asia as well as literature and culture of the Slavic world and Central Asia.

Admission Requirements

Complete the preparatory Russian courses (RUSS 1101, 1102, 3001, 3002) with a minimum grade of C-, or the equivalent.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Students are required to take 4 semester(s) of Russian.

Required Courses

Advanced Language Courses
RUSS 3101 - Advanced Russian I (4.0 cr)
RUSS 3102 - Advanced Russian II (4.0 cr)

Major Courses
RUSS 3421 - Literature: Middle Ages to Dostoevsky in Translation, LIT (3.0 cr)
RUSS 3422 - Literature: Tolstoy to the Present in Translation, LIT (3.0 cr)
RUSS 3512 - Russian Art and Culture,OH (3.0 cr)

Electives
Take 12 credits, excluding preparatory courses.
Take 4 or more course(s) from the following:
RUSS 3xxx
RUSS 4xxx
RUSS 5xxx

Senior Project
RUSS 3311 - Russian Major Project (3.0 cr)

Russian Minor

Institute of Linguistics, ESL, and Slavic Languages and Literatures

Requirements for this program are current for Fall 2006.

Required credits in this minor: 16.

See the major description for more information.

Admission Requirements

Students must complete language study equivalent to two semesters (intermediate level) before beginning the minor.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Students are required to take 2 semester(s) of Russian.

Required Courses

Minor Courses
RUSS 3001 - Intermediate Russian I (5.0 cr)
RUSS 3002 - Intermediate Russian II (5.0 cr)
Take 6 or more credit(s) from the following:
RUSS 3xxx
RUSS 4xxx
RUSS 5xxx

Russian Area Studies Minor

Institute for Global Studies

Requirements for this program are current for Fall 2006.

Required credits in this minor: 15.

The minor requires one year of Russian language and 15 credits (five courses) related to Russia. Students must complete at least one course in humanities. Additional information may be found at http://igs.cla.umn.edu.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Students are required to take 2 semester(s) of Russian.

The minor program must be approved by the global studies adviser.

Required Courses

Minor Courses
POL 4471 may be substituted for GEOG 3181, HIST 3636 may be substituted for HIST 3637.
GEOG 3181 - Russia and Environs, IP, SSCI (3.0 cr)
HIST 3637 - Modern Russia: From Peter the Great to the Present (3.0 cr)
RUSS 3421 - Literature: Middle Ages to Dostoevsky in Translation, LIT (3.0 cr)
or RUSS 3422 - Literature: Tolstoy to the Present in Translation, LIT (3.0 cr)
Complete one course in the humanities on Russia or Central Asia approved by the global studies adviser.
Complete one course focusing on any aspect of Russia or Central Asia approved by a global studies adviser.

Scandinavian Languages and Finnish B.A.

German, Scandinavian, and Dutch

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 31 to 32.

Degree: Bachelor of Arts.

The program teaches and conducts research in the languages and literature of the Scandinavian countries—Denmark, Finland, Norway, and Sweden—in the context of relevant cultural-historical background. Majors and minors are offered with concentrations in Danish, Finnish, Norwegian, and Swedish.

The department recommends study abroad in one of the countries for at least six months in order to acquire cultural familiarity and language fluency. Students may apply appropriate coursework to the major or minors. The Learning Abroad Center has information on study abroad at www.UMabroad.umn.edu.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

The major consists of a minimum of 31 credits in 3xxx, 4xxx (beyond 4004), and 5xxx courses, with concentration in Danish, Finnish, Norwegian, or Swedish. All courses in the major must be taken A-F and completed with a grade of C- or better. At least two courses must be taken in the Scandinavian program at the University of Minnesota. The major program must be approved by the director of undergraduate studies.

Required Courses

Major Courses
Required for Danish, Norwegian, or Swedish concentrations
SCAN 3011 - Readings in Scandinavian Languages (4.0 cr)
or
Required for Finnish concentration
FIN 3011 - Advanced Finnish (3.0 cr)
FIN 3012 - Advanced Finnish (3.0 cr)
Required for all
Take 3 or more course(s) from the following:
SCAN 3501W - Scandinavian Culture Past and Present, IP, WI (3.0 cr)
SCAN 3502 - Scandinavian Myths, LIT (3.0 cr)
SCAN 3503 - Scandinavian Folklore, LIT (3.0 cr)
SCAN 3504 - The Immigrant Experience, HP, IP (3.0 cr)
SCAN 3601 - Great Literary Works of Scandinavia, LIT (3.0 cr)

Major Project
The major project is a substantial paper of approximately 20 typed pages. The paper is prepared in the Major Project Seminar with the guidance and supervision of a faculty member.

GSD 3451W - Major Project Seminar, WI (4.0 cr)
or GSD 3451V - Honors major Project Seminar

Danish, Norwegian or Swedish Concentration

Students are required to complete one of the following course groups.

Substantial work in the student's language of concentration must be done in conjunction with two of the Scandinavian literature or culture courses (SCAN designator), as directed by the instructor or by the director of undergraduate studies. One elective may be taken in an appropriate social science course in consultation with the director of undergraduate studies.

Take 5 or more course(s) from the following:
Scan 3xxx
Scan 4xxx
Scan 5xxx

-OR-

Finnish
Substantial work in the student's language of concentration must be done in conjunction with two of the Scandinavian literature or culture courses (SCAN designator), as directed by the instructor or by the director of undergraduate studies. One elective may be taken in an appropriate social science course in consultation with the director of undergraduate studies.

Take 4 or more course(s) from the following:
Fin 3xxx
Fin 5xxx
Scan 3xxx
Scan 4xxx
Scan 5xxx

Danish Minor

German, Scandinavian, and Dutch

Requirements for this program are current for Fall 2006.

Required credits in this minor: 16

The minor includes study of the spoken language, literature, culture, and civilization.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions web site at http://admissions.tc.umn.edu.

Program Requirements

The minor in Danish consists of a minimum of 16 credits in Scan 3xxx-, 4xxx-, and 5xxx-level courses. No more than one course may be directed or independent study. All courses in the minor must be taken on A-F grading and must be completed with a grade of C- or better. At least one course must be taken in the Scandinavian Program of the University of Minnesota. The minor program must be approved by the Director of Undergraduate Studies.

Required Courses

Minor Courses
Scan 3011, Readings in Scandinavian Languages (4.0. cr)

Take 12 or more credits from the following:
Scan 3xxx
Scan 4xxx
Scan 5xxx

Finnish Minor

German, Scandinavian, and Dutch

Requirements for this program are current for Fall 2006.

Required credits in this minor: 16

The minor includes study of the spoken language, literature, culture, and civilization.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions web site at http://admissions.tc.umn.edu.

Program Requirements

The minor in Finnish consists of a minimum of 15 credits in Scan 3xxx-, 4xxx-, and 5xxx-level courses. No more than one course may be directed or independent study. All courses in the minor must be taken on A-F grading and must be completed with a grade of C- or better. At least one course must be taken in the Scandinavian Program of the University of Minnesota. The minor program must be approved by the Director of Undergraduate Studies.

Required Courses

Minor Courses
Fin 3011, Advanced Finnish
Fin 3012, Advanced Finnish

Take 9 or more credits from the following:
Fin 3xxx
Fin 5xxx
Scan 3xxx
Scan 4xxx
Scan 5xxx

Norwegian Minor

German, Scandinavian, and Dutch

Requirements for this program are current for Fall 2006.

Required credits in this minor: 16

The minor includes study of the spoken language, literature, culture, and civilization.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions web site at http://admissions.tc.umn.edu.

Program Requirements

The minor in Norwegian consists of a minimum of 16 credits in Scan 3xxx-, 4xxx-, and 5xxx-level courses. No more than one course may be directed or independent study. All courses in the minor must be taken on A-F grading and must be completed with a grade of C- or better. At least one course must be taken in the Scandinavian Program of the University of Minnesota. The minor program must be approved by the Director of Undergraduate Studies.

Required Courses

Minor Courses
Scan 3011, Readings in Scandinavian Languages

Take 12 or more credits from the following:
Scan 3xxx

Scan 4xxx
Scan 5xxx

Swedish Minor

German, Scandinavian, and Dutch

Requirements for this program are current for Fall 2006.

Required credits in this minor: 16

The minor includes study of the spoken language, literature, culture, and civilization.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions web site at http://admissions.tc.umn.edu.

Program Requirements

The minor In Swedish consists of a minimum of 16 credits in Scan 3xxx-, 4xxx-, and 5xxx-level courses. No more than one course may be directed or independent study. All courses in the minor must be taken on A-F grading and must be completed with a grade of C- or better. At least one course must be taken in the Scandinavian Program of the University of Minnesota. The minor program must be approved by the Director of Undergraduate Studies.

Required Courses

Minor Courses
Scan 3011, Readings in Scandinavian Languages

Take 12 or more credits from the following:
Scan 3xxx
Scan 4xxx
Scan 5xxx

Sociology B.A.

Sociology

Requirements for this program are current for Summer 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 31.

Degree: Bachelor of Arts.

Sociology examines stability and change in social life by addressing the underlying patterns of social relations in formal organizations, in legal institutions, and in the family, economy, and political arena.

Coursework focuses on the criminal justice system and criminal behavior; mental health; families and close relationships; education; urban and rural communities; politics and policy formation; social movements and social change; diverse racial and ethnic groups; and social psychology. Faculty interests in the comparative study of social relations and institutions in various countries add an international emphasis to these areas of study. All sociology courses emphasize the skills of social inquiry necessary for analyzing patterns of social relationships.

For more information, visit the sociology Web site for undergraduates at: www.soc.umn.edu/undergrad/undergrad.htm.

Admission Requirements

Students must complete 1 courses before admission to the program.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Required Courses for Admission

Preparatory Coursework
SOC 1001 - Introduction to Sociology, CD, SSCI (4.0 cr)
or SOC 1011V - Honors: Introduction to Sociology, CD, SSCI, WI, H (4.0 cr)

Program Requirements

Students are required to take 4 semester(s) of any second language.

Before beginning the senior project, students must complete all major coursework except one elective course. Students must be on a pre-approved waiting list to register for the senior project and should contact the Department of Sociology at least two semesters in advance of registration.

Required Courses

Required Courses
SOC 3701 - Social Theory (4.0 cr)
SOC 3801W - Sociological Research Methods, WI (4.0 cr)
SOC 3811 - Basic Social Statistics, MATH (4.0 cr)

Take 15 or more credit(s) from the following:
SOC 3xxx
SOC 4xxx
SOC 5xxx

Take 1 or more course(s) from the following:
SOC 4xxx
SOC 5xxx

Final Project
Before beginning the senior project, students must complete all major coursework except one elective course. The elective must be taught by the same faculty member who is guiding the student project. Elective coursework must be chosen from a list available from the department.

SOC 4966W - Major-Project Seminar, WI (4.0 cr)
or SOC 4094W - Directed Research: Senior Project, WI (4.0 cr)
or consult with your faculty adviser.
SOC 4967W - Advanced Senior Project Independent Study, WI (1.0 cr)
SOC 3xxx
or
SOC 4xxx
or
SOC 5xxx

Sociology B.S.

Sociology

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 31.

Degree: Bachelor of Science.

Sociology examines stability and change in social life by addressing the underlying patterns of social relations in formal organizations, in legal institutions, and in the family, economy, and political arena.

Coursework focuses on the criminal justice system and criminal behavior; mental health; families and close relationships; education; urban and rural communities; politics and policy formation; social movements and social change; diverse racial

and ethnic groups; and social psychology. Faculty interests in the comparative study of social relations and institutions in various countries add an international emphasis to these areas of study. All sociology courses emphasize the skills of social inquiry necessary for analyzing patterns of social relationships.

For more information, visit the sociology Web site for undergraduates at: www.soc.umn.edu/undergrad/undergrad.htm.

Admission Requirements

Students must complete 1 courses before admission to the program.

To be considered for the B.S. option, students must submit a written proposal to the undergraduate adviser in the Department of Sociology. Students will be signed up for the B.A. in sociology until the proposal is approved by department faculty.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Required Courses for Admission

Preparatory Coursework
Students are encouraged to complete two semesters of calculus before declaring the major. Calculus is often a prerequisite for some courses in the major.

SOC 1001 - Introduction to Sociology, CD, SSCI (4.0 cr)
or SOC 1011V - Honors: Introduction to Sociology, CD, SSCI, WI, H (4.0 cr)

Program Requirements

All major coursework must be completed before beginning the senior project. Students must be on a pre-approved waiting list to register for the senior project and should contact the Department of Sociology at least two semesters in advance of registration.

Required Courses

Required Courses
At least 3 credits of the electives must be at the 4xxx level.

SOC 3701 - Social Theory (4.0 cr)
SOC 3801W - Sociological Research Methods, WI (4.0 cr)
SOC 3811 - Basic Social Statistics, MATH (4.0 cr)
Take 15 or more credit(s) from the following:
SOC 3xxx
SOC 4xxx
SOC 5xxx

Supportive Field
Complete 12-16 credits. Consult with an adviser for other appropriate courses.

Take 2 or more course(s) from the following:
CSCI 4041 - Algorithms and Data Structures (4.0 cr)
ECON 4113 - Introduction to Mathematical Economics (4.0 cr)
ECON 4211 - Principles of Econometrics (4.0 cr)
ECON 4261 - Introduction to Econometrics (4.0 cr)
ECON 4262 - Econometric Analysis (2.0 cr)
MATH 4242 - Applied Linear Algebra (4.0 cr)
MATH 4606 - Advanced Calculus (4.0 cr)
MATH 5248 - Cryptology and Number Theory (4.0 cr)
MATH 5335 - Geometry I (4.0 cr)
MATH 5651 - Basic Theory of Probability and Statistics (4.0 cr)
MATH 5707 - Graph Theory and Non-enumerative Combinatorics (4.0 cr)
STAT 3021 - Introduction to Probability and Statistics (3.0 cr)
STAT 3022 - Data Analysis (4.0 cr)
STAT 4101 - Theory of Statistics I (4.0 cr)
STAT 4102 - Theory of Statistics II (4.0 cr)
STAT 5201 - Sampling Methodology in Finite Populations (3.0 cr)
STAT 5302 - Applied Regression Analysis (4.0 cr)
STAT 5421 - Analysis of Categorical Data (3.0 cr)

Supportive Field
Take no more than two courses from the following.
EPSY 3119 - Learning, Cognition, and Assessment, SSCI (3.0 cr)
or EPSY 5113 - Psychology of Instruction and Technology (3.0 cr)
or EPSY 5114 - Psychology of Student Learning (3.0 cr)
or PHIL 3601W - Scientific Thought, OH, WI (4.0 cr)
or PHIL 4611 - Philosophy of the Social Sciences, WI (3.0 cr)
or PSY 5862 - Psychological Measurement: Theory and Methods (3.0 cr)

Final Project
All major coursework must be completed prior to beginning the senior project. Elective coursework must be taught by the same faculty member who is guiding the students project.

SOC 4966W - Major-Project Seminar, WI (4.0 cr)
or SOC 4094W - Directed Research: Senior Project, WI (4.0 cr)
SOC 4967W - Advanced Senior Project Independent Study, WI (1.0 cr)
SOC 3xxx
or
SOC 4xxx
or
SOC 5xxx

Sociology Minor

Sociology

Requirements for this program are current for Fall 2006.

Required credits in this minor: 18 to 20.

Sociology examines stability and change in social life by addressing the underlying patterns of social relations in formal organizations, in legal institutions, and in the family, economy, and political arena.

Admission Requirements

Students must complete 4 credits before admission to the program.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Required Courses

SOC 1001 - Introduction to Sociology, CD, SSCI (4.0 cr)

Program Sub-plans

Students are required to complete one of the following sub-plans. (Note: The honors sub-plan does not meet this requirement.) Honors students are required to complete one sub-plan plus the honors sub-plan.

General Sociology

Required Courses

SOC 3701 - Social Theory (4.0 cr)
SOC 3801W - Sociological Research Methods, WI (4.0 cr)
or SOC 3811 - Basic Social Statistics, MATH (4.0 cr)
Take 2 or more course(s) from the following:
SOC 3xxx
SOC 4xxx

Law, Crime, and Deviance

Required Courses

SOC 3101 - Introduction to the American Criminal Justice System, C/PE, SSCI (3.0 cr)
or SOC 3102 - Introduction to Criminal Behavior and Social Control (3.0 cr)
SOC 3701 - Social Theory (4.0 cr)
or SOC 3801W - Sociological Research Methods, WI (4.0 cr)
or SOC 3811 - Basic Social Statistics, MATH (4.0 cr)

Take 3 or more course(s) including 2 or more sub-requirement(s) from the following:

Take 1 or more course(s) from the following:
SOC 3xxx
SOC 41xx

Take 2 or more course(s) from the following:
SOC 4xxx

Sociology of Law, Criminology, and Deviance B.A.

Sociology

Requirements for this program are current for Summer 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 31.

Degree: Bachelor of Arts.

Sociology examines stability and change in social life by addressing the underlying patterns of social relations in formal organizations, in legal institutions, and in the family, economy, and political arena.

Coursework focuses on the criminal justice system and criminal behavior; mental health; families and close relationships; education; urban and rural communities; politics and policy formation; social movements and social change; diverse racial and ethnic groups; and social psychology. Faculty interests in the comparative study of social relations and institutions in various countries add an international emphasis to these areas of study. All sociology courses emphasize the skills of social inquiry necessary for analyzing patterns of social relationships.

For more information, visit the sociology Web site at www.soc.umn.edu/undergrad/undergrad.htm.

Admission Requirements

Students must complete 1 course before admission to the program.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Required Courses for Admission

Preparatory Course
SOC 1001 - Introduction to Sociology, CD, SSCI (4.0 cr)
or SOC 1011V - Honors: Introduction to Sociology, CD, SSCI, WI, H (4.0 cr)

Program Requirements

Students are required to take 4 semester(s) of any second language.

Before beginning the senior project, students must complete all major coursework except one elective course. Students must be on a pre-approved waiting list to register for the senior project and should contact the Department of Sociology at least two semesters in advance of registration.

Required Courses

Major Courses
SOC 3101 - Introduction to the American Criminal Justice System, C/PE, SSCI (3.0 cr)
or SOC 3102 - Introduction to Criminal Behavior and Social Control (3.0 cr)
SOC 3701 - Social Theory (4.0 cr)
SOC 3801W - Sociological Research Methods, WI (4.0 cr)
SOC 3811 - Basic Social Statistics, MATH (4.0 cr)

Electives
Three credits must be in general sociology electives and at least 6 credits must be in law, criminology, and deviance (LCD) 41xx electives.

Take 12 or more credit(s) from the following:
SOC 3xxx
SOC 4xxx
SOC 5xxx

General Sociology Electives
Take 1 or more course(s) from the following:
SOC 3xxx
SOC 4xxx

Senior Project
Before beginning the senior project, students must complete all major coursework except one elective course. The elective must be taught by the same faculty member who is guiding the student project. Elective coursework must be chosen from a list available from the department.

SOC 4094W - Directed Research: Senior Project, WI (4.0 cr)
or SOC 4966W - Major-Project Seminar, WI (4.0 cr)
SOC 4967W - Advanced Senior Project Independent Study, WI (1.0 cr)
SOC 3xxx
or
SOC 4xxx
or
SOC 5xxx

Sociology of Law, Criminology, and Deviance B.S.

Sociology

Requirements for this program are current for Fall 2005.

Required credits to graduate with this degree: 120.

Required credits within the major: 31.

Degree: Bachelor of Science.

Sociology examines stability and change in social life by addressing the underlying patterns of social relations in formal organizations, in legal institutions, and in the family, economy, and political arena.

Coursework focuses on the criminal justice system and criminal behavior; mental health; families and close relationships; education; urban and rural communities; politics and policy formation; social movements and social change; diverse racial and ethnic groups; and social psychology. Faculty interests in the comparative study of social relations and institutions in various countries add an international emphasis to these areas of study. All sociology courses emphasize the skills of social inquiry necessary for analyzing patterns of social relationships.

For more information, please visit the sociology Web site at www.soc.umn.edu/undergrad/undergrad.htm.

Admission Requirements

Students must complete 1 courses before admission to the program.

To be considered for the B.S. program, students must submit a written proposal to the undergraduate adviser in the Department of Sociology. Students will be signed up for the B.A. in sociology until the proposal is approved by department faculty.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Required Courses for Admission

Preparatory Courses

Students are encouraged to complete two semesters of calculus before declaring the major. Calculus is often a prerequisite to complete other courses in the major.

SOC 1001 - Introduction to Sociology, CD, SSCI (4.0 cr)
or SOC 1011V - Honors: Introduction to Sociology, CD, SSCI, WI, H (4.0 cr)

Program Requirements

All major coursework must be completed before beginning the senior project. Students must be on a pre-approved waiting list to register for the senior project and should contact the Department of Sociology at least two semesters in advance of registration.

Required Courses

Major Courses

SOC 3101 - Introduction to the American Criminal Justice System, C/PE, SSCI (3.0 cr)
or SOC 3102 - Introduction to Criminal Behavior and Social Control (3.0 cr)
SOC 3701 - Social Theory (4.0 cr)
SOC 3801W - Sociological Research Methods, WI (4.0 cr)
SOC 3811 - Basic Social Statistics, MATH (4.0 cr)

At least 6 credits must be from 41xx law, criminology, and deviance courses.

Take 12 or more credit(s) from the following:
SOC 3xxx
SOC 4xxx
SOC 5xxx

Supportive Field Courses

Take 2 or more course(s) totaling 12 - 16 credit(s) from the following:
CSCI 4041 - Algorithms and Data Structures (4.0 cr)
ECON 4113 - Introduction to Mathematical Economics (4.0 cr)
ECON 4211 - Principles of Econometrics (4.0 cr)
ECON 4261 - Introduction to Econometrics (4.0 cr)
ECON 4262 - Econometric Analysis (2.0 cr)
EPSY 3119 - Learning, Cognition, and Assessment, SSCI (3.0 cr)
EPSY 5113 - Psychology of Instruction and Technology (3.0 cr)
EPSY 5114 - Psychology of Student Learning (3.0 cr)
MATH 4242 - Applied Linear Algebra (4.0 cr)
MATH 4606 - Advanced Calculus (4.0 cr)
MATH 5248 - Cryptology and Number Theory (4.0 cr)
MATH 5335 - Geometry I (4.0 cr)
MATH 5651 - Basic Theory of Probability and Statistics (4.0 cr)
MATH 5707 - Graph Theory and Non-enumerative Combinatorics (4.0 cr)
PHIL 3601W - Scientific Thought, OH, WI (4.0 cr)
PHIL 4611 - Philosophy of the Social Sciences, WI (3.0 cr)
PSY 5862 - Psychological Measurement: Theory and Methods (3.0 cr)
STAT 3021 - Introduction to Probability and Statistics (3.0 cr)
STAT 3022 - Data Analysis (4.0 cr)
STAT 4101 - Theory of Statistics I (4.0 cr)
STAT 4102 - Theory of Statistics II (4.0 cr)
STAT 5201 - Sampling Methodology in Finite Populations (3.0 cr)
STAT 5302 - Applied Regression Analysis (4.0 cr)
STAT 5421 - Analysis of Categorical Data (3.0 cr)

Senior Project

All major coursework must be completed prior to beginning the senior project. Elective coursework must be taught by the same faculty member who is guiding the student's project.

SOC 4094W - Directed Research: Senior Project, WI (4.0 cr)
or SOC 4966W - Major-Project Seminar, WI (4.0 cr)
SOC 4967W - Advanced Senior Project Independent Study, WI (1.0 cr)
SOC 3xxx
or SOC 4xxx
or SOC 5xxx

Sociology of Law, Criminology, and Deviance Minor

Sociology

Requirements for this program are current for Fall 2006.

Required credits in this minor: 16.

Sociologists study human social behavior. More specifically, sociology examines how we group ourselves (families, social groups, formal organizations, societies); how we behave in groups (collective action, social change, crime and delinquency); and how characteristics like age, race, social class, and gender affect our relationships with each other and with organizations and institutions.

Admission Requirements

Students must complete 4 credits before admission to the program.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Required Courses for Admission

Preparatory Courses

SOC 1001 - Introduction to Sociology, CD, SSCI (4.0 cr)
or SOC 1011V - Honors: Introduction to Sociology, CD, SSCI, WI, H (4.0 cr)
or equivalent Transfer Course

Program Requirements

One elective may be taken S-N. The remaining credits must earn a grade of at least C- in each course.

Transfer students must meet the requirements either through approved coursework completed at their transfer institution or at the University of Minnesota, with at least 6 credits (at least two courses) from the University of Minnesota, Twin Cities, Department of Sociology.

Required Courses

Minor Courses

SOC 3101 - Introduction to the American Criminal Justice System, C/PE, SSCI (3.0 cr)
or SOC 3102 - Introduction to Criminal Behavior and Social Control (3.0 cr)

SOC 3701 - Social Theory (4.0 cr)
or SOC 3811 - Basic Social Statistics, MATH (4.0 cr)
or SOC 3801W - Sociological Research Methods, WI (4.0 cr)

Electives
Take one upper level non-criminology sociology course and two 41xx courses chosen from the LCD area of sociology.
Two 41xx courses (6 credits) from LCD area of sociology.

Take 3 or more credit(s) from the following:
SOC 3xxx
SOC 4xxx

South Asian and Middle Eastern Studies Minor

Institute for Global Studies

Requirements for this program are current for Fall 2006.

Required credits in this minor: 15.

The minor requires completion of five 3xxx-5xxx courses (totaling at least 15 credits) related to South Asia and the Middle East.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Two years of an adviser-approved Middle Eastern or South Asian language is required. Courses must be drawn from at least three departments. All courses must be taken A-F, with a grade of at least C-. The minor program must be approved by the global studies adviser.

Required Courses

Minor Courses
One course (3 credits) in the humanities of South Asia or the Middle East.
One course (3 credits) in the social sciences or history of South Asia or the Middle East.
9 credits of coursework relating to South Asia or the Middle East, chosen in consultation with a global studies adviser.

Spanish Studies B.A.

Spanish and Portuguese

Requirements for this program are current for Summer 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 34 to 35.

Degree: Bachelor of Arts.

The program develops analytical skills and methodologies needed to explore Hispanic, Hispanic-American, and Luso-Brazilian languages and cultures. The department offers two majors (Spanish studies and combined Spanish-Portuguese studies) and two minors (Spanish studies and Portuguese studies).

It is important to note that department majors and minors are not simply Spanish and Portuguese language majors or minors, rather, they are liberal arts majors and minors concentrating on Spanish, Latin American and/or Luso-Brazilian literary, cultural, and linguistic studies with language skills at the foundation. All major and minor options in this department begin with prerequisite language courses, followed by advanced language skills courses (special arrangements may be made for native speakers of Spanish or Portuguese). These are followed by critical analysis skills courses in Hispanic literature, culture, and linguistics that prepare students to take advanced coursework in specific areas. The major options culminate in the completion of an individual major research project through the Graduation Seminar.

The department strongly encourages majors and minors to study abroad in a Spanish or Portuguese-speaking area. The department sponsors study abroad programs in Spain, Mexico, Venezuela, and Ecuador. Students who wish to complete department program requirements through study abroad must meet with the department adviser prior to departure. Detailed information regarding Spanish and Portuguese studies undergraduate academic issues is available from the Undergraduate Advising Office in 34 Folwell Hall.

This description should only be used as a gneral overview of departmental programs. For more detailed information see departmental advising staff in 34 Folwell Hall (Telephone: 612-624-9348, e-mail: spadvise@umn.edu). Students must declare majors within the department before completing the majority of major requirements and are encouraged to declare the major as early as possible (preferably during preparatory pre-requisite stages). For declaration procedures see the department website at www.spanport.umn.edu.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Prepatory work: In order to begin coursework in the major students must have completed the equivalent of four semesters of college level Spanish (at least 16 credits) and have successfully passed all parts of the Language Proficiency Exam (LPE).

Language Proficiency
The department emphasizes student initiative and responsibility in acquiring a high level of language proficiency that is crucial for successful completion of courses beyond SPAN 3021. The department sponsors study abroad programs in Mexico, Ecuador, Venezuela, and Spain; offers a course in incorporating service learning in the local Chicano-Latino community; and provides a language tutoring lab and advanced writing center during the academic year while courses are in session.

Required Courses

Major Courses
Students who do not receive a B- or better in SPAN 3015 must take SPAN 3021.

SPAN 3015 - Spanish Composition and Communication (4.0 cr)
SPAN 3104W - Analysis and Interpretation of Texts, LIT, WI (3.0 cr)
SPAN 3105W - Introduction to the Study of Hispanic Civilizations, WI (3.0 cr)
SPAN 3107W - Introduction to the Study of Hispanic Linguistics, WI (3.0 cr)

Electives
A total of 6 elective courses must be taken to complete the major. Take at least 4 courses that have a SPAN 31xx course as pre-requisite. The following is a list of some of the courses that fulfill this requirement.

SPAN 3211 - Literary Discourses of Imperial Spain, 1492-1800 (3.0 cr)
SPAN 3212 - Literary Discourses of Modern and Contemporary Spain (1800-Present) (3.0 cr)
SPAN 3221 - Latin American Colonial Discourses Since 1492 (3.0 cr)
SPAN 3222 - Discourses of Nation Building and Modernization in Latin America (3.0 cr)
SPAN 3501 - Spanish Civilization: Roots of Modern Spain and Latin America (3.0 cr)
SPAN 3502 - Spanish Civilization: Modern Spain (3.0 cr)
SPAN 3510 - Issues in Hispanic Cultures (3.0 cr)
SPAN 3512 - Modern Latin American Civilization (3.0 cr)
SPAN 3701 - The Structure of Spanish: Phonology (3.0 cr)
SPAN 3702 - Structure of Spanish: Morphology and Syntax (3.0 cr)
SPAN 3703 - Origins and History of Spanish and Portuguese (3.0 cr)
SPAN 3704 - Sociolinguistics of the Spanish-Speaking World (3.0 cr)
SPAN 3730 - Topics in Hispanic Linguistics (3.0 cr)
SPAN 3800 - Film Studies in Spanish (3.0 cr)
SPAN 3910 - Topics in Spanish Peninsular Literature (3.0 cr)
SPAN 3920 - Topics in Spanish-American Literature (3.0 cr)
SPAN 3940 - Figures in Spanish Peninsular Literature (3.0 cr)
SPAN 3950 - Figures in Spanish American Literature (3.0 cr)
SPAN 3970 - Directed Studies (1.0-4.0 cr)
Topics courses may be repeated up to 3 times. Those courses end in "0." Examples are SPAN 3510, 3910, 3920, 3730 etc.

Take no more than 2 courses that do not have a Span 31xx re-requisite. Examples are: SPAN 3021*
*Students who do not receive a B- or better in SPAN 3015 are required to take SPAN 3021 as one of their 6 elective courses.
SPAN 3401 - Service Learning in the Chicano/Latino Community (3.0 cr)
SPAN 3044 - Advanced Medical Spanish (4.0 cr)
SPAN 3404 - Medical Spanish and Community Health Service (3.0 cr)
SPAN 3022 Advanced Business Spanish (4.0 cr)
PORT 3001 - Portuguese for Spanish Speakers (4.0 cr)

To complete the Spanish residency requirement, 9 credits of upper division coursework (6 credits of which must have a Span 31xx pre-requisite) must be completed at the University of Minnesota, Twin Cities. Students pursuing a second CLA major may choose to complete the major project requirement in the other major. These students must substitute 3 credits in advanced electives in the Spanish major for SPAN 3972.

Senior Project

All B.A. candidates must complete a major project in Spanish by registering in and attending SPAN 3972 after all other major credits are completed. Graduation seminar informational/preparatory sessions are available in the department several times a year. Permission for seminar registration must be obtained from the department adviser.

SPAN 3972W - Graduation Seminar, WI (3.0 cr)

Spanish Studies Minor

Spanish and Portuguese

Requirements for this program are current for Fall 2006.

Required credits in this minor: 16-17.

See the major for information on undergraduate programs, department sponsored study abroad programs, and declaration procedures.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

In order to begin coursework in the major students must have completed the equivalent of four semesters of college level Spanish (at least 16 credits) and have successfully passed all parts of the Language Proficiency Exam (LPE).

Students must declare the minor at least one full term before completing minor requirements and are encouraged to declare it as early as possible (preferably during preparatory coursework).

Required Courses

The minor consists of 5 courses

Minor Courses

*Students who do not receive a B- or better in SPAN 3015 must take SPAN 3021.

SPAN 3015 - Spanish Composition and Communication (4.0 cr)
SPAN 3104W - Analysis and Interpretation of Texts, LIT, WI (3.0 cr)
or SPAN 3105W - Introduction to the Study of Hispanic Civilizations, WI (3.0 cr)
or SPAN 3107W - Introduction to the Study of Hispanic Linguistics, WI (3.0 cr)

Take 3 courses from the following:
Students who do not receive a B- or better in SPAN 3015 must take SPAN 3021
SPAN 3xxx
SPAN 3021 - Advanced Communication Skills (4.0 cr)

Spanish and Portuguese Studies B.A.

Spanish and Portuguese

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 35 - 36.

Degree: Bachelor of Arts.

the Spanish Studies B.A. for information on Undergraduate programs, department sponsored study abroad programs, and declaration procedures.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

In order to begin coursework in the major students must have completed the equivalent of four semesters of college level Spanish (at least 16 credits) and have successfully passed all parts of the Language Proficiency Exam (LPE) AND take PORT 3001 - Portuguese for Spanish Speakers or the equivalent of four semesters of college level Portuguese..

Major Courses

Students that do not receive a B- or better in SPAN 3015 must take SPAN 3021

PORT 3003 - Portuguese Conversation and Composition (4.0 cr)
SPAN 3015 - Spanish Composition and Communication (4.0 cr)*
SPAN 3104W - Analysis and Interpretation of Texts, LIT, WI (3.0 cr)
SPAN 3105W - Introduction to the Study of Hispanic Civilizations, WI (3.0 cr)
SPAN 3107W - Introduction to the Study of Hispanic Linguistics, WI (3.0 cr)

Electives

Take two SPAN electives that have a SPAN 31xx pre-requisite. Below is a list of some of the courses that fulfill this requirement.

Spanish Electives

SPAN 3212 - Literary Discourses of Modern and Contemporary Spain (1800-Present) (3.0 cr)
SPAN 3221 - Latin American Colonial Discourses Since 1492 (3.0 cr)
SPAN 3222 - Discourses of Nation Building and Modernization in Latin America (3.0 cr)
SPAN 3501 - Spanish Civilization: Roots of Modern Spain and Latin America (3.0 cr)
SPAN 3502 - Spanish Civilization: Modern Spain (3.0 cr)
SPAN 3510 - Issues in Hispanic Cultures (3.0 cr)
SPAN 3512 - Modern Latin American Civilization (3.0 cr)
SPAN 3701 - The Structure of Spanish: Phonology (3.0 cr)
SPAN 3702 - Structure of Spanish: Morphology and Syntax (3.0 cr)
SPAN 3703 - Origins and History of Spanish and Portuguese (3.0 cr)
SPAN 3704 - Sociolinguistics of the Spanish-Speaking World (3.0 cr)
SPAN 3730 - Topics in Hispanic Linguistics (3.0 cr)
SPAN 3800 - Film Studies in Spanish (3.0 cr)
SPAN 3910 - Topics in Spanish Peninsular Literature (3.0 cr)
SPAN 3920 - Topics in Spanish-American Literature (3.0 cr)
SPAN 3940 - Figures in Spanish Peninsular Literature (3.0 cr)
SPAN 3950 - Figures in Spanish American Literature (3.0 cr)
Topics courses may be repeated up to 3 times. These courses end in "0." Examples are: SPAN 3510, 3910, 3920, 3730 etc.

Portuguese Electives

Take two PORT electives. The following are some courses that fulfill this requirement:

PORT 3501W - Foundations of Portuguese Culture, WI (3.0 cr)
PORT 3502W - Foundations of Brazilian Culture, WI (3.0 cr)
PORT 3503W - Literatures and Cultures of Lusophone Africa, WI (3.0 cr)
PORT 3800 - Film Studies in Portuguese (3.0 cr)
PORT 3970 - Directed Readings (1.0-4.0 cr)

Senior Project

All B.A. candidates must complete a major project in Spanish-Portuguese by registering in and attending SPAN 3972 after all other major credits are completed. Graduation seminar informational/preparatory sessions are available in the department several times a year. Permission for seminar registration must be obtained from the department adviser.

SPAN 3972W - Graduation Seminar, WI (3.0 cr)

Portuguese Studies Minor

Spanish and Portuguese

Requirements for this program are current for Fall 2006.

Required credits in this minor: 16

See Spanish Major B.A. for Information on Undergraduate programs, department sponsored study abroad programs, and declaration procedures.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Prepatory work: In order to begin coursework in the major students must have completed the equivalent of four semesters of college level Portuguese (at least 16 credits) and have successfully passed all parts of the Language Proficiency Exam (LPE)

Required Courses

PORT 3003 - Portuguese Conversation and Composition (4.0 cr)

Electives

Take four 3xxx PORT classes.The following are of some of the courses that fulfill this requirement.

PORT 3501W - Foundations of Portuguese Culture, WI (3.0 cr)
PORT 3502W - Foundations of Brazilian Culture, WI (3.0 cr)
PORT 3503W - Literatures and Cultures of Lusophone Africa, WI (3.0 cr)
PORT 3800 - Film Studies in Portuguese (3.0 cr)
PORT 3970 - Directed Readings (1.0-4.0 cr)

Speech-Language-Hearing Sciences B.A.

Speech-Language-Hearing Sciences

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 39 - 41.

Degree: Bachelor of Arts.

The curriculum examines the physical, biological, and behavioral foundations of human communication. Courses focus on the study of normal speech, language, and hearing processes, and seek to apply that knowledge to identifying, preventing, evaluating, and managing disordered speech, language, and hearing.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Students are required to take 4 semester(s) of any second language.

Majors are advised to select additional courses beyond those needed to satisfy the liberal education requirements in the behavioral, biological, cognitive, physical, and social sciences; mathematics; statistics; and research design and methodology.

Required Courses

Major Courses

SLHS 1301W - The Physics and Biology of Spoken Language, PHYS SCI/L, WI (4.0 cr)
or SLHS 1402 - The Talking Brain (3.0 cr)
SLHS 3301 - Introduction to Acoustics (3.0 cr)
SLHS 3302 - Anatomy and Physiology of the Speech and Hearing Mechanisms (3.0 cr)
SLHS 3303 - Language Acquisition and Science, SSCI (3.0 cr)
SLHS 3304 - Phonetics (3.0 cr)
SLHS 3305W - Speech Science, WI (3.0 cr)
SLHS 3306 - Hearing Science (3.0 cr)
SLHS 4301 - Introduction to the Neuroscience of Human Communication (3.0 cr)
SLHS 4502 - Atypical Speech and Language (3.0 cr)
SLHS 4801 - Hearing Measurement and Disorders (3.0 cr)
SLHS 4802 - Rehabilitative Audiology (3.0 cr)
SLHS 1401 - Communication Differences and Disorders, CD, SSCI (3.0 cr)
or SLHS 3401 - Communication Differences and Disorders, CD, SSCI (3.0 cr)

Senior Project

SLHS 3402W - Major Project in Speech and Hearing Science, WI (3.0 cr)

Speech-Language-Hearing Sciences Minor

Speech-Language-Hearing Sciences

Requirements for this program are current for Fall 2006.

Required credits in this minor: 14.

The minor's curriculum examines the physical, biological, and behavioral foundations of human communication. Courses focus on the study of normal speech, language, and hearing processes, and apply that knowledge to identifying, preventing, evaluating, and managing disordered speech, language, and hearing.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Choose 14 credits of 3xxx, 4xxx, or 5xxx courses in the Department of Speech-Language-Hearing Sciences. No more than 20 percent of the credits may be directed study. All courses must be completed with a grade of at least C.

Required Courses

Minor Courses

Take 14 or more credit(s) from the following:

SLHS 3xxx
SLHS 4xxx
SLHS 5xxx

Statistics B.A.

Statistics, School of-ADM

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 27.

Degree: Bachelor of Arts.

Statistics is concerned with theories and methods of data collection, tabulation, analysis, and interpretation, and their use in learning from data and making decisions.

A bachelor's degree gives students an understanding of the theory of statistics and trains them in basic use of the most important types of statistical methods. The degree prepares students for graduate work or for jobs in such diverse areas as marketing analysis, quality management, and support for scientific research.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Students must complete 27 credits in STAT 3xxx or higher (including one year of theory, one year of introductory statistical methods, and three courses in advanced statistical methods) plus two years of math (including multivariable calculus and linear algebra) and onc computer programming course, all with grade C- or better.

Required Courses

MATH 5651 can replace STAT 5101.

STAT 3011 - Introduction to Statistical Analysis, MATH (4.0 cr)
or STAT 3021 - Introduction to Probability and Statistics (3.0 cr)
STAT 3022 - Data Analysis (4.0 cr)
STAT 4101 - Theory of Statistics I (4.0 cr)
STAT 4102 - Theory of Statistics II (4.0 cr)
or
STAT 5101 - Theory of Statistics I (4.0 cr)
STAT 5102 - Theory of Statistics I (4.0 cr)
STAT 4893 - Senior Paper
At least 10 credits of adviser-approved statistics electives chosen from the following: STAT 5031, 5041, 5201, 5302, 5303, 5401, 5421, 5601, 4931, 5931, 5932

Mathematics

MATH 1271 - Calculus I, MATH (4.0 cr)
or MATH 1371 - IT Calculus I, MATH (4.0 cr)
MATH 1272 - Calculus II (4.0 cr)
or MATH 1372 - IT Calculus II (4.0 cr)MATH 2243 - Linear Algebra and Differential Equations (4.0 cr)
or MATH 2373 - IT Linear Algebra and Differential Equations (4.0 cr)
MATH 2263 - Multivariable Calculus (4.0 cr)
or MATH 2374 - IT Multivariable Calculus and Vector Analysis (4.0 cr)
or

Honors Sequence

MATH 1571H - Honors Calculus I, MATH, H (4.0 cr)
MATH 1572H - Honors Calculus II, H (4.0 cr)
MATH 2573H - Honors Calculus III, H (4.0 cr)
MATH 2574H - Honors Calculus IV, H (4.0 cr)

Major Courses

MATH 4242 - Applied Linear Algebra (4.0 cr)
STAT 3011 - Introduction to Statistical Analysis , Math (4.0 cr)
STAT 3021 - Introduction to Probability and Statistics (3.0 cr.)
STAT 3022 - Data Analysis (4.0 cr)
STAT 4893W - Senior Paper, WI (1.0 cr)

Programming for Statisticians

CSCI 1103 - Introduction to Computer Programming in Java (4.0 cr)
or CSCI 1107 - Introduction to FORTRAN Programming for Scientists and Engineers (3.0 cr)
or CSCI 1113 - Introduction to C/C++ Programming for Scientists and Engineers (4.0 cr)

Additional Mathematics courses

MATH 2243 - Linear Algebra and Differential Equations (4.0 cr)
MATH 2263 - Multivariable Calculus (4.0 cr)
MATH 4242 - Applied Linear Algebra (4.0 cr)

Electives

Take 10 or more credit(s) from the following:

STAT 4931 - Topics in Statistics (3.0 cr)
STAT 4932 - Topics in Statistics (3.0 cr)
STAT 5031 - Statistical Methods for Quality Improvement (4.0 cr)
STAT 5201 - Sampling Methodology in Finite Populations (3.0 cr)
STAT 5302 - Applied Regression Analysis (4.0 cr)
STAT 5303 - Designing Experiments (4.0 cr)
STAT 5401 - Applied Multivariate Methods (3.0 cr)
STAT 5421 - Analysis of Categorical Data (3.0 cr)
STAT 5601 - Nonparametric Methods (3.0 cr)
STAT 5931 - Topics in Statistics (3.0 cr)
STAT 5932 - Topics in Statistics (3.0 cr)

Statistics Minor

Requirements for this program are current for Fall 2006.

Required credits in this minor: 14.

Statistics is concerned with theories and methods of data collection, tabulation, analysis, and interpretation, and their use in learning from data and making decisions.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Required Courses

Minor Courses

Take at least 14 credit(s) from the following:
STAT 3xxx
STAT 4xxx
STAT 5xxx

Take at least two courses from:
STAT 4xxx
STAT 5xxx

Studies in Cinema and Media Culture B.A.

Cultural Studies and Comparative Literature

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 32.

Degree: Bachelor of Arts.

Studies in cinema and media culture (SCMC) examines cinema by emphasizing its location within the intricate social, historical, and cultural matrix of audiovisual forms and practices. Core courses and electives are offered not only in the Department of Cultural Studies and Comparative Literature (CSCL) but also in a number of other contributing departments. Through the program's interdisciplinary framework, students explore the sounds and images of cinema as they have changed throughout the 19th and 20th centuries. Print, photography, radio, television, video, and digital media are also considered crucial to understanding the medium. Students develop the ability to 'read' the production and circulation of meaning in cinema, especially within the institutions of mass culture; examine the history of cinema cultures; engage the cross-cultural and global dynamics of cinema production and reception; and explore the theoretical models that have shaped thinking about the cinema and its relations to other media.

Although the major includes a production component, its principal focus is on cultural contexts, history, and theory.

Effective fall 2001 the studies in cinema and media culture major replaced the film studies major. Currently declared film studies majors have the option of either completing their degree in film studies or transferring to the new SCMC major. The director of undergraduate studies can help students transfer programs.

For the latest information on the SCMC major, visit the CSCL Web site.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Students are required to take 4 semester(s) of any second language.

Required Courses

Major Courses

ARTH 1921W - Introduction to Film Study, IP, OH, WI (4.0 cr)
or CSCL 1201 - Introduction to Cinema and Media Culture, OH (4.0 cr)
or CSCL 1921 - Introduction to Film Study, OH (4.0 cr)
or SCMC 1201 - Introduction to Cinema and Media Culture, OH (4.0 cr)
ARTH 3921W - Art of the Film, IP, OH, WI (4.0 cr)
or SCMC 3001 - History of Cinema and Media Culture (4.0 cr)
SCMC 5001 - Critical Debates in the Study of Cinema and Media Culture (4.0 cr)

Context, Practice, Difference, and Analysis

AMST 3111 - American Cultures and the Arts (3.0 cr)
or AMST 3252W - American Popular Culture and Politics: 1900 to 1940, C/PE, HP, WI (4.0 cr)
or AMST 3253W - American Popular Culture and Politics: 1940 to the Present, C/PE, HP, WI (4.0 cr)
or ARTH 3575 - The Art of Walt Disney in American Culture (4.0 cr)
or COMM 3211 - Introduction to U.S. Electronic Media (3.0 cr)
or COMM 5261 - Political Economy of Media Culture (3.0 cr)
or HIST 3705 - From Printing Press to Internet: Media, Communications, and History (3.0 cr)
or HSCI 4321 - History of Computing (3.0 cr)
or JOUR 3614 - History of Media Communication, HP (3.0 cr)
or JOUR 3745 - Mass Media and Popular Culture, CD, SSCI (3.0 cr)
or JOUR 5615 - History of the Documentary (3.0 cr)
COMM 3201 - Introduction to Electronic Media Production (4.0 cr)
or ENGW 5205 - Screenwriting (4.0 cr)
AFRO 5655 - African American Cinema, CD, OH (3.0 cr)
or ALL 3456 - Japanese Film, OH (3.0 cr)
or COMM 4231 - Comparing Electronic Media Systems, IP (3.0 cr)
or COMM 4235 - Electronic Media and Ethnic Minorities—A World View, IP (3.0 cr)
or COMM 5233W - Electronic Media and National Development, WI (3.0 cr)
or CSCL 3176 - Oppositional Cinemas, IP, OH (4.0 cr)
or FRIT 3802 - Cinema and Realism (3.0 cr)
or FRIT 3803 - New Wave Cinemas: Love, Alienation and Landscape in Post-War Italian and French Film (3.0 cr)
or GER 3604W - Introduction to German Cinema, OH, WI (3.0 cr)
ARTH 3927 - Documentary Cinema (4.0 cr)
or ARTH 5927 - Documentary Cinema (4.0 cr)
AFRO 3741 - People of Color and the Mass Media (3.0 cr)
or JOUR 3741 - People of Color and the Mass Media, CD (3.0 cr)
CSCL 3115 - Cinema and Ideology, OH (4.0 cr)
or WOST 3307 - Feminist Film Studies, CD, OH (3.0 cr)
ARTH 3927 - Documentary Cinema (4.0 cr)
or ARTH 5927 - Documentary Cinema (4.0 cr)

Electives

One elective may be 1xxx, and one 3xxx, 4xxx, 5xxx course may serve as a basis for the senior project. Courses used to fulfill other requirements may not be counted toward the elective course requirement.

Take 3 or more course(s) from the following:
AFRO 3654 - African Cinema, IP, OH (4.0 cr)
AFRO 3741 - People of Color and the Mass Media (3.0 cr)
AFRO 5655 - African American Cinema, CD, OH (3.0 cr)
ALL 1001 - Asian Film and Animation (3.0 cr)

ALL 3356W - Chinese Film, IP, OH, WI (3.0 cr)
ALL 3456 - Japanese Film, OH (3.0 cr)
AMIN 3402 - American Indians and the Cinema, CD, OH (3.0 cr)
AMST 3111 - American Cultures and the Arts (3.0 cr)
AMST 3252W - American Popular Culture and Politics: 1900 to 1940, C/PE, HP, WI (4.0 cr)
AMST 3253W - American Popular Culture and Politics: 1940 to the Present, C/PE, HP, WI (4.0 cr)
ARTH 1921W - Introduction to Film Study, IP, OH, WI (4.0 cr)
ARTH 3575 - The Art of Walt Disney in American Culture (4.0 cr)
ARTH 3921W - Art of the Film, IP, OH, WI (4.0 cr)
ARTH 5655 - African American Cinema, CD, OH (3.0 cr)
ARTS 3601 - Interactivity: Digital Processes (4.0 cr)
ARTS 3703 - Photography: Digital Imaging (4.0 cr)
ARTS 5610 - Interactivity: Advanced Digital Processes (4.0 cr)
COMM 3201 - Introduction to Electronic Media Production (4.0 cr)
COMM 3204 - Advanced Electronic Media Production (3.0 cr)
COMM 3211 - Introduction to U.S. Electronic Media (3.0 cr)
COMM 4231 - Comparing Electronic Media Systems, IP (3.0 cr)
COMM 4235 - Electronic Media and Ethnic Minorities—A World View, IP (3.0 cr)
COMM 5210 - Contemporary Problems in U.S. Electronic Media (3.0 cr)
COMM 5233W - Electronic Media and National Development, WI (3.0 cr)
CSCL 1201 - Introduction to Cinema and Media Culture, OH (4.0 cr)
CSCL 1921 - Introduction to Film Study, OH (4.0 cr)
CSCL 3115 - Cinema and Ideology, OH (4.0 cr)
CSCL 3176 - Oppositional Cinemas, IP, OH (4.0 cr)
CSCL 3177 - On Television (4.0 cr)
ENGL 3040 - Studies in Film (3.0 cr)
ENGW 5205 - Screenwriting (4.0 cr)
FRIT 3802 - Cinema and Realism (3.0 cr)
FRIT 3803 - New Wave Cinemas: Love, Alienation and Landscape in Post-War Italian and French Film (3.0 cr)
GER 1601 - Fleeing Hitler: German and Austrian Filmmakers Between Europe and Hollywood, IP, OH (3.0 cr)
GER 3604W - Introduction to German Cinema, OH, WI (3.0 cr)
HIST 3705 - From Printing Press to Internet: Media, Communications, and History (3.0 cr)
HSCI 4321 - History of Computing (3.0 cr)
ITAL 1837 - Imagining Italy: Italian and Italian-American Culture, History, and Society Through Film, IP, OH (4.0 cr)
JOUR 1001 - Introduction to Mass Communication, SSCI, C/PE (3.0 cr)
JOUR 3614 - History of Media Communication, HP (3.0 cr)
JOUR 3741 - People of Color and the Mass Media, CD (3.0 cr)
JOUR 3745 - Mass Media and Popular Culture, CD, SSCI (3.0 cr)
JOUR 3796 - Mass Media and Politics, C/PE (3.0 cr)
JOUR 5615 - History of the Documentary (3.0 cr)
POL 1015 - Mass Politics in a Media Age, C/PE (3.0 cr)
POL 3491 - Film and Latin American Politics (3.0 cr)
SCMC 1201 - Introduction to Cinema and Media Culture, OH (4.0 cr)
SCMC 3001 - History of Cinema and Media Culture (4.0 cr)
SCMC 3177 - On Television (4.0 cr)
SCMC 5001 - Critical Debates in the Study of Cinema and Media Culture (4.0 cr)
SPAN 3800 - Film Studies in Spanish (3.0 cr)
WOST 3409W - Asian American Women's Cultural Production, CD, WI (3.0 cr)
ARTH 3927 - Documentary Cinema (4.0 cr)
or ARTH 5927 - Documentary Cinema (4.0 cr)
GEOG 3374W - The City in Film, IP, OH, WI (4.0 cr)
or GEOG 5374W - The City in Film, IP, WI (4.0 cr)

Senior Project
The senior project requirement may be satisfied by completing one course (3xxx, 4xxx, or 5xxx). Senior projects that involve production (short films, video installations, computer games, among others) are welcome, but emphasis in SCMC falls on research and critical analysis.

Studies in Cinema and Media Culture Minor

Cultural Studies and Comparative Literature

Requirements for this program are current for Fall 2006.

Required credits in this minor: 18.

Studies in cinema and media culture (SCMC) examines cinema by emphasizing its location within the intricate social, historical, and cultural matrix of audiovisual forms and practices.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Required Courses

Minor Courses
ARTH 1921W - Introduction to Film Study, IP, OH, WI (4.0 cr)
or CSCL 1201 - Introduction to Cinema and Media Culture, OH (4.0 cr)
or CSCL 1921 - Introduction to Film Study, OH (4.0 cr)
or SCMC 1201 - Introduction to Cinema and Media Culture, OH (4.0 cr)

Electives
Take 14 credits of 3xxx-5xxx courses from the approved list.

Theatre Arts B.A.

Theatre Arts and Dance

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 43.

Degree: Bachelor of Arts.

This degree program offers study of the art form in both theoretical historical context and the practice of live dramatic performance. Course offerings include theatre history and dramatic literature; acting, movement, and voice; directing; design and technology for scenery, costume, lighting, makeup, and sound; and stage and arts management.

Coursework also embraces theatre as a group art, an art in which individual excellence is often fully realized only in collaboration with other artists. The practical application of the art encourages students to test classroom experiences under the pressure of public performance in the laboratory of the University Theatre.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Students are required to take 4 semester(s) of any second language.

Required Courses

Major Courses
Complete at least 4 credits. At least 2 credits must be taken in some technical capacity.

No more than 2 credits may be taken in acting/performance

TH 1101W - Introduction to the Theatre, IP, LIT, WI (4.0 cr)
TH 1321 - Beginning Acting: Fundamentals of Performance (3.0 cr)
TH 1322 - Creating the Performance (3.0 cr)
TH 3171 - History of the Theatre: Ancient Greece Through Neo-Classicism (3.0 cr)
TH 3172 - History of the Theatre: Age of Enlightenment to Present (3.0 cr)
TH 3513 - Design and Technical Production I (4.0 cr)
TH 3515 - Design and Technical Production II (4.0 cr)
TH 4177W - Survey of Dramatic Literature I: Strategic Interpretation, WI (3.0 cr)
or TH 4178W - Survey of Dramatic Literature II: Representation and its Effects, WI (3.0 cr)
Take no more than 3 credits in acting.
TH 3100 - Theatre Practicum (1.0 cr)

Electives
Complete 10 credits of electives at any level from either theatre arts or dance courses.
Complete a 3 credit or more content course.

Senior Seminar
TH 4901 - Senior Seminar (2.0 cr)

Theatre Arts Minor

Theatre Arts and Dance

Requirements for this program are current for Fall 2006.

Required credits in this minor: 24.

The minor offers study of the art form in both theoretical historical context and the practice of live dramatic performance. Course offerings include theatre history and dramatic literature; acting, movement, and voice; directing; design and technology for scenery, costume, lighting, makeup, and sound; and stage and arts management.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Required Courses

Minor Courses
TH 1101W - Introduction to the Theatre, IP, LIT, WI (4.0 cr)
TH 1321 - Beginning Acting: Fundamentals of Performance (3.0 cr)
TH 1322 - Creating the Performance (3.0 cr)
TH 3513 - Design and Technical Production I (4.0 cr)
TH 3515 - Design and Technical Production II (4.0 cr)

Take 2 or more course(s) from the following:
TH 3171 - History of the Theatre: Ancient Greece Through Neo-Classicism (3.0 cr)
TH 3172 - History of the Theatre: Age of Enlightenment to Present (3.0 cr)
TH 4177W - Survey of Dramatic Literature I: Strategic Interpretation, WI (3.0 cr)
TH 4178W - Survey of Dramatic Literature II: Representation and its Effects, WI (3.0 cr)

Urban Studies B.A.

Geography

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 36.

Degree: Bachelor of Arts.

This cross-disciplinary major involves urban studies coursework, fieldwork experiences, internships, and coursework in disciplines that offer useful perspectives on contemporary urban and postindustrial society.

The program focuses on the conceptual and analytical frameworks and specialized skills needed for professions focused on urban change or development. Students completing the program work in public agencies or private business or pursue graduate study in urban planning, law, social welfare, public affairs, or the social and environmental sciences.

Students are encouraged to incorporate field study into the major or minor. Options include urban studies programs sponsored by the Higher Education Consortium for Urban Affairs (HECUA) in South America, Norway, and Minneapolis-St. Paul.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Students are required to take 4 semester(s) of any second language.

Required Courses

Major Courses
Take two half semesters of either URBS 3201 or 3202.
URBS 1001W or 3001W - Introduction to Urban Studies: The Complexity of Metropolitan Life, C/PE, WI (3.0 cr)Take two semesters of: the following:
URBS 3500 - Urban Studies Workshop (3.0 cr)

Skills and Methods Courses
Take 2 or more course(s) totaling 6 or more credit(s) from the following:

Take 0-1 course(s) from the following:
EPSY 3264 - Basic and Applied Statistics, MATH (3.0 cr)
EPSY 5261 - Introductory Statistical Methods (3.0 cr)
GEOG 3511 - Principles of Cartography (4.0 cr)
GEOG 3531 - Numerical Spatial Analysis (4.0 cr)
PA 5031 - Empirical Analysis I (4.0 cr)
PSY 4801 - Introduction to Statistics (4.0 cr)
SOC 3801W - Sociological Research Methods, WI (4.0 cr)
SOC 3811 - Basic Social Statistics, MATH (4.0 cr)
STAT 3011 - Introduction to Statistical Analysis, MATH (4.0 cr)
STAT 3021 - Introduction to Probability and Statistics (3.0 cr)
Take 1 - 2 course(s) from the following:
GEOG 3561 - Principles of Geographic Information Science (4.0 cr)
GEOG 5511 - Advanced Cartography (3.0 cr)
GEOG 5562 - Geographic Information Science and Analytical Cartography (3.0 cr)
GEOG 5563 - Advanced Geographic Information Science (3.0 cr)
STAT 3212 - Data Analysis (4.0 cr)
STAT 4101 - Theory of Statistics I (4.0 cr)
STAT 4102 - Theory of Statistics II (4.0 cr)
STAT 5021 - Statistical Analysis (4.0 cr)
STAT 5201 - Sampling Methodology in Finite Populations (3.0 cr)
STAT 5401 - Applied Multivariate Methods (3.0 cr)

STAT 5421 - Analysis of Categorical Data (3.0 cr)
CE 3101 - Computer Applications in Civil Engineering I (3.0 cr)
DHA 5469 - Understanding Housing: Assessment and Analysis (3.0 cr)
GEOG 5564 - Urban Geographic Information Science and Analysis (3.0 cr)
GEOG 5588 - Multimedia Cartography (3.0 cr)
HIST 5011 - Quantitative Methods for Historical Research (4.0 cr)
PA 5022 - Economics For Policy Analysis and Planning II (1.5-3.0 cr)
PA 5271 - Geographic Information Systems: Applications in Planning and Policy Analysis (3.0 cr)
POL 3085 - Quantitative Analysis in Political Science, MATH (4.0 cr)
GEOG 4001 - Modes of Geographic Inquiry (4.0 cr)
GEOG 5563 - Advanced Geographic Information Science (3.0 cr)
GEOG 5565 - Geographical Analysis of Environmental Systems and Global Change (3.0 cr)
GEOG 5701 - Field Research (3.0 cr)
HIST 4959 - How to Do History (3.0 cr)
MKTG 3010 - Marketing Research (4.0 cr)
PA 5035 - Survey Research and Data Collection (1.5 cr)
PA 5112 - Public Budgeting (3.0 cr)
PA 5221 - Private Sector Development (3.0 cr)
PA 5511 - Community Economic Development (3.0 cr)
PA 5521 - Development Planning and Policy Analysis (4.0 cr)
WOST 5101 - Feminist Approaches to Ethnography (3.0 cr)
Take 0 - 1 course(s) from the following:
COMM 3411 - Introduction to Small Group Communication (3.0 cr)
COMM 3441 - Introduction to Organizational Communication (3.0 cr)
COMM 5411 - Small Group Communication Research (3.0 cr)
COMM 5441 - Communication in Human Organizations (3.0 cr)
PA 3003 - Non-profit Public Financial Analysis and Budgeting (3.0 cr)
PA 4101 - Nonprofit Management and Governance (3.0 cr)
PA 5253 - Designing Planning and Participation Processes (3.0 cr)

Urban Form and Society Courses

Take 2 or more course(s) from the following:
AFRO 4013 - Cities in Africa: African, Islamic, European Traditions, HP, IP (3.0 cr)
ARCH 3412 - Architectural History since 1750, HP, IP (3.0 cr)
DESI 4050 - Design Institute Seminar: Mapcity (3.0 cr)
DHA 2463 - Housing and Community Development, C/PE (3.0 cr)
GEOG 3371W - Cities, Citizens, and Communities, CD, SSCI, WI (4.0 cr)
GEOG 3373 - Changing Form of the City, HP, IP (3.0 cr)
GEOG 3605W - Geographical Perspectives on Planning, C/PE, IP, WI (4.0 cr)
GEOG 3973 - Geography of the Twin Cities, C/PE, CD (3.0 cr)
GEOG 5371W - American Cities I: Population and Housing, WI (4.0 cr)
GEOG 5605W - Geographical Perspectives on Planning, C/PE, IP, WI (4.0 cr)
HIST 3479 - History of Chinese Cities and Urban Life (3.0-4.0 cr)
HIST 3703W - European Cities: 1300-1800, HP, IP, WI (3.0 cr)
PA 5201W - American Cities I: Population and Housing, WI (4.0 cr)
CSCL 5256W - Suburbia (3.0 cr)

Internship and Senior Paper

URBS 3900 - Urban Studies Internship Seminar (2.0 cr)
URBS 3955W - Senior Paper Seminar, WI (2.0 cr)

Urban Studies Concentrations

Students are required to complete one of the following course groups.

Social and Cultural Analysis of Urban Life

Take 3 or more course(s) from the following:
AFRO 3072 - Racism: Social and Psychological Consequences for Black Americans, CD (3.0 cr)
AFRO 4231 - The Color of Public Policy: African Americans, American Indians, and Chicanos in the United States (3.0 cr)
AFRO 5910 - Topics in African American and African Studies (1.0-3.0 cr)
AMIN 4231 - The Color of Public Policy: African Americans, American Indians, and Chicanos in the United States (3.0 cr)
AMIN 4511 - American Indian Political Economy, CD (3.0 cr)
CHIC 4231 - The Color of Public Policy: African Americans, American Indians, and Chicanos in the United States (3.0 cr)
COMM 3451W - Intercultural Communication: Theory and Practice, IP, WI (3.0 cr)
COMM 5451W - Intercultural Communication Processes, IP, WI (3.0 cr)
DHA 5467W - Housing and the Social Environment, WI (4.0 cr)
GEOG 3374W - The City in Film, IP, OH, WI (4.0 cr)
GEOG 3375 - Minority Settlement in America, CD (3.0 cr)
GEOG 5374W - The City in Film, IP, WI (4.0 cr)
HIST 3442 - Chicana/o History: 1900 to Present, CD (3.0 cr)
HIST 3821 - United States in the 20th Century to 1945, HP (3.0 cr)
HIST 3822 - United States in the 20th Century Since 1945, HP (3.0 cr)
HIST 3851 - Labor in the 19th-Century United States (3.0 cr)
HIST 3852 - U.S. Labor in the 20th Century (3.0 cr)
HIST 3865 - African American History, 1865 to Present, CD, HP (4.0 cr)
HIST 3872 - American Indian History: 1830 to the Present, CD, HP (4.0 cr)
PA 5401 - Poverty, Inequality, and Public Policy (3.0 cr)
PA 5601 - Survey of Women, Law, and Public Policy in the United States (3.0 cr)
POL 3739 - Politics of Race, Class, and Ethnicity, CD, IP (3.0 cr)
PSY 3201 - Introduction to Social Psychology (4.0 cr)
SOC 3451W - Cities and Social Change, SSCI, WI (3.0 cr)
SOC 4108 - Current Issues in Crime Control (3.0 cr)
SW 3101 - Interventions in Community and Social Policy, C/PE (3.0 cr)
SW 5101 - Historical Origins and Contemporary Policies and Programs in Social Welfare (3.0-4.0 cr)
URBS 3301W - American Cities As Settings for Cultural Diversity, CD, WI (3.0 cr)
WOST 4502 - Women and Public Policy (3.0 cr)
WOST 5404 - Working Class Women's Cultures (3.0 cr)

-OR-

Urban Infrastructure and Environment

Take 3 or more course(s) from the following:
APEC 3611 - Environmental and Natural Resource Economics, ENVT (3.0 cr)
ARCH 3401W - Environmental Design and the Sociocultural Context, C/PE, WI (3.0 cr)
ARCH 4671 - Historic Preservation (3.0 cr)
ARCH 4701 - Introduction to Urban Form and Issues (3.0 cr)
ARCH 5672 - Historic Building Conservation (3.0 cr)
ARCH 5673 - Historic Building Research and Documentation (3.0 cr)
ARCH 5711 - Design Principles of the Urban Landscape (3.0 cr)
CE 3201 - Transportation Engineering (3.0 cr)
CE 5211 - Traffic Engineering (3.0 cr)
CE 5212 - Transportation Policy, Planning, and Deployment (3.0 cr)
ECON 3611 - Environmental Economics, ENVT (3.0 cr)
GEOG 5372W - American Cities II: Land Use, Transportation, and the Urban Economy, WI (4.0 cr)
LA 3501 - Environmental Design and Its Biological and Physical Context, ENVT (3.0 cr)
PA 5013 - Law and Urban Land Use (1.5 cr)
PA 5202W - American Cities II: Land Use, Transportation, and the Urban Economy (4.0 cr)
PA 5212 - Managing Urban Growth and Change (3.0 cr)
PA 5231 - Transit Planning and Management (3.0 cr)
PA 5421 - Racial Inequality and Public Policy (3.0 cr)
PA 5531 - Strategies for Sustainable Development: Theory and Practice (2.0 cr)
PA 5722 - Environmental and Resource Economics Policy (3.0 cr)
URBS 3751 - Understanding the Urban Environment, ENVT (3.0 cr)
URBS 3771 - Fundamentals of Transit (3.0 cr)
NRES 3011W - Ethics and Leadership in Resource Management (3.0 cr)
ESPM 3245 - Sustainable Land Use Planning and Policy (3.0 cr)

-OR-

Urban Political Economy

Take 3 or more course(s) from the following:

APEC 5321 - Regional Economic Analysis (3.0 cr)
APEC 5341 - Public Finance (3.0 cr)
APEC 5611 - Economic Aspects of Environmental Management (3.0 cr)
DHA 5463 - Housing Policy (3.0 cr)
ECON 3501 - Labor Economics (3.0 cr)
ECON 4266 - Urban Economics, (4.0 cr)
ECON 4623 - Housing Markets and Public Policy (3.0 cr)
ECON 4821 - Public Economics (3.0 cr)
GEOG 3331 - Geography of the World Economy, IP, SSCI (3.0 cr)
GEOG 3361W - Land Use, Landscapes and the Law (3.0 cr)
GEOG 4001 - Modes of Geographic Inquiry (4.0 cr)
GEOG 5361 - Geography and Real Estate (4.0 cr)
HIST 3841 - American Business History (3.0 cr)
PA 4200 - Urban and Regional Planning (3.0 cr)
PA 5004 - Introduction to Planning (3.0 cr)
PA 5013 - Law and Urban Land Use (1.5 cr)
PA 5211 - Land Use Planning (3.0 cr)
PA 5221 - Private Sector Development (3.0 cr)
PA 5261 - Housing Policy (3.0 cr)
PA 5421 - Racial Inequality and Public Policy (3.0 cr)
PA 5511 - Community Economic Development (3.0 cr)
PA 5590 - Topics in Economic and Community Development (3.0 cr)
POL 3477 - Political Development, SSCI (3.0-4.0 cr)
POL 3739 - Politics of Race, Class, and Ethnicity, CD, IP (3.0 cr)
URBS 3771 - Fundamentals of Transit (3.0 cr)

Urban Studies B.S.

Geography

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 41 to 48.

Degree: Bachelor of Science.

This cross-disciplinary major involves urban studies coursework, fieldwork experiences, internships, and coursework in disciplines that offer useful perspectives on contemporary urban and postindustrial society.

The program focuses on the conceptual and analytical frameworks and specialized skills needed for professions focused on urban change or development. Students completing the program work in public agencies or private business or pursue graduate study in urban planning, law, social welfare, public affairs, or the social and environmental sciences.

Students are encouraged to incorporate field study into the major or minor. Options include urban studies programs sponsored by the Higher Education Consortium for Urban Affairs (HECUA) in South America, Norway, and Minneapolis-St. Paul.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Required Courses

Major Courses

URBS 1001W or 3001W - Introduction to Urban Studies: The Complexity of Metropolitan Life, C/PE, WI (3.0 cr)
Take two semesters of either URBS 3201 or 3202.

Take two semesters of the following:

URBS 3500 - Urban Studies Workshop (3.0 cr)

Skills and Methods Courses

Take 4 or more course(s) totaling 12 or more credit(s) from the following:Take 0 - 1 course(s) from the following:

EPSY 3264 - Basic and Applied Statistics, MATH (3.0 cr)
EPSY 5261 - Introductory Statistical Methods (3.0 cr)
GEOG 3511 - Principles of Cartography (4.0 cr)
GEOG 3531 - Numerical Spatial Analysis (4.0 cr)
PA 5031 - Empirical Analysis I (4.0 cr)
PSY 4801 - Introduction to Statistics (4.0 cr)
SOC 3801W - Sociological Research Methods, WI (4.0 cr)
SOC 3811 - Basic Social Statistics, MATH (4.0 cr)
STAT 3011 - Introduction to Statistical Analysis, MATH (4.0 cr)
STAT 3021 - Introduction to Probability and Statistics (3.0 cr)
Take 0 - 2 course(s) from the following:
GEOG 5511 - Advanced Cartography (3.0 cr)
GEOG 3561 - Principles of Geographic Information Science (4.0 cr)
GEOG 5562 - Geographic Information Science and Analytical Cartography (3.0 cr)
GEOG 5563 - Advanced Geographic Information Science (3.0 cr)
STAT 3212 - Data Analysis (4.0 cr)
STAT 4101 - Theory of Statistics I (4.0 cr)
STAT 4102 - Theory of Statistics II (4.0 cr)
STAT 5021 - Statistical Analysis (4.0 cr)
STAT 5201 - Sampling Methodology in Finite Populations (3.0 cr)
STAT 5401 - Applied Multivariate Methods (3.0 cr)
STAT 5421 - Analysis of Categorical Data (3.0 cr)

Take 0 - 2 course(s) from the following:

CE 3101 - Computer Applications in Civil Engineering I (3.0 cr)
DHA 5469 - Understanding Housing: Assessment and Analysis (3.0 cr)
GEOG 5588 - Multimedia Cartography (3.0 cr)
GEOG 5564 - Urban Geographic Information Science and Analysis (3.0 cr)
HIST 5011 - Quantitative Methods for Historical Research (4.0 cr)
POL 3085 - Quantitative Analysis in Political Science, MATH (4.0 cr)
PA 5022 - Economics For Policy Analysis and Planning II (1.5-3.0 cr)
PA 5271 - Geographic Information Systems: Applications in Planning and Policy Analysis (3.0 cr)

Take 0 - 2 course(s) from the following:

GEOG 4001 - Modes of Geographic Inquiry (4.0 cr)
GEOG 5563 - Advanced Geographic Information Science (3.0 cr)
GEOG 5701 - Field Research (3.0 cr)
GEOG 5565 - Geographical Analysis of Environmental Systems and Global Change (3.0 cr)
HIST 4959 - How to Do History (3.0 cr)
MKTG 3010 - Marketing Research (4.0 cr)
PA 4101 - Nonprofit Management and Governance (3.0 cr)
PA 5035 - Survey Research and Data Collection (1.5 cr)
PA 5111 - Financial Management in Public and Nonprofit Organizations (3.0 cr)
PA 5112 - Public Budgeting (3.0 cr)
PA 5221 - Private Sector Development (3.0 cr)
PA 5253 - Designing Planning and Participation Processes (3.0 cr)
PA 5511 - Community Economic Development (3.0 cr)
PA 5521 - Development Planning and Policy Analysis (4.0 cr)
WOST 5101 - Feminist Approaches to Ethnography (3.0 cr)

Urban Form and Society Coursework

Take 2 or more course(s) from the following:

AFRO 4013 - Cities in Africa: African, Islamic, European Traditions, HP, IP (3.0 cr)
ARCH 3412 - Architectural History since 1750, HP, IP (3.0 cr)
DESI 4050 - Design Institute Seminar: Mapcity (3.0 cr)
DHA 2463 - Housing and Community Development, C/PE (3.0 cr)
GEOG 3371W - Cities, Citizens, and Communities, CD, SSCI, WI (4.0 cr)
GEOG 3373 - Changing Form of the City, HP, IP (3.0 cr)
GEOG 3605W - Geographical Perspectives on Planning, C/PE, IP, WI (4.0 cr)
GEOG 3973 - Geography of the Twin Cities, C/PE, CD (3.0 cr)

GEOG 5371W - American Cities I: Population and Housing, WI (4.0 cr)
GEOG 5605W - Geographical Perspectives on Planning, C/PE, IP, WI (4.0 cr)
HIST 3479 - History of Chinese Cities and Urban Life (3.0-4.0 cr)
HIST 3703W - European Cities: 1300-1800, HP, IP, WI (3.0 cr)
PA 5201W - American Cities I: Population and Housing, WI (4.0 cr)
CSCL 5256W - Suburbia (3.0 cr)

Urban Studies Internship and Senior Paper
URBS 3900 - Urban Studies Internship Seminar (2.0 cr)
URBS 3955W - Senior Paper Seminar, WI (2.0 cr)

Urban Studies Concentrations

Students are required to complete one of the following course groups.

Social and Cultural Analysis of Urban Life
Take 3 or more course(s) from the following:
AFRO 3072 - Racism: Social and Psychological Consequences for Black Americans, CD (3.0 cr)
AFRO 4231 - The Color of Public Policy: African Americans, American Indians, and Chicanos in the United States (3.0 cr)
AFRO 5910 - Topics in African American and African Studies (1.0-3.0 cr)
AMIN 4231 - The Color of Public Policy: African Americans, American Indians, and Chicanos in the United States (3.0 cr)
AMIN 4511 - American Indian Political Economy, CD (3.0 cr)
CHIC 4231 - The Color of Public Policy: African Americans, American Indians, and Chicanos in the United States (3.0 cr)
COMM 3451W - Intercultural Communication: Theory and Practice, IP, WI (3.0 cr)
COMM 5451W - Intercultural Communication Processes, IP, WI (3.0 cr)
DHA 5467W - Housing and the Social Environment, WI (4.0 cr)
GEOG 3374W - The City in Film, IP, OH, WI (4.0 cr)
GEOG 3375 - Minority Settlement in America, CD (3.0 cr)
GEOG 5374W - The City in Film, IP, WI (4.0 cr)
HIST 3442 - Chicana/o History: 1900 to Present, CD (3.0 cr)
HIST 3821 - United States in the 20th Century to 1945, HP (3.0 cr)
HIST 3822 - United States in the 20th Century Since 1945, HP (3.0 cr)
HIST 3851 - Labor in the 19th-Century United States (3.0 cr)
HIST 3852 - U.S. Labor in the 20th Century (3.0 cr)
HIST 3865 - African American History, 1865 to Present, CD, HP (4.0 cr)
HIST 3872 - American Indian History: 1830 to the Present, CD, HP (4.0 cr)
PA 5401 - Poverty, Inequality, and Public Policy (3.0 cr)
PA 5601 - Survey of Women, Law, and Public Policy in the United States (3.0 cr)
POL 3739 - Politics of Race, Class, and Ethnicity, CD, IP (3.0 cr)
PSY 3201 - Introduction to Social Psychology (4.0 cr)
SOC 3451W - Cities and Social Change, SSCI, WI (3.0 cr)
SOC 4108 - Current Issues in Crime Control (3.0 cr)
SW 3101 - Interventions in Community and Social Policy, C/PE (3.0 cr)
SW 5101 - Historical Origins and Contemporary Policies and Programs in Social Welfare (3.0-4.0 cr)
URBS 3301W - American Cities As Settings for Cultural Diversity, CD, WI (3.0 cr)
WOST 4502 - Women and Public Policy (3.0 cr)
WOST 5404 - Working Class Women's Cultures (3.0 cr)

-OR-

Urban Infrastructure and Environment
Take 3 or more course(s) from the following:
APEC 3611 - Environmental and Natural Resource Economics, ENVT (3.0 cr)
ARCH 3401W - Environmental Design and the Sociocultural Context, C/PE, WI (3.0 cr)
ARCH 4671 - Historic Preservation (3.0 cr)
ARCH 4701 - Introduction to Urban Form and Issues (3.0 cr)
ARCH 5672 - Historic Building Conservation (3.0 cr)
ARCH 5673 - Historic Building Research and Documentation (3.0 cr)
ARCH 5711 - Design Principles of the Urban Landscape (3.0 cr)
CE 3201 - Transportation Engineering (3.0 cr)
CE 5211 - Traffic Engineering (3.0 cr)
CE 5212 - Transportation Policy, Planning, and Deployment (3.0 cr)
ECON 3611 - Environmental Economics, ENVT (3.0 cr)
GEOG 5372W - American Cities II: Land Use, Transportation, and the Urban Economy, WI (4.0 cr)
LA 3501 - Environmental Design and Its Biological and Physical Context, ENVT (3.0 cr)
PA 5013 - Law and Urban Land Use (1.5 cr)
PA 5202W - American Cities II: Land Use, Transportation, and the Urban Economy (4.0 cr)
PA 5212 - Managing Urban Growth and Change (3.0 cr)
PA 5231 - Transit Planning and Management (3.0 cr)
PA 5531 - Strategies for Sustainable Development: Theory and Practice (2.0 cr)
PA 5722 - Environmental and Resource Economics Policy (3.0 cr)
URBS 3751 - Understanding the Urban Environment, ENVT (3.0 cr)
ESPM 3245 - Sustainable Land Use Planning and Policy (3.0 cr)
NRES 3011W - Ethics and Leadership in Resource Management (3.0 cr)
URBS 3771 - Fundamentals of Transit (3.0 cr)

-OR-

Urban Political Economy
Take 3 or more course(s) from the following:
APEC 5321 - Regional Economic Analysis (3.0 cr)
APEC 5341 - Public Finance (3.0 cr)
APEC 5611 - Economic Aspects of Environmental Management (3.0 cr)
DHA 5463 - Housing Policy (3.0 cr)
ECON 3501 - Labor Economics (3.0 cr)
ECON 4266 - Urban Economics, (4.0 cr)
ECON 4623 - Housing Markets and Public Policy (3.0 cr)
ECON 4821 - Public Economics (3.0 cr)
GEOG 3331 - Geography of the World Economy, IP, SSCI (3.0 cr)
GEOG 3361W - Land Use and the Law (3.0 cr)
GEOG 5361 - Geography and Real Estate (4.0 cr)
HIST 3841 - American Business History (3.0 cr)
PA 4200 - Urban and Regional Planning (3.0 cr)
PA 5004 - Introduction to Planning (3.0 cr)
PA 5013 - Law and Urban Land Use (1.5 cr)
PA 5211 - Land Use Planning (3.0 cr)
PA 5221 - Private Sector Development (3.0 cr)
PA 5421 - Racial Inequality and Public Policy (3.0 cr)
PA 5511 - Community Economic Development (3.0 cr)
PA 5590 - Topics in Economic Development (3.0 cr)
POL 3477 - Political Development, SSCI (3.0-4.0 cr)
POL 3739 - Politics of Race, Class, and Ethnicity, CD, IP (3.0 cr)
PA 5261 - Housing Policy (3.0 cr)
URBS 3771 - Fundamentals of Transit (3.0 cr)

Urban Studies Minor

Requirements for this program are current for Fall 2006.

Required credits in this minor: 14.

The program focuses on the conceptual and analytical frameworks and specialized skills needed for professions focused on urban change or development.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Required Courses

Minor Courses

Two sessions of URBS 3201 or 3202. Electives from the following tracks: urban form and society, cultural analysis, political economy, and infrastructure and environment.

URBS 1001W - Introduction to Urban Studies: The Complexity of Metropolitan Life, C/PE, WI (3.0 cr)

URBS 3500 - Urban Studies Workshop (3.0 cr)

Two courses (6 credits) from one of the four URBS tracks.

URBS 3201 - Urban Studies Colloquium (1.0 cr)

or URBS 3202 - Urban Studies Colloquium (1.0 cr)

Women's Studies

(Gender, Women, and Sexuality Studies B.A. effective fall 2006)

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 36.

Degree: Bachelor of Arts.

Gender,Women, and Sexuality Studies offers an interdisciplinary curriculum that looks at issues of gender and sexuality in the United States and around the world, taking into account the intersections and interrelations of generation, economic status, race, geographic location, and other social and historical variables. Gender, Women, and Sexuality Studies also seeks to transform traditional fields of study by incorporating new data, methods, theories, and frameworks developed by feminist scholars.

In addition to the faculty in women's studies, several departments and centers lend their interdisciplinary teaching and advisory expertise to women's studies students. Among these are the Departments of African American and African Studies; American Studies; American Indian Studies; Anthropology; Chicano Studies; Communication Studies; Comparative Studies in Discourse and Society; English; French and Italian; German, Scandinavian, and Dutch; History; Philosophy; Sociology; and Spanish and Portuguese. Affiliated programs include the School of Nursing; the Hubert H. Humphrey Institute of Public Affairs' Center on Women and Public Policy; the Institute for Global Studies; the MacArthur Interdisciplinary Program on Global Change, Sustainability, and Justice; Minnesota Institute for Sustainable Agriculture; and the Tucker Center for Research on Girls and Women in Sport.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Students are required to take 4 semester(s) of any second language.

Students must complete 27-30 credits of required courses plus upper level electives as needed to reach 36 credits.

Required Courses

Major Courses

Courses in this list may not be used to fulfill the cultural pluralism, international studies, and advanced theory requirements.

Take four courses from the following list.

WOST 1001 - Introduction to Women's Studies, CD, SSCI (3.0-4.0 cr)

or WOST 1002 - Politics of Sex, CD, SSCI (3.0-4.0 cr)

WOST 3102W - Feminist Thought and Theory., C/PE, OH, WI (3.0-4.0 cr)

WOST 4402 - Rebels, Radicals, and Revolutionaries: History of Western Feminisms (3.0 cr)

WOST 1003W - Women Write the World, IP, LIT, WI (3.0-4.0 cr)

or WOST 3002 - Gender, Race, and Class: Women's Lives in the United States, C/PE, CD (3.0-4.0 cr)

or WOST 3003 - Gender and Global Politics, IP, SSCI (3.0-4.0 cr)

or WOST 3004W - Point/Counterpoint: Contemporary Feminist Debates, C/PE, OH, WI (3.0-4.0 cr)

Cultural Pluralism, International Studies, and Advanced Theory

Take one course from each category. Consult an adviser to use a course from one category to fulfill the requirement for another category. Courses cannot fulfill requirements for more than one category.

Cultural Pluralism

WOST 3203W - Skin, Sex, and Genes, CD, OH, WI (3.0 cr)

or WOST 3303W - Writing Differences: Literature by U.S. Women of Color, CD, LIT, WI (3.0 cr)

or WOST 3403W - Jewish Women in the United States, CD, HP, WI (3.0 cr)

or WOST 3409W - Asian American Women's Cultural Production, CD, WI (3.0 cr)

or WOST 3410 - La Chicana, CD (3.0 cr)

or WOST 3411 - Las Mujeres, CD (3.0 cr)

or WOST 3412 - American Indian Women: Ethnographic and Ethnohistorical Perspectives, CD, SSCI (3.0 cr)

or WOST 4302H - Honors: Women's Personal Narratives, H (3.0 cr)

or WOST 4401 - Chicana/Latina Cultural Studies, CD (3.0 cr)

or WOST 5403 - Chicana/Latina Feminisms (3.0 cr)

or WOST 5405 - Chicanas: Women and Work (3.0 cr)

International Studies

WOST 3003 - Gender and Global Politics, IP, SSCI (3.0-4.0 cr)

or WOST 3404 - International Lesbian and Queer Studies (3.0 cr)

or WOST 3405 - Latin American Women's Lives, IP (3.0 cr)

Advanced Theory

WOST 4103H - Honors: International Feminist Theories, H (3.0 cr)

or WOST 4302H - Honors: Women's Personal Narratives, H (3.0 cr)

or WOST 4401 - Chicana/Latina Cultural Studies, CD (3.0 cr)

or WOST 4403 - Queering Theory (3.0 cr)

or WOST 5101 - Feminist Approaches to Ethnography (3.0 cr)

or WOST 5102 - Feminist Approaches to History (3.0 cr)

or WOST 5103 - Feminist Pedagogies (3.0 cr)

or WOST 5201 - Global Processes and the Politics of Sexuality (3.0 cr)

or WOST 5300 - Communication and Gender (3.0 cr)

or WOST 5403 - Chicana/Latina Feminisms (3.0 cr)

Senior Project

The senior project must be completed in one of two 4xxx-5xxx courses. If the project is not done in one of the courses designed to produce the senior project (e.g. WOST 4108), it may be completed in any 4xxx-5xxx WOST course, by contract and with instructor approval.

WOST 4xxx
WOST 5xxx

Take 2 or more course(s) from the following:
WOST 4xxx

Take 2 or more course(s) from the following:
WOST 5xxx

Electives
Take 6 - 9 credit(s) from the following:
WOST 3xxx
WOST 4xxx
WOST 5xxx

Women's Studies Minor

Women's Studies

Requirements for this program are current for Fall 2006.

Required credits in this minor: 18.

The minor offers an interdisciplinary curriculum that looks at issues of women and gender in the United States and around the world, taking into account significant social and historical variables. Women's studies seeks to transform traditional fields of study by incorporating new data, methods, theories, and frameworks developed by feminist scholars.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

Required Courses

Minor Courses
Not more than one of the elective 3xxx-5xxx courses may be used from WOST 3002, 3003, and 3004.

WOST 1001 - Introduction to Women's Studies, CD, SSCI (3.0-4.0 cr)
or WOST 1002 - Politics of Sex, CD, SSCI (3.0-4.0 cr)

Take 15 or more credit(s) from the following:
WOST 3xxx
WOST 4xxx
WOST 5xxx

This is the Carlson School of Management General Information and Degree Programs section of the 2006-2008 Undergraduate Catalog for the University of Minnesota, Twin Cities campus.

Carlson School of **Management**

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LCOME CARLSON
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General Information

History
- University of Minnesota School of Business founded in 1919
- Named the Curtis L. Carlson School of Management in 1986
- Moved into current building in 1998

Faculty and Staff
- 108 faculty, including 22 endowed faculty
- 228 staff members

Alumni
- 43,000 alumni
- Located in 50 states, Washington D.C., and 70 foreign countries
- 85 Outstanding Achievement Awards

Rankings
- Ranked 12th among all business schools and 8th among all public business schools by U.S. News & World Report, 2006
- Part-time M.B.A. program ranked 15th in nation by U.S. News & World Report, 2006
- Executive M.B.A. program ranked 20th in the nation by U.S. News & World Report, 2006
- Full-time M.B.A. program ranked 23rd in the nation by U.S. News & World Report, 2006
- 2nd tier M.B.A. program, Business Week, 2004

Degrees Awarded
- Bachelor of science in business (B.S.B.)
- Master of business administration (M.B.A.)
- Executive M.B.A. (C.E.M.B.A.)
- Master of arts in human resources and industrial relations (M.A.H.R.I.R.)
- Master of business taxation (M.B.T.)
- Master of science in management of technology (M.S.-M.O.T.)
- Doctorate in business administration (Ph.D. Business)
- Doctorate in industrial relations (Ph.D. I.R.)

2005-2006 Enrollments
- 1700 undergraduates
- 202 full time M.B.A. students
- 1650 part time M.B.A. students
- 125 C.E.M.B.A. students
- 117 M.A.H.R.I.R. day students
- 71 M.A.H.R.I.R. evening students
- 124 M.B.T. students
- 60 M.S.-M.O.T. students
- 93 Ph.D.-business administration students
- 16 Ph.D.-industrial relations students

2005 Placement Statistics
Average salaries of new graduates:
- B.S.B.—$43,659
- M.B.A.—$82,436
- M.A.H.R.I.R.—$61,013

Professional Education
- Executive Development Center
- Labor Education Service
- ISP (Healthcare Administration)

Carlson Sponsored International Programs
- Graduate student exchange programs in Australia, Belgium, Brazil, China, Costa Rica, Denmark, England, France, Japan, New Zealand, Spain, Sweden, and Switzerland
- Short-term global enrichment electives for undergraduate and graduate students, including the Vienna Seminar and Vienna Summer Program with Wirtschaftsuniversitat Wien in Austria, the Lyon Summer Program with Universite' Jean Moulin-Lyon III in France, the Copenhagen Summer Program at Copenhagen Business School in Denmark, and the Costa Rica Seminar with the Instituto Centroamericano de Administracion de Empresas
- Joint executive M.B.A. degree program with Warsaw School of Economics, Poland
- Joint executive M.B.A. degree program with Wirtschaftsuniversitat Wein, Austria
- Joint executive M.B.A. degree program with Lingnan College (University) in Guanzhou, China
- Undergraduate semester business exchange programs in Austria, Belgium, China, Denmark, England, France, Italy, Netherlands, Norway, New Zealand, Singapore, and Switzerland. Hundreds of other study abroad opportunities are also available through the University's Learning Abroad Center.)
- Faculty exchange programs in China, France, Japan, Austria, and Poland

Accreditation
The Carlson School of Management is accredited by AACSB International, the Association to Advance Collegiate Schools of Business. AACSB is the premier accrediting agency for undergraduate and graduate business administration and accounting programs.

Research Centers
- Accounting Research Center
- Center for Brand Management
- Center for Entrepreneurial Studies
- Center for the Financial Services Industry
- Medical Industry Leadership Institution
- Human Resources Research Institute
- Industrial Relations Center
- Logistics Management Research Center
- Management Information Systems Research Center
- Juran Center for Leadership in Quality
- Strategic Management Research Center

At the Carlson School of Management our mission is to provide the highest quality education for present and future business and academic leaders, and advance the understanding and practice of management through research and outreach.

Admission

Each year Carlson admits approximately 375 freshmen, 50 sophomores, and 120 juniors.

Freshman Admission

The Carlson School of Management admits students based on an overall assessment of the applicant's background and accomplishments as presented in the application materials. In addition to very strong academic records, applicants should have strong leadership and service experience. Among the factors considered in the application review are academic performance (i.e. completion of the high school preparation requirements, a strong background in math and science, high school class rank, ACT/SAT scores and competitiveness of curriculum), demonstrated leadership skills, and active participation in extra-curricular activities.

The following profile of the class of fall 2005 is intended as a guide to help students assess their qualifications for admission:

- Average high school rank 94th percentile
- Average ACT score 28

Applicants who submit a completed application by the December 15 priority application deadline will receive priority consideration for admission. Applications postmarked or completed after the priority deadline are reviewed on a space-available basis. Applications are available online and from the Office of Admissions, 240 Williamson Hall, 231 Pillsbury Drive S.E. Minneapolis, MN 55455 (612-625-2008 or 800-752-1000).

Admission at the Sophomore Year

A limited number of sophomores from within the University of Minnesota system are admitted each fall. To be considered for admission as a sophomore, the following standards apply:

- Completion of 30–49 credits (at least 50 percent of the total credits must be taken from the University of Minnesota)
- Completion of microeconomics, macroeconomics, and calculus

Students should complete both the *Application for Undergraduate Change of College* form and the *Carlson School Addendum*, available at the Student Service Center, 200 Fraser Hall or 130 West Bank Skyway, or the Carlson School Undergraduate Program Office, 1-105 Carlson School of Management, by the March 1 deadline.

Admission to Upper Division Carlson Major Programs

Students from within the University of Minnesota system and from other institutions may apply directly to the upper division program. Applications are reviewed for fall admission only and should be submitted by the March 1 deadline.

To be considered for admission at the junior level or higher, the following standards apply:

- Completion of 50 or more semester credits
- Completion of calculus, microeconomics, macroeconomics, business statistics, and introduction to financial accounting

Transfer Admission

Transfer admission is competitive and is based on an overall assessment of the applicant's background and accomplishments as presented in the application materials. Applicants who have completed the required tool courses are considered. Academic performance is assessed on factors such as overall grade point average and rigor of curriculum, progress in the tool courses, grade trends and completion patterns. In addition to very strong academic records, applicants should have strong leadership, service, and/or work experience. The application addendum, which must be completed in addition to the application, provides the basis for assessing an applicant's accomplishments outside the classroom.

Students who started their college career as freshmen in the University of Minnesota system may apply for transfer at the sophomore or junior level. Students from outside the University of Minnesota system are accepted only at the junior level or higher

If transferring from within the University of Minnesota system, students should complete the Application for Undergraduate Change of College form and the Carlson School Addendum, available at the Student Service Center, 200 Fraser Hall or 130 West Bank Skyway, or the Carlson School Undergraduate Program Office, 1-105 Carlson School of Management.

If transferring from outside the University, students are encouraged to apply online at http://admissions.tc.umn.edu. Students may also obtain an admission application and the Application Addendum at the Office of Admissions, 240 Williamson Hall, 231 Pillsbury Drive S.E., Minneapolis, MN 55455 (612-625-2008). Students must request that an official transcript from each college attended be sent directly from the college to the Office of Admissions. In addition, a nonrefundable application fee must accompany the application.

How Credits Transfer to Carlson

Transferable credits completed at another institution may be used to meet admission requirements. Junior- and senior-level business courses from other institutions are usually accepted for general elective credit but must be evaluated by an appropriate faculty member before they can be used in lieu of Carlson upper division course requirements. To have courses evaluated, students should bring their syllabi to the Undergraduate Program Office in 1-105 Carlson School of Management after admission to the program. The Carlson School does not normally accept lower division business coursework in lieu of upper division course requirements.

Note: If students have earned a bachelor's degree in business from another four-year institution, they may not earn a second bachelor's degree from the Carlson School.

Foreign Credits

If students earned credit at a recognized educational institution abroad, the credits may transfer to the Carlson School if the coursework meets specific lower division distribution requirements or upper division elective requirements, as determined by the admissions coordinator. If students completed credits at a foreign institution before admission to the University of Minnesota, the credits are generally accepted on the S-N grading system only.

Non-degree-seeking Students

If students are interested in taking courses but not in earning a degree and have a bachelor's degree or business experience and a strong undergraduate record, they may enroll as a non-degree-seeking student.

Students admitted as non-degree-seeking students who later decide to become degree candidates must satisfy Carlson's admission requirements and apply to transfer into a degree program.

Applications for admission with non-degree-seeking status are available in the Office of Admissions, 240 Williamson Hall.

Degrees

Baccalaureate Programs

A Carlson degree combines management and liberal arts coursework to provide students with strong communication, analytical, and creative problem-solving skills. The Carlson School offers programs leading to the bachelor of science in business (B.S.B.) with majors in accounting, actuarial science, entrepreneurial management, finance, human resources and industrial relations, risk management and insurance, management information systems, marketing, operations, supply chain management, and a self-designed general management major. International business may also be completed as a co-major with one of the majors listed above.

Because of the globalization of the U.S. economy, the school encourages all students to spend at least one semester in a study abroad program during their undergraduate program.

Minors

The Carlson School offers a management minor to students in other degree programs at the University of Minnesota, Twin Cities. Please see the Degree Programs section for details on the minor.

Certified Public Accountant (C.P.A.)

The Uniform CPA Examination is one of the "Three Es" (education, examination, and experience) that are required for licensure as a CPA. Individuals must pass the examination to qualify for licensure as certified public accountants in any of the 55 U.S. jurisdictions (the 50 states, the District of Columbia, Puerto Rico, U.S. Virgin Islands, Guam, and the Commonwealth of Northern Mariana Islands), but passing the examination is not, in itself, sufficient to meet requirements for licensure. Licensure requirements vary by jurisdiction, and are described on Boards of Accountancy Web sites. Links to these Web sites are available at www.nasba.org/nasbaweb.nsf/exam.

Graduate Programs

The Carlson School, in conjunction with the Graduate School, offers programs leading to the degrees of master of business administration (M.B.A.), master of business taxation (M.B.T.), and doctor of philosophy (Ph.D.). The Department of Industrial Relations, in conjunction with the Graduate School, offers programs in industrial relations leading to the degrees of master of arts (M.A.H.R.I.R.) and doctor of philosophy (Ph.D.). Complete descriptions of these programs and graduate-level courses in these areas are in the Graduate School Catalog as well as in the publications of each program.

Scholastic Standards and Policies

Academic Progress Standards for Carlson Students

Students in the Carlson School of Management are expected to make continued progress toward completion of their degree. Students entering as freshmen have specific progress standards to meet in order to matriculate to the sophomore year. The progress standards include completing a minimum of 30 semester credits including microeconomics, macroeconomics, calculus, and freshmen composition with a grade of C- or higher; maintaining a 3.00 GPA; and meeting with their academic adviser each term of their freshmen year.

Students not making satisfactory academic progress are contacted by their adviser to develop a plan of action. A copy of the plan is placed in the student's file.

Declaring a Major

All freshmen enter the program with premajor status. They may declare their major once they have earned at least 50 semester credits and have completed the required tool courses. Transfer students enter the program with a declared major. All students should have a declared major by the time they have earned 60 credits. There are no restrictions for entrance into any of the majors once students are admitted into the Carlson School.

To declare a major, students should complete the Major/Minor Declaration form available in the Undergraduate Program Office, 1-105 Carlson School of Management.

Grading Options

Carlson students must earn a minimum of 90 A-F credits. All coursework applied toward the major must be taken on the A-F grading basis.

Incompletes

Students may request a grade of incomplete when they have an emergency or extenuating circumstance that prevents them from completing one or two assignments or a final examination within the normal time frame. Students should work out the details of completing the coursework with the instructor prior to the end of the term, and must complete the work within a year. Incompletes are not awarded to students who are seeking more time to master course material in order to improve their grade. Students are not permitted to sit through a later section of a Carlson School course, or any portion of it, as a means of completing an incomplete. An incomplete changes to an F on the student's transcript 365 days after the end of the term in which the incomplete was given.

Petitions

The Student Scholastic Standing Committee, comprised of professional staff, meets on a weekly basis to review requests for exceptions to policies and program requirements. Students who submit a petition for an exception are generally required to include written documentation in support of their request.

The Scholastic Committee strives to uphold the integrity of University of Minnesota policies throughout the process, and treats each request in an unbiased and objective manner.

Leave of Absence

Students planning to leave school for a semester or more should contact an adviser in the Undergraduate Program Office and request to be placed on a temporary leave of absence. Undergraduates who have not been granted a leave of absence

and who do not register for two consecutive semesters (excluding summer session) are placed on "discontinued" status and need to contact the Undergraduate Program Office for approval to return.

Graduation Requirements

To graduate from the Carlson School students must

- complete a minimum of 120 credits. These credits include the required tool courses, liberal education requirements, and major requirements.
- complete a minimum of 60 credits in nonbusiness coursework. This includes liberal education coursework, statistics, and up to 8 credits of economics.
- complete the University of Minnesota liberal education requirements.
- complete at least half (24) of the upper division credits in the major at the Carlson School.
- complete a minimum of 30 credits at the University of Minnesota. Of the last 30 credits earned prior to the awarding of the degree, at least 15 of these must be earned at the University of Minnesota. (With prior approval, students may apply credits earned at an institution participating in the National Student Exchange Program and through foreign studies programs toward these 30 credits.)
- earn a C- or higher in all major coursework. Major coursework includes the tool courses and all upper division business coursework applied toward the major or minor.
- be in good academic standing with a minimum GPA of 2.00 in all work taken at the University of Minnesota.

Advising

The Carlson School offers centralized advising services to undergraduates currently enrolled or interested in its programs. Professional advisers work with students from the point of entry through graduation to provide individualized guidance to the student. Advisers use a holistic approach to insure a comprehensive and successful experience for each student. Students should prepare for appointments with their adviser by giving careful thought to possible course selections, program schedules, and short- and long-term educational and career goals.

Students enrolled in the Carlson School may schedule an appointment with a professional academic adviser by calling 612-624-3313 or coming in to 1-105 Carlson School of Management. Walk-in advising is also available on a daily basis for general questions or urgent matters.

Prospective transfer students may meet with an adviser on a walk-in basis during office hours, Monday through Friday, to discuss admission requirements.

All students are required to attend an orientation program prior to their first term in the school.

Honors

The Carlson School honors program is available to high achieving students. While the program requires hard work and a strong commitment to learning, it offers students access to a richer undergraduate experience by combining academic coursework and extracurricular activities.

Admission—The honors program is extremely competitive and all applicants must have excellent academic records and a history of high achievement. Freshmen who rank at the top of their high school class and have extensive leadership experience will be invited to apply. Sophomores and juniors should apply online after establishing a strong college record.

Freshmen and Sophomores—This program provides an introductory honors experience by allowing high achieving freshmen and sophomores to study in smaller classes and interact more closely with faculty. Participants also receive extended library privileges and can live in honors housing. Although students do not receive an award designation at commencement, they are recognized for having completed the program on their official transcript.

Requirements:

- Complete the Emerging Leadership Program
- Complete four honors courses, selecting from the list below:

  ECON 1101H - Microeconomics (4 cr) or ECON 1104

  ECON 1102H - Macroeconomics (4 cr) or ECON 1105

  OMS 2550H - Honors: Business Statistics: Data Sources, Presentation, and Analysis (4 cr)

  ENGC 1011H - Honors: University Writing and Critical Reading (4 cr)

  MATH 1571H - Honors Calculus I (4 cr)

  ACCT 2050H - Financial Accounting (4 cr)

  College of Liberal Arts honors colloquia or liberal arts honors course
- Maintain an overall GPA of 3.50 during the freshman and sophomore years.

Juniors and Seniors—This program gives high achieving juniors and seniors the opportunity to study in smaller classes, interact more closely with faculty, and work with other high achieving students. Students do not need to complete the freshman/sophomore program to be admitted to the junior/senior program. Students who complete the program will receive an honors designation on their diploma.

Requirements:

- Complete the following three courses:

  BA 3200H—Leadership Colloquium (2 cr)

  BA 4000H—Honors Seminar (3 cr)

  MGMT 4004V—Honors: Business Policy: Strategy Formulation and Implementation (3 cr)
- Complete two courses from the following:

  BA 3033V—Honors: Business Communications (3 cr)

  MGMT 3040H—Honors: Understanding the International Environment of Firms, International Business (3 cr)

  BA 3990H—Honors topics (2-4 cr) (topics vary from semester to semester)

  3xxx or 5xxx College of Liberal Arts honors seminar
- Complete at least 60 credits at the University of Minnesota.
- Achieve a GPA in the final 60 credits to qualify for graduation with Latin honors (as established by the University).

  3.50 GPA—cum laude

  3.66 GPA—magna cum laude

  3.75 GPA—summa cum laude

Emerging Leadership Program—This program encourages high achieving students to engage in extracurricular activities that foster intellectual and personal growth. Activities promote the development of the characteristics associated with productive, ethical, and successful leaders. The program is open to students with an overall GPA of 3.50. To earn the Emerging Leadership designation, students must complete and document a minimum of 15 hours of activity in each of the following categories, plus an additional 10 hours of activity in one of them: leadership, community service, diversity, career development. After the activities are completed, students present their program to a panel of alumni, staff, and an honors board member.

Graduating with Honors—Students may be awarded Latin honors by completing the honors program above. Students may also qualify to graduate with high distinction or distinction without completing the honors requirements. They must complete at least 60 credits at the University of Minnesota to qualify. High distinction—3.900 GPA, distinction—3.750 GPA.

Special Learning Opportunities and Resources

The Carlson School provides programs and services that promote a positive learning experience to help foster student success. The comprehensive programs offered by the undergraduate program range from workshops, student organizations, retreats, case competitions, and national leadership conferences. Activities vary in length and intensity and are designed to provide students at all levels with leadership development opportunities.

Mentorship Program—This program provides valuable career exploration and professional development opportunities by matching students with successful professionals from the Twin Cities business community. Open to sophomores, juniors, and seniors, volunteer mentors guide students to become more focused in their professional goals. The program begins each fall, with activities continuing throughout the fall and spring semesters, and concludes in mid-April.

Technology Support—The Carlson School's Office of Information Technology provides a variety of services and programs to Carlson students, faculty, and staff. Workshops on basic computing skills, including the use of word processing, spreadsheet, e-mail, and database systems, are offered on a regular basis. Equipment is available for students to check out. In addition, computer labs specifically designated for Carlson undergraduate students' use are available in the school.

Ambassador Program—Carlson's Undergraduate Ambassador Program is a service organization focused on leadership and service. The program serves on the college, University, and community. Student ambassadors are afforded a unique opportunity to interact with legislators, deans, corporate and community members, and prospective and fellow students on a frequent basis. Student volunteers are selected in September to serve one academic year, renewable once. Time commitment for the ambassador program varies depending on the time of year; however, students on average commit to 5 to 8 hours per week. The program begins in September and ends at May commencement. Summer commitments are not part of the ambassador program.

Carlson's ambassadors enthusiastically and professionally represent the college at a variety of activities throughout the academic year. They serve as student representatives at committee meetings, greet special guests of the school, build strong relationships with the University community, meet with corporate recruiters, and help plan and organize special events at the Carlson School.

Business Week—As one of the most highly profiled annual events at the Carlson School of Management, Business Week provides a great opportunity for companies who recruit at the Carlson School and students to create or further establish a relationship with one another. Each year's celebration includes a variety of events, both social and professional, organized to recognize the many achievements throughout the academic and business community.

Case Competitions—Each academic year seniors are provided the opportunity to compete in internal case competitions with other Carlson undergraduate students. From this pool of students a select few are chosen to compete in national case competitions. The national case competition locations vary by year. Typically, internal case competitions are held during September.

Leadership Conferences—The undergraduate program selects a few students each year to participate in national leadership conferences. Students who are chosen for this opportunity are typically juniors who have demonstrated exceptional leadership abilities. Conferences vary on location and time of year.

Scholarships

A variety of scholarships—both need- and merit-based—are available for current and prospective Carlson students. The priority deadline for most freshman scholarships is January 15. Applications are available from the Office of Admissions, 240 Williamson Hall (612-625-2008). Information and scholarship applications for continuing students are available online beginning in March of each year.

International Programs

Carlson School students in all majors are encouraged to study abroad. The undergraduate program is committed to having 50 percent or more of its students participate in a study abroad program as part of their undergraduate experience. In addition to providing a firsthand experience of today's complex global economy, international study programs allow students to fulfill liberal education and major-related requirements, as well as elective credits. Semester-length programs, exchange programs, and several short-term global enrichment electives are available to students. All students with an international business major participate in a study abroad experience.

Explore study abroad programs, find out about scholarships, and get answers:

Learning Abroad Center

www.umabroad.umn.edu

230 Heller Hall

612-626-9000

Carlson International Programs Office

www.carlsonschool.umn.edu/Page615.aspx

Suite 4-104 Carlson School of Management

612-625-9361

Career Information

Carlson School students gain knowledge, practical skills, and real-life business experiences that today's recruiters are looking for. In addition to developing strong communication and teamwork skills, students can participate in leadership and mentorship programs, connect with alumni, and use the Business Career Center. The Business Career Center (1-110 Carlson School of Management, 612-624-0011) offers a wide range of services, including career workshops, mock interviews, a career skills course (BA 3000), national site and industry visits, networking events, internship and full-time job postings through the Carlson Automated Recruiting System (CARS), and individual career coaching. Last year, more than 70 percent of Carlson students had jobs at graduation, far surpassing the national average of 45 percent.

Student Organizations

With more than 500 organizations at the University of Minnesota—dozens of which are affiliated with the Carlson School—students can get involved and connect with others who share their interests. Student organizations associated with the Carlson School include:

Actuarial Club consists of actuary, math, and business students from freshman to graduate status. The club holds monthly meetings and features speakers from many different consulting and insurance companies. There are also study groups, social events, and volunteer opportunities. The main event is the Actuarial Science Career Fair held every November.

Alpha Kappa Psi, a coeducational, national business fraternity, brings together students with a common interest in business for scholastic and social activities. Prominent men and women in business are featured at meetings throughout the year. Members participate in tours, seminars, and community service projects. Meetings are held Sunday evenings at the chapter house, 1116 Fifth Street S.E., Minneapolis. Visitors are welcome.

American Marketing Association (AMA) is a student-run organization whose main goal is to promote a better understanding of marketing and its role in the business world. AMA provides opportunities to hear area business leaders speak on current marketing issues, tour area firms, and make valuable business contacts. AMA is a great way to meet fellow marketing students, learn interviewing tips, and gain knowledge of careers in marketing.

Beta Alpha Psi (BAP) is a national, professional honorary organization made up of accounting majors. BAP introduces the aspiring accountant to the business world by encouraging interaction among students, faculty, alumni, and area business people. This is a great way to make new friends, get acquainted with professionals in the field, and learn about careers in accounting.

Beta Gamma Sigma encourages and rewards scholarship, promotes advancement of education in business, and fosters integrity in the conduct of business operations. Membership in Beta Gamma Sigma is the highest national recognition a student can receive in an undergraduate or master's program in business or management. To be eligible for membership students must rank in the upper 7 percent of their junior class, upper 10 percent of their graduating senior class, or upper 20 percent of their graduating master's class. Members are elected to membership and publicly recognized during spring semester.

Business Association for Multicultural Students (BAM) is a non-major specific organization. It exposes members to local companies who discuss their line of work, what employment opportunities they have, and what they look for in potential employees. Although most members are students of color, anyone is welcome to join. BAM sponsors tours of local corporations, guest speakers, and social events during the academic year

Business Board (B-Board) is the student government of the Carlson School undergraduate program that sets policies that govern student organizations. Members serve on various school committees and plan activities to foster interaction among students and faculty. All students registered in the Carlson School are urged to inquire about nomination and election to the Board. Non-board members are welcome to participate in all B-Board meetings and events. Meetings are held on Wednesdays at 5:30 p.m. in the Undergraduate Student Lounge, Suite 1-112, at the Carlson School.

Club MIS is a student organization that offers opportunities to learn about the MIS industry. It's a fun, relaxing environment to meet other students interested in MIS. At most meetings, there is a company presentation in addition to regular meeting activities. This provides students with a great opportunity to network and learn about companies they may be interested in for future internships or jobs. Club MIS also sponsors a variety of social activities, such as intramural teams, barbecues, dinners, and an annual ski-trip.

Consulting Club is for highly driven students interested in a consulting career. To create a dynamic and diverse club, students from all majors across the University are welcome. The club acts as a liaison between students and consulting firms by hosting various opportunities and events for students to acquire and refine their skills to be a competitive individual in the consulting field.

Delta Sigma Pi is an international professional business fraternity for men and women that offers everything from community service opportunities to intramural athletics. Meetings are held on Monday evenings.

Entrepreneurship Club is dedicated to teaching students how to become financially independent, successful entrepreneurs. The Entre Club is a group of student entrepreneurs who have come together to bring the spirit of entrepreneurship to the University by putting students and successful business owners together. Every week, members network with small business owners, presidents/CEOs, venture capitalists, restaurant/café owners, home business owners, bankers, investors, real estate investors, tax accountants, finance specialists, authors, and local leaders. All University students are welcome.

GLOBE provides opportunities for Carlson students, faculty, and staff interested in international business to learn about the topic through monthly speakers and various cultural activities. Globe's mission is to promote international activities that integrate Carlson School students, community leaders, faculty, and staff for greater educational and social opportunities.

Honors Association believes that in addition to achieving excellent academic records, honors students in business should provide leadership and support activities outside of the classroom. You must be in the honors program to be a member of the Honors Association. See the Honors section for more information.

Investment and Finance Organization (InFO) is open to all students who wish to meet professionals within various areas of the financial industry. InFO exposes students to speakers from investing and finance companies that give valuable insight into career paths. InFO also sponsors social events to help students acquaint themselves with other students that have similar interests. Weekly meetings involve in-depth discussions about the stock market, investing, bonds, commodities, and financial planning.

Phi Beta Lambda (PBL) is the collegiate version of the Future Business Leaders of America (FBLA). It provides students interested in business-related careers the opportunity to sharpen their communication, leadership, and analytical skills through a series of local and national competitions. This organization is open to all University students and seeks participation particularly from freshmen and sophomores.

Pi Sigma Epsilon (PSE) is the only national, professional, and co-educational fraternity in marketing, sales management, and selling. The University of Minnesota chapter was founded in 2003. This organization provides great leadership, professional and career opportunities, workshops, site visits, and social events. PSE's mission is to develop foundations of leadership and professionalism, while shaping members into able businessmen/women through real-world and educational experience within the fields of marketing and sales.

Real Estate Club is a group of highly motivated undergraduate students who are devoted to learn how to begin investing in real estate and firmly believe that real estate should secure an integral part in any serious investor's portfolio. Join the Real Estate Club at weekly meetings to meet some of Minnesota's most accomplished real estate professionals to. All majors are welcome.

Society for the Advancement of Management (SAM) welcomes management and non-management students interested in becoming involved in the business community. Members learn practical business techniques by interacting with practicing professionals and other students.

Society for Human Resource Management (SHRM) promotes mutually beneficial interaction between HR students and practitioners. Membership offers students the opportunity to supplement their classroom experiences with real-world knowledge and hands-on experiences.

Student Association for Accounting (SAFA) provides opportunities for accounting and finance students to meet members of the Twin Cities business community through a variety of social and professional events in a casual, relaxed environment. Events include a fall golf tournament as well as many smaller events with accounting and finance firms. SAFA has 10 executive committee members, allowing many people to plan events and take on various leadership roles.

Student Association for Nonprofit Enterprise (SANE) is dedicated to increasing nonprofit business awareness through interactions with the community and the University. SANE's mission is to give University students the opportunity to give back to the community through volunteer services and to help the Carlson School integrate a nonprofit focus into the undergraduate program.

Supply Chain and Operations Club is a bridge for students between the academic world and the professional world. All majors are welcomed and encouraged to join. The club has numerous ties with professional organizations in the Twin Cities and regularly attends events with business professionals from the local community. Speaker events and site visits are held during every semester and there are numerous opportunities for networking and leadership. With the growing importance of lean supply chain management and the continual drive for quality and efficient operations, membership in the undergraduate Supply Chain and Operations Club indicates sensitivity to the ever-changing business environment.

Truth in Business (TiB) is a Christian business student organization that focuses on faith in the marketplace. Through weekly meetings, lectures, discussions, social events, and mentoring relationships students will gain the tools they need to be successful living out their faith in a bottom line business world. Open to all University students and welcome people of all denominations and beliefs.

Women in Business (WIB) is dedicated to bringing women together in business-related fields through networking, speakers, volunteering, and events. WIB strives to make opportunities in the business world for women more apparent and help overcome challenges encountered. WIB helps to develop skills to succeed in the business world and facilitates personal and professional growth. All majors and sexes are welcome.

Directory

Accounting and Business Law
3-122 Carlson School of Management
612-624-6506

Business Career Center
1-110 Carlson School of Management
612-624-0011

Carlson Executive M.B.A. Program
4-106 Carlson School of Management
612-624-1385

Executive Development Center
2-250 Carlson School of Management
612-624-2545

Finance
3-122 Carlson School of Management
612-624-2888

Health Care Management (moved to School of Public Health)
612-624-5151

Human Resources and Industrial Relations
Industrial Relations Center (IRC)
3-300 Carlson School of Management
612-624-2500 (graduate programs, 624-5810)

Employer Education Service
612-624-5525
I.R. Reference Room
612-624-7011

Labor Education Service
612-624-5020

Information and Decision Sciences
3-365 Carlson School of Management
612-624-8030

Management and Information
Systems Research Center
3-306 Carlson School of Management
612-624-6565

International Programs
4-104 Carlson School of Management
612-625-9361

Juran Center for Leadership in Quality
3-306 Carlson School of Management
612-624-4554

Marketing and Logistics Management
3-150 Carlson School of Management
612-624-5055

Center for Entrepreneurial Studies
3-306 Carlson School of Management
612-624-3838

M.B.A. Program (full-time)
2-210 Carlson School of Management
612-624-0006

M.B.A. Program (part-time)
4-106 Carlson School of Management
612-626-7900

M.B.T. Program
3-108 Carlson School of Management
612-624-7511

M.S.-M.O.T. Program
107 Lind Hall
612-624-5747

Office of the Dean
4-300 Carlson School of Management
612-626-9636

Advancement
612-626-9636

Communications
612-626-7756

Financial Services
612-626-9382

Human Resources
612-626-9636

Office of Information Technology
1-160 Carlson School of Management
612-625-5550

Physical Resources
612-624-5567

Operations and Management Sciences
3-150 Carlson School of Management
612-624-7010

Ph.D. Program
4-201 Carlson School of Management
612-624-0875

Strategic Management and Organization
3-365 Carlson School of Management
612-624-5232

Strategic Management Research
3-306 Carlson School of Management
612-624-0226

Undergraduate Program
1-105 Carlson School of Management
612-624-3313

Mailing Address
Undergraduate Program Office
Carlson School of Management
University of Minnesota
1-105 Carlson School of Management
321 19th Avenue S.
Minneapolis, MN 55455-0430
612-624-3313
Fax: 624-0350
Web: www.carlsonschool.umn.edu

Degree Programs and Minors

Accounting B.S.B.

Accounting

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 24.

Degree: Bachelor of Science in Business.

Accounting is the process of gathering financial information and presenting it in a manner that will help others make better decisions. Accountants also are frequently called upon to analyze financial information and provide important business advice. The terms and definitions that have emerged from the discipline of accounting are used widely within industry. In fact, accounting is commonly described as the "language of business."

With increased automation over the years, the role of accountants has changed dramatically. Accountants have become recognized as valued business advisers and important members of an organization□s management team.

The major areas of study within the accounting curriculum are financial accounting, management accounting, income taxation, auditing, and business law.

The Carlson School Honors program offers students access to a richer undergraduate experience. Honors students have closer contact with their professors. They work in smaller classes and they put their skills to work for the benefit of the community. The program requires hard work and a strong commitment to learning.

Admission Requirements

Students must complete 50 credits before admission to the program.

A GPA above 2.00 is preferred for the following:

- 3.00 for students transferring from another University of Minnesota college.
- 3.00 for students transferring from outside the University.

Freshmen are admitted to Carlson School of Management, but do not declare a major until 50 credits have been completed. Part of the 50 credits should include the five tool courses and liberal education requirements. Those transferring in as sophomores must complete microeconomics, macroeconomics, and calculus before admission. Juniors and above must complete microeconomics, macroeconomics, calculus, business statistics, and accounting before admission.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Required Courses for Admission

Tool Courses

An adviser-approved statistics course may be taken in place of OMS 2550.

ACCT 2050 - Introduction to Financial Reporting (4.0 cr)
APEC 1101 - Principles of Microeconomics, SSCI (3.0 cr)
or ECON 1101 - Principles of Microeconomics, IP, SSCI (4.0 cr)
or ECON 1101H - Honors Course: Principles of Microeconomics, IP, SSCI, H (4.0 cr)
or ECON 1104 - Principles of Microeconomics, IP, SSCI (4.0 cr)
APEC 1102 - Principles of Macroeconomics, IP, SSCI (3.0 cr)
or ECON 1102 - Principles of Macroeconomics, IP, SSCI (4.0 cr)
or ECON 1102H - Honors: Principles of Macroeconomics, IP, SSCI, H (4.0 cr)
or ECON 1105 - Principles of Macroeconomics, IP, SSCI (4.0 cr)
MATH 1142 - Short Calculus, MATH (4.0 cr)
or MATH 1271 - Calculus I, MATH (4.0 cr)
or MATH 1571H - Honors Calculus I, MATH, H (4.0 cr)
OMS 2550 - Business Statistics: Data Sources, Presentation, and Analysis (4.0 cr)
or OMS 2550H - Honors: Business Statistics: Data Sources, Presentation, and Analysis, H (4.0 cr)

Technology and Psychology

BA 1001 is required for students admitted as freshmen and recommended for others who need additional background in technology.

BA 1001 - Introduction to Information Technology (1.0 cr)
PSY 1001 - Introduction to Psychology, SSCI (4.0 cr)

General Requirements

Recommended freshman writing course(s) for this program: ENGC 1011, 1012, 1013, or 1014

Program Requirements

Effective July 1, 2006: Students who wish to earn the Certified Public Accountant (CPA) certification will need to complete 150 credit hours of coursework.

Required Courses

Functional Core

ACCT 3001 - Introduction to Management Accounting (3.0 cr)
BA 3000 - Career Skills (1.0 cr)
FINA 3001 - Finance Fundamentals (3.0 cr)
HRIR 3021 - Human Resource Management and Industrial Relations (3.0 cr)
IDSC 3001 - Information Systems for Business Processes and Management (3.0 cr)
MGMT 3001 - Fundamentals of Management (3.0 cr)
MKTG 3001 - Principles of Marketing (3.0 cr)
OMS 3001 - Introduction to Operations Management (3.0 cr)

Communication, International, Business Policy Core

BA 3033W - Business Communication, WI (3.0 cr)
or BA 3033V - Honors: Business Communication, WI, H (3.0 cr)
MGMT 3040 - Understanding the International Environment of Firms: International Business, IP (3.0 cr)
or MGMT 3040H - Honors: Understanding the International Environment of Firms, International Business, H (3.0 cr)
MGMT 4004W - Business Policy: Strategy Formulation and Implementation, WI (3.0 cr)
or MGMT 4004V - Honors: Business Policy: Strategy Formulation and Implementation, WI, H (3.0 cr)

Major Courses

ACCT 5101 - Intermediate Accounting I (4.0 cr)
ACCT 5102 - Intermediate Accounting II (4.0 cr)
ACCT 5125 - Auditing Principles and Procedures (4.0 cr)

ACCT 5135 - Fundamentals of Federal Income Tax (4.0 cr)
ACCT 3201 - Intermediate Management Accounting (2.0 cr)
BLAW 3058 - The Law of Contracts and Agency (4.0 cr)
ACCT 5126 - Internal Auditing (2.0 cr)
or ACCT 5160 - Financial Statement Analysis (2.0 cr)
or ACCT 5180 - Consolidations and Advanced Reporting (2.0 cr)
or ACCT 5236 - Introduction to Taxation of Business (2.0 cr)
or ACCT 5271 - Accounting Information Systems (2.0 cr)
or ACCT 5310 - International Accounting (2.0 cr)
or ACCT 5320 - Current Topics in Accounting (2.0 cr)

Accounting Minor

Accounting

Requirements for this program are current for Fall 2006.

Required credits in this minor: 12.

See major description for more information.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

This minor is only available to students admitted to another degree program in the Carlson School of Management.

Required Courses

Minor Courses
ACCT 5101 - Intermediate Accounting I (4.0 cr)
ACCT 5102 - Intermediate Accounting II (4.0 cr)
Take 4 or more credit(s) from the following:
ACCT 3201 - Intermediate Management Accounting (2.0 cr)
ACCT 5135 - Fundamentals of Federal Income Tax (4.0 cr)
ACCT 5160 - Financial Statement Analysis (2.0 cr)
ACCT 5180 - Consolidations and Advanced Reporting (2.0 cr)
ACCT 5310 - International Accounting (2.0 cr)

Actuarial Science B.S.B.

Finance

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 23.

Degree: Bachelor of Science in Business.

Actuarial science applies mathematics to insurance problems. Practicing actuaries calculate insurance premiums, policy and loss reserves (liabilities), and estimate costs of future losses.

Students are introduced to professional organizations, including The Society of Actuaries, American Academy of Actuaries, Casualty Actuarial Society, Conference of Consulting Actuaries, and American Society of Pension Actuaries. Students typically take at least two professional actuarial examinations before graduation.

There are multiple career opportunities for students with the mathematics, business, and communication skills developed through the actuarial science major. The insurance and actuarial community strongly supports this program.

The Carlson School Honors program offers students access to a richer undergraduate experience. Honors students have closer contact with their professors. They work in smaller classes and they put their skills to work for the benefit of the community. The program requires hard work and a strong commitment to learning.

Admission Requirements

Students must complete 50 credits before admission to the program.

A GPA above 2.00 is preferred for the following:

- 3.00 for students transferring from another University of Minnesota college.
- 3.00 for students transferring from outside the University.

Freshmen are admitted to Carlson School of Management, but do not declare a major until 50 credits have been completed. Part of the 50 credits should include the five tool courses and liberal education requirements. Those transferring in as sophomores need to complete microeconomics, macroeconomics, and calculus before admission. Juniors and above need to complete microeconomics, macroeconomics, calculus, business statistics, and accounting before admission.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Required Courses for Admission

Tool Courses
An adviser-approved statistics course may be taken in place of OMS 2550. MATH 1271 is recommended instead of MATH 1142 and is a prerequisite for future math courses in the major.

ACCT 2050 - Introduction to Financial Reporting (4.0 cr)
APEC 1101 - Principles of Microeconomics, SSCI (3.0 cr)
or ECON 1101 - Principles of Microeconomics, IP, SSCI (4.0 cr)
or ECON 1101H - Honors Course: Principles of Microeconomics, IP, SSCI, H (4.0 cr)
or ECON 1104 - Principles of Microeconomics, IP, SSCI (4.0 cr)
APEC 1102 - Principles of Macroeconomics, IP, SSCI (3.0 cr)
or ECON 1102 - Principles of Macroeconomics, IP, SSCI (4.0 cr)
or ECON 1102H - Honors: Principles of Macroeconomics, IP, SSCI, H (4.0 cr)
or ECON 1105 - Principles of Macroeconomics, IP, SSCI (4.0 cr)
MATH 1271 - Calculus I, MATH (4.0 cr)
or MATH 1142 - Short Calculus, MATH (4.0 cr)
or MATH 1571H - Honors Calculus I, MATH, H (4.0 cr)
OMS 2550 - Business Statistics: Data Sources, Presentation, and Analysis (4.0 cr)
or OMS 2550H - Honors: Business Statistics: Data Sources, Presentation, and Analysis, H (4.0 cr)

Technology and Psychology
BA 1001 is required for students admitted as freshmen and recommended for others who need additional background with technology.

BA 1001 - Introduction to Information Technology (1.0 cr)
PSY 1001 - Introduction to Psychology, SSCI (4.0 cr)

Preparatory Mathematics
These courses are prerequisites to mathematics courses for the major.

MATH 1272 - Calculus II (4.0 cr)
MATH 2243 - Linear Algebra and Differential Equations (4.0 cr)
MATH 2263 - Multivariable Calculus (4.0 cr)

General Requirements

Recommended freshman writing course(s) for this program: ENGC 1011, 1012, 1013, or 1014

Program Requirements

Required Courses

Functional Core

ACCT 3001 - Introduction to Management Accounting (3.0 cr)
BA 3000 - Career Skills (1.0 cr)
FINA 3001 - Finance Fundamentals (3.0 cr)
HRIR 3021 - Human Resource Management and Industrial Relations (3.0 cr)
IDSC 3001 - Information Systems for Business Processes and Management (3.0 cr)
MGMT 3001 - Fundamentals of Management (3.0 cr)
MKTG 3001 - Principles of Marketing (3.0 cr)
OMS 3001 - Introduction to Operations Management (3.0 cr)

Communication, International, Business Policy Core

BA 3033W - Business Communication, WI (3.0 cr)
or BA 3033V - Honors: Business Communication, WI, H (3.0 cr)
MGMT 3040 - Understanding the International Environment of Firms: International Business, IP (3.0 cr)
or MGMT 3040H - Honors: Understanding the International Environment of Firms, International Business, H (3.0 cr)
MGMT 4004W - Business Policy: Strategy Formulation and Implementation, WI (3.0 cr)
or MGMT 4004V - Honors: Business Policy: Strategy Formulation and Implementation, WI, H (3.0 cr)

Major Couses

MATH 4065 - Theory of Interest (3.0 cr)
MATH 5067 - Actuarial Mathematics I (4.0 cr)
MATH 5068 - Actuarial Mathematics II (4.0 cr)
MATH 5651 - Basic Theory of Probability and Statistics (4.0 cr)
MATH 5652 - Introduction to Stochastic Processes (4.0 cr)
STAT 4101 - Theory of Statistics I (4.0 cr)
STAT 4102 - Theory of Statistics II (4.0 cr)
Adviser-approved probability course
STAT 5101 - Theory of Statistics I (4.0 cr)
or STAT 5102 - Theory of Statistics II (4.0 cr)

Electives

Take 4 or more credit(s) from the following:
INS 4100 - Corporate Risk Management (2.0 cr)
INS 4101 - Employee Benefits (2.0 cr)
INS 4200 - Insurance Theory and Practice (2.0 cr)
INS 4201 - Personal Financial Management (2.0 cr)
INS 4202 - Personal Financial Planning 2: Tax and Estate Planning Techniques (2.0 cr)

Actuarial Science Minor

Finance

Requirements for this program are current for Fall 2006.

Required credits in this minor: 15.

See major description for more information.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

This minor is only available to students admitted to a degree program in the Carlson School of Management.

Required Courses

Minor Courses

MATH 4065 - Theory of Interest (3.0 cr)
MATH 5067 - Actuarial Mathematics I (4.0 cr)
MATH 5068 - Actuarial Mathematics II (4.0 cr)

Take 4 or more credit(s) from the following:
INS 4100 - Corporate Risk Management (2.0 cr)
INS 4101 - Employee Benefits (2.0 cr)
INS 4200 - Insurance Theory and Practice (2.0 cr)
INS 4201 - Personal Financial Management (2.0 cr)
INS 4202 - Personal Financial Planning 2: Tax and Estate Planning Techniques (2.0 cr)

Entrepreneurial Management B.S.B.

Strategic Management & Organization

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 20.

Degree: Bachelor of Science in Business.

Businesses, large and small, are coming to understand a new environment of rapid change. They are being challenged to take advantage of new markets and greater demands on current products. Their ability to adapt to a rapidly changing environment can yield great rewards, but it requires multifunctional and multitasking individuals able to form and develop new businesses and comfortably exist within a sea of change.

The entrepreneurial management major provides current and future business professionals with the necessary skills and tools to successfully form and develop businesses and function as entrepreneurs or as productive members of entrepreneurial, emerging, or aggressively-positioned companies. These organizations require individuals that have the ability to manage risk, multitask across functional boundaries, and creatively engage and adapt to an environment that is constantly changing.

The Carlson School Honors program offers students access to a richer undergraduate experience. Honors students have closer contact with their professors. They work in smaller classes and they put their skills to work for the benefit of the community. The program requires hard work and a strong commitment to learning.

Admission Requirements

Students must complete 50 credits before admission to the program.

A GPA above 2.00 is preferred for the following:

- 3.00 for students transferring from another University of Minnesota college.
- 3.00 for students transferring from outside the University.

Freshmen are admitted to Carlson School of Management, but do not declare a major until 50 credits have been completed. Part of the 50 credits should include the five tool courses and liberal education requirements. Those transferring in as sophomores need to complete microeconomics, macroeconomics, and calculus before admission. Juniors and above need to complete microeconomics, macroeconomics, calculus, business statistics, and accounting before admission.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Required Courses for Admission

Tool Courses

An adviser-approved statistics course may be taken in place of OMS 2550.

ACCT 2050 - Introduction to Financial Reporting (4.0 cr)
APEC 1101 - Principles of Microeconomics, SSCI (3.0 cr)
or ECON 1101 - Principles of Microeconomics, IP, SSCI (4.0 cr)
or ECON 1101H - Honors Course: Principles of Microeconomics, IP, SSCI, H (4.0 cr)
or ECON 1104 - Principles of Microeconomics, IP, SSCI (4.0 cr)
APEC 1102 - Principles of Macroeconomics, IP, SSCI (3.0 cr)
or ECON 1102 - Principles of Macroeconomics, IP, SSCI (4.0 cr)
or ECON 1102H - Honors: Principles of Macroeconomics, IP, SSCI, H (4.0 cr)
or ECON 1105 - Principles of Macroeconomics, IP, SSCI (4.0 cr)
MATH 1142 - Short Calculus, MATH (4.0 cr)
or MATH 1271 - Calculus I, MATH (4.0 cr)
or MATH 1571H - Honors Calculus I, MATH, H (4.0 cr)
or MATH 1572H - Honors Calculus II, H (4.0 cr)
OMS 2550 - Business Statistics: Data Sources, Presentation, and Analysis (4.0 cr)
or OMS 2550H - Honors: Business Statistics: Data Sources, Presentation, and Analysis, H (4.0 cr)

Technology and Psychology

BA 1001 is required for students admitted as freshmen and recommended for others who need additional background with technology.

BA 1001 - Introduction to Information Technology (1.0 cr)
PSY 1001 - Introduction to Psychology, SSCI (4.0 cr)

General Requirements

Recommended freshman writing course(s) for this program: ENGC 1011, 1012, 1013, or 1014

Program Requirements

Required Courses

Functional Core

ACCT 3001 - Introduction to Management Accounting (3.0 cr)
BA 3000 - Career Skills (1.0 cr)
FINA 3001 - Finance Fundamentals (3.0 cr)
HRIR 3021 - Human Resource Management and Industrial Relations (3.0 cr)
IDSC 3001 - Information Systems for Business Processes and Management (3.0 cr)
MGMT 3001 - Fundamentals of Management (3.0 cr)
MKTG 3001 - Principles of Marketing (3.0 cr)
OMS 3001 - Introduction to Operations Management (3.0 cr)

Communication, International, Business Policy Core

BA 3033W - Business Communication, WI (3.0 cr)
or BA 3033V - Honors: Business Communication, WI, H (3.0 cr)
MGMT 3040 - Understanding the International Environment of Firms: International Business, IP (3.0 cr)
or MGMT 3040H - Honors: Understanding the International Environment of Firms, International Business, H (3.0 cr)
MGMT 4004W - Business Policy: Strategy Formulation and Implementation, WI (3.0 cr)
or MGMT 4004V - Honors: Business Policy: Strategy Formulation and Implementation, WI, H (3.0 cr)

Major Courses

MGMT 3010 - Introduction to Entrepreneurship (4.0 cr)
MGMT 4008 - Entrepreneurial Management (4.0 cr)
MGMT 4050 - Management of Innovation and Change (2.0 cr)
MGMT 4177 - The Business Plan (2.0 cr)

Electives

Take 8 or more credit(s) from the following:

ACCT 3201 - Intermediate Management Accounting (2.0 cr)
ACCT 5100 - Corporate Financial Reporting (4.0 cr)
ACCT 5160 - Financial Statement Analysis (2.0 cr)
BLAW 3058 - The Law of Contracts and Agency (4.0 cr)
FINA 4241 - Corporate Financing Decisions (4.0 cr)
FINA 4242 - Corporate Investment Decisions (4.0 cr)
FINA 4641 - International Finance and Risk Managment (4.0 cr)
HRIR 3031 - Staffing and Selection: Strategic and Operational Concerns (2.0 cr)
IDSC 3202 - Analysis and Modeling for Business Systems Development (4.0 cr)
INS 4100 - Corporate Risk Management (2.0 cr)
INS 4201 - Personal Financial Management (2.0 cr)
MGMT 4002 - Managerial Psychology (4.0 cr)
MKTG 3010 - Marketing Research (4.0 cr)
MKTG 4050 - Integrated Marketing Communications (4.0 cr)
OMS 3041 - Project Management (2.0 cr)
OMS 3056 - Operations Planning and Control (4.0 cr)

Entrepreneurial Management Minor

Strategic Management & Organization

Requirements for this program are current for Fall 2006.

Required credits in this minor: 16.

See major description for more information.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

This minor is only available for students admitted to a degree program in the Carlson School of Management.

Required Courses

Minor Courses

Students minoring in entrepreneurial management must take a minimum of 10 credits from the required courses below, and an additional 6 credits from either the required courses or elective courses listed below. Required courses may not be used to fulfill the 6 credits of electives requirement.

Take 10 or more credit(s) from the following:

MGMT 3010 - Introduction to Entrepreneurship (4.0 cr)
MGMT 4008 - Entrepreneurial Management (4.0 cr)
MGMT 4050 - Management of Innovation and Change (2.0 cr)
MGMT 4177 - The Business Plan (2.0 cr)

Electives

Take 6 or more credit(s) from the following:

ACCT 3201 - Intermediate Management Accounting (2.0 cr)
ACCT 5100 - Corporate Financial Reporting (4.0 cr)
ACCT 5160 - Financial Statement Analysis (2.0 cr)
BLAW 3058 - The Law of Contracts and Agency (4.0 cr)
FINA 4241 - Corporate Financing Decisions (4.0 cr)

FINA 4242 - Corporate Investment Decisions (4.0 cr)
FINA 4641 - International Finance and Risk Managment (4.0 cr)
HRIR 3031 - Staffing and Selection: Strategic and Operational Concerns (2.0 cr)
IDSC 3202 - Analysis and Modeling for Business Systems Development (4.0 cr)
INS 4100 - Corporate Risk Management (2.0 cr)
INS 4201 - Personal Financial Management (2.0 cr)
MGMT 3010 - Introduction to Entrepreneurship (4.0 cr)
MGMT 4002 - Managerial Psychology (4.0 cr)
MGMT 4008 - Entrepreneurial Management (4.0 cr)
MGMT 4050 - Management of Innovation and Change (2.0 cr)
MGMT 4177 - The Business Plan (2.0 cr)
MKTG 3010 - Marketing Research (4.0 cr)
MKTG 4050 - Integrated Marketing Communications (4.0 cr)
OMS 3041 - Project Management (2.0 cr)
OMS 3056 - Operations Planning and Control (4.0 cr)

Finance B.S.B.

Finance

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 20.

Degree: Bachelor of Science in Business.

The finance major develops students' understanding of principles and techniques of effective financial decision making. It provides students with the skills and knowledge required to assist businesses, governments, or individuals in answering questions regarding raising funds, making investments, evaluating performance, and distributing profits.

The Carlson School Honors program offers students access to a richer undergraduate experience. Honors students have closer contact with their professors. They work in smaller classes and they put their skills to work for the benefit of the community. The program requires hard work and a strong commitment to learning.

Admission Requirements

Students must complete 50 credits before admission to the program.

A GPA above 2.00 is preferred for the following:

- 3.00 for students transferring from another University of Minnesota college.
- 3.00 for students transferring from outside the University.

Freshmen are admitted to Carlson School of Management, but do not declare a major until 50 credits have been completed. Part of the 50 credits should include the five tool courses and liberal education requirements. Those transferring in as sophomores need to complete microeconomics, macroeconomics, and calculus before admission. Juniors and above need to complete microeconomics, macroeconomics, calculus, business statistics, and accounting before admission.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Required Courses for Admission

Tool Courses

An adviser-approved statistics course may be taken in place of OMS 2550.

ACCT 2050 - Introduction to Financial Reporting (4.0 cr)
APEC 1101 - Principles of Microeconomics, SSCI (3.0 cr)
or ECON 1101 - Principles of Microeconomics, IP, SSCI (4.0 cr)
or ECON 1101H - Honors Course: Principles of Microeconomics, IP, SSCI, H (4.0 cr)
or ECON 1104 - Principles of Microeconomics, IP, SSCI (4.0 cr)
APEC 1102 - Principles of Macroeconomics, IP, SSCI (3.0 cr)
or ECON 1102 - Principles of Macroeconomics, IP, SSCI (4.0 cr)
or ECON 1102H - Honors: Principles of Macroeconomics, IP, SSCI, H (4.0 cr)
or ECON 1105 - Principles of Macroeconomics, IP, SSCI (4.0 cr)
MATH 1142 - Short Calculus, MATH (4.0 cr)
or MATH 1271 - Calculus I, MATH (4.0 cr)
or MATH 1571H - Honors Calculus I, MATH, H (4.0 cr)
or MATH 1572H - Honors Calculus II, H (4.0 cr)
OMS 2550 - Business Statistics: Data Sources, Presentation, and Analysis (4.0 cr)
or OMS 2550H - Honors: Business Statistics: Data Sources, Presentation, and Analysis, H (4.0 cr)

Technology and Psychology

BA 1001 is required for students admitted as freshmen and recommended for others who need additional background with technology.

BA 1001 - Introduction to Information Technology (1.0 cr)
PSY 1001 - Introduction to Psychology, SSCI (4.0 cr)

General Requirements

Recommended freshman writing course(s) for this program: ENGC 1011, 1012, 1013, or 1014

Program Requirements

Required Courses

Functional Core

ACCT 3001 - Introduction to Management Accounting (3.0 cr)
BA 3000 - Career Skills (1.0 cr)
FINA 3001 - Finance Fundamentals (3.0 cr)
HRIR 3021 - Human Resource Management and Industrial Relations (3.0 cr)
IDSC 3001 - Information Systems for Business Processes and Management (3.0 cr)
MGMT 3001 - Fundamentals of Management (3.0 cr)
MKTG 3001 - Principles of Marketing (3.0 cr)
OMS 3001 - Introduction to Operations Management (3.0 cr)

Communication, International, Business Policy Core

BA 3033W - Business Communication, WI (3.0 cr)
or BA 3033V - Honors: Business Communication, WI, H (3.0 cr)
MGMT 3040 - Understanding the International Environment of Firms: International Business, IP (3.0 cr)
or MGMT 3040H - Honors: Understanding the International Environment of Firms, International Business, H (3.0 cr)
MGMT 4004W - Business Policy: Strategy Formulation and Implementation, WI (3.0 cr)
or MGMT 4004V - Honors: Business Policy: Strategy Formulation and Implementation, WI, H (3.0 cr)

Major Courses

FINA 4241 - Corporate Financing Decisions (4.0 cr)

Take the following course or course pair:

ACCT 5100 - Corporate Financial Reporting (4.0 cr)
or
ACCT 5101 - Intermediate Accounting I (4.0 cr)
ACCT 5102 - Intermediate Accounting II (4.0 cr)

Electives

Take 12 or more credit(s) from the following:

ACCT 5160 - Financial Statement Analysis (2.0 cr)
FINA 4121 - Financial Markets and Interest Rates (2.0 cr)
FINA 4122 - Banking Institutions (2.0 cr)
FINA 4242 - Corporate Investment Decisions (4.0 cr)
FINA 4321 - Portfolio Management and Performance Evaluation (2.0 cr)

FINA 4322 - Security Analysis (2.0 cr)
FINA 4541 - Futures, Options, and Other Derivative Securities (4.0 cr)
FINA 4641 - International Finance and Risk Managment (4.0 cr)

Finance Minor

Finance

Requirements for this program are current for Fall 2006.

Required credits in this minor: 12.

See major description for more information.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

This minor is only available for students admitted to a degree program in the Carlson School of Management.

Required Courses

Minor Courses
FINA 4241 - Corporate Financing Decisions (4.0 cr)

Take 8 or more credit(s) from the following:
ACCT 5100 - Corporate Financial Reporting (4.0 cr)
FINA 4121 - Financial Markets and Interest Rates (2.0 cr)
FINA 4122 - Banking Institutions (2.0 cr)
FINA 4242 - Corporate Investment Decisions (4.0 cr)
FINA 4321 - Portfolio Management and Performance Evaluation (2.0 cr)
FINA 4322 - Security Analysis (2.0 cr)
FINA 4541 - Futures, Options, and Other Derivative Securities (4.0 cr)
FINA 4641 - International Finance and Risk Managment (4.0 cr)

General Management Self-Designed B.S.B.

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 16.

Degree: Bachelor of Science in Business.

The general management self-designed major is intended for students who wish to developed an area of expertise outside of the major programs offered by the Carlson School. Students who pursue this major should have a particular career goal or objective in mind that can best be addressed through a self-designed program of study.

Admission Requirements

Students must complete 50 credits before admission to the program.

Freshmen are admitted to Carlson School of Management, but do not declare a major until 50 credits have been completed. Part of the 50 credits should include the 5 tool courses and liberal education requirements.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Required Courses for Admission

Tool Courses
An adviser-approved statistics course may be taken in place of OMS 2550.

ACCT 2050 - Introduction to Financial Reporting (4.0 cr)
APEC 1101 - Principles of Microeconomics, SSCI (3.0 cr)
or ECON 1101 - Principles of Microeconomics, IP, SSCI (4.0 cr)
or ECON 1101H - Honors Course: Principles of Microeconomics, IP, SSCI, H (4.0 cr)
or ECON 1104 - Principles of Microeconomics, IP, SSCI (4.0 cr)
APEC 1102 - Principles of Macroeconomics, IP, SSCI (3.0 cr)
or ECON 1102 - Principles of Macroeconomics, IP, SSCI (4.0 cr)
or ECON 1102H - Honors: Principles of Macroeconomics, IP, SSCI, H (4.0 cr)
or ECON 1105 - Principles of Macroeconomics, IP, SSCI (4.0 cr)
MATH 1142 - Short Calculus, MATH (4.0 cr)
or MATH 1271 - Calculus I, MATH (4.0 cr)
or MATH 1571H - Honors Calculus I, MATH, H (4.0 cr)
or MATH 1572H - Honors Calculus II, H (4.0 cr)
OMS 2550 - Business Statistics: Data Sources, Presentation, and Analysis (4.0 cr)
or OMS 2550H - Honors: Business Statistics: Data Sources, Presentation, and Analysis, H (4.0 cr)

Technology and Psychology
BA 1001 is required for students admitted as freshmen and recommended for others who need additional background with technology.

BA 1001 - Introduction to Information Technology (1.0 cr)
PSY 1001 - Introduction to Psychology, SSCI (4.0 cr)

General Requirements

Recommended freshman writing course(s) for this program: EngC 1011, 1012, 1013, or 1014

Program Requirements

Required Courses

Functional Core
ACCT 3001 - Introduction to Management Accounting (3.0 cr)
BA 3000 - Career Skills (1.0 cr)
FINA 3001 - Finance Fundamentals (3.0 cr)
HRIR 3021 - Human Resource Management and Industrial Relations (3.0 cr)
IDSC 3001 - Information Systems for Business Processes and Management (3.0 cr)
MGMT 3001 - Fundamentals of Management (3.0 cr)
MKTG 3001 - Principles of Marketing (3.0 cr)
OMS 3001 - Introduction to Operations Management (3.0 cr)

Communication, International, Business Policy Core
BA 3033W - Business Communication, WI (3.0 cr)
or BA 3033V - Honors: Business Communication, WI, H (3.0 cr)
MGMT 3040 - Understanding the International Environment of Firms: International Business, IP (3.0 cr)
or MGMT 3040H - Honors: Understanding the International Environment of Firms, International Business, H (3.0 cr)
MGMT 4004W - Business Policy: Strategy Formulation and Implementation, WI (3.0 cr)
or MGMT 4004V - Honors: Business Policy: Strategy Formulation and Implementation, WI, H (3.0 cr)

Major Courses
There are no specific course requirements for the general management self-designed major. Each student designs his or her own course of study in consultation with their adviser.

Human Resources and Industrial Relations B.S.B.

Industrial Relations Center

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 16.

Degree: Bachelor of Science in Business.

The human resources and industrial relations (HRIR) major prepares graduates for positions involving the recruitment and/or selection of new employees, identification of training needs among new and current workers, the functional operation of compensation systems and benefits packages, and the management of employee relations programs where workers are represented by trade unions. Human resource specialists have progressed from record keepers to strategic partners in the areas of finance and marketing as organizations recognize the importance of qualified people to their success. Today businesses compete as much based on human capital as they do on physical capital.The Carlson School Honors program offers students access to a richer undergraduate experience. Honors students have closer contact with their professors. They work in smaller classes and they put their skills to work for the benefit of the community. The program requires hard work and a strong commitment to learning.

Admission Requirements

Students must complete 50 credits before admission to the program.

A GPA above 2.00 is preferred for the following:

- 3.00 for students transferring from another University of Minnesota college.
- 3.00 for students transferring from outside the University.

Freshmen are admitted to Carlson School of Management, but do not declare a major until 50 credits have been completed. Part of the 50 credits should include the five tool courses and liberal education requirements. Those transferring in as sophomores need to complete microeconomics, macroeconomics, and calculus before admission. Juniors and above need to complete microeconomics, macroeconomics, calculus, business statistics, and accounting before admission.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Required Courses for Admission

Tool Courses

An adviser-approved statistics course may be taken in place of OMS 2550.

ACCT 2050 - Introduction to Financial Reporting (4.0 cr)
APEC 1101 - Principles of Microeconomics, SSCI (3.0 cr)
or ECON 1101 - Principles of Microeconomics, IP, SSCI (4.0 cr)
or ECON 1101H - Honors Course: Principles of Microeconomics, IP, SSCI, H (4.0 cr)
or ECON 1104 - Principles of Microeconomics, IP, SSCI (4.0 cr)
APEC 1102 - Principles of Macroeconomics, IP, SSCI (3.0 cr)
or ECON 1102 - Principles of Macroeconomics, IP, SSCI (4.0 cr)
or ECON 1102H - Honors: Principles of Macroeconomics, IP, SSCI, H (4.0 cr)
or ECON 1105 - Principles of Macroeconomics, IP, SSCI (4.0 cr)
MATH 1142 - Short Calculus, MATH (4.0 cr)
or MATH 1271 - Calculus I, MATH (4.0 cr)
or MATH 1571H - Honors Calculus I, MATH, H (4.0 cr)
or MATH 1572H - Honors Calculus II, H (4.0 cr)
OMS 2550 - Business Statistics: Data Sources, Presentation, and Analysis (4.0 cr)
or OMS 2550H - Honors: Business Statistics: Data Sources, Presentation, and Analysis, H (4.0 cr)

Technology and Psychology

BA 1001 is required for students admitted as freshmen and recommended for others who need additional background with technology.

BA 1001 - Introduction to Information Technology (1.0 cr)
PSY 1001 - Introduction to Psychology, SSCI (4.0 cr)

General Requirements

Recommended freshman writing course(s) for this program: ENGC 1011, 1012, 1013, or 1014

Program Requirements

Required Courses

Functional Core

ACCT 3001 - Introduction to Management Accounting (3.0 cr)
BA 3000 - Career Skills (1.0 cr)
FINA 3001 - Finance Fundamentals (3.0 cr)
HRIR 3021 - Human Resource Management and Industrial Relations (3.0 cr)
IDSC 3001 - Information Systems for Business Processes and Management (3.0 cr)
MGMT 3001 - Fundamentals of Management (3.0 cr)
MKTG 3001 - Principles of Marketing (3.0 cr)
OMS 3001 - Introduction to Operations Management (3.0 cr)

Communication, International, Business Policy Core

BA 3033W - Business Communication, WI (3.0 cr)
or BA 3033V - Honors: Business Communication, WI, H (3.0 cr)
MGMT 3040 - Understanding the International Environment of Firms: International Business, IP (3.0 cr)
or MGMT 3040H - Honors: Understanding the International Environment of Firms, International Business, H (3.0 cr)
MGMT 4004W - Business Policy: Strategy Formulation and Implementation, WI (3.0 cr)
or MGMT 4004V - Honors: Business Policy: Strategy Formulation and Implementation, WI, H (3.0 cr)

Major Courses

Take 16 or more credit(s) from the following:

HRIR 3031 - Staffing and Selection: Strategic and Operational Concerns (2.0 cr)
HRIR 3032 - Training and Development (2.0 cr)
HRIR 3041 - The Individual in the Organization (2.0 cr)
HRIR 3042 - The Individual and Organizational Performance (2.0 cr)
HRIR 3051 - Compensation: Theory and Practice (2.0 cr)
HRIR 3071 - Union Organizing and Labor Relations (2.0 cr)
HRIR 3072 - Collective Bargaining and Dispute Resolution (2.0 cr)
HRIR 5000 - Topics in Human Resources and Industrial Relations (2.0 cr)
HRIR 5021 - Systems of Conflict and Dispute Resolution (4.0 cr)
HRIR 5022 - Managing Diversity (2.0 cr)
HRIR 5023 - Employment and Labor Law for the HRIR Professional (2.0 cr)
HRIR 5024 - Employee Performance: Appraisal and Management (2.0 cr)
HRIR 5025 - Comparative and International Human Resources and Industrial Relations, IP (2.0 cr)
HRIR 5026 - Innovative HR Leadership in the Context of Change and Uncertainty (2.0 cr)
HRIR 5054 - Public Policies on Employee Benefits: Social Safety Nets (2.0 cr)
HRIR 5061 - Public Policies on Work and Pay (3.0 cr)
HRIR 5991 - Independent Study in Human Resources and Industrial Relations (1.0-8.0 cr)
INS 4101 - Employee Benefits (2.0 cr)

Human Resources and Industrial Relations Minor

Industrial Relations Center

Requirements for this program are current for Fall 2006.

Required credits in this minor: 8.

See major description for more information.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

This minor is only available for students admitted to a degree program in the Carlson School of Management.

Required Courses

Minor Courses

Take 8 or more credit(s) from the following:

HRIR 3031 - Staffing and Selection: Strategic and Operational Concerns (2.0 cr)
HRIR 3032 - Training and Development (2.0 cr)
HRIR 3041 - The Individual in the Organization (2.0 cr)
HRIR 3042 - The Individual and Organizational Performance (2.0 cr)
HRIR 3051 - Compensation: Theory and Practice (2.0 cr)
HRIR 3071 - Union Organizing and Labor Relations (2.0 cr)
HRIR 3072 - Collective Bargaining and Dispute Resolution (2.0 cr)
HRIR 5000 - Topics in Human Resources and Industrial Relations (2.0 cr)
HRIR 5021 - Systems of Conflict and Dispute Resolution (4.0 cr)
HRIR 5022 - Managing Diversity (2.0 cr)
HRIR 5023 - Employment and Labor Law for the HRIR Professional (2.0 cr)
HRIR 5024 - Employee Performance: Appraisal and Management (2.0 cr)
HRIR 5025 - Comparative and International Human Resources and Industrial Relations, IP (2.0 cr)
HRIR 5026 - Innovative HR Leadership in the Context of Change and Uncertainty (2.0 cr)
HRIR 5061 - Public Policies on Work and Pay (3.0 cr)
INS 4101 - Employee Benefits (2.0 cr)

International Business B.S.B.

Curtis L. Carlson School of Management - Adm

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 16.

Degree: Bachelor of Science in Business.

Carlson's international mission is "to ensure that its faculty and students obtain the necessary understanding of and appreciation for the impact of a global economy on the teaching and practice of management...." The major in international business follows this mission and allows students to combine study abroad experience(s) with coursework in international business and economics, and language.

The international business program may only be completed as a second major in combination with another Carlson School major.

The Carlson School Honors program offers students access to a richer undergraduate experience. Honors students have closer contact with their professors. They work in smaller classes and they put their skills to work for the benefit of the community. The program requires hard work and a strong commitment to learning.

Admission Requirements

Students must complete 50 credits before admission to the program.

A GPA above 2.00 is preferred for the following:

- 3.00 for students transferring from another University of Minnesota college.
- 3.00 for students transferring from outside the University.

Freshmen are admitted to Carlson School of Management, but do not declare a major until 50 credits have been completed. Part of the 50 credits should include the five tool courses and liberal education requirements. Those transferring in as sophomores need to complete microeconomics, macroeconomics, and calculus before admission. Juniors and above need to complete microeconomics, macroeconomics, calculus, business statistics, and accounting before admission.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Required Courses for Admission

Tool Courses

An adviser-approved statistics course may be taken in place of OMS 2550.

ACCT 2050 - Introduction to Financial Reporting (4.0 cr)
APEC 1101 - Principles of Microeconomics, SSCI (3.0 cr)
or ECON 1101 - Principles of Microeconomics, IP, SSCI (4.0 cr)
or ECON 1101H - Honors Course: Principles of Microeconomics, IP, SSCI, H (4.0 cr)
or ECON 1104 - Principles of Microeconomics, IP, SSCI (4.0 cr)
APEC 1102 - Principles of Macroeconomics, IP, SSCI (3.0 cr)
or ECON 1102 - Principles of Macroeconomics, IP, SSCI (4.0 cr)
or ECON 1102H - Honors: Principles of Macroeconomics, IP, SSCI, H (4.0 cr)
or ECON 1105 - Principles of Macroeconomics, IP, SSCI (4.0 cr)
MATH 1142 - Short Calculus, MATH (4.0 cr)
or MATH 1271 - Calculus I, MATH (4.0 cr)
or MATH 1571H - Honors Calculus I, MATH, H (4.0 cr)
or MATH 1572H - Honors Calculus II, H (4.0 cr)
OMS 2550 - Business Statistics: Data Sources, Presentation, and Analysis (4.0 cr)
or OMS 2550H - Honors: Business Statistics: Data Sources, Presentation, and Analysis, H (4.0 cr)

Technology and Psychology

BA 1001 is required for students admitted as freshmen and recommended for others who need additional background with technology.

BA 1001 - Introduction to Information Technology (1.0 cr)
PSY 1001 - Introduction to Psychology, SSCI (4.0 cr)

General Requirements

Recommended freshman writing course(s) for this program: ENGC 1011, 1012, 1013, or 1014

Program Requirements

Students are required to take 4 semester(s) of any second language.

The international business major is completed as a co-major within the Carlson School. Students complete coursework abroad or at the University of Minnesota and should satisfy the following requirements:

- At lease one course with an international focus supporting or broadening the student's knowledge of their primary major.
- At least one course focusing on the economic environment in which global business operates.

- Two supporting courses (6 credits maximum) focusing on the humanities and sociocultural aspects of the population of the region.
- Students submit a proposal outlining the courses they wish to include along with a rationale of how the courses contribute to an understanding of international business.

Required Courses

Functional Core

ACCT 3001 - Introduction to Management Accounting (3.0 cr)
BA 3000 - Career Skills (1.0 cr)
FINA 3001 - Finance Fundamentals (3.0 cr)
HRIR 3021 - Human Resource Management and Industrial Relations (3.0 cr)
IDSC 3001 - Information Systems for Business Processes and Management (3.0 cr)
MGMT 3001 - Fundamentals of Management (3.0 cr)
MKTG 3001 - Principles of Marketing (3.0 cr)
OMS 3001 - Introduction to Operations Management (3.0 cr)

Communication, International, Business Policy Core

BA 3033W - Business Communication, WI (3.0 cr)
or BA 3033V - Honors: Business Communication, WI, H (3.0 cr)
MGMT 3040 - Understanding the International Environment of Firms: International Business, IP (3.0 cr)
or MGMT 3040H - Honors: Understanding the International Environment of Firms, International Business, H (3.0 cr)
MGMT 4004W - Business Policy: Strategy Formulation and Implementation, WI (3.0 cr)
or MGMT 4004V - Honors: Business Policy: Strategy Formulation and Implementation, WI, H (3.0 cr)

Major Courses

Students must complete 10–12 credits of coursework that supports their primary business major and focuses on the economic environment in which global business operates. In addition, students must complete 4–6 credits focusing on the sociocultural aspects of the population of the region. Courses may be completed in a study abroad program or on campus. However, a study abroad experience of at least a semester in length is required, and it is recommended that at least half of the international business requirements are completed abroad.

Management Minor

Requirements for this program are current for Fall 2006.

Required credits in this minor: 16.

The Carlson School's management minor provides a broad understanding of business principles through the study of seven functional areas. Available to students in all majors at the University of Minnesota, Twin Cities, this general management background will help students succeed in whatever field they choose.

The Carlson School has partnered with the Hubert H. Humphrey Institute of Public Affairs in offering courses focusing on the nonprofit environment as part of the management minor.

Admission Requirements

Students must complete 30 credits before admission to the program.

A GPA above 2.00 is preferred for the following:

- 3.00 for students already admitted to the degree-granting college.
- 3.00 for students transferring from another University of Minnesota college.
- 3.00 for students transferring from outside the University.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Required Courses for Admission

Economics, Math, and Statistics Courses

ECON 1102 or ECON 1105 are recommended but not required.

ECON 1101 - Principles of Microeconomics, IP, SSCI (4.0 cr)
or ECON 1104 - Principles of Microeconomics, IP, SSCI (4.0 cr)
MATH 1031 - College Algebra and Probability, MATH (3.0 cr)
or
a higher level math course may be taken in place of MATH 1031.
OMS 2550 - Business Statistics: Data Sources, Presentation, and Analysis (4.0 cr)
or
an adviser-approved statistics course may be substituted for OMS 2550.

Program Requirements

Required Courses

Minor Courses

ACCT 2050 - Introduction to Financial Reporting (4.0 cr)
Take 12 or more credit(s) from the following:
ACCT 3001 - Introduction to Management Accounting (3.0 cr)
FINA 3001 - Finance Fundamentals (3.0 cr)
HRIR 3021 - Human Resource Management and Industrial Relations (3.0 cr)
IDSC 3001 - Information Systems for Business Processes and Management (3.0 cr)
MGMT 3001 - Fundamentals of Management (3.0 cr)
MKTG 3001 - Principles of Marketing (3.0 cr)
TOMS 3001 - Introduction to Operations Management (3.0 cr)
PA 3003 - Nonprofit and Public Financial Analysis and Budgeting (3.0 cr)
PA 4101 - Nonprofit Management and Governance (3.0 cr)

Management Information Systems B.S.B.

Information & Decision Sciences

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 20.

Degree: Bachelor of Science in Business.

The management information systems (MIS) major prepares students to be leaders in conceptualizing, prescribing, developing, and delivering leading-edge information system applications that support business processes and management decision making. It provides students with an understanding of the functions of information systems in organizations and detailed knowledge of information system analysis, design, and operation.

The Carlson School Honors program offers students access to a richer undergraduate experience. Honors students have closer contact with their professors. They work in smaller classes and they put their skills to work for the benefit of the community. The program requires hard work and a strong commitment to learning.

Admission Requirements

Students must complete 50 credits before admission to the program.

A GPA above 2.00 is preferred for the following:

- 3.00 for students transferring from another University of Minnesota college.
- 3.00 for students transferring from outside the University.

Freshmen are admitted to Carlson School of Management, but do not declare a major until 50 credits have been completed. Part of the 50 credits should include the five tool courses and liberal education requirements. Those transferring in as sophomores need to complete microeconomics, macroeconomics, and calculus before admission. Juniors and above need to complete microeconomics, macroeconomics, calculus, business statistics, and accounting before admission.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Required Courses for Admission

Tool Courses

An adviser-approved statistics course may be taken in place of OMS 2550.

ACCT 2050 - Introduction to Financial Reporting (4.0 cr)
APEC 1101 - Principles of Microeconomics, SSCI (3.0 cr)
or ECON 1101 - Principles of Microeconomics, IP, SSCI (4.0 cr)
or ECON 1101H - Honors Course: Principles of Microeconomics, IP, SSCI, H (4.0 cr)
or ECON 1104 - Principles of Microeconomics, IP, SSCI (4.0 cr)
APEC 1102 - Principles of Macroeconomics, IP, SSCI (3.0 cr)
or ECON 1102 - Principles of Macroeconomics, IP, SSCI (4.0 cr)
or ECON 1102H - Honors: Principles of Macroeconomics, IP, SSCI, H (4.0 cr)
or ECON 1105 - Principles of Macroeconomics, IP, SSCI (4.0 cr)
MATH 1142 - Short Calculus, MATH (4.0 cr)
or MATH 1271 - Calculus I, MATH (4.0 cr)
or MATH 1571H - Honors Calculus I, MATH, H (4.0 cr)
or MATH 1572H - Honors Calculus II, H (4.0 cr)
OMS 2550 - Business Statistics: Data Sources, Presentation, and Analysis (4.0 cr)
or OMS 2550H - Honors: Business Statistics: Data Sources, Presentation, and Analysis, H (4.0 cr)

Technology and Psychology

BA 1001 is required for students admitted as freshmen and recommended for others who need additional background with technology.

BA 1001 - Introduction to Information Technology (1.0 cr)
PSY 1001 - Introduction to Psychology, SSCI (4.0 cr)

General Requirements

Recommended freshman writing course(s) for this program: ENGC 1011, 1012, 1013, or 1014

Program Requirements

Required Courses

Functional Core

ACCT 3001 - Introduction to Management Accounting (3.0 cr)
BA 3000 - Career Skills (1.0 cr)
FINA 3001 - Finance Fundamentals (3.0 cr)
HRIR 3021 - Human Resource Management and Industrial Relations (3.0 cr)
IDSC 3001 - Information Systems for Business Processes and Management (3.0 cr)
MGMT 3001 - Fundamentals of Management (3.0 cr)
MKTG 3001 - Principles of Marketing (3.0 cr)
OMS 3001 - Introduction to Operations Management (3.0 cr)

Communication, International, Business Policy Core

BA 3033W - Business Communication, WI (3.0 cr)
or BA 3033V - Honors: Business Communication, WI, H (3.0 cr)
MGMT 3040 - Understanding the International Environment of Firms: International Business, IP (3.0 cr)
or MGMT 3040H - Honors: Understanding the International Environment of Firms, International Business, H (3.0 cr)
MGMT 4004W - Business Policy: Strategy Formulation and Implementation, WI (3.0 cr)
or MGMT 4004V - Honors: Business Policy: Strategy Formulation and Implementation, WI, H (3.0 cr)

Major Courses

IDSC 3201 - Introduction to Programming for Systems Development (4.0 cr)
IDSC 3202 - Analysis and Modeling for Business Systems Development (4.0 cr)
IDSC 4203 - Information Technology Infrastructure (4.0 cr)
IDSC 4204 - Managing Information Services (4.0 cr)

Electives

Take 4 or more credit(s) from the following:

IDSC 4421 - Financial Information Systems and Technologies (2.0 cr)
IDSC 4431 - Advanced Database Design (2.0 cr)
IDSC 4432 - Advanced Database Management and Administration (2.0 cr)
IDSC 4441 - Electronic Commerce (2.0 cr)
IDSC 4461 - Data Warehousing (2.0 cr)
IDSC 4490 - Information Systems Special Topics (2.0 cr)
IDSC 4496 - Information Systems Industry Internship (2.0 cr)

Management Information Systems Minor

Information & Decision Sciences

Requirements for this program are current for Fall 2006.

Required credits in this minor: 12.

The management information systems (MIS) minor prepares students to be leaders in conceptualizing, prescribing, developing, and delivering leading-edge information system applications that support business processes and management decision making. It provides students with an understanding of the functions of information systems in organizations and detailed knowledge of information system analysis, design, and operation.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

This minor is only available for students admitted to a degree program in the Carlson School of Management.

Required Courses

Minor Requirements

IDSC 3202 - Analysis and Modeling for Business Systems Development (4.0 cr)

Take 8 or more credit(s) from the following:
IDSC 3201 - Introduction to Programming for Systems Development (4.0 cr)
IDSC 4203 - Information Technology Infrastructure (4.0 cr)
IDSC 4204 - Managing Information Services (4.0 cr)
IDSC 4401 - Information Security (2.0 cr)
IDSC 4421 - Financial Information Systems and Technologies (2.0 cr)
IDSC 4431 - Advanced Database Design (2.0 cr)
IDSC 4432 - Advanced Database Management and Administration (2.0 cr)
IDSC 4441 - Electronic Commerce (2.0 cr)
IDSC 4461 - Data Warehousing (2.0 cr)
IDSC 4490 - Information Systems Special Topics (2.0 cr)

Marketing B.S.B.

Marketing & Logistics Management

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 20.

Degree: Bachelor of Science in Business.

Marketing is concerned with the flow of goods and services through the economy and the distribution of both industrial and consumer goods. Because more than one half of the consumer dollar goes to pay for marketing services, marketing is a significant part of the economy, and the efficiency with which marketing activities are carried out has major social and economic implications.

The Carlson School Honors program offers students access to a richer undergraduate experience. Honors students have closer contact with their professors. They work in smaller classes and they put their skills to work for the benefit of the community. The program requires hard work and a strong commitment to learning.

Admission Requirements

Students must complete 50 credits before admission to the program.

A GPA above 2.00 is preferred for the following:

- 3.00 for students transferring from another University of Minnesota college.
- 3.00 for students transferring from outside the University.

Freshmen are admitted to Carlson School of Management, but do not declare a major until 50 credits have been completed. Part of the 50 credits should include the five tool courses and liberal education requirements. Those transferring in as sophomores need to complete microeconomics, macroeconomics, and calculus before admission. Juniors and above need to complete microeconomics, macroeconomics, calculus, business statistics, and accounting before admission.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Required Courses for Admission

Tool Courses

An adviser-approved statistics course may be taken in place of OMS 2550.

ACCT 2050 - Introduction to Financial Reporting (4.0 cr)
APEC 1101 - Principles of Microeconomics, SSCI (3.0 cr)
or ECON 1101 - Principles of Microeconomics, IP, SSCI (4.0 cr)
or ECON 1101H - Honors Course: Principles of Microeconomics, IP, SSCI, H (4.0 cr)
or ECON 1104 - Principles of Microeconomics, IP, SSCI (4.0 cr)
APEC 1102 - Principles of Macroeconomics, IP, SSCI (3.0 cr)
or ECON 1102 - Principles of Macroeconomics, IP, SSCI (4.0 cr)
or ECON 1102H - Honors: Principles of Macroeconomics, IP, SSCI, H (4.0 cr)
or ECON 1105 - Principles of Macroeconomics, IP, SSCI (4.0 cr)
MATH 1142 - Short Calculus, MATH (4.0 cr)
or MATH 1271 - Calculus I, MATH (4.0 cr)
or MATH 1571H - Honors Calculus I, MATH, H (4.0 cr)
or MATH 1572H - Honors Calculus II, H (4.0 cr)
OMS 2550 - Business Statistics: Data Sources, Presentation, and Analysis (4.0 cr)
or OMS 2550H - Honors: Business Statistics: Data Sources, Presentation, and Analysis, H (4.0 cr)

Technology and Psychology

BA 1001 is required for students admitted as freshmen and recomended for others who need additional background with technology.

BA 1001 - Introduction to Information Technology (1.0 cr)
PSY 1001 - Introduction to Psychology, SSCI (4.0 cr)

General Requirements

Recommended freshman writing course(s) for this program: ENGC 1011, 1012, 1013, or 1014

Program Requirements

Required Courses

Functional Core

ACCT 3001 - Introduction to Management Accounting (3.0 cr)
BA 3000 - Career Skills (1.0 cr)
FINA 3001 - Finance Fundamentals (3.0 cr)
HRIR 3021 - Human Resource Management and Industrial Relations (3.0 cr)
IDSC 3001 - Information Systems for Business Processes and Management (3.0 cr)
MGMT 3001 - Fundamentals of Management (3.0 cr)
MKTG 3001 - Principles of Marketing (3.0 cr)
OMS 3001 - Introduction to Operations Management (3.0 cr)

Communication, International, Business Policy Core

BA 3033W - Business Communication, WI (3.0 cr)
or BA 3033V - Honors: Business Communication, WI, H (3.0 cr)
MGMT 3040 - Understanding the International Environment of Firms: International Business, IP (3.0 cr)
or MGMT 3040H - Honors: Understanding the International Environment of Firms, International Business, H (3.0 cr)
MGMT 4004W - Business Policy: Strategy Formulation and Implementation, WI (3.0 cr)
or MGMT 4004V - Honors: Business Policy: Strategy Formulation and Implementation, WI, H (3.0 cr)
Major Courses
MKTG 3010 - Marketing Research (4.0 cr)
Complete at least 16 credits from the following:
MKTG 4020 - Advanced Logistics and Supply Chain Management (2.0 cr)
or MKTG 4030 - Selling and Sales Management (4.0 cr)
or MKTG 4040 - Buyer Behavior (4.0 cr)
or MKTG 4050 - Integrated Marketing Communications (4.0 cr)
or MKTG 4060 - Marketing and Distribution Channels (4.0 cr)
or MKTG 4070 - International Marketing (2.0 cr)
or MKTG 4080 - Marketing Strategy (4.0 cr)
or MKTG 4090 - Marketing Topics (2.0 cr)

Marketing Minor

Marketing & Logistics Management

Requirements for this program are current for Fall 2006.

Required credits in this minor: 12.

See major description for more information.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

This minor is only available for students admitted to a degree program in the Carlson School of Management.

Required Courses

Minor Courses

MKTG 3010 - Marketing Research (4.0 cr)

Take 8 or more credit(s) from the following:

MKTG 4020 - Advanced Logistics and Supply Chain Management (2.0 cr)
MKTG 4030 - Selling and Sales Management (4.0 cr)
MKTG 4040 - Buyer Behavior (4.0 cr)
MKTG 4050 - Integrated Marketing Communications (4.0 cr)
MKTG 4060 - Marketing and Distribution Channels (4.0 cr)
MKTG 4070 - International Marketing (2.0 cr)
MKTG 4080 - Marketing Strategy (4.0 cr)
MKTG 4090 - Marketing Topics (2.0 cr)

Operations B.S.B.

Operations & Management Science

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 20.

Degree: Bachelor of Science in Business.

Admission Requirements

Students must complete 50 credits before admission to the program.

A GPA above 2.00 is preferred for the following:

- 3.00 for students transferring from another University of Minnesota college.
- 3.00 for students transferring from outside the University.

Freshmen are admitted to Carlson School of Management, but do not declare a major until 50 credits have been completed. Part of the 50 credits should include the five tool courses and liberal education requirements. Those transferring in as sophomores need to complete microeconomics, macroeconomics, and calculus before admission. Juniors and above need to complete microeconomics, macroeconomics, calculus, business statistics, and accounting before admission.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Required Courses for Admission

Tool Courses

An adviser-approved statistics course may be taken in place of OMS 2550.

ACCT 2050 - Introduction to Financial Reporting (4.0 cr)
APEC 1101 - Principles of Microeconomics, SSCI (3.0 cr)
or ECON 1101 - Principles of Microeconomics, IP, SSCI (4.0 cr)
or ECON 1101H - Honors Course: Principles of Microeconomics, IP, SSCI, H (4.0 cr)
or ECON 1104 - Principles of Microeconomics, IP, SSCI (4.0 cr)
APEC 1102 - Principles of Macroeconomics, IP, SSCI (3.0 cr)
or ECON 1102 - Principles of Macroeconomics, IP, SSCI (4.0 cr)
or ECON 1102H - Honors: Principles of Macroeconomics, IP, SSCI, H (4.0 cr)
or ECON 1105 - Principles of Macroeconomics, IP, SSCI (4.0 cr)
MATH 1142 - Short Calculus, MATH (4.0 cr)
or MATH 1271 - Calculus I, MATH (4.0 cr)
or MATH 1571H - Honors Calculus I, MATH, H (4.0 cr)
OMS 2550 - Business Statistics: Data Sources, Presentation, and Analysis (4.0 cr)
or OMS 2550H - Honors: Business Statistics: Data Sources, Presentation, and Analysis, H (4.0 cr)

Technology and Psychology

BA 1001 is required for students admitted as freshmen and recommended for others who need additional background with technology.

BA 1001 - Introduction to Information Technology (1.0 cr)
PSY 1001 - Introduction to Psychology, SSCI (4.0 cr)

General Requirements

Recommended freshman writing course(s) for this program: EngC 1011, 1012, 1013, or 1014

Program Requirements

Required Courses

Functional Core

ACCT 3001 - Introduction to Management Accounting (3.0 cr)
BA 3000 - Career Skills (1.0 cr)
FINA 3001 - Finance Fundamentals (3.0 cr)
HRIR 3021 - Human Resource Management and Industrial Relations (3.0 cr)
IDSC 3001 - Information Systems for Business Processes and Management (3.0 cr)
MGMT 3001 - Fundamentals of Management (3.0 cr)
MKTG 3001 - Principles of Marketing (3.0 cr)
OMS 3001 - Introduction to Operations Management (3.0 cr)

Communication, International, Business Policy Core

BA 3033W - Business Communication, WI (3.0 cr)
or BA 3033V - Honors: Business Communication, WI, H (3.0 cr)
MGMT 3040 - Understanding the International Environment of Firms: International Business, IP (3.0 cr)
or MGMT 3040H - Honors: Understanding the International Environment of Firms: International Business, H (3.0 cr)
MGMT 4004W - Business Policy: Strategic Formulation and Implementation, WI (3.0 cr)
or MGMT 4004V - Honors: Business Policy: Strategic Formulation and Implementation, WI, H (3.0 cr)

Major Requirements

OMS 3041 - Project Management (2.0 cr)
OMS 3056 - Operations Planning and Control (4.0 cr)
OMS 3059 - Quality Management and Six Sigma (4.0 cr)
OMS 4081 - Operations Strategy and Technology (4.0 cr)

Electives
Note prerequisites for some courses within this list.

Take 6 or more credit(s) from the following:
IDSC 3202 - Analysis and Modeling for Business Systems Development (4.0 cr)
IDSC 4441 - Electronic Commerce (2.0 cr)
MKTG 4020 - Advanced Logistics and Supply Chain Management (2.0 cr)
MKTG 4060 - Marketing and Distribution Channels (4.0 cr)
OMS 3045 - Purchasing and Supply Management (2.0 cr)
OMS 5170 - Simulation Modeling and Analysis (4.0 cr)

Operations Minor

Operations & Management Science

Requirements for this program are current for Fall 2006.

Required credits in this minor: 12.

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Program Requirements

This minor is only available to students admitted to a degree program in the Carlson School of Management.

Required Courses

Minor Requirements
OMS 3056 - Operations Planning and Control (4.0 cr)
OMS 3059 - Quality Management and Six Sigma (4.0 cr)
OMS 4081 - Operations Strategy and Technology (4.0 cr)

Risk Management and Insurance B.S.B.

Finance

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 11 to 12.

Degree: Bachelor of Science in Business.

Risk management is the practice of identifying the risks that affect a company's business and finding ways to mitigate and offset those risks. Risk management tools and techniques help corporations deal with all types of issues, legal concerns, and human resources changes.

This major introduces students to the risk management discipline and multiple career paths, including corporate risk manager, benefits manager, insurance agent/broker, underwriter, loss adjuster, consultant, and personal financial planner.

The Carlson School Honors program offers students access to a richer undergraduate experience. Honors students have closer contact with their professors. They work in smaller classes and they put their skills to work for the benefit of the community. The program requires hard work and a strong commitment to learning.

Admission Requirements

Students must complete 50 credits before admission to the program.

A GPA above 2.00 is preferred for the following:

- 3.00 for students transferring from another University of Minnesota college.
- 3.00 for students transferring from outside the University.

Freshmen are admitted to Carlson School of Management, but do not declare a major until 50 credits have been completed. Part of the 50 credits should include the five tool courses and liberal education requirements. Those transferring in as sophomores need to complete microeconomics, macroeconomics, and calculus before admission. Juniors and above need to complete microeconomics, macroeconomics, calculus, business statistics, and accounting before admission.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Required Courses for Admission

Tool Courses
An adviser-approved statistics course may be taken in place of OMS 2550.

ACCT 2050 - Introduction to Financial Reporting (4.0 cr)
APEC 1101 - Principles of Microeconomics, SSCI (3.0 cr)
or ECON 1101 - Principles of Microeconomics, IP, SSCI (4.0 cr)
or ECON 1101H - Honors Course: Principles of Microeconomics, IP, SSCI, H (4.0 cr)
or ECON 1104 - Principles of Microeconomics, IP, SSCI (4.0 cr)
APEC 1102 - Principles of Macroeconomics, IP, SSCI (3.0 cr)
or ECON 1102 - Principles of Macroeconomics, IP, SSCI (4.0 cr)
or ECON 1102H - Honors: Principles of Macroeconomics, IP, SSCI, H (4.0 cr)
or ECON 1105 - Principles of Macroeconomics, IP, SSCI (4.0 cr)
MATH 1142 - Short Calculus, MATH (4.0 cr)
or MATH 1271 - Calculus I, MATH (4.0 cr)
or MATH 1571H - Honors Calculus I, MATH, H (4.0 cr)
or MATH 1572H - Honors Calculus II, H (4.0 cr)
OMS 2550 - Business Statistics: Data Sources, Presentation, and Analysis (4.0 cr)
or OMS 2550H - Honors: Business Statistics: Data Sources, Presentation, and Analysis, H (4.0 cr)

Technology and Psychology
BA 1001 is required for students admitted as freshmen and recommended for others who need additional background with technology.

BA 1001 - Introduction to Information Technology (1.0 cr)
PSY 1001 - Introduction to Psychology, SSCI (4.0 cr)

General Requirements

Recommended freshman writing course(s) for this program: ENGC 1011, 1012, 1013, or 1014

Program Requirements

Required Courses

Functional Core
ACCT 3001 - Introduction to Management Accounting (3.0 cr)
BA 3000 - Career Skills (1.0 cr)
FINA 3001 - Finance Fundamentals (3.0 cr)
HRIR 3021 - Human Resource Management and Industrial Relations (3.0 cr)
IDSC 3001 - Information Systems for Business Processes and Management (3.0 cr)
MGMT 3001 - Fundamentals of Management (3.0 cr)
MKTG 3001 - Principles of Marketing (3.0 cr)
OMS 3001 - Introduction to Operations Management (3.0 cr)

Communication, International, Business Policy Core

BA 3033W - Business Communication, WI (3.0 cr)

or BA 3033V - Honors: Business Communication, WI, H (3.0 cr)

MGMT 3040 - Understanding the International Environment of Firms: International Business, IP (3.0 cr)

or MGMT 3040H - Honors: Understanding the International Environment of Firms, International Business, H (3.0 cr)

MGMT 4004W - Business Policy: Strategy Formulation and Implementation, WI (3.0 cr)

or MGMT 4004V - Honors: Business Policy: Strategy Formulation and Implementation, WI, H (3.0 cr)

Major Courses

INS 4100 - Corporate Risk Management (2.0 cr)

INS 4101 - Employee Benefits (2.0 cr)

INS 4200 - Insurance Theory and Practice (2.0 cr)

INS 4201 - Personal Financial Management (2.0 cr)

Take 3 or more credit(s) from the following:

BLAW 3058 - The Law of Contracts and Agency (4.0 cr)

FINA 4241 - Corporate Financing Decisions (4.0 cr)

FINA 4242 - Corporate Investment Decisions (4.0 cr)

MATH 4065 - Theory of Interest (3.0 cr)

MATH 5067 - Actuarial Mathematics I (4.0 cr)

MATH 5068 - Actuarial Mathematics II (4.0 cr)

INS 4202 - Personal Financial Planning 2: Tax and Estate Planning Techniques (2.0 cr)

Risk Management and Insurance Minor

Finance

Requirements for this program are current for Fall 2006.

Required credits in this minor: 8

Program Requirements

This minor is only available for students admitted to a degree program in the Carlson School of Management.

Required Courses

Minor Courses

INS 4100 - Corporate Risk Management (2.0 cr)

INS 4101 - Employee Benefits (2.0 cr)

INS 4200 - Insurance Theory and Practice (2.0 cr)

Take 2 additional credits chosen from the following:

BLAW 3058 - The Law of Contracts and Agency (4.0 cr)

FINA 4241 - Corporate Financing Decisions (4.0 cr)

FINA 4242 - Corporate Investment Decisions (4.0 cr)

MATH 4065 - Theory of Interest (3.0 cr)

MATH 5067 - Actuarial Mathematics I (4.0 cr)

MATH 5068 - Actuarial Mathematics II (4.0 cr)

INS 4202 - Personal Financial Planning 2: Tax and Estate Planning Techniques (2.0 cr)

INS 4201 - Personal Financial Management (2.0 cr)

Supply Chain Management B.S.B.

Marketing & Logistics Management

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 20.

Degree: Bachelor of Science in Business.

Supply chain management manages the flow of goods, information, and services in order to deliver maximum value to the consumer while minimizing the costs of the flow. It is an integrative process across functions within a firm and between trading partners. It is also considered an essential strategy for product-oriented firms as they seek competitive advantage.

The Carlson School Honors program offers students access to a richer undergraduate experience. Honors students have closer contact with their professors. They work in smaller classes and they put their skills to work for the benefit of the community. The program requires hard work and a strong commitment to learning.

Admission Requirements

Students must complete 50 credits before admission to the program.

A GPA above 2.00 is preferred for the following:

- 3.00 for students transferring from another University of Minnesota college.
- 3.00 for students transferring from outside the University.

Freshmen are admitted to Carlson School of Management, but do not declare a major until 50 credits have been completed. Part of the 50 credits should include the five tool courses and liberal education requirements. Those transferring in as sophomores need to complete microeconomics, macroeconomics, and calculus before admission. Juniors and above need to complete microeconomics, macroeconomics, calculus, business statistics, and accounting before admission.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Required Courses for Admission

Tool Courses

An adviser-approved statistics course may be taken in place of OMS 2550.

ACCT 2050 - Introduction to Financial Reporting (4.0 cr)

APEC 1101 - Principles of Microeconomics, SSCI (3.0 cr)

or ECON 1101 - Principles of Microeconomics, IP, SSCI (4.0 cr)

or ECON 1101H - Honors Course: Principles of Microeconomics, IP, SSCI, H (4.0 cr)

or ECON 1104 - Principles of Microeconomics, IP, SSCI (4.0 cr)

APEC 1102 - Principles of Macroeconomics, IP, SSCI (3.0 cr)

or ECON 1102 - Principles of Macroeconomics, IP, SSCI (4.0 cr)

or ECON 1102H - Honors: Principles of Macroeconomics, IP, SSCI, H (4.0 cr)

or ECON 1105 - Principles of Macroeconomics, IP, SSCI (4.0 cr)

MATH 1142 - Short Calculus, MATH (4.0 cr)

or MATH 1271 - Calculus I, MATH (4.0 cr)

or MATH 1571H - Honors Calculus I, MATH, H (4.0 cr)

or MATH 1572H - Honors Calculus II, H (4.0 cr)

OMS 2550 - Business Statistics: Data Sources, Presentation, and Analysis (4.0 cr)

or OMS 2550H - Honors: Business Statistics: Data Sources, Presentation, and Analysis, H (4.0 cr)

Technology and Psychology
BA 1001 is rquired for students admitted as freshmen and recommended for others who need additional background with technology.

BA 1001 - Introduction to Information Technology (1.0 cr)
PSY 1001 - Introduction to Psychology, SSCI (4.0 cr)

General Requirements

Recommended freshman writing course(s) for this program: ENGC 1011, 1012, 1013, or 1014

Program Requirements

Required Courses

Functional Core
ACCT 3001 - Introduction to Management Accounting (3.0 cr)
BA 3000 - Career Skills (1.0 cr)
FINA 3001 - Finance Fundamentals (3.0 cr)
HRIR 3021 - Human Resource Management and Industrial Relations (3.0 cr)
IDSC 3001 - Information Systems for Business Processes and Management (3.0 cr)
MGMT 3001 - Fundamentals of Management (3.0 cr)
MKTG 3001 - Principles of Marketing (3.0 cr)
OMS 3001 - Introduction to Operations Management (3.0 cr)

Communication, International, Business Policy Core
BA 3033W - Business Communication, WI (3.0 cr)
or BA 3033V - Honors: Business Communication, WI, H (3.0 cr)
MGMT 3040 - Understanding the International Environment of Firms: International Business, IP (3.0 cr)
or MGMT 3040H - Honors: Understanding the International Environment of Firms, International Business, H (3.0 cr)
MGMT 4004W - Business Policy: Strategy Formulation and Implementation, WI (3.0 cr)
or MGMT 4004V - Honors: Business Policy: Strategy Formulation and Implementation, WI, H (3.0 cr)
Major Courses
IDSC 3202 - Analysis and Modeling for Business Systems Development (4.0 cr)
MKTG 4060 - Marketing and Distribution Channels (4.0 cr)
OMS 3045 - Purchasing and Supply Management (2.0 cr)
OMS 3056 - Operations Planning and Control (4.0 cr)

Electives
Take 6 or more credit(s) from the following:
IDSC 4204 - Managing Information Services (4.0 cr)
IDSC 4441 - Electronic Commerce (2.0 cr)
MGMT 3070 - Topics in Management (4.0 cr)
MKTG 4020 - Advanced Logistics and Supply Chain Management (2.0 cr)
MKTG 4030 - Selling and Sales Management (4.0 cr)
MKTG 4070 - International Marketing (2.0 cr)
OMS 3041 - Project Management (2.0 cr)
OMS 3059 - Quality Management and Six Sigma (4.0 cr)
OMS 5170 - Simulation Modeling and Analysis (4.0 cr)

This is the Medical Technology General Information and Degree Program section of the 2006-2008 Undergraduate Catalog for the University of Minnesota, Twin Cities campus.

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Medical Technology

General Information

The medical technology program (also called clinical laboratory science) was established at the University of Minnesota in 1922 to prepare men and women for professional work in laboratory science and advanced study. This program provides a strong foundation in the sciences together with rich experiences in the clinical laboratory. Approximately 20 percent of medical technology graduates go on to complete an advanced degree.

Clinical laboratory scientists (medical technologists) perform many and varied laboratory analyses and use critical thinking in determining the correctness of test results. They recognize the interdependency of testing information and have knowledge of physiologic and pathologic conditions affecting results in order to validate them. In many health care settings, they provide data used by physicians in determining the presence, extent, and, as far as possible, causes of disease.

Clinical laboratory scientists/medical technologists

- develop and establish procedures for collecting, processing, and analyzing biological specimens and other substances;
- perform analytical tests of body fluids, blood, serum, plasma, cells, and other substances.
- integrate and relate data generated by various clinical laboratories while making decisions regarding possible discrepancies.
- confirm abnormal results, verify and execute quality control procedures, and solve problems concerning the generation of laboratory data to maintain accuracy and precision.
- establish and perform preventive and corrective maintenance of equipment and instruments as well as identify appropriate sources for repairs.
- develop, evaluate, and select new techniques, instruments, and methods in terms of their usefulness and practicality within the context of a given laboratory's personnel, equipment, space, and budgetary resources.
- demonstrate professional conduct through interpersonal skills with patients, laboratory personnel, other health care professionals, and the public.
- participate in continuing education for growth and maintenance of professional competence.
- provide leadership in educating other health personnel and the community.
- exercise principles of management, safety, and supervision.
- apply principles of educational methodologies.

Source: National Accrediting Agency for Clinical Laboratory Sciences, Chicago, Illinois.

Tests and procedures are performed or supervised by laboratory technologists in hematology, coagulation, microbiology, immunohematology, immunology, clinical chemistry, and urinalysis. Subspecialty areas in which laboratory personnel work include such fields as molecular diagnostics, cytogenetics, fertility testing, flow cytometry, tissue typing, bone and skin banks, forensics, and infection control.

As complexities of clinical laboratories increase, many medical technologists specialize in immunohematology, hematology, microbiology, chemistry, immunology, virology, coagulation, administration, computer science, education, quality assurance, and other areas. There are opportunities for graduates to work in hospital laboratories, clinics, physician offices, public health agencies, research, and industry.

As a general rule, a student who has excelled in scientific subjects in high school will succeed in medical technology.

The program is fully accredited by the National Accrediting Agency for Clinical Laboratory Sciences, 8410 West Bryn Mawr, Suite 670, Chicago, IL 60631 (773-714-8880; e-mail INFO@naacls.org).

Mission Statement

The mission of the Division of Medical Technology is to be a leader in educating clinical laboratory science professionals. In accordance with the University of Minnesota's mission, the division strives to do this in an environment that embodies the values of academic freedom, responsibility, integrity, and cooperation; that provides an atmosphere of mutual respect, free from racism, sexism, and other forms of prejudice and intolerance; that assists individuals, institutions, and communities in responding to a continuously changing world; that is conscious of and responsive to the needs of the many communities it is committed to serving; that creates and supports partnerships within the University, with other educational programs, and with communities to achieve common goals; and that inspires, sets high expectations for, and empowers the individuals within the community.

The division pursues this mission through teaching, research, and actively working with the health care community to assist in meeting the clinical laboratory needs of the state of Minnesota. Specifically, the division

- educates students to be clinical laboratory professionals who have the knowledge, skills, and values to provide competent and ethical practice in clinical laboratory science;
- develops new knowledge about the practice of clinical laboratory sciences;
- helps communities and other professionals develop an awareness and understanding of the role of the clinical laboratory professional and the work they perform;
- collaborates with other professionals within the health care community to assess the changing needs of the clinical laboratory, design solutions to meet the challenges, and monitor the quality of laboratory practice; and
- provides continuing education opportunities to practicing clinical laboratory professionals.

Facilities

Health sciences facilities are in a complex of buildings on the East Bank of the Minneapolis campus, including the Mayo Memorial Building, Malcolm Moos Health Sciences Tower, Weaver-Densford Hall, and the Phillips-Wangensteen Building. Close to or connected with the complex are University of Minnesota Medical Center, Fairview; Dwan Variety Club Cardiovascular Research Center; Veterans of Foreign Wars Cancer Research Center; and Children's Rehabilitation Center. Extensive resources and services of the Bio-Medical Library, including the Learning Resources Center, are housed in Diehl Hall.

These facilities provide learning, research, and internship sites for many students. They are excellent research centers, not only for studying diseases, healthy physiological processes, and environmental health, but also for developing new procedures and delivering expert health care. The proximity of the Academic Health Center units to each other and to the rest of the campus facilitates interdepartmental communication and underscores the interdisciplinary nature of health care. The Academic Health Center units also maintain affiliations with many hospitals and health care facilities around the Twin Cities and greater Minnesota, which afford students access to a wide spectrum of health care situations.

Clinical experiences for University of Minnesota medical technology students are available at the Veterans Affairs Medical Center, Allina Laboratories, and Fairview Health Services; Mayo Clinic (Rochester); the North Central Blood Services of St. Paul, Regions Hospital (St. Paul), and HealthEast Hospitals (St. Paul and Maplewood), North Memorial Medical Center (Robbinsdale), Park Nicollet Health Services (St. Louis Park), Ridgeview Medical Center (Waconia), St. Cloud Hospital (St. Cloud), Immanuel–St. Joseph's Hospital (Mankato), Lakeview Hospital (Stillwater), and Rice Memorial Hospital (Willmar).

Admission

Medical Technology sets its own standards and requirements for admission. These include a strong background in the natural sciences (specifically biology, chemistry, and physiology), as well as in the social and behavioral sciences. The Division recommends that applicants be genuinely interested in human services and sincerely committed to promoting the public's health and general welfare. Students generally enter the program at the beginning of their junior year.

Application Process

The medical technology curriculum consists of the preprofessional program at the University of Minnesota or its equivalent at another regionally accredited institution and the professional program in the Division of Medical Technology, which is part of the Academic Health Center.

Admission to the Preprofessional Program—Students who apply to enroll in a preprofessional program must meet the admission criteria and follow academic regulations of that college. The preprofessional program is pursued during the first two years of college.

The medical technology sequence is based on entrance to the professional program in the fall semester of year three or four, depending on completion of prerequisites. Admission to year three of the curriculum sequence is preferred. Space is very limited for year 4 admission.

Admission to the preprofessional program at the University of Minnesota does not assure admission to the professional program.

Admission to the Professional Program—For admission to the Division of Medical Technology, a student must have completed 60 semester credits, including required courses. The major criterion for admission is satisfactory academic performance as judged by the student's grade point average (GPA) in prerequisite science courses and cumulative GPA. Students are admitted once each year for the fall semester. Admission to the professional program is competitive because of the limited number of students who can be accommodated in the teaching and clinical facilities.

Students in residence at the University of Minnesota who expect to complete the requirements for admission to the professional program must file an *Application for Undergraduate Change of College* form with the One Stop Student Services Center, 200 Fraser Hall, by March 1. (Priority deadline is March 1. Applications are accepted until the class is full.) Students with sufficient credits but have course deficiencies should consult the Division of Medical Technology adviser regarding their status.

Students from other regionally accredited colleges and universities may transfer to the University of Minnesota to complete the medical technology program. Courses completed that are equivalent to those offered at the University of Minnesota are accepted to satisfy the requirements for admission to Medical Technology. Students who have a baccalaureate degree in a science curriculum and have completed required courses may finish the program in 15 months, as space is available in affiliated laboratories. Students transferring from other colleges may
apply online by referring to the admissions Web site at http://admissions.tc.umn.edu. The preferred deadline to apply is March 1. It is strongly advised that transfer students ascertain their status by writing to the Adviser, Medical Technology, University of Minnesota, MMC 711, 420 Delaware Street S.E., Minneapolis, MN 55455. Required science courses must be completed by the end of spring semester.

English Proficiency—If students are not native speakers of English, they must take the Test of English as a Foreign Language (TOEFL) or the Michigan English Language Assessment Battery (MELAB). To register for the TOEFL, students should contact the agency that handles TOEFL registration in their country or write to the Educational Testing Service (Box 6151, Princeton, NJ 08541, USA). If students are already in the Twin Cities area, they may register for the MELAB with the Minnesota English Center, University of Minnesota, 315 Nolte Center for Continuing Education, Minneapolis, MN 55455, or call 612-624-4548. To register for the MELAB outside the Twin Cities area, contact the English Language Institute, Testing and Certification Division, University of Michigan, Ann Arbor, MI 48109, USA, or call 734-764-2416. Required is a TOEFL score of at least 570 (paper version), 230 (computer version), or 88 (Internet version), or a MELAB score of at least 84.

Those who have completed one year of instruction and composition at a college or university where English is the language of instruction may have the English requirement waived.

Degrees

Bachelor of Science—Medical Technology offers the bachelor of science (B.S.) degree.

Bachelor of Applied Science—The College of Continuing Education offers the bachelor of applied science (B.A.Sc.) degree in clinical laboratory science through Medical Technology for students with MLT/CLT certification from a MNSCU program.

Master of Science—Graduate work in clinical laboratory science is available for qualified candidates who wish to prepare for a career of research, teaching, or work in industry. The master of science (M.S.) program in clinical laboratory science is offered by the Graduate School. The program is offered only under Plan A (master's degree with thesis). Each student must complete a thesis involving independent research in one of the subareas of this field under the direction of an adviser.

Admission requirements include a bachelor's degree from an accredited institution of higher learning with sufficient scholarly attainment in medical technology or chemistry and the biological sciences to justify graduate work in these areas.

For more information, see the *Graduate School Catalog* or contact the Clinical Laboratory Science Graduate Program Coordinator, MMC 609, 420 Delaware Street S.E., Minneapolis, MN 55455 (612-625-8952).

Extended Career Paths in Medical Technology

Hospital/Medical Center: Laboratory Areas

Acute care
Andrology/Fertility testing
Blood bank
Bone marrow
Cell markers
Chemistry
Coagulation
Computer science
Components - Transfusion service
Cytogenetics
Cytodiagnostic urinalysis
Cytology/Histology
Development laboratory
Drug analysis (toxicology)
Endocrinology
Flow cytometry
Forensic science
Genetics
Hematology
Immunology
Immunopathology
Immunophenotyping
Infection control
Laboratory supervisor or administrator
Microbiology
Molecular diagnostics
Mycology
Nuclear medicine
Out patient or clinic laboratory
Parasitology
Pathology - Surgical, autopsy
Phlebotomy/Specimen processing
Platelet studies
Photography/Illustration (e.g., in forensic medicine)
Quality assurance
Serology
Skin or bone bank
Special stains
STAT (emergency) laboratory
Tissue typing
Transfusion technical specialty
Transplant services
Urinalysis
Virology

Health Care Administration

Clinic manager/administrator
Coder-Abstractor (business or medical records office)
Consultant service specialist
Personnel director
Emergency medical services coordinator
Financial manager/planner
Group practice administrator
Hazardous waste coordinator
Health care administrator
Health insurance administrator
Health policy analyst
Health promotion coordinator
Hospital quality assurance coordinator
Infection control officer
Epidemiologist
Laboratory supervisor
Laboratory director
Laboratory utilization review coordinator
Long-term care administrator
Mental health administrator
Purchaser (laboratory/hospital/medical center)
Staffing coordinator (laboratory or home care)

Health Care Agency/Government

Administrator for Veterans Affairs hospital
Biometrist
Crime laboratory scientist
Department of Health - Educator
Department of Health - Proficiency test consultant
Employee recruiter/Placement officer
Environmental health specialist (inspector)
Environmental pathology technologist
Fraud investigator
Health Management Organization - Health educator
JCAHO Survey team member/CAP inspector
Medical examiner investigator (e.g., for coroner)
Military service - Armed Forces, ROTC, National Guard
NASA mission specialist
Patient educator
Private investigator FBI/Special agent (forensic lab)

Management Information System

Biometrician
Director - Division of Biometry
Hospital Information Systems - Team leader
Installer/Educator
Programmer
Systems analyst

Research - Basic and Applied

Associate scientist/Scientist
Clinical trial coordinator
Director of research
Research analyst
Research assistant

Industry (U.S. or International)

Adviser to or inventor of "home" or other lab tests
Biomedical specialist - Occupational health
Cell culture consultant
Clinical trial coordinator
Compliance coordinator
Computer consultant
Director of marketing
Documentation supervisor
Editor/manager - Medical publications
Food technologist - Quality assurance manager
Health care reimbursement coordinator
Health promotion and education specialist
Industrial hygiene specialist
Installation specialist
Insurance underwriter
Manager-Health claims administration
Medical claims reviewer/Auditor/Insurance processor
Medical consultant (TV/Movie industry)
Medical fee analyst - Insurance
Owner/Director of employee placement service
Product specialist
Quality control/Quality assurance monitor/Director
Research and development technologist or director
Research scientist
Risk management representative - Insurance
Salesperson
Technical representative

Other Professional Routes

Accounting
Consultant to physician office laboratories
Dentistry
Health radiation science
Laboratory scientist
Law (e.g., patent attorney)
Legislature - Politician, lobbyist, regulations writer
Medical Physics/Engineering
Medicine
Optometry
Public health
Reference/Independent/Commercial laboratory scientist
Veterinary medicine

Education

Academician
Allied health dean/Health sciences administrator
Education coordinator or program director
Educator of students in clinical settings
Faculty member in CLS/CLT/Cyto/SBB program
Higher education administrator
Instructor in veterinary medicine or other allied health program
Medical community services program coordinator

Humanitarian Work

Medical missionary work
Peace Corps
Project HOPE, others

Policies

Immunizations—Upon enrollment into the medical technology program, students are required to submit proof of the following immunizations and vaccinations:

- Measles/mumps/rubella documentation or positive titre
- Two- step tuberculosis skin test (Mantoux)
- Hepatitis B series or documented immunity
- Past DTP or diphtheria/tetanus within the last 10 years
- Varicella Zoster (chicken pox) positive history or two doses of vaccine

For the specific AHC policy and form, see www.bhs.umn.edu/services/ahc.htm on the Web. Start early to complete this requirement.

Health Insurance Coverage—Medical technology students are expected to carry health insurance to cover emergency medical situations. Specifics on the AHC health insurance policy can be located on the Web at www.bhs.umn.edu/insurance/ahc.htm. Students should carry their insurance information at all times.

Background Check—Medical technology students are placed in a variety of clinical settings during their clinical coursework. In accord with Minnesota law, a criminal background check is required of each student before clinical courses. The Division of Medical Technology arranges this check.

Satisfactory Academic Progress—Students in the professional program are subject to the regulations established by the Division of Medical Technology and must maintain satisfactory academic progress.

Satisfactory performance is considered to be not only a passing level in scientific and technical skills together with theoretical knowledge, but also complete personal integrity and honesty.

Students not achieving satisfactory progress may be placed on scholastic probation upon recommendation of the Student Scholastic Standing Committee (SSSC). This committee is composed of Division of Medical Technology faculty and student representatives, as appropriate.

Students' work is considered unsatisfactory when they earn less than a C- grade average (1.67 grade points for each credit) for any course in a given year or semester. In addition, students must earn a minimum grade of C- in selected courses to enroll in related clinical rotations, and maintain an overall GPA of 2.00 in the professional program.

If students receive an unsatisfactory grade in a course, remedial work in the course may be provided, if possible; if not, students must repeat the course the next time it is offered. If students receive an unsatisfactory grade in more than one course, either concurrently or in different semesters, the matter is referred to the SSSC for investigation and action. If the committee decides students should not continue in the curriculum, students are notified. Unsatisfactory grades in two courses are sufficient basis for dismissal.

Medical Technology Essential Functions

To successfully complete a clinical laboratory science program, medical technology students must be able to perform the following functions.

Communication skills—Must be able to communicate effectively in written and spoken English; comprehend and respond to both formal and colloquial English—person-to-person, by telephone, and in writing; appropriately assess nonverbal as well as verbal communication.

Locomotion—Must be able to move freely from one location to another in physical settings, such as the clinical laboratory, patient areas, corridors, and elevators.

Small motor skills—Must have sufficient eye-motor coordination to allow delicate manipulations of specimens, instruments, and tools. Must be able to grasp and release small objects (e.g., test tubes, microscope slides); twist and turn dials/knobs (e.g., for a microscope, balance, or spectrophotometer); and manipulate other laboratory materials (e.g., reagents and pipettes) in order to complete tasks.

Other physical requirements—Must be able to lift and move objects of at least 20 pounds. Must have a sense of touch and temperature discrimination.

Visual acuity—Must be able to identify and distinguish objects macroscopically and microscopically; read charts, graphs, and instrument scales.

Safety—Must be able to work safely with potential chemical, radiologic, and biologic hazards and follow prescribed guidelines for working with all potential hazards, including mechanical and electrical.

Professional skills—Must be able to follow written and verbal directions; work independently and with others and under time constraints; prioritize requests and work concurrently on at least two different tasks; maintain alertness and concentration during a normal work period.

Stability—Must possess the psychological health required for full use of abilities and be able to respond to others in a collegial manner; must be able to recognize emergency situations and take appropriate actions.

Affective (valuing) skills—Must show respect for self and others and project an image of professionalism, including appearance, dress, and confidence; and have complete personal integrity and honesty. Must adhere to appropriate professional manner and conduct.

Application skills—Must be able to apply knowledge, skills, and values learned from previous coursework and life experiences to new situations.

Certification and Placement

Division of Medical Technology graduates are eligible to take national examinations for certification as medical technologists or clinical laboratory scientists. These examinations are conducted by national certifying agencies. Many organizations and institutions require certification for employment.

Program graduates are assisted in finding employment by the Division of Medical Technology adviser. Notices of employment opportunities in the field are received from all parts of the United States and are posted in the medical technology office, 15-170 Phillips-Wangensteen Building.

Licensure

The licensed medical technologist practices in accordance with the requirements of individual state laws. In some states, a medical technologist must participate in continuing education courses for license renewal. Minnesota does not require a license to practice.

Advising

Medical Technology offers centralized advising services to undergraduates currently enrolled or interested in medical technology. In addition, the medical technology adviser works closely with the College of Liberal Arts natural science advisers. For more information, contact the medical technology office, 15-170 Phillips-Wangensteen Building (612-625-9490).

Special Learning Opportunities and Resources

Minority Program—The Academic Health Center is committed to the recruitment and retention of minority persons who come from groups underrepresented in the health professions. Advising and special courses are offered through the Martin Luther King Program and the following learning resource centers: African American Learning Resource Center, American Indian Learning Resource Center, Asian/Pacific American Learning Resource Center, and Chicano-Latino Learning Resource Center.

Scholarships

Medical Technology offers seven scholarship programs for students in the professional program. Scholarships are provided on the basis of scholastic achievement, need, and professional promise. For more information, contact the Medical Technology office, 15-170 Phillips-Wangensteen Building (612-625-9490). The scholarship application deadline is April 1.

Career Paths

The Extended Career Paths in Medical Technology chart represents positions taken by University of Minnesota medical technology graduates. It shows the opportunity and versatility of a medical technology (laboratory science) degree for positions not only in hospital laboratories, but also in industry, research, public health, government, information systems, consulting, reference (private) laboratories, education, and other areas.

Student Organizations

Council for Health Interdisciplinary Participation—The Council for Health Interdisciplinary Participation (CHIP) is an interdisciplinary student service organization dedicated to enhancing the quality of life and education of all Academic Health Center students. Activities include noontime lectures, evening workshops, and weekend symposia in areas such as bioethics, international health, alternative health care, and women's issues. CHIP publishes a newsletter featuring announcements of upcoming health sciences events, volunteer opportunities, and articles about topics of current interest to students. CHIP headquarters are located in an informal, comfortable lounge in 1-425 Malcolm Moos Health Sciences Tower. For more information, call 612-625-7100.

Medical Technology Student Council—Students in the professional program are represented on the Medical Technology Council by elected members from each class. The council promotes student-faculty relationships, sponsors social and educational activities, and considers matters affecting students in the program.

Student Membership in Professional Organizations—Medical technology undergraduates are eligible for student membership in the American Society for Clinical Laboratory Science. Medical technology students are also urged to participate in the activities of the Academic Health Center's Council for Health Interdisciplinary Participation (CHIP) and other University student organizations.

Campus Contacts

Patricia Solberg, Medical Technology, University of Minnesota, MMC 711, 420 Delaware Street S.E., Minneapolis, MN 55455. Offices at 15-170 Phillips-Wangensteen Building (612-625-9490; e-mail medtech@umn.edu). Web site: http://medtech.umn.edu.

Medical Technology

Degree Program

Medical Technology B.S.

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 60.

This program requires summer terms.

Degree: Bachelor of Science.

The medical technology program prepares students to work as clinical laboratory scientists in hospital, clinical, and medical research laboratories. Students can be accepted in either the junior or senior year. All medical technology courses are taken in the fall and spring semester of the senior year, followed by 22 weeks of clinical coursework.

Admission Requirements

Students must complete 9 courses before admission to the program.

Freshmen students are usually admitted to pre-major status before admission to this major.

A GPA above 2.00 is preferred for the following:

- 2.50 for students already admitted to the degree-granting college.
- 2.50 for students transferring from another University of Minnesota college.
- 2.50 for students transferring from outside the University.

Upon admission, students are required to submit proof of certain immunizations and vaccinations.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Required Courses for Admission

Pre-Medical Technology Courses

Students must take one math course at the level of college algebra or higher and one course in calculus or statistics. The same course may not be used to satisfy both distribution requirements.

MATH 1031 - College Algebra and Probability, MATH (3.0 cr)
or MATH 1051 - Precalculus I (3.0 cr)
or MATH 1142 - Short Calculus, MATH (4.0 cr)
or MATH 1271 - Calculus I, MATH (4.0 cr)
MATH 1142 - Short Calculus, MATH (4.0 cr)
or MATH 1151 - Precalculus II, MATH (3.0 cr)
or MATH 1271 - Calculus I, MATH (4.0 cr)
or MATH 1272 - Calculus II (4.0 cr)
or STAT 3011 - Introduction to Statistical Analysis, MATH (4.0 cr)
BIOL 1009 - General Biology, BIOL SCI/L (4.0 cr)
or BIOL 1001 - Introductory Biology I: Evolutionary and Ecological Perspectives, BIOL SCI/L, ENVT (4.0 cr)
and BIOL 1002W - Introductory Biology II: Molecular, Cellular, and Developmental Perspectives, WI (5.0 cr)
CHEM 1021 - Chemical Principles I, ENVT, PHYS SCI/L (4.0 cr)
CHEM 1022 - Chemical Principles II, ENVT, PHYS SCI/L (4.0 cr)
CHEM 2301 - Organic Chemistry I (3.0 cr)
CHEM 2302 - Organic Chemistry II (3.0 cr)
PHSL 3051 - Human Physiology (4.0 cr)

Program Requirements

INMD 3001, LAMP 4177, MEDT 1010, and MICB 4131 are highly recommended but not required for students pursuing a B.S. degree in medical technology.

Students are placed in a variety of clinical settings during their clinical coursework. In accord with Minnesota law, a criminal background check is required of each student before clinical courses. The Division of Medical Technology arranges this check.

Required Courses

Junior Year Courses

BIOC 3021 - Biochemistry (3.0 cr)
BIOL 4003 - Genetics (3.0 cr)
or GCD 3022 - Genetics (3.0 cr)
BIOL 2032 - General Microbiology with Laboratory (4.0 cr)
or MICB 3301 - Biology of Microorganisms (5.0 cr)

Senior Year Courses

MEDT 4064 - Introduction to Clinical Immunohematology (2.0 cr)
MEDT 4065 - Introduction to Clinical Immunohematology: Laboratory (2.0 cr)
MEDT 4100 - Virology, Mycology, and Parasitology for Medical Technologists (2.0 cr)
MEDT 4104 - Principles of Diagnostic Microbiology: Lecture (2.0 cr)
MEDT 4105 - Principles of Diagnostic Microbiology: Laboratory (2.0 cr)
MEDT 4127W - Introduction to Management and Education I, WI (1.0 cr)
MEDT 4253 - Hemostasis (1.0 cr)
MEDT 4310 - Clinical Chemistry I: Lecture (2.0 cr)
MEDT 4311 - Clinical Chemistry I: Laboratory Applications (2.0 cr)
MEDT 4320 - Clinical Chemistry II: Lecture (2.0 cr)
MEDT 4321 - Clinical Chemistry II: Laboratory Applications (2.0 cr)
MEDT 4400 - Immunological and Molecular Basis of Laboratory Testing (1.0 cr)
MEDT 4251 - Hematology I: Basic Techniques (3.0 cr)
MEDT 4252 - Hematology II: Morphology and Correlation (2.0 cr)

Clinical Courses

These courses should be completed during the 22 weeks of clinical rotations in the summer and fall terms following the senior year, including six weeks of clinical chemistry, five weeks in hematology and coagulation, five weeks in immunohematology, five weeks in microbiology, and one week in a specialty laboratory area.

MEDT 4082 - Applied Clinical Chemistry (3.0 cr)
MEDT 4085 - Applied Clinical Hematology (2.0 cr)
MEDT 4086 - Applied Clinical Immunohematology (2.0 cr)
MEDT 4088 - Applied Diagnostic Microbiology (2.0 cr)
MEDT 4089 - Specialty Rotation (1.0 cr)

This is the Mortuary Science General Information and Degree Program section of the 2006-2008 Undergraduate Catalog for the University of Minnesota, Twin Cities campus.

Mortuary Science

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Mortuary Science

General Information

The Program of Mortuary Science at the University of Minnesota, established in 1908, was the first program of its kind in this country to be organized at a state university. During the first 50 years of its existence, the program grew from a 6-week session to a 36-week course of study. In 1951, a two-year curriculum leading to the associate in mortuary science degree was approved. The course of study for the associate degree was expanded to three years in 1955. The bachelor of science degree with a major in mortuary science, granted upon satisfactory completion of a four-year curriculum, was approved by the Board of Regents in 1968. Impetus for the changes in program length and academic credentials resulted from changes in the philosophy and needs of the funeral service profession. The Program of Mortuary Science is part of the Medical School. The Program of Mortuary Science at the University of Minnesota is accredited by the American Board of Funeral Service Education (ABFSE), 3432 Ashland Avenue, Suite U, St. Joseph, MO 64506 (816-233-3747), an agency recognized by the United States Office of Education, and the International Conference of Funeral Service Examining Boards, Inc.

Accreditation

The Program of Mortuary Science at the University of Minnesota is accredited by the American Board of Funeral Service Education (ABFSE), 3432 Ashland Avenue, Suite U, St. Joseph, Missouri, 64506, 816-233-3747, www.abfse.org. The annual passage rate of first-time takers on the National Board Examination (NBE) for the most recent three-year period for this institution and all ABFSE accredited funeral service education programs is posted on the ABFSE Web site (www.abfse.org).

Mission

Funeral directors are health care professionals who serve others during a time of loss, pain, and grief. The mission of this program is to skillfully combine the study of behavioral, physical, and applied sciences for the goal of preparing graduates for careers as knowledgeable, skilled, and innovative funeral service professionals. Program graduates will be prepared to serve bereaved members of their communities in a manner that is proficient, dignified, and caring.

Objectives

The program recognizes an obligation to students, the profession, and the community. Its objectives have been adopted by the program's Advisory Board, and conform with the Accreditation Standards set forth by the American Board of Funeral Service Education.

The objectives of the program are to

- enlarge the background and knowledge of students about the funeral service profession.
- educate students in every phase of funeral service, and to help them to develop the proficiency and skills necessary of the profession.
- educate students concerning the responsibilities of the funeral service profession to the community at large.
- emphasize high standards of ethical conduct.
- provide a curriculum at the postsecondary level of instruction.
- encourage research in the field of funeral service.
- encourage faculty and students to be advocates for the funeral service profession.

Goals

The goals of the program include:

- Synthesizing psychosocial aspects of grief and the funeral directing arts.
- Developing technical competence in applying funeral service sciences to the care of the disposition of the dead.
- Developing an understanding of business, legal, and ethical theories and principles related to funeral service practice.

Aims

Upon entrance into the workforce as funeral directors, graduates will be able to

- provide support to the bereaved during the initial stages of their grief.
- prepare a decedent's body for final disposition according to the wishes of the survivors in accordance with the law.
- secure information for legal documents.
- handle business-related tasks required of mortuary operations.
- advise and give counsel to survivors regarding various funeralization options.
- help survivors adapt to changes in their lives following a death, through counseling and support group activities.

Admission

Students usually enter the Program of Mortuary Science at the beginning of their junior year. Freshmen and sophomores interested in a mortuary science major are urged to contact the program office at A275 Mayo, MMC 740, 420 Delaware Street S.E., Minneapolis, MN 55455, for counsel in planning an appropriate preprofessional program. On the Twin Cities campus, freshmen and sophomores usually register in the College of Liberal Arts (CLA) for their premortuary science coursework. Admission criteria and other information related to CLA can be found in the CLA section in this catalog. Applicants transferring from any regionally accredited college or university are given the same consideration as those who transfer from within the University. Applicants seeking admission to the Program of Mortuary Science who will be earning their first baccalaureate degree must have completed:

- the University of Minnesota's high school preparation requirements (see Freshman Admission in the General Information section of this catalog).
- at least 60 semester credits with grades of A, B, C, or S from a regionally accredited college or university.
- prerequisite coursework with a grade point average (GPA) of 2.50 on a 4.00 scale.

- the preprofessional requirements of the Program of Mortuary Science—(a) at least one course in each of the areas of English composition, statistics, general biology with lab, accounting, general psychology, general chemistry with lab, introduction to sociology, speech, human anatomy and physiology, plus (b) sufficient electives to total 60 credits.

A student who has completed all of the admission and liberal education requirements may be able to complete degree requirements in three semesters.

Immunizations

A signed health clearance form with proof of immunizations is a condition for enrollment after admission, unless a student qualifies for exemption. Immunization from, or immunity to, the following is required: Hepatitis B, Measles/Mumps/Rubella, Varicella, Tetanus/Diphtheria, and Mantoux (PPD)—annual and two-step tests. Students may be exempt if a vaccine is contraindicated due to potential allergic reactions or pregnancy. For more information, visit www.bhs.umn.edu/services/immunizationservices.htm.

Liberal Education Requirements

For University of Minnesota, Twin Cities campus liberal education requirements, see the Policies section of this catalog.

Students entering the Program of Mortuary Science who have already completed a bachelor's degree, or have completed the Minnesota Transfer Curriculum, are exempt from the liberal education requirements, but must meet all other admission requirements.

Application Procedure

Transfer Within the University—Students already admitted to one college or campus of the University of Minnesota must submit an *Application for Undergraduate Change of College* form, available from the One Stop Student Services Center on any campus.

Transfer From Outside the University—Students who have completed their preprofessional coursework at another university must apply for admission to the University of Minnesota. Transfer students should obtain the *Application for Transfer Admission* from the Office of Admissions, 240 Williamson Hall, 231 Pillsbury Drive S.E., Minneapolis, MN 55455 (612-625-2008, or 1-800-752-1000); and return it to that office; or they can apply online at http://admissions.tc.umn.edu/admissioninfo/trans_applications.html. An official transcript from each institution outside the University where coursework was attempted or completed must be sent to the Office of Admissions. A nonrefundable application fee is also required.

The priority deadline for application is March 1 for fall semester admission. Applications received after the priority deadline will be reviewed on a space-available basis.

Orientation

Various orientation activities are offered to help students get acquainted with one another, the campus, and the program. These activities include individual and group meetings for program planning, and presentations on University resources and regulations. Students are notified of orientation dates at the time they receive registration information.

Policies

Credit Load

Most students take about 15 credits of coursework each semester. To take fewer than 13 credits per semester requires permission from the Student Scholastic Advisory Committee. Registration for more than 20 credits per semester must also be approved by this committee.

Academic Performance Standards

The Student Scholastic Advisory Committee decides upon appropriate actions when notified that a student is experiencing problems meeting academic standards.

A student's work is considered unsatisfactory when the student earns a GPA in a given semester (including summer session) below 2.00. If a student's GPA drops below 2.00, the student receives a letter from the program director and is required to meet with the director to discuss the student's academic progress within the program. The student is then automatically placed on academic probation for one semester. While on academic probation, the student must complete the probationary term with a GPA of at least 2.50 and earn no grades below C. (A C- is unsatisfactory.) Failure to meet these criteria results in automatic suspension from the program. The period of suspension begins on the first day following the end of the probationary term and terminates no earlier than the last class day of the following 15-week academic semester. Thus, if a student is suspended at the end of spring semester, the earliest term for which the student can register is spring semester of the following year.

Upon return to the program following academic suspension, the student must complete a second probationary term with a GPA of at least 2.75 and earn no grades below C. (A C- is unsatisfactory.) Following a period of suspension, failure to meet these criteria results in automatic dismissal from the program. Once dismissed from the program for failure to meet academic performance standards, a student must apply for readmission. Students may not reapply for readmission until one calendar year after the date of dismissal has passed.

Graduation Requirements

To be recommended for the bachelor of science degree with a major in mortuary science, students must complete the University's graduation requirements (see Policies section). Students complete a minimum of 120 credits outlined in Degree Requirements.

Certification/Licensure

Students planning to practice in a state other than Minnesota should determine the qualifications for licensure by writing to the licensing agency in the state in which they intend to practice. These regulations vary from state to state, may change frequently, and students should make certain they have accurate information.

Advising

Advisers assist students with program and career planning. It is recommended that the student's academic advisers approve student registrations for each academic term.

Financial Aid

For information concerning financial aid, students should contact the Office of Student Finance, 200 Fraser Hall, 106 Pleasant Street S.E., Minneapolis, MN 55455 (612-624-1111), or visit http://onestop.umn.edu/onestop/Financial_Aid/grants.html for grant and scholarship resources.

Student Organization

Student Association of the Program of Mortuary Science— Each student enrolled in the program automatically becomes a member of this association, which serves as a forum for expressing student opinions about mortuary science education, a liaison between students and faculty, and an organization to foster and support mortuary science education.

Contact Information

Program of Mortuary Science, University of Minnesota, MMC 740, 420 Delaware Street S.E., Minneapolis, MN 55455 (612-624-6464; fax 612-626-4163; e-mail mortsci@umn.edu). Offices are located at A275 Mayo Memorial Building, 401 Church Street S.E., Minneapolis, MN 55455. Web site: www.mortuaryscience.umn.edu.

Mortuary Science

Degree Program

Mortuary Science B.S.

Medical School

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 61.

This program requires summer terms.

Degree: Bachelor of Science.

The Program of Mortuary Science combines coursework in the basic and behavioral sciences with instruction in the liberal arts.

Funeral directors are health care professionals who serve others during a time of loss, pain, and grief. The mortuary science program prepares graduates to serve bereaved members of their communities in a manner that is proficient, dignified, and caring. Program objectives conform with standards of the American Board of Funeral Service Education; International Conference of Funeral Service Examining Boards, Inc.; and Minnesota Department of Health.

The Program of Mortuary Science at the University of Minnesota is accredited by the American Board of Funeral Service Education (ABFSE), 3432 Ashland Avenue, Suite U, St. Joseph, MO 64506, 816-233-3747.

Students usually enter the program at the start of their junior year. An advanced standing plan is open to applicants with outstanding course records and who already hold their first bachelor's degree from an accredited college or university or who have completed the University's liberal education requirements. To decrease the number of credits taken as a part of this curriculum, students may be able to transfer similar courses from other institutions (for example, microbiology, personal/community health, and medical or health sciences terminology). Contact the program office before registering to determine if courses will be approved for transfer credit.

Admission Requirements

Students must complete 60 credits before admission to the program.

Freshmen students are usually admitted to pre-major status before admission to this major.

A GPA above 2.00 is preferred for the following:

- 2.50 for students already admitted to the degree-granting college.
- 2.50 for students transferring from another University of Minnesota college.
- 2.50 for students transferring from outside the University.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Required Courses for Admission

Pre-Mortuary Science Courses

Students usually enter the Program of Mortuary Science at the beginning of their junior year. Freshmen and sophomores are urged to contact the program office for counsel in planning an appropriate preprofessional program. The following courses are required for admission to the B.S. program (except PUBH 3001 and PHAR 1002, which are not required but strongly recommended).

BIOL 1001 - Introductory Biology I: Evolutionary and Ecological Perspectives, BIOL SCI/L, ENVT (4.0 cr)
or BIOL 1009 - General Biology, BIOL SCI/L (4.0 cr)
CHEM 1011 - Introductory Chemistry: Lecture and Laboratory, PHYS SCI/L (4.0 cr)
or CHEM 1021 - Chemical Principles I, ENVT, PHYS SCI/L (4.0 cr)
ACCT 2050 - Introduction to Financial Reporting (4.0 cr)
COMM 1101 - Introduction to Public Speaking (3.0 cr)
EPSY 3264 - Basic and Applied Statistics, MATH (3.0 cr)
PSTL 1135 - Human Anatomy and Physiology, BIOL SCI/L (4.0 cr)
PHAR 1002 - Health Sciences Terminology (2.0 cr)
PSY 1001 - Introduction to Psychology, SSCI (4.0 cr)
PUBH 3001 - Personal and Community Health (2.0 cr)
SOC 1001 - Introduction to Sociology, CD, SSCI (4.0 cr)

Program Requirements

Required Courses

Junior Year Courses

Students must take MORT 3379 both semesters of the junior year and during the following summer term.

MORT 3005 - History of Funeral Service (2.0 cr)
MORT 3014 - Funeral Service Rules and Regulations (2.0 cr)
MORT 3018 - Funeral Practice (3.0 cr)
MORT 3019 - Funeral Practice II (3.0 cr)
MORT 3021W - Funeral Service Psychology, WI (3.0 cr)
MORT 3022W - Funeral Service Counseling, WI (3.0 cr)
MORT 3049 - Microbiology (2.0 cr)
MORT 3061 - Embalming Theory (3.0 cr)
MORT 3161 - Embalming Laboratory (1.0 cr)
MORT 3171 - Human Anatomy Laboratory (2.0 cr)
MORT 3370 - Death and Dying Across Cultures and Religions (3.0 cr)
MORT 3379 - Clinical Funeral Service Rotation (3.0 cr)
PHAR 1002 - Health Sciences Terminology (2.0 cr)
PUBH 3001 - Personal and Community Health (2.0 cr)

Senior Year Courses

MORT 3012 - Organization and Management of Funeral Business (3.0 cr)
MORT 3016 - Funeral Service Marketing and Merchandising (3.0 cr)
MORT 3025 - Business Law (3.0 cr)
MORT 3030 - Funeral Service Law (3.0 cr)
MORT 3050 - Forensic Pathology (3.0 cr)
MORT 3051 - Restorative Art (2.0 cr)
MORT 3055W - Complicated Grief, WI (3.0 cr)
MORT 3065 - Embalming Chemistry (3.0 cr)
MORT 3151 - Restorative Art Laboratory (1.0 cr)
National Board Examiniation
Exit interview

This is the Nursing General Information and Degree Program section of the 2006-2008 Undergraduate Catalog for the University of Minnesota, Twin Cities campus.

School of **Nursing**

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University
of Minnesota
School of Nursing

School of Nursing

General Information

Established in 1909, the University of Minnesota School of Nursing holds the distinction of being the first continuing nursing program on a university campus in the United States. The School of Nursing assumes responsibility for improving nursing care through its programs in nursing education, research, and community service. The School of Nursing offers three programs and one certificate: the bachelor of science in nursing, the master of science with a major in nursing, the nursing post-baccalaureate certificate and the doctor of philosophy with a major in nursing.

The School of Nursing is part of the University's Academic Health Center, whose mission is to be a leader in the ethical, innovative, and efficient discovery and dissemination of knowledge to enhance the health and well-being of Minnesota, the nation, and the world.

Admission

Admission to the Post-Baccalaureate Certificate Program— The School of Nursing offers a graduate-level certificate to those with previous BA/BS degrees in non-nursing areas of study who wish to become nurses. Visit the School of Nursing Web site for more information.

Admission to the BSN Program—Students are admitted to the nursing major once a year in the fall, at the sophomore level, after completing prerequisite courses. Prerequisite courses are listed below. Admission to the major is competitive.

The nursing major can be completed at the University of Minnesota Twin Cities campus or the University of Minnesota Rochester campus. Clinical coursework is completed throughout the respective communities.

Prerequisite Courses—The nursing major builds on a foundation of prerequisite courses in the natural and behavioral sciences. The following prerequisites are applicable to students entering the nursing program as sophomores in fall 2007:

Content Areas	Minimum Semester Credits
General principles of chemistry	3
General psychology	3
Freshman composition	3
Nutrition	3
Human anatomy and physiology I (Rochester applicants)	3
Microbiology	4
Human growth and development	3

Application Deadline—The application deadline for fall 2007 is February 1, 2007. The School of Nursing admits students to the major for fall semester only.

English Language Requirement—Applicants whose native language is not English, and have lived in the United States for less than eight years as of the first day of fall semester, must submit the following minimum test scores: 1) a Test of Spoken English (TSE) score of 50; 2) Test of English as a Foreign Language (TOEFL) score of at least 240 on the computerized version, 95 on the Web version (IBT) or 586 on the paper version or Michigan English Language Assessment battery (MELAB) score of 85 or higher.

Application Process

Applicants must apply to the University of Minnesota School of Nursing in a competitive two-part process.

1. A *School of Nursing Application* must be completed and submitted to the School of Nursing. It is available online at www.nursing.umn.edu.
2. Applicants who have never been enrolled at any campus or in any college at the University of Minnesota must submit an *Undergraduate Application* in addition to the *School of Nursing Application*. The *Undergraduate Application* is available through the Office of Admissions at http://admission.tc.umn.edu.

   OR

   Current or former University of Minnesota students must submit a *Change of College* form in addition to the *School of Nursing Application*. It is available at http://onestop.umn.edu/forms.

Admission Deposit Fee—Applicants admitted to the School of Nursing must pay a nonrefundable deposit fee to hold their admission place. This fee will be applied against the student's first semester tuition and fees.

Orientation

All students enrolled in the School of Nursing must attend the school's orientation-registration program.

CPR—Students who have been admitted to the School of Nursing are required to have current certification in cardiopulmonary resuscitation, at the health professional level.

Health—Students who have been admitted to the School of Nursing are required to provide evidence that they have completed a physical assessment examination with appropriate immunizations.

A condition of admission is documentation for required immunizations according to the AHC Policy of Prevention of and Response to the Educational Exposure to Blood Borne Pathogen and Tuberculosis.

Disability Accommodations—For information on disability accommodations, contact Disability Services at http://ds.umn.edu or at 612-626-1333 or 612-624-3316.

Degrees/Majors

The baccalaureate program prepares outstanding graduates who are skilled in delivering nursing care, able to contribute to the evolving science of nursing, and capable of moving into leadership positions where they can positively influence health care for individuals and groups. Graduates of the program are confident of their contributions to the care of clients, identify with nursing as a profession, and are able to articulate the nurse's role to other disciplines in health care and to the public.

The program is for high-ability, achievement-oriented students and provides a challenging learning environment with innovative approaches to faculty-student relationships and scholarly learning experiences.

Nursing courses include lectures, seminars, laboratories, and clinical practice. Students learn client care in hospitals, clinics, homes, long-term care facilities, and other health care settings. Students provide care to clients with diverse health care problems in real life situations.

Graduate study leading to the M.S. or Ph.D. degree with a major in nursing is available for qualified candidates. For more information, contact the student recruiter, School of Nursing, University of Minnesota, 5-160 Weaver-Densford Hall, 308 Harvard Street S.E., Minneapolis, MN 55455 (612-625-7980) or via e-mail at nurseoss@umn.edu.

Continuing education programs in nursing foster intellectual curiosity and growth. The school offers a calendar of contemporary, challenging, and flexible learning experiences that use a variety of academic, professional, and community resources.

Honors

The School of Nursing honors program provides academic opportunities that challenge students to perform at their highest level.

Honors students experience the excitement of discovery and the rigor of problem solving in an intellectually stimulating environment. In honors seminars, students discuss issues and questions important to health care and to the role that nurses play. Through honors courses and self-directed clinical and field experiences, students gain depth and breadth in the theory and practice of nursing.

Students admitted to the School of Nursing with a strong academic record will be invited to apply to the honors program. Further criteria for admission include leadership potential, critical thinking skills, communication skills, creativity, perseverance, and self-direction. After completing the curricular and honors requirements, students graduate with Latin honors.

Graduation Requirements

Prospective graduates must submit an application for degree to the One Stop Student Services Center, 200 Fraser Hall, by the deadline specified by that office for application.

To participate in the spring baccalaureate graduation ceremony, students must have completed all Nurs-designated courses. Students who have been approved to participate in the graduation ceremony are not automatically guaranteed degree clearance.

Professional Licensure

Examinations for state licensure may be taken after all program requirements have been completed and the degree awarded. Applications for examination are available from the Minnesota Board of Nursing, 2829 University Avenue S.E. #500, Minneapolis, MN 55414 (612-617-2270), or from the state in which the examination will be taken.

Advising

Academic advising for students is provided by their college of enrollment. Nursing students receive academic advising by nursing faculty. Advisers help students with academic concerns as well as with decisions concerning nursing careers and graduate study.

The School of Nursing Office of Student Services hosts information sessions. Further information is available online at the School of Nursing Web site, www.nursing.umn.edu.

Student Organizations

Nursing College Board (NCB)—NCB is the official student organization within the School of Nursing. The student body elects board representatives. The board promotes unity among nursing students and provides them with an official mode of communication with faculty, administration, and other members of the University community. Board activities include representing students on School committees and planning School events. NCB is part of the Graduate Professional Student Assembly and has representation in the Minnesota Student Association, Nursing Alumni Society, and Council for Health Interdisciplinary Participation (CHIP).

CHIP—CHIP is dedicated to enhancing the educational experience of University health sciences students, encouraging the exchange of ideas, and opening the lines of communication among students in the Academic Health Center.

The CHIP Student Center is in 1-425 Malcolm Moos Health Sciences Tower (612-625-7100).

Alpha Tau Delta—Alpha Tau Delta, a professional nursing fraternity, was founded in 1921 on the campus of the University of California at Berkeley. The Beta Chapter at the University of Minnesota was chartered in 1927. Alpha Tau Delta is dedicated to developing leadership, maintaining high professional educational standards, providing service to the community, and encouraging mutual helpfulness and understanding among students in the profession. Membership is open to all School of Nursing students.

Sigma Theta Tau International—The international honor society of nursing, Sigma Theta Tau, has a chapter at the University of Minnesota. Installed in 1934, Zeta Chapter is one of the oldest chapters in the country. The honor society recognizes superior achievement and leadership qualities, fosters high professional standards, encourages creative work, and strengthens commitment to the ideals and purposes of the profession. Zeta Chapter sponsors an annual research day, provides grants for research, presents annual awards for nursing excellence and leadership, and organizes programs of interest to its members. The membership selects new members from undergraduate and graduate students nominated by the faculty and from professional nurses in the community nominated by members or faculty.

School of Nursing Alumni Society—All School of Nursing graduates are encouraged to become members of the Alumni Society of the School of Nursing. The Society provides

- a link for alumni to the School of Nursing
- opportunities to enhance students' experiences
- communication among the School's alumni, faculty, and students about educational trends and developments in nursing
- support to the School of Nursing's mission of research, education, and service

Directory

Administrative Offices

Office of the Dean

5-140 Weaver-Densford Hall,
308 Harvard St., Minneapolis
612-624-5959

Development Office

5-139 Weaver-Densford Hall,
308 Harvard St., Minneapolis
612-624-2490

Outreach Office

5-140H Weaver-Densford Hall,
308 Harvard St., Minneapolis
612-626-1817

Office of Student Services

5-160 Weaver-Densford Hall,
308 Harvard St., Minneapolis
612-625-7980

Alumni Relations

612-624-0103

Recruitment

612-625-7980

Registration

612-625-7980

School of Nursing

Degree Program

Nursing B.S.N.

School of Nursing

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 90.

This program requires summer terms.

Degree: Bachelor of Science in Nursing.

The four-year bachelor of science in nursing (B.S.N.) program consists of one year of prerequisite courses and a three-year nursing sequence. Students are admitted to the three-year nursing sequence after completing the prerequisites. The program has a full-time, day school curriculum.

The program prepares students to be professional nurses who think critically and analytically as they encounter today's complex health care issues and a wide variety of client needs. Graduates are eligible to take the registered nurse (R.N.) licensure examination and be certified as public health nurses. The School of Nursing is accredited by the Commission on Collegiate Nursing Education (CCNE).

Today faculty emphasize clinical competence, leadership skills, critical thinking, and analysis. Located in one of the nation's most extensive interdisciplinary academic health centers, at one of the nation's top three public research universities (University of Florida study), and in the heart of one of the nation's most progressive health care communities--the school is a synergy of research and practice. Students learn from nationally and world-renowned faculty who draw their clinical skills from research and a rich array of clinical learning experiences.

The School of Nursing has two campuses. One is in the Twin Cities and the other is in Rochester, Minnesota. Both campuses are located in Minnesota's "Medical Alley," and provide students clinical experiences at a wide variety of top public and private facilities.

Admission Requirements

Students must complete 16 credits before admission to the program.

A GPA above 2.00 is preferred for the following:

- 2.8 for students already admitted to the degree-granting college.
- 2.8 for students transferring from another University of Minnesota college.
- 2.8 for students transferring from outside the University.

Send an application for B.S.N. to School of Nursing.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Required Courses for Admission

Prerequisite Courses

Students must maintain at least a 2.80 GPA in the pre-nursing required courses. It is preferred that students take NURS 2001 or NURS 3690-3691.

FSCN 1112 - Principles of Nutrition, ENVT (3.0 cr)
PSY 1001 - Introduction to Psychology, SSCI (4.0 cr)
CHEM 1011 - Introductory Chemistry: Lecture and Laboratory, PHYS SCI/L (4.0 cr)
or CHEM 1021 - Chemical Principles I, ENVT, PHYS SCI/L (4.0 cr)
FSCN 1021 - Introductory Microbiology, BIOL SCI/L (4.0 cr)
or MICB 4001 - Microorganisms and Disease (2.0 cr)
or VBS 2032 - General Microbiology With Laboratory (4.0 cr)

Human Growth and Development

PSTL 2283W - Psychology of Human Development, SSCI, WI (4.0 cr)
or NURS 2001 - Human Growth and Development: A Life Span Approach, SSCI (3.0 cr)
or

take both of the following:
NURS 3690 - Life Span, Growth, and Development I (2.0 cr)
NURS 3691 - Life Span, Growth, and Development II (1.0 cr)

Program Requirements

Required Courses

Sophomore Year

INMD 3001 - Human Anatomy (3.0 cr)
LAMP 4177 - Pathology for Allied Health Students (3.0 cr)
NURS 3700 - Human Experience of Health and Illness (2.0 cr)
NURS 3702 - Foundations of Professional Nursing (3.0 cr)
NURS 3704 - Nursing Fundamentals I: Assessment and Intervention (4.0 cr)
NURS 3706 - Therapeutic Communication (3.0 cr)
NURS 4104 - Ethical Sensitivity and Reasoning in Health Care, C/PE (2.0 cr)
PHAR 3800 - Pharmacotherapy for the Health Professions (3.0 cr)
PHSL 3051 - Human Physiology (4.0 cr)

Junior Year

NURS 3710 - Statistics for Clinical Practice and Research, MATH (3.0 cr)
NURS 4201 - Nursing Care of Adults (6.0 cr)
NURS 4203 - Nursing Fundamentals II: Assessment and Intervention (4.0 cr)
NURS 4320 - Psychiatric and Mental Health Nursing (5.0 cr)
NURS 4322 - Population-based Public Health Nursing (5.0 cr)
NURS 4326 - Nursing Care of Older Adults (3.0 cr)
NURS 4205W - Nursing Theory and Research, WI (3.0 cr)
or NURS 4205V - Honors: Nursing Theory and Research, WI, H (3.0 cr)
NURS 4324 - Transcultural Nursing and Global Health, CD, IP (3.0 cr)
or NURS 5040H - Seeking Solutions to Global Health Issues, IP, H (3.0 cr)

Senior Year

NURS 4402 - Taking Ethical Action in Health Care, C/PE (1.0 cr)
NURS 4403 - Nursing Care of Childbearing Families (4.0 cr)
NURS 4404 - Applied Nursing Research and Research Utilization (2.0 cr)
NURS 4500W - Nursing Leadership and Health Care Systems, WI (4.0 cr)
NURS 4502 - Clinical Immersion (6.0 cr)
NURS 4504 - Professional Issues (2.0 cr)

Program Sub-plans

A sub-plan is not required for this program.

Honors

This is an honors sub-plan.

Honors students must take NURS 4205V and 5040H as choices within their regular curriculum. In addition, they take NURS 4404H.

Required Courses

Honors Applied Clinical Research
NURS 4404H - Honors: Applied Research and Research Utilization, H (2.0 cr)

Rochester

The nursing major is available at two campus locations, the University of Minnesota, Twin Cities and the University of Minnesota, Rochester. Policies, application materials, and course content are the same at both campuses.

At the University of Minnesota, Rochester, prerequisites differ slightly due to course availability at the Rochester Community and Technical College. Contact the School of Nursing or the University of Minnesota, Rochester for specific information.

This is the ROTC section of the 2006-2008 Undergraduate Catalog for the University of Minnesota, Twin Cities campus.

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Reserve Officers Training Corps

ROTC

General Information

The Reserve Officers Training Corps (ROTC) plays an important role in the national defense framework of our nation. The American tradition of military instruction on civilian college campuses began in 1819 when a former superintendent at West Point established the American Literary, Scientific, and Military Academy, which later became Norwich University. Military instruction soon spread to other institutions—Virginia Military Institute in 1839, the University of Tennessee in 1840, and The Citadel in 1842.

In 1862 the U.S. Congress, foreseeing the dual necessity of creating additional institutions of higher learning as well as providing a means of schooling in the military arts, passed the Morrill Land Grant Act. This act provided money from the sale of government lands to establish colleges and universities and specified that courses in the military arts should be offered at these institutions.

The University of Minnesota opened its doors in 1869 through the benefits made available by the Morrill Act. One of the original nine faculty members was the University's first professor of military science, Major General Richard W. Johnson. For 70 years, on-campus military training and, after 1916, ROTC programs at the University prepared students to enter the Army. In 1939 a Naval ROTC unit was established, and in 1949 an Air Force ROTC program began.

For more than 150 years, on-campus military training and ROTC programs have provided intelligent, well-educated leaders for the nation's defense. In keeping with the typical American concept of the citizen-soldier and civilian control of military forces, the programs produce military officers from all geographic and social strata whose leadership is characterized by initiative, ingenuity, and flexibility. ROTC officers may return to civilian status when they have fulfilled their military obligation or choose to serve as reserve officers. ROTC programs provide leadership resources not only for national defense but also for civilian enterprise.

Programs

At the University of Minnesota, ROTC programs are offered by the U.S. Army, Navy-Marine Corps, and Air Force. ROTC coursework is completed concurrently with degree work so that participants qualify for officer commissions in one of the four military services—Army, Navy, Marine Corps, or Air Force— as they complete requirements for a University degree. ROTC coursework offers students the opportunity to widen their perspective; sharpen their sense of responsibility; develop their ability to organize, motivate, and lead others; and acquire a maturity of judgment that can be a source of strength and self-confidence throughout their careers.

Four- and two-year programs are available, each offering a different approach toward earning a commission for students who meet selection requirements. Four-year programs consist of a basic course and an advanced course. The basic course is taken during the freshman and sophomore years and the advanced course normally comprises the junior and senior years. Two-year programs consist of the advanced course only. Scholarship students entering their sophomore year incur a service commitment; nonscholarship students are obligated to a service commitment once they enter the advanced course. Programs are open for undergraduate and graduate students.

Curricula

ROTC courses prepare students for military service as junior officers. Students learn to exercise self-discipline, organize time and effort efficiently, perform effectively under stress, analyze and react quickly and with good judgment, and consistently exhibit exemplary military bearing and appearance. Juniors and seniors are placed in positions of command and apply the leadership skills they have developed during their preceding years of ROTC training. Following the final year of practical experience, these men and women are well prepared to assume leadership responsibilities as commissioned officers.

ROTC curricula are administered by the University's Offices of the Executive Vice President and Provost and the Departments of Military Science (Army ROTC), Naval Science (Navy-Marine ROTC), and Aerospace Studies (Air Force ROTC).

Benefits

ROTC scholarship programs provide up to four years (five years under specific circumstances) of subsidized education, paying all tuition costs, instructional fees, and providing a $300 per-semester allotment for textbook expenses. Additionally, scholarship students receive a subsistence allowance on an upward scale between $250 to $400 per month. Nonscholarship students in their junior and senior years receive the subsistence allowance for a maximum of 20 months. While attending summer training, all ROTC students receive approximately $700 plus housing, travel, and allowances. Students attending summer training to qualify for a two-year program receive the same pay and allowances as ROTC students (see Scholarships in this section).

Obligations

Students who complete all requirements are commissioned as Second Lieutenants (Army, Air Force, and Marines) or ensigns (Navy). Upon commissioning, Naval ROTC scholarship students incur a four-year active duty service obligation; nonscholarship students incur a three-year active duty service obligation. Extended commitments to active duty are required for all pilots (eight years after qualification), naval flight officers (six years after qualification), and Nuclear Propulsion Program officers (five years after commissioning). Air Force pilot and navigator program students incur a commitment of 10 and 6 years, respectively, after completing their training; all other Air Force students incur a four-year active duty service commitment (students who receive five years of scholarship incur a five-year commitment). Army students selected for active duty serve for three years; Army scholarship students selected for active duty serve four years. Army students commissioned into the National Guard or Army Reserve serve on active duty for initial schooling and then assume reserve obligations of varying durations.

Admission

The three ROTC programs are open to all students. Young men and women are selected on the basis of their own merits. Certain qualifications and eligibility criteria for enrollment and commissioning must be met, as set forth in the laws and regulations that govern the programs. Students who do not meet these criteria may enroll in a course for its educational value but do not receive financial benefits or an officer's commission.

To be eligible for admission to a University ROTC program, applicants must

- be full-time college students;
- have reached their 17th birthday by June 30 of the year they plan to enroll;
- be of sound physical condition;
- show evidence of moral integrity, satisfactory scholarship and extracurricular activity, and potential officer capabilities; and
- have no moral or personal convictions that will prevent them from conscientiously bearing arms in support and defense of the U.S. Constitution.

Transfer Students—Students who have participated in ROTC training at another college or university may request transfer if they were honorably released by the first institution and are accepted by a University of Minnesota ROTC program.

Advanced Standing—Students who have participated in ROTC training at another institution may be granted advanced standing for military courses successfully completed.

Veterans—Veterans may take advantage of their military service and experience by seeking advanced placement in a ROTC program. G.I. Bill educational benefits and ROTC benefits may be received concurrently. Army students may receive advanced standing for membership in the National Guard or Army Reserve through the Simultaneous Membership Program. After commissioning, veterans can count their prior service for longevity pay and retirement.

Scholarships

Scholarships are available through national or regional selection systems. High school seniors may compete for four-year scholarships. Completed applications must be submitted no later than November 15 (Army), December 1 (Air Force), or January 1 (Navy-Marine) for enrollment the following fall semester. College freshmen and sophomores may compete for three- and two-year scholarships.

Students accepted into one of the ROTC nonscholarship programs are normally eligible to compete for the scholarship program after one or two semesters of enrollment. Aptitude for military service and academic performance are major considerations for acceptance. For more information about particular/special scholarship programs, contact the appropriate department.

Student Activities

Each ROTC department offers a wide range of activities for its students. A variety of local and nationally affiliated organizations offer interested and qualified students the opportunity to participate in activities, both on and off campus, that develop their leadership and managerial skills. Social events and athletic competitions, scheduled throughout the school year, round out the activities available.

Department of Military Science

The Department of Military Science conducts the Army Reserve Officers Training Corps (ROTC) program to prepare men and women to serve as Second Lieutenants in the United States Army. Students serve our nation in one of the three components of the Army—Active, Reserve, National Guard—upon completion of a bachelor or graduate degree and completion of the ROTC program. Students serve in various career fields including the Nurse Corps, Aviation, Armor, Military Intelligence branches, and Signal branches to name a few. Students enrolled in Army ROTC have a wide variety of majors and attend the University of Minnesota or one of the program's 12 partnership schools in the Twin Cities area.

The Army ROTC program focus is on management and leadership skills. The core coursework includes 16 to 26 credits in topics such as the art and science of leadership, ethics, values, integrity, honor, problem solving skills, responsibility, basic military skills, military history, physical training, and adventure training. Students register and earn academic credit for Army ROTC courses in the same manner as other elective courses in their college curriculum.

An academic minor in military science is available but is not required.

Programs

Three programs are available in the Department of Military Science for students to earn a commission as a Second Lieutenant in the United States Army.

Four-Year Program—The four-year program is divided into two parts—the basic course and the advanced course. The basic course is typically completed in the first two years of college. Unless a cadet has accepted a scholarship, the basic course is voluntary and all students are eligible. After completing the basic course, students that meet the physical and academic standards, and have demonstrated leadership potential, contract into the advanced course. The advanced course includes four concurrent semesters of coursework and the Leader Development and Assessment Course (LDAC). The LDAC is a paid six-week leadership course conducted at Fort Lewis, Washington, during the summer. Typically students attend LDAC during the summer after the first year of the advance course.

Three-Year Program—The three-year program is designed for students who want to start ROTC as sophomores. Students complete the basic course in one year instead of two. This method is referred to as compression. Students completing the basic course as compression students go on to contract in the advanced course as above.

Two-Year Program—The two-year program enables eligible students to contract in the advanced course at the time they are academic juniors or seniors, or graduate students with four semesters remaining before graduation. Eligible students are those with one or more of the following:

- Prior service in the military.
- Member of the National Guard or Reserve with basic training completed.
- Completion of three or more years of Junior ROTC in high school.
- Completion of the Army ROTC Leader's Training Course.

Students that are members of the National Guard or Army Reserve can participate in the Simultaneous Membership Program (SMP), which provides additional income and the opportunity to serve in a leadership position in the student's unit of choice.

Military Science Minor—A military science minor is available through the College of Continuing Education in collaboration with the Department of Military Science. This minor provides students with basic concepts and principles of military science and the art of leadership. Areas of study include citizenship, military history, values, ethics, integrity, honor, responsibility, management, and leadership skills. Students gain practical leadership experience, develop self-discipline, gain confidence, and improve physical stamina—all of which are valuable qualities when applied to service in a military or civilian career.

The military science minor is open only to ROTC cadets pursuing a bachelor's degree from the University and a commission in the United States Army.

To complete the minor, students must complete 20-28 credits of specialized coursework including MIL 3130, 3131, 3140, 3141, four semesters of Military Science Leadership Lab, HIST 3891—American Military History, and an approved philosophy course.

Benefits

The Department of Military Science offers many benefits to students with or without military experience.

Personal Growth—The Department of Military Science gives students the opportunity to gain confidence, improve self-discipline, and improve physical and mental toughness. The leadership experience gained by completion of the program gives students a marketable asset—leadership.

Scholarships—A wide variety of scholarships are available and application can be made at anytime during the year. Scholarships range from two to four years in duration with extensions possible for high demanding majors such as nursing or engineering. Scholarships pay for all tuition and mandatory fees and $900 per year for textbooks. Two-year scholarships are available for members of the National Guard and Army Reserve. These scholarships feature continued reserve duty after commissioning and guaranteed branching in the student's unit. Scholarships for two to four years are also available and include duty in the Active Army after commissioning.

Guaranteed Job after Graduation—Upon commissioning, students have a full time job in the Active Army or part time job in the National Guard or Army Reserve. The military obligation of service is eight years after commissioning (four years Active Army and four years in the reserve component, or eight years in the National Guard or Army Reserve). The type of obligation is determined at the time of contracting in the advanced course and is tied to the type of scholarship. Cadets are selected for a specific branch depending on factors such as their interest, academic major, LDAC performance rating, and the needs of the Army.

Income—All contracted cadets receive $300 to $500 per month, depending upon the class, for up to ten months of the year. Students with prior service, SMP cadets, and members of the National Guard or Army Reserve may be eligible for Montgomery GI Bill (MGIB) benefits, financial assistance or reimbursement for tuition, and an additional $350 per month.

Department of Naval Science

The Naval Reserve Officers Training Corps (NROTC) offers the opportunity for qualified young men and women to earn commissions as Navy, Marine Corps, or Navy Nurse Corps officers as they complete requirements for a University degree. The NROTC program is the nation's largest producer of naval officers.

During their four years of college, NROTC students (midshipmen) complete 32 credits of instruction in naval orientation, naval ship systems, seapower and maritime affairs, navigation, shipboard operations, organization, management, leadership, and ethics, plus 120 hours of professional training in military ceremonies, customs, and skills, and various hands-on training opportunities.

Upon receiving a commission, a new Navy ensign usually receives advanced specialty training and then is assigned to duty aboard a surface ship, nuclear-powered submarine, or with an aviation squadron. Newly commissioned Marine Corps second lieutenants attend The Basic School in Quantico, Virginia following graduation. They then choose from several occupational fields, such as infantry, armor, aviation, artillery, intelligence, and engineering. Nurse program graduates are commissioned as Navy Nurse Corps officers and assigned to Navy medical facilities throughout the world.

Student Categories

Students who study and train with NROTC can be classified into three categories.

Scholarship Students—NROTC offers many scholarships. Scholarship students are appointed through an annual national selection process before college admittance or through competition with their peers after entering the NROTC program. Once appointed, students are designated as midshipmen in the Naval Reserve and receive a scholarship that covers all tuition and fees, a per-semester allotment for textbooks, and a subsistence allowance of between $250 to $400 per month for up to 40 months. Upon graduation and commission into the Navy-Marine Corps Reserve, they serve a minimum active duty obligation of four years.

College Program Students—These students are enrolled by the professor of naval science and frequently are "walk-ons" who join the NROTC program from the regular University student population. They are provided with uniforms and naval science textbooks, but pay their own tuition and fees. The college program consists of the basic (freshman and sophomore) and advanced (junior and senior) courses. Advanced course students are selected from the ranks of basic course students. Advanced course midshipmen receive a subsistence allowance of between $350 to $400 per month for up to 20 months. Upon graduation and commission into the Navy-Marine Corps Reserve, they serve a minimum active duty obligation of three years.

College program students may apply for NROTC scholarships based on the professor of naval science's recommendation. Special scholarship opportunities may be available for college program students at various points in the program.

Naval Science Students—Naval science students are associated with the Department of Naval Science for academic instruction only, e.g., for courses in navigation or organization and management. They register and pay fees in the same manner as for other University courses. These students do not wear uniforms, participate in summer training programs, or receive NROTC benefits. However, those who are eligible may apply for enrollment as NROTC college program or two-year scholarship program students.

Programs

The following NROTC programs and scholarship opportunities lead to rewarding careers as officers in the Navy or Marine Corps.

Four-Year Scholarship Program—This program educates and trains qualified young men and women for active duty as reserve officers in the Navy or Marine Corps.

Scholarship recipients are chosen by a national selection board and must be accepted by the University. The application deadline is January 1 for enrollment the following fall semester.

Navy option scholarship students (with the exception of Navy Nurse Corps option midshipmen) must successfully complete one year of calculus by the end of their sophomore year and one year of calculus-based physics by the end of their junior year. Marine Corps option scholarship students have a slightly different sequence of naval science courses and are not required to fulfill the calculus or physics requirements.

Scholarship students are required to complete three summer training periods, for which they receive training pay. After completing naval science requirements and earning a bachelor's degree, students are commissioned as officers in the Navy-

Marine Corps Reserve and serve on active duty for a minimum of four years.

Students already enrolled in the college program may apply for the scholarship program if nominated by the professor of naval science and selected by the chief of naval education and training.

Navy Nurse Corps Scholarship—Four-year scholarships are available to students planning to pursue the bachelor of science degree in nursing (B.S.N.). Upon graduation, these students are commissioned as reserve officers in the Navy Nurse Corps. Eligibility and selection procedures are the same as for the regular four-year NROTC scholarship program.

Four-Year College Program—This program is for students who wish to serve their country as reserve officers in the Navy or Marine Corps. Participants are University freshmen selected by the professor of naval science.

There are almost no restrictions on undergraduate academic courses students may choose provided they can be applied to a bachelor's degree. Students must complete the basic (freshman and sophomore) and advanced (junior and senior) naval science course sequences and certain University courses before graduation. College program students are not required to fulfill the calculus and physics requirements that apply to the scholarship program. Instead, they may take any math course of college-level algebra or higher and any physical science course that includes a lab. In addition, students attend a summer training cruise between their junior and senior years.

After graduating and completing their naval science requirements, students are commissioned as ensigns in the Naval Reserve or second lieutenants in the Marine Corps Reserve and serve on active duty for a minimum of three years.

Two-Year Scholarship Program—This program provides the same NROTC benefits to college juniors and seniors as the four-year scholarship program. To qualify, applicants must have a 2.50 cumulative GPA. Navy option applicants must have successfully completed one year of calculus and must complete one year of calculus-based physics before the end of their junior year. Interested students should apply before March 1 of their sophomore year. Selected students must complete a six-week course of instruction at the Naval Science Institute (NSI) in Newport, Rhode Island. Following NSI, students enroll in the NROTC advanced course. Commissioning as a Navy ensign or Marine Corps second lieutenant follows successful completion of the program and carries an obligation to serve four years of active duty.

Two-Year College Program—Students attending or transferring to the University should apply to the two-year college program before March 1 of their sophomore year. Students selected must attend a six-week course of instruction at the Naval Science Institute (NSI) in Newport, Rhode Island.

Upon return to the University, they enroll in the college program advanced course. After graduation and commissioning, students incur a three-year active duty obligation. Any student finishing near the top of the NSI class may be offered a two-year NROTC scholarship. This includes full tuition plus the other scholarship program benefits, and also incurs a four-year active duty obligation.

Naval Science Institute (NSI)—Students selected for either of the two-year programs attend the Naval Science Institute (NSI) in Newport, Rhode Island, following their sophomore year. NSI provides a six-week course of instruction in naval science and professional training. While at NSI, students receive pay, uniforms, room and board, and transportation. Successful completion of NSI qualifies students to enroll in the NROTC advanced course.

Summer Training—NROTC offers exciting training opportunities. Each summer, NROTC midshipmen train around the world at Navy and Marine Corps bases and aboard U.S. Navy and allied foreign navy vessels of all types. Scholarship students participate in four to six weeks of training each summer following their freshman year while college program students attend training during the summer between their junior and senior years.

Cross-Town Agreements—Students who attend the University of St. Thomas or Macalester College are eligible to participate in any of the University of Minnesota NROTC programs and earn commissions as Navy or Marine Corps officers.

Curriculum

The naval science curriculum covers basic seamanship to fleet operations and provides intensive education in the art and science of being a naval officer. All midshipmen learn about the background and meaning of our national and naval traditions and the importance of professional and ethical performance. This awareness, combined with the opportunity to develop and practice basic leadership principles, affords them the inner confidence necessary to effectively lead others and assume the responsibilities of a Navy or Marine Corps officer.

Midshipmen take the course sequence described below. During the second and third years, they take either the Navy or Marine Corps sequence. In addition to the specified courses, students attend NROTC professional training for three hours each week. During the junior and senior years, these sessions emphasize command and leadership skills. NROTC students must also take certain University courses specified by the Navy.

Navy Sequence—First Year

NAV 1000 - Professional Training in Naval Science
NAV 1101 - Introduction to Naval Science
NAV 1102 - Seapower and Maritime Affairs

Navy Sequence—Second Year

NAV 2000 - Professional Training in Naval Science
NAV 2201 - Ship Systems I (Naval Engineering)
NAV 4401 - Leadership and Management I

Navy Sequence—Third Year

NAV 3000 - Professional Training in Naval Science
NAV 3301 - Navigation I (Piloting and Celestial Navigation)
NAV 3302 - Navigation II (Seamanship and Ship Operations)

Navy Sequence—Fourth Year

NAV 4000 - Professional Training in Naval Science
NAV 2202 - Ship Systems II (Weapons)
NAV 4402 - Leadership, Management, and Ethics II

Marine Option—Second Year

NAV 2000 - Professional Training in Naval Science
NAV 3310 - Evolution of Warfare (can also be taken in third year)

Marine Option—Third Year

NAV 3000 - Professional Training in Naval Science
NAV 4410 - Amphibious Warfare (can also be taken in fourth year)

Students register for NROTC courses in the same manner as for other courses in their academic programs. These courses carry academic credit and may be used to fulfill University degree requirements. Students who are not in the NROTC program may enroll in a naval science course as an elective with the instructor's consent.

Department of Aerospace Studies

The Air Force ROTC (AFROTC) program enables qualified men and women to work toward commissions as officers in the Air Force while completing requirements for a University degree. Students are commissioned as second lieutenants upon graduation.

The AFROTC curriculum emphasizes development of leadership and communication skills. Students learn ways in which the Air Force supports national policy. Leadership theory and its practical application in directing personnel and programs are emphasized.

AFROTC courses are offered by the Department of Aerospace Studies. Students register for these courses in the same manner as for other University courses.

Programs

AFROTC programs and associated scholarships vary from one to four years in length. The length of the program and scholarship is based on the number of years the student has left until graduation. For example, a high school senior who earns a four-year scholarship joins the four-year program during their freshman year at the University and activates a four-year scholarship. Alternatively, a college senior would join the one-year program and, if qualified, activate a one-year scholarship. Students can join AFROTC at any time throughout the year; typically scholarship activation occurs during the fall term.

Scholarship boards are held several times a year. The application deadlines for scholarships are:

- High school student application deadline for a four-year scholarship—December 1 of senior year
- College student application deadline for one- to three-year scholarships—January 15 for the primary board; June 1 for a supplemental board

Students do not need to be members of AFROTC to compete and apply for an in-college scholarship, however, they must become members to activate any scholarship.

Students must enroll in aerospace studies classes every semester regardless of the length of the program. In addition, all students must successfully complete a summer field-training encampment prior to commissioning. This training typically takes place during the summer between the students' sophomore and junior years. Note: The one-year program is not offered every year and is based on the needs of the Air Force. Contact the University AFROTC to find out more about program availability.

Time requirements for AFROTC students vary by year. Freshmen and sophomores typically spend from three to five hours per week performing ROTC duties, and juniors and seniors typically spend from five to ten hours per week. Duties include attending mandatory classes and maintaining physical fitness.

The vast breadth of the Air Force and its operations is difficult to portray in the classroom; so Air Force cadets have the opportunity to visit bases for firsthand observation of how the Air Force operates. These trips are frequently made on weekends or scheduled to coincide with school vacation periods. Cadets may be flown by military aircraft to an Air Force base to tour facilities, receive mission briefings, and inspect aircraft and other technical equipment. There are many other opportunities available to cadets that range from free fall parachuting, to piloting a glider aircraft, to visiting Air Force installations in other countries.

Curriculum

Aerospace studies classes provide students with the tools required to become effective leaders in the Air Force. Freshmen and sophomores take a 1-credit survey course each semester to learn the basics of the Air Force and AFROTC (AIR 1104 and 1105) and Air Force history (AIR 1204 and 1205). Juniors and seniors take a 3-credit survey course each semester to study the traits and characteristics of effective leaders and managers (AIR 3301 and 3302) and to examine national security policy and professionalism (AIR 3401 and 3402). In addition, all AFROTC students must enroll in the Leadership Laboratory where class lessons are employed by running a cadet organizational structure (AIR 1000).

Students taking aerospace studies courses for academic credit only and not enrolled in AFROTC are exempt from the Leadership Laboratory requirement.

For the joint military science leadership minor, students must complete Air Force history (AIR 1204 and AIR 1205), Air Force leadership and management (AIR 3301 and AIR 3302), national security affairs (AIR 3401), preparation for active duty (AIR 3402), and a philosophy or rhetoric or leadership course approved by the professor of aerospace studies/chair of the Department of Aerospace Studies. Note: AIR 1204 and 1205 can be substituted with AF ROTC Field Training.

Admission

Entry into the last two years of the AFROTC program is competitive. Candidates must

- pass the Air Force Officer Qualifying Test (AFOQT).
- pass an Air Force medical examination.
- have a GPA of 2.00 or higher.
- pass a physical fitness test and meet weight standards.
- complete field training.
- graduate and commission before the age of 35.

Scholarship Age Limit—Students must be under the age of 31 on December 31 of the commissioning year to be eligible for a scholarship. Otherwise, cadets must be commissioned and enter active duty before reaching age 35. Students not eligible for a scholarship due to age restrictions are eligible for a financial incentive.

Benefits

AFROTC offers students a challenging position in the Air Force immediately after graduation in a variety of career fields. All cadets receive uniforms and AFROTC textbooks free throughout the program. All scholarship recipients and all cadets in their last two years of AFROTC receive between $250 and $400 per academic month and may travel on any military aircraft (space-available status). All cadets also have the opportunity for orientation flights aboard Air Force aircraft and visits to Air Force bases.

Active Duty Requirements

Students not programmed for pilot and/or navigator training incur a four-year active duty commitment. Those programmed for pilot and navigator programs incur a commitment of ten and six years active duty, respectively, after completing their training.

Scholarship Programs

AFROTC offers many scholarships. These scholarships may cover full tuition, fees, and books plus a nontaxable monthly allowance of $250 to $400 paid directly to the student. Some scholarships are awarded on a competitive basis while others are awarded on a fully qualified basis. Most three- and four-year

scholarships are offered on a best-qualified basis. The one- and two-year scholarships are typically offered on a fully qualified basis.

Four-year scholarships are available on a competitive basis to high school seniors. Applications are usually available early each summer, with a deadline of December 1 for enrollment the following fall semester.

Scholarship entitlements and types of scholarships offered vary according to the needs of the Air Force. Students should contact the University AFROTC office to find out if they qualify for a competitive or fully qualified scholarship. More information and scholarship applications are available online at www.afrotc.com and www.afrotc.umn.edu.

Directory

Military Science (Army ROTC)

LTC Curt S. Cooper
106 Armory Building
15 Church Street S.E.
Minneapolis, MN 55455
612-624-2583
E-mail: arotc@umn.edu
www.umn.edu/arotc

Naval Science (Navy-Marine ROTC)

Captain James D. Coulson, USN
203 Armory Building
15 Church Street S.E.
Minneapolis, MN 55455
612-625-6677
E-mail: nrotc@umn.edu
www.nrotc.umn.edu

Aerospace Studies (Air Force ROTC)

Lieutenant Colonel Douglas A. Ballinger, USAF
3 Armory Building
15 Church Street S.E.
Minneapolis, MN 55455
612-624-2884
E-mail: afrotc@umn.edu
www.afrotc.umn.edu

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Institute of Technology

General Information

For more than a century, the Institute of Technology (IT) has provided education, research, and technology transfer in science and engineering. With 4,500 students enrolled in its undergraduate programs, 2,600 in graduate programs, and 400 faculty, IT's 12 departments and schools and 15 research centers are committed to excellence in all they undertake.

Computer Facilities—The Institute of Technology, in cooperation with the Department of Computer Science and Engineering and the office of Academic and Distributed Computing Services, has established a number of computer laboratories for students. These laboratories provide interactive computing using either stand-alone computers and workstations or remote access to central computing facilities, including those of the Minnesota Supercomputer Institute. Laboratories are available to IT students any time during the work day and evening and weekend hours.

Students also have access through their departments to many special-purpose machines, ranging from small tabletop units for data reduction in laboratories to larger models reserved for special projects.

The Department of Computer Science offers a series of courses in Java and C++. Discipline-related computing courses are offered in some departments.

Admission

Freshman Admission

See Freshman Admission in the General Information section of this catalog and refer to the University of Minnesota, Twin Cities undergraduate application booklet for freshman admission requirements.

Appeals—Any student who believes that the circumstances concerning their application need further consideration may submit a written appeal to the Office of Admissions.

Upper Division Admission—Students entering as freshmen or sophomores must apply for admission to the upper division (junior and senior years). New freshmen and sophomores are told upon admission and at orientation what GPA might be required for entry into their desired upper division major field. (For procedure, see Upper Division under Scholastic Policies in this college section.)

Admission Without a Designated Major—Students who want to keep their options open and learn about IT fields before selecting a specific major should indicate "Undecided" on the admission application. They receive advising from the Office of Lower Division Programs until they are admitted to upper division. During that period students can use the many resources available to learn about IT fields, including mentors; peer, faculty, industry, and alumni advisers; special courses; and written materials. These resources provide information about career opportunities in IT's various fields and other colleges and help students avoid the mistake of selecting a major for the wrong reasons.

All students are urged to take advantage of the Industry Adviser and Mentor Programs, and visit selected industries to learn about engineering and science fields with an engineer and/or scientist of their choice. Currently, more than 200 engineers and scientists from Honeywell, 3M, NSP, and many other companies serve as advisers to IT students through this program. Arrangements to participate are made by online application.

IT undecided students follow the same first-year academic program as that followed by IT students with a specified major.

Advanced Standing Admission (Transfer)

Students who have completed any postsecondary classes after high school are considered for admission with advanced standing. Students planning to transfer to IT should be pursuing a lower division engineering, science, or math program. The mathematics, chemistry, physics, and computer science courses required for the preferred major should be mostly completed at the time of application. Admission decisions are based on an overall "technical" GPA using grades in science, calculus, computer science, and engineering. Because demand for some IT programs exceeds available places, applicants are asked to indicate three majors in order of preference. Applications must include recent transcripts from all colleges attended, reflecting all college work attempted (whether satisfactorily completed or not). Applications must also include a high school transcript to show whether the preparation requirements listed have been met. Most courses transfer routinely. Equivalency for technical courses has been established between IT and most colleges and universities (see www.it.umn.edu/prospective/equiv). Technical courses in which a D has been earned do not transfer.

Dual Degree (3/2) Programs—IT has cooperative agreements with a number of public and private colleges. These programs support students who want to combine a strong liberal arts background with study in engineering—and are willing to spend another year or two achieving this goal.

Under one plan a student can complete three years of study at a private college and then transfer to IT for two additional years. Core college requirements and the pre-engineering core courses in math and science are completed at the private college. A bachelor's degree is awarded by both the private college and IT.

The second plan requires completion of a bachelor of arts degree in math or science before coming to the University to work toward a master of science degree in engineering. This typically involves completing some undergraduate engineering coursework. This plan minimizes the amount of undergraduate coursework required. The amount of such coursework will vary by department and area of study. Participating colleges include (in Minnesota) Augsburg College, Bethany Lutheran College, Bethel College, Concordia College (Moorhead), Gustavus Adolphus College, Hamline University, Macalester College, MN State University–Moorhead, Northwestern College, the College of St. Catherine, Saint Mary's College, St. Olaf College, St. John's University-College of St. Benedict, St. Scholastica, University of St. Thomas, University of Minnesota, Morris; (outside Minnesota) Augustana College, SD; Carroll College, MT; Carthage College, WI; Jackson State University, MS; Lawrence University, WI; Luther College, IA; Morningside College, IA; North Central College, IL; North Park College, IL; Simpson College, IA; University of Mary, ND; University of Winnipeg, Manitoba, Canada; University of Wisconsin–Eau Claire, WI; University of Wisconsin–La Crosse, WI; University of Wisconsin-Oshkosh; University of Wisconsin–River Falls, WI; Westmont College, CA; Wheaton College, IL; Whittier College, CA.

Degrees and Programs

Undergraduate Degrees—Each of IT's undergraduate programs provides a rigorous and stimulating education enhanced by close interaction with distinguished research faculty and access to IT's research facilities.

Nineteen degrees are offered:

bachelor of aerospace engineering and mechanics*

bachelor of science in astrophysics

bachelor of bio-based products engineering

bachelor of biomedical engineering*

bachelor of biosystems and agricultural engineering*

bachelor of chemical engineering*

bachelor of science in chemistry

bachelor of civil engineering*

bachelor of computer engineering*

bachelor of science in computer science

bachelor of electrical engineering*

bachelor of geological engineering*

bachelor of science in geology

bachelor of science in geophysics

bachelor of materials science and engineering*

bachelor of science in mathematics

bachelor of mechanical engineering*

bachelor of science in physics

bachelor of science in statistics

** Program is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET).*

Graduate Degrees—The University of Minnesota is the only institution in the state that offers a full range of graduate programs in mathematics and computer science, the physical sciences, and engineering. Each IT department offers M.S. and Ph.D. degree programs in several areas within its discipline. For detailed information about the various graduate programs, consult the Graduate School Catalog.

IT and the Graduate School jointly offer a program leading to the master of engineering (M.E.) degree in any of the engineering disciplines. This program provides advanced preparation in specialized design work for recent graduates in engineering as well as for working engineers who wish to improve their technical capabilities.

The management of technology program is an executive-format graduate program that prepares working engineers and scientists for careers in technology management. It is a part-time, two-year program leading to a master of science degree in the management of technology (M.S.-M.O.T.). Similar professional masters programs are offered in infrastructure systems, and software engineering. For more information, contact the Center for the Development of Technological Leadership, 510 West Bank Office Building, 1300 S. Second Street, Minneapolis, MN 55455 (612-624-5747).

Interdisciplinary Programs—IT students can plan interdisciplinary programs tailored to their specific interests. Although a degree is approved by a single department, students can combine coursework from several departments.

Many interdisciplinary programs are possible. A few examples include acoustics, bioengineering, environmental engineering, nuclear engineering, and transportation. Students should contact their department office or visit 105 Lind Hall for more information.

Premedical Programs—Because there is no prescribed premedical major, some students plan their IT programs as preparation for medical school. The Minnesota medical schools in Duluth, Minneapolis, and Rochester give strong preference to applicants who are state residents.

The Minneapolis campus Medical School has approved the following courses to fulfill its premedical requirements.

Biology—BIOL 1009 and 3211 and 2005. This sequence is most parallel to MCAT.

Biochemistry—BIOC 3021, BIOC 4025 (optional lab)

Chemistry—CHEM 1021–1022, 2301–2302 and 2311

English and Literature—One English composition course and one literature course

Calculus—MATH 1271 or equivalent

Physics—PHYS 1201 and 1202 or 1301 and 1302

Social and Behavioral Sciences and Humanities—Four courses: one course in psychology with the remaining coursework in at least two of the following areas—history, sociology, anthropology, philosophy, comparative studies, music, or art.

All math/science courses must be taken A-F. A-F grading is preferred for all coursework.

Coursework in genetics and upper level statistics is strongly recommended.

Additional academic courses to complete degree requirements.

Prerequisite courses do change occasionally. The Medical School Web sites have the most up-to-date information and can be found at:

Duluth: http://penguin.d.umn.edu/Admissions

Minneapolis: www.meded.umn.edu

Rochester: www.mayo.edu/mms/md-admissions.html

For more information, contact the Health Careers Center in 2-571/585 Moos Tower (612-624-6767) or visit the Web site at www.healthcareers.umn.edu.

Minors

Information Technology Minor Only

This interdisciplinary minor provides opportunities to students in nontechnical disciplines to supplement their major with courses focused on information technology. For more information, see the Degree Programs and Minors section.

Honors Program

The IT honors program provides special educational experiences to those students who have the ability and motivation to accept an extra challenge. Honors opportunities include a specially designed academic curriculum during the freshman and sophomore years, upper division programs leading to the cum laude degrees, close contact with instructors, opportunities for research, and a variety of elective honors courses, seminars, and colloquia offered in IT and the College of Liberal Arts.

During the freshman year, most lower division honors students take enriched mathematics, physics, and chemistry courses that provide excellent preparation for any IT major. Students also participate in the many social and cocurricular activities initiated by the IT Student Honors Group and may live in honors housing.

This special lower division academic program continues into the sophomore year offering enough flexibility so students can take the courses they need to pursue any major. For the junior and senior years, each department offers its own upper division honors program consisting of courses, research projects, and honors opportunities leading to the cum laude degrees.

Admission to Lower Division Honors Program—Lower division honors students begin their participation in the honors program in the fall of the freshman year. These students apply and are admitted in their senior year of high school. Selection is based on academic accomplishments in high school, scores on standardized tests, an application essay, and a recommendation usually from a teacher or counselor. The priority application deadline for freshman admission is January 15. Applications may be obtained by contacting the Office of Admissions, 240 Williamson Hall (612-625-2008).

Admission to Upper Division Honors Programs—Students about to enter their junior year may apply to the upper division honors program administered through their major department. Admission requirements are set by the individual departments and may be obtained from the department or the IT Honors Office. Previous enrollment in the lower division honors program is not required for participation in upper division honors programs.

Graduation With Honors—Enrollment in the upper division honors program is required for graduation with the honors designations cum laude, magna cum laude, and summa cum laude. Other graduation criteria include at least two years of University of Minnesota coursework, quality of the grade record, participation in honors opportunities, fulfillment of requirements designated in the major field, and an honors thesis.

IT Honors Office—This office provides academic advising, procedural information, and other college office services to honors students. The address is IT Honors Office, University of Minnesota, 136 Lind Hall, 207 Church Street S.E., Minneapolis, MN 55455 (612-625-2800).

Scholastic Policies

Continuation in Sequences—IT students taking the following lower division sequence courses must earn at least a C- each semester to continue in the sequence.

CHEM 1021-1022, 2101-2111

CHEM 2301, 2302, 2311

EE 2001, 2011

MATH 1155, 1271-1272*

MATH 1371-1372

MATH 1571-1572

PHYS 1301, 1302

PHYS 2303,** 2601

** To continue in additional mathematics courses (in particular MATH 2243 or MATH 2263) or sequences, IT students must earn at least a C- in MATH 1272, 1372, or 1572.*

*** To continue in physics sequences, IT students must earn at least a C- in PHYS 2303.*

IT students must earn at least a C- in all 1xxx and 3xxx math, physics, and chemistry courses, and all courses required by the major. All courses required by the major must be taken A-F.

Upper Division—The upper division corresponds to the junior and senior years.

Freshmen and sophomores must apply for entry and are told at orientation what minimum GPA might be required. Students should file an application in 105 Lind Hall before completing their sophomore year.

Changing Majors—To change majors within IT, upper division students must petition. Forms are available in 105 Lind Hall. A transcript must accompany the petition.

Students who graduate from IT but continue to register for courses will automatically have their status changed to nondegree unless they had previously been admitted to a second (double) major.

To change from IT to another college unit or campus within the University, students must apply for transfer through the One Stop Student Services Center, 200 Fraser Hall, as far as possible in advance of the projected transfer. Some units have transfer application deadlines. Students must meet admission requirements of the unit they plan to enter.

Conduct and Discipline

IT assumes that all students who enroll in its programs are serious about their education and expects them to be responsible individuals who demand of themselves high standards of honesty and good personal conduct.

IT expects the highest standards of honesty and integrity in the academic performance of its students. Any act of scholastic dishonesty is regarded as a serious offense, which may result in expulsion. IT defines scholastic dishonesty as submission of false records of academic achievement; cheating on assignments or examinations; plagiarizing; altering, forging, or misusing a University academic record; taking, acquiring, or using test materials without faculty permission; acting alone or in cooperation with another to falsify records or to obtain dishonestly grades, honors, awards, or professional endorsement. Aiding and abetting a student in an act of scholastic dishonesty is also considered a serious offense.

All students at the University have the right to a calm, productive, and stimulating learning environment. Students who engage in behavior that disrupts the learning environment for others may be subject to disciplinary action under the Student Conduct Code, which prohibits disruptive conduct. In addition, students responsible for such behavior may be required to cancel their registration (or have their registration canceled).

All disciplinary cases that are academic and nonacademic in nature or that involve two or more colleges are referred to the Office for Student Academic Integrity, 123 University Office Plaza, 2221 University Avenue S.E., Minneapolis, MN 55414 (612-624-6073).

A student has the right to a hearing and to appeal any disciplinary action. Copies of the procedures for cases of scholastic dishonesty are available at the Office for Student Academic Integrity.

Professional Registration

Registration is a legal requirement for certain kinds of practice in engineering and in geoscience. A professional license is required before an individual may use the designation of engineer in any legal connection. Many engineers obtain a license to show their support for legal recognition of the professional standing of the engineer or geologist. Many also obtain a license because professional registration may be useful or required in future employment.

The license is awarded in most states to those graduates of an accredited engineering curriculum who have passed examinations in the fundamentals, principles, and practice of engineering and demonstrated their competence by a specified number of years of appropriate experience. The fundamentals of engineering examination covers materials studied in undergraduate curricula. This examination is given in the spring and fall each year and may be taken by students in their senior year. More information and applications may be obtained from

the Career Center for Science and Engineering in 50 Lind Hall or by writing to the Minnesota State Board of Architecture, Engineering, Land Surveying, Landscape Architecture, Geoscience, and Interior Design, 133 7th Street E., St. Paul, MN 55101-2333 (651-296-2388).

Advising

Advising for freshmen is coordinated by the Office of Lower Division Programs, 128 Lind Hall (612-624-2890). Every IT freshman is assigned to a team of approximately 100 students. During orientation, freshmen meet with their team adviser and plan their fall schedule. Students on each team take one or more courses together; this encourages the formation of study and support groups. Freshmen must meet with their team adviser at least once each term to discuss their progress and plan their schedule for the following semester.

All lower division students obtain advising through the Office of Lower Division Programs until admission to upper division.

Special Learning Opportunities and Resources

Student Affairs Office—Prospective and current students can discuss any questions or problems with an advising staff member in the Student Affairs Office, 105 Lind Hall (612-624-8504) or e-mail studentaff@itdean.umn.edu. This office is responsible for admission, orientation, scholastic conduct, institute-wide scholarships, degree requirements and procedures, and related functions. Appointments are encouraged.

Tutors—IT provides peer tutors for students in chemistry, mathematics, physics, and other IT courses. These teaching assistants, selected from junior and senior IT students, are trained, qualified, and willing to assist students one-on-one with problems in IT lower division courses. Tutoring is provided in various locations—in 150 Lind Hall, by appointment in 128 Lind Hall, and in all residence halls.

Mathematics graduate teaching assistants are available in 150 Lind Hall with the undergraduate teaching assistants. In addition, graduate teaching assistants provide tutoring for computer science courses in 4-205 Electrical Engineering/Computer Science.

For more information about tutors, contact the Office of Lower Division Programs, 128 Lind Hall (612-624-2890).

Paid Learning Opportunities—The Career Center for Science and Engineering (CCSE) provides information about off-campus employment related to major or career interests. Many options are available for part-time, summer internship, and cooperative education employment. Students may be eligible for part-time or summer internship opportunities as early as the end of their freshman year. Students entering upper division may be eligible to participate in cooperative education programs offered through their major department. For more information, visit the CCSE Web site or contact CCSE, 50 Lind Hall (612-624-4090).

IDEAS (Integrated Degrees in Engineering, Arts, and Sciences)—This scholarship program is for undergraduates who integrate degrees from IT and the College of Liberal Arts. IDEAS enriches students' education by exploring how technology and society influence each other and promotes leadership in technology by providing students with educational opportunities for increased breadth and depth in liberal arts, business, and technical management. For more information, contact the IT Student Affairs Office, 105 Lind Hall, (612-624-8504).

Academic Program for Excellence in Engineering and Science (APEXES)—APEXES promotes academic excellence and the increased presence of underrepresented groups (African American, Chicano/Latino, Native American) in engineering and the physical sciences. Through its precollege, undergraduate, and graduate/faculty programs, it promotes diversity in the classroom, laboratory, and workplace to prepare IT students for careers in an ethnically diverse workforce.

Working with other IT and University offices, the program offers a variety of academic enrichment programs such as tutoring, learning assessment, career assessment, and study groups. Through collaboration with IT departments and corporate sponsors, APEXES identifies experiences outside the classroom such as internships, cooperative programs, and work teams to expose students to applications in science and engineering. These collaborations also provide merit scholarships for underrepresented students in engineering and the physical sciences who excel academically.

For more information, contact APEXES, 107 Lind Hall, 207 Church Street S.E., Minneapolis, MN 55455 (612-626-0219; e-mail APEXES@umn.edu).

Program for Women—The mission of this program is to encourage, recruit, and retain women faculty and students in the physical sciences, mathematics, and engineering. Since its establishment in 1990, the program has been responsible for numerous activities and events for undergraduate and graduate women, women faculty, and pre-college outreach programs. The program supports a female graduate student in each academic department to encourage networking within the department and assist in recruiting more women into the program. Retention strategies focus on networking within and across the academic departments in IT both for faculty and students.

For more information visit the IT Program for Women Web site at www.it.umn.edu/students/women/ or contact Associate Dean Roberta M. Humphreys, 105 Walter Library, 612-624-2006.

UNITE Instructional Television—About 50 credit courses each semester are offered through UNITE (UNiversity-Industry Television for Education), an instructional television system for continuing education at the employee's workplace. In addition, 25 of these courses are offered by streaming video—live as they happen on campus—or by video-on-demand. These include both upper division and graduate courses as well as specially developed courses and seminars. Classes are held in TV studio classrooms with on-campus students in attendance. The system is interactive, enabling students at all sites to talk with the instructor and take part in class discussions. Participating companies help support the system by paying a fee based on the number of credits for which its employees are enrolled. This fee is separate from tuition, which is paid either by the student or the company, depending on company policy.

For more information, contact the Director, UNITE Instructional Television, 514 Vincent Hall, 206 Church Street S.E., Minneapolis, MN 55455 (612-624-2332).

On-campus Living Experiences for Freshmen in IT—The Explorations in Engineering and Sciences House (IT Explorations) and the Women in Science and Engineering House (WISE) are the IT residential learning environments. These houses create a smaller living-learning environment in which students can benefit from others who have similar academic and career interests in science and/or engineering. Participating students find support from their peers that can enhance their success in the classroom and on campus. Faculty and staff advisers from IT provide guidance during students' first year on campus, on-site academic advising, access to information on career options, and coordinate various social activities such as dinner with professionals, faculty members, and student organizations.

All participants are strongly encouraged to register for IOFT 1312—Exploring Careers in Science and Engineering (2 cr). This course can be used as a freshman seminar.

IT Explorations is a co-ed community open to 140 students in Frontier Hall. The WISE House is a female first-year freshman community open to 30 students in Comstock Hall. For more information, contact the IT Student Affairs Office at 612-624-8010, e-mail kubit001@umn.edu, or visit the Housing and Residential Life Web site at www.housing.umn.edu.

International Programs

IT students have hundreds of study abroad programs to choose from. Students can study in or outside their major, study a second language, or study the history and culture of a region. Study in English is possible at various sites including Hong Kong, Sweden, Norway, England, Denmark, Australia, New Zealand, and many others. Students may spend a semester, academic year, or May session enhancing their cross-cultural skills, language ability, or professional experience. These opportunities are very affordable and the Learning Abroad Center offers more than $150,000 in scholarships for study abroad. IT has also been supportive to students with financial need. Each IT department has a list of recommended locations for study abroad. Students can learn more about these options by contacting Susan Kubitschek, 106 Lind Hall, kubit001@umn.edu, 612-624-8010.

Internship Opportunities in Technical Fields—Interested in a summer paid internship abroad? Students interested in doing an international internship in a technical field should contact the International Association for the Exchanges of Students for Technical Experience (IAESTE) in 4 Lind Hall at IAESTE@umn.edu or call 612-624-8010 to find out about this active student chapter on campus.

Other Information—For information about opportunities through the International Student Exchange Program (ISEP), IAESTE, and Institute for Study Abroad (Butler University, IN), visit the Learning Abroad Center in 230 Heller Hall. Advisers there can assist you with study and credit options, financial aid, and orientations. Attend a First Step meeting held daily for a full listing of study abroad opportunities, or visit www.UMabroad.umn.edu for more information

Career Information

The Career Center for Science and Engineering (CCSE), 50 Lind Hall (612-624-4090) provides comprehensive career services to students and alumni from the Institute of Technology and the College of Biological Sciences.

CCSE assists students in the career exploration process as they identify and research majors and careers best suited to their skills, interests, and values. Each semester, the office offers IOFT 1312 - Exploring Careers in Science and Engineering (2 credits). This course exposes students to all aspects of the career development and job search processes.

CCSE also provides resources and programs aimed at assisting students with their search for part-time, internship, and co-op positions, or permanent jobs following graduation. The services provided by CCSE include on-campus interviewing, job postings, workshops on many job search-related topics, and individual assistance with any career issues.

CCSE also provides information regarding the Fundamentals of Engineering (FE) exam.

Student Organizations and Activities

Scientists and engineers find that membership in technical or professional societies usually helps their career development. Many of these societies have student chapters at the University. Through them students have the opportunity to participate in activities of the parent society, gain experience in conducting technical meetings, and meet senior members of the societies. In addition, regular membership in the society is facilitated upon graduation and any entrance fee is reduced or waived for former student members.

Professional Societies

Branches of the following national professional societies are maintained at the University of Minnesota by students and faculty: American Institute of Chemical Engineers, Society of Physics Students, American Society of Civil Engineers, American Society of Mechanical Engineers, Society for Engineering in Agricultural, Food, and Biological Systems, American Institute of Aeronautics and Astronautics, American Institute of Industrial Engineers, and Institute of Electrical and Electronic Engineers. Additional professional societies include the Society of Women Engineers, National Society of Black Engineers, Triangle, Theta Tau, and Alpha Sigma Kappa.

Honorary Scholastic Societies

These IT societies promote the high standards of the engineering profession by conferring memberships, awards, and other honors on undergraduates distinguished for scholastic achievement and for character. The societies normally elect members from the junior and senior classes on the basis of scholarship (as measured by class rank) and character (as judged by peers and faculty). Of these honorary societies, only Tau Beta Pi selects its members from students in all IT undergraduate departments. The others confine their membership to students from a single department: Alpha Epsilon (biosystems and agricultural engineering), Chi Epsilon (civil engineering), Eta Kappa Nu and Kappa Eta Kappa (electrical engineering), Pi Tau Sigma (mechanical engineering), and Sigma Gamma Tau (aerospace engineering and mechanics).

Plumb Bob

A senior honorary leadership and service society, Plumb Bob works to create and maintain a spirit of fellowship and cooperation among IT students and further the interests of IT and the University. Its members are chosen for their character, leadership, and service.

IT Student Board

This board is the executive body of IT students, representing them in matters affecting the general interests of IT and the University.

Student Publications

Two publications are produced by IT students. IT Connection is IT's bi-weekly newsletter for students, staff, and faculty and includes meetings notices and information on scholarships and programs of interest. For more information contact connection@itdean.umn.edu. Minnesota Technolog is IT's official student magazine. Published three times a year, this 83-year-old publication features pieces written by students on science and engineering issues. For more information contact technolog@itdean.umn.edu.

The IT Student Publications selects editors and business managers and directs the overall policy of the publications. Students are encouraged to participate as publication staff members.

Directory

Office of the Dean

105 Walter Library
612-624-2006
E-mail: info@it.umn.edu

Office of the Associate Dean for Student Affairs

106 Lind Hall
612-624-5091
E-mail: studentaff@itdean.umn.edu

Office of Lower Division Programs

128 Lind Hall
612-624-2890
E-mail: itld@umn.edu

Student Affairs Office (Admissions)

105 Lind Hall
612-624-8504
E-mail: studentaff@itdean.umn.edu

Center for the Development of Technological Leadership

510 West Bank Office Building
612-624-5747
E-mail:.general-cdtl@umn.edu

IT Honors Office

136 Lind Hall
612-625-2800
E-mail: honors@it.umn.edu

Career Center for Science and Engineering

50 Lind Hall
612-624-4090
E-mail: ccse@umn.edu

Academic Program for Excellence in Engineering and Science (APEXES)

107 Lind Hall
612-626-0219
E-mail: apexes@umn.edu

Departments

Aerospace Engineering and Mechanics

107 Akerman Hall
612-625-8000
E-mail: dept@aem.umn.edu

Astronomy

356 Tate Laboratory of Physics
612-624-0211
E-mail: tjj@astro.umn.edu

Bio-based Products Engineering

203 Kaufert Laboratory
612-625-5200
E-mail: shri@umn.edu

Biomedical Engineering

7-105 Nils Hasselmo Hall
612-624-4507
E-mail: bmedus@umn.edu

Biosystems and Agricultural Engineering

213 Biosystems and Agricultural Engineering Building, St. Paul
612-625-7733
E-mail: bae@umn.edu

Chemical Engineering and Materials Science

151 Amundson Hall
612-625-1313
E-mail: williams@cems.umn.edu

Chemistry

135 Smith Hall
612-624-8008
E-mail: stathopo@chem.umn.edu

Civil Engineering

122 Civil Engineering Building
612-625-5522
E-mail: cive@umn.edu

Computer Science and Engineering

4-192 Electrical Engineering/Computer Science
612-625-4002
E-mail: ugrad_info@cs.umn.edu

Electrical and Computer Engineering

4-174 Electrical Engineering/Computer Science
612-625-3300
E-mail: undergraduate_studies@ece.umn.edu

Geology and Geophysics (Earth Sciences)

108 Pillsbury Hall
612-624-1333
E-mail: geology@umn.edu

Mathematics

115 Vincent Hall
612-625-4848
E-mail: ugrad@math.umn.edu

Mechanical Engineering

1120 Mechanical Engineering
612-625-5842
E-mail: jeanne@me.umn.edu

Physics

148 Tate Laboratory of Physics
612-624-7375
E-mail: ugrad@physics.spa.umn.edu

Statistics

313 Ford Hall
612-625-8046
E-mail: info@stat.umn.edu

IT Web Site

www.it.umn.edu

Degree Programs and Minors

Aerospace Engineering and Mechanics B.A.E.M.

Aerospace Engineering & Mechanics

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 127.

Required credits within the major: 56.

Degree: Bachelor of Aerospace Engineering and Mechanics.

The mission of the bachelor of aerospace engineering and mechanics (B.A.E.M.) program is to produce graduates who are prepared to enter and sustain the practice of aerospace engineering and related fields, or to pursue advanced studies. This mission is consistent with the mission of the University of Minnesota in learning and teaching, and with the mission of the Institute of Technology: to provide a rigorous and stimulating education for its undergraduate majors and to provide programs of instruction in engineering that meet nationally accepted standards for practice of the profession of engineering.

Aerospace engineering is a multidisciplinary field that encompasses many areas of science and engineering and plays a major role in the technological advancement of society. As a constantly changing profession, aerospace engineering is concerned with a wide range of problems and the latest technologies. An aerospace engineer must have a comprehensive fundamental education in mathematics, physical sciences, and engineering sciences. The four-year program leading to the B.A.E.M. provides this broad background. The program is accredited by the Engineering Accreditation Commission of ABET.

Admission Requirements

Students must complete 9 courses before admission to the program.

Freshmen and transfer students are usually admitted to pre-major status before admission to this major.

A GPA above 2.00 is preferred for the following:

- 2.80 for students transferring from outside the University.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Required Courses for Admission

Mathematics Core

MATH 1371 - IT Calculus I, MATH (4.0 cr)
or MATH 1271 - Calculus I, MATH (4.0 cr)
MATH 1372 - IT Calculus II (4.0 cr)
or MATH 1272 - Calculus II (4.0 cr)
MATH 2374 - IT Multivariable Calculus and Vector Analysis (4.0 cr)
or MATH 2263 - Multivariable Calculus (4.0 cr)
MATH 2373 - IT Linear Algebra and Differential Equations (4.0 cr)
or MATH 2243 - Linear Algebra and Differential Equations (4.0 cr)

Physics Core

PHYS 1301W - Introductory Physics for Science and Engineering I, PHYS SCI/L, WI (4.0 cr)
or PHYS 1401V - Honors Physics I, PHYS SCI/L, WI, H (4.0 cr)
PHYS 1302W - Introductory Physics for Science and Engineering II, PHYS SCI/L, WI (4.0 cr)
or PHYS 1402V - Honors Physics II, PHYS SCI/L, WI, H (4.0 cr)
PHYS 2503 - Physics III: Foundations of Modern Physics (4.0 cr)
or PHYS 2403H - Honors Phys III, H (4.0 cr)

Statics and Dynamics Core

AEM 2011 - Statics (3.0 cr)
AEM 2012 - Dynamics (3.0 cr)

Program Requirements

Required Courses

AEM Core

AEM 2301 - Mechanics of Flight (3.0 cr)
AEM 3031 - Deformable Body Mechanics (3.0 cr)
AEM 4201 - Fluid Mechanics (4.0 cr)
AEM 4202 - Aerodynamics (4.0 cr)
AEM 4203 - Aerospace Propulsion (4.0 cr)
AEM 4301 - Spaceflight Dynamics (3.0 cr)
AEM 4303 - Flight Dynamics and Control (3.0 cr)
AEM 4331 - Aerospace Vehicle Design I: Aircraft (3.0 cr)
AEM 4332W - Aerospace Vehicle Design II: Space Vehicles, Missions, and Systems, WI (4.0 cr)
AEM 4501 - Aerospace Structures (3.0 cr)
AEM 4601 - Instrumentation Laboratory (3.0 cr)
AEM 4602W - Aeromechanics Laboratory, WI (4.0 cr)

Science and Engineering

CHEM 1021 - Chemical Principles I, ENVT, PHYS SCI/L (4.0 cr)
or CHEM 1031H - Honors Chemistry I, ENVT, PHYS SCI/L, H (4.0 cr)
CSCI 1113 - Introduction to C/C++ Programming for Scientists and Engineers (4.0 cr)
EE 3005 - Fundamentals of Electrical Engineering (4.0 cr)
EE 3006 - Fundamentals of Electrical Engineering Laboratory (1.0 cr)
MATS 2001 - Introduction to the Science of Engineering Materials (3.0 cr)
ME 3324 - Introduction to Thermal Science (3.0 cr)
Solids, Materials or Structures Elective

AEM 4502, 4511, 4581 count as honors experiences.

Solids, materials, or structures elective

or AEM 4502 - Computational Structural Analysis (3.0 cr)
or AEM 4511 - Mechanics of Composite Materials (3.0 cr)
or AEM 4581 - Mechanics of Solids (3.0 cr)
or AEM 5441 - Structural Dynamics (3.0 cr)
or AEM 5651 - Aeroelasticity (3.0 cr)

Technical Electives

Take at least two courses (to total 6 credits), which may include but are not limited to: any math/science course 2xxx or higher (such as AST 2001, which completes a minor in astronomy); any computation course 3xxx or higher (such as CE 3101); any STAT 3xxx or higher course (such as STAT 3021). See an adviser for other options.

Program Sub-plans

A sub-plan is not required for this program.

EIP

Students may obtain professional experience in an industry or government assignment through either an Internship or Co-op program. The internship program usually consists of one term experience often in the summer. The Co-op program consists of multiple terms off campus. The Co-op program almost always prolongs the time required to graduate. The practical engineering experience obtained through the internship or co-op programs not only enhances a student's education but also gives an edge on future employment after graduation.

Students can receive up to 3 academic credits by taking AEM 4796. These credits can be counted as a technical elective toward the BAEM Degree.

Required Courses

Internship

AEM 4796 - Professional Experience (1.0-3.0 cr)

Astrophysics B.S.Astrop.

Astronomy

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 43 to 45.

Degree: Bachelor of Science in Astrophysics.

The astrophysics program enables students to develop the skills necessary to tackle complex and ill-defined problems within the physical sciences. The program prepares students for careers in professional astronomy, computational astrophysics, secondary education in the physical sciences, ROTC programs in the Air Force or Navy, data analysis, or laboratory science.

Admission Requirements

Students must complete 8 courses before admission to the program.

Freshmen and transfer students are usually admitted to pre-major status before admission to this major.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Required Courses for Admission

Mathematics Core

MATH 1271 - Calculus I, MATH (4.0 cr)
or MATH 1371 - IT Calculus I, MATH (4.0 cr)
MATH 1272 - Calculus II (4.0 cr)
or MATH 1372 - IT Calculus II (4.0 cr)
MATH 2243 - Linear Algebra and Differential Equations (4.0 cr)
or MATH 2373 - IT Linear Algebra and Differential Equations (4.0 cr)
MATH 2263 - Multivariable Calculus (4.0 cr)
or MATH 2374 - IT Multivariable Calculus and Vector Analysis (4.0 cr)

Physics Core

PHYS 1301W - Introductory Physics for Science and Engineering I, PHYS SCI/L, WI (4.0 cr)
or PHYS 1401V - Honors Physics I, PHYS SCI/L, WI, H (4.0 cr)
PHYS 1302W - Introductory Physics for Science and Engineering II, PHYS SCI/L, WI (4.0 cr)
or PHYS 1402V - Honors Physics II, PHYS SCI/L, WI, H (4.0 cr)
PHYS 2303 - Physics III: Physics of Matter (4.0 cr)
or PHYS 2403H - Honors Phys III, H (4.0 cr)
or PHYS 2503 - Physics III: Foundations of Modern Physics (4.0 cr)
PHYS 2601 - Quantum Physics (4.0 cr)

Program Requirements

Students interested in astrophysics are encouraged to take AST 1011H.

Required Courses

Astrophysics Core

AST 2001 - Introduction to Astrophysics (4.0 cr)
AST 4994W - Directed Research, WI (3.0-5.0 cr)
PHYS 2605 - Quantum Physics Laboratory (3.0 cr)
PHYS 4001 - Analytical Mechanics (4.0 cr)
PHYS 4002 - Electricity and Magnetism (4.0 cr)

Take 2 or more course(s) from the following:

AST 4xxx
AST 5xxx
MATH 2283 - Sequences, Series, and Foundations (3.0 cr)
or
MATH 3xxx
or
MATH 4xxx

Astrophysics Focus

Students are required to complete one of the following course groups.

Data Analysis Specialist

This emphasis prepares students for careers in corporate and government labs and research divisions. Examples are programming, image processing, laboratory instrumentation, and general data analysis. Suggested courses are listed below.

Take 16 or more credit(s) from the following:

AST 5201 - Methods of Experimental Astrophysics (4.0 cr)
CSCI 1113 - Introduction to C/C++ Programming for Scientists and Engineers (4.0 cr)
CSCI 2031 - Introduction to Numerical Computing (4.0 cr)
EE 3005 - Fundamentals of Electrical Engineering (4.0 cr)
PHYS 4051 - Methods of Experimental Physics I (5.0 cr)
PHYS 4052W - Methods of Experimental Physics II, WI (5.0 cr)

-OR-

Professional Astronomer

This emphasis prepares students for graduate school in astronomy. The program is similar to doing a double major in astrophysics and physics. The program emphasizes observational astronomy.

Take 16 or more credit(s) from the following:

PHYS 4101 - Quantum Mechanics (4.0 cr)
PHYS 4201 - Statistical and Thermal Physics (3.0 cr)

Take 0 or more course(s) from the following:

AST 4xxx
AST 5xxx

CHEM 3xxx
CHEM 4xxx
CHEM 5xxx
CSCI 3xxx
CSCI 4xxx
CSCI 5xxx
EE 3xxx
EE 4xxx
EE 5xxx
GEO 3xxx
GEO 4xxx
GEO 5xxx
MATH 3xxx
MATH 4xxx
MATH 5xxx
PHYS 3xxx
PHYS 4xxx
PHYS 5xxx

-OR-

Secondary Education
This emphasis prepares students for entry to a masters program in secondary science education. In addition to the courses listed below, students must complete 100 hours of in-class experience across at least two semesters.

PSY 1001 - Introduction to Psychology, SSCI (4.0 cr)
HSCI 1814 - Introduction to History of Science: Ancient Science to the Scientific Revolution, HP, IP (4.0 cr)
or HSCI 4121 - History of 20th-Century Physics (3.0 cr)
or HSCI 4111 - History of 19th-Century Physics (3.0 cr)
PHIL 1005 - Scientific Reasoning (4.0 cr)
or PHIL 3601W - Scientific Thought, OH, WI (4.0 cr)
AST 5201 - Methods of Experimental Astrophysics (4.0 cr)
or
Physics research
or
This course pair replaces AST 4994 in the student's program.

PHYS 4051 - Methods of Experimental Physics I (5.0 cr)
PHYS 4052W - Methods of Experimental Physics II, WI (5.0 cr)

-OR-

Technical Electives
Select 16 credits in consultation with your adviser.

Bio-Based Products Engineering B.B.P.E.

Bio-Based Products

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 128.

Required credits within the major: 113.

Degree: Bachelor of Bio-Based Products Engineering.

Bio-based products are materials, chemicals, and energy derived from renewable, bio-resources including forestry, agriculture and other biomass. Many commercial products and forms of energy that come from fossil fuels can be derived from renewable, bio-resources. The molecular building blocks and components of biomass can be harnessed to heat homes, run cars, light buildings, and provide industrial and consumer products. These products include biofuels, biofibers and fiber-based products, paper, board, engineered wood, structural panels, bio-based composites, renewable plastics, and bio-derived chemicals and energy.

Admission Requirements

Students must complete 15 courses before admission to the program.

Freshmen and transfer students are usually admitted to pre-major status before admission to this major.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Required Courses for Admission

Preparatory Courses
BP 1001 - Bio-based Products Orientation (1.0 cr)
BP 1002 - Wood and Fiber Science (3.0 cr)
BP 1003 - Wood and Fiber Science Lab (1.0 cr)
BIOL 1009 - General Biology, BIOL SCI/L (4.0 cr)
or BIOL 1009H - Honors: General Biology, BIOL SCI/L, H (4.0 cr)

Mathematics
MATH 1271 - Calculus I, MATH (4.0 cr)
or MATH 1371 - IT Calculus I, MATH (4.0 cr)
MATH 1272 - Calculus II (4.0 cr)
or MATH 1372 - IT Calculus II (4.0 cr)
MATH 2263 - Multivariable Calculus (4.0 cr)
or MATH 2374 - IT Multivariable Calculus and Vector Analysis (4.0 cr)
MATH 2243 - Linear Algebra and Differential Equations (4.0 cr)
or MATH 2373 - IT Linear Algebra and Differential Equations (4.0 cr)

Physical Sciences
CHEM 1021 - Chemical Principles I, ENVT, PHYS SCI/L (4.0 cr)
or CHEM 1031H - Honors Chemistry I, ENVT, PHYS SCI/L, H (4.0 cr)
CHEM 1022 - Chemical Principles II, ENVT, PHYS SCI/L (4.0 cr)
or CHEM 1032H - Honors Chemistry II, ENVT, PHYS SCI/L, H (4.0 cr)
CHEM 2301 - Organic Chemistry I (3.0 cr)
CHEM 2302 - Organic Chemistry II (3.0 cr)
CHEM 3501 - Physical Chemistry I (3.0 cr)
PHYS 1301W - Introductory Physics for Science and Engineering I, PHYS SCI/L, WI (4.0 cr)
or PHYS 1401V - Honors Physics I, PHYS SCI/L, WI, H (4.0 cr)
PHYS 1302W - Introductory Physics for Science and Engineering II, PHYS SCI/L, WI (4.0 cr)
or PHYS 1402V - Honors Physics II, PHYS SCI/L, WI, H (4.0 cr)

General Requirements

Recommended freshman writing course(s) for this program: RHET 1101

Program Requirements

Required Courses

Major Courses

BP 3001 - Statics, Mechanics, and Structural Design (4.0 cr)
BP 4504W - Bio-based Products Development and Management, WI (3.0 cr)

Engineering Courses

BAE 3013 - Engineering Principles of Molecular and Cellular Processes (3.0 cr)
BAE 4013 - Transport in Biological Systems (4.0 cr)
CE 3502 - Fluid Mechanics (4.0 cr)
CHEN 4001 - Material and Energy Balances (4.0 cr)
CHEN 4101 - Chemical Engineering Thermodynamics (4.0 cr)
BAE 4713 - Bioprocess Engineering (3.0 cr)
BP 4001 - Chemistry of Plant Materials (4.0 cr)
BP 4301 - Surface and Colloid Science in Bio-based Products Manufacturing (3.0 cr)
BP 4302 - Organisms Impacting Bio-based Products (3.0 cr)
BP 4303 - Bio-Based Materials Science (3.0 cr)
BP 4401 - Bio-based Products Engineering (4.0 cr)
BP 4402 - Bio-based Products Engineering Lab I (1.0 cr)
BP 4403 - Bio-based Products Engineering Lab II (1.0 cr)
BP 4404 - Bio-based Composites Engineering (3.0 cr)
BP 4405 - Process Control and Simulation (3.0 cr)
BP 4501 - Process and Product Design I (2.0 cr)
BP 4502W - Process and Product Design II, WI (3.0 cr)

Biomedical Engineering B.Bm.E.

Biomedical Engineering Institute

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 125.

Required credits within the major: 30.

Degree: Bachelor of Biomedical Engineering.

Biomedical engineers apply the fundamentals of mathematics, physics, chemistry, and biology to solve medically-relevant problems. Examples of biomedical engineering activities include medical device design, fabrication and testing, prosthesis fabrication, ergonomics and human factors, physiological function monitoring, home health care technology development, biomedical informatics, functional imaging and tomography, biomaterial development and biocompatibility, artificial tissue and organ fabrication, cell- and biomolecule-based sensors and therapeutics, gene therapy development, and biomedical microsystems.

Admission Requirements

Students must complete 14 courses before admission to the program.

Freshmen and transfer students are usually admitted to pre-major status before admission to this major.

A GPA above 2.00 is preferred for the following:

- 2.70 for students already admitted to the degree-granting college.
- 2.70 for students transferring from another University of Minnesota college.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Required Courses for Admission

Mathematics

MATH 1271 - Calculus I, MATH (4.0 cr)
or MATH 1371 - IT Calculus I, MATH (4.0 cr)
MATH 1272 - Calculus II (4.0 cr)
or MATH 1372 - IT Calculus II (4.0 cr)
MATH 2243 - Linear Algebra and Differential Equations (4.0 cr)
or MATH 2373 - IT Linear Algebra and Differential Equations (4.0 cr)
MATH 2263 - Multivariable Calculus (4.0 cr)
or MATH 2374 - IT Multivariable Calculus and Vector Analysis (4.0 cr)

Physical Sciences

CHEM 1021 - Chemical Principles I, ENVT, PHYS SCI/L (4.0 cr)
or CHEM 1031H - Honors Chemistry I, ENVT, PHYS SCI/L, H (4.0 cr)
CHEM 1022 - Chemical Principles II, ENVT, PHYS SCI/L (4.0 cr)
or CHEM 1032H - Honors Chemistry II, ENVT, PHYS SCI/L, H (4.0 cr)
CHEM 2301 - Organic Chemistry I (3.0 cr)
PHYS 1301W - Introductory Physics for Science and Engineering I, PHYS SCI/L, WI (4.0 cr)
or PHYS 1401V - Honors Physics I, PHYS SCI/L, WI, H (4.0 cr)
PHYS 1302W - Introductory Physics for Science and Engineering II, PHYS SCI/L, WI (4.0 cr)
or PHYS 1402V - Honors Physics II, PHYS SCI/L, WI, H (4.0 cr)

Preparatory Courses

CSCI 1107 - Introduction to FORTRAN Programming for Scientists and Engineers (3.0 cr)
STAT 3021 - Introduction to Probability and Statistics (3.0 cr)
BIOC 3021 - Biochemistry (3.0 cr)
or CHEM 3501 - Physical Chemistry I (3.0 cr)
BIOL 1009 - General Biology, BIOL SCI/L (4.0 cr)
or BIOL 1009H - Honors: General Biology, BIOL SCI/L, H (4.0 cr)

Program Requirements

Required Courses

Major Courses

BMEN 2501 - Cellular and Molecular Biology for Biomedical Engineers (4.0 cr)
BMEN 2601 - Biomedical Engineering Undergraduate Seminar I (1.0 cr)
BMEN 2602 - Biomedical Engineering Undergraduate Seminar II (1.0 cr)
BMEN 3001 - Biomechanics (4.0 cr)
BMEN 3101 - Biomedical Transport Processes (4.0 cr)
BMEN 3201 - Bioelectricity and Bioinstrumentation (4.0 cr)
BMEN 3301 - Biomaterials (4.0 cr)
BMEN 3701 - Physiology Lab (2.0 cr)
BMEN 4001W - Biomedical Engineering Design I, WI (3.0 cr)
BMEN 4002W - Biomedical Engineering Design II, WI (3.0 cr)
PHSL 3061 - Principles of Physiology (4.0 cr)

Technical Electives

Take 24 credits of technical electives approved by an adviser. A maximum of 10 credits of science courses and a maximum of 6 credits of research may be counted toward the total.

Biosystems and Agricultural Engineering B.B.A.E.

Dept of Biosystems and Agricultural Engineering

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 128.

Required credits within the major: 30.

Degree: Bachelor of Biosystems and Agricultural Engr.

The mission of the Department of Biosystems and Agricultural Engineering is to conduct research and educate people to solve engineering problems in agricultural and biological environments. Educational objectives for the program are to produce graduates with the following:

- A broad fundamental engineering background including mathematics, physical science, biological science, engineering science, and computational skills needed for their future practice of biosystems and agricultural engineering.
- The skills necessary to carry out an effective design process including the ability to think creatively, work cooperatively, formulate problems, synthesize information, develop and evaluate alternatives, implement solutions, and communicate effectively at all stages of the process.
- The ability to address issues of ethics, safety, professionalism, and social and economic impacts in engineering practice and design.
- Specific abilities to pursue careers that integrate engineering and biology to design efficient, economical systems to produce and deliver high quality, safe food to consumers; to design sustainable systems that protect the environment, humans, plants, and animals; and to design safe and efficient machines, processes, and practices for biological systems.
- Opportunities to develop in-depth background in one of the following areas of emphasis: Bioprocessing and Food, Environment, or Machinery Systems.

Admission Requirements

Students must complete 10 courses before admission to the program.

Freshmen and transfer students are usually admitted to pre-major status before admission to this major.

A GPA above 2.00 is preferred for the following:

- 2.50 for students transferring from outside the University.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Required Courses for Admission

Mathematics

MATH 1271 - Calculus I, MATH (4.0 cr)
or MATH 1371 - IT Calculus I, MATH (4.0 cr)
MATH 1272 - Calculus II (4.0 cr)
or MATH 1372 - IT Calculus II (4.0 cr)
MATH 2243 - Linear Algebra and Differential Equations (4.0 cr)
or MATH 2373 - IT Linear Algebra and Differential Equations (4.0 cr)
MATH 2263 - Multivariable Calculus (4.0 cr)
or MATH 2374 - IT Multivariable Calculus and Vector Analysis (4.0 cr)

Biological and Physical Sciences

BIOL 1009 - General Biology, BIOL SCI/L (4.0 cr)
or BIOL 1009H - Honors: General Biology, BIOL SCI/L, H (4.0 cr)
CHEM 1021 - Chemical Principles I, ENVT, PHYS SCI/L (4.0 cr)
or CHEM 1031H - Honors Chemistry I, ENVT, PHYS SCI/L, H (4.0 cr)
CHEM 1022 - Chemical Principles II, ENVT, PHYS SCI/L (4.0 cr)
or CHEM 1032H - Honors Chemistry II, ENVT, PHYS SCI/L, H (4.0 cr)
PHYS 1301W - Introductory Physics for Science and Engineering I, PHYS SCI/L, WI (4.0 cr)
or PHYS 1401V - Honors Physics I, PHYS SCI/L, WI, H (4.0 cr)
PHYS 1302W - Introductory Physics for Science and Engineering II, PHYS SCI/L, WI (4.0 cr)
or PHYS 1402V - Honors Physics II, PHYS SCI/L, WI, H (4.0 cr)

Statics and Dynamics

Take 1 or more course(s) from the following:
AEM 2021 - Statics and Dynamics (4.0 cr)

Take the following course pair
AEM 2011 - Statics (3.0 cr)
AEM 2012 - Dynamics (3.0 cr)

Program Requirements

Required Courses

Major Courses

BAE 1011 - Biosystems and Agricultural Engineering Orientation (1.0 cr)
BAE 2113 - Introduction to Design (3.0 cr)
BAE 3013 - Engineering Principles of Molecular and Cellular Processes (3.0 cr)
BAE 3023 - Engineering Principles of Soil-Water-Plant Processes (3.0 cr)
BAE 4013 - Transport in Biological Systems (4.0 cr)
BAE 4023 - Instrumentation and Control for Biological Systems (3.0 cr)
BAE 4114W - Capstone Design Project, WI (4.0 cr)
BAE 5212 - Safety and Environmental Health Issues in Plant and Animal Production and Processing, C/PE, ENVT, H (3.0 cr)
AEM 3031 - Deformable Body Mechanics (3.0 cr)
CE 3502 - Fluid Mechanics (4.0 cr)
EE 3005 - Fundamentals of Electrical Engineering (4.0 cr)
ME 3331 - Thermal Sciences I (3.0 cr)
RHET 3562W - Technical and Professional Writing, WI (4.0 cr)
STAT 3021 - Introduction to Probability and Statistics (3.0 cr)

Electives

Students who wish to have a concentration within their elective coursework must take at least two courses belonging to the same designated emphasis. The designated emphases and the courses which comprise them are as follows: Bioprocessing and Food (BAE 4713, 4723); Environment (BAE 4523, 4533, 5513); and Machinery Systems (BAE 4313, 4323).

Take 3 or more course(s) from the following:
BAE 4313 - Design of Machine Systems (3.0 cr)
BAE 4323 - Machinery Elements (3.0 cr)
BAE 4523 - Water Management Engineering (3.0 cr)
BAE 4533 - Agricultural Waste Management Engineering (3.0 cr)
BAE 4713 - Bioprocess Engineering (3.0 cr)
BAE 4723 - Food Process Engineering (3.0 cr)
BAE 5513 - Watershed Engineering (3.0 cr)

Technical Electives

Complete 8 credits of engineering electives, 6 credits of biology electives, and at least 3 credits of technical electives (computer science or 3 additional credits of engineering or biology electives). Any of the emphases (sub-plans) may be completed as part of the requirement. See an adviser for a list of courses that fulfill electives or visit www.bae.umn.edu/teaching/ugrad/electives.html.

Program Sub-plans

A sub-plan is not required for this program.

Bioprocessing and Food

Processing of agricultural and biological materials yields many important products, from foods to pharmaceuticals. In this emphasis, students are prepared for careers in the design and development of systems for processing, storing, and distributing food and agricultural products; processes to recover and purify products such as proteins produced through biotechnology; processes to make products such as biodegradable plastics from biological materials; new food products as a member of a team of food scientists and marketing specialists; and systems to ensure food safety and quality.

With completion of an additional 3 credits, this subplan fulfills the Technical Electives requirement.

Required Courses

Engineering Electives
Take any non-required BAE course not used as a BAE elective.

Take 8 or more credit(s) from the following:
CHEN 5754 - Food Processing Technology (3.0 cr)
CHEN 5759 - Principles of Mass Transfer in Engineering and Biological Engineering (2.0 cr)
EE 5821 - Biological System Modeling and Analysis (3.0 cr)
IE 5531 - Engineering Optimization I, H (4.0 cr)
IE 5541 - Project Management (4.0 cr)
MATS 3011 - Introduction to Materials Science and Engineering (3.0 cr)
ME 5381 - Biological Transport Processes (4.0 cr)

Biology Electives
See an adviser for other options.

Take 6 or more credit(s) from the following:
BIOC 3021 - Biochemistry (3.0 cr)
CHEM 2301 - Organic Chemistry I (3.0 cr)
FSCN 4111 - Food Chemistry (3.0 cr)
FSCN 4121 - Food Microbiology and Fermentations (3.0 cr)
VBS 2022 - General Microbiology (2.0-3.0 cr)
VBS 2032 - General Microbiology With Laboratory (4.0 cr)

EIP

This option provides students with a hands-on work experience after the freshman year of the degree program. Students can take up to two semesters of intern work with one or more employers. An example may be two summers and one semester. This may be adjusted to suit individual needs. Students have an opportunity to assist in design work and apply their knowledge to practical problem solving. The experience helps students choose a career and select electives for the degree.

During the academic portion of the intern program students are expected to take a normal load of 11-13 credits. Graduation may be delayed because of the intern experience. It is important to plan ahead, since biosystems and agricultural engineering classes are usually offered only once per year, and in some cases in alternating years. Students registering for BAE 4900 must first submit a proposed plan of study with the intern coordinator.

Required Courses

Internship
A total of 4 BAE 4900 intern Experience credits may be taken and applied toward the degree program as general engineering electives, but not as BAE electives.

BAE 4900 - Intern Reports (2.0 cr)

Environment

The world is faced with important environmental and natural resource issues affecting soil, water, and air. In this emphasis, students are prepared for careers in the design or development of systems to control runoff and flooding in agricultural and small urban watersheds; systems to manage water (drainage or irrigation) to enhance crop production; practices to improve water quality and control soil erosion; plans and practices to restore wetlands; systems to store, treat, and use livestock or food processing wastes; and processes for bioremediation of polluted areas.

With completion of an additional 3 credits, this Sub-plan fulfills the Technical Electives requirement.

Required Courses

Engineering Electives
See an adviser for other options.

Take 8 or more credit(s) from the following:
CE 3202 - Surveying and Mapping (2.0 cr)
CE 3301 - Soil Mechanics I (3.0 cr)
CE 3402 - Construction Materials (3.0 cr)
CE 3501 - Environmental Engineering, C/PE, ENVT (3.0 cr)
CE 4301 - Soil Mechanics II (3.0 cr)
CE 4351 - Groundwater Mechanics (3.0 cr)
CE 4501 - Hydrologic Design (4.0 cr)
CE 4502 - Water and Wastewater Treatment (3.0 cr)
CE 4511 - Hydraulic Structures (4.0 cr)
CE 4512 - Open Channel Hydraulics (4.0 cr)

Biology Electives
See an adviser for other options.

Take 6 or more credit(s) from the following:
BIOL 3007W - Plant Biology: Diversity and Adaptation, WI (4.0 cr)
BIOL 3407 - Ecology, ENVT (3.0 cr)
EEB 3001 - Ecology and Society, ENVT (3.0 cr)
EEB 4601 - Limnology (3.0 cr)
ES 3612W - Soil and Environmental Biology, WI (3.0 cr)
SOIL 3416 - Plant Nutrients in the Environment (3.0 cr)

Machinery Systems

Machines are important components of systems for production and processing of food and other biological materials. In this emphasis, students are prepared for careers in the design and development of machines for agricultural, horticultural, and landscape industries; machines and systems that incorporate operator safety, health, and comfort; machines for food processing and handling; automated systems for identification, sorting, or grading; agricultural and other off-road vehicles to improve performance and minimize adverse impact to the soil; and systems for precision agriculture that use technologies such as global positioning systems and geographical information systems

With completion of an additional 3 credits, this sub-plan fulfills the Technical Electives requirement.

Required Courses

Engineering Electives
See an adviser for other options.

Take 8 or more credit(s) from the following:
MATS 2001 - Introduction to the Science of Engineering Materials (3.0 cr)
ME 3221 - Design and Manufacturing I: Engineering Materials and Manufacturing Processes (4.0 cr)
ME 3222 - Design and Manufacturing II (4.0 cr)
ME 3281 - System Dynamics and Control (4.0 cr)
ME 5243 - Advanced Mechanism Design (4.0 cr)

ME 5247 - Stress Analysis, Sensing, and Transducers (4.0 cr)
ME 5248 - Vibration Engineering (4.0 cr)

Biology Electives
See an adviser for other options.

Take 6 or more credit(s) from the following:
AGRO 4005 - Applied Crop Physiology and Development (4.0 cr)
AGRO 4605 - Management Strategies for Crop Production (4.0 cr)
BIOL 2022 - General Botany (3.0 cr)
BIOL 3007W - Plant Biology: Diversity and Adaptation, WI (4.0 cr)
BIOL 3407 - Ecology, ENVT (3.0 cr)
EEB 3001 - Ecology and Society, ENVT (3.0 cr)
ES 3612W - Soil and Environmental Biology, WI (3.0 cr)
SOIL 3416 - Plant Nutrients in the Environment (3.0 cr)

Chemical Engineering B.Ch.E.

Chemical Engineering & Materials Science

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 128.

Required credits within the major: 30.

Degree: Bachelor of Chemical Engineering.

Chemical engineering deals with operations such as materials handling, mixing, fluid flow and metering, extrusion, coating, heat exchange, filtration, drying, evaporation, distillation, absorption, extraction, ion exchange, combustion, catalysis, and processing in chemical and biochemical reactors.

Because many industries are based on some chemical or physical transformation of matter, chemical engineers are much in demand. They may work in the manufacture of inorganic products (fertilizers, paints, ceramics, electronic materials); in the manufacture of organic products (polymers, films, papers, petrochemicals); in the manufacture of batteries and fuel cells; in the processing of minerals and materials; in food processing and fermentation; or in the production of antibiotics and biochemical products.

Admission Requirements

Students must complete 11 courses before admission to the program.

Freshmen and transfer students are usually admitted to pre-major status before admission to this major.

A GPA above 2.00 is preferred for the following:

- 2.60 for students already admitted to the degree-granting college.
- 2.60 for students transferring from another University of Minnesota college.
- 2.60 for students transferring from outside the University.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Required Courses for Admission

Mathematics
MATH 1271 - Calculus I, MATH (4.0 cr)
or MATH 1371 - IT Calculus I, MATH (4.0 cr)
MATH 1272 - Calculus II (4.0 cr)
or MATH 1372 - IT Calculus II (4.0 cr)
MATH 2243 - Linear Algebra and Differential Equations (4.0 cr)
or MATH 2373 - IT Linear Algebra and Differential Equations (4.0 cr)
MATH 2263 - Multivariable Calculus (4.0 cr)
or MATH 2374 - IT Multivariable Calculus and Vector Analysis (4.0 cr)

Physical Sciences
CHEM 1021 - Chemical Principles I, ENVT, PHYS SCI/L (4.0 cr)
or CHEM 1031H - Honors Chemistry I, ENVT, PHYS SCI/L, H (4.0 cr)
CHEM 1022 - Chemical Principles II, ENVT, PHYS SCI/L (4.0 cr)
or CHEM 1032H - Honors Chemistry II, ENVT, PHYS SCI/L, H (4.0 cr)
CHEM 2301 - Organic Chemistry I (3.0 cr)
CHEM 2302 - Organic Chemistry II (3.0 cr)
PHYS 1301W - Introductory Physics for Science and Engineering I, PHYS SCI/L, WI (4.0 cr)
or PHYS 1401V - Honors Physics I, PHYS SCI/L, WI, H (4.0 cr)
PHYS 1302W - Introductory Physics for Science and Engineering II, PHYS SCI/L, WI (4.0 cr)
or PHYS 1402V - Honors Physics II, PHYS SCI/L, WI, H (4.0 cr)

Program Requirements

Students interested in chemical engineering are encouraged to take CHEN 1001.

Required Courses

Major Courses
CHEM 3501 - Physical Chemistry I (3.0 cr)
CHEM 3502 - Physical Chemistry II (3.0 cr)
CHEM 4121 - Process Analytical Chemistry (3.0 cr)
CHEM 2311 - Organic Lab (4.0 cr)
or CHEM 2312 - Honors Organic Lab, H (5.0 cr)
CHEN 3701 - Introduction to Biomolecular Engineering (3.0 cr)
CHEN 4001 - Material and Energy Balances (4.0 cr)
CHEN 4005 - Transport Phenomena: Momentum and Heat (4.0 cr)
CHEN 4006 - Mass Transport and Separation Processes (4.0 cr)
CHEN 4101 - Chemical Engineering Thermodynamics (4.0 cr)
CHEN 4102 - Reaction Kinetics and Reactor Engineering (4.0 cr)
CHEN 4201 - Numerical methods in ChEn applications (3.0 cr)
CHEN 4401W - Chemical Engineering Lab I, WI (3.0 cr)
CHEN 4402W - Chemical Engineering Lab II, WI (2.0 cr)
CHEN 4501W - Chemical Engineering Process Design, WI (3.0 cr)
CHEN 4502W - Chemical Engineering Process Design II, WI (2.0 cr)
CHEN 4601 - Process Control (3.0 cr)
MATS 3011 - Introduction to Materials Science and Engineering (3.0 cr)

Technical Electives
Take 17 credits of electives. These normally include CHEN 4214 and 3 other courses selected with the aid of an adviser.

Chemistry B.S.Chem.

Chemistry

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 40.

Degree: Bachelor of Science in Chemistry.

The mission of the Department of Chemistry is to enrich the science of chemistry through the education of students from all disciplines, the training of future professional chemists, and the pursuit of knowledge.

Chemistry probes the fundamental concepts of nature and helps us understand the world around us. It deals with all substances at the molecular level: their composition, their properties, and how they are transformed into new substances.

Chemistry is a central science of great importance to society. It provides a broad range of opportunities in many specialized fields, including biotechnology, polymer chemistry, environmental chemistry, materials chemistry, and medicine.

After graduating with a bachelor's degree, many chemistry majors go on to graduate or professional schools to pursue advanced degrees. Other graduates find employment in industry, education, or government.

Admission Requirements

Students must complete 10 courses before admission to the program.

Freshmen and transfer students are usually admitted to pre-major status before admission to this major.

A GPA above 2.00 is preferred for the following:

- 2.80 for students transferring from outside the University.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Required Courses for Admission

Mathematics

MATH 1271 - Calculus I, MATH (4.0 cr)
or MATH 1371 - IT Calculus I, MATH (4.0 cr)
MATH 1272 - Calculus II (4.0 cr)
or MATH 1372 - IT Calculus II (4.0 cr)
MATH 2263 - Multivariable Calculus (4.0 cr)
or MATH 2374 - IT Multivariable Calculus and Vector Analysis (4.0 cr)

Physical Sciences

CHEM 1021 - Chemical Principles I, ENVT, PHYS SCI/L (4.0 cr)
or CHEM 1031H - Honors Chemistry I, ENVT, PHYS SCI/L, H (4.0 cr)
CHEM 1022 - Chemical Principles II, ENVT, PHYS SCI/L (4.0 cr)
or CHEM 1032H - Honors Chemistry II, ENVT, PHYS SCI/L, H (4.0 cr)
CHEM 2101 - Introductory Analytical Chemistry Lecture (3.0 cr)
CHEM 2111 - Introductory Analytical Chemistry Lab (2.0 cr)
PHYS 1301W - Introductory Physics for Science and Engineering I, PHYS SCI/L, WI (4.0 cr)
or PHYS 1401V - Honors Physics I, PHYS SCI/L, WI, H (4.0 cr)
PHYS 1302W - Introductory Physics for Science and Engineering II, PHYS SCI/L, WI (4.0 cr)
or PHYS 1402V - Honors Physics II, PHYS SCI/L, WI, H (4.0 cr)

Additional Math, Science, or Statistics

If a student completes the Honors Math sequence this requirement is automatically fulfilled.

MATH 2243 - Linear Algebra and Differential Equations (4.0 cr)
or MATH 2373 - IT Linear Algebra and Differential Equations (4.0 cr)
or PHYS 2303 - Physics III: Physics of Matter (4.0 cr)
or PHYS 2403H - Honors Phys III, H (4.0 cr)
or STAT 3021 - Introduction to Probability and Statistics (3.0 cr)

Program Requirements

Required Courses

Major Courses

CHEM 2301 - Organic Chemistry I (3.0 cr)
CHEM 3501 - Physical Chemistry I (3.0 cr)
CHEM 3502 - Physical Chemistry II (3.0 cr)
CHEM 4701 - Inorganic Chemistry (3.0 cr)
CHEM 2302 - Organic Chemistry II (3.0 cr)

Lab can be taken concurrent with or after taking CHEM 2302

CHEM 2311 - Organic Lab (4.0 cr)
or CHEM 2312 - Honors Organic Lab, H (5.0 cr)

Electives

Take 3 or more course(s) from the following:

CHEM 4094W - Directed Research, WI (1.0-5.0 cr)
CHEM 4111W - Intermediate Analytical Chemistry Lab, WI (2.0 cr)
CHEM 4311W - Advanced Organic Chemistry Lab, WI (2.0 cr)
CHEM 4511W - Advanced Physical Chemistry Lab, WI (2.0 cr)
CHEM 4711W - Advanced Inorganic Chemistry Lab, WI (2.0 cr)
CHEM 5223W - Polymer Laboratory, WI (2.0 cr)

Select one course (3 credits) from any non-required upper division course in chemistry.

CHEM 4xxx
or
CHEM 5xxx

Technical Electives

Take two 3xxx or higher courses of 3 credits or more in any field of science (at least 6 credits).

Technical Elective 1
Technical Elective 2

Civil Engineering B.C.E.

Civil Engineering

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 128.

Required credits within the major: 64.

This program requires summer terms.

Degree: Bachelor of Civil Engineering.

Civil engineering deals with the science and art of engineering applied to solving problems and designing systems related to infrastructure and the environment. Principal fields within civil engineering are structural engineering, environmental engineering, water resources engineering, transportation engineering, and geotechnical engineering. The upper division civil engineering program requires students to take introductory courses in all of the above areas. In addition, students may emphasize a special interest in one of the areas by selecting appropriate technical electives in consultation with their adviser.

Admission Requirements

Students must complete 10 courses before admission to the program.

Freshmen and transfer students are usually admitted to pre-major status before admission to this major.

A GPA above 2.00 is preferred for the following:

- 2.80 for students transferring from outside the University.

It is recommended that students take GEO 1001 and CE 1101, but these courses are not required to be admitted to the program.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Required Courses for Admission

Mathematics

MATH 1271 - Calculus I, MATH (4.0 cr)
or MATH 1371 - IT Calculus I, MATH (4.0 cr)
MATH 1272 - Calculus II (4.0 cr)
or MATH 1372 - IT Calculus II (4.0 cr)
MATH 2243 - Linear Algebra and Differential Equations (4.0 cr)
or MATH 2373 - IT Linear Algebra and Differential Equations (4.0 cr)

MATH 2263 - Multivariable Calculus (4.0 cr)
or MATH 2374 - IT Multivariable Calculus and Vector Analysis (4.0 cr)

Physical Science and Mechanics
AEM 2011 - Statics (3.0 cr)
AEM 3031 - Deformable Body Mechanics (3.0 cr)
CHEM 1021 - Chemical Principles I, ENVT, PHYS SCI/L (4.0 cr)
or CHEM 1031H - Honors Chemistry I, ENVT, PHYS SCI/L, H (4.0 cr)
CHEM 1022 - Chemical Principles II, ENVT, PHYS SCI/L (4.0 cr)
or CHEM 1032H - Honors Chemistry II, ENVT, PHYS SCI/L, H (4.0 cr)
PHYS 1301W - Introductory Physics for Science and Engineering I, PHYS SCI/L, WI (4.0 cr)
or PHYS 1401V - Honors Physics I, PHYS SCI/L, WI, H (4.0 cr)
PHYS 1302W - Introductory Physics for Science and Engineering II, PHYS SCI/L, WI (4.0 cr)
or PHYS 1402V - Honors Physics II, PHYS SCI/L, WI, H (4.0 cr)

Program Requirements

Required Courses

Major Courses
AEM 2012 - Dynamics (3.0 cr)
CE 3201 - Transportation Engineering (3.0 cr)
CE 3202 - Surveying and Mapping (2.0 cr)
CE 3301 - Soil Mechanics I (3.0 cr)
CE 3401 - Linear Structural Analysis (3.0 cr)
CE 3402 - Construction Materials (3.0 cr)
CE 3501 - Environmental Engineering, C/PE, ENVT (3.0 cr)
CE 3502 - Fluid Mechanics (4.0 cr)
CE 4101W - Project Management, WI (3.0 cr)
CE 4102W - Capstone Design, WI (3.0 cr)
CE 4301 - Soil Mechanics II (3.0 cr)
CE 4401 - Steel and Reinforced Concrete Design (4.0 cr)
CE 4501 - Hydrologic Design (4.0 cr)
CE 4502 - Water and Wastewater Treatment (3.0 cr)

Computer Applications/Programming
A substitution for CE 3101 may be made with approval of the director of undergraduate studies.

CE 3101 - Computer Applications in Civil Engineering I (3.0 cr)
or CSCI 1113 - Introduction to C/C++ Programming for Scientists and Engineers (4.0 cr)
or CSCI 1107 - Introduction to FORTRAN Programming for Scientists and Engineers (3.0 cr)
or CSCI 1103 - Introduction to Computer Programming in Java (4.0 cr)

Statistics
Stat 3021 may be substituted for CE 3102 with approval of the director of undergraduate studies.

CE 3102 - Uncertainty and Decision Analysis in Civil Engineering (3.0 cr)
or STAT 3021 - Introduction to Probability and Statistics (3.0 cr)

Technical Electives
Students must take 17 credits of Technical Electives, approved by an adviser. Technical Electives may be directed to focus on an area of emphasis in construction, environmental, geomechanics, public works, structural, transportation, or water resources engineering. See the section below for a list of possible courses, but consult your adviser before taking them.

Students are required to complete one of the following course groups.

General
Consult your adviser for additional courses to total 17 credits.

CE 1101 - Civil Engineering Orientation (1.0 cr)
CE 3111 - CADD for Civil Engineers (2.0 cr)
CE 4190 - Engineering Co-op Assignment (2.0-6.0 cr)

-OR-

Environmental Engineering
Consult your adviser about selecting courses to meet this requirement.

Take 1 or more course(s) from the following:
BIOL 3407 - Ecology, ENVT (3.0 cr)
CE 4352 - Groundwater Modeling (3.0 cr)
CE 4561 - Solid Hazardous Wastes (3.0 cr)
CE 4562 - Environmental Remediation Technology (3.0 cr)
CE 5541 - Environmental Water Chemistry (3.0 cr)
CE 5551 - Environmental Microbiology Laboratory (4.0 cr)
CE 4591 - Environmental Law for Engineers (3.0 cr)
CHEM 2301 - Organic Chemistry I (3.0 cr)
CHEN 4005 - Transport Phenomena: Momentum and Heat (4.0 cr)
CHEN 4101 - Chemical Engineering Thermodynamics (4.0 cr)
CHEN 4102 - Reaction Kinetics and Reactor Engineering (4.0 cr)
EEB 4601 - Limnology (3.0 cr)
GEO 5108 - Principles of Environmental Geology (3.0 cr)
GEO 5701 - General Hydrogeology (3.0 cr)
STAT 5021 - Statistical Analysis (4.0 cr)

-OR-

Geomechanics Engineering
Consult your adviser about selecting courses to meet this requirement.

Take 1 or more course(s) from the following:
AEM 4581 - Mechanics of Solids (3.0 cr)
CE 3311 - Rock Mechanics I (3.0 cr)
CE 4121 - Computer Applications in Civil Engineering II (3.0 cr)
CE 4311 - Rock Mechanics II (3.0 cr)
CE 4341 - Engineering Geostatistics (3.0 cr)
CE 4351 - Groundwater Mechanics (3.0 cr)
CE 4352 - Groundwater Modeling (3.0 cr)
CE 5311 - Experimental Geomechanics (3.0 cr)
CE 5321 - Geomechanics (3.0 cr)
CE 5331 - Geomechanics Modeling (3.0 cr)
GEO 4203 - Principles of Geophysical Exploration (3.0 cr)
GEO 4501 - Structural Geology (3.0 cr)
MATH 4457 - Methods of Applied Mathematics I (4.0 cr)
MATH 4458 - Methods of Applied Mathematics II (4.0 cr)
MATH 4567 - Introduction to Fourier Analysis (4.0 cr)
MATH 5583 - Complex Analysis (4.0 cr)

-OR-

Public Works Engineering
Consult your adviser about selecting courses to meet this requirement.

Take 1 or more course(s) from the following:
CE 4111 - Engineering Systems Analysis (3.0 cr)
CE 4201 - Highway Design (3.0 cr)
CE 4232 - Cemented Materials (3.0 cr)
CE 5211 - Traffic Engineering (3.0 cr)
CE 5231 - Pavement Management and Rehabilitation (3.0 cr)

CE 4591 - Environmental Law for Engineers (3.0 cr)
CE 4231 - Pavement Engineering (3.0 cr)
CE 4511 - Hydraulic Structures (4.0 cr)
CE 4561 - Solid Hazardous Wastes (3.0 cr)
CE 4562 - Environmental Remediation Technology (3.0 cr)
CE 5212 - Transportation Policy, Planning, and Deployment (3.0 cr)
BULLETPA 4200 - Urban and Regional Planning (3.0 cr)
BULLETPA 5013 - Law and Urban Land Use (1.5 cr)
BULLETPA 5231 - Transit Planning and Management (3.0 cr)

-OR-

Structural Engineering
Consult your adviser about selecting courses to meet this requirement.

Take 1 or more course(s) from the following:
AEM 4501 - Aerospace Structures (3.0 cr)
AEM 4502 - Computational Structural Analysis (3.0 cr)
AEM 4511 - Mechanics of Composite Materials (3.0 cr)
AEM 4581 - Mechanics of Solids (3.0 cr)
CE 4411 - Matrix Structural Analysis (3.0 cr)
CE 4412 - Reinforced Concrete Design II (3.0 cr)
CE 4413 - Steel Design II (3.0 cr)
CE 5232 - Advanced Portland Cement Concrete (3.0 cr)
CE 5233 - Advanced Bituminous Materials (3.0 cr)
CE 5311 - Experimental Geomechanics (3.0 cr)
CE 5411 - Applied Structural Mechanics (3.0 cr)
CE 4414 - Prestressed Concrete Design (3.0 cr)
CE 4415 - Masonry Structures (3.0 cr)
MATH 4242 - Applied Linear Algebra (4.0 cr)
MATH 4457 - Methods of Applied Mathematics I (4.0 cr)
MATH 4512 - Differential Equations with Applications (3.0 cr)
MATH 5485 - Introduction to Numerical Methods I (4.0 cr)
MATH 5487 - Computational Methods for Differential and Integral Equations in Engineering and Science I (4.0 cr)
ME 5247 - Stress Analysis, Sensing, and Transducers (4.0 cr)

-OR-

Transportation Engineering
Consult your adviser about selecting courses to meet this requirement.

Take 1 or more course(s) from the following:
AEM 4201 - Fluid Mechanics (4.0 cr)
CE 4121 - Computer Applications in Civil Engineering II (3.0 cr)
CE 4201 - Highway Design (3.0 cr)
CE 4231 - Pavement Engineering (3.0 cr)
CE 4232 - Cemented Materials (3.0 cr)
CE 5211 - Traffic Engineering (3.0 cr)
CE 5212 - Transportation Policy, Planning, and Deployment (3.0 cr)
CE 5231 - Pavement Management and Rehabilitation (3.0 cr)
CE 5232 - Advanced Portland Cement Concrete (3.0 cr)
CE 5233 - Advanced Bituminous Materials (3.0 cr)
CSCI 2021 - Machine Architecture and Organization (4.0 cr)
CSCI 2031 - Introduction to Numerical Computing (4.0 cr)
MATH 4242 - Applied Linear Algebra (4.0 cr)
MATH 4512 - Differential Equations with Applications (3.0 cr)
STAT 5021 - Statistical Analysis (4.0 cr)
STAT 5302 - Applied Regression Analysis (4.0 cr)

-OR-

Water Resources Engineering
Consult your adviser about selecting courses to meet this requirement.

Take 1 or more course(s) from the following:
BAE 5513 - Watershed Engineering (3.0 cr)
CE 4121 - Computer Applications in Civil Engineering II (3.0 cr)
CE 4341 - Engineering Geostatistics (3.0 cr)
CE 4351 - Groundwater Mechanics (3.0 cr)
CE 4352 - Groundwater Modeling (3.0 cr)
CE 4511 - Hydraulic Structures (4.0 cr)
CE 4512 - Open Channel Hydraulics (4.0 cr)
CSCI 2031 - Introduction to Numerical Computing (4.0 cr)
GEO 4701 - Geomorphology (3.0-4.0 cr)

Program Sub-plans

A sub-plan is not required for this program.

EIP

Required Courses

CE 4190 - Engineering Co-op Assignment (2.0-6.0 cr)

Computer Engineering B.Comp.E.

Computer Science and Engineering

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 126.

Required credits within the major: 78.

Degree: Bachelor of Computer Engineering.

The mission of the computer engineering program is to educate students in the core topics as well as in a broad set of specialties of computer engineering, to impart students with professional attributes that characterize a well-schooled engineer and citizen, and to provide students with opportunities for research experience in one of the leading computer engineering centers of scholarship.

The field of computer engineering resulted from the tremendous development of computers and, in particular, the evolution of microprocessors. The design process for almost every electronic system includes the specification and development of the control program for the system's microprocessor. A particular computer engineering job can be more closely related to hardware or software, to functional design or detailed design. The B.Comp. Eng. degree provides the background necessary for persons, with continuing study, to work in any of the many computer engineering subfields. The bachelor's degree itself does not, however, provide highly specialized knowledge in any particular subfield.

Admission Requirements

Students must complete 10 courses before admission to the program.

Freshmen and transfer students are usually admitted to pre-major status before admission to this major.

A GPA above 2.00 is preferred for the following:

- 2.50 for students already admitted to the degree-granting college.
- 2.50 for students transferring from another University of Minnesota college.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Required Courses for Admission

Mathematics

MATH 1271 - Calculus I, MATH (4.0 cr)
or MATH 1371 - IT Calculus I, MATH (4.0 cr)
MATH 1272 - Calculus II (4.0 cr)
or MATH 1372 - IT Calculus II (4.0 cr)
MATH 2243 - Linear Algebra and Differential Equations (4.0 cr)
or MATH 2373 - IT Linear Algebra and Differential Equations (4.0 cr)
MATH 2263 - Multivariable Calculus (4.0 cr)
or MATH 2374 - IT Multivariable Calculus and Vector Analysis (4.0 cr)

Physics

PHYS 1301W - Introductory Physics for Science and Engineering I, PHYS SCI/L, WI (4.0 cr)
or PHYS 1401V - Honors Physics I, PHYS SCI/L, WI, H (4.0 cr)
PHYS 1302W - Introductory Physics for Science and Engineering II, PHYS SCI/L, WI (4.0 cr)
or PHYS 1402V - Honors Physics II, PHYS SCI/L, WI, H (4.0 cr)

Preparatory Courses

CSCI 1901 - Structure of Computer Programming I (4.0 cr)
CSCI 1902 - Structure of Computer Programming II (4.0 cr)
EE 2001 - Introduction to Electronic and Electrical Circuits (3.0 cr)
EE 2002 - Introductory Circuits and Electronics Laboratory (1.0 cr)
EE 2011 - Linear Systems and Circuits (3.0 cr)

Take all of the following in the same term:
EE 2301 - Introduction to Digital System Design (4.0 cr)
EE 301 - Introduction to Digital System Design: Discussion (0.0 cr)

Take all of the following in the same term:
EE 2361 - Introduction to Microcontrollers (4.0 cr)
EE 361 - Introduction to Microcontrollers: Discussion (0.0 cr)

Program Requirements

Students interesting in pursuing computer engineering or electrical engineering as a major are encouraged to take EE 1001 during their first year.

Required Courses

Major Courses

CSCI 2011 - Discrete Structures of Computer Science (4.0 cr)
CSCI 4041 - Algorithms and Data Structures (4.0 cr)
CSCI 4061 - Introduction to Operating Systems (4.0 cr)
EE 3015 - Signals and Systems (3.0 cr)
EE 3025 - Statistical Methods in Electrical and Computer Engineering (3.0 cr)
EE 3101 - Circuits and Electronics Laboratory I (2.0 cr)
EE 3102 - Circuits and Electronics Laboratory II (2.0 cr)
EE 3115 - Analog and Digital Electronics (4.0 cr)
EE 4363 - Computer Architecture and Machine Organization (4.0 cr)

Electives

With adviser approval, courses from areas outside of EE/CSCI may be substituted to meet up to 12 credits of this requirement (i.e., the technical electives). Courses taken as part of the EIP program may be used to meet the technical elective requirement. Courses may not be used to meet both the core and the elective requirements. Courses used to fulfill other requirements will not count as lab experiences.

Take 26 or more credit(s).

Take 3 or more course(s) from the following:
EE 4951W - Senior Design Project, WI (2.0 cr)
or

Honors Project
EE 4981H - Senior Honors Project I, H (2.0 cr)
EE 4982V - Senior Honors Project II, WI, H (2.0 cr)

Take 1 or more course(s) from the following:
EE 4111 - Advanced Analog Electronics Design (4.0 cr)
EE 4235 - Linear Control Systems Laboratory (1.0 cr)
EE 4237 - State Space Control Laboratory (1.0 cr)
EE 4301 - Digital Design With Programmable Logic (4.0 cr)
EE 4341 - Microprocessor and Microcontroller System Design (4.0 cr)
EE 4505 - Communications Systems Laboratory (1.0 cr)
EE 4703 - Electric Drives Laboratory (1.0 cr)
EE 4721 - Introduction to Power System Analysis (4.0 cr)
EE 4743 - Switch-Mode Power Electronics Laboratory (2.0 cr)
EE 5141 - Introduction to Microsystem Technology (4.0 cr)
EE 5173 - Basic Microelectronics Laboratory (1.0 cr)
EE 5327 - VLSI Design Laboratory (3.0 cr)
EE 5545 - Digital Signal Processing Design (3.0 cr)
EE 5613 - RF/Microwave Circuit Design Laboratory (2.0 cr)
EE 5622 - Physical Optics Laboratory (1.0 cr)
EE 5627 - Optical Fiber Communication (3.0 cr)
EE 5811 - Biomedical Instrumentation (3.0 cr)

Take 0 or more course(s) from the following:
CSCI 4xxx
CSCI 5xxx
EE 4xxx
EE 5xxx

Program Sub-plans

A sub-plan is not required for this program.

EIP

Internship/Cooperative Learning

Take EE 3961 (1 credit) and then EE 4961 (2 credits), with the possibility of a third course, EE 4962 (2 credits).

EE 3961 and EE 4961 are also listed in Senior Electives and may not be used to satisfy both requirements.

Required Courses

Internship

EE 3961 - Industrial Assignment I (1.0 cr)
EE 4961 - Industrial Assignment II (2.0 cr)

Computer Science B.S. Comp.Sc.

Computer Science and Engineering

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 124.

Required credits within the major: 45.

Degree: Bachelor of Science in Computer Science.

Computer science is concerned with the study of the hardware, software, and theoretical aspects of high-speed computing devices and with the application of these devices to scientific, technological, and business problems.

A bachelor's degree gives students a basic understanding of computer science. After completing a required set of fundamental courses, students arrange their subsequent work around one of several upper division emphases within either computer science or an interdisciplinary area involving computer applications. The degree prepares students for graduate work or for various industrial, governmental, and business positions involving the use of computers.

Admission Requirements

Students must complete 6 courses before admission to the program.

Freshmen and transfer students are usually admitted to pre-major status before admission to this major.

A GPA above 2.00 is preferred for the following:

- 2.40 for students already admitted to the degree-granting college.
- 2.40 for students transferring from another University of Minnesota college.
- 2.80 for students transferring from outside the University.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Required Courses for Admission

Mathematics Core

MATH 1371 - IT Calculus I, MATH (4.0 cr)
or MATH 1271 - Calculus I, MATH (4.0 cr)
MATH 1372 - IT Calculus II (4.0 cr)
or MATH 1272 - Calculus II (4.0 cr)
MATH 2373 - IT Linear Algebra and Differential Equations (4.0 cr)
or MATH 2243 - Linear Algebra and Differential Equations (4.0 cr)

Computer Science Introductory Core

CSCI 1901 - Structure of Computer Programming I (4.0 cr)
CSCI 1902 - Structure of Computer Programming II (4.0 cr)
CSCI 2011 - Discrete Structures of Computer Science (4.0 cr)

Program Requirements

Required Courses

Physics Core

PHYS 1301W - Introductory Physics for Science and Engineering I, PHYS SCI/L, WI (4.0 cr)
or PHYS 1401V - Honors Physics I, PHYS SCI/L, WI, H (4.0 cr)
PHYS 1302W - Introductory Physics for Science and Engineering II, PHYS SCI/L, WI (4.0 cr)
or PHYS 1402V - Honors Physics II, PHYS SCI/L, WI, H (4.0 cr)

Computer Science Core

CSCI 2021 - Machine Architecture and Organization (4.0 cr)
CSCI 2031 - Introduction to Numerical Computing (4.0 cr)
CSCI 3081W - Program Design and Development, WI (4.0 cr)
CSCI 4011 - Formal Languages and Automata Theory (4.0 cr)
CSCI 4041 - Algorithms and Data Structures (4.0 cr)
CSCI 4061 - Introduction to Operating Systems (4.0 cr)
MATH 4xxx
STAT 3021 - Introduction to Probability and Statistics (3.0 cr)

Computer Science Emphases (Technical Electives)

17 credits of approved 4xxx and 5xxx electives that form a coherent academic program in an area of computer science or its applications; it must include at least 9 credits of computer science electives and no more than 3 credits from CSCI 59xx or CSCI 4970 or outside independent study. The emphases listed below represent possible options; students should consult with their adviser before choosing their technical electives.

Students are required to complete one of the following course groups.

Computer Architecture

Consult your adviser for additional courses to meet the 17-credit requirement.

CSCI 4203 - Computer Architecture (4.0 cr)
CSCI 5204 - Advanced Computer Architecture (3.0 cr)
CSCI 5283 - Computer-Aided Design I (3.0 cr)

-OR-

Artificial Intelligence

Take 17 or more credit(s) from the following:

CSCI 5511 - Artificial Intelligence I (3.0 cr)
CSCI 5512W - Artificial Intelligence II, WI (3.0 cr)
CSCI 5521 - Pattern Recognition (3.0 cr)
CSCI 5551 - Introduction to Intelligent Robotic Systems (3.0 cr)
CSCI 5561 - Computer Vision (3.0 cr)
PSY 5031W - Perception, WI (3.0 cr)
PSY 5038W - Introduction to Neural Networks, WI (3.0 cr)

-OR-

Hardware

Take 17 or more credit(s) from the following:

CSCI 4203 - Computer Architecture (4.0 cr)
CSCI 4211 - Introduction to Computer Networks (3.0 cr)
CSCI 5204 - Advanced Computer Architecture (3.0 cr)
CSCI 5283 - Computer-Aided Design I (3.0 cr)
EE 4341 - Microprocessor and Microcontroller System Design (4.0 cr)

-OR-

Computational Biology

Consult your adviser for additional courses to meet the 17-credit requirement.

CSCI 5481 - Computational Techniques for Genomics (3.0 cr)

-OR-

Databases

Consult your adviser for additional courses to meet the 17-credit requirement.

CSCI 4707 - Practice of Database Systems (3.0 cr)
CSCI 5708 - Architecture and Implementation of Database Management Systems (3.0 cr)
CSCI 5421 - Advanced Algorithms and Data Structures (3.0 cr)

-OR-

Graphics

Take 17 or more credit(s) from the following:

CSCI 4707 - Practice of Database Systems (3.0 cr)
CSCI 5707 - Principles of Database Systems (3.0 cr)
CSCI 5108 - Fundamentals of Computer Graphics II (3.0 cr)
CSCI 5109 - Visualization (3.0 cr)
CSCI 5115 - User Interface Design, Implementation and Evaluation (3.0 cr)
CSCI 5116 - GUI Toolkits and Their Implementation (3.0 cr)
PSY 5031W - Perception, WI (3.0 cr)

-OR-

Management of Information Systems
Consult your adviser for additional courses to meet the 17-credit requirement.

CSCI 4707 - Practice of Database Systems (3.0 cr)
CSCI 5708 - Architecture and Implementation of Database Management Systems (3.0 cr)
IDSC 4441 - Electronic Commerce (2.0 cr)

-OR-

Network Security
Consult your adviser for additional courses to meet the 17-credit requirement.

CSCI 4211 - Introduction to Computer Networks (3.0 cr)
CSCI 5103 - Operating Systems (3.0 cr)
CSCI 5471 - Modern Cryptography (3.0 cr)
MATH 5248 - Cryptology and Number Theory (4.0 cr)

-OR-

Networking
Take 17 or more credit(s) from the following:
CSCI 4211 - Introduction to Computer Networks (3.0 cr)
EE 5505 - Wireless Communication (3.0 cr)
INET 4011 - Network Administration (4.0 cr)
INET 4021 - Network Programming (4.0 cr)
INET 4041 - Emerging Network Technologies and Applications (3.0 cr)

-OR-

Programming
Consult your adviser for additional courses to meet the 17-credit requirement.

CSCI 4131 - Internet Programming (3.0 cr)
CSCI 5106 - Programming Languages (3.0 cr)
CSCI 5801 - Software Engineering I (3.0 cr)

-OR-

Software Engineering
Consult your adviser for additional courses to meet the 17-credit requirement.

CSCI 5801 - Software Engineering I (3.0 cr)
CSCI 5802 - Software Engineering II (3.0 cr)
CSCI 5106 - Programming Languages (3.0 cr)

-OR-

Theory
Consult your adviser for additional courses to meet the 17-credit requirement.

Take 4 or more course(s) from the following:
CSCI 5421 - Advanced Algorithms and Data Structures (3.0 cr)
CSCI 5403 - Computational Complexity (3.0 cr)
CSCI 5451 - Introduction to Parallel Computing: Architectures, Algorithms and Programming (3.0 cr)
CSCI 5481 - Computational Techniques for Genomics (3.0 cr)
MATH 4707 - Introduction to Combinatorics and Graph Theory (4.0 cr)

-OR-

User Interfaces
Consult your adviser for additional courses to meet the 17-credit requirement.

CSCI 5115 - User Interface Design, Implementation and Evaluation (3.0 cr)
CSCI 5116 - GUI Toolkits and Their Implementation (3.0 cr)
PSY 5051W - Psychology of Human-Machine Interaction, WI (3.0 cr)
KIN 5001 - Foundations of Human Factors/Ergonomics (3.0 cr)

Electrical Engineering B.E.E.

Electrical and Computer Engineering

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 126.

Required credits within the major: 78.

Degree: Bachelor of Electrical Engineering.

The mission of the electrical engineering program is to educate students in the core topics as well as in a broad set of specialties of electrical engineering, to impart students with professional attributes that characterize a well-schooled engineer and citizen, and to provide students with opportunities for research experience in one of the leading electrical engineering centers of scholarship.

Electrical engineers work in highly diverse areas such as computers, telecommunications, semiconductors, electric energy, consumer and entertainment electronics, biomedical technology, defense and aerospace systems, and automotive electronics. They design and develop components, software, and systems; carry out analysis; and work in research, management, and sales. The bachelor of electrical engineering prepares students for immediate entry into professional work, for graduate study and further specialization in engineering, for advanced work in business and management, or for study in a different direction such as medicine.

Admission Requirements

Students must complete 9 courses before admission to the

program.

Freshmen and transfer students are usually admitted to pre-major status before admission to this major.

A GPA above 2.00 is preferred for the following:

- 2.30 for students already admitted to the degree-granting college.
- 2.30 for students transferring from another University of Minnesota college.
- 2.80 for students transferring from outside the University.

Students interested in pursuing a degree in computer engineering or electrical engineering are encouraged to take EE 1001 in their first year.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Required Courses for Admission

Mathematics

MATH 1271 - Calculus I, MATH (4.0 cr)
or MATH 1371 - IT Calculus I, MATH (4.0 cr)
MATH 1272 - Calculus II (4.0 cr)
or MATH 1372 - IT Calculus II (4.0 cr)
MATH 2243 - Linear Algebra and Differential Equations (4.0 cr)

or MATH 2373 - IT Linear Algebra and Differential Equations (4.0 cr)
MATH 2263 - Multivariable Calculus (4.0 cr)
or MATH 2374 - IT Multivariable Calculus and Vector Analysis (4.0 cr)

Physical Sciences
CHEM 1021 - Chemical Principles I, ENVT, PHYS SCI/L (4.0 cr)
or CHEM 1031H - Honors Chemistry I, ENVT, PHYS SCI/L, H (4.0 cr)
CHEM 1022 - Chemical Principles II, ENVT, PHYS SCI/L (4.0 cr)
or CHEM 1032H - Honors Chemistry II, ENVT, PHYS SCI/L, H (4.0 cr)
or PHYS 2303 - Physics III: Physics of Matter (4.0 cr)
or PHYS 2311 - Modern Physics (4.0 cr)
or PHYS 2403H - Honors Phys III, H (4.0 cr)
PHYS 1301W - Introductory Physics for Science and Engineering I, PHYS SCI/L, WI (4.0 cr)
or PHYS 1401V - Honors Physics I, PHYS SCI/L, WI, H (4.0 cr)
PHYS 1302W - Introductory Physics for Science and Engineering II, PHYS SCI/L, WI (4.0 cr)
or PHYS 1402V - Honors Physics II, PHYS SCI/L, WI, H (4.0 cr)

Preparatory Courses
EE 2001 - Introduction to Electronic and Electrical Circuits (3.0 cr)
EE 2002 - Introductory Circuits and Electronics Laboratory (1.0 cr)
EE 2011 - Linear Systems and Circuits (3.0 cr)
CSCI 1113 - Introduction to C/C++ Programming for Scientists and Engineers (4.0 cr)
or EE 1301 - Introduction to Computing Systems (4.0 cr)

Take all of the following in the same term:
EE 301 - Introduction to Digital System Design: Discussion (0.0 cr)
EE 2301 - Introduction to Digital System Design (4.0 cr)

Take all of the following in the same term:
EE 361 - Introduction to Microcontrollers: Discussion (0.0 cr)
EE 2361 - Introduction to Microcontrollers (4.0 cr)

Program Requirements

Required Courses

Major Courses
EE 3015 - Signals and Systems (3.0 cr)
EE 3025 - Statistical Methods in Electrical and Computer Engineering (3.0 cr)
EE 3101 - Circuits and Electronics Laboratory I (2.0 cr)
EE 3102 - Circuits and Electronics Laboratory II (2.0 cr)
EE 3115 - Analog and Digital Electronics (4.0 cr)
EE 3161 - Semiconductor Devices (3.0 cr)
EE 3601 - Transmission Lines, Fields, and Waves (3.0 cr)

Electives
With adviser approval, courses from areas outside of EE/CSCI may be substituted to meet up to 12 credits of this requirement (i.e., the technical electives). Courses taken as part of the EIP program may be used to meet the technical elective requirement. Courses may not be used to meet both the core and the elective requirements.

Take 26 or more credit(s).

Courses used to fulfill other requirements will not count as lab experiences.

Take 3 or more course(s) from the following:
EE 4951W - Senior Design Project, WI (2.0 cr)
or

Honors Project
EE 4981H - Senior Honors Project I, H (2.0 cr)
EE 4982V - Senior Honors Project II, WI, H (2.0 cr)

Take 1 or more course(s) from the following:
EE 4111 - Advanced Analog Electronics Design (4.0 cr)
EE 4235 - Linear Control Systems Laboratory (1.0 cr)
EE 4237 - State Space Control Laboratory (1.0 cr)
EE 4301 - Digital Design With Programmable Logic (4.0 cr)
EE 4341 - Microprocessor and Microcontroller System Design (4.0 cr)
EE 4505 - Communications Systems Laboratory (1.0 cr)
EE 4703 - Electric Drives Laboratory (1.0 cr)
EE 4721 - Introduction to Power System Analysis (4.0 cr)
EE 4743 - Switch-Mode Power Electronics Laboratory (2.0 cr)
EE 5141 - Introduction to Microsystem Technology (4.0 cr)
EE 5173 - Basic Microelectronics Laboratory (1.0 cr)
EE 5327 - VLSI Design Laboratory (3.0 cr)
EE 5545 - Digital Signal Processing Design (3.0 cr)
EE 5613 - RF/Microwave Circuit Design Laboratory (2.0 cr)
EE 5622 - Physical Optics Laboratory (1.0 cr)
EE 5627 - Optical Fiber Communication (3.0 cr)
EE 5811 - Biomedical Instrumentation (3.0 cr)

Take 0 or more course(s) from the following:
CSCI 4xxx
CSCI 5xxx
EE 4xxx
EE 5xxx

Program Sub-plans

A sub-plan is not required for this program.

EIP

Internship/Cooperative learning program.

Take EE 3961 (1 cr) and then EE 4961 (2 cr), with the possibility of a third course, EE 4962 (2 cr).

EE 3961 and EE 4961 are also listed in Sr Electives and may not be used to fulfill both requirements simultaneously.

Required Courses

Internship
EE 3961 - Industrial Assignment I (1.0 cr)
EE 4961 - Industrial Assignment II (2.0 cr)

Geological Engineering B.Geo.E.

Civil Engineering

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 128.

Required credits within the major: 40.

This program requires summer terms.

Degree: Bachelor of Geo-Engineering.

The mission of the geological engineering program comprises three overlapping and mutually supportive components:

- Prepare students to become productive engineers and contributing members of their professional community
- Prepare students for continual learning and professional development
- Prepare students for formal advanced education.

The program has four core objectives:

1. To produce graduates with a strong fundamental scientific and technical knowledge base and critical thinking skills required for engineering problem formulation and problem solving.
2. To produce graduates with the ability to work as a professional team member. This includes the ability to communicate effectively through both oral and written language.

3. To produce graduates with an understanding of their obligations as professional geological engineers to protect human health, welfare, and the environment.
4. To ensure that graduates have had opportunities to complement their academic studies with scholarly (research) investigations, co-ops, and internships.

Admission Requirements

Students must complete 11 courses before admission to the program.

Freshmen and transfer students are usually admitted to pre-major status before admission to this major.

A GPA above 2.00 is preferred for the following:

- 2.80 for students transferring from outside the University.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Required Courses

Mathematics and Statistics
STAT 3021 - Introduction to Probability and Statistics (3.0 cr)
MATH 1271 - Calculus I, MATH (4.0 cr)
or MATH 1371 - IT Calculus I, MATH (4.0 cr)
MATH 1272 - Calculus II (4.0 cr)
or MATH 1372 - IT Calculus II (4.0 cr)
MATH 2243 - Linear Algebra and Differential Equations (4.0 cr)
or MATH 2373 - IT Linear Algebra and Differential Equations (4.0 cr)
MATH 2263 - Multivariable Calculus (4.0 cr)
or MATH 2374 - IT Multivariable Calculus and Vector Analysis (4.0 cr)

Mechanics
AEM 2011 - Statics (3.0 cr)
AEM 3031 - Deformable Body Mechanics (3.0 cr)

Physical Sciences
CHEM 1021 - Chemical Principles I, ENVT, PHYS SCI/L (4.0 cr)
or CHEM 1031H - Honors Chemistry I, ENVT, PHYS SCI/L, H (4.0 cr)
CHEM 1022 - Chemical Principles II, ENVT, PHYS SCI/L (4.0 cr)
or CHEM 1032H - Honors Chemistry II, ENVT, PHYS SCI/L, H (4.0 cr)
PHYS 1301W - Introductory Physics for Science and Engineering I, PHYS SCI/L, WI (4.0 cr)
or PHYS 1401V - Honors Physics I, PHYS SCI/L, WI, H (4.0 cr)
PHYS 1302W - Introductory Physics for Science and Engineering II, PHYS SCI/L, WI (4.0 cr)
or PHYS 1402V - Honors Physics II, PHYS SCI/L, WI, H (4.0 cr)

Program Requirements

Required Courses

Major Courses
GEO 1001 - Earth and Its Environments, ENVT, PHYS SCI/L (4.0 cr)
GEO 2301 - Mineralogy (3.0 cr)
GEO 2302 - Petrology (3.0 cr)
GEO 4501 - Structural Geology (3.0 cr)
GEO 3911 - Introductory Field Geology (4.0 cr)
or GEO 4971 - Field Hydrogeology (4.0 cr)
GEO 4203 - Principles of Geophysical Exploration (3.0 cr)
or GEO 4211 - Solid Earth Geophysics I (3.0 cr)
GEO 4602 - Sedimentology and Stratigraphy (3.0 cr)
or GEO 4701 - Geomorphology (3.0-4.0 cr)
or GEO 4703 - Glacial Geology (4.0 cr)

Engineering
CE 3101 - Computer Applications in Civil Engineering I (3.0 cr)
CE 3502 - Fluid Mechanics (4.0 cr)
GEOE 4102W - Capstone Design, WI (3.0 cr)
GEOE 4341 - Engineering Geostatistics (3.0 cr)
GEOE 4351 - Groundwater Mechanics (3.0 cr)
CE 3301 - Soil Mechanics I (3.0 cr)
or GEOE 3301 - Soil Mechanics I (3.0 cr)

Geological Engineering Options
Students are required to complete one of the following course groups.

Geoenvironmental
Focuses on soil and groundwater contamination, modeling, and remediation; solid and hazardous waste characterization, management, and disposal; and groundwater resources management and exploitation.

CE 3501 - Environmental Engineering, C/PE, ENVT (3.0 cr)
CE 4501 - Hydrologic Design (4.0 cr)
CE 4531 - Environmental Process Engineering (3.0 cr)
CE 4561 - Solid Hazardous Wastes (3.0 cr)
GEOE 4352 - Groundwater Modeling (3.0 cr)

-OR-

Geomechanics
Focuses on foundations for buildings, bridges, roads, and dams; analysis and design of surface and subsurface excavations; and evaluation of natural geologic hazards.

AEM 2012 - Dynamics (3.0 cr)
CE 4121 - Computer Applications in Civil Engineering II (3.0 cr)
GEOE 3311 - Rock Mechanics I (3.0 cr)
GEOE 4301 - Soil Mechanics II (3.0 cr)
GEOE 4311 - Rock Mechanics II (3.0 cr)

Geology B.S.Geol.

Geology & Geophysics

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 52.

This program requires summer terms.

Degree: Bachelor of Science in Geology.

Geology is the study of the composition, structure, and history of the Earth and of the processes that operate on and within it, with emphasis on the crust, oceans, and atmosphere. The department□s programs emphasize applications of physics, chemistry, and biology to understanding the Earth.

Geologists and geophysicists are employed in a wide range of fields, including exploration for and development of natural resources (hydrocarbons, minerals, groundwater); environmental science; urban planning; education; and oceanography. Potential employers include the oil, gas, and minerals industries; environmental consultants; federal and private research institutions; universities; schools; and government agencies. An advanced degree is usually required for a career in research or teaching.

Admission Requirements

Students must complete 5 courses before admission to the program.

Freshmen and transfer students are usually admitted to pre-major status before admission to this major.

A GPA above 2.00 is preferred for the following:

- 2.50 for students transferring from outside the University.

Students intersted in geology as a major may want to consider taking geology 1001, which can be counted as an elective.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Required Courses for Admission

Mathematics
MATH 1271 - Calculus I, MATH (4.0 cr)
or MATH 1371 - IT Calculus I, MATH (4.0 cr)
MATH 1272 - Calculus II (4.0 cr)
or MATH 1372 - IT Calculus II (4.0 cr)
Multivariable Calculus may be substituted.
MATH 2243 - Linear Algebra and Differential Equations (4.0 cr)
or MATH 2263 - Multivariable Calculus (4.0 cr)
or MATH 2373 - IT Linear Algebra and Differential Equations (4.0 cr)
or MATH 2374 - IT Multivariable Calculus and Vector Analysis (4.0 cr)

Physical Sciences
CHEM 1021 - Chemical Principles I, ENVT, PHYS SCI/L (4.0 cr)
or CHEM 1031H - Honors Chemistry I, ENVT, PHYS SCI/L, H (4.0 cr)
CHEM 1022 - Chemical Principles II, ENVT, PHYS SCI/L (4.0 cr)
or CHEM 1032H - Honors Chemistry II, ENVT, PHYS SCI/L, H (4.0 cr)

One course of Physics I and one course of Physics II must be complete before admission to upper division
PHYS 1301W - Introductory Physics for Science and Engineering I, PHYS SCI/L, WI (4.0 cr)
or PHYS 1401V - Honors Physics I, PHYS SCI/L, WI, H (4.0 cr)
PHYS 1302W - Introductory Physics for Science and Engineering II, PHYS SCI/L, WI (4.0 cr)
or PHYS 1402V - Honors Physics II, PHYS SCI/L, WI, H (4.0 cr)

Program Requirements

Required Courses

Major Courses
GEO 2201 - Geodynamics I: The Solid Earth (3.0 cr)
GEO 2301 - Mineralogy (3.0 cr)
GEO 2302 - Petrology (3.0 cr)
GEO 2303W - Geochemical Principles, WI (3.0 cr)
GEO 3202 - Geodynamics II: The Fluid Earth (3.0 cr)
GEO 3401 - Geochronology and Earth History (3.0 cr)
GEO 3911 - Introductory Field Geology (4.0 cr)
GEO 4501 - Structural Geology (3.0 cr)
GEO 4602 - Sedimentology and Stratigraphy (3.0 cr)
GEO 4631W - Earth Systems: Geosphere/Biosphere Interactions, WI (3.0 cr)

Workshops and Advanced Fieldwork
Take one course in advanced field geology during the summer after the junior year.

Take 2 or more course(s) from the following:
GEO 3870 - Modeling Workshop (1.0 cr)
GEO 3880 - Laboratory Workshop (1.0 cr)
GEO 3890 - Field Workshop (1.0 cr)
GEO 4911 - Advanced Field Geology (4.0 cr)
or GEO 4971 - Field Hydrogeology (4.0 cr)

Electives
Take at least 12 additional credits of geology during the junior and senior years, with no more than 4 credits from 1xxx and 3 credits from 2xxx.

Take 12 or more credit(s) from the following:
GEO 1xxx
GEO 2xxx
GEO 3xxx
GEO 4xxx
GEO 5xxx

Technical Electives
Take 8 credits of additional elective courses in physical and natural sciences or mathematics, chosen in consultation with an adviser.

Geophysics B.S.Geop.

Geology & Geophysics

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 52.

This program requires summer terms.

Degree: Bachelor of Science in Geophysics.

Geophysics is the study of the physical structure and properties of the Earth through application of the principles and techniques of classical physics. Major topics include the physical properties of rocks and minerals, the origin and dynamics of the Earth's gravity and magnetic fields, earthquakes and the propagation of waves in the Earth (seismology), and the dynamics of the Earth's crust, mantle, and deep interior.

Geologists and geophysicists are employed in a wide range of fields, including exploration for and development of natural resources (hydrocarbons, minerals, groundwater); environmental science; urban planning; education; and oceanography. Potential employers include the oil, gas, and minerals industries; environmental consultants; federal and private research institutions; universities; schools; and government agencies. An advanced degree is usually required for a career in research or teaching.

Admission Requirements

Students must complete 11 courses before admission to the program.

A GPA above 2.00 is preferred for the following:

- 2.50 for students transferring from outside the University.

Students interested in a geophysics major may want to consider taking GEOG 1001, which can be counted as a geology elective.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Required Courses for Admission

Mathematics
MATH 1271 - Calculus I, MATH (4.0 cr)
or MATH 1371 - IT Calculus I, MATH (4.0 cr)
MATH 1272 - Calculus II (4.0 cr)
or MATH 1372 - IT Calculus II (4.0 cr)
MATH 2243 - Linear Algebra and Differential Equations (4.0 cr)
or MATH 2373 - IT Linear Algebra and Differential Equations (4.0 cr)
MATH 2263 - Multivariable Calculus (4.0 cr)
or MATH 2374 - IT Multivariable Calculus and Vector Analysis (4.0 cr)

Physical Sciences
CHEM 1021 - Chemical Principles I, ENVT, PHYS SCI/L (4.0 cr)
or CHEM 1031H - Honors Chemistry I, ENVT, PHYS SCI/L, H (4.0 cr)
CHEM 1022 - Chemical Principles II, ENVT, PHYS SCI/L (4.0 cr)
or CHEM 1032H - Honors Chemistry II, ENVT, PHYS SCI/L, H (4.0 cr)
PHYS 1301W - Introductory Physics for Science and Engineering I, PHYS SCI/L, WI (4.0 cr)
or PHYS 1401V - Honors Physics I, PHYS SCI/L, WI, H (4.0 cr)
PHYS 1302W - Introductory Physics for Science and Engineering II, PHYS SCI/L, WI (4.0 cr)
or PHYS 1402V - Honors Physics II, PHYS SCI/L, WI, H (4.0 cr)
PHYS 2303 - Physics III: Physics of Matter (4.0 cr)

Program Requirements

Required Courses

Major Courses
GEO 2201 - Geodynamics I: The Solid Earth (3.0 cr)
GEO 2301 - Mineralogy (3.0 cr)
GEO 2302 - Petrology (3.0 cr)
GEO 2303W - Geochemical Principles, WI (3.0 cr)
GEO 3202 - Geodynamics II: The Fluid Earth (3.0 cr)
GEO 3401 - Geochronology and Earth History (3.0 cr)
GEO 3911 - Introductory Field Geology (4.0 cr)
GEO 4501 - Structural Geology (3.0 cr)
GEO 4911 - Advanced Field Geology (4.0 cr)
or GEO 4971 - Field Hydrogeology (4.0 cr)

Take 2 or more course(s) from the following:
GEO 3870 - Modeling Workshop (1.0 cr)
GEO 3880 - Laboratory Workshop (1.0 cr)
GEO 3890 - Field Workshop (1.0 cr)

Take 9 or more credit(s) from the following:
GEO 4211 - Solid Earth Geophysics I (3.0 cr)
GEO 4212 - Solid Earth Geophysics II (3.0 cr)
GEO 4203 - Principles of Geophysical Exploration (3.0 cr)
GEO 4204 - Geomagnetism and Paleomagnetism (3.0 cr)
GEO 5203 - Mineral and Rock Physics (3.0 cr)

Electives
Take 9 additional credits of GEO courses, with no more than 4 credits of 1xxx and 3 credits of 2xxx.

Take 9 or more credit(s) from the following:
GEO 1xxx
GEO 2xxx
GEO 3xxx
GEO 4xxx
GEO 5xxx

Technical Electives
Take 9 additional credits of math or science approved by adviser.

Information Technology Minor

Computer Science and Engineering

Requirements for this program are current for Fall 2006.

Required credits in this minor: 16.

This interdisciplinary minor requires at least 16 credits, including two core courses from the Institute of Technology and three breadth courses from the Colleges of Design and Liberal Arts. The minor enables students in nontechnical disciplines to supplement their major with a practical set of courses focused on information technology.

Program Requirements

Required Courses

Core Courses
Take 2 or more course(s) from the following:
CSCI 1001 - Overview of Computer Science (4.0 cr)
CSCI 1103 - Introduction to Computer Programming in Java (4.0 cr)
CSCI 1121 - Introduction to the Internet 1 (4.0 cr)

Breadth Courses
Note: DHA 2334 is a prerequisite for more advanced graphic design courses; although these courses are limited to graphic design majors, admission can be obtained through permission of the instructor.

Take 3 or more course(s) from the following:
COMM 3201 - Introduction to Electronic Media Production (4.0 cr)
COMM 3211 - Introduction to U.S. Electronic Media (3.0 cr)
COMM 4231 - Comparing Electronic Media Systems, IP (3.0 cr)
COMM 4235 - Electronic Media and Ethnic Minorities--A World View, IP (3.0 cr)
COMM 4291 - New Telecommunication Media (3.0 cr)
COMM 5233 - Electronica Media and National Development (3.0 cr)
DHA 2334 - Computer Applications I: Digital Composition for Design (3.0 cr)
DHA 4334 - Computer Applications II: Design for the Digital Environment (3.0 cr)
DHA 4384 - Interactive Media (3.0 cr)
DHA 5381 - Digital Illustration (3.0 cr)
DHA 5382 - Digital Sound and Video (3.0 cr)
DHA 5383 - Digital Illustration and Animation (4.0 cr)
DHA 5385 - Internet-Based Media (3.0 cr)
DHA 5399 - Theory of Electronic Design (3.0 cr)
ENGC 3632 - Electronic Texts (3.0 cr)
GEOG 3561 - Principles of Geographic Information Science (4.0 cr)
GEOG 5563 - Advanced Geographic Information Science (3.0 cr)
GEOG 5564 - Urban Geographic Information Science and Analysis (3.0 cr)
JOUR 3004 - Information for Mass Communication (3.0 cr)
JOUR 3614 - History of Media Communication, HP (3.0 cr)
JOUR 3776 - Mass Communication Law (3.0 cr)

Materials Science and Engineering B.Mat.S.E.

Chemical Engineering & Materials Science

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 128.

Required credits within the major: 38.

Degree: Bachelor of Materials Science and Engineering.

The program in materials science and engineering leads to a bachelor's degree that enables students to immediately enter the profession. The program develops an understanding of the properties and the origin of these properties in a broad range of materials, including metals, ceramics, semiconductors, polymers, and composites. Because the program is broadly based, graduates find employment across a broad range of industries, including the automotive, chemical, electronics, energy, and medical technology industries. Graduates also find positions in consulting, research, technical management, and teaching.

The materials science and engineering (MSE) program provides educational experiences that challenge students to

- learn the scientific and engineering principles underlying the four major elements of materials engineering: structure, properties, processing, and performance of engineering materials (including metals and alloys, ceramics, polymers, and composites).
- apply and integrate knowledge of the above four elements to identify, formulate, and solve materials selection problems and design problems.
- learn experimental, statistical, and computational techniques in the context of MSE.
- design and conduct experiments, as well as analyze and interpret data.
- prepare for an engineering career by developing communication and teamwork skills and an understanding of the importance of lifelong learning, professionalism, and ethical responsibility.

Admission Requirements

Students must complete 11 courses before admission to the program.

Freshmen and transfer students are usually admitted to pre-major status before admission to this major.

A GPA above 2.00 is preferred for the following:

- 2.80 for students transferring from outside the University.

Students interested in materials science and engineering are recommended to take MATS 1001/CHEN 1001 in order to learn more about the field.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Required Courses for Admission

Mathematics

MATH 1271 - Calculus I, MATH (4.0 cr)
or MATH 1371 - IT Calculus I, MATH (4.0 cr)
MATH 1272 - Calculus II (4.0 cr)
or MATH 1372 - IT Calculus II (4.0 cr)
MATH 2243 - Linear Algebra and Differential Equations (4.0 cr)
or MATH 2373 - IT Linear Algebra and Differential Equations (4.0 cr)
MATH 2263 - Multivariable Calculus (4.0 cr)
or MATH 2374 - IT Multivariable Calculus and Vector Analysis (4.0 cr)

Physical Sciences

AEM 2011 - Statics (3.0 cr)
CHEM 1021 - Chemical Principles I, ENVT, PHYS SCI/L (4.0 cr)
or CHEM 1031H - Honors Chemistry I, ENVT, PHYS SCI/L, H (4.0 cr)
CHEM 1022 - Chemical Principles II, ENVT, PHYS SCI/L (4.0 cr)
or CHEM 1032H - Honors Chemistry II, ENVT, PHYS SCI/L, H (4.0 cr)
CHEM 2301 - Organic Chemistry I (3.0 cr)
PHYS 1301W - Introductory Physics for Science and Engineering I, PHYS SCI/L, WI (4.0 cr)
or PHYS 1401V - Honors Physics I, PHYS SCI/L, WI, H (4.0 cr)
PHYS 1302W - Introductory Physics for Science and Engineering II, PHYS SCI/L, WI (4.0 cr)
or PHYS 1402V - Honors Physics II, PHYS SCI/L, WI, H (4.0 cr)
PHYS 2303 - Physics III: Physics of Matter (4.0 cr)
or PHYS 2403H - Honors Phys III, H (4.0 cr)

Program Requirements

Required Courses

Major Courses

AEM 3031 - Deformable Body Mechanics (3.0 cr)
AEM 4511 - Mechanics of Composite Materials (3.0 cr)
CE 3101 - Computer Applications in Civil Engineering I (3.0 cr)
MATS 3011 - Introduction to Materials Science and Engineering (3.0 cr)
MATS 3012 - Metals and Alloys, WI (3.0 cr)
MATS 3801 - Structural Characterization Lab (2.0 cr)
MATS 3851W - Materials Properties Lab, WI (2.0 cr)
MATS 4001 - Thermodynamics of Materials (4.0 cr)
MATS 4002 - Mass Transport and Kinetics (4.0 cr)
MATS 4013 - Electrical and Magnetic Properties of Materials (3.0 cr)
MATS 4212 - Ceramics (3.0 cr)
MATS 4214 - Polymers (3.0 cr)
MATS 4221 - Materials Design and Performance (4.0 cr)
MATS 4301W - Materials Processing, WI (4.0 cr)
MATS 4400 - Senior Design Project (3.0 cr)

Technical Electives

Students must take 13 credits of technical electives. See an adviser for a list of possible courses.

Mathematics B.S.Math.

School of Mathematics

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 56.

Degree: Bachelor of Science in Mathematics.

The mission of the program is to provide high-quality mathematics instruction in a stimulating intellectual atmosphere. The goal is to educate students at all levels to provide cultural enrichment, to give them the analytic tools they need to become responsible citizens, and to prepare them for careers involving mathematics.

The School of Mathematics offers a program leading to the bachelor of science degree. The course of study is flexible and may be adapted to satisfy a wide variety of interests and needs. Students may prepare for graduate study in mathematics or emphasize various fields of interest, such as preparation for secondary school teaching, actuarial science, or programs in applied mathematics, including industrial mathematics, biology, mathematics applicable to computer science, and numerical analysis. Programs for specializations in actuarial science, preparation for teaching in the secondary school, and

mathematics applicable to computer science earn a designation that appears on the diploma.

Admission Requirements

Students must complete 8 courses before admission to the program.

Freshmen and transfer students are usually admitted to pre-major status before admission to this major.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Required Courses for Admission

Mathematics

MATH 1271 - Calculus I, MATH (4.0 cr)
or MATH 1371 - IT Calculus I, MATH (4.0 cr)
MATH 1272 - Calculus II (4.0 cr)
or MATH 1372 - IT Calculus II (4.0 cr)
MATH 2243 - Linear Algebra and Differential Equations (4.0 cr)
or MATH 2373 - IT Linear Algebra and Differential Equations (4.0 cr)
MATH 2263 - Multivariable Calculus (4.0 cr)
or MATH 2374 - IT Multivariable Calculus and Vector Analysis (4.0 cr)
MATH 2283 - Sequences, Series, and Foundations (3.0 cr)
or MATH 3283W - Sequences, Series, and Foundations: Writing Intensive, WI (4.0 cr)

Physics

PHYS 1301W - Introductory Physics for Science and Engineering I, PHYS SCI/L, WI (4.0 cr)
or PHYS 1401V - Honors Physics I, PHYS SCI/L, WI, H (4.0 cr)
PHYS 1302W - Introductory Physics for Science and Engineering II, PHYS SCI/L, WI (4.0 cr)
or PHYS 1402V - Honors Physics II, PHYS SCI/L, WI, H (4.0 cr)

Program Requirements

Students must complete eight upper division math courses at 4xxx or above and two technical elective courses, which can be mathematics courses.

The School of Mathematics will accept STAT 5101 and 5102 as part of the eight-course upper division mathematics requirement. The content of STAT 5101 is the same as MATH 5651. No other courses from other departments may be used as part of the eight-course math requirement, though other courses may be used as technical electives.

MATH 4512 may not be used to satisfy part of the eight course upper division math requirement, though it may be used as technical elective. MATH 3113, 3116, 3118, 4113, 4116, 4118, 3283W, and 4005 may not be used to satisfy part of the eight-course upper division math requirement or as technical electives.

In addition to the specializations described below, students who wish to pursue a pure mathemtics track or are planning to go to graduate school in mathematics should consult their adviser about appropriate course choices.

Specializations in Mathematics

Students are required to complete one of the following course groups.

Mathematics (No Specialization)

Students who do not choose one of the other specializations complete the basic requirements listed here. For the Technical Electives requirement, students must take at least 6 credits from courses that meet the following criteria: prerequisite of calculus; 3xxx or higher; courses form a coherent part of the student's program.

Take 2 or more course(s).

Take 1 or more course(s) from the following:

MATH 4281 - Introduction to Modern Algebra (4.0 cr)
MATH 5248 - Cryptology and Number Theory (4.0 cr)
MATH 5251 - Error-Correcting Codes, Finite Fields, Algebraic Curves (4.0 cr)
MATH 5285H - Honors: Fundamental Structures of Algebra I, H (4.0 cr)
MATH 5286H - Honors: Fundamental Structures of Algebra II, H (4.0 cr)
MATH 5385 - Introduction to Computational Algebraic Geometry (4.0 cr)

Take 0 or more course(s) from the following:

MATH 4242 - Applied Linear Algebra (4.0 cr)
MATH 5705 - Enumerative Combinatorics (4.0 cr)
MATH 5707 - Graph Theory and Non-enumerative Combinatorics (4.0 cr)
MATH 5711 - Linear Programming and Combinatorial Optimization (4.0 cr)
MATH 5485 - Introduction to Numerical Methods I (4.0 cr)

Take 2 or more course(s) from the following:

MATH 4606 - Advanced Calculus (4.0 cr)
MATH 5486 - Introduction To Numerical Methods II (4.0 cr)
MATH 5525 - Introduction to Ordinary Differential Equations (4.0 cr)
MATH 5535 - Dynamical Systems and Chaos (4.0 cr)
MATH 5583 - Complex Analysis (4.0 cr)
MATH 5587 - Elementary Partial Differential Equations I (4.0 cr)
MATH 5588 - Elementary Partial Differential Equations II (4.0 cr)
MATH 5652 - Introduction to Stochastic Processes (4.0 cr)
MATH 5654 - Prediction and Filtering (4.0 cr)
MATH 5615H - Honors: Introduction to Analysis I, H (4.0 cr)
MATH 5616H - Honors: Introduction to Analysis II, H (4.0 cr)
MATH 5651 - Basic Theory of Probability and Statistics (4.0 cr)
or STAT 5101 - Theory of Statistics I (4.0 cr)
CSCI 1103 - Introduction to Computer Programming in Java (4.0 cr)
or CSCI 1107 - Introduction to FORTRAN Programming for Scientists and Engineers (3.0 cr)
or CSCI 1113 - Introduction to C/C++ Programming for Scientists and Engineers (4.0 cr)
or CSCI 1901 - Structure of Computer Programming I (4.0 cr)
or CSCI 1902 - Structure of Computer Programming II (4.0 cr)
PHYS 2303 - Physics III: Physics of Matter (4.0 cr)
or PHYS 2311 - Modern Physics (4.0 cr)
or PHYS 2503 - Physics III: Foundations of Modern Physics (4.0 cr)

Complete 6 credits of technical electives selected in consultation with your adviser.

-OR-

Mathematical Biology Specialization

Students select one of three options: environmental science, genomics, or physiology. Consult an adviser for more information.

MATH 4428 - Mathematical Modeling (4.0 cr)
MATH 4242 - Applied Linear Algebra (4.0 cr)

Take 1 or more course(s) from the following:

MATH 4281 - Introduction to Modern Algebra (4.0 cr)
MATH 5248 - Cryptology and Number Theory (4.0 cr)
MATH 5251 - Error-Correcting Codes, Finite Fields, Algebraic Curves (4.0 cr)
MATH 5285H - Honors: Fundamental Structures of Algebra I, H (4.0 cr)
MATH 5286H - Honors: Fundamental Structures of Algebra II, H (4.0 cr)
MATH 5385 - Introduction to Computational Algebraic Geometry (4.0 cr)
BIOL 1009 - General Biology, BIOL SCI/L (4.0 cr)
or

take the following course pair

BIOL 1001 - Introductory Biology I: Evolutionary and Ecological Perspectives, BIOL SCI/L, ENVT (4.0 cr)
BIOL 1002W - Introductory Biology II: Molecular, Cellular, and Developmental Perspectives, WI (5.0 cr)
CSCI 1103 - Introduction to Computer Programming in Java (4.0 cr)
or CSCI 1107 - Introduction to FORTRAN Programming for Scientists and Engineers (3.0 cr)

or CSCI 1113 - Introduction to C/C++ Programming for Scientists and Engineers (4.0 cr)
or CSCI 1901 - Structure of Computer Programming I (4.0 cr)
or CSCI 1902 - Structure of Computer Programming II (4.0 cr)
MATH 5525 - Introduction to Ordinary Differential Equations (4.0 cr)
MATH 5535 - Dynamical Systems and Chaos (4.0 cr)
MATH 5651 - Basic Theory of Probability and Statistics (4.0 cr)

Senior seminar (1 credit)
Complete an approved research internship for at least 4 credits.

Complete the requirements for the environmental science or genomics or physiology option. See your adviser for specifics.

-OR-

Actuarial Specialization
Complete the requirements for the actuarial sub-plan.

-OR-

Mathematics Education Specialization
Complete the requirements for the mathematics education sub-plan.

-OR-

Computer Applications Specialization
Complete the requirements for the computer applications sub-plan.

Program Sub-plans

A sub-plan is not required for this program.

Actuarial Science

Students should take 6 courses of mathematics or statistics and math electives in economics, accounting, insurance, and finance. For the computer science requirement, only 1103 or 1113 should be chosen.

Required Courses

Math and Computer Science
These courses will fulfill both the analysis course requirement and one of the algebra course requirements.

MATH 4065 - Theory of Interest (3.0 cr)
MATH 5067 - Actuarial Mathematics I (4.0 cr)
MATH 5068 - Actuarial Mathematics II (4.0 cr)
MATH 4242 - Applied Linear Algebra (4.0 cr)
Take 1 or more course(s) from the following:
MATH 4281 - Introduction to Modern Algebra (4.0 cr)
MATH 5248 - Cryptology and Number Theory (4.0 cr)
MATH 5251 - Error-Correcting Codes, Finite Fields, Algebraic Curves (4.0 cr)
MATH 5285H - Honors: Fundamental Structures of Algebra I, H (4.0 cr)
MATH 5286H - Honors: Fundamental Structures of Algebra II, H (4.0 cr)
MATH 5385 - Introduction to Computational Algebraic Geometry (4.0 cr)
CSCI 1103 - Introduction to Computer Programming in Java (4.0 cr)
or CSCI 1113 - Introduction to C/C++ Programming for Scientists and Engineers (4.0 cr)
MATH 5651 - Basic Theory of Probability and Statistics (4.0 cr)
or STAT 5101 - Theory of Statistics I (4.0 cr)
MATH 5652 - Introduction to Stochastic Processes (4.0 cr)
or STAT 5102 - Theory of Statistics II (4.0 cr)

Economics and Business
ECON 1101 - Principles of Microeconomics, IP, SSCI (4.0 cr)
ECON 1102 - Principles of Macroeconomics, IP, SSCI (4.0 cr)
or
ECON 1104 - Principles of Microeconomics, IP, SSCI (4.0 cr)
or ECON 1105 - Principles of Macroeconomics, IP, SSCI (4.0 cr)
ACCT 2050 - Introduction to Financial Reporting (4.0 cr)
ECON 3101 - Intermediate Microeconomics (4.0 cr)
FINA 3001 - Finance Fundamentals (3.0 cr)
ECON 4751 - Financial Economics (3.0 cr)
or FINA 4241 - Corporate Financing Decisions (4.0 cr)
Take 2 or more course(s) from the following:
INS 4100 - Corporate Risk Management (2.0 cr)
INS 4101 - Employee Benefits (2.0 cr)
INS 4200 - Insurance Theory and Practice (2.0 cr)

Computer Applications
Take at least 24 credits of math/computer science courses relating to computer applications. Students who complete the computer application emphasis will also satisfy the requirements for a minor in computer science.

Required Courses

Computer Applications
MATH 5486 may be used toward the analysis distribution requirement and MATH 5485 toward the algebra requirement.

CSCI 2011 - Discrete Structures of Computer Science (4.0 cr)
MATH 5165 - Mathematical Logic I (4.0 cr)
MATH 5485 - Introduction to Numerical Methods I (4.0 cr)
MATH 5486 - Introduction To Numerical Methods II (4.0 cr)
CSCI 1103 - Introduction to Computer Programming in Java (4.0 cr)
or CSCI 1113 - Introduction to C/C++ Programming for Scientists and Engineers (4.0 cr)
CSCI 1901 - Structure of Computer Programming I (4.0 cr)
or CSCI 1902 - Structure of Computer Programming II (4.0 cr)

Additional Algebra
Take 1 or more course(s) from the following:
MATH 4281 - Introduction to Modern Algebra (4.0 cr)
MATH 5248 - Cryptology and Number Theory (4.0 cr)
MATH 5251 - Error-Correcting Codes, Finite Fields, Algebraic Curves (4.0 cr)
MATH 5285H - Honors: Fundamental Structures of Algebra I, H (4.0 cr)
MATH 5286H - Honors: Fundamental Structures of Algebra II, H (4.0 cr)
MATH 5385 - Introduction to Computational Algebraic Geometry (4.0 cr)

Additional Analysis
Take 1 or more course(s) from the following:
MATH 4606 - Advanced Calculus (4.0 cr)
MATH 5525 - Introduction to Ordinary Differential Equations (4.0 cr)
MATH 5535 - Dynamical Systems and Chaos (4.0 cr)
MATH 5583 - Complex Analysis (4.0 cr)
MATH 5587 - Elementary Partial Differential Equations I (4.0 cr)
MATH 5588 - Elementary Partial Differential Equations II (4.0 cr)
MATH 5652 - Introduction to Stochastic Processes (4.0 cr)
MATH 5654 - Prediction and Filtering (4.0 cr)
MATH 5615H - Honors: Introduction to Analysis I, H (4.0 cr)
MATH 5616H - Honors: Introduction to Analysis II, H (4.0 cr)
MATH 5651 - Basic Theory of Probability and Statistics (4.0 cr)
or STAT 5101 - Theory of Statistics I (4.0 cr)

Additional Computing-Related Mathematics
A course chosen from this group that also meets the algebra distribution requirement must be taken in addition to the two courses required for all majors.

MATH 4242 - Applied Linear Algebra (4.0 cr)
or MATH 5166 - Mathematical Logic II (4.0 cr)
or MATH 5248 - Cryptology and Number Theory (4.0 cr)
or MATH 5251 - Error-Correcting Codes, Finite Fields, Algebraic Curves (4.0 cr)

or MATH 5285H - Honors: Fundamental Structures of Algebra I, H (4.0 cr)
or MATH 5286H - Honors: Fundamental Structures of Algebra II, H (4.0 cr)
or MATH 5385 - Introduction to Computational Algebraic Geometry (4.0 cr)
or MATH 5487 - Computational Methods for Differential and Integral Equations in Engineering and Science I (4.0 cr)
or MATH 5705 - Enumerative Combinatorics (4.0 cr)
or MATH 5707 - Graph Theory and Non-enumerative Combinatorics (4.0 cr)
or MATH 5711 - Linear Programming and Combinatorial Optimization (4.0 cr)

Computer Science
Upper level computer science courses may be counted as technical electives.

Take 3 or more course(s) from the following:
CSCI 4041 - Algorithms and Data Structures (4.0 cr)
CSCI 5107 - Fundamentals of Computer Graphics 1 (3.0 cr)
CSCI 5108 - Fundamentals of Computer Graphics II (3.0 cr)
CSCI 5403 - Computational Complexity (3.0 cr)
CSCI 5421 - Advanced Algorithms and Data Structures (3.0 cr)
CSCI 5511 - Artificial Intelligence I (3.0 cr)
CSCI 5521 - Pattern Recognition (3.0 cr)
CSCI 8442 - Computational Geometry and Applications (3.0 cr)
CSCI 5512W - Artificial Intelligence II, WI (3.0 cr)
or CSCI 5519 - Artificial Intelligence II (non-WI) (3.0 cr)

Physics
A physics course from the following list should be taken in the third semester (fall semester of the second year).

PHYS 2303 - Physics III: Physics of Matter (4.0 cr)
or PHYS 2311 - Modern Physics (4.0 cr)
or PHYS 2503 - Physics III: Foundations of Modern Physics (4.0 cr)

Mathematics Education

Preparation for teaching in secondary education

Courses that are recommended but not required for this specialization include MATH 5652 Stochastic Processes or STAT 5102 Theory of Statistics II; and MATH 5336 Geometry II. IT majors can satisfy the technical elective requirement with courses in mathematics education. These may include two of MATHE 5011, MATHE 5021 and MATHE 5031, but the mathematics adviser should be consulted to approve the technical elective.

Required Courses

These course fulfill the both the algebra and analysis requirements.

MATH 5335 - Geometry I (4.0 cr)
MATH 4242 - Applied Linear Algebra (4.0 cr)
or MATH 4281 - Introduction to Modern Algebra (4.0 cr)
or MATH 5285H - Honors: Fundamental Structures of Algebra I, H (4.0 cr)
MATH 4707 - Introduction to Combinatorics and Graph Theory (4.0 cr)
or MATH 5705 - Enumerative Combinatorics (4.0 cr)
or MATH 5707 - Graph Theory and Non-enumerative Combinatorics (4.0 cr)
MATH 5651 - Basic Theory of Probability and Statistics (4.0 cr)
or STAT 5101 - Theory of Statistics I (4.0 cr)

Computer Science
CSCI 1103 - Introduction to Computer Programming in Java (4.0 cr)
or CSCI 1107 - Introduction to FORTRAN Programming for Scientists and Engineers (3.0 cr)
or CSCI 1113 - Introduction to C/C++ Programming for Scientists and Engineers (4.0 cr)
or CSCI 1901 - Structure of Computer Programming I (4.0 cr)
or CSCI 1902 - Structure of Computer Programming II (4.0 cr)

Physics
Take one of the following physics courses in the third semeser (fall semester of the second year).

PHYS 2303 - Physics III: Physics of Matter (4.0 cr)
or PHYS 2311 - Modern Physics (4.0 cr)
or PHYS 2503 - Physics III: Foundations of Modern Physics (4.0 cr)

School Mathematics
Consult an adviser before completing this requirement.

Take 2 or more course(s) from the following:
MTHE 5011 - Arithmetic Structures in School Mathematics (3.0 cr)
MTHE 5021 - Algebraic Structures in School Mathematics (3.0 cr)
MTHE 5031 - Geometric Structures in School Mathematics (3.0 cr)

Mechanical Engineering B.M.E.

Mechanical Engineering

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 128.

Required credits within the major: 49.

Degree: Bachelor of Mechanical Engineering.

The Department of Mechanical Engineering is committed to offering undergraduate and graduate education of the highest quality in mechanical and industrial engineering, to conducting significant basic and applied research in selected areas, and to providing professional service to the appropriate constituencies of a major land grant university.

Mechanical engineering is involved in most technological activities of society and dominates many, including automotive, transportation and materials handling, environmental and pollution control systems, refrigeration and cryogenics, power systems design, automation, system dynamics and control, computer-aided design and manufacturing, and machinery/consumer products production. A mechanical engineer may be engaged in design, development, research, testing, manufacturing, administration, marketing, consulting, or education.

Admission Requirements

Students must complete 9 courses before admission to the program.

Freshmen and transfer students are usually admitted to pre-major status before admission to this major.

A GPA above 2.00 is preferred for the following:

- 2.50 for students already admitted to the degree-granting college.
- 2.5o for students transferring from another University of Minnesota college.
- 3.0o for students transferring from outside the University.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Required Courses for Admission

Mathematics

MATH 1271 - Calculus I, MATH (4.0 cr)
or MATH 1371 - IT Calculus I, MATH (4.0 cr)
MATH 1272 - Calculus II (4.0 cr)
or MATH 1372 - IT Calculus II (4.0 cr)
MATH 2243 - Linear Algebra and Differential Equations (4.0 cr)
or MATH 2373 - IT Linear Algebra and Differential Equations (4.0 cr)
MATH 2263 - Multivariable Calculus (4.0 cr)
or MATH 2374 - IT Multivariable Calculus and Vector Analysis (4.0 cr)

Physical Sciences

CSCI 1113 - Introduction to C/C++ Programming for Scientists and Engineers (4.0 cr)
CHEM 1021 - Chemical Principles I, ENVT, PHYS SCI/L (4.0 cr)
or CHEM 1031H - Honors Chemistry I, ENVT, PHYS SCI/L, H (4.0 cr)
PHYS 1301W - Introductory Physics for Science and Engineering I, PHYS SCI/L, WI (4.0 cr)
or PHYS 1401V - Honors Physics I, PHYS SCI/L, WI, H (4.0 cr)
PHYS 1302W - Introductory Physics for Science and Engineering II, PHYS SCI/L, WI (4.0 cr)
or PHYS 1402V - Honors Physics II, PHYS SCI/L, WI, H (4.0 cr)

Statics and Dynamics

AEM 2021 - Statics and Dynamics (4.0 cr)
or
take the following course pair
AEM 2011 - Statics (3.0 cr)
AEM 2012 - Dynamics (3.0 cr)

Program Requirements

Required Courses

Major Courses

AEM 3031 - Deformable Body Mechanics (3.0 cr)
EE 3005 - Fundamentals of Electrical Engineering (4.0 cr)
EE 3006 - Fundamentals of Electrical Engineering Laboratory (1.0 cr)
IE 4521 - Statistics, Quality, and Reliability (4.0 cr)
MATS 2001 - Introduction to the Science of Engineering Materials (3.0 cr)
ME 2011 - Introduction to Engineering (4.0 cr)
ME 3221 - Design and Manufacturing I: Engineering Materials and Manufacturing Processes (4.0 cr)
ME 3222 - Design and Manufacturing II (4.0 cr)
ME 3281 - System Dynamics and Control (4.0 cr)
ME 3331 - Thermal Sciences I (3.0 cr)
ME 3332 - Thermal Sciences II (3.0 cr)
ME 3333 - Thermal Sciences III (3.0 cr)
ME 4031W - Basic Mechanical Measurements Laboratory, WI (4.0 cr)
ME 4054W - Design Projects, WI (4.0 cr)

Electives

ME 4131W - Thermal Environmental Engineering Laboratory, WI (4.0 cr)
or ME 4231 - Motion Control Laboratory (4.0 cr)
or ME 4232 - Fluid Power Control Lab (4.0 cr)
or ME 4331 - Thermal Engineering Laboratory (4.0 cr)
or ME 4431W - Energy Conversion Systems Laboratory, WI (4.0 cr)
or ME 5133 - Aerosol Measurement Laboratory (4.0 cr)
or ME 5231 - Digital and Analog Control Laboratory (4.0 cr)

Technical Electives

Complete 16 credits of upper division technical electives, with at least 8 credits in ME/IE. Students may choose options in power and propulsion, design and manufacturing, thermodynamics and heat transfer, or environment or select electives in consultation with their adviser.

Program Sub-plans

A sub-plan is not required for this program.

EIP

ME EIP program (engineering intern program or co-op program) is available during the last two years of study. Upper division status and a satisfactory GPA are required for admission. The co-op program provides applied engineering training in selected established industries during semesters of supervised assignments that alternate with semesters of University studies.

Students in the ME EIP program (engineering intern program or Co-op program) register for three industrial assignment courses. ME 3041 (2 credits), ME 4042 (2 credits), and ME 4043W (4 credits) for a total of 8 credits. These courses are used in place of two technical electives.

Students register for industrial assignments as they would for regular classes. Requirements for the course include writing a summary of an article in a technical journal, attending a workshop (ME 3041, ME 4043), submitting a report draft, and writing a final report. The course grade is based on writing; work performance cannot be considered in assigning a grade. The last industrial assignment, ME 4043, is oriented toward solving a design problem and fulfills a 4-credit intensive writing course requirement. Cooperation from company personnel is required in accomplishing most reports, particularly the ME 4043 reports.

Required Courses

Internship

ME 3041 - Industrial Assignment I (2.0 cr)
ME 4042 - Industrial Assignment II (2.0 cr)
ME 4043W - Industrial Assignment III, WI (4.0 cr)

Industrial Engineering

The IE option gives students an understanding of managerial and human factor issues involved in designing products and running manufacturing, logistics, and service operations. Students also learn additional skills for analysis, optimization, and simulation of large-scale systems such as factories, logistical systems, and organizational networks.

Students who select the IE option complete the same set of required courses as other mechanical engineering students, but their technical electives are selected from the industrial engineering course options and in consultation with a faculty adviser.

Required Courses

Technical Electives

Take 4 Courses (16 credits) from the following list. Choose one course from each area.

Tech Elective - Human Factors

or IE 5511 - Human Factors and Work Analysis (4.0 cr)
or IE 5512 - Applied Ergonomics (4.0 cr)
or IE 5513 - Engineering Safety (4.0 cr)

Tech Elective - Engineering Management
or IE 5441 - Engineering Cost Accounting and Cost Control (4.0 cr)
or IE 5522 - Quality Engineering and Reliability (4.0 cr)
or IE 5541 - Project Management (4.0 cr)
Tech Elective - Production Systems
or IE 5551 - Production Planning and Inventory Control (4.0 cr)
or IE 5552 - Design and Analysis of Manufacturing Systems (4.0 cr)

Tech Elective - Operations Research
or IE 5531 - Engineering Optimization I, H (4.0 cr)
or IE 5553 - Simulation (4.0 cr)

Industrial Engineering EIP

The Engineering Intern Program (EIP or co-op program) for industrial engineering students is offered through an industrial engineering option. Students complete the same set of required courses as other mechanical engineering students, but their technical electives must be selected from an approved list and in consultation with a faculty adviser. Students selecting the option may also apply to the co-op program.

Technical electives should be taken in the IE department. Students should also take the neccessary course in conjunction with their internship/co-op program.

Required Courses

Technical Electives
Choose 4 courses (16 credits) from the following list. Choose one course from each area.

Tech Elective - Human Factors
or IE 5511 - Human Factors and Work Analysis (4.0 cr)
or IE 5512 - Applied Ergonomics (4.0 cr)
or IE 5513 - Engineering Safety (4.0 cr)

Tech Elective - Engineering Management
or IE 5441 - Engineering Cost Accounting and Cost Control (4.0 cr)
or IE 5522 - Quality Engineering and Reliability (4.0 cr)
or IE 5541 - Project Management (4.0 cr)

Tech Elective - Production Systems
or IE 5551 - Production Planning and Inventory Control (4.0 cr)
or IE 5552 - Design and Analysis of Manufacturing Systems (4.0 cr)

Tech Elective - Operations Research
or IE 5531 - Engineering Optimization I, H (4.0 cr)
or IE 5553 - Simulation (4.0 cr)

Internship
ME 3041 - Industrial Assignment I (2.0 cr)
ME 4042 - Industrial Assignment II (2.0 cr)
ME 4043W - Industrial Assignment III, WI (4.0 cr)

Physics B.S. Phys.

School of Physics & Astronomy

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 38 to 41.

Degree: Bachelor of Science in Physics.

The physics program prepares students for employment, often in industrial or governmental laboratories, or for further study at graduate or professional schools in physics, engineering, biophysics, medicine, education, law, or business.

The program integrates a broad foundation in physics that can be flexibly combined with coursework in other technical disciplines or used to specialize in physics. Students should consult a physics adviser to help formulate objectives for study.

Admission Requirements

Students must complete 7 courses before admission to the program.

Freshmen and transfer students are usually admitted to pre-major status before admission to this major.

A GPA above 2.00 is preferred for the following:

- 2.50 for students transferring from another University of Minnesota college.
- 2.80 for students transferring from outside the University.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Required Courses for Admission

Preparatory Mathematics
Math 1571-1572-2573 (Honors math sequence) may be taken in place of the listed courses.

MATH 1271 - Calculus I, MATH (4.0 cr)
or MATH 1371 - IT Calculus I, MATH (4.0 cr)
MATH 1272 - Calculus II (4.0 cr)
or MATH 1372 - IT Calculus II (4.0 cr)
MATH 2243 - Linear Algebra and Differential Equations (4.0 cr)
or MATH 2373 - IT Linear Algebra and Differential Equations (4.0 cr)
MATH 2263 - Multivariable Calculus (4.0 cr)
or MATH 2374 - IT Multivariable Calculus and Vector Analysis (4.0 cr)

Preparatory Physics
PHYS 1301W - Introductory Physics for Science and Engineering I, PHYS SCI/L, WI (4.0 cr)
or PHYS 1401V - Honors Physics I, PHYS SCI/L, WI, H (4.0 cr)
PHYS 1302W - Introductory Physics for Science and Engineering II, PHYS SCI/L, WI (4.0 cr)
or PHYS 1402V - Honors Physics II, PHYS SCI/L, WI, H (4.0 cr)
PHYS 2403H - Honors Phys III, H (4.0 cr)
or PHYS 2503 - Physics III: Foundations of Modern Physics (4.0 cr)

Program Requirements

In addition to the official concentrations in physics (biological physics, engineering physics, physics for teaching), students may also complete a focus in either computational physics or professional physics.

For computational physics, students must take the two remaining courses they did not use to satisfy the major core requirements from the list of PHYS 4001, 4002, 4101, and 4201 noted above. Students must also take 19 credits of technical electives, chosen in consultation with an adviser. Any course in the sciences, math, or engineering may be used to fulfill these requirements. Students intending to pursue graduate study in physics are strongly encouraged to take PHYS 4303.

Required Courses

Major Courses
PHYS 2601 - Quantum Physics (4.0 cr)
PHYS 2605 - Quantum Physics Laboratory (3.0 cr)
PHYS 4051 - Methods of Experimental Physics I (5.0 cr)
PHYS 4052W - Methods of Experimental Physics II, WI (5.0 cr)

Technical Electives or Specializations
Complete 19 credits of technical electives or one of the optional specializations (sub-plans).

Students are required to complete one of the following course groups.

Specialization
Complete the requirements listed in the any of the following physics subplans: computational physics, biological, engineering, or teaching.

-OR-

Technical Electives
Select at least 19 credits of technical electives in consultation with your adviser.

-OR-

Professional Physics
For students who want the strongest possible grounding in physics, are interested in fundamental physics or astrophysics or applying physics to the workplace, or plan to continue physics education in graduate school.

PHYS 4001 - Analytical Mechanics (4.0 cr)
PHYS 4002 - Electricity and Magnetism (4.0 cr)
PHYS 4101 - Quantum Mechanics (4.0 cr)
PHYS 4201 - Statistical and Thermal Physics (3.0 cr)
Take an additional 19 credits of approved technical electives from the sciences, math, or engineering.

Take 3 or more credit(s) from the following:
MATH 3xxx
MATH 4xxx
MATH 5xxx

Take 1 or more course(s) totaling 3 or more credit(s) from the following:
PHYS 3xxx
PHYS 4xxx
PHYS 5xxx

Program Sub-plans

A sub-plan is not required for this program.

Biological

For students with an interest in the biological applications of physics.

Required Courses

Physics for Biology
BIOC 3021 - Biochemistry (3.0 cr)
BIOL 1009 - General Biology, BIOL SCI/L (4.0 cr)
CHEM 1021 - Chemical Principles I, ENVT, PHYS SCI/L (4.0 cr)
CHEM 1022 - Chemical Principles II, ENVT, PHYS SCI/L (4.0 cr)
CHEM 2301 - Organic Chemistry I (3.0 cr)
PHYS 4001 - Analytical Mechanics (4.0 cr)
PHYS 4002 - Electricity and Magnetism (4.0 cr)
Complete 14 credits of technical electives with a biology emphasis, chosen in consultation with your adviser.

CHEM 3501 - Physical Chemistry I (3.0 cr)
or PHYS 4201 - Statistical and Thermal Physics (3.0 cr)
CHEM 3502 - Physical Chemistry II (3.0 cr)
or PHYS 4101 - Quantum Mechanics (4.0 cr)

Computational Physics

For students who are interested in the practical application of physics and computational methods, but who want a less specialized education than they would find in a computer science department.

Consult with a physics adviser for selection of at least 19 credits of technical electives.

Required Courses

Select 19 credits of technical electives in consultation with your adviser.

Engineering

For students interested in physics as applied in engineering professions.

Take the two remaining courses you did not use to satisfy the major core requirements from the list of PHYS 4001, 4002, 4101, and 4201.

Required Courses

Physics for Engineering
CHEM 1021 - Chemical Principles I, ENVT, PHYS SCI/L (4.0 cr)
PHYS 4101 - Quantum Mechanics (4.0 cr)
Complete 25 credits of technical electives in various engineering fields, physical sciences, or math, in consultation with your adviser.

AEM 2021 - Statics and Dynamics (4.0 cr)
or PHYS 4001 - Analytical Mechanics (4.0 cr)
or

take the following course pair
AEM 2011 - Statics (3.0 cr)
AEM 2012 - Dynamics (3.0 cr)
EE 3601 - Transmission Lines, Fields, and Waves (3.0 cr)
or PHYS 4002 - Electricity and Magnetism (4.0 cr)
ME 3321 - Thermodynamics (4.0 cr)
or ME 3324 - Introduction to Thermal Science (3.0 cr)
or PHYS 4201 - Statistical and Thermal Physics (3.0 cr)

Teaching

For students with an interest in teaching the physical sciences at the primary or secondary levels.

Required Courses

Chemistry and Upper Division Physics

CHEM 1021 - Chemical Principles I, ENVT, PHYS SCI/L (4.0 cr)
or CHEM 1031H - Honors Chemistry I, ENVT, PHYS SCI/L, H (4.0 cr)
CHEM 1022 - Chemical Principles II, ENVT, PHYS SCI/L (4.0 cr)
or CHEM 1032H - Honors Chemistry II, ENVT, PHYS SCI/L, H (4.0 cr)

Students are encouraged to complete all four courses.

Take 2 or more course(s) from the following:
PHYS 4001 - Analytical Mechanics (4.0 cr)
PHYS 4002 - Electricity and Magnetism (4.0 cr)
PHYS 4101 - Quantum Mechanics (4.0 cr)
PHYS 4201 - Statistical and Thermal Physics (3.0 cr)

Technical Electives

Complete 22 credits, including 8 or 9 credits chosen in consultation with an adviser. To meet licensure requirements, technical electives should include two courses in engineering, one of which has a substantial design component. Students must also demonstrate knowledge of computer programming in at least one language through coursework or completion of a project.

Take 13 or more credit(s). Other courses may be substituted in consultation with your adviser.

Take 1 or more course(s) from the following:
HSCI 4111 - History of 19th-Century Physics (3.0 cr)
HSCI 4121 - History of 20th-Century Physics (3.0 cr)

Other courses may be substituted in consultation with your adviser.

Take 1 or more course(s) from the following:
AST 2001 - Introduction to Astrophysics (4.0 cr)
AST 4001 - Astrophysics I (4.0 cr)
AST 4002 - Astrophysics II (4.0 cr)
PHYS 5022 - Relativity, Cosmology, and the Universe (4.0 cr)

Other courses may be substituted in consultation with your adviser.

Take 1 or more course(s) from the following:
GEO 2201 - Geodynamics I: The Solid Earth (3.0 cr)
GEO 2303W - Geochemical Principles, WI (3.0 cr)
GEO 3202 - Geodynamics II: The Fluid Earth (3.0 cr)
GEO 3401 - Geochronology and Earth History (3.0 cr)

Other courses may be substituted in consultation with your adviser.

Take 1 or more course(s) from the following:
AEM 4201 - Fluid Mechanics (4.0 cr)
EE 5621 - Physical Optics (3.0 cr)
ME 3321 - Thermodynamics (4.0 cr)
PHYS 4711 - Introduction to Optics (3.0 cr)
PHYS 5701 - Solid-State Physics for Engineers and Scientists (4.0 cr)

Complete an additional 8 or 9 credits (three courses), preferably in engineering and computer science. Consult your adviser for appropriate choices.

Statistics B.S. Stat.

Requirements for this program are current for Fall 2006.

Required credits to graduate with this degree: 120.

Required credits within the major: 38.

Degree: Bachelor of Science in Statistics.

The program gives students an understanding of the theory of statistics, trains them in basic use of the most important types of statistical methods, and prepares them for graduate work or for jobs in such diverse areas as marketing analysis, quality management, and support for scientific research.

The program provides a broad foundation in statistics that can be combined with coursework in other technical disciplines or as a basis for further specialization in statistics.

Admission Requirements

Students must complete 4 courses before admission to the program.

Freshmen and transfer students are usually admitted to pre-major status before admission to this major.

A GPA above 2.00 is preferred for the following:

- 2.50 for students transferring from outside the University.

For information about University of Minnesota admission requirements, visit the Office of Admissions Web site at http://admissions.tc.umn.edu.

Required Courses for Admission

Mathematics

MATH 1271 - Calculus I, MATH (4.0 cr)
or MATH 1371 - IT Calculus I, MATH (4.0 cr)
MATH 1272 - Calculus II (4.0 cr)
or MATH 1372 - IT Calculus II (4.0 cr)
MATH 2243 - Linear Algebra and Differential Equations (4.0 cr)
or MATH 2373 - IT Linear Algebra and Differential Equations (4.0 cr)
MATH 2263 - Multivariable Calculus (4.0 cr)
or MATH 2374 - IT Multivariable Calculus and Vector Analysis (4.0 cr)

Program Requirements

Required Courses

Major Courses

STAT 3011 - Introduction to Statistical Analysis, MATH (4.0 cr)
or STAT 3021 - Introduction to Probability and Statistics (3.0 cr)
MATH 4242 - Applied Linear Algebra (4.0 cr)
STAT 3022 - Data Analysis (4.0 cr)
STAT 4893W - Senior Paper, WI (1.0 cr)

Take one of the following pairs of courses.
STAT 4101 - Theory of Statistics I (4.0 cr)
STAT 4102 - Theory of Statistics II (4.0 cr)
or
STAT 5101 - Theory of Statistics I (4.0 cr)
STAT 5102 - Theory of Statistics II (4.0 cr)

Electives

Take 10 or more credit(s) from the following:
STAT 5031 - Statistical Methods for Quality Improvement (4.0 cr)
STAT 5041 - Bayesian Decision Making (3.0 cr)
STAT 5201 - Sampling Methodology in Finite Populations (3.0 cr)
STAT 5302 - Applied Regression Analysis (4.0 cr)
STAT 5303 - Designing Experiments (4.0 cr)
STAT 5401 - Applied Multivariate Methods (3.0 cr)
STAT 5421 - Analysis of Categorical Data (3.0 cr)
STAT 5601 - Nonparametric Methods (3.0 cr)

Computer and Physical Sciences

CSCI 1103 - Introduction to Computer Programming in Java (4.0 cr)

or CSCI 1107 - Introduction to FORTRAN Programming for Scientists and Engineers (3.0 cr)

or CSCI 1113 - Introduction to C/C++ Programming for Scientists and Engineers (4.0 cr)

Students must complete 3 science courses with a lab component, chosen from at least 2 of the fields of physics, chemistry, biology.

Take 3 or more course(s) including 2 or more sub-requirement(s).

Take 0 - 1 course(s) from the following:

BIOL 1009 - General Biology, BIOL SCI/L (4.0 cr)

BIOL 1009H - Honors: General Biology, BIOL SCI/L, H (4.0 cr)

Take 0 - 2 course(s) from the following:

CHEM 1021 - Chemical Principles I, ENVT, PHYS SCI/L (4.0 cr)

or CHEM 1031H - Honors Chemistry I, ENVT, PHYS SCI/L, H (4.0 cr)

CHEM 1022 - Chemical Principles II, ENVT, PHYS SCI/L (4.0 cr)

or CHEM 1032H - Honors Chemistry II, ENVT, PHYS SCI/L, H (4.0 cr)

Take 0 - 2 course(s) from the following:

PHYS 1301W - Introductory Physics for Science and Engineering I, PHYS SCI/L, WI (4.0 cr)

or PHYS 1401V - Honors Physics I, PHYS SCI/L, WI, H (4.0 cr)

PHYS 1302W - Introductory Physics for Science and Engineering II, PHYS SCI/L, WI (4.0 cr)

or PHYS 1402V - Honors Physics II, PHYS SCI/L, WI, H (4.0 cr)

Technical Electives

Students complete 10 credits of adviser-approved courses in computer science, biostatistics, industrial engineering, mathematics, or other areas.

This is AHS to CMGT of the Course Description section of the 2006-2008 Undergraduate Catalog for the University of Minnesota, Twin Cities campus.

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Course Descriptions

The courses in this catalog are current as of April 12, 2006. Check the University Catalogs Web site at www.catalogs.umn.edu for the most current course information.The courses in this catalog are not offered every semester. To find out whether a course is offered during a particular semester, consult the online *Class Schedule* at http://onestop.umn.edu/registrar/registration/courses.html.

Course Numbers

0xxx Courses that do not carry credit toward any University degree.

1xxx Courses primarily for undergraduate students in their first year of study.

2xxx Courses primarily for undergraduate students in their second year of study.

3xxx Courses primarily for undergraduate students in their third year of study.

4xxx Courses primarily for undergraduate students in their fourth year of study; graduate students may enroll in such courses for degree credit. 4xxx courses can be counted for a Graduate School degree if the course is taught by a member of the graduate faculty or an individual appointed to Limited Teaching Status (LTS).

5xxx Courses primarily for graduate students; undergraduate students in their third or fourth year may enroll in such courses.

Abbreviations

The following abbreviations are used throughout the course prerequisites of most University catalogs to denote common and recurring items of information.

Prereq .....Course prerequisites.

cr .....Credit.

div .....Division.

DUS.....Director of undergraduate studies.

equiv.....Equivalent.

fr, soph, jr, sr .....Freshman, sophomore, junior, senior.

H.....Honors. Courses with an H following the course number satisfy honors requirements.

V.....Honors and Writing Intensive. Courses with a V following the course number satisfy both honors and liberal education writing intensive requirements.

W.....Writing Intensive. Courses with a W following the course number satisfy the writing intensive requirement for liberal education.

A-F, S-N, NGA.....Grading options. NGA means "no grade associated." If no grading option is listed, the course may be take either A-F or S-N. For more information about grading, see page 29.

Course Designators

In conjunction with course numbers, departments and programs are identified by a 2-, 3-, or 4-letter designator prefix (e.g., CE for Civil Engineering, Pol for Political Science, WoSt for Women's Studies). When no designator precedes the number of a course listed as a prerequisite, that prerequisite course is in the same department as the course being described.

Course Symbols

The following symbols are used throughout the course prerequisites of most University catalogs to denote common and recurring items of information.

§.....Credit will not be granted if credit has been received for the course listed after this symbol.

¶.....Concurrent registration is required (or allowed) in the course listed after this symbol.

#.....Approval of the instructor is required for registration.

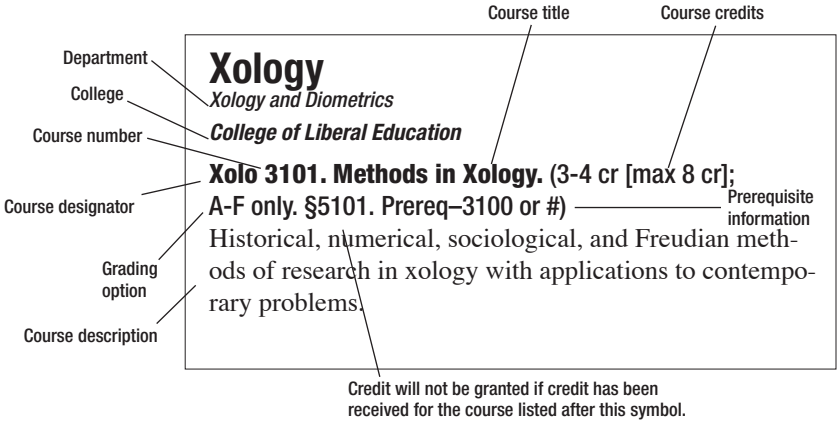
Δ.....Approval of the department offering the course is required for registration.

❑ .....Approval of the college offering the course is required for registration.

,.....In prerequisite listings, comma means "and."

1-4 cr [max 6].....The course can be taken for 1 to 4 credits and may be repeated for up to 6 credits.

Course Listing Sample



For definitions of course numbers, symbols, and abbreviations, see page 300.

Academic Health Center Shared (AHS)

AHS 1101. Orientation to the Health Sciences. (1 cr)
Interest/personality assessment, health-related academic majors/professions, professionalism/ethics in health care. Students integrate information about self and career-related information to move towards a major and career choice.

AHS 1102. Orientation to Health Sciences. (1 cr)
Semester-long Web course. Interest/personality assessment, health-related academic majors/professions, professionalism/ethics in health care. Students integrate information about self and career-related information to move towards a major and career choice.

AHS 1601. The Future Physician. (1 cr. Prereq–[ACT 30 or higher or SAT 1340 or higher], #)
A career in medicine. Life/work of physicians, what it takes to be successful. Issues/trends including Institute of Medicine core competencies, medical ethics, concept of health teams, multiculturalism, global issues, disparities in accessing medical care.

AHS 1602. Experiences in Health. (1 cr. Prereq–1601, #)
Sudents plan for and select a community-based volunteer experience, develop tools/skills to make connections in the community and secure a volunteer opportunity. Four hours per week at program site.

Accounting (ACCT)

Department of Accounting

Curtis L. Carlson School of Management

ACCT 2050. Introduction to Financial Reporting. (4 cr; A-F only. §APEC 1251. Prereq–Completion of 30 credits)
Introduction to financial accounting for U.S. organizations. Reading financial statements.

ACCT 2050H. Honors: Introduction to Financial Reporting. (4 cr; A-F only)
Introduction to financial accounting for U.S. organizations. Reading financial statements.

ACCT 3001. Introduction to Management Accounting. (3 cr; A-F only. Prereq–2050, at least 30 cr)
Costing techniques, including activity-based costing. Applying costing methods to determine costs of products, services, and production processes. Use of costs in operating/strategic decisions.

ACCT 3199. Internship in Public Accounting. (2 cr; S-N only. Prereq–5125, #)
Full-time work for a public accounting firm plus a written report on the work experience.

ACCT 3201. Intermediate Management Accounting. (2 cr; A-F only. Prereq–3001, ACCT or finance major)
Activity-based costing techniques in specific industries including service firms. Other topics could include costing for Just-in-Time manufacturing, tracking customer profitability, and costing quality.

ACCT 3299. Internship in Management Accounting. (2 cr; S-N only. Prereq–ACCT 3201, #)
Full-time work in general accounting, cost accounting, or internal auditing in an industrial or governmental organization plus a written report analyzing the work experience.

ACCT 5100. Corporate Financial Reporting. (4 cr; A-F only. Prereq–MGMT student, non-accounting major)
Overview of asset/liability valuation and income measurement. Focus on how economic events are reported in the financial statements. Examines accounting theory and the accounting standard-setting process.

ACCT 5101. Intermediate Accounting I. (4 cr; A-F only. Prereq–Grade of at least B- in 2050, [MGMT major or MGMT grad student])
Valuation, measurement, and reporting issues related to selected assets/liabilities of a firm. Theory underlying accounting issues. Applying accounting principles.

ACCT 5102. Intermediate Accounting II. (4 cr; A-F only. Prereq–5101[MGMT or grad MGMT student])
Basic valuation problems encountered in financial reporting. Focuses on valuation of liabilities. Accounting for leases, pensions, and deferred taxes. Introduces consolidated financial statements.

ACCT 5125. Auditing Principles and Procedures. (4 cr; A-F only. Prereq–[3101 or 5101 or 5100 or 6100], [ACCT major or grad MGMT student])
Concepts of auditing internal control/financial statements in accordance with generally accepted auditing/professional standards established by Public Company Oversight Board (PCAOB) and American Institute of Certified Public Accountants (AICPA).

ACCT 5135. Fundamentals of Federal Income Tax. (4 cr; A-F only. Prereq–[2050 or MBA 6030], [MGMT or grad MGMT student])
U.S. federal system of taxation. Concepts of gross income, deductions, credits. Analysis of structure of Internal Revenue Code, its provisions with respect to specific areas of law. Interrelationships between legislative, judicial, and administrative authority. Methods, tools, and techniques to conduct tax research.

ACCT 5160. Financial Statement Analysis. (2 cr; A-F only. Prereq–[5100/6100 or 3101/5101], [accounting or finance major])
Interpretation/analysis of financial statements. Introduces basic techniques of financial statement analysis and applies them in different settings (e.g., in investment/credit decisions).

ACCT 5180. Consolidations and Advanced Reporting. (2 cr; A-F only. Prereq–[5102, MGMT or grad MGMT student])
Theory underlying the preparation of consolidated financial statements, as well as the mechanical computations needed to prepare the statements themselves.

ACCT 5236. Introduction to Taxation of Business. (2 cr; A-F only. Prereq–5135, ACCT major)
Introduction to the income tax laws governing the taxation of corporations, partnerships, limited liability companies, limited liability partnerships, and S corporations. Students will also increase their knowledge and skills related to tax research by writing research memorandums.

ACCT 5271. Accounting Information Systems. (2 cr. Prereq–3101/5101 or 5100/6100)
Applications of electronic data processing systems in accounting, including modeling, financial planning, auditing, and data security. Analysis/design of accounting information systems.

ACCT 5281. Special Topics in Financial Reporting. (2 cr; A-F only. Prereq–5102, [MGMT or grad MGMT student])
Covers areas of financial reporting frequently covered on the CPA exam, including partnerships, foreign operations, and accounting for government and nonprofit organizations.

ACCT 5310. International Accounting. (2 cr; A-F only. Prereq–2050, MGMT student)
Review of macroeconomic concepts of international economics, including trade, international markets for capital, and the role of accounting. Survey of different accounting policies and approaches among nations. Reading and understanding financial statements produced in countries other than the United States.

ACCT 5320. Current Topics in Accounting. (2 cr; A-F only)
Topics vary.

Adult Education (ADED)

Department of Work and Human Resource Education

College of Education and Human Development

ADED 3001. Adult Education Overview. (1 cr; A-F only)
Theory/practice of adult learning/development.

ADED 3101. Introduction to Strategies for Teaching Adults. (3 cr; A-F only)
Theories of adult learning, learning/teaching styles, methods/perspectives of teaching, applications of teaching in various settings.

ADED 5101. Strategies for Teaching Adults. (3 cr; A-F only)
Psychological theories of adult learning; learning styles and personality types; teaching styles; group and team learning; moderating and study circles; teaching technologies and distance learning; gender, race, and cultural communication. Applications of strategies.

ADED 5102. Perspectives of Adult Learning and Development. (3 cr)
Emphasis on major adult development theorists, theories, and current applications. Transformative learning, self-directed learning, experiential learning, and cooperative learning provide theoretical framework for exploring physiological, psychological, sociological, and cultural aspects of adult development through the life span.

ADED 5103. Designing the Adult Education Program. (3 cr; A-F only)
Designing and implementing educational programs for adults. Application of concepts, theories, and models in different adult learning situations.

ADED 5196. Field Experience in Adult Education. (3-6 cr [max 6 cr]; S-N only)
Supervised fieldwork and practice. Presentations and evaluations of adult education practices.

ADED 5201. Introduction to Adult Literacy. (3 cr)
Definitions of literacy: workplace, community and family. Issues: poverty, welfare, ethnicity, cultural diversity, social class, language and learning, immigrants. Review of literacy programs, funding, and professionalization. Reaching/recruiting undereducated adults. Role of family, schools, community, and state/local government. New social action approaches required for licensure.

ADED 5202. Assessment of Adult Literacy. (3 cr. Prereq–§: ADED 5224, 5225, 5226)
Assessment of adult literacy problems as they affect work, family, and community. Setting educational goals. Formal versus informal assessment. Case studies. Educational planning.

ADED 5203. Methods of Teaching Adult Literacy. (3 cr)
Approaches to teaching reading, writing, and mathematics to adults. Technology as a teaching tool. Teaching students with disabilities. Cultural/gender differences. English as second language. Evaluation of commercial materials/software.

ADED 5211. Introduction to the Undereducated Adult. (1 cr; A-F only)
Definitions of literacy in workplace, community, and family. Issues: poverty/welfare, ethnicity, cultural diversity, social class, language/learning, immigrants.

ADED 5212. Introduction to Adult Literacy in the Workplace. (1 cr; A-F only. Prereq–5211)
Review workplace literacy programs, funding, program planning, and needs assessment. Reaching/recruiting workers. Role of employers and the unions. Writing for low literacy employees.

ADED 5213. Introduction to Adult Literacy in the Community. (1 cr; A-F only. Prereq–5211)
Reviews role of the community programs in the United States in literacy building, the family in developing literacy skills, correctional education in reintegrating offenders back into community. Integrating people with disabilities through community literacy programs. Literacy/development in developing countries. Reaching/recruiting indigenous, migrant, and immigrant groups. Social action approaches to literacy education.

ADED 5224. Formal Assessment of Adult Literacy. (1 cr; A-F only. Prereq–5211)
Assessment of adult English/literacy skills needed for work, family, community, and continuing education. Formal testing policy, techniques, standardized tests. Underlying assumptions about testing, cultural bias, and interpretation of formal tests. Test preparation programs.

ADED 5225. Informal Assessment of Adult Literacy. (1 cr; A-F only. Prereq–5211)
Informal assessment of adult English/literacy skills for work, family, community, and further education. Informal testing techniques, setting educational goals, formal versus informal assessment.

ADED 5226. Advanced Assessment of Adult Literacy. (1 cr; A-F only. Prereq–5211, 5224, 5225)
Applications and case studies. Educational planning for work, family, and community.

ADED 5233. Methods of Teaching Beginning Adult Literacy. (1 cr; A-F only. Prereq–5211)
Learning English and literacy as an adult: initial approaches to teaching reading, writing, and communications skills. Theories of learning and curriculum design. Technology as a teaching tool: teaching students with disabilities or with cultural/gender differences.

ADED 5234. Methods of Teaching Intermediate Adult Literacy. (1 cr; A-F only. Prereq–5211, 5233)
Learning English/literacy as an adult. Intermediate approaches to teaching reading, writing, and communications skills. Emphasizes communication/comprehension in oral/written English. English reading and oral communication skills for workplace. Evaluating commercial materials/software.

ADED 5235. Methods of Teaching Advanced Adult Literacy. (1 cr; A-F only. Prereq–5211, 5234)
Advanced approaches to teaching reading, writing, and communication skills. Preparing students for college and continuing education. Reading/study skills. English in workplace and on Internet. Problem solving, analytical thinking. Technology as teaching tool. Evaluating commerical material/software.

ADED 5302. Continuing Education for Professionals. (3 cr)
Analysis of philosophies, issues, policies, trends, professional needs and statutory requirements in continuing professional education programs. Role of the program director and organization.

ADED 5303. Working with Volunteers in Community Settings. (3 cr)
Uses collaborative, experiential methods to address fundamental issues and practices in volunteer development. Explore personal philosophies, staffing, and key issues and trends in the administration of volunteer programs.

ADED 5700. Special Topics in Adult Education. (1-8 cr [max 12 cr])
Exploration of issues, methods, and knowledge in areas of adult education. Content varies.

Aerospace Engineering and Mechanics (AEM)

Department of Aerospace Engineering and Mechanics

Institute of Technology

AEM 2011. Statics. (3 cr; A-F only. Prereq–PHYS 1301W, [¶Math 2374 or equiv], IT)
Force/moment vectors, resultants. Principles of statics and free-body diagrams. Applications to simple trusses, frames, and machines. Distributed loads. Internal forces in beams. Properties of areas, second moments. Laws of friction.

AEM 2012. Dynamics. (3 cr; A-F only. Prereq–2011, [¶Math 2373 or equiv], IT student)
Kinematics/kinetics of particles. Newton's laws. Energy/momentum methods. Systems of particles. Kinematics/kinetics of planar motions of rigid bodies. Plane motion of rigid bodies. Mechanical vibrations.

AEM 2021. Statics and Dynamics. (4 cr; A-F only. Prereq–PHYS 1301W, [¶Math 2374 or equiv], IT)
Force/moment vectors, resultants. Principles of statics and free-body diagrams. Applications to simple trusses, frames, and machines. Properties of areas, second moments. Internal forces in beams. Laws of friction. Principles of particle dynamics. Mechanical systems and rigid-body dynamics. Kinematics/dynamics of plane systems. Energy/momentum of 2-D bodies/systems.

AEM 2301. Mechanics of Flight. (3 cr; A-F only. Prereq–PHYS 1301W, [¶Math 2373 or equiv], IT)
Standard atmospheric properties, basic aerodynamics, generation of lift/drag. Airfoils and finite wings. Elements of aircraft performance, atmospheric flight mechanics, wind tunnel experiments. Experimental determination of lift/drag. Introduction to MatLab.

AEM 3031. Deformable Body Mechanics. (3 cr; A-F only. Prereq–[2011 or 2021 or [BMEN 3001, BMEN major]], [Math 2374 or equiv], [¶Math 2373 or equiv], IT)
Uniaxial loading/deformation. Stress/strain at a point, Mohr's circle. Internal forces in beams. Material behavior, linear elasticity. Torsion of circular shafts. Bending of beams of symmetrical section. Column buckling. Statically indeterminate structures.

AEM 4201. Fluid Mechanics. (4 cr; A-F only. Prereq–2012, [Math 2373 or equiv], [Math 2374 or equiv], [IT upper div or grad student])
First course in fluid mechanics. Stress/strain rate descriptions, fluid statics. Use of differential and finite control volume analysis with continuity. Momentum/energy equations, Bernoulli/Euler equations, vorticity, potential flow, incompressible viscous flow using Navier-Stokes equations, dimensional analysis, pipe flow, boundary layers, separation, introduction to turbulence.

AEM 4202. Aerodynamics. (4 cr; A-F only. Prereq–Upper div IT or grad, 4201)
Inviscid aerodynamics. Subsonic, transonic, and supersonic airfoil theory; wing theory. Introduction to compressible flow, normal and oblique shock waves, Prandtl-Meyer expansions. Linearized compressible flow. Wing-body combinations. Computational aerodynamics methods.

AEM 4203. Aerospace Propulsion. (4 cr; A-F only. Prereq–4202, [IT upper div or grad student])
Basic one-dimensional flows: isentropic, area change, heat addition. Overall performance characteristics of propellers, ramjets, turbojets, turbofans, rockets. Performance analysis of inlets, exhaust nozzles, compressors, burners, and turbines. Rocket flight performance, single-/multi-stage chemical rockets, liquid/solid propellants. Design problems. Design project with technical report.

AEM 4295. Problems in Fluid Mechanics. (1-3 cr [max 6 cr]. Prereq–Δ)
Topics of current interest. Individual projects with consent of faculty sponsor.

AEM 4301. Spaceflight Dynamics. (3 cr; A-F only. Prereq–[2012 or equiv], [Math 2373 or equiv], [IT upper div or grad student])
Two-body problem, Earth-satellite operations, rocket performance, reentry dynamics, space environments, restricted three-body problem, interplanetary trajectories, numerical simulations, elementary spacecraft attitude control. Design project.

AEM 4303. Flight Dynamics and Control. (3 cr; A-F only. Prereq–IT upper div or grad, 2301, or #)
Reference frames, kinematics, equations of motion for a rigid body. Forces and moments, trim, linearization, dynamic response characteristics for aircraft and spacecraft. Aircraft stability derivatives, static longitudinal and lateral stability. Handling qualities. Phugoid, short period, spiral, roll subsidence, dutch roll modes, approximations, transfer functions. Use of MatLab for dynamic analysis. Design project.

AEM 4311. Automatic Control Systems. (4 cr. Prereq–IT upper div or grad, 4303 or equiv)
Analysis and synthesis of automatic control systems. Transfer functions. Root locus, Nyquist and Bode techniques. Introduction to state space formulation. Applications, design project, lab.

AEM 4331. Aerospace Vehicle Design I: AIRcraft. (3 cr; A-F only. Prereq–[2301, AEM sr] or #)
Students teams/disciplines design atmospheric flight vehicle with realistic constraints and engineering standards: Design process, project environment, mission requirements, trade studies, vehicle sizing, performance, stability/control, propulsion, trajectory analysis, CAD/vehicle integration, systems/equipment, operating envelopes, baseline specification, certification. Professional ethics/responsibilities. Students keep design log or notebook, present a Conceptual Design Review (oral presentation) with written report.

AEM 4332W. Aerospace Vehicle Design II: Space Vehicles, Missions, and Systems. (4 cr; A-F only. Prereq–[4331 or #], [ENGC 1011 or equiv])
Student teams design space vehicle, system, or mission with realistic design constraints, detailed design proposals, schedules/milestones, CAD/CAM, space environments, atmosphere entry, attitude determination/control, configuration/structure, thermal environment, power propulsion, and telecommunications. Students keep design log/notebook, prepare status reports, written report, and oral presentation.

AEM 4333. Aerospace Design III-Special Projects. (3 cr [max 6 cr]. Prereq–4331 or #)
Student groups design, build, and test major aerospace projects. Projects include designs from 4331/4332 or projects such as microgravity experiments. Students keep a design log/notebook, prepare status reports, and give a final oral presentation.

AEM 4371. Helicopter Aerodynamics. (3 cr. Prereq–2301, 4202, [IT upper div or grad student])
Review of basic aerodynamics, unique features of helicopters, momentum theory in axial flight and in rotor flow states, momentum theory in non-axial flight, blade-element theory, vortex theory, helicopter equations of motion. Design project.

AEM 4495. Problems in Dynamics and Control. (1-3 cr [max 6 cr]. Prereq–Δ)
Topics of Current interest. Individual projects with consent of faculty sponsor.

AEM 4501. Aerospace Structures. (3 cr; A-F only. Prereq–IT upper div or grad, 3031 or equiv)
Advanced strength of materials analysis of elastic structures with aerospace applications; failure modes and criteria, buckling, matrix methods for analysis, plane truss design; energy and Castigliano methods for statically determinate and indeterminate structures; torsion and bending of asymmetrical thin-walled sections. Design project.

AEM 4502. Computational Structural Analysis. (3 cr. Prereq–[Grade of at least C in 4501, [IT upper div or grad student]] or #)
Application of finite element methods to problems in structural analysis. Emphasizes properly posing problems and interpreting calculation results. Use of commercial FEA packages. Introduction to theory of finite elements.

AEM 4511. Mechanics of Composite Materials. (3 cr. Prereq–3031, [IT upper div or grad student])
Analysis, design, and applications of laminated and chopped fiber reinforced composites. Micro-/macro-mechanical analysis of elastic constants, failure, and environmental degradation. Design project.

AEM 4581. Mechanics of Solids. (3 cr. Prereq–3031, [Math 2373 or equiv], [Math 2374 or equiv], [IT upper div or grad student])
Continuum mechanics in one dimension: kinematics; mass, momentum/energy, constitutive theory. Wave propagation, heat conduction. Strings. Euler-Bernoulli theory. 3-D deformations/stress. Topics from fracture mechanics, structural stability, vibrations, thin films, layered media, smart materials, phase transformations, 3-D elastic wave propagation. Elasticity, viscoelasticity, plasticity.

AEM 4595. Problems in Mechanics and Materials. (1-3 cr [max 6 cr]. Prereq–Δ)
Topics of current interest. Individual projects with consent of faculty sponsor.

AEM 4601. Instrumentation Laboratory. (3 cr; A-F only. Prereq–CSCI 1113, EE 3005, EE 3006, [upper div IT or grad student])
Introduction to lab instrumentation. Computerized data acquisition. Statistical analysis of data. Time series data, spectral analysis. Transducers for measurement of solid, fluid, and dynamical quantities. Design of experiments.

AEM 4602W. Aeromechanics Laboratory. (4 cr; A-F only. Prereq–IT upper div or grad, 4201, 4501, 4601, ENGC 1011 or equiv)
Experimental methods/design in fluid/solid mechanics. Wind tunnel/water channel experiments with flow visualization, pressure, velocity, force measurements. Measurement of stresses/strains/displacements in solids/ structures: stress concentrations, materials behavior, structural dynamics. Computerized data acquisition/analysis, error analysis, data reduction. Experiment design. Written/oral reports. Lab ethics. Writing intensive.

AEM 4796. Professional Experience. (1-3 cr [max 3 cr]; A-F only. Prereq–IT upper div, AEM major, Δ)
Work experience with substantive engineering component. Written report. Number of credits awarded based on extent of experience.

AEM 5245. Hypersonic Aerodynamics. (3 cr; A-F only. Prereq–4202, [grad studednt or upper div IT])
Importance/properties of hypersonic flow. Hypersonic shock and expansion-wave relations. Local surface inclination methods. Approximate/exact methods for hypersonic inviscid flow fields. Viscous flow: boundary layers, aerodynamic heating, hypersonic viscous interactions, computational methods. Hypersonic propulsion and vehicle design.

AEM 5251. Computational Fluid Mechanics. (3 cr; A-F only. Prereq–[4201 or equiv], [CSCI 1113 or equiv], [IT upper div or grad student])
Introductory concepts in finite difference and finite volume methods as applied to various ordinary/partial differential model equations in fluid mechanics. Fundamentals of spatial discretization and numerical integration. Numerical linear algebra. Introduction to engineering and scientific computing environment. Advanced topics may include finite element methods, spectral methods, grid generation, turbulence modeling.

AEM 5401. Intermediate Dynamics. (3 cr. Prereq–IT upper div or grad, 2012, Math 2243)
Three-dimensional Newtonian mechanics, kinematics of rigid bodies, dynamics of rigid bodies, generalized coordinates, holonomic constraints, Lagrange equations, applications.

AEM 5431. Trajectory Optimization. (3 cr; A-F only. Prereq–4311 or equiv or #)
Parameter optimization problems. Topics in calculus of variations; necessary conditions of nonlinear optimal control problems; classification of trajectory optimization algorithms; steady-state aircraft flight; minimum-time climb aircraft trajectory; aero-assisted orbital transfer trajectories; optimal space trajectories.

AEM 5441. Structural Dynamics. (3 cr; A-F only. Prereq–2012, 3031, [grad student or IT upper div])
Frequency, time domain analysis of multi-degree of freedom mechanical systems. Natural frequencies, normal modes of vibration. Free/forced vibrations of strings, rods, and shafts beams. Introduction to finite elements in structural dynamics.

AEM 5451. Optimal Estimation. (3 cr; A-F only. Prereq–[[Math 2243, STAT 3021] or equiv, 4311] or #)
Basic probability theory. Batch/recursive least squares estimation. Filtering of linear/non-linear systems using Kalman and extended Kalman filters. Applications to sensor fusion, fault detection, and system identification.

AEM 5495. Topics in Aerospace Systems. (1-4 cr [max 4 cr]; A-F only. Prereq–Δ)
Topics of current interest. Individual projects with faculty sponsor.

AEM 5501. Continuum Mechanics. (3 cr. Prereq–IT upper div or grad, 3031, Math 2243 or equiv or #)
Concepts common to all continuous media; elements of tensor analysis; motion, deformation, vorticity; material derivatives; mass, continuity equation; balance of linear, angular momentum; geometric characterization of stress; constitutive equations.

AEM 5503. Theory of Elasticity. (3 cr; A-F only. Prereq–4501 or equiv, Math 2263 or equiv or #)
Introduction to the theory of elasticity, with emphasis on linear elasticity. Linear and nonlinear strain measures, boundary-value problem for linear elasticity, plane problems in linear elasticity, three dimensional problems in linear elasticity. Topics from nonlinear elasticity, micromechanics, contact problems, fracture mechanics.

AEM 5651. Aeroelasticity. (3 cr; A-F only. Prereq–4202, 4301, [grad student or IT upper div])
Static aeroelastic phenomena, torsional divergence of a lifting surface, control surface reversal. Aeroelastic flutter, unsteady aerodynamics. Problems of gust response, buffeting. Design project.

Aerospace Studies (AIR)

Department of Aerospace Studies (Airforce ROTC)

Office of the Senior Vice President for Academic Affairs and Provost

AIR 1000. Leadership Laboratory. (1 cr; S-N only)
Air Force customs and courtesies, drill and ceremonies, military commands, the environment of the Air Force officer, and learning about areas of opportunity available to commissioned officers. Interviews, guidance, and information to increase the understanding, motivation, and performance of other cadets.

AIR 1104. Introduction to the Air Force Today I. (1 cr; A-F only)
Mission and organization of the Air Force, officership and professionalism, military customs and courtesies, Air Force officer opportunities, group leadership problems, and introduction to communication skills.

AIR 1105. Introduction to the Air Force Today II. (1 cr; A-F only)
Structure and missions of Air Force organizations. Communicative skills. How cadets are selected for the Professional Officer Course, categorization into specific career areas (pilot and navigator) occurs in the AFROTC junior year, and selection for specific career fields is made in a cadet's senior year.

AIR 1204. History of Airpower and Communication Skills. (1 cr; A-F only)
Air Force heritage and leaders, Quality Air Force, and introduction to ethics and values, introduction to leadership, group leadership problems, and continuing application of communication skills.

AIR 1205. Quality Air Force, Group Leadership Problems, and Presentation Techniques. (1 cr; A-F only)
Leadership and followership. Officership, ethics, and values; Air Force's core values. Air Force heritage and leaders, Quality Air Force, group leadership problems, and continuing application of communicative skills.

AIR 3301. Air Force Leadership, Quality, and Communication. (3 cr; A-F only)
Study of leadership, quality management fundamentals, and communication skills required of an Air Force junior officer. Case studies.

AIR 3302. Air Force Officership, Quality, and Communication. (3 cr; A-F only. Prereq–3301 recommended)
Focus on completing Quality Air Force training, learning the Officer Professional Development system, exploring leadership styles, ethics, core values, character development, and standards of conduct. Improve written and oral communication skills. Case studies.

AIR 3401. National Security Policy. (3 cr; A-F only)
National security process, regional studies, advanced leadership ethics, Air Force doctrine, and military justice. Military as a profession, officership, civilian control of the military, preparation for active duty, and current issues affecting military professionalism. Focus on refining communication skills.

AIR 3402. Preparation for Active Duty. (3 cr; A-F only)
National security process, regional studies, advanced leadership ethics, and Air Force doctrine. Military law, current issues affecting military professionalism, and preparation for active duty as a second lieutenant in the U.S. Air Force.

Afro-American Studies (AFRO)

Department of African American and African Studies

College of Liberal Arts

AFRO 1009. History of Women in Africa: 1500 to the Present. (3 cr)
Histories of women on African frontiers. Women in relations with their families, with other African/non-African people. Women of borders of Sahil-Savanna, Savanna-Forest, within country of Morocco, and of Swahili Coast and Atlantic Coast frontiers.

AFRO 1011. Introduction to African American Studies. (4 cr)
The study of peoples of African descent including the evolution of African American culture, comparative race relations, feminism and social policy change.

AFRO 1021. Introduction to Africa. (4 cr)
Diverse themes and disciplines in African Studies from prehistory to post-colonial period. Introduction to methodologies of inquiry.

AFRO 1131. Contemporary Issues in Africa. (3 cr)
Africa from its colonial history to present. Emphasizes growth of African democracies. AIDS epidemic, ethnic/civil conflicts, debt crisis. Strategies of African governments and non-governmental organizations to combat crises. Rise of middle class in sub-Saharan Africa. Postcolonial legacies, population as political/social issue, rural to urban migration.

AFRO 1221. Beginning Swahili, Semester I. (5 cr)
Comprehension, speaking, reading, writing.

AFRO 1222. Beginning Swahili II. (5 cr. Prereq–1221 or equiv)
Continuation of skill development from 1221.

AFRO 1902. Freshman Seminar. (3 cr. Prereq–Fr)
Topics specified in *Class Schedule*.

AFRO 1904. Freshman Seminar. (3 cr; A-F only. Prereq–Fr or less than 30 cr)
Topics specific in *Class Schedule*.

AFRO 1909W. Freshman Seminar. (3 cr [max 6 cr]; A-F only. Prereq–Fr with no more than 30 cr)
Topics specified in *Class Schedule*.

AFRO 3001. West African History: Early Times to 1800. (3 cr)
West Africa from late prehistoric times to establishment/histories of states. Relations with North African, Mediterranean, Asian, and American worlds. Examines non-centralized patriarchal authority.

AFRO 3002. West African History: 1800 to Present. (3 cr)
West African history from late-18th century to present. Themes include study of continuities with the past and profound changes including new 19th century state formation, European colonialism, and post-colonial issues.

AFRO 3006. Impact of African Migrations in the Atlantic World. (3 cr; A-F only)
People of African descent through history. Archeology, geography, literature. Migrations/activities in the Atlantic world. African history in the New World. Transfer of African rice growing technology and other skills. Development of African American society in the United States.

AFRO 3061. The Black Family. (3 cr)
A sociological view of African American family life in the United States.

AFRO 3072. Racism: Social and Psychological Consequences for Black Americans. (3 cr)
Racism and its effects on African Americans; definitions, determinants, and dynamics. Examined in an experiential context to reflect individual and institutional racism.

AFRO 3108. Black Music: A History of Jazz. (3 cr)
The development of jazz in America and in the world, with special emphasis given to the roots or jazz in the African American experience.

AFRO 3110. Study of an African Language. (4 cr [max 8 cr]. Prereq–Enrolled in Minnesota Studies in International Development in-country language course in [Swahili or Wolof or Twi])
Introduction to a selected African language. Emphasizes oral communication skills and cultural context.

AFRO 3112. In the Heart of the Beat: the Poetry of Rap. (3 cr; A-F only)
Contemporary African American poetry as expressed by popular culture contributors. Students analyze/evaluate poems used in rap, in context of African American literature, American culture, and aesthetics.

AFRO 3120. Social and Intellectual Movements in the African Diaspora. (3 cr; A-F only. §AFRO 5120)
Political, cultural, and historical linkages between Africans, African-Americans, and African-Caribbean. Development of black socio-political movements and radical intellectual trends in late 19th/20th centuries within African Diaspora. African independent struggles against colonialism. Black resistance in Suriname, Guyana, and the Caribbean against colonialism/racism. Protest organizations, intellectual discourses, and radical movements in the United States and Europe.

AFRO 3131. Contemporary Issues in Africa: Challenges of Peace in 21st Century Africa. (3 cr)
Why peace has been elusive throughout history of Africa, from period of slave raids through colonialism and until today. Intractable conflicts in Great Lakes Region, Horn of Africa, South Africa, Nigeria, Liberia/Sierra Leone, Mauritania, Sudan. Why no peaceful resolution despite multiple mediation efforts. Case studies.

AFRO 3141. Africa. (3 cr. §GEOG 3 141)
Regional differentiation of human groups and environments; cultural contact and problems of underdeveloped countries south of the Sahara.

AFRO 3204. History of South Africa to 1910. (3 cr. §HIST 3434)
Introductory survey of the history of South Africa from early humans to the arrival of the first Dutch settlers at the Cape of Good Hope in 1652 to the formation of the Union of South Africa in 1910.

AFRO 3205. History of South Africa from 1910. (3 cr. §HIST 3435)
The history of South Africa from the Union to the present. Focus on such issues as African and Afrikaner nationalism, structures of apartheid, forced population removals, divestment and sanctions, and the post-apartheid era.

AFRO 3225. Third Semester Swahili. (4 cr. Prereq–1 yr Swahili or equiv)
Readings of contemporary Swahili texts. Review of grammar and complex verb forms, building vocabulary and communication skills.

AFRO 3226. Fourth Semester Swahili. (4 cr. Prereq–3225 or equiv)
Advanced Swahili readings, speaking, and writing practice.

AFRO 3251W. Sociological Perspectives on Race, Class, and Gender. (3 cr; A-F only. §SOC 3251W)
Race, class, and gender as aspects of social identity and as features of social organization. Experiences of women of color in the United States. Family life, work, violence, sexuality/reproduction, possibilities for social change.

AFRO 3301. The Music of Black Americans. (3 cr)
Musical contributions of African American artists and innovators from 1619 to the present. Musical genres explored include spirituals, blues, ragtime, gospel, art music, and jazz.

AFRO 3334. Black Women: Interdisciplinary Perspectives. (4 cr)
Interdisciplinary study of the experience of African American women, including economic, political, and social factors, psycho-sexual development, and family roles.

AFRO 3405. The African American Child. (3 cr. §AFRO 5405)
Resesarch carried out by African American psychologists and behavioral/social scientists, and by experts on African American child/youth development.

AFRO 3426. African Americans, Social Policy, and the Welfare State. (3 cr)
Period between New Deal (1930s) and present. History/impact of federal policy (presidential, congressional, judicial) and race on African Americans. Politics of allocation of insurance versus relief in Social Security Act of 1935. Race and expansion of social benefits after World War II. School desegregation. Kennedy s civil rights policy, LBJ's War on Poverty. Affirmative Action. Warren court. Busing. Conservative retreat from welfare state under Ronald Reagan and George Bush.

AFRO 3429. Slavery in Africa and in the Americas, 1400 to 1880. (3 cr; A-F only. §AFRO 5429)
History of slavery in Africa and the New World. Indigenous institutions of unfree labor in West Africa. Origins of European slave trade in West Africa and South Africa. Development of plantation societies in South America, the Caribbean, and the United States. Comparative approach to understanding New World slavery and slavery on the African subcontinent. Focuses on religion, creolization, and antislavery resistance.

AFRO 3431. Early Africa and Its Global Connections. (4 cr. §HIST 3431)
Socioeconomic, political, and cultural development in precolonial Africa, from ancient Egypt through era of trans-Atlantic slave trade.

AFRO 3432. Modern Africa in a Changing World. (4 cr. §HIST 3432)
Socioeconomic, political, and cultural development in Africa, from abolition of trans-Atlantic slave trade through postcolonial era.

AFRO 3436. Historical Background to Contemporary African Conflicts: Case Studies. (3 cr)
Historical contexts in which specific contemporary political conflicts developed. Slave trade, colonial conquest, indirect rule, forced labor, discretionary justice. Patterns of human rights violations and of socio-political conflict. Cases studies might include Somalia, Democratic Republic of Congo, and Rwanda.

AFRO 3437. History of East Africa. (3 cr; A-F only. §AFRO 5437, HIST 3437, HIST 5437)
Major themes in history of East Africa, from era of early human cultural development to present. Methods that historians use to reconstruct history. Varying interpretations/constructions of history over time.

AFRO 3439. Popular Narratives of the African Past. (3 cr)
Diverse ways that ordinary Africans have interpreted/portrayed particular events in African history. Popular depictions of African past, their relationships with academic histories.

AFRO 3543. Psychology and the Black American Experience. (3 cr)
Historical and contemporary perspectives of the relationship between the area of psychology and African Africans in research and practice.

AFRO 3578. Arts of Africa. (3 cr. §ARTH 3578)
Survey of the diverse arts of Africa, from ancient times to present. Visual arts of several civilizations. Relation of visual arts to larger cultural issues (religion, cosmology, gender, identity, political power).

AFRO 3585. African American Art. (3 cr; A-F only. §ARTH 3585)
Four hundred year history of African American art. How/why African Americans created artwork at specific times, in specific places. Arts of African Americans within their own communities, National arts movements, and American life during historical junctures.

AFRO 3591W. Introduction to African American Literature. (4 cr. §ENGL 3591W)
African American autobiography, fiction, essay, poetry, drama, and folklore from late-18th century to present.

AFRO 3592W. Introduction to Black Women Writers in the United States. (3 cr)
The literature of African American women writers explored in novels, short stories, essays, poetry, autobiographies, and drama from the 18th to the late-20th century.

AFRO 3594W. Introduction to Contemporary Black Fiction. (3 cr; A-F only)
Major contemporary Black fiction writers, such as Gayle Jones, Ernest Gaines, Charles Johnson, Toni Morrison, Gloria Naylor, and John Edgar Wideman, among others, whose works span the period from 1970s to 1990s.

AFRO 3597W. Introduction to African American Literature and Culture I. (4 cr)
African American oral tradition, slave narrative, autobiography, poetry, essay, fiction, oratory, and drama, from colonial era through Harlem Renaissance.

AFRO 3598. Arts of the African Diaspora. (3 cr)
Survey of African cultural heritage in art/architecture of African Diaspora in USA, Latin America, and Caribbean. Focuses on traditions retained. Addition/reformation of identities through artistic, architectural, religious syncretism.

AFRO 3601. Introduction to African Literature. (3 cr)
Oral and written literature of the 19th and 20th centuries. Emphasis on literature written in English and French. All readings in English.

AFRO 3625. Black Women Writers in the Diaspora. (3 cr)
Works of black women writers from Europe, Africa, South America, and the Caribbean. Novels, drama, films, and essays.

AFRO 3626. Literature of African American Men: Sex, Family, and Relationships. (3 cr; A-F only)
African American male fiction writers' approach to subject of family and relationships. Social, economic, and psychological consequences of racism/oppression, and effect on African American men writing about themselves within context of family/relationships. Manhood/masculinity as interpreted/articulated in fiction.

AFRO 3628. Literature of Rebellion: the Amistad and other Revolts. (3 cr; A-F only)
Amistad affair and other slave revolts in fictional/non-fictional texts. Nature of race/oppression. Historical representation of these specific incidents as settled in American conciousness. Responsibilities/challenges presented to authors in terms of accuracy, commercial viability, and literary quality. Introduction to issues concerning African American slavery.

AFRO 3634. Blues & Rhythm and Blues. (3 cr)
Black American culture as expessed by blues and by rhythm and blues. Evolution of blues from work songs and field hollars of slavery/emancipation through postwar blues sounds of Louis Jordan, through expressions of pre-rock-n-roll rhythm and blues, and to more current expressions of performers like Brian McKnight.

AFRO 3654. African Cinema. (4 cr)
Films by African filmmakers from West, Central, and Southern Africa. Aesthetic, theoretical, and sociocultural issues will be explored through class screenings and critical readings.

AFRO 3741. People of Color and the Mass Media. (3 cr; A-F only)
Past and present depictions of minority individuals and groups in movies, literature, radio/TV, etc., as seen against anthropological, psychological, and sociological knowledge and experience. Emphasis on personal and political effects of media depictions.

AFRO 3756. Social and Cultural History of Blacks in Sports. (3 cr. §AFRO 5756)
Social/cultural contexts surrounding eras of athletes such as Jack Johnson, Jackie Robinson, Joe Louis, Jesse Owens, Althea Gibson, Wilma Rudolph, Muhammad Ali, Michael Jordan, and Tiger Woods. Impact of these athletes on national/international events. Periods when it was not uncommon for black entertainers/athletes to become involved in politics and community activism.

AFRO 3864. African American History: 1619 to 1865. (4 cr. §HIST 3864)
Importance of dynamics of class, gender, region, and political ideology. Changing nature of race/racism.

AFRO 3865. African American History: 1865 to the Present. (4 cr. §HIST 3865)
Internal migrations, industrialization/unionization, the Great Depression, world wars, large scale movements for social/political change.

AFRO 3866. The Civil Rights and Black Power Movement, 1954-1984. (3 cr. §AFRO 5866)
Modern black civil rights struggle in the U.S., i.e., the second reconstruction. Failure of reconstruction, abdication of black civil rights in 19th century. Assault on white supremacy via courts, state, and grass roots southern movement in 1950s and 1960s. Black struggle in north and west. New emphasis on Black Power, by new organizations. Ascendancy of Ronald Reagan, conservative assault on the movement.

AFRO 3868. Race, War, and Race Wars in American History. (3 cr)
Role that race has played in American war history. Impact that wars have had on race and race relations in the U.S. and the world.

AFRO 3910. Topics in African American and African Studies. (1-3 cr [max 9 cr])
Topics specified in *Class Schedule*.

AFRO 3993. Directed Study. (1-3 cr [max 5 cr]. Prereq–#, Δ, ❑)
Guided individual research and study.

AFRO 4001. Seminar: History of Women in South Africa. (3 cr. §HIST 3438)
The changing role and status of women in South Africa from precolonial era to the present, and relationships to political, social, and economic development.

AFRO 4013. Cities in Africa: African, Islamic, European Traditions. (3 cr)
History of African cities, their common and unique features. Case study of Swahili cities. Roots and issues of 20th century urban growth.

AFRO 4221. Beginning Swahili . (4 cr)
Comprehension, speaking, reading, writing.

AFRO 4231. The Color of Public Policy: African Americans, American Indians, and Chicanos in the United States. (3 cr. §AAS 4231, AMIN 4231, CHIC 4231)
Examination of structural or institutional conditions through which people of color have been marginalized in public policy. Critical evaluation of social theory in addressing the problem of contemporary communities of color in the United States.

AFRO 4301. The African Novel. (3 cr)
African novel and its historical, thematic, aesthetic, and ideological complexity. Origin of African novel, its purported status as an experiment in form, mimesis/realism. Role of the African writer. Writers such as Ngugi wa Thiong o, Mongo Beti, Ahmadou Kourouma, Ousmane Sembene, Flora Nwapa, Aminata Sow Fall, Mariama Ba, Ama Ata Aidoo, Ken Bugul.

AFRO 4302H. Honors: Women's Personal Narratives. (3 cr)
Focus is on literary autobiography, journals, travel narratives, essays, slave narratives, testimonials, and ethnographies to consider the content and the methodological, theoretical, and aesthetic issues of the construction and production of women's experience.

AFRO 4352. Black Families in the Diaspora: Comparative Perspectives. (3 cr)
Cross-cultural perspectives of family formation, social structure, and gender patterns of families of African descent.

AFRO 4432. Colloquium: Before the Field: Internships, Community Service, and Study Abroad. (3 cr)
Theoretical and practical preparation for internships, community work, and study abroad.

AFRO 4478. Contemporary Politics in Africa and the Colonial Legacy. (3 cr; A-F only. §AFRO 5478, POL 4478, POL 5478)
How current politics in mainly, though not exclusively, sub-Saharan Africa have been shaped by pre-colonial/colonial processes. Reality of independence, recurrent political/economic crises, global context, prospects for effective democracy.

AFRO 4593. The African American Novel. (3 cr. §ENGL 5593)
Contextual readings of 19th- and 20th-century black novelists, including Chesnut, Hurston, Wright, Baldwin, Petry, Morrison, and Reed.

AFRO 4597. Seminar: Harlem Renaissance. (3 cr. §ENGL 5597)
A multidisciplinary review of the Jazz Age's Harlem Renaissance: literature, popular culture, visual arts, political journalism, and major black and white figures.

AFRO 4598. Seminar: Black Arts Renaissance, 1960s and 1970s. (3 cr)
Multidisciplinary perspectives on the 1960s and 1970s Black Power "renaissance" of African American art and politics.

AFRO 4622. Caribbean Writers: Rethinking Caribbean Literature in a World Context. (3 cr)
Literary/historical issues explored by Caribbean writers in English, French, and Spanish-speaking Caribbean through autobiographies, short stories, novels, poetry, and films.

AFRO 4632. Black Francophone Writers in Translation. (3 cr)
Exploration of ideas, particularly negritude and issues of creoleness, central to male and female writers in French from Africa and the Caribbean. Novels, essays, short stories, and plays.

AFRO 4655. African American Cinema. (3 cr. §ARTH 5655)
Exploration of African American cinematic achievements, from the silent films of Oscar Micheaux through contemporary Hollywood and independent films, using class screenings and critical readings.

AFRO 4800. African Studies Seminar. (3 cr)
Topics vary and reflect instructor's research interests. Topics specified in *Class Schedule*.

AFRO 4991W. Thesis Research and Writing. (2 cr; A-F only. Prereq–Δ)
Preparing a research paper that satisfies major project requirement. Defining a research problem. Collecting/analyzing data. Writing the research paper.

AFRO 4992. Thesis. (1 cr; A-F only. Prereq–4991W, Δ)
Work with thesis adviser to complete final copy of senior project.

AFRO 5072. Racism: Social and Psychological Consequences for Black Americans. (3 cr)
Racism and its effects on African Americans; definitions, determinants, and dynamics. Examined in an experiential context to reflect individual and institutional racism.

AFRO 5101. Seminar: Introduction to Africa and the African Diaspora. (3 cr)
Comparative frameworks, related theories, and pivotal texts in study of Africa and African Diaspora.

AFRO 5103. African History from the Perspective of the African Diaspora. (3 cr; A-F only)
Writings and intellectual networks of major Black thinkers whose historical/ethnographic works on Africa span period from 19th to 20th century. Thinkers such as David Walker, Henry Highland Garnet, Martin R. Delany, J.W.C. Pennington, George Washington Williams, Alexander Crummell, W.E. B. Dubois, Carter G. Woodson, William Leo Hansberry .

AFRO 5120. Social and Intellectual Movements in the African Diaspora. (3 cr; A-F only. §AFRO 3120)
Political, cultural, and historical linkages between Africans, African-Americans, and African-Caribbean. Development of black socio-political movements and radical intellectual trends in late 19th/20th centuries within African Diaspora. African independent struggles against colonialism. Black resistance in Suriname, Guyana, and the Caribbean against colonialism/racism. Protest organizations, intellectual discourses, and radical movements in the United States and Europe.

AFRO 5181. Blacks in American Theatre. (3 cr. §TH 5181)
Historical survey of significant events in the development of American black theater traditions. Essays, plays, playwrights, and theaters from early colonial references to the Black Arts Movement.

AFRO 5182. Contemporary Black Theatre: 1960-Present. (3 cr. §TH 5182)
Essays, plays, playwrights, and theaters that have contributed significantly to contemporary black theater. From the beginning of the Black Arts movement to the present.

AFRO 5191. Seminar: The African American Experience in South Africa. (3 cr. §HIST 5438)
Ideological, political, religious, and cultural ties that have informed African American and black South African relations from late 18th century to present.

AFRO 5401. Field Studies in African American and African Studies. (1-6 cr [max 6 cr]. Prereq–[[African American or African Studies] major or minor], #)
Supervised field study/internship focused on African American or African culture(s), language(s), and development.

AFRO 5405. The African American Child. (3 cr. §AFRO 3405)
Research carried out by African American psychologists and behavioral/social scientists, and by experts on African American child/youth development.

AFRO 5429. Slavery in Africa and in the Americas, 1400 to 1880. (3 cr; A-F only. §AFRO 3429)
History of slavery in Africa and the New World. Indigenous institutions of unfree labor in West Africa. Origins of European slave trade in West Africa and South Africa. Development of plantation societies in South America, the Caribbean, and the United States. Comparative approach to understanding New World slavery and slavery on the African subcontinent. Focuses on religion, creolization, and antislavery resistance.

AFRO 5437. History of East Africa. (3 cr; A-F only. §AFRO 3437, HIST 3437, HIST 5437)
Major themes in history of East Africa, from era of early human cultural development to present. Methods that historians use to reconstruct history. Varying interpretations/constructions of history over time.

AFRO 5478. Contemporary Politics in Africa and the Colonial Legacy. (4 cr; A-F only. §AFRO 4478, POL 4478, POL 5478. Prereq–POL 1054 or POL 3051 or non-pol sci grad student or #)
How current politics in mainly, though not exclusively, sub-Saharan Africa have been shaped by pre-colonial/colonial processes. Reality of independence, recurrent political/economic crises. Global context, prospects for effective democracy.

AFRO 5551. Methods: Use of Oral Traditions as Resources for History. (3 cr)
Use of spoken information through time as a source for writing history. Use of canons of history to analyze and critique oral traditions and integrate them into written history.

AFRO 5701. Proseminar: Classic Works in African American Studies. (3 cr)
Classic works in African American studies. Conceptual frameworks. Multidisciplinary focus.

AFRO 5702. Proseminar: Major Figures in African American Studies. (3 cr)
Major figures from various fields in African American studies. Bio-critical focus.

AFRO 5741. Minorities and Mass Media. (3 cr; A-F only. Prereq–jour major or minor, JOUR 3004, Δ)
Analysis of relationships between mass media and communities of color in the United States. Focuses on issues of content and control.

AFRO 5756. Social and Cultural History of Blacks in Sports. (3 cr. §AFRO 3756)
Social/cultural contexts surrounding eras of athletes such as Jack Johnson, Jackie Robinson, Joe Louis, Jesse Owens, Althea Gibson, Wilma Rudolph, Muhammad Ali, Michael Jordan, and Tiger Woods. Impact of these athletes on national/international events. Periods when it was not uncommon for black entertainers/athletes to become involved in politics and community activism.

AFRO 5864. Proseminar: African-American History. (3-4 cr [max 4 cr]. Prereq–#)
Examination of issues including slavery, Reconstruction, the Great Depression, and civil rights movement using cultural and intellectual history and autobiography/biography. Focuses on dynamics of race, gender, class, region, sexuality, and religion.

AFRO 5865. Proseminar: African-American History. (3-4 cr [max 4 cr]. Prereq–#)
Construction of a detailed research agenda, locating appropriate depositories of primary materials and secondary sources, and developing appropriate methodologies and frameworks.

AFRO 5866. The Civil Rights and Black Power Movement, 1954-1984. (3 cr; A-F only. §AFRO 3866)
The "second reconstruction." Failure of Reconstruction, abdication of black civil rights in 19th century. Post-1945 assault on white supremacy via courts/state, grass-roots southern movement in 1950s/1960s. Black struggle in north and west, emphasis on Black Power by new organizations/ideologies/leaders. Ascendancy of Reagan, conservative assault on movement.

AFRO 5876. Proseminar: Approaches to African Development. (3 cr)
Study, critical analysis, and comparison of primary documents relevant to African development.

AFRO 5910. Topics in African American and African Studies. (1-3 cr [max 9 cr])
Topics specified in *Class Schedule*.

AFRO 5993. Directed Study. (1-3 cr [max 3 cr]. Prereq–#)
Guided individual reading/study for qualified seniors and graduate students.

Agricultural Industries and Marketing (AIM)

Soil, Water, and Climate

College of Food, Agricultural and Natural Resource Sciences

AIM 4011. Student Project/Field Investigation. (3 cr)
Application of marketing knowledge that involves building a complete marketing plan for an agricultural product or device. Team projects are used.

Agricultural, Food, and Environmental Education (AFEE)

Department of Human and Resource Education

College of Education and Human Development

AFEE 1001. Introduction to Agricultural Education and Extension. (1 cr)
Historical development of the discipline of agricultural education; orientation to career opportunities; areas and expectations of specialization; issues in the field.

AFEE 1002. Principles of Career Planning for Agricultural Professionals. (1 cr. §AGUM 1111)
Self assessment and analysis of interests, skills, and abilities. Analyses of occupations, employment potential, employee expectations for work. Use informational interviews to examine career options and employment portfolio for career planning.

AFEE 2051. Current Technical Competencies. (3 cr)
Prepares agricultural education teachers and other agricultural professionals to use technology. Develop basic skills and knowledge to plan, implement, operate, and maintain agricultural structural and mechanical systems. Experiential learning principles and applied problem solving.

AFEE 2096. Professional Practicum in Agricultural Education: Early Experience. (1-3 cr [max 3 cr]; A-F only)
Observe schools, extension offices, and agricultural oriented businesses to learn about the work and workplaces in agricultural education.

AFEE 2221. People Skills for Leadership. (3 cr; A-F only)
How to be an effective leader in profit/non-profit agricultural settings. Roles, responsibilities, knowledge, attitudes, and skills to hire staff, set goals, coach, mentor/manage teams, and improve communication.

AFEE 3096. Experiential Learning: Production and Business. (1-8 cr [max 12 cr]. Prereq–AgEd major, #)
Experiential learning in agricultural production and business. Planned, organized, monitored, and evaluated based on a per-experience diagnosis of learning prerequisite to higher level courses in technical agriculture and agricultural business.

AFEE 3112. Technical Drawing and Production Technologies. (3 cr; A-F only. §BIE 3112)
Experiences in technical drawing, design technology, and production technologies related to construction and manufacturing. Develop manipulative skills and techniques; understand principles and processes of technologies through hands-on work in a multiple activity laboratory.

AFEE 3221. Presentations and Meeting Management for Agricultural Industry. (3 cr; A-F only)
Planning/delivering formal/informal presentations in agricultural business/non-profit settings. Skill development in parliamentary procedure. Using appropriate technolgy for data summary and presentationswith individuals and large/small audiences. Instruction is student-centered, relies on the interaction/participation.

AFEE 4096. Practicum: Agricultural Education Technology. (1-3 cr [max 6 cr])
Individualized study packages addressing technology in agriculture production, horticulture, natural resource, biotechnology, farm and agribusiness, management, agricultural science, agriculture mechanics, youth organizations, adult and beginning farm and agribusiness management.

AFEE 4221. Rural Leadership Development. (3 cr)
Understanding the role, function, and features of leadership in rural communities; importance of personal involvement, personal leadership qualities, and vision for individuals and rural community organizations.

AFEE 5111. Agricultural Education: Methods of Teaching. (4 cr)
Use of teaching resources; principles of teaching and learning; problem-solving techniques, lesson plan construction for large group, small group and individual investigations; student management; and assessment.

AFEE 5112. Agricultural Education Program Organization and Curriculum for Youth. (3 cr)
Development of community school program in agriculture, agribusiness, and environmental science. Program to meet graduation outcomes and determine student needs.

AFEE 5113. Adult Agricultural Education Program Development and Technology. (3 cr; A-F only)
Organization and implementation of education programs for farmers, farm managers, and agribusiness personnel using community and environmental resources, agricultural and instructional technology, and management information systems to attain family and business goals.

AFEE 5114. Agricultural Education Teaching Seminar. (1 cr)
Reflective learning on teacher preparation experience; identify issues and problems facing the discipline; needs for continual preparation and program adjustment.

AFEE 5116. Coordination of SAE Programs: Work-based Learning. (2 cr; A-F only. Prereq–Agricultural education major or #)
Principles/techniques for coordinating work-based learning. Supervised agricultural experience in agricultural education. Historical/philosophical roots of experiential learning, integration with classroom instruction, legal aspects, record keeping, coordination techniques, current agreement laws.

AFEE 5118. Strategies for Managing and Advising the FFA Organization. (2 cr; A-F only. Prereq–Agricultural education major or #)
Principles/techniques to advise an FFA chapter. Historical/philosophical basis of FFA, organization/structure. Integration with classroom instruction, public relations, recruitment, and administration of FFA chapters.

AFEE 5220. Special Topics in Agriculture Education and Extension. (1-3 cr [max 12 cr])
Content varies by offering.

AFEE 5231. Agricultural Education Curriculum K-12. (2 cr; A-F only)
Philosophy, organization, and administration of instruction in agricultural education programs at the elementary, middle, and high school levels.

AFEE 5233. Advanced Procedures in Teaching Agricultural Education. (2 cr; A-F only)
New developments in methodology; assessment of innovations and procedures; consideration of various levels of instruction.

AFEE 5235. Advanced Supervised Agricultural Experience Programs. (2 cr)
The organization and administration of agricultural experience programs for middle and secondary level students: career exploration, improvement projects, experiments, placement in production/business/community settings, entrepreneurship. Current state and national programs and resource material.

AFEE 5237. Mentorship for Supervising Agricultural Education Teachers. (2 cr)
Professional development training for experienced teachers to serve as mentors for beginning and student teachers of agricultural education. Emphasis on supervision and assessment of teaching performance. Focus on critical period of induction into the teaching profession.

AFEE 5239. Program Organization and Management in Agricultural Education. (2 cr)
Analysis of organization, management, and assessment of agricultural education programs at the middle, high school, and adult levels.

AFEE 5280. Current Issues for the Beginning Agricultural Education Teacher. (1-3 cr [max 3 cr])
Reflection, analysis on current problems and issues confronting beginning teachers of agricultural education. Issues in teaching methods, classroom and program management, discipline, curriculum, FFA and SAE development, school-to-work relationships.

AFEE 5290. Seminar: Current Issues in Agricultural Education and Extension. (1-3 cr [max 6 cr])
Exploration of current issues in agricultural education and extension, strategies of response, implications of response actions, and related leadership roles.

AFEE 5296. Professional Experience Practicum in Agricultural Education and Extension. (1-4 cr [max 4 cr])
Observation, study, and experience in agricultural business and industry; identification of educational problems observed in the agricultural industry; evaluation of personal experience.

AFEE 5331. History, Philosophy, and Systems of Extension. (3 cr; A-F only)
History and philosophy of extension; modification and adaptation to worldwide methods and approved practices; extension methodologies; innovative approaches; systems appropriate to development environments.

AFEE 5361. World Development Problems. (3 cr; A-F only)
Introduction to development problems throughout the world. Development in Third World countries. Examples of First World development problems. Interdisciplinary focus on population, health and disease, education, agriculture, industry, finance, politics, and human rights.

AFEE 5371. Farming Systems Research and Extension. (3 cr; A-F only)
Introduction to the theory and practice of linking farming systems, research, and extension. An interdisciplinary and holistic approach to rural development for individuals and communities throughout the world.

AFEE 5401. Introduction to Farm Business Management Education Teaching. (3 cr; A-F only)
Farm business management career and technical education teaching. Philosophy, history, mission, purposes. Course development, learning styles, roles of instructor. Rewards of profession. Curriculum. Foundational economics principles. Instructional methods. Recruiting/retaining students.

AFEE 5405. Advanced Farm Financial Analysis Methodology and Concepts. (1 cr)
Farm financial analysis concepts, whole entity financial analysis issues/tools, enterprise analysis options/methodologies. Evaluation of industry standardization efforts. Analysis of where each option fits.

AFEE 5407. Application of Advanced Farm Financial Analysis Tools and Methods. (1 cr)
Use of advanced farm financial analysis tools/methodology to analyze financial performance of actual farm businesses. Case farms are used to apply whole entity financial analysis tools/concepts and enterprise analysis methodologies.

AFEE 5409. Seminar: Teaching Strategic Farm Business Planning. (1 cr [max 4 cr]; A-F only)
Teaching strategic business planning to farm managers and agricultural professionals. Philosophy of strategic management, components of a strategic business plan. Materials/tools to apply strategic farm business planning in educational programs. Students apply strategic planning methods/concepts to case farm businesses.

AFEE 5411. Seminar: Farm Financial Planning Teaching Tools and Methods. (1 cr [max 4 cr]; A-F only)
Preparation to teach farm financial planning to farm managers and agricultural professionals. Principles/concepts of long range financial planning and short range cash flow planning. Farm planning software tools, case farm situations, practical farm planning experience.

AFEE 5413. Seminar: Teaching Effective Use of Commodity Marketing Tools. (1 cr [max 4 cr]; A-F only)
Teaching commodity marketing tools to farm managers and agricultural professionals. Commodity marketing tools, including cash forward contracts, futures, and options, and how to use them to enhance price and protect income. How to choose marketing tools, given financial/market conditions.

AFEE 5415. Seminar: Teaching Commodity Marketing Strategies. (1 cr [max 4 cr]; A-F only)
Teaching commodity market planning to farm managers and agricultural professionals. Development of marketing plans to enhance price and protect income. Introduction to tools to simulate implementation of plans against actual price scenarios.

AFEE 5993. Directed Study in Agricultural Education and Extension. (1-9 cr [max 9 cr])
Topics may be chosen to permit study of areas within education or to supplement areas of inquiry not provided in the regular course structure.

AFEE 5995. Integrating Paper—Master of Education: Agricultural and Extension Education. (1-4 cr [max 4 cr]; A-F only)
Students prepare paper dealing with issues in agricultural education applied to professional responsibilities.

Agronomy and Plant Genetics (AGRO)

Department of Agronomy and Plant Genetics

College of Food, Agricultural and Natural Resource Sciences

AGRO 1007. Horse in Your Backyard. (2 cr; A-F only. §ANSC 1007)
Role of horses in society. How to keep a horse well fed and healthy. Fundamentals of horse nutrition, feedstuffs, pasture, and horse health. How to seek/interpret information to make decisions on vaccination, worming, nutrition, grazing management, hay selection, manure handling, and use of dietary feed additives/enhancers.

AGRO 1093. Directed Studies. (1-4 cr [max 12 cr]. Prereq–4 cr in AGROnomy, #)
Allows study of agronomy in greater depth or in areas not currently offered in formal courses. Tutorial instruction under staff guidance.

AGRO 1101. Biology of Plant Food Systems. (4 cr)
Fundamental concepts of biology at the molecular, cellular, organismal, and ecosystem levels. Plants and plant use by humans. Lab, greenhouse, field, and classroom discussions.

AGRO 1103. Crops, Environment, and Society. (4 cr. §AGUM 2222)
Plants that supply food, fiber, beverages, and medicine to humans. Plant identification, plant physiology, plant breeding/biotechnology, plant ecology, crop culture/management.

AGRO 1660. First-Year Colloquium/Experience in AGROecosystems Analysis. (2 cr; A-F only. Prereq–1st yr in major hosted by Department of AGROnomy and Plant Genetics)
Agroecosystems and their impacts on the environment, landscapes, and rural communities. Students develop a course plan within their major, explore career options, and increase their familiarity with the department, its history, and its faculty/staff. Field trips, discussions, readings, reflective writings.

AGRO 2101. Biology of Food, Land, People, and the Environment. (4 cr; A-F only. Prereq–Elementary education major)
Biological basis of food, land, people, and environmental systems. Biology at cellular, organism and ecosystems level in relation to human activity systems. Active learning, project-based approach.

AGRO 2104. Grain and Seed Technology. (2 cr. Prereq–[1103, APEC 3411] recommended)
Practice/principles of grain grading using Federal Grain Inspection Service (FGIS) standards with examples of commodity, classes, subclasses, defects, and special grades. Seed analysis identifying common crops and weed seeds. Seed laws, seed handling, conditioning/viability testing. Primarily laboratory discussion, practicum, and problem solving.

AGRO 2501. Plant Identification for Urban and Rural Landscapes. (2 cr. §AGUM 2240. Prereq–BIOL 1009 or equiv)
Plant/weed species important in turf, horticulture, forestry, and crop production systems. Emphasizes identification of native grasses/forbs, field crops, and weed species in Minnesota and Upper Midwest. Plant life cycles, habitats, and relationships to humans.

AGRO 3203W. Environment, Global Food Production, and the Citizen. (3 cr. §AGUM 2224, ANSC 3203W. Prereq–BIOL 1009 or equiv)
Ecological and ethical concerns of food production systems in global agriculture—past, present, future. Examines underlying ethical positions about how agroecosystems should be configured. Decision cases, discussions, videos, other media.

AGRO 4005. Applied Crop Physiology and Development. (4 cr [max 8 cr]. Prereq–[CHEM 1011 or CHEM 1021 or equiv], 8 cr in [BIOL or plant science])
Applications of plant physiology processes of water relations, photosynthesis, mineral uptake/function, transpiration, translocation, and their relationships to plant growth/development from seed germination to maturation and dry down for harvest. Emphasizes inquiry, field problems, and group activity. Lecture, laboratory.

AGRO 4093. Directed Studies for Advanced Students. (1-4 cr [max 12 cr]. Prereq–15 cr in Agronomy, #)
Allows study of agronomy in greater depth or in areas not currently offered in formal courses. Tutorial instruction under staff guidance.

AGRO 4096. Professional Experience Program: Internship. (1-3 cr [max 6 cr]; S-N only. Prereq–#, COAFES undergrad, complete internship contract available in COAFES Career Services before enrolling; UC only)
Supervised professional experience in agribusiness firms or government agencies; evaluative reports and consultations with faculty advisers and employers.

AGRO 4101. Agricultural Decision Making and Experimentation. (3 cr. Prereq–Jr or sr)
Principles of field plot techniques and design applied to field demonstrations/experiments. Inductive/deductive reasoning, analysis of data, tests of significance. Treatment comparisons, decision making. Computers used for data processing and statistical analysis.

AGRO 4103. World Food Problems. (3 cr. §APEC 4103, CVM 6060, FSCN 4103. Prereq–jr or sr or grad)
Multi-disciplinary look at problems of and possible solutions for food production, storage, and utilization in developing countries. Presentations and discussions introduce conflicting views on population, use of technology, and ethical and cultural values held in various parts of the world.

AGRO 4401. Plant Genetics and Breeding. (4 cr. §HORT 4401. Prereq–[BIOL 1009 or equiv or grad], #)
Principles of plant genetics and environmental variation. Applications of genetics to crop evolution and breeding of self-pollinated, cross-pollinated, and asexually propagated crops. Lab experiments in hybridization, variation, and selection.

AGRO 4505. Biology, Ecology, and Management of Invasive Plants. (3 cr. Prereq–4005, [Bio 3002 or equiv], SOIL 2125, [AGRO 2501 or HORT 1011])
Ecology/biology of invasive plant species (weeds). Principles of invasive plant management in agricultural/horticultural, urban, wetland, aquatic, and other non-cropland landscape systems, utilizing biological, cultural, and chemical means. Management strategies to design systems that optimize invasive plant management in terms of economic, environmental, and social impacts.

AGRO 4603. Field Crop Scouting and Problem Diagnosis. (3 cr. Prereq–3005, SOIL 3416, [[2501, Ent 3001, PLPA 2002] or Agri 3001], [jr or sr], 16-20 cr in major)
Insects, diseases, weeds. Nutrient status. Environmental stresses due to wind, hail, frost, soil conditions, and chemical injury. Calibration of equipment associated with crop protection. Pesticide use, safety procedures. Crop growth staging and growing degree day as components of decision-making and precision agriculture. Intensive summer training sessons at selected Minnesota agricultural research and outreach centers.

AGRO 4605. Management Strategies for Crop Production. (4 cr. Prereq–Jr or sr or grad student with program committee approval)
Crop management situations/needs in various climate zones, soil types, from seed selection to crop storage. Focuses on cropping systems involving corn, soybeans, small grains, and forages. Emphasizes long term productivity, profitability, and sustainability. Lecture, discussion, problem sets, laboratory.

AGRO 4660. Senior Capstone: Leadership, Decision Making, and Problem Solving. (2 cr; A-F only. Prereq–4096 or ScAg 4009 or #)
Professional leadership and decision making from ethical, technical, societal, and personal reflection perspectives. Linked to undergraduate internship and other experiential learning opportunities. Problems, decision-centered cases, interviews.

AGRO 4888. Issues in Sustainable Agriculture. (2 cr. Prereq–1103, SOIL 1125 or 2125 or equiv)
Agroecology, sustainable practices, production economics, environmental quality, holistic resource management, healthy food/water, rural communities. Meet sustainable-agriculture advocates, including farmers, faculty, and representatives of non-profit sustainable-agriculture organizations.

AGRO 5021. Introduction to Plant Breeding. (3 cr. Prereq–GCB 3022 or equiv, background in plant science)
For majors not specializing in plant breeding. How genetics is applied to plant improvement. Emphasizes sustainable-production scenarios.

AGRO 5121. Applied Experimental Design. (4 cr. §ENT 5121. Prereq–STAT 5021 or equiv or #)
Principles of sampling methodologies, experimental design, and statistical analyses. Methods/procedures in generating scientific hypotheses. Organizing, initiating, conducting, and analyzing scientific experiments using experimental designs and statistical procedures.

AGRO 5311. Research Methods in Crop Improvement and Production. (1 cr; S-N only. Prereq–Applied plant sciences grad)
Demonstrations and discussions of techniques in crop improvement and/or production research. Presentations integrate biotechnology with traditional breeding methods; production sessions emphasize ecologically sound cropping systems.

AGRO 5321. Ecology of Agricultural Systems. (3 cr; A-F only. §ENT 5321. Prereq–[3xxx or above] course in [AGRO or ANSC or Ent or Hort or PLPA or Soil] or #)
Ecological approach to problems in agricultural systems. Formal methodologies of systems inquiry are developed/applied.

AGRO 5999. Special Topics: Workshop in AGROnomy. (1-6 cr [max 6 cr]. Prereq–Jr or sr or grad student)
Workshops on various topics in agronomy and plant genetics. Presenters/faculty may include guest lecturers/experts. Topics specified in *Class Schedule*.

Akkadian (AKKA)

Department of Classical and Near Eastern Studies

College of Liberal Arts

AKKA 5011. Elementary Akkadian I. (3 cr. Prereq–Adv undergrads with # or grads)
Introduction to cuneiform script. Basics of Old Babylonian morphology and syntax. Written drills, readings from Hammurabi laws, foundation inscriptions, annals, religious and epic literature.

AKKA 5012. Elementary Akkadian II. (3 cr. Prereq–5011)
Continuation of 5011. Readings include The Gilgamesh Epic, The Descent of Ishtar, Mari Letters, Annals of Sennacherib and Essarhaddon, Sargon II.

AKKA 5300. Readings in Akkadian. (3 cr [max 18 cr]. Prereq–5011, 5022)
Survey of Akkadian literature, including literary, legal, historiographical, and sacred texts. Topics specified in *Class Schedule*.

American Indian Studies (AMIN)

Department of American Indian Studies

College of Liberal Arts

AMIN 1001. American Indian Peoples in the United States. (3 cr)
Introduction to how voices/visions of indigenous peoples have contributed to history of cultural expression in North America. Historic contexts/varieties of this expression by region, tribal cultures. Emphasizes contributions in literature, philosophy, politics, fine arts.

AMIN 1002. Indigenous Peoples in Global Perspective. (3 cr; A-F only. §POL 1019)
Colonial experiences of selected indigenous peoples in Americas, Euroasia, Pacific Rim.

AMIN 1003. Indigenous Peoples: a Minnesota Perspective. (3 cr; A-F only)
History, culture, and lived experience of American Indian people in Minnesota. Self-representation and histories of Anishinaabe (Ojibwe) and Dakota peoples through film, music, oral traditions, and written texts. Work by non-Indian scholars that focuses on distinctive cultural, philosophical, and linguistic perspectives of Anishinaabe and Dakota peoples.

AMIN 1101. Beginning Ojibwe I. (5 cr)
Acquisition of speaking skills, fundamentals of grammar, writing systems.

AMIN 1102. Beginning Ojibwe II. (5 cr. Prereq–1101)
Acquisition of speaking skills, fundamentals of grammar, and writing systems.

AMIN 1121. Beginning Dakota I. (5 cr)
Development of the four skills of language acquisition: listening, speaking, reading, and writing. Oral drills and in-class participation focused on questions and answers.

AMIN 1122. Beginning Dakota II. (5 cr. Prereq–1121)
Further development of language acquisition skills with oral drills and in-class participation focused on questions and answers.

AMIN 1902. Freshman Seminar. (3 cr; A-F only. Prereq–Freshman)
Topic specified in *Course Guide*.

AMIN 1905. Freshman Seminar. (3 cr. Prereq–Fr or at least 30 cr)
Topics specified in *Course Guide*.

AMIN 1908W. Freshman Seminar. (3 cr [max 6 cr]; A-F only. Prereq–Freshman)
Topics specified in *Class Schedule*.

AMIN 3103. Intermediate Ojibwe I. (5 cr. Prereq–1101, 1102)
Improving speaking skills; grammatical structures; storytelling, oral history, and translation projects.

AMIN 3104. Intermediate Ojibwe II. (5 cr. Prereq–1101, 1102, 3103)
Improving speaking skills; grammatical structure; storytelling, oral history, and translation projects.

AMIN 3107. Structure of Anishinaabemowin, the Ojibwe Language. (3 cr; A-F only. §AMIN 5107. Prereq–3103)
Analysis of grammatical structures of Anishinaabemowin.

For definitions of course numbers, symbols, and abbreviations, see page 300.

AMIN 3108. History of Anishinaabemowin, the Ojibwe Language. (3 cr; A-F only. §AMIN 5108. Prereq–3107)
Historical development of Anishinaabwmowin.

AMIN 3109. Anishinaabe Literature. (3 cr; A-F only. §AMIN 5109. Prereq–3103)
Readings in Anishinaabe oral literature.

AMIN 3123. Intermediate Dakota I. (5 cr. Prereq–1122)
Development of listening, speaking, reading, and writing skills with oral drills and in class participation focused on questions and answers.

AMIN 3124. Intermediate Dakota II. (5 cr. Prereq–1121, 1122, 3123)
Further development of the listening, speaking, reading, and writing skills with oral drills and in class participation focused on questions and answers.

AMIN 3141. American Indian Language Planning. (3 cr; A-F only. §AMIN 5141. Prereq–3103 or 3123)
Planning for maintenence/revitalization of North American indigenous languages. Condition/status of languages. Documentation, cultivation, literacy, education.

AMIN 3143. Language in American Indian Culture and Society. (3 cr; A-F only. §ANTH 3143)
Survey of North American indigenous languages in social/cultural contexts, from before European contact to present.

AMIN 3201W. American Indian Literature. (3 cr)
Comparative studies of oral traditions, modern literature from various tribal cultures.

AMIN 3203W. American Indian Aesthetics. (3 cr; A-F only)
Ways in which American Indians have distinguished themselves as artistic thinkers. Regional traditions of American Indian art. Ways in which art was connected with everyday life and with religious practices. How American Indians thought about art differently from their Western counterparts. Innovations that contemporary American Indian artists have made in the way art is done and thought about by Indians/non-Indians.

AMIN 3301. American Indian Philosophies. (4 cr)
World views of the indigenous people of the Americas. Topics include native medicines and healing practices, ceremonies and ritual, governance, ecology, humor, tribal histories, and status of contemporary native people.

AMIN 3303. American Indians and Photography. (3 cr. §AMIN 5303)
Historical/comparative overview of photos in which American Indian people are central subjects. Primary features of images in American Indian photos. Relationships among those involved in making/viewing photos. Ways in which photos are interpreted. Relation of photos to social contexts in which they are produced and to agencies of those who stand behind their making.

AMIN 3401. American Indian Art. (4 cr)
Visual arts depicting rituals, traditions, values, and worldviews of major American Indian populations. Creative processes of art from pre-contact times through contemporary art. Emphasis placed on style, technique, materials and imagery, and symbolism.

AMIN 3402. American Indians and the Cinema. (3 cr; A-F only)
Representations of American Indians in film, historically/contemporarily. What such representations assert about Native experience and cultural viability. What they reflect about particular relationships of power.

AMIN 3409. American Indian Women: Ethnographic and Ethnohistorical Perspectives. (3 cr. §AMIN 5409, WOST 3412)
Comparative survey of ethnographic/ethnohistorical writings by/about American Indian women.

AMIN 3501. American Indian Tribal Governments and Politics. (3 cr; A-F only. §POL 3701)
History, development, structure, politics of American Indian Governments. North American indigenous societies from pre-colonial times to present. Evolution of aboriginal governments confronted/affected by colonizing forces of European/Euro-American states. Bearing of dual citizenship on nature/powers of tribal governments in relation to states, federal government.

AMIN 3601. American Indian Oral Traditions. (3 cr; A-F only. Prereq–1001 or 1002 or 1003)
Survey of oral traditions of indigenous peoples of North America.

AMIN 3701. Ojibwe Culture and History. (3 cr)
Ojibwe culture, history, and traditions including philosophy, religion, and lifestyle. Students develop an appreciation for the values and belief systems of traditional Indian people.

AMIN 3711. Dakota Culture and History. (3 cr)
An overview of Dakota culture, language, history, literature, contemporary issues, and the arts.

AMIN 3713. American Indian Communities of the Great Lakes. (3 cr)
American Indian communities of the Great Lakes over time, with particular attention to Ojibwe, Dakota, and HoChunk experiences. How the richness of the world created by Great Lakes tribes was damaged, depressed, and altered but not destroyed by the arrival of Euroamericans.

AMIN 3870. Topics in American Indian History. (3 cr. §HIST 3870)
Topics may include social history, oral history, history of particular regions, political systems, education, and policy. Designed for undergraduates.

AMIN 3871. American Indian History: Pre-Contact to 1830. (4 cr. §HIST 3871)
American Indian history from the era of ancient Native America to the removal era. Social, cultural, political, and economic diversity of Native American peoples and Native American experiences with European colonialism.

AMIN 3872. American Indian History: 1830 to the Present. (4 cr. §HIST 3872)
American Indian history from 1830 to the present. Impact of federal Indian policy on American Indian cultures and societies.

AMIN 3876. American Indian Education. (3 cr)
Educational processes in American Indian cultures; history of school programs established for tribes by missionaries and the U.S. and Canadian governments; the importance of boarding schools in shaping the lives, families, communities, and educational expectations of Indian people in the late-19th and early-20th centuries.

AMIN 3920. American Indian Studies Topics. (1-3 cr [max 6 cr]; A-F only)
Various topics in American Indian Studies.

AMIN 4201. Topics in American Indian Literature. (3 cr)
Topics organized around issues of theme or genre or region or tribe or gender.

AMIN 4231. The Color of Public Policy: African Americans, American Indians, and Chicanos in the United States. (3 cr. §AAS 4231, AFRO 4231, CHIC 4231)
Structural or institutional conditions through which people of color have been marginalized in public policy. Critical evaluation of social theory in addressing the problem of contemporary communities of color in the United States.

AMIN 4301. American Indian Intellectuals. (3 cr; A-F only)
Contributions that American Indians have made to understanding American Indain topics and the world around them. Works that have stood as paradigms of American Indian thinking. Emphasizes works written after 1945.

AMIN 4501. Law, Sovereignty, and Treaty Rights. (3 cr. Prereq–1001)
History of American Indian law and the post-contact effects of colonial and U.S. law on American Indians through the 20th century.

AMIN 4511. American Indian Political Economy. (3 cr. Prereq–1001)
Sources, nature, consequences of social/economic development/change in Indian communities. Precontact Indian communities. Effect of European contact. Social movements into 20th century, including phenomenon of urban Indian communities.

AMIN 4515. Contemporary American Indian Movements. (3 cr. Prereq–1001)
American Indian organizations and social movements of the 20th century. Explorations of political activism on and off reservations; treaty disputes; economic development strategies; the revival of traditional beliefs.

AMIN 4525W. Federal Indian Policy. (3 cr. §POL 4525W)
Formulation, implementation, evolution, comparison of Indian policy from pre-colonial times to self-governance new millennium. Theoretical approaches to federal Indian policy. Major federal Indian policies. Views/attitudes of policy-makers, reactions of indigenous nations to policies. Effect of bodies of literature related to policies.

AMIN 4990. Topics in American Indian Studies. (1-4 cr [max 8 cr])
Topics specified in *Class Schedule*.

AMIN 4991. Independent Study. (1-12 cr [max 18 cr]. Prereq–#, Δ, ❑)

AMIN 4994. Directed Research. (1-12 cr [max 18 cr]. Prereq–#, Δ, ❑)
Individually arranged research with faculty to meet student needs and interests.

AMIN 4996. Field Study. (1-12 cr [max 18 cr]. Prereq–#, Δ, ❑)
Opportunities for experiential learning in a variety of American Indian community settings. Consult department faculty at least one term before enrolling.

AMIN 5107. The Structure of Anishinaabemowin, the Ojibwe Language. (3 cr; A-F only. §AMIN 3107. Prereq–3104)
Analysis of grammatical structures of Anishinaabemowin.

AMIN 5108. History of Anishinaabemowin, the Ojibwe Language. (3 cr; A-F only. §AMIN 3108. Prereq–3107 or #)
Historical development of Anishinaabemowin.

AMIN 5109. Anishinaabe Literature. (3 cr; A-F only. §AMIN 3109. Prereq–3107 or 5107 or #)
Readings in Anishinaabe oral literature.

AMIN 5141. American Indian Language Planning. (3 cr; A-F only. §AMIN 3141. Prereq–3103 or 3123 or #)
Planning for maintenance/revitalization of North American indigenous languages. Condition/status of languages. Documentation, cultivation, literacy, education.

AMIN 5301. American Indian Intellectuals. (3 cr)
Major works produced by two most important generations of American Indian intellectual history. 1890-1934 Transition Period, in which Charles Eastman, Zitkala-Sa, Luther Standing Bear, and Arthur Parker defined American Indian culture and history as integral parts of contemporary American society. Impact of 1968-1975 Red Power movement and its continuing influence on American Indian Studies, as exemplified by works of Vine Deloria, Jr., N. Scott Momaday, Paula Gunn Allen, and Gerald Vizenor.

AMIN 5303. American Indians and Photography. (3 cr. §AMIN 3303)
Historical/comparative overview of photos in which American Indian people are central subjects. Primary features of images in American Indian photos. Relationships among those involved in making/viewing photos. Ways in which photos are interpreted. Relation of photos to social contexts in which they are produced and to agencies of those who stand behind their making.

AMIN 5402. American Indians and the Cinema. (3 cr; A-F only)
Representations of American Indians in film, historically/contemporarily. What such representations assert about Native experience and cultural viability. What they reflect about particular relationships of power.

AMIN 5409. American Indian Women: Ethnographic and Ethnohistorical Perspectives. (3 cr. §AMIN 3409, WOST 3412)
Comparative survey of ethnographic/ethnohistorical writings by/about American Indian women.

AMIN 5890. Problems in American Indian History. (3 cr. §HIST 5890. Prereq–#)
Intensive consideration of topics in American Indian history. Possible topics include social history, Indian history of particular regions, political systems, education, and American Indian policy.

AMIN 5920. Topics in American Indian Studies. (3 cr [max 12 cr]; A-F only)
Various topics in American Indian Studies depending upon instructor and semester

American Sign Language (ASL)

Department of Educational Psychology

College of Education and Human Development

ASL 1701. American Sign Language I. (5 cr)
First of a 4-course sequence. American Sign Language (ASL), cultural values/rules of behavior of Deaf community in the United States. Receptive/expressive readiness activities, sign vocabulary, grammatical structure, receptive/expressive fingerspelling, aspects of Deaf culture. Lab sessions.

ASL 1702. American Sign Language II. (5 cr. Prereq–1701 with a final grade of at least [S or C-] or #)
Second of a four-course sequence. American Sign Language (ASL), cultural values/rules of behavior of Deaf community in the United States. Receptive/expressive readiness activities, sign vocabulary, grammatical structure, receptive/expressive fingerspelling, aspects of Deaf culture. Lab sessions.

ASL 3703. American Sign Language III. (5 cr. Prereq–1702 with final grade of at least [S or C-] or #)
Third of a four-course sequence. American Sign Language (ASL), cultural values/rules of behavior of Deaf community in the United States. Receptive/expressive readiness activities, sign vocabulary, grammatical structure, receptive/expressive fingerspelling, aspects of Deaf culture. Lab sessions.

ASL 3704. American Sign Language IV. (5 cr. Prereq–3703 with final grade of at least [S or C-] or #)
Fourth of a four-course sequence. American Sign Language (ASL), cultural values/rules of behavior of Deaf community in the United States. Receptive/expressive readiness activities, sign vocabulary, grammatical structure, receptive/expressive fingerspelling, aspects of Deaf culture. Lab sessions.

ASL 3705. Cultural Perspectives of Deafness. (3 cr)
Introduction to the deaf community as a linguistic and cultural minority group. Role of deaf people in the larger society; political activism; laws; access to information; educational philosophies and methods; and communication systems.

ASL 5642. Classroom Communication Through ASL. (1-2 cr [max 5 cr]; S-N only. Prereq–Fluency in ASL, # required)
American Sign Language (ASL) form/function, vocabulary production, grammatical features needed by professionals working with children, storytelling strategies, technical sign language for classroom teachers. Content progresses in repeated segments.

American Studies (AMST)

Department of American Studies

College of Liberal Arts

AMST 1001. American Popular Arts and Public Life, 1900-1940. (4 cr)
Interdisciplinary study of American society from precontact to industrialization. American literature, art, music, and popular culture in historical context.

AMST 1001H. Honors: American Popular Arts and Public Life, 1900-1940. (4 cr)
Interdisciplinary study of American society from precontact to industrialization. American literature, art, music, and popular culture in historical context.

AMST 1002. American Popular Arts and Public Life, 1940 to present. (4 cr)
Interdisciplinary study of American society from industrialization through the present. Examination of American literature, art, music, and popular culture in historical context.

AMST 1011. Religions and American Identity in the United States, from World War II to the Present. (3 cr)
Political changes of last 60 years through lens of religion. Diversity of religious experience within U.S. How religious communities have shaped and been shaped by political events. Historical context of religion's role in current debates over race, gender, sexuality, science and foreign policy.

AMST 1401. Comparative Genders and Sexualities. (3 cr)
Gender and sexual practices/identities within a comparative (i.e. international) frame. How such practices/identities reflect/refract national ideals, that is, how gender and sexual practices express national/international division.

AMST 1902. Freshman Seminar. (3 cr; A-F only. Prereq–Freshman)
Topics specified in *Class Schedule*.

AMST 1907W. Freshman Seminar. (3 cr [max 6 cr]; A-F only. Prereq–Freshman)
Topics specified in *Class Schedule*.

AMST 1908W. Freshman Seminar. (3 cr; A-F only. Prereq–Freshman)
Topics specified in *Class Schedule*.

AMST 1909W. Topics: Freshman Seminar. (3 cr; A-F only. Prereq–Freshman)
Topics specified in *Class Schedule*.

AMST 2011. The United States since September 11. (3 cr)
How American citizenship and nationhood have changed since 9/11. The event and its aftermath in historical perspective. Political, economic, and military antecedents. How 9/11 has changed relations between the U.S. government, U.S. citizens, immigrants, and international community. How 9/11 has been remembered.

AMST 3001. Contemporary Perspectives on Asian America. (3 cr)
Interdisciplinary overview of Asian American experiences/identities. Emphasizes post-1965 migration/community. History, cultural productions, and contemporary concerns of Americans of Chinese, Japanese, Korean, South Asian, Filipino, and Southeast Asian ancestry.

AMST 3003. Public History. (3 cr; A-F only. Prereq–[AMST jr or sr], #)
Interpretations of a collective past as produced in various public venues, including museum exhibitions, films, theme parks, and Web sites. Intellectual/political issues associated with history produced for public audiences. Introduction to career opportunities in the field.

AMST 3111. American Cultures and the Arts. (3 cr)
Relationships between American cultures and artistic production through study of the works and lives of selected artists. How American societies and cultures shape, and are shaped by, artistic forms and expressions.

AMST 3113W. America's Diverse Cultures. (3 cr)
Diverse cultural (racial, ethnic, class) groups in America. Institutions/processes that shape their relations and create domination, resistance, hybridity, nationalism, racism, alliance. Specific content may vary.

AMST 3114. America in International Perspective. (3 cr. §JPN 3167)
The nature of international cultural exchange. The impact of U.S. cultures and society on other countries of the world as well as the impact of other cultures and societies on the United States.

AMST 3116. Jews and Popular Culture in 20th Century United States. (3 cr. §JWST 3116)
How theater, film, music, humor, and television were affected by Jews. innovations, social marginality, and wish to assimilate or resist assimilation to the culture. How the nation was and was not reshaped in the process.

AMST 3212. Dissident Sexualities in U.S. History. (3 cr; A-F only. Prereq–AMST [Jr or sr], #)
History of sexuality in the United States. Emphasizes sexualities that have challenged dominant social/cultural norms. Development of transgender, bisexual, lesbian, and gay identities/communities. Politics of sex across lines of race/ethnicity. Historical debates over controversial practices, including sex work.

AMST 3252W. American Popular Culture and Politics: 1900 to 1940. (4 cr)
Historical analysis of how popular arts represent issues of gender, race, consumerism, and citizenship. How popular artists define boundaries of citizenship and public life: inclusions/exclusions in polity and national identity. How popular arts reinforce/alter political ideologies.

AMST 3253W. American Popular Culture and Politics: 1940 to the Present. (4 cr; A-F only)
Historical analysis of how popular arts represent issues of gender, race, consumerism, and citizenship. How popular artists define boundaries of citizenship and public life: inclusions/exclusions in polity and national identity. How popular arts reinforce/alter political ideologies.

AMST 3301W. Senior Proseminar in American Studies. (3 cr. Prereq–AMST sr or #)
Problem related to representative theme, figure, or period. Students research/write senior theses.

AMST 3402. American Indians and the Cinema. (3 cr; A-F only)
Representations of American Indians in film, historically/contemporarily. What such representations assert about Native experience and cultural viability. What they reflect about particular relationships of power.

AMST 3632W. Jewish Women in the United States. (3 cr. §JWST 3632W, WOST 3403W)
History of American Jewish women. Uses literary/religious texts, primary documents, films, and histories to analyze Jewish women.s experiences in the United States and their transformation of Judaism, political activism, and their role in the bourgeois family. How they are represented, how they represent themselves. Interdisciplinary approach,

AMST 3920. Topics in American Studies. (2-4 cr [max 8 cr]. Prereq–jr or sr)
Topics specified in *Class Schedule*.

AMST 3993. Directed Studies. (1-9 cr [max 9 cr]. Prereq–#)
Guided individual reading or study.

AMST 4101. Gender, Sexuality, and Politics in America. (3 cr; A-F only)
Ways public and private life intersect through the issues of gender, sexuality, family, politics, and public life; ways in which racial, ethnic, and class divisions have been manifest in the political ideologies affecting private life.

For definitions of course numbers, symbols, and abbreviations, see page 300.

AMST 4301. Workers and Consumers in the Global Economy. (3 cr. Prereq–AMST major or advanced undergrad or #)
Impact of global economy on workplaces/workers in the United states, Mexico, and Caribbean countries. Influence on consumption. Consequences for American culture/character. Effects on U.S./Mexican factory work, service sector, temporary working arrangements, offshore production jobs in Dominican Republic, and professional/managerial positions. How work/consumption is lived through race, class, gender, and nation.

AMST 4961. Proseminar I. (3 cr. Prereq–AMST jr or AMST sr or #)
Classic/contemporary works/problems. Development of American Studies. Idealizing of American past. Challenges of multiculturalism. Contemporary themes.

AMST 4962W. Second Proseminar in American Studies. (3 cr. Prereq–AMST sr or #)
Problem related to representative theme, figure, or period. Students research/write senior theses.

AMST 5101. Religion and American Culture. (3 cr; A-F only)
Role of religion in shaping contemporary American cultural pluralism. Institutions and processes, intellectual frameworks, aesthetic and symbol systems that form religious communities and contribute to religious conflicts in U.S. society and culture.

AMST 5202. Thought and Practice of American Religions. (4 cr. Prereq–#)
Holidays, festivals, religious arts, organizations, spirituality, ethics, and systems of thought of "civil religion," "women's religion," indigenous American religions, American versions of Christianity, Judaism, Islam, Buddhism, and other world faiths, and their interactions in the United States and worldwide.

AMST 5402. American Indians in the Cinema. (3 cr; A-F only)
Representations of American Indians in film, historically/contemporarily. What such representations assert about Native experience and cultural viability. What they reflect about particular relationships of power.

AMST 5920. Topics in American Studies. (1-4 cr [max 9 cr])
Topics specified in *Class Schedule*.

Anatomy (ANAT)

Department of Integrative Biology and Physiology

Medical School

ANAT 3001. Human Anatomy. (3 cr. §ANAT 3301. Prereq–[BIOL 1009 or equiv], soph; ¶3002 or ¶3302 recommended)

ANAT 3002. Human Anatomy Laboratory. (1 cr. §ANAT 3302. Prereq–[BIOL 1009 or equiv], soph)
Complements 3001 or 3301.

ANAT 3301. Human Anatomy. (3 cr. §ANAT 3001. Prereq–[BIOL 1009 or equiv], soph; ¶3002 or ¶3302 recommended)

ANAT 3302. Human Anatomy Laboratory. (1 cr. §ANAT 3002. Prereq–[BIOL 1009 or equiv], soph)
Complements 3001 or 3301.

ANAT 4900. Directed Studies in Anatomy. (2 cr [max 6 cr] Prereq–#)

ANAT 5999. Head and Neck Anatomy. (3 cr; A-F only. Prereq–#)

Animal Science (ANSC)

Department of Animal Science

College of Food, Agricultural and Natural Resource Sciences

ANSC 1001. Orientation to Animal Science. (1 cr; S-N only. Prereq–Incoming fr)
Current issues, career planning, professional development. Interviews with faculty and other resource persons.

ANSC 1007. Horse in Your Backyard. (2 cr; A-F only. §AGRO 1007)
Role of horses in society. How to keep a horse well fed and healthy. Nutrition, feedstuffs, pasture, health. How to seek/interpret information on vaccination, worming, nutrition, grazing management, hay selection, manure handling, and use of dietary feed additives/enhancers.

ANSC 1011. Animals and Society. (3 cr)
Controversial issues in animal agriculture including animal products in the human diet. Livestock/human competition for limited resources. Animal behavior, welfare, and rights. Organic vs. conventionally-produced food. Livestock integration into sustainable resource utilization.

ANSC 1021. Avian Sampler. (1 cr)
Aspects of avian biology. Planned environmental/conservation practices. Wildlife rehabilitation programs for maintaining healthy populations of wild birds in Minnesota. Emphasizes care, management, and health considerations of avian species such as domestic poultry, raptors, and companion birds.

ANSC 1101. Introductory Animal Science. (4 cr)
Fundamental concepts of animal breeding, physiology, nutrition, and management as they apply to the production of beef, dairy, horses, poultry, sheep, swine, and other livestock.

ANSC 1403. Companion Animal Nutrition and Care. (3 cr)
For those without animal or nutrition training who have an interest in animal care. Nutrition of healthy animals and factors including behavior, environmental conditions, food type and availability. Focus on companion animals.

ANSC 1511. Food Animal Products for Consumers. (3 cr. §FSCN 1511)
Introduction to the compositional variation, processing, selection, storage, cookery, palatability, nutritional value, and safety of red meat, poultry, fish, and dairy products.

ANSC 2001. Animal Science Orientation for Transfer Students. (1 cr)
The major, the faculty. Clubs, organizations, resources. Career exploration/preparation. Internship opportunities, working on a resume, developing interview skills.

ANSC 2011. Dairy Cattle Judging. (2 cr. Prereq–#)
Evaluation of dairy animals on the basis of physical appearance, including classes of heifers and cows from the six major dairy breeds. Held in conjunction with the Minnesota State Fair. Training in oral reasons.

ANSC 2012. Livestock and Carcass Evaluation. (3 cr)
Evaluation of cattle, swine, and sheep. Breeding stock evaluated on live appraisal, performance records, and breeding values. Market animals evaluated, graded, and priced on physical appearance followed by evaluation and grading of their carcasses.

ANSC 2013. Beginning Livestock Judging. (2 cr. Prereq–Soph or jr or sr, #; ¶2012 recommended)
Visual evaluation of beef cattle, swine, and sheep for type, muscling, degree of finish, structure, and soundness. Short oral presentations. Preparation for collegiate livestock judging competition.

ANSC 2014. Poultry Judging. (2 cr)
How to distinguish subtle differences among poultry and poultry products. Intact eggs, broken-out eggs, chicken carcasses, live chickens. Students compete for position on four-person team representing the U of M at U.S. Poultry & Egg Association s Collegiate Poultry Judging.

ANSC 2055. Horse Health Management. (2 cr)
Theory/practice related to horse health/disease. Strategies for prevention of disease. Environmental hygiene, facility design, parasite control, prevention of infectious disease through vaccination. Major infectious, parasitic, developmental, nutritional, and metabolic diseases of North American horses. Physical therapies to treat injuries and maintain performance of sport horses. Body condition scoring, estimation of body weight, administration of vaccines and parasite control products, intramuscular injections. Bandaging methods, physical exam, first aid techniques. Lectures, labs, field trips.

ANSC 2102. Horse Production. (3 cr)
Fundamentals of horse care. Equine nutrition, behavior, diseases. Hoof care. First aid, health care, disease prevention. Parasites.

ANSC 2211. Biometrics for Livestock. (3 cr. §STAT 3011, STAT 5021. Prereq–MATH 1031 or higher)
Descriptive statistics. Elementary probability. Correlation. Regression. ANOVA. Statistics as applied to livestock.

ANSC 2401. Animal Nutrition. (3 cr)
Classification/function of nutrients. Use of nutrients for body maintenance, growth, egg production, gestation, and lactation. Comparative study of digestive systems of farm animal species.

ANSC 3007. Equine Nutrition. (3 cr. Prereq–2401)
Principles of nutrition. Emphasizes unique aspects of equine nutrition. Nutritional needs of healthy animals. Factors in feeding. Animal behavior, growth/development, physiological status, environmental conditions, food type, availability. How physiology of horse's gastrointestinal tract, utilization of feedstuffs, and horse's nutritional requirements interrelate. Balanced rations, nutritional related ailments. Pasture management, forage selection, use of dietary feed additives/enhancers.

ANSC 3052. Equine Anatomy and Exercise Physiology. (4 cr. Prereq–Jr or sr; 3301 recommended)
Interrelationship between physical structure/function. Emphasizes ways in which specialized aspects of anatomy/physiology contribute to unique athletic performance capabilities of horse.

ANSC 3141. Advanced Dairy Judging. (1 cr. Prereq–2011 or #)
Training in presentation of oral reasons in dairy cattle judging. Selected students from this course participate in fall intercollegiate dairy judging contest.

ANSC 3142. Advanced Livestock Judging. (2 cr. Prereq–2013 or #)
Visual evaluation of beef cattle, swine, and sheep for muscling, finish, structure, and soundness. Use of production (growth and reproduction) records in evaluation. Oral presentations. Preparation for national collegiate livestock judging contest.

ANSC 3143. Meat Judging and Grading. (2 cr. Prereq–1511, #)
In-depth training in beef, pork, and lamb judging, writing reasons, and beef carcass grading and specifications. Field trips to packing plants. Students selected from course participate in intercollegiate meats judging contests.

ANSC 3144. Advanced Poultry Judging. (1 cr. Prereq–2014)
How to judge live poultry and poultry products. Students compete for a position on four-person team representing U of M at National Collegiate Poultry Judging contest.

ANSC 3203W. Environment, Global Food Production, and the Citizen. (3 cr. §AGRO 3203W, AGUM 2224)
Ecological/ethical concerns of food production systems in global agriculture: past, present, and future. Underlying ethical positions about how agroecosystems should be configured. Interactive learning using decision cases, discussions, videos, other media.

ANSC 3221. Animal Breeding. (4 cr)
Application of qualitative and quantitative genetics to animal breeding. Concepts of livestock improvement through selection and mating programs.

ANSC 3301. Systemic Physiology. (4 cr. Prereq–[BIOL 1009 or equiv], [CHEM 1011 or CHEM 1021])
Introduction to physiology of neural, circulatory, respiratory, immune, and digestive systems of domestic animals.

ANSC 3305. Reproductive Biology in Health and Disease. (4 cr. Prereq–BIOL 1009 or equiv)
Reproductive organ functions, fertilization, estrous cycle and endocrine control, reproductive efficiency, problems/principles of artificial insemination. Anatomy, physiology, biochemistry of mammary gland. Mammary growth, initiation/maintenance of lactation, milk synthesis, factors influencing lactation curve.

ANSC 3307. Artificial Insemination Techniques. (1 cr; S-N only. Prereq–3305 recommended, #)
Hands-on training and techniques of artificial insemination at an off-campus laboratory setting. Proper techniques of AI and semen handling, and criteria for selection of bulls.

ANSC 3501. FARM Animal Environment. (3 cr. Prereq–[2301, jr] or #)
Biological/physical processes involved in adjustment of animals to ambient environments. Applications to farm animal management.

ANSC 3509. Animal Biotechnology. (3 cr. Prereq–BIOL 4003 or #)
Scientific, social, and ethical issues related to current topics in animal biotechnology. Introduction to molecular genetics. Use of animals as biological reagents/tools, topics in reproductive biotechnology, methods for genetic modification of animals.

ANSC 3511. Animal Growth and Development. (3 cr. Prereq–BIOL 1009)
Principles of animal growth. Interaction of nutrition, hormones, exercise, heredity, and disease in regulating growth.

ANSC 3609. Animal Production Systems. (2 cr)
Systems approach to decision making and problem solving in production enterprises. Planning, long range goal setting, production analysis, risk analysis, and cost-benefit analysis. Quality-of-life issues.

ANSC 4011. DAIRy Cattle Breeding. (3 cr. Prereq–3221)
Applying quantitative genetic principles to the breeding of dairy cattle. Primary emphasis on the evaluation of males, females, and systems of mating. Rates of genetic improvement with and without AI.

ANSC 4092. Special Problems in Animal Science. (1-4 cr [max 4 cr]. Prereq–#)
Research in an area of animal science under the supervision of a faculty member. Written report on the research is required.

ANSC 4093. Tutorial in Animal Science. (1-4 cr [max 4 cr]. Prereq–#)
Informally structured to encourage in-depth study of specific disciplines in animal science. Pertinent readings; preparation of written essays of high quality required.

ANSC 4096. Professional Experience Program: Internship. (1-3 cr [max 6 cr]; S-N only. Prereq–COAFES undergrad, #, complete internship contract available in COAFES Career Services before enrolling; UC only)
Supervised professional experience in animal industries and farm enterprise systems with study of various aspects of the industry and related fields; evaluative reports and consultations with faculty advisers and employers.

ANSC 4099. Special Workshop in Animal Science. (1-4 cr [max 4 cr])
Workshops on a variety of topics in animal science. Consult Class Schedule or department for offerings. Topics may use guest lecturers/experts.

ANSC 4102. Equine Management. (3 cr. Prereq–2102)
Fundamentals of horse management. Record keeping (traditional, computerbased). Marketing, sales techniques. Legal aspects (e.g., contracts, zoning, liability, insurance). A management project involves establishing, maintaining, improving an equine business.

ANSC 4401. Swine Nutrition. (3 cr. Prereq–2401, 3511 recommended)
A comprehensive review of major considerations in providing optimum, cost-effective nutrition to swine in all stages of production.

ANSC 4403. Ruminant Nutrition. (3 cr. Prereq–2401)
Nutrient requirements of ruminants, physiology of digestion in ruminants, nutrient content of feedstuffs, primarily forages; energy utilization, protein and nonprotein nitrogen utilization; nutritional disorders; formulation of adequate rations.

ANSC 4404. Applied Dairy Nutrition. (2 cr. Prereq–ANSC 4403 recommended)
Application of nutrition principles to dairy cow nutrition. Nutrient requirements of dairy cows, feed ingredient selection/usage, formulation/evaluation of dairy cow rations using computer programs. Case study analysis of feeding programs used on dairy farms.

ANSC 4405. Poultry Nutrition. (3 cr. Prereq–2401)
Nutrient requirements of chickens and turkeys; feed composition and use in formulation of adequate diets. Role of feed additives. Least cost formulations, nutritional interrelationships, and feeding systems.

ANSC 4601. Pork Production Systems Management. (4 cr)
Interrelationships of business, marketing, and biological performance of pigs in various types of production systems.

ANSC 4602. Sheep Production Systems Management. (4 cr. Prereq–2401; 3221 recommended)
Sheep management using feeding, breeding, selection, health, and physiological management aids for breeding flock and market lamb production. Taught via ITV with Crookston campus and the West Central Experiment Station, Morris.

ANSC 4603. Beef Production Systems Management. (4 cr)
How to resolve problems and manage cow-calf, stocker, or feedlot operations. Various segments of the beef industry and their current challenges. Nutrition, reproduction, genetics, and health as they relate to beef cattle production. Students evaluate a beef cattle enterprise and contribute solutions to problems in areas of marketing, selection, reproduction, nutrition, or health management.

ANSC 4604. Dairy Production Systems Management. (4 cr)
Practical applications of principles of animal breeding, nutrition, physiology, reproduction, housing, and economics in a problem solving context. Decision-cases, farm visits, field diagnostic techniques labs.

ANSC 4605. Poultry Production Systems Management. (4 cr. Prereq–2401; 4405 recommended)
Physiology, genetics, diseases, nutrition of poultry and relation to current management practices for production of eggs, broilers, and turkeys. Technical and practical phases of production and marketing in relation to their underlying principles. Visits to commercial production units.

ANSC 4611. Advanced Pork Production Systems Management. (2 cr. Prereq–¶4609; 4601)
Analysis of pork production systems using case studies and visits to modern pork production operations.

ANSC 4613. Advanced Beef Production Systems Management. (2 cr. Prereq–4609, ¶4603, sr)
Half semester course. Student enterprise-analysis teams evaluate a beef cattle enterprise and contribute solutions to problems in areas of marketing, selection, reproduction, nutrition, or health management.

ANSC 4614. Advanced Dairy Production Systems Management. (2 cr. Prereq–¶4609; 4604)
Analysis of dairy production systems using case studies and visits to actual dairies.

ANSC 5099. Special Workshop in Animal Science. (1-6 cr [max 12 cr]; A-F only. Prereq–#)
Topics vary. See Class Schedule or department. Topics may use guest lectures/experts.

ANSC 5200. Statistical Genetics and Genomics. (4 cr. §CMB 5200. Prereq–[STAT 3021 or equiv], [BIOL 4003 or equiv])
Linkage analysis for mapping genes with codominance, dominance, imprinting inheritance modes, linkage/transmission disequilibrium. Radiation hybrid mapping. Parentage testing. Testing/estimation of candidate gene effects. Experimental designs, statistical analysis for mapping quantitative trait loci (QTL) with additive, dominance, and epistasis effects, and for gene expression studies using microarrays. QTL analysis of gene expression data for mapping transcriptional regulation factors.

ANSC 5327. Endocrine and Reproductive Physiology. (2 cr. Prereq–2301, BIOC 3021)
Endocrine system. Synthesis, structure, actions, and regulation of hormones. Major endocrine glands/tissues, including the hypothalamus, anterior/posterior pituitary, thyroid, parathyroid, pancreas, adrenal cortex and medulla, gastrointestinal tract, and gonads. Emphasizes metabolic/reproductive endocrinology.

Anthropology (ANTH)

Department of Anthropology

College of Liberal Arts

ANTH 1001. Human Evolution. (4 cr)
From ancestors of chimpanzees and humans to origins of modern humans. Principles of evolutionary theory, behavioral biology, and comparative anatomy used to reconstruct the major events in human evolution and the behavior of ourselves and our ancestors.

ANTH 1001H. Honors: Human Evolution. (4 cr. Prereq–honors)
From ancestors of chimpanzees/humans to origins of modern humans. Principles of evolutionary theory, behavioral biology, comparative anatomy used to reconstruct the major events in human evolution, behavior of ourselves/our ancestors.

ANTH 1003V. Understanding Cultures: Honors. (4 cr. Prereq–Honors)
Introduction to social/cultural anthropology. Comparative study of societies/cultures around world. Adaptive strategies. Economic processes. Kinship, marriage, gender. Social stratification. Politics/conflicts. Religion/ritual. Personality/culture.

ANTH 1003W. Understanding Cultures. (4 cr)
Introduction to social and cultural anthropology. Comparative study of societies and cultures around the world. Topics include adaptive strategies; economic processes; kinship, marriage, and gender; social stratification; politics and conflicts; religion and ritual; personality and culture.

ANTH 1005V. Introduction to Cultural Diversity and the World System. (4 cr; A-F only)
Anthropology of cultural diversity in the United States and around the world. Comparative study of relationship between local cultures, global processes. Race/ethnicity, economic/social organization, political/religious systems, gender, social change.

For definitions of course numbers, symbols, and abbreviations, see page 300.

ANTH 1005W. Introduction to Cultural Diversity and the World System. (4 cr)
Anthropology of cultural diversity, in the United States and around the world. Comparative study of relationship between local cultures and global processes. Race/ethnicity, economic/social organization, political/religious systems, gender, social change.

ANTH 1111. Human Origins. (3 cr; A-F only)
World prehistory as investigated by anthropologists. Methods/concepts used to study prehistoric human biological/cultural development.

ANTH 1902. Freshman Seminar. (3 cr; A-F only. Prereq–Freshman)
Topics specified in *Class Schedule*.

ANTH 1904. Freshman Seminar. (3 cr; A-F only. Prereq–Freshman)
Topics specified in *Class Schedule*.

ANTH 1905. Freshman Seminar: Anthropology of Dreaming and Myth. (3 cr; A-F only. Prereq–Fr)
Topics specified in *Class Schedule*.

ANTH 1906W. Freshman Seminar. (3 cr; A-F only. Prereq–Freshman)
Topics vary. See *Course Guide*.

ANTH 1907W. Freshman Seminar. (3 cr [max 6 cr]; A-F only. Prereq–Freshman)
Topics specified in *Class Schedule*.

ANTH 1908W. Freshman Seminar. (3 cr; A-F only. Prereq–Freshman)
Topics specified in *Class Schedule*.

ANTH 1909W. Freshman Seminar. (3 cr; A-F only. Prereq–Freshman)
Topics specified in *Class Schedule*.

ANTH 1910W. Freshman Seminar. (3 cr [max 6 cr]; A-F only. Prereq–Freshman)
Topics specified in *Class Schedule*.

ANTH 3001. Introduction to Archaeology. (4 cr)
The fundamentals of fieldwork, laboratory analysis, and interpretation in archaeology. How field and laboratory research are designed and implemented, and how results are interpreted.

ANTH 3002. Sex, Evolution, and Behavior: Examining Human Evolutionary Biology. (4 cr; A-F only)
Methods/theories used to understand humans in an evolutionary framework. What can be known only, or primarily, form an evolutionary perspective. How evolutionary biology of humans might lead to better evolutionary theory. How physiology, development, behavior, and ecology coordinate/co-evolve in humans.

ANTH 3003. Cultural Anthropology. (3 cr. §GLOS 3003. Prereq–1003 or 1005 or #)
Areas of study may include: field research and politics of ethnographic knowledge; Marxist/feminist theories of culture; culture, language, and discourse; psychological anthropology; culture/transnational processes.

ANTH 3004. Great Controversies in Anthropology. (3 cr; A-F only)
Notable controversies in anthropology: Is human "reason" the same in all cultures? What makes up evidence/truth when we study people? Whose "voices" should be heard? Should anthropologists support contemporary attempts at economic "development"? Is it possible to agree on a set of universal individual or cultural rights? Can we make qualitative judgments about cultures? What civic/political responsibilities does the anthropologist have at home and with the people whom she or he studies? In-class debates.

ANTH 3005W. Language, Culture, and Power. (4 cr)
Studying sociocultural forms by analyzing linguistic data obtained in fieldwork setting. Students work with fluent speaker of non-English language to explore an unfamiliar culture in manner of an ethnographer working with a key informant.

ANTH 3007. Laboratory Techniques in Archaeology. (1-4 cr [max 4 cr]. Prereq–#)
Plant remains, material culture, faunal remains, human osteology. Emphasizes lab experience.

ANTH 3008. Introduction to Flintknapping. (3 cr; A-F only)
Hands-on experience in replication of prehistoric stone tools, as basis for archaeological analysis and as art form in itself.

ANTH 3009. Rise of Civilization. (3 cr)
Concept of civilization, from early hunter gatherer groups through settled agricultural villages to rise of towns/cities. Compares processes of change in eight regions of the world.

ANTH 3010. Native North Americans in Regional Perspective. (3-4 cr [max 6 cr])
An in-depth cultural and historical survey of native peoples who inhabit a particular region of North American (e.g., the greater southwest, prairie/woodland transition zone, Great Lakes area, Northwest coast, etc.).

ANTH 3017. Peoples and Cultures of Middle America. (3 cr. §LAS 3017)
Indian and Mestizo (Hispanic) cultures of Mexico and Guatemala and parts of Belize, Honduras, and Nicaragua. Describes both pre-Hispanic and Hispanic influences, with attention to area-wide patterns and local traditions.

ANTH 3019. Hispanic Cultures of Latin America. (3 cr. §LAS 3019)
Hispanic cultures from Mexico to South America. Economy, underdevelopment. The family and ritual kinship. Gender, religion, values, ideology, and change. Continuity/change.

ANTH 3020. Topics in the Anthropology of Africa. (3-6 cr [max 6 cr])
Perspectives on Africa using ethnographic methods and theories. Topics such as kinship and gender; ecological adaptations; economic systems; belief systems; political organization; art and aesthetics; Islamicization; colonization; liberation movements and nationalism; culture change.

ANTH 3023. Culture and Society of India. (3 cr. §ALL 3676, GLOS 3961)
Contemporary society and culture in South Asia from an anthropological perspective with reference to nationalism; postcolonial identities; media and public culture; gender, kinship and politics; religion; ethnicity; and the Indian diaspora.

ANTH 3025. Pacific Island Societies. (3 cr. Prereq–1003 or 1005 or 3003 or #)
Geography, prehistory, and Western exploration of Pacific Islands from Hawaii to Papua New Guinea. Culture change as these peoples become incorporated into the modern world system. Topics in regional ethnology. Relationship of societies to major issues in anthropological thought.

ANTH 3027W. Archaeology of Prehistoric Europe. (3 cr. §ANTH 5027W)
Early development of non-Mediterranean European society from Old Stone Age through Iron Age to the Roman Period, based on archaeological evidence. Principle transformations of European culture with introduction of agriculture, development of metallurgy, and emergence of towns and cities.

ANTH 3028. Introduction to Historical Archaeology. (3 cr; A-F only)
Emphasizes research approaches. Documentary research, oral history, probate inventories/acculturation, integration of documents/archaeological data, analysis of community patterning, social analysis of architecture, foodways, artifact identification, mean ceramic dating, industrial archaeology, estimation of social status with cemetery data, sampling, report writing.

ANTH 3029. Archaeology of Native Americans. (3 cr. Prereq–1001)
Pre-European contact and contact period archaeology of American Indians north of Mexico.

ANTH 3031. Altering States: After Communism. (3 cr)
Post-socialist transitions in Central/Eastern Europe from anthropological perspective. Daily life under socialism. Collapse of socialist rule in relation to key areas of social life such as gender, identity, nationalism, and ethnicity.

ANTH 3035. Anthropologies of Death. (3 cr; A-F only)
Anthropological perspectives on death. Diverse understandings of afterlife, cultural variations in death ritual, secularization of death in modern era, management of death in medicine, cultural shifts/conflicts in what constitutes good or natural death.

ANTH 3041. Ecological Anthropology. (3 cr. §ANTH 5041, ANTH 8213. Prereq–1003 or #)
Concepts, theories, and methods of ecological anthropology (cultural ecology).How humans interact with biophysical environment. Compares biological/cultural interactions with environment. Examines adaptive strategies cross-culturally.

ANTH 3043. Art, Aesthetics and Anthropology. (3 cr)
The relationship of art to culture from multiple perspectives including art as a cultural system; the cultural context of art production; the role of the artist in different cultures; methodological considerations in the interpretation of art across cultural boundaries.

ANTH 3045. Religion and Culture. (3 cr. Prereq–1003 or 1005 or #)
Religious beliefs and world views cross-culturally. Religious dimensions of human life through theories of origins, functions, and forms (e.g. myth, ritual, and symbolism) of religion in society.

ANTH 3046W. Romance and Culture. (3 cr)
Romance, aspects of this kind of love relationships from different perspectives in social/biological sciences. Draws on cross-cultural materials.

ANTH 3047W. Gender in Cross-Cultural Perspectives. (3 cr)
Relationship of biology and culture; cultural construction of gender and sexuality; variations in economic organization; women's involvement in ritual and religion; impact of colonialism on gender; rise of the state and gender issues.

ANTH 3143. American Indian Languages and Cultures. (3 cr. §AMIN 3143)
Survey of cultural developments among native peoples of North American from historic times to present.

ANTH 3212. Globalization, Markets, and Inequality. (3 cr; A-F only. §GLOS 3212)
Globalization of American business/culture, uneven relationships between developed/underdeveloped national economies, social/economic consequences of market economies and free trade. Focuses on growing inequalities in global economy. Wall Street and transnational corporations, sweatshops, consumer culture, brand-name global marketing, mass downsizings.

ANTH 3221. Archaeology Field School. (3-6 cr [max 6 cr]. Prereq–3001, #)
Archaeological field excavation, survey and research. Intensive training in excavation techniques, recordation, analysis, and interpretation of archaeological materials.

ANTH 3306W. Medical Anthropology. (4 cr; A-F only. Prereq–1003 or 1005 or entry level social science course recommended)
Relations among human affliction, health, healing, social institutions, and cultural representations cross-culturally. Human health/affliction. Medical knowledge/power. Healing. Body, international health, colonialism, and emerging diseases. Reproduction. Aging in a range of geographical settings.

ANTH 3310. Topics in Biological and Physical Anthropology. (3-6 cr [max 6 cr]. Prereq–1001)
Topics may include faunal analysis, the human skeleton and osteology, primate and human evolution, and forensic anthropology. Topics vary according to student and faculty interest.

ANTH 3913. Senior Project Planning. (1 cr. Prereq–[Jr or sr] ANTH major, #)
Evaluation of work to date. Planning future course work and prospectus for senior research project. Defining senior project, finding an adviser, developing preliminary bibliography.

ANTH 3980. Topics in Anthropology. (3 cr [max 6 cr])
Topics specified in *Class Schedule*.

ANTH 4001. Advanced Method and Theory in Archaeology. (3 cr. Prereq–1001 or 3001)
Survey and in-depth discussion of past and contemporary archaeological, theoretical, and methodological issues and approaches. Projects incorporating theories and methods. Emphasis on problem solving and integrating method and theory.

ANTH 4003W. Contemporary Perspectives in Cultural Anthropology. (3 cr; A-F only. Prereq–[[1003 or 1005], jr] or #)
Concept of culture, practice of fieldwork as they relate to various social institutions. Anthropological perspectives on race, ethnicity, gender.

ANTH 4011. Senior Seminar. (3 cr; A-F only. Prereq–Sr, ANTH major)
Research seminar. Topics/methodologies differ according to staff, student interests. Students complete substantial research paper.

ANTH 4013. Senior Project. (3 cr. Prereq–Sr major, #)
Independent research project fulfilling the senior option; directed by a faculty member.

ANTH 4019. Symbolic Anthropology. (3 cr. §ANTH 8211. Prereq–1003 or 1005 or grad student or #)
Pragmatic/structural aspects of social symbolism cross-culturally. Focuses on power, exchange, social boundaries, gender, and rituals of transition/reversal.

ANTH 4021. Psychological Anthropology. (3 cr. §ANTH 8209. Prereq–[[1003 or 1005], 3003] or #)
Self, emotion, cognition, and child development in cross-cultural perspective. Examines cultural and social influences on personality, and psychological foundations of society and culture.

ANTH 4023W. Culture Theory. (3 cr; A-F only. Prereq–Jr or sr or grad or #)
In-depth examination of key developments in the culture concept, from Darwin to present-day postmodern approaches. Examines the view that cultures have an inherent order that cannot be explained psychologically or biologically, and reactions to this view.

ANTH 4025. Studies in Ethnographic Classics. (3 cr; A-F only. Prereq–1003 or 1005)
Five types of explanations employed in ethnographic research: diffusionism and theory of survivals; functionalist response; British structuralists; French structuralism; interpretive turn. Problems in ethnographic practice, analysis, and writing. Focuses on several classic monographic examples and associated theoretical writing.

ANTH 4031W. Anthropology and Social Justice. (4 cr. Prereq–1003 or 1005 or 4003 or grad student or #)
Practical application of theories/methods from social/cultural anthropology. Issues of policy, planning, implementation, and ethics as they relate to applied anthropology.

ANTH 4035. Ethnographic Research Methods. (3 cr. Prereq–1003 or 1005 or grad student)
History of and current issues in ethnographic research. Research projects, including participant observation, interviewing, research design, note taking, life history, and other ethnographic methods.

ANTH 4043. Archaeology of Northern Europe. (3 cr)
Archaeology of Scandinavia, British Isles, and northern parts of continental Europe, from late-Bronze Age through Viking Period. Themes include art and symbolism; growth of towns; societal interactions; religion and ritual; introduction of Christianity; and development of long-distance trade.

ANTH 4045. Gender and Power in South Asia. (3 cr)
Analysis of the politics of gender in South Asia, especially India, focusing on colonial and nationalist constructions of gender and "tradition"; kinship, class and gender; gender and women's speech; feminism in India; fundamentalism and postcolonial identities; gender and violence.

ANTH 4047. Anthropology of American Culture. (3 cr. Prereq–1003 or 1005 or 3003 or #)
Anthropological approaches to contemporary American society and culture. Tensions between market and family. Unity and diversity. Individualism and community.

ANTH 4049. Religion and Culture. (3 cr. Prereq–1003 or 1005 or #)
Religious beliefs and world views cross-culturally. Religious dimensions of human life through theories of origins, functions, and forms (e.g. myth, ritual, symbolism) of religion in society.

ANTH 4051. Kinship, Gender, and Diversity. (3 cr. Prereq–1003 or 1005)
Cross-cultural variation in meanings, expectations, and practices related to marriage, family, sexuality and parenthood. Applies knowledge of variations to cultural diversity and other issues in U.S. society (e.g. changing marriage and family forms, incest, reproductive rights, reproductive technology).

ANTH 4053. Economy, Culture, and Critique. (3 cr. §ANTH 8205)
Systems of production/distribution, especially in nonindustrial societies. Comparison, history, and critique of major theories. Cross-cultural anthropological approach to material life that subsumes market/nonmarket processes.

ANTH 4057. Politics and Law. (3 cr. Prereq–1003 or 1005 or grad student)
Problems of inequality, order and authority in nonstate as well as state-based societies. Historical and cross-cultural survey of the concepts through which these problems have been understood. Comparative political/legal systems, featuring case studies from Africa, Burma, New Guinea, Indonesia, and the United States.

ANTH 4065. The Anthropology of Development. (3 cr)
Anthropological contributions to development practice/theory. Anthropological analysis of development institutions. Theories of development. Case studies from several parts of world explore relation of global forces and local cultures.

ANTH 4069. Environmental Archaeology. (3 cr. Prereq–1001, 3001 or grad)
Use of remains from archaeological sites and off-site records of ancient landscapes, vegetation, and climate to reconstruct how humans interacted with their environments. Interdisciplinary approaches toward reconstructing past human environments; long-term local and global environmental change.

ANTH 4071. Race and Culture. (3 cr; A-F only. Prereq–1003 or 1005 or 3003 or #)
Evaluation of main trends in study of racism. Psychological, sociological, symbolic, and "critical" approaches that treat racism as a sociodiscursive phenomenon. Racist discourse as a practice that defines an "other" and subjugates that other to strategies of exclusion.

ANTH 4075. Cultural Histories of Healing. (3 cr; A-F only. Prereq–Jr or sr or grad student or #)
Introduction to historically informed anthropology of healing practice. Shift to biologically based medicine in Europe, colonialist dissemination of biomedicine, political/cultural collisions between biomedicine and "ethnomedicines," traffic of healing practices in a transnationalist world.

ANTH 4077. Neanderthals: Biology and Culture of Humanity's Nearest Relative. (3 cr. Prereq–1001 or 3001 or 3002 or #)
Paleontological/archaeological record. Students reconstruct behavioral similarities/differences between Neanderthals and modern humans. Why humans alone survived end of Pleistocene.

ANTH 4980. Topics in Sociocultural Anthropology. (3 cr [max 6 cr]. Prereq–1003 or #)
Special topics in social/cultural anthropology. Topics specified in *Class Schedule*.

ANTH 4990. Topics in Archaeology: Seminar. (3-6 cr [max 6 cr]. Prereq–1001 or 3001 or #)
Discussion/review/analysis of specific current theoretical and/or methodological issues in archaeology. Topics specified in *Class Schedule*.

ANTH 4991. Independent Study. (1-6 cr [max 6 cr]. Prereq–#)
Under special circumstances and with the approval of the instructor, qualified students may register for a listed course on a tutorial basis.

ANTH 4992. Directed Readings. (1-6 cr [max 6 cr]. Prereq–#)
Allows students to pursue special interests in anthropology through reading materials under the guidance of a faculty member.

ANTH 4993. Directed Study. (1-6 cr [max 6 cr]. Prereq–#)
Allows students to pursue special interests in anthropology under the guidance of a faculty member.

ANTH 4994W. Directed Research. (1-6 cr [max 6 cr]. Prereq–#)
Qualified students may conduct a well-defined research project under the guidance of a faculty member.

ANTH 5008. Advanced Flintknapping. (3 cr; A-F only. Prereq–[3008 or 5269] or #)
Hands-on training in techniques of advanced stone tool production, artifact reproduction, and lithic experimental design for academic/artistic purposes.

ANTH 5025W. Cultural Semantics. (3 cr)
Understanding cultures and cognitive classification systems through lexical semantics.

ANTH 5027W. Origins of European Civilization. (3 cr. §ANTH 3027W)
Early development of European society, from Old Stone Age to Roman period. Principle transformations of European culture with introduction of agriculture, development of metallurgy and trade, and emergence of towns and cities.

ANTH 5029. Philosophical Anthropology. (3 cr; A-F only. Prereq–Sr or grad or #)
Advanced survey of traditional problems associated with broad-ranging views on human nature and culture. Specific arguments of relativists, behaviorists, phenomenologists, and others in relation to social life. Structuralist and post-structuralist approaches.

ANTH 5031. Science as Cultural Practice. (3 cr. Prereq–Sr or grad student or #)
Ethnographic, historical and sociological accounts of scientific practice. How facts are constructed/negotiated. Social, cultural, and politcal influences on scientific methods. How scientific projects articulate with hierarchies of race/gender. International differences in scientific practice.

ANTH 5033. Feminist Anthropology. (3 cr. Prereq–3047 or grad or #)
Advanced introduction to the development of feminist theory in anthropology. Theoretical and methodological shifts in feminist anthropology and ethnography. Feminist ethnography within the discipline as a whole; current debates concerning the reading and writing of ethnography.

ANTH 5041. Ecological Anthropology. (3 cr. §ANTH 3041, ANTH 8213. Prereq–Grad or #)
Concepts, theories, and methods of ecological anthropology (cultural ecology) show how humans interact with the biophysical environment. Compare biological and cultural interactions with the environment; examine adaptive strategies cross-culturally.

ANTH 5043. Colonialism and Culture. (3 cr; A-F only. §GLOS 5643)
Making of culture as colonial/anthropological object of knowledge. Relationship between colonial knowledge/formation of academic disciplines (especially anthropology). Colonial/postcolonial transformations of colony, nation, and metropole.

ANTH 5045. Urban Anthropology. (3 cr. Prereq–4003 or grad or #)
Anthropological approaches to urban life in Western and non-Western settings. Topics include social networks and voluntary organizations; class, ethnicity, gender and power; migration and immigration; urban labor and economics; and urban "problems."

ANTH 5221. Anthropology of Material Culture. (3 cr; A-F only)
Material culture as a social creation, studied from multiple perspectives (e.g., social anthropology, archaeology, primatology). Conceptions of how humans articulate with material world they construct.

ANTH 5244. Skeletal Materials for Archaeologists. (4 cr; A-F only. §ANTH 8244. Prereq–#)
How anthropologists use fossil bones to answer questions of past human diet, behavior, and environments. Basics of skeletal-element/species identification of humans and large mammals. Project where students analyze a small assemblage of bones. Emphasizes scientific method, data analysis using computers.

ANTH 5269. Analysis of Stone Tool Technology. (4 cr; A-F only. Prereq–1001 or 3001 or #)
Practical lab experience. How to analyze archaeological collections of stone tools to learn about human technological behavior in past. Students analyze archaeological/experimental collections, make stone tools themselves.

ANTH 5980. Topics in Anthropology. (3 cr [max 6 cr])
Topics specified in *Class Schedule*.

ANTH 5990. Topics in Archaeology. (3 cr [max 9 cr]; A-F only. Prereq–#)
Topics specified in *Class Schedule*.

Applied Business (ABUS)

College of Continuing Education

ABUS 4011. Historical Perspectives and Contemporary Business Challenges. (3 cr; A-F only. Prereq–At least 45 cr)
Global competitiveness, product and service quality, information revolution, and changing customer/workforce demographics. Approaches to meeting contemporary challenges studied against historical backdrop of evolving management practices. Emphasizes developing systematic ways of analyzing complex problems.

ABUS 4012. Problem Solving in Complex Organizations. (3 cr; A-F only. Prereq–At least 45 cr)
Open systems perspective. Analyzing root causes/effects of problems/solutions across boundaries in organization. Process analysis as problem-solving tool. Problem-solving frameworks/processes. Techniques for analyzing root causes, expanding alternatives, predicting consequences, making choices.

ABUS 4021. Small Group Behavior and Teamwork. (3 cr; A-F only. Prereq–At least 45 cr)
Emphasizes work groups in organizations. Factors affecting performance/productivity. Identify formal/informal roles. How effective teamwork is created/sustained. Leadership/followership practiced.

ABUS 4022. Management in Organizations. (3 cr; A-F only. Prereq–45 cr completed)
Demands on today s managers. Techniques/ideas beyond traditional studies. Focuses on small to medium-sized organizations. Applying management theory to all levels. Managing in global workplace. Organizational planning and decision making. Organizing resources. Leading/motivating people. Controlling/evaluating organizational activities.

ABUS 4023W. Communicating for Results. (3 cr; A-F only. Prereq–45 cr completed)
Aspects of communication essential for being persuasive/influential. Organizing/presenting ideas effectively, strategies for audience analysis, choosing communication methods, making appropriate use of informal influence methods, handling dissent. Processes for intercultural communication.

ABUS 4024. Effective Oral Communication and Business Presentations. (1 cr [max 2 cr]; A-F only. Prereq–BAS student with at least 45 cr)
Building/developing business presentation skills and oral communications effectiveness. Videotaping/critiques of actual presentations based on audience analysis, technique selection, and handling receptive/hostile audiences.

ABUS 4025. Negotiating for Agreement. (1 cr; A-F only. Prereq–At least 45 cr)
Practical negotiating tools, hands-on practice to engage in win-win negotiations.

ABUS 4031. Accessing and Using Information Effectively. (3 cr; A-F only. Prereq–Computer literacy, at least 45 cr)
Role of information in business operations. Information systems, data management. Accessing external information using information search services, CD-ROMs and periodicals. Accessing internal information using desktop database system, electronic mail, or computer conferencing. Typology of information applied in case studies and exercises.

ABUS 4032. Quantitative Skills for Decision Making. (3 cr; A-F only. Prereq–College algebra, college statistics, at least 45 cr)
Exploratory data analysis, visual display of data, basic mathematical/statistical techniques for analysis. Decision theory, decision modeling.

ABUS 4041. Dynamics of Leadership. (3 cr; A-F only. Prereq–At least 45 cr)
Successful leadership via flexible approach. Knowledge, skills, and abilities that leaders develop from eight leadership strategies: academic, bureaucratic, eclectic, economic, fellowship, military, political, social. Ways to lead diverse populations in a global environment.

ABUS 4042. Planning and Implementing Strategic Decisions. (3 cr; A-F only. Prereq–4101, [4103 or 4701], at least 45 cr)
Strategic assessment of a company s competitive capabilities/performance. How companies allocate resources to their activities. Analyzing business environment, assessing business risk, determining what actions are needed. Evaluating choices firms make to compete successfully and sustain profitability.

ABUS 4043. Project Management in Practice. (3 cr; A-F only. Prereq–4102, at least 45 cr)
Introduction to project management, including tools/techniques to support project leader in scheduling, coordinating, and allocating resources. Students work in teams to develop/conduct a field project, putting tools of project management into practice. Requires use of MS Project (bundled w/textbook), Word, PowerPoint.

ABUS 4044. Tools for International Trade. (3 cr; A-F only. Prereq–At least 45 cr)
International forces/trends. Identifying ways in which businesses can work within context of international change. Tools used in specific transactions, ways to diagnose in what circumstances they are most appropriately applied.

ABUS 4101. Accounting for Managers. (3 cr; A-F only. Prereq–Financial accounting, at least 45 cr)
Using accounting data to make day-to-day management decisions. Determining cost-volume-profit relationships, measuring various costs, evaluating capital budgets. Acceptability of investment projects. Constructing profit plans, evaluating budget variances. Analyzing activity costing and standard costs.

ABUS 4102. Operations in Manufacturing and Service Businesses. (3 cr; A-F only. Prereq–At least 45 cr)
Concepts/principles related to management of operations functions. Operations strategy, process, design, just-in-time inventory management, forecasting, scheduling, quality improvement. Relationships between operations and the environment.

ABUS 4103. Marketing and Sales. (3 cr; A-F only. Prereq–At least 45 cr)
Legal, behavioral, ethical, competitive, economic, and technological factors as they affect product pricing, promotion, and marketing. Personal selling function as integral part of distribution system. Sales force organization, selection, training, motivation, compensation, forecasting, budgeting, control.

ABUS 4104. Management and Human Resource Practices. (3 cr; A-F only. Prereq–At least 45 cr)
Providing day-to-day leadership. Organizing work, motivating employees. Delegating, coordinating, and achieving results. Front line human resource practices, including selection, induction, and training of new employees, employee appraisal. Handling grievances/discipline.

ABUS 4501. Entrepreneurship. (3 cr; A-F only. Prereq–4101, [4103 or 4701], at least 45 cr)
Self-employment as alternative to employment. Phases of entrepreneurship, including identifying an opportunity, start-up, managing/harvesting a small business. Emphasizes all aspects of business plan.

ABUS 4503. Technological Change, Work Organization, and Management Practices. (3 cr; A-F only. Prereq–At least 45 cr)
Evolution of work organization in the United States. Factors responsible for changes. Effect of changes on labor-management relations. Revolutions in technology, scientific management, collective bargaining, self-directed work teams, and lean production methods.

ABUS 4505. Values and Ethics at Work. (1 cr; A-F only. Prereq–At least 45 cr)
Ways in which we look at work/our jobs. Religious, legal, social, cultural, and personal viewpoints. Topics may include pay equity/benefits, discrimination, product liability, corporate political contributions, loyalty, family/work conflicts, community responsibility, and role of business in society. Case examples.

ABUS 4507. Change-Agent Skills. (3 cr; A-F only. Prereq–At least 45 cr)
Assessing needed change in relation to environment. Phases of change. Persuasive techniques. Shared responsibilities in carrying out change. Change as internal/external process. Leadership practices.

ABUS 4509. New Product Development. (3 cr; A-F only. Prereq–[[4103 or 4701 or MKTG 3001], at least 45 cr] or #)
How new consumer, industrial, and service products are planned/developed. Idea generation, concept/buyer testing, pricing, sales/profit strategies, product positioning, promotion, packaging/distribution. Marketing case histories. Student projects.

ABUS 4511. Small Business Management Skills. (3 cr; A-F only. Prereq–[4501 or business plan experience], [4101 or 4701 or equiv], at least 45 cr)
Forging realistic growth trajectory. Designing adaptive organization. Identifying/building on strengths. Avoiding growth-induced failure. Coping in environment of resource poverty. Real-life cases.

ABUS 4515. Changing the American Workplace: Choice or Destiny?. (3 cr; A-F only. Prereq–At least 45 cr)
Evolution of work organization. Revolutions in technology, scientific management, collective bargaining, self-directed work teams, and lean production methods. Limited to 25.

ABUS 4601. Corporate Finance. (3 cr; A-F only. Prereq–ACCT 2050, [ECON 1101 or ECON 1102], MATH 1031, 45 cr completed)
Principles of financial management. Implementation by corporate financial managers in strategic financial decisions. Financial statement analysis. Time value of money. Risk/return. Equity valuation. Fixed income securities. Capital budgeting analysis. Cost of capital. Long-term financing. Capital structure analysis. Dividend policy.

ABUS 4701. Introduction to Marketing. (3 cr; A-F only. Prereq–ACCT 2050, ECON 1101, 45 cr completed)
Conceptual tools for creating a marketing plan. How marketing relates to other functional areas of business. Importance of an ethical, global view.

ABUS 4901. Special Topics in Applied Business. (3 cr; A-F only. Prereq–At least 45 cr)
Management issues in a changing workplace. Topics vary.

ABUS 4993. Directed Study. (1-3 cr [max 6 cr]. Prereq–#, Δ)
Specially arranged projects, trips, or field work.

ABUS 4999. Practicum. (3 cr [max 9 cr]; A-F only. Prereq–BAS student in applied business, at least 33 applied-business cr, #, Δ)
Project in student's employing organization or in organization providing an internship. Integrates projects from previous coursework or develops plan for new venture or expands existing business. Limited class meetings.

Applied Economics (APEC)

Department of Applied Economics

College of Food, Agricultural and Natural Resource Sciences

APEC 1001. Orientation to Applied Economics. (1 cr; A-F only)
Introduction to curriculum offerings, liberal education requirements, employment opportunities, faculty in the Department of Applied Economics. Emphasizes historical development of the discipline, areas of specialization, coursework expectations, career planning.

APEC 1101. Principles of Microeconomics. (3 cr. §ECON 1101, ECON 1101H, ECON 1104)
Theory of the household and firm; demand and supply; price determination; government in the market; market structures; agriculture and food; externalities and the environment; labor markets and unions; capital and interest; project evaluation; human capital.

APEC 1102. Principles of Macroeconomics. (3 cr. §ECON 1102, ECON 1102H, ECON 1105. Prereq–1101 or ECON 1101)
Unemployment/inflation, measures of national income, macro models, fiscal policy/problems. Taxes and the national debt. Money/banking, monetary policy/problems. Poverty and income distribution. International trade and exchange rates. Economic growth/development.

APEC 1251. Principles of Accounting. (3 cr. §ACCT 2050. Prereq–30 cr; not recommended for premajors in AgFoodBus majors)
Fundamentals of business accounting, basic finance concepts, use of accounting data for income tax and managerial decision making.

APEC 1905. Topics: Freshman Seminar. (1-3 cr [max 3 cr]; A-F only. Prereq–Fr)
Topics vary.

APEC 3000. Seminar in International Agriculture. (1 cr [max 3 cr]. Prereq–#)
Presentation and discussion of students' research papers, literature reviews of selected topics, or discussions by students and faculty of their experiences in international agriculture.

APEC 3001. Applied Microeconomics: Consumers, Producers, and Markets. (4 cr. §ECON 3101, ECON 3101H, ECON 3105. Prereq–[[1101 or ECON 1101], [MATH 1142 or MATH 1271]] or #)
Consumer/producer decisions. Supply/demand, market structure. General equilibrium and welfare. Effects of government regulations, market failure.

APEC 3002. Applied Microeconomics: Managerial Economics. (4 cr. Prereq–[[3001 or ECON 3101], [OMS 2550 or STAT 3011]] or #)
Microeconomic theory, its application to managerial problems. Introduction to regression analysis, demand analysis, demand function estimation, forecasting, cost function estimation, resource allocation decisions, linear programming, market structure, pricing policy, risk analysis, investment analysis.

APEC 3006. Applied Macroeconomics: Government and the Economy. (3 cr. §ECON 3102, ECON 3102H. Prereq–[[1102 or ECON 1102], [3001 or ECON 3101]] or #)
Public sector and market economics. Public goods, externalities, and other allocation issues. Government and stabilization of national economy. Overview of new classical/Keynesian models. Principles of taxation. Individual income tax. Sales, business, and property taxes.

APEC 3007. Applied Macroeconomics: Policy, Trade, and Development. (3 cr. Prereq–[1101 or ECON 1101], [1102 or ECON 1102]; 3001, 3006 recommended)
Foreign trade, development, and growth. General equilibrium models for affects of trading blocks on U.S. agriculture and broader economy. Importance of growth on incomes. Foreign trade. Policies that impact world trade, economic growth.

APEC 3041W. Economic Development of U.S. Agriculture. (3 cr. Prereq–1101 or ECON 1101)
Economic, political, social, and technical forces that have shaped development of U.S. agriculture. Role of agricultural development in national economic development in the United States. Implications for developing countries.

APEC 3071. Agriculture and Economic Growth in Developing Countries. (3 cr. Prereq–1101, 1102, ECON 1101, 1102 or #)
Characteristics and performance of peasant agriculture; potential role of agriculture in economic development, and design of economic policies to achieve agriculture and economic development; role of women in agricultural development.

APEC 3411. Commodity Marketing. (3 cr. Prereq–1101 or ECON 1101)
Economic concepts related to marketing agricultural commodities. Conditions of competitive markets, historical perspectives on market institutions/policy, structural characteristics of markets, policies/regulations affecting agricultural marketing of livestock, crop, and dairy products.

APEC 3451. Food and Agricultural Sales. (3 cr. Prereq–1101 or ECON 1101)
Professional selling of agricultural and food products. Students build/refine sales abilities, identify/qualify prospects, deliver sales presentations, close the sale. Principles of market research.

APEC 3501. Agribusiness Finance. (3 cr. §FINA 3000, FINA 3001. Prereq–[[1251 or ACCT 2050], 60 cr] or #)
Analysis of financing and investment strategies for agribusiness firms and their effects on liquidity, solvency, and profitability. Analysis of financial institutions, markets, and instruments. Management problems, issues facing financial intermediaries serving agriculture.

APEC 3611. Environmental and Natural Resource Economics. (3 cr. Prereq–1101 or ECON 1101)
Basic concepts of resource use. Financial/economic feasibility. External effects, market failures. Resource use, environmental problems. Measuring impacts of resource development. Economics of alternative resource programs, environmental strategies.

APEC 3801. Health Economics and Policy. (3 cr. §PUBH 3801. Prereq–[[1101 or ECON 1101], knowledge of plane geometry] or #)
Economics of health care markets. Problems faced by consumers and health care services. Builds on microeconomic principles of supply/demand for health, health care, health insurance, and role of government. Theoretical/empirical models, applications.

APEC 3811. Principles of Farm Management. (3 cr. Prereq–1101 or ECON 1101)
Strategic and operations aspects of farm management; financial analysis, budgeting, strategic management; marketing plan and control; enterprise and whole farm planning and control; investment analysis, quality, risk, and personnel management.

APEC 3821. Retail Center Management. (3 cr. Prereq–[1101 or ECON 1101], [1251 or ACCT 2050])
Management of garden centers, grocery stores, and other retail units selling perishable agricultural products.

APEC 3991. Independent Study in Applied Economics. (1-4 cr [max 4 cr]. Prereq–#)
Independent study and supervised reading and research on subjects and problems not covered in regularly offered courses.

APEC 4096. Professional Experience Program: Internship. (1-3 cr [max 6 cr]; S-N only. Prereq–COAFES jr or sr, #, complete internship contract available in COAFES Career Services before enrolling; UC only)
Professional experience in agribusiness firms or government agencies gained through supervised practical experience; evaluative reports and consultations with faculty advisers and employers.

APEC 4103. World Food Problems. (3 cr. §AGRO 4103, CVM 6060, FSCN 4103. Prereq–jr or sr or grad)
A multi-disciplinary look at problems and possible solutions affecting food production, storage, and utilization in developing countries. Presentations and discussions introduce conflicting views on population, technology, and ethical and cultural values of people in various parts of the world.

APEC 4311. Tourism Development: Principles, Processes, Policies. (3 cr. Prereq–1101, 1102 or ECON 1101, 1102)
Evolution of tourism industry; economic, environmental, and sociocultural impacts of tourism development; influence of government policies and organizations; models and tools needed for successful development; consequences of development activities and ways to involve stakeholders in decisions.

APEC 4451W. Food Marketing Economics. (3 cr. §APEC 5451. Prereq–[[1101 or ECON 1101], MKTG 3001, 60 cr] or #)
Economics of food marketing in the United States. Food consumption trends, consumer food behavior, marketing strategies, consumer survey methodology, food distribution/retailing system. Policy issues related to food marketing. Individual/group projects.

APEC 4481. Futures and Options Markets. (3 cr. §APEC 5481. Prereq–[[3001 or ECON 3101], [ANSC 2211 or OMS 1550 or STAT 3011], 60 cr] or #)
Economics of futures/options trading in theory/application. Basis/price relationship in storable/nonstorable commodities. Hedging/commercial use of futures/options contracts. Speculation. Pricing efficiency. Market performances/regulation.

APEC 4501. Financial Applications. (3 cr; A-F only. Prereq–[3501 or FINA 3001], [1251 or ACCT 2050])
Designing/implementing solutions to financial problems with Microsoft Excel® spreadsheet software. Development of computer-based tools. Interpreting/implementing concepts/theories in economics/finance.

For definitions of course numbers, symbols, and abbreviations, see page 300.

APEC 4821W. Agribusiness Management. (5 cr. Prereq–3002, [3501 or FINA 3001], MGMT 3001)
Strategic/operations management for production, processing, wholesaling, retailing, and service. Establishing mission/goals. Strategy formulation, implementation, and control. Quality management, process selection, operations planning, inventory management, human resource issues. Business plans. Case study analysis.

APEC 5031. Methods of Economic Data Analysis. (3 cr. Prereq–MATH 1271, STAT 5021, knowledge of matrix algebra)
Statistical and econometrics techniques for applied economists. Theory and application of multivariate regression model using data sets from published economic studies. Emphasis on use of statistical technique to understand market behavior.

APEC 5032. Economic Data Analysis for Managerial and Policy Decisions. (3 cr. Prereq–[5031 or #, familiarity with SAS)
Statistical/econometric methods for the analysis of large data sets to support managerial/policy decisions. Methods for organizing, accessing, and ensuring the quality of data. Estimation techniques include panel data methods, limited dependent variable models, and time series analysis. Emphasizes clarity of reporting and design of procedures for maintaining/updating data estimates.

APEC 5151. Applied Microeconomics: Firm and Household. (3 cr. Prereq–3001 or or MATH 1271 or Math 2243 or equiv or grad student or #)
Quantitative techniques for analysis of economic problems of firms and households. Links between quantitative tools and economic analysis Regression analysis, mathematical programming, and present value analysis.

APEC 5152. Applied Macroeconomics: Income and Employment. (3 cr. Prereq–3001 or or MATH 1271 or Math 2243 or equiv or grad student or #)
Static general equilibrium open economy models and simple business cycle models that examine economic growth, business cycles, and fiscal and monetary policy. Input-output analysis and large scale econometric models. Sources/properties of economy and sector-wide data. Empirical applications.

APEC 5321. Regional Economic Analysis. (3 cr. Prereq–3006 or ECON 3102 or #)
Regional development patterns and role of resources, transportation, and institutional constraints. Trade, migration, and investments in regional growth and change. Regional economic information in investment and location decisions. Evaluation of economic development policies and tools. Economic impact analysis.

APEC 5341. Public Finance. (3 cr; A-F only. Prereq–3001 or ECON 3101 or PA 5021)
Which services should the public sector provide? Which level of government should provide them? How should governments fund those services? Which types of taxes should be levied and on whom? Applying economic theory/analysis to spending, revenue, and tax policy issues facing governments.

APEC 5451. Food Marketing Economics. (3 cr; A-F only. §APEC 4451W. Prereq–Grad student)
Economics of food marketing in the United States. Food consumption trends. Consumer food behavior, expenditure, data collection. Consumer utility models, demand forecasting. Food distribution system. Changes in supply chain, industry structure that serves retail food outlets. Individual/group projects.

APEC 5481. Futures and Options Markets. (3 cr. §APEC 4481. Prereq–Grad student)
Economic concepts related to futures/options trading. Hedging, speculation.

APEC 5511. Labor Economics. (3 cr. Prereq–[[3001 or ECON 3101 or PA 5021], [PA 5032 or equiv], grad student] or #)
Theoretical foundations of labor markets. Intertemporal/household labor supply. Demand for labor, efficiency wages. Human capital theory, unemployment, migration decisions. Analysis of econometric research applied to labor policy issues such as minimum wage, tax policy, social insurance, education.

APEC 5581. Human Capital and Household Economics. (3 cr. Prereq–3001 or ECON 3101 or #)
Household economics and investment in human capital (e.g., children, education, health and nutrition); labor force participation, lifetime earnings, and nonmarket work; time allocation and substitution of capital for labor in the household in the western and third world.

APEC 5611. Economic Aspects of Environmental Management. (3 cr; A-F only. Prereq–[Sr or grad student] in [biological science or conservation biology or ecology or fisheries or forestry or public affAIRs or water resources or wildlife conservation] or CLA or #)
Economist approach to environmental problems such as water/air pollution. Application of supply/demand concepts to evaluation of environmental resources. Methods of evaluation. Analysis of pollution control policies from economic point of view.

APEC 5651. Economics of Natural Resource and Environmental Policy. (3 cr. Prereq–[[3001 or ECON 3101], [4611 or ECON 3611 or NRES 3261W]] or #)
Economic analyses, including project evaluation of current natural resource/environmental issues. Emphasizes intertemporal use of natural resources, natural resource scarcity/adequacy, environmental quality, and mechanisms for pollution control and their implications for public policy.

APEC 5711. U.S. Agricultural and Environmental Policy. (3 cr. Prereq–3001 or ECON 3101)
U.S. agricultural policy in an open world economy; role of private markets and government in regulating supply and demand; income vs. price support, supply controls, environmental constraints, and export protectionism; functioning of markets; roles of public interest groups and future of American agricultural policy.

APEC 5721. Economics of Science and Technology Policy. (3 cr. Prereq–[[5151 or ¶5151], PA 5022] or #)
Economics of technical change, research, and technology. Productivity. Methods for evaluating impacts of R&D. Intellectual property rights.

APEC 5731. Economic Growth and International Development. (3 cr. Prereq–3002 or [ECON 3101, STAT 3022]; ECON 4211 recommended)
Economics of research/development. Technical change, productivity growth. Impact of technology on institutions. Science/technology policy.

APEC 5751. Global Trade and Policy. (3 cr. Prereq–3001 or ECON 3101 or PA 5021)
Trade policies of import/export nations, gains from trade, trade negotiations/agreements. Free trade and common market areas. Exchange rate impacts. Primary commodities and market instability. Current trade issues.

APEC 5811. Cooperative Organization. (3 cr. Prereq–3001 or ECON 3101 or PA 5021 or #)
Application of economic analysis to cooperative form of organization. Producer/consumer cooperatives used to examine economic issues such as changing market organization, financing, management incentives, taxation, and antitrust regulations. Cooperatives as a tool for economic development.

APEC 5891. Independent Study: Advanced Topics in FARM and Agribusiness Management. (1-4 cr [max 4 cr]. Prereq–#)
Special topics or individual work suited to the needs of particular groups of students.

APEC 5991. Special Topics and Independent Study in Applied Economics. (1-4 cr [max 12 cr]. Prereq–#)
Special classes, independent study, and supervised reading and research on subjects and problems not covered in regularly offered courses.

Arabic (ARAB)

Department of African American and African Studies

College of Liberal Arts

ARAB 1101. Beginning Arabic. (5 cr)
Oral practice, reading, comprehension, basic grammar. For students with no previous training in Arabic.

ARAB 1102. Beginning Arabic. (5 cr. Prereq–1101 or equiv or #)
Comprehension, oral practice, and reading of standard Arabic. Continuation of 1101.

ARAB 1201. Reading in Arabic I. (4 cr. Prereq–1101 or equiv or #)
Reading authentic texts/articles in Arabic. Translation, interpretation.

ARAB 1202. Reading in Arabic II. (4 cr. Prereq–1201 or equiv or #)
Reading authentic texts/articles in Arabic. Translation, interpretation.

ARAB 3036. Islam: Religion and Culture. (3 cr. §HIST 3493, HUM 3036, RELA 3036)
Religion of Islam, faith, practices, sectarian splintering, expansion outside original home to status of world religion, institutions, status in world societies—Asia, Europe, the Americas.

ARAB 3101. Intermediate Arabic I. (5 cr. Prereq–1102 or equiv or #)
Advanced grammar and conversational practice. Reading Arabic texts.

ARAB 3102. Intermediate Arabic II. (5 cr. Prereq–3101 or #)
Advanced grammar, analyses of readings, oral comprehension.

ARAB 3491. Classical Islamic Civilization. (3 cr. §ARAB 5491, HIST 3491, MELC 3491)
Islamic legacy in the classical age (800-1400), including medical and natural sciences, mathematics, philosophy, literature, and their transmission to Europe.

ARAB 3505. Survey of the Middle East. (3 cr. §ARAB 5505, HIST 3505, MELC 3505)
Peoples, lands, and cultures of the Middle East. Historical survey from earliest civilizations to the present.

ARAB 3514. African-Arabic Literature in Translation. (3 cr)
Literature from continental Africa in Arabic. Novels, short stories, poetry, and drama by such writers as Abd-al-Hayy, Abd-al-Sabur, Mahfouz, El-Saadawi, and Wattar. No knowledge of Arabic required.

ARAB 3524. Introduction to the Qur'an. (3 cr)
Textual, thematic, interpretive, and narrative aspects of the Qur'an and its influence on modern Arabic literature. All readings in English.

ARAB 3541. Islam in the Catholic Age: ARAB Phase 600 A.D. to 900 A.D.. (3 cr. §ARAB 5541, HIST 3541, MELC 3541)
The rise of Islam in its Arabian setting. Roles of the prophet, the Orthodox and Umayyad Caliphs. Development of the Islamic state and empire. Status of Muslims and non-Muslims.

ARAB 3542. Medieval Islam. (3 cr. §ARAB 5542, HIST 3542, MELC 3542)
Islamic dynasties, Mamluks and Mongols, and Crusaders and Assassins. Abbasid Caliphate's disintegration and rise of Seljuk Turks.

ARAB 3543. Arabs Under Mamluks and Ottomans: 1300-1920. (3 cr. §ARAB 5543, HIST 3543, MELC 3543)
Struggle against Crusaders and Mongols. Disintegration and reemergence under Muhammad Ali of Egypt; dynastic struggles in Syria; rise of Young Turks; Arab revolt.

ARAB 3544. Arab World 1920 to the Present. (3 cr. §ARAB 5544, HIST 3544, MELC 3544)
Struggle in the Arab world for independence and its course since independence. Emphasis on development, political stability and unity; political structures; the Arab-Israeli conflict.

ARAB 3547. The Ottoman Empire. (3 cr. §HIST 3547)
Founding of Ottoman society and state to empire, 1300 to end of the empire in 1920. Lands, institutions, peoples, legacy, impact on Europe.

ARAB 3900. Topics in Arabic Culture and Literature. (4 cr [max 8 cr])
Topics specified in course guide.

ARAB 3993. Directed Study. (1-3 cr [max 3 cr]. Prereq–#)
For advanced students with individual faculty members.

ARAB 5001. Research Methods in Arabic Studies. (3 cr)
Skills and techniques required to deal with medieval and modern works in Arabic literature and Islam. A survey of the most important research bibliographies in Arabic and Islamic studies. Bibliographic references in English and, when appropriate, Arabic.

ARAB 5011. Islam in Africa. (3 cr)
Ideological, doctrinal, and ritual aspects of continental African Islam. Emphasis on various religious brotherhoods and Sufi orders from different African countries in the 20th century. No knowledge of Arabic required.

ARAB 5036. Islam: Religion and Culture. (3 cr)
Religion of Islam, faith, practices, sectarian splintering, expansion outside original home to status of world religion, institutions, status in world societies - Asia, Europe, Americas.

ARAB 5101. Advanced Arabic I. (3 cr [max 4 cr]. Prereq–3102 or equiv or #)
Advanced readings in classical and modern Arabic. Compositions based on texts.

ARAB 5102. Advanced Arabic II. (3 cr [max 4 cr]. Prereq–5101 or #)
Readings of Arabic texts. Writing compositions based on texts. Continuation of 5101.

ARAB 5491. Classical Islamic Civilization. (3 cr. §ARAB 3491, HIST 3491, MELC 3491)
Islamic legacy in the classical age (800-1400), including medical/natural sciences, mathematics, philosophy, literature, and their transmission to Europe.

ARAB 5501. Modern Arabic Poetry in Translation. (3 cr)
Free verse movement and its major trends: post-romantic, social realist, symbolist, resistance, prose poem. Emphasizes leading poets such as al-Mala'ika, al-Sayyab, al-Bayati, and Adunis. Theoretical/critical essays. All readings in English.

ARAB 5502. The Arabic Novel in Translation. (3 cr)
The novel as a new genre in Arabic literature. Trends: realist, psychological, existentialist, feminist, post-modernist, fantastic, experimentalist. Emphasizes major writers such as Mahfouz, Ghanem, Salih, Jabra, El Sa'dawi, Munif, and Khouri. Theoretical/critical essays. Cultural /historical context.

ARAB 5503. Arabic Drama in Translation. (3 cr)
Emergence and development of drama as a European-inspired genre in Arabic literature. Emphasizes major trends and playwrights. All readings in English.

ARAB 5505. Survey of the Middle East. (3 cr. §ARAB 3505, HIST 3505, MELC 3505)
Peoples, lands, and cultures of the Middle East. Historical survey from earliest civilizations to the present.

ARAB 5541. Islam in the Catholic Age: Arab Phase 600 A.D. to 900 A.D.. (3 cr. §ARAB 3541, HIST 3541, MELC 3541)
The rise of Islam in its Arabian setting. Roles of the prophet, the Orthodox and Umayyad Caliphs. Development of the Islamic state and empire. Status of Muslims and non-Muslims.

ARAB 5542. Medieval Islam. (3 cr. §ARAB 3542, HIST 3542, MELC 3542)
Islamic dynasties, Mamluks and Mongols, and Crusaders and Assassins. Abbasid Caliphate's disintegration and rise of Seljuk Turks.

ARAB 5543. Arabs Under Mamluks and Ottomans: 1300-1920. (3 cr. §ARAB 3543, HIST 3543, MELC 3543)
Struggle against Crusaders and Mongols. Disintegration and reemergence under Muhammad Ali of Egypt; dynastic struggles in Syria; rise of Young Turks; Arab revolt.

ARAB 5544. ARAB World 1920 to the Present. (3 cr [max 4 cr]. §ARAB 3544, HIST 3544, MELC 3544)
Struggle in the Arab world for independence and its course since independence. Emphasis on development, political stability and unity; political structures; the Arab-Israeli conflict.

ARAB 5678. Seminar: African-Arabic Fiction in Translation. (3 cr)
African fiction in Arabic, including works of Barrada, Idris, Mahrouz, al-Matwi, El-Saadawi, and el-Zayat. Emphasizes twentieth century. Tests discussed in historical/cultural context. Theoretical/critical essays. All readings in English.

ARAB 5900. Topics in Arabic Literature and Culture. (3 cr [max 9 cr]. Prereq–5102 or #)
Readings and discussion of selected works in Arabic. Topics specified in *Class Schedule*.

ARAB 5992. Directed Readings. (1-3 cr [max 3 cr]. Prereq–#)
Individual research and readings for advanced students.

Aramaic (ARM)

Department of Classical and Near Eastern Studies

College of Liberal Arts

ARM 5011. Biblical Aramaic and Old Aramaic Inscriptions. (3 cr. Prereq–1 yr Hebrew or Arabic or #)
Biblical Aramaic — grammar, fluency in reading Biblical Aramaic and Old Aramaic inscriptions.

ARM 5012. Syriac. (3 cr. Prereq–1 yr Hebrew or Arabic or #)
Emphasis on fundamentals of grammar and reading Syriac texts fluently.

Architecture (ARCH)

Department of Architecture

College of Design

ARCH 1281. Design Fundamentals I. (4 cr)
Design thinking, theory/principles. Films, design reviews in small groups. Off-campus service learning project.

ARCH 1301. Introduction to Drawing in Architecture. (4 cr; A-F only. Prereq–ARCH major or #)
Perceiving/representing the material environment. Sketching/drawing conventions of visual phenomena/forms.

ARCH 1701. The Designed Environment. (3 cr; A-F only)
Examination of seminal issues in the designed environment, including relationships between place and space, and realms of the ideal and real, public and private. Survey of how the fields of architecture, landscape architecture, and urban design have explored those issues.

ARCH 1701H. Honors: The Designed Environment. (3 cr; A-F only. Prereq–[Fr or soph], honors; meets HON req)
How seminal issues (e.g., relationships of place, space, ideal/real, public/private) have been reflected in, explored through architecture, landscape architecture, urban design.

ARCH 1905. Architecture: Ideas, Making. (3 cr)
Ideas about architecture as simultaneous/two-way relationship between thinking and making, between architecture as "idea" and as "verb." Architecture as a group of conscious intentions within larger framework of our cultural past, present, and speculative future.

ARCH 1906W. Waste (Not): Envisioning Alternatives to a Throw-Away Culture. (2 cr; A-F only. Prereq–Freshman)
What we use. What we waste. Thinking creatively about how to live/work more sustainably. How objects/environments might be designed to allow multiple uses, have longer life-cycles, or enable recycling/reuse.

ARCH 2281. Design Fundamentals II. (4 cr. Prereq–1281)
Foundation architectural design studio. Design principles, technical drawing, material manipulation.

ARCH 3150. Topics in Architecture. (1-3 cr [max 3 cr])
Selected topics in architecture design, theory, representation, or history.

ARCH 3301. Drawing for Design in Architecture. (3 cr; A-F only. Prereq–1301)
Introduction to practical/conceptual function of drawing in architecture.

ARCH 3311. Design in the Digital Age. (3 cr; A-F only. §ARCH 5611)
Introduction to design, design process. Developing/understanding ways of seeing, thinking, and acting as a designer. Changes in design being wrought by digital technology. Team design project.

ARCH 3351. AutoCAD I. (3 cr. §ARCH 5351. Prereq–ARCH major or BED major or #)
Concepts, tools, and techniques of computer-aided drawing with current AutoCAD Release. Producing dimensioned/annotated drawings for plotting. 3-D drawing capabilities. Use of dimension variables, attributes, blocks, symbols.

ARCH 3352. AutoCAD II. (3 cr. Prereq–BA or BS or BED ARCH major or #)
Concepts, tools, and techniques of computer-aided drawing with current AutoCAD Release. Strategies for producing dimensioned/annotated drawing for plotting. Dimension variables, attributes, blocks, symbols. Creation of customized menus.

ARCH 3381. Introduction to Computer Aided Architectural Design. (3 cr; A-F only. Prereq–ARCH or BED)
2-D drawing, 3-D modeling/animation, printing, plotting. Electronic networking/communications, database management, spreadsheet analysis, land-use analysis, project management.

ARCH 3411. Architectural History to 1750. (3 cr)
History of architecture and city planning from antiquity to 1750, as illustrated by major monuments from western and non-western cultures.

ARCH 3412. Architectural History since 1750. (3 cr)
History/theories of architecture and related landscapes and urban forms since 1750.

ARCH 3422H. Honors: Architectural History Since 1750. (3 cr; A-F only. Prereq–Soph, honors)
History/theories of architecture and related landscapes and urban forms since 1750.

ARCH 3490H. Honors Theory Seminar. (3 cr; A-F only. Prereq–[CLA BA or CALA BS] honors or #)
Topics selected by faculty, from their area of scholarship, in contemporary issues from literature of architecture. Specific buildings or building types, or areas of architectural thought, history, representation, design, technology. See *Class Schedule*.

ARCH 3711V. Honors: Environmental Design and the Sociocultural Context. (3 cr. Prereq–Soph or #)
Designed environment as cultural medium and as product of a sociocultural process and expression of values, ideas, and behavioral patterns. Design/construction as complex political process.

ARCH 3711W. Environmental Design and the Sociocultural Context. (3 cr. Prereq–Soph or #)
Designed environment as cultural medium/product of a sociocultural process and as expression of values, ideas, and behavioral patterns. Design/construction as complex political process.

ARCH 3993. Directed Study. (1-6 cr [max 6 cr]. Prereq–#)
Guided individual reading or study.

ARCH 4150. Topics in Architecture. (1-4 cr [max 24 cr] Prereq–ARCH undergrad major or #)
Topics in architecture design, technology, history, theory, representation, or urbanism.

ARCH 4250. Advanced Topics in Design. (1-6 cr [max 24 cr]; A-F only. Prereq–[4282, ARCH major] or #)

ARCH 4281. Undergraduate Architecture Studio I. (6 cr. Prereq–ARCH major, CALA)
Architectural questions in settlement patterns, architectural elements in their formal organization. Mapping techniques, orthographic projections, analytic drawing, models.

ARCH 4282. Undergraduate Architecture Studio II. (6 cr; A-F only. Prereq–4281, CALA)
Human response to natural forces of gravity, light, and air. Their influence on organization of material form to create places of human habitation.

ARCH 4283. Undergraduate Architecture Studio III. (6 cr. Prereq–ARCH BS, CALA)
Design issue or topic, its influence on organization of material form to create places of human habitation.

ARCH 4284. Undergraduate Architecture Studio IV. (4 cr. Prereq–ARCH BS student, CALA)
Design studio.

ARCH 4301. Conceptual Drawing. (3 cr. Prereq–1301, [ARCH or M Arch major])
Drawing as a way of analyzing, exploring, and generating design ideas. Projection systems, diagramming, mapping. Different modes of visual perception. Nonverbal structures.

ARCH 4311. Theory of Architectural Representation. (3 cr; A-F only. §ARCH 5311. Prereq–[3301, [BA or BS or BED]] or #)
Integration of emerging computer graphics with photography and architectural graphic conventions. Historical, theoretical, and critical issues of representation. Influence of visual media on architectural field.

ARCH 4313. Visual Communication Techniques in Architecture. (3 cr; A-F only. §ARCH 5313. Prereq–[3301 or jr or sr], #)
Delineation, presentation, and design techniques. Various visual media, methods of investigation.

ARCH 4321. Architecture in Watercolor. (3 cr; A-F only. §ARCH 5321. Prereq–3301 or #)
Watercolor as a tool in design process. Foundation principles, techniques, medium, tools, materials. Color relationships, mixing, composition, applications to design.

ARCH 4361. 3-D Computer Architectural Modeling and Design. (3 cr; A-F only. §ARCH 5361. Prereq–3351, ARCH major)
Use of 3D computer modeling for representation in abstract/realistic ways. Creation/arrangement of objects. Setting up lighting. Developing surface materials. Creating still renderings/animations. Ways computer visualization can be used for design exploration, feedback during idea development, and realistic representation of designs.

ARCH 4421W. Architecture and Interpertation: The Cave and the Light. (3 cr. §ARCH 5421. Prereq–[3411, 3412] or #)
Historical/hermeneutical investigation of iconography of grotto. Intertwined themes of descent into earth and ascent to light, from earliest strata of human culture to present day.

ARCH 4423. Gothic Architecture. (3 cr; A-F only. §ARCH 5423. Prereq–3411 or #)
History of architecture and urban design in Western Europe, from 1150 to 1400.

ARCH 4424. Renaissance Architecture. (3 cr; A-F only. §ARCH 5424. Prereq–3411 or #)
History of architecture and urban design in Italy, from 1400 to 1600. Emphasizes major figures (Brunelleschi, Alberti, Bramante, Palladio) and evolution of major cities (Rome, Florence, Venice).

ARCH 4425. Baroque Architecture. (3 cr; A-F only. §ARCH 5425. Prereq–3411 or #)
Architecture and urban design in Italy, from 1600 to 1750. Emphasizes major figures (Bernini, Borromini, Cortona, Guarini) and evolution of major cities (Rome, Turin).

ARCH 4426. Architecture and Nature: 1500-1750. (3 cr. §ARCH 5426. Prereq–3411, 3412, ARCH major)
History of interaction of architecture and nature in Italy, England, and France in 16th/17th centuries. Major monuments, their relationship to theories of architecture/gardening and to urban/rural life.

ARCH 4431W. Eighteenth-Century Architecture and the Enlightenment. (3 cr; A-F only. §ARCH 5431. Prereq–3411, 3412, undergrad ARCH major)
Architecture, urban planning, and garden design in Europe and America, 1650 to 1850.

ARCH 4432. Modern Architecture. (3 cr; A-F only. §ARCH 5432. Prereq–3412, ARCH major)
Architecture and urban design in Europe and the United States from early 19th century to World War II.

ARCH 4434. Contemporary Architecture. (3 cr; A-F only. §ARCH 5434. Prereq–3412, ARCH major)
Developments, theories, movements, and trends in architecture and urban design from World War II to present.

ARCH 4439. History of Architectural Theory. (3 cr; A-F only. §ARCH 5439. Prereq–3412, ARCH major)
History of architectural theory from antiquity to 20th century.

ARCH 4445W. Suburbia. (3 cr)
Suburbia, from origins in 18th-century England to present. Historical changes and present challenges, especially in America. Ideology, mythology, planning, development, geography, transportation, the family. Specific sites/designs. Representations in film, television, popular literature, and music.

ARCH 4446. Architecture Since World War II: Post-War Experimentation; Aesthetics and Politics of Architecture. (3 cr. Prereq–3412 or #)
Avant-garde responses to post-war consciousness of social/meaning in architecture. Eroding communal identity, common man, architectural symbolism, monumentality, critical regionalism, place/technology in form making, popular culture, rise of theory.

ARCH 4461. North American Indian Architecture. (3 cr. §ARCH 5461. Prereq–ARCH 3412, ARCH or AMIN major)
Historic/contemporary principles/theories of North American Indian architecture. Culture, technology, environment, art, and craft of North American Indians in their settlements/architecture.

ARCH 4511. Building Systems I. (3 cr; A-F only. Prereq–ARCH BS)
Building materials, assemblies, and construction operations shaping building designs. Material properties for design/detailing of building systems, elements, and components. Implications in design applications. Modeling, hands-on building experiences.

ARCH 4521. Introduction to Environmental Technology. (3 cr. Prereq–ARCH BS)
Issues related to environmental quality/design. Climate response. Heating, cooling, lighting design. Indoor air quality.

ARCH 4542. Building Energy Systems. (3 cr; A-F only)
Functions of building mechanical systems and their integration with other building components. Residential/commercial HVAC systems, alternative energy sources, energy effciency, structural implications of mechanical systems, indoor air quality, environmental strategies. Case studies.

ARCH 4552. Integrated Design Processes. (3 cr; A-F only)
Wood/steel building design topics. Emphasizes whole building design and individual structural elements. Conceptual design strategies. Planning/design phases. Criteria for selection of building systems. Principles of wood/steel structural systems. Basic building code requirements. Individual/group design/research projects.

ARCH 4561. Architecture and Ecology. (4 cr; A-F only. §ARCH 5501. Prereq–ARCH major or #)
Introduction to theories/practices of ecological approaches to architectural design. Ecological context, implications/opportunities of architecture. Historical/theoretical framework for ecological design thinking. Issues studied at various scales: site/community, building, component.

ARCH 4571. Introduction to Structures. (3 cr; A-F only. Prereq–ARCH BS)
Concepts/methods to find effective/efficient structural forms. Elements of structural mechanics, graphic/quantitative analysis. Loads, materiality, strength, equilibrium, stability, serviceability, reliability. Relationships between external/internal forces: tension, compression, shear, bending, moments, stress, strain. Shear/moment diagrams/calculations. Graphical/quantitative form finding methods/analysis. Structural behavior of building systems and their components. Computation, analysis. Basic design problems using wood/steel members.

ARCH 4572. Structural Frames and Building Design/Construction. (3 cr; A-F only. Prereq–AEM 2011 or BP 3001 or BP 3393)
Basic contemporary structural systems in masonry, steel, and wood framing systems. Forms/performance of systems.

ARCH 4671. Historic Preservation. (3 cr)
Philosophy, theory, and origins of historic preservation. Historic archaeology, research, descriptive analysis, and documentation of historic buildings. Government's role in historic preservation, preservation standards and guidelines, preservation and building codes, neighborhood preservation, preservation advocacy, and future directions for historic preservation. Research on architectural/historical aspects of historic sites using primary/secondary resources and on controversial aspects of preservation.

ARCH 4672. Historic Building Conservation. (3 cr. Prereq–[3412, 4671] or #)
Historic building materials, systems, and methods of conservation. Structural systems, building repair/pathology. Introduction of new environmental systems in historic buildings. Conservation of historic interiors. Research on historic building materials/techniques, using primary/secondary resources. Documentation of a specific historic site through large-format photography and measured drawings

ARCH 4701. Introduction to Urban Form and Issues. (3 cr. Prereq–3412 or #)
Urban form and related issues of design/culture. Thematic history of cities. Lectures, discussions, field exercises, assignments.

ARCH 5101. Architectural Design Studies. (7 cr. Prereq–3+ track for MArch)
Principles/methods architecture design. Theories, history, technologies, media, and processes as foundation for critical thinking. Analytic modeling, visual thinking.

ARCH 5123. Architectural Thesis. (8 cr; A-F only. Prereq–5122, 5241, BA ARCH major; students must submit thesis plan in semester before writing thesis)
Student's choice, study and solution of an architectural problem to demonstrate proficiency in all phases of design.

ARCH 5241. Principles of Design Programming. (3 cr; A-F only. Prereq–For undergrads 5122, BA ARCH major; for grads 8255, M Arch major or #)
Concepts and techniques of architectural programming, including space and activity analysis, site selection, precedent study, code review, appropriate technology identification, hypothesis formulation and evaluation. Emphasis on conceptual development, research, and analytic drawing.

ARCH 5291. Accelerated Undergraduate Architecture Studio I. (6 cr; A-F only. Prereq–#)
Selected architectural problems developed by faculty to deepen/enrich ideas introduced in required architectural studio sequence.

ARCH 5292. Accelerated Undergraduate Architecture Studio II. (6 cr; A-F only. Prereq–[5291, accelerated status] or #)
Architectural problems. Emphasizes development of structures as integral part of design, site planning, design process.

ARCH 5301. Conceptual Drawing. (3 cr. Prereq–[1301, M.ARCH major] or #)
Drawing as way of analyzing, exploring, and generating design ideas. Projection systems, diagramming, mapping. Different modes of visual perception. Nonverbal structures.

ARCH 5311. Theory of Architectural Representation. (3 cr; A-F only. §ARCH 4311. Prereq–[5371, 5372, M Arch] or instr consent)
Integration of emerging computer graphics with photography and architectural graphic conventions. Historical, theoretical, and critical issues of representation. Influence of visual media on architectural field.

ARCH 5313. Visual Communication Techniques in Architecture. (3 cr; A-F only. §ARCH 4313. Prereq–M Arch major or instr consent)
Delineation, presentation, and design techniques. Various visual media and methods of investigation.

ARCH 5321. Architecture in Watercolor. (3 cr; A-F only. §ARCH 4321. Prereq–M Arch grad student or #)
Watercolor as a tool in design process. Foundation principles, techniques, medium, tools, materials. Color relationships, mixing, composition, applications to design.

ARCH 5350. Topics in Architectural Representation. (1-3 cr [max 3 cr]; A-F only. Prereq–[5321, [ARCH major or M. ARCH major]] or #)
Selected topics in architectural representation.

ARCH 5351. AutoCAD I. (3 cr. §ARCH 3351. Prereq–M Arch major or instr consent; may not be taken for graduate credit)
Basic concepts, tools, and techniques of computer-aided drawing with current AutoCAD Release. Strategies and techniques for producing dimensioned and annotated drawings suitable for plotting and an introduction to 3-D drawing capabilities. Use of dimension variables, attributes, blocks, symbols, and the creation of customized menus.

ARCH 5361. 3-D Computer Architectural Modeling and Design. (3 cr; A-F only. §ARCH 4361. Prereq–M Arch major)
Use of 3D computer modeling for representation in abstract/realistic ways. Computer modeling software. Creation/arrangement of objects, setting up lighting, developing surface materials, creating still renderings/animations. Ways in which computer visualization can be used for design exploration, for feedback during development of ideas, and for realistic representation of fully formed designs.

ARCH 5371. Computer Methods I. (1 cr; S-N only. §LA 5371. Prereq–Concurrent enrollment 8251, M Arch major or #)
Introduction to current techniques, computer programs, and their application to architectural computing.

ARCH 5372. Computer Methods II. (1 cr; S-N only. §LA 5372. Prereq–5371, ¶8252 and M Arch major or #)
Current techniques, computer programs, and their application to architectural computing and design.

ARCH 5373. Computer Methods III. (1 cr; S-N only. §LA 5373. Prereq–5372, ¶8253, M Arch major or #)
Advanced techniques, computer programs, and their application to architectural computing in design, theory, and technology.

ARCH 5374. Computer Methods IV. (1 cr. Prereq–5373, ¶8254, M Arch major or #)
Advanced architectural computing applications in design, history, theory, representation, and technology.

ARCH 5381. Introduction to Computer Aided Architectural Design. (3 cr; A-F only. Prereq–Arch or BED or M Arch or grad student in LA or #)
2-D drawing, 3-D modeling/animation, printing, plotting. Electronic networking/communications, database management, spreadsheet analysis, land-use analysis, project management.

ARCH 5382. Computer Aided Architectural Design. (3 cr; A-F only. Prereq–[3381, [BA or BS or BED]] or #)
2-D/3-D CAD, image manipulation. Advanced multimedia visualization techniques for design, including solid modeling, photo-/realistic imaging, animation, video-editing/recording.

ARCH 5410. Topics in Architectural History. (3 cr [max 12 cr]; A-F only. Prereq–M Arch major or #)
Advanced study in architectural history. Readings, research, seminar reports.

ARCH 5411. Principles of Design Theory. (3 cr; A-F only. Prereq–M Arch major or #)
Principles of design and their instrumentation. How and why architecture theory is generated. Types and significance of formal analysis. Theoretical positions and modes of criticism.

ARCH 5421. Architecture and Interpertation: The Cave and the Light. (3 cr. §ARCH 4421W. Prereq–[3411, 3412] or #)
Historical/hermeneutical investigation of iconography of grotto. Intertwined themes of descent into earth and ascent to light, from earliest strata of human culture to present day.

ARCH 5423. Gothic Architecture. (3 cr; A-F only. §ARCH 4423. Prereq–M Arch major or #)
History of architecture and urban design in Western Europe, from 1150 to 1400.

ARCH 5424. Renaissance Architecture. (3 cr; A-F only. §ARCH 4424. Prereq–M Arch major or instr consent)
History of architecture and urban design in Italy from 1400 to 1600. Emphasizes major figures (Brunelleschi, Alberti, Bramante, Palladio) and evolution of major cities (Rome, Florence, Venice).

ARCH 5425. Baroque Architecture. (3 cr; A-F only. §ARCH 4425. Prereq–M Arch major or instr consent)
Architecture and urban design in Italy from 1600 to 1750. Emphasizes major figures (Bernini, Borromini, Cortona, Guarini) and evolution of major cities (Rome, Turin).

ARCH 5426. Architecture and Nature: 1500-1750. (3 cr. §ARCH 4426. Prereq–M Arch major or instr consent)
History of interaction of architecture and nature in Italy, England, and France in 16th/17th centuries. Major monuments, their relationship to theories of architecture/gardening and to urban/rural life.

ARCH 5431. Eighteenth-Century Architecture and the Enlightenment. (3 cr; A-F only. §ARCH 4431W. Prereq–M Arch grad student or #)
Architecture, urban planning, and garden design in Europe and America from 1650 to 1850.

ARCH 5432. Modern Architecture. (3 cr; A-F only. §ARCH 4432. Prereq–M Arch major or instr consent)
Architecture and urban design in Europe and the United States from early 19th century to World War II.

ARCH 5434. Contemporary Architecture. (3 cr; A-F only. §ARCH 4434. Prereq–M Arch major or instr consent)
Developments, theories, movements, and trends in architecture and urban design from World War II to present.

ARCH 5439. History of Architectural Theory. (3 cr; A-F only. §ARCH 4439. Prereq–M Arch major or instr consent)
History of architectural theory from antiquity to 20th century.

ARCH 5445. Suburbia. (3 cr)
Suburbia, from origins in 18th-century England to present. Historical changes and present challenges, especially in America. Ideology, mythology, planning, development, geography, transportation, the family. Specific sites/designs. Representations in film, television, popular literature, and music.

ARCH 5446. Architecture Since World War II: Postwar Experimentation, Aesthetics, and Politics of Architecture. (3 cr. Prereq–3412 or #)
Avant-garde responses to post-war consciousness of social issues/meaning in architecture. Eroding communal identity, common man, architectural symbolism, monumentality, critical regionalism, place/technology in form making, popular culture, rise of theory.

ARCH 5450. Topics in Architectural Theory. (1-3 cr [max 9 cr]; A-F only. Prereq–ARCH major or M Arch major or #)
Selected topics in architectural theory and criticism.

ARCH 5451. Architecture: Defining the Discipline. (3 cr; A-F only. Prereq–M Arch major or #)
Architecture as a discipline: its nature, role, purpose, and meaning discussed within a general, philosophical, and theoretical framework. Investigation and discussion of paradigms defining architectural theory and practice.

ARCH 5452. Architecture: Design, Form, Order, and Meaning. (3 cr; A-F only. Prereq–M Arch major or #)
Architecture and the issue of meaning. Explores fundamental and constituent elements of architectural form and order; their inherent tectonic, phenomenal, experiential, and symbolic characteristics; their potential and implications for the creation and structure of meaningful human places.

ARCH 5455. Typology and Architecture: Theories of Analysis and Synthesis. (3 cr; A-F only. Prereq–5411, M Arch major, #)
Theoretical traditions and development of typology's role in architecture. Investigates works of Laugier, Quatremere de Quincy, Viollet-Le Duc, Ledoux, Durand, Camillo Sitte, and Le Corbusier. Recent developments and theoretical positions of neo-rational and contextual arguments for contemporary applications of the idea of type.

ARCH 5458. Architecture and Culture. (3 cr; A-F only. Prereq–3412, ARCH major or grad student or #)
Architecture as a cultural medium. Relationships among architecture, people, and culture; research findings and design; vernacular and high style architecture. Physiological and symbolic messages; reception theory in architecture; cultural critique and change; implications for architectural practice.

ARCH 5459. Gender and Architecture. (3 cr. Prereq–ARCH or WoSt major or M Arch major or #)
Examination of ideas related to gender and architecture, gendered and non-gendered places and practices, and their relations to cultural norms and change.

ARCH 5461. North American Indian Architecture. (3 cr. §ARCH 4461. Prereq–M Arch major or instr consent)
Historic/contemporary principles/theories of North American Indian architecture. Culture, technology, environment, art, and craft of North American Indians in their settlements/architecture.

ARCH 5511. Construction Materials in Architecture. (3 cr; A-F only. Prereq–M Arch or #)
Building materials, assemblies, and construction operations shaping building designs. Material properties for design/detailing of building systems, elements, and components. Implications in design applications. Modeling, hands-on building experiences.

ARCH 5512. Building Methods in Architecture. (3 cr; A-F only. Prereq–5511, M Arch major or #)
Analysis of architectural materials, building systems, and construction operations related to enclosure systems design, building infrastructure, and detailing. Application of legal constraints and regulations (e.g., ADA, building codes, life-safety issues) in preparation of drawings, specifications, and construction documents for building design.

ARCH 5513. Environmental Technology I: Thermal Design in Architecture. (3 cr; A-F only. Prereq–M Arch major or #)
Thermal and climatic issues in the design of small and mid-size buildings. Investigations in built and mechanical methods to modify climate. Evaluation of the impact of design techniques on energy use, the environment, and architectural meaning.

ARCH 5514. Environmental Technology II: Lighting and Acoustic Design. (3 cr; A-F only. Prereq–M Arch major or #)
Principles of daylighting, electric lighting, and acoustic design in architecture. Relationship between luminous and acoustic environments, human comfort and architectural experience. Analytical methods, design process, and modeling of daylighting.

ARCH 5525. Design in Masonry. (3 cr; A-F only. Prereq–5512, M Arch major or #)
Design principles, construction methods, and document production for masonry structures.

ARCH 5539. Daylighting and Architecture Design. (3 cr; A-F only. Prereq–5514, M Arch major or #)
Role of daylighting in architectural design: principles, strategies, energy and environmental issues, psychology of light, color, and integration of electric lighting. Design projects investigate qualitative and quantitative issues through drawing, physical models, and photometric analysis.

ARCH 5550. Topics in Technology. (1-3 cr [max 6 cr]. Prereq–#)
Selected topics in architecture technology, including construction, environmental management, energy performance, lighting, or materials.

ARCH 5561. Building Production Processes. (3 cr. Prereq–M Arch major or #)
Document production, contract execution, building project management. Construction industry organization, scheduling, consultant relations, legal/code restraints, contractual stipulations, budget/project resource allocations. Case studies, hands-on experiences.

ARCH 5571. Architectural Structures I: Wood and Steel Design. (3 cr; A-F only. Prereq–M Arch or #)
Influence of history/culture on architecture/structure. Structural mechanics, analysis, form finding, and design by experimental, qualitative/intuitive, and quantitative methods. Vector-/form-active structural systems, funicular structures. Bending/compression elements, plates/grids. Tensile architecture, shells. Traditional construction materials.

ARCH 5572. Architectural Structures II: Concrete and Masonry Design. (3 cr; A-F only. Prereq–5571, M Arch major or #)
Overview of advanced materials: reinforced fiberglass, structural glass, and structural tensile fabrics. Impact of construction technology on architecture and methods of integrating knowledge of structural materials and construction methods into the design process.

ARCH 5611. Design in the Digital Age. (3 cr; A-F only. §ARCH 3311. Prereq–Grad student or upper level undergrad student)
Introduction to design, design process. Developing/understanding ways of seeing, thinking, and acting as a designer. Changes in design being wrought by digital technology. Team design project.

ARCH 5621. Professional Practice in Architecture. (3 cr; A-F only. Prereq–M Arch major or #)
Legal, ethical, business, and practical requirements of architectural practice. Contemporary and historical models of contract formation, business principles, accounting, project management, design services, and marketing.

ARCH 5631. Legal Contracts in Architecture. (3 cr; A-F only. Prereq–M Arch major or #)
Legal subject matter relevant to the work of architects and design professionals.

ARCH 5645. Real Estate Development in Architecture. (3 cr. Prereq–For undergrads BA ARCH major; for grads M Arch major or #)
Fundamentals of real estate development and investment building. Processes and rules of specialists in development of investment projects. Topics include pro forma value and depreciation, tax shelter, feasibility, market analysis, appraisal equity financing, design, construction, leasing, and property management.

ARCH 5650. Topics in Architectural Practice. (1-4 cr [max 8 cr]. Prereq–5621, ARCH major or 5621, M Arch major or #)
Topics in architectural practice, methods of design production, marketing, operation, and relationships among clients, architecture, and society.

ARCH 5670. Topics in Historic Preservation. (1-3 cr [max 3 cr]. Prereq–ARCH or M Arch major or #)
Selected topics in the theory, philosophy, research, and methods of architectural historic preservation.

ARCH 5671. Historic Preservation. (3 cr. Prereq–3412 or #)
Philosophy, theory, and origins of historic preservation. Historic archaeology and research, descriptive analysis, and documentation of historic buildings. Government's role in historic preservation, preservation standards and guidelines, preservation and building codes, neighborhood preservation, preservation advocacy, and future directions for historic preservation. Research on architectural and historical aspects of historic sites using primary and secondary resources and on controversial aspects of preservation.

ARCH 5672. Historic Building Conservation. (3 cr. Prereq–3412, 5671 or #)
Historic building materials, systems, and methods of conservation. Discussion of structural systems, building repair and pathology, introduction of new environmental systems in historic buildings, and conservation of historic interiors. Research on historic building materials and techniques using primary and secondary resources and on documentation of a specific historic site through large-format photography and measured drawings.

ARCH 5673. Historic Building Research and Documentation. (3 cr. Prereq–3412, 5672 or #)
Philosophy, theory, and methods of historic building research, descriptive analysis of buildings, building documentation, historical archaeology, and architectural taxonomy.

ARCH 5711. Design Principles of the Urban Landscape. (3 cr; A-F only. Prereq–BED major or **M Arch** major or LA grad major or grad student or #)
Art/design of creating city, neighborhood, and development plans. Public policies, planning tools/processes, and hysical models used by design professionals and private/civic institutions to shape physical environment.

ARCH 5721. Proseminar in Metropolitan Design. (3 cr; A-F only. §LA 5721. Prereq–[[5711 or equiv], enrollment in CMD prog] or #)
Reading seminar. Evolution of the contemporary city. Dynamics that created contemporary urban spatial patterns. Planning/design theories that have guided public interventions in the built environment. Thematic texts, classroom discussions.

ARCH 5750. Topics in Urban Design. (1-4 cr [max 4 cr]; A-F only. Prereq–ARCH major)
Special topics in theory/practice of urban design.

ARCH 5790. Special Topics in Metropolitan Design. (3 cr [max 6 cr]; A-F only. §LA 5790. Prereq–Enrollment in CMD prog or #)

ARCH 5993. Directed Study. (1-4 cr [max 3 cr]; A-F only. Prereq–#)
Guided individual reading or study.

Art (ARTS)

Department of Art

College of Liberal Arts

ARTS 1001W. Concepts in Visual Art. (4 cr)
Concepts of visual art-making in contemporary/historical contexts. The media, environment, concerns of the practicing artist. Creative process, visual expression, criteria. Aesthetic foundation for beginning studio courses.

ARTS 1101. Drawing. (4 cr)
Introduction to fundamental principles and processes of drawing; exploration of various drawing media. Work from still life, nature, the life model, and imagination.

ARTS 1102. Painting. (4 cr. Prereq–1101 or #)
Introduction to painting with attention to understanding and applying the fundamental principles of spatial organization and color interaction.

ARTS 1301. Sculpture. (4 cr)
An introduction to sculptural practice examining materials, methods, concepts, and history with emphasis on the correlation between concepts and materials. Work in clay, plaster, metal, and wood.

ARTS 1501. Printmaking: Intaglio and Lithography. (4 cr)
Introduction to techniques of intaglio etching/lithography. Historical approaches/use through contemporary materials/concepts. Emphasizes interrelationship of process, materials, and ideas/aesthetics.

ARTS 1502. Printmaking: Relief, Screen, and Digital. (4 cr)
Introduction to techniques of relief (linoleum and woodcut), screenprint, and digital printmaking. Historical approaches and use through contemporary materials, concepts, and practices. Emphasizes interrelationship of process, materials, and ideas.

ARTS 1505. Papermaking. (4 cr)
Introduction to approaches, forms, and aesthetic possibilities of paper as an expressive medium. Studio work in both Eastern and Western traditions and sculptural applications.

ARTS 1601. Time and Interactivity. (4 cr)
Introduction to use of computer technologies as source for creative art making. Emphasizes digital time-based/interactive processes that use image/sound editing software and basic scripting languages.

ARTS 1701. Photography. (4 cr)
Presents conceptual, technical, and historical aspects of photography within the fine arts context. Emphasis on the creative process through hands-on experience in use of camera, film development, enlarging, and printing.

ARTS 1702. Digital Photography. (4 cr)
Introduction to conceptual, technical and historical aspects of photography as a creative medium using digital technology. Digital image capture, related software, digital output and studio procedures. Historical issues, contemporary practice.

ARTS 1801. Ceramics. (4 cr)
Fundamentals of wheel-thrown and hand-built ceramics as forms of creative expression. Introduction to clay, glazes, and firing techniques.

ARTS 1902. Freshman Seminar. (3 cr [max 6 cr]; A-F only. Prereq–Freshman)
Topics specified in *Class Schedule*.

ARTS 1905. Freshman Seminar. (3 cr; A-F only. Prereq–Freshman)
Topics specified in *Class Schedule*.

ARTS 1910W. Topics: Freshman Seminar. (3 cr; A-F only. Prereq–Freshman)
Topics specified in *Class Schedule*.

ARTS 3101. Intermediate Drawing. (4 cr. Prereq–1001, 1101)
Further exploration and understanding of drawing elements with emphasis on developing visual judgment, drawing process, and execution. Specific problems to promote the understanding of pictorial structure and personal expression.

ARTS 3102. Intermediate Painting. (4 cr. Prereq–1001, 1101, 1102)
Emphasizes development of visual sensibility, individual direction, critical judgment.

ARTS 3105. Dimensional Painting. (4 cr. Prereq–1001, 1101, 1102)
Application of two-dimensional visual concerns as they relate to sculptural form. Exploration of how painting ideas affect perception of real space.

ARTS 3106. Drawing: Interpreting the Site. (4 cr. Prereq–1001, 1101)
Field trips to draw or paint in various metropolitan area locations. Site interpretations, experimentation with marks/symbols. Focuses on search for personal content as inspired by site.

ARTS 3111. Life Drawing I. (4 cr. Prereq–1001, 1101)
Focus on the human form with an introduction to anatomy. Exploration of various concepts of representation and methods of image construction. Work from life, anatomical casts, memory and imagination.

ARTS 3112. Life Drawing II. (4 cr. Prereq–3111 or #)
The human form in pictorial structure, single, and multiple figure compositions. The creative process, work toward a personal direction. Attention to representation of the human image in cultural, historical, and contemporary context.

ARTS 3301. Sculpture: Direct Metal. (4 cr. Prereq–1001, 1301)
Constructive approach to sculpture through welding in steel, other metals. Studio practice, investigation of historical/contemporary methods/concepts.

ARTS 3302. Sculpture: Spatial Problems. (4 cr. Prereq–1001, 1301)
Focuses on sculptural practice outside traditional media/approaches. Theoretical constructions of space as primary medium of sculpture. Installation, theater, public art, architecture.

ARTS 3303. Sculpture: Metalcasting. (4 cr. Prereq–1001, 1301)
Metal casting of sculpture in bronze, iron, aluminum, other metals. Studio practice, investigation of historical/contemporary methods/concepts.

ARTS 3304. Sculpture: Carving and Construction. (4 cr. Prereq–1001, 1301)
Carving/construction using wood, other materials. Studio practice, investigation of historical/contemporary methods/concepts. Development of personal sculptural imagery.

ARTS 3305. Sculpture: Kinetics. (4 cr. Prereq–1001, 1301)
The exploration of movement in sculpture (wind, water, electric). Studio practice and investigation of historical and contemporary methods and concepts.

ARTS 3306. Performance Art and Installation. (4 cr. Prereq–1001, 1301)
Studio practice, investigation of forms of expression involving narrative, performance, installation. Hybrid art forms introduced by Dada movement in 1920's, continued by Fluxus movement in 1950's, to contemporary performance/installation artists.

ARTS 3307. Sculpture: Traditional Approaches. (4 cr. Prereq–1001, 1301)
Clay modeling of human figure, other forms. Mold-making, plaster casting with historical/contemporary systems. Studio practice, investigation of traditional sculptural methods/concepts.

ARTS 3401W. Critical Theories and Their Construction From a Studio Perspective. (3 cr. Prereq–1001, jr, or #)
Primary critical theories that shape the analysis of works of art. Evaluation of works from the artist's perspective. Theory as an organizational structure from which to understand contemporary works.

ARTS 3402. Artists' Books. (4 cr. Prereq–1001, one visual art course)
Study/creation of unique, handmade books using various structures, media, techniques. Critical, historical, theoretical issues surrounding contemporary book arts.

ARTS 3403. Women's Images and Images of Women. (3 cr. §ARTS 5403. Prereq–1001 or #)
Women's place in Western art from the artist's perspective. Women as artists and the imagery they have created. Women as the object of imagery and the social and political attitudes those images convey. Survey of women artists from late-Renaissance through contemporary feminism; relevant issues.

ARTS 3411H. Honors Tutorial in Visual Arts. (1-4 cr [max 6 cr]; A-F only. Prereq–Honors, #)
Individual consultation with a faculty member on visual work, research project, presentation, paper, or bibliography.

ARTS 3415H. Honors Exhibition. (2 cr; A-F only. Prereq–Magna or Summa Honors candidate, #, Δ)
Advanced problems in studio and research, leading to a magna or summa exhibition.

ARTS 3416H. Honors Thesis. (1 cr; A-F only. Prereq–Summa level honors candidate, #)
Summa thesis paper written in support of honors exhibition or in relation to candidate's visual/conceptual interests.

ARTS 3420. Visiting Artists Program. (1 cr [max 2 cr] Prereq–ARTS or #)
Guest speakers, artist presentations. Identification of themes, correlations between ideas presented by guest artists/critics and students' own creative work.

ARTS 3444. Major Project. (1 cr; S-N only. Prereq–#)
Individually designed independent project or exhibition.

ARTS 3496. Internship in the Arts. (1-3 cr [max 3 cr]; S-N only. Prereq–BFA Art major, #)
Field work at local, regional, national, or international arts organization or with professional artist provides experience in activities/administration of art/art-based organizations.

ARTS 3499. Internship at Katherine E. Nash Gallery. (3 cr; S-N only. Prereq–1001, #)
Hands-on experience in day-to-day operation/mission of Department of Art's professional gallery.

ARTS 3501. Printmaking: Intaglio and Screen. (4 cr. Prereq–1001, 1501)
In-depth investigation of intaglio/screenprinting. Application of traditional/contemporary techniques. Emphasizes individual artistic expression. Review of historical/cultural development of the media.

ARTS 3502. Printmaking: Relief and Lithography. (4 cr. Prereq–1001, 1501)
Expressive/formal aesthetics of woodcut relief, hand lithography. Studio practice/investigation of artistic attitudes as exemplified through historical perspectives, traditional/contemporary usages.

ARTS 3505. Papermaking as an Art Form. (4 cr. Prereq–1001, 1505)
Further exploration of Eastern, Western, and sculptural applications of papermaking as an art form. Development of visual vocabulary through experimentation and focused inquiry into historical and contemporary methods.

ARTS 3510. Intermediate Printmaking: Traditional and Contemporary Approaches. (4 cr [max 8 cr]. Prereq–1001W or 1501 or 1502)
The print as vehicle for conceptual/personal expression. Traditional printmaking techniques, evolving contemporary processes for realizing visual concepts. Historical/cultural development of multiple/matrix as means of communication.

ARTS 3601. New Media: Making Art Interactive. (4 cr. Prereq–1001W, 1601)
Conceptual/aesthetic development with digital, interactive art. Experimental approaches to interactive technologies. Responsive, tangible media. Critical theory/history of new media.

ARTS 3602. Narrative Digital Video. (4 cr. Prereq–1001W, 1601)
Narrative forms of video. Documentary, live action, memoir, experimental forms. Digital video production/editing. Personal aesthetic/conceptual directions. Theory, critical readings about historical/contemporary works in video.

ARTS 3603. Experimental Video. (4 cr. Prereq–1001W, 1601)
Experimental approaches in producing digital video within a contemporary art context. Using digital media technologies in installation, performance, and interactive video art. Emphasizes development of personal, creative projects. Theoretical issues. Critical/historical readings in media arts.

ARTS 3604. Animation. (4 cr. Prereq–1001W, 1601)
Creating ideas visually with 2-/3-dimensional animation technologies. Vector-/layer-based raster animation. Modeling objects/spaces, creating textures, lighting, movement, sound track.

ARTS 3605. Sound Art. (4 cr. Prereq–1001W, 1601)
Sound Art practice/theory. Students produce creative projects using sound as primary material. History of experimental sound art from early 20th century to present. Critiques, readings, writing, public presentations.

ARTS 3606. The Body Electric: Sensing New Domains for Creative Expression. (4 cr. Prereq–1001W, 1601)
Cultural conceptions of the most personal of new media s hybrid domains of physical/virtual interplay. Readings of contemporary/historic conceptions of the body and the machine. Boundaries/membranes, response/reaction. The biological, the computational, the bionic. Aesthetic explorations with interactive, sensing, and programmable technologies.

ARTS 3701. Photography: Silver Processes. (4 cr. Prereq–1001, 1701)
Classical photographic practice, concentrating on camera/darkroom controls. Historical overview of the medium. Conceptual/contemporary approaches to traditional themes.

ARTS 3702. Photography: The Extended Image. (4 cr. Prereq–1001, 1701)
Manipulation of the photo image using various camera and darkroom methods including sequence, multiples, narrative, and book formats. Marking and altering photographic surfaces, applied color, and toning. Use of the photograph in interdisciplinary projects.

ARTS 3703. Photography: Digital Imaging. (4 cr. Prereq–1001, 1701)
Photographic digital imaging in fine arts. Manipulation, computer applications. Editing in photo imaging software.

ARTS 3801. Ceramics: Wheel Throwing. (4 cr. Prereq–1001, 1801)
Expands wheel-throwing skills, develops aesthetic awareness of ceramic forms. Kiln firing, glaze formulation.

ARTS 3802. Ceramics: Handbuilding. (4 cr. Prereq–1001, 1801)
Intermediate handbuilding. Development of abilities, critical awareness. Kiln firing, glaze formulation.

ARTS 3803. Ceramics: Mold Making. (4 cr. Prereq–1001, 1801)
Introduction to plaster mold making for ceramics. Plaster mold fabrication, ceramic production, contemporary methods/concepts. Development of personal visual expression.

ARTS 3804. Neon. (4 cr. Prereq–1001)
Introduction to neon sculpture; investigating materials, methods, concepts, history, and studio procedures. Work with glass tubing, electrical components, mixed media, and installation.

ARTS 3810. Intermediate Ceramics. (4 cr [max 8 cr]; A-F only. Prereq–1001W, 1801, 3801, 3802)
Studio ceramics. Handbuilding, wheelthrowing, kiln firing, glaze formulation, contemporary issues. Development of a slide portfolio. Review for entrance into advanced ceramics.

ARTS 5104. The Nature of Abstraction. (4 cr. Prereq–3102 or #)
Exploration of abstraction as concept. Studio practice with attention to developing individual work. Emphasizes understanding topics relevant to abstraction. Approached from discipline of painting, open to various material sensibilities.

ARTS 5105. Advanced Dimensional Painting. (4 cr. Prereq–3105 or #)
Illusionary space applied to sculptural forms. Practical applications of spatial/painterly concepts. Emphasizes critical/visual judgment. Development of cohesive body of work reflecting interaction of two/three dimensions.

ARTS 5106. Advanced Drawing: Interpreting the Site. (4 cr. Prereq–3106 or #)
Search for personal content as inspired by site. Field trips (2/3 of course) to draw or paint from various metropolitan area locations. Interpretations enhanced by experimentation with new marks/symbols.

ARTS 5110. Advanced Drawing. (4 cr [max 12 cr]. Prereq–3101 or 3111 or #)
Developing personal direction in form/content. Various media. Various aesthetic/conceptual approaches.

ARTS 5120. Advanced Painting. (4 cr [max 12 cr]. Prereq–3102 or #)
Developing personal vision/content through painting. Emphasizes critical thinking, self-evaluation, and independent pursuit of ideas.

ARTS 5130. Advanced Painting: Watercolor. (4 cr [max 12 cr]. Prereq–3102 or #)
Expressive/technical possibilities of transparent watercolor. Emphasizes pictorial structure, color relationships, visual expression. Work from still life, nature, life model, imagination.

ARTS 5310. Advanced Sculpture: Direct Metal. (4 cr [max 12 cr]. Prereq–3301 or #)
Direct metal sculpture in steel, other metals. Studio practice, investigation of historical/contemporary methods/concepts. Development of personal sculpture imagery.

ARTS 5320. Advanced Sculpture: Spatial Problems. (4 cr [max 12 cr]. Prereq–3302 or #)
Sculptural practice outside traditional media/approaches. Installation, theater, public art, architecture as topics for individual investigations into spatial organization.

ARTS 5330. Advanced Sculpture: Metal Casting. (4 cr [max 12 cr]. Prereq–3303 or #)
Metal casting of sculpture in bronze, iron, aluminum, other metals. Studio practice, investigation of historical/contemporary methods/concepts. Development of personal sculptural imagery.

ARTS 5340. Advanced Sculpture: Carving and Construction. (4 cr [max 12 cr]. Prereq–3304)
Carving/construction using wood, other materials. Studio practice, investigation of historical/contemporary methods/concepts. Development of personal sculptural imagery.

ARTS 5350. Advanced Sculpture: Kinetics. (4 cr [max 12 cr]. Prereq–3305 or #)
Studio practice in kinetic sculpture. Historical/contemporary methods/concepts of sculpture produced by motion. Development of personal imagery.

ARTS 5360. Advanced Performance Art and Installation. (4 cr [max 12 cr]. Prereq–3306 or #)
Studio practice in performance art and installation; investigation of historical and contemporary methods and concepts of interdisciplinary expression. Development of personal imagery.

ARTS 5370. Advanced Sculpture: Traditional Approaches. (4 cr [max 12 cr]. Prereq–3307 or #)
Clay figure modeling. Mold making using historical/contemporary systems. Casting in semi-permanent materials. Studio practice, traditional sculptural methods/concepts. Development of personal imagery.

ARTS 5400. Seminar: Concepts and Practices in Art. (3 cr [max 6 cr]. Prereq–BFA candidate or #)
Various ideologies, cultural strategies that influence practice/interpretation of art. Emphasizes diversity of viewpoints. Application of issues in developing final BFA exhibition.

ARTS 5402. Artists' Books. (4 cr. Prereq–3402 or #)
Advanced projects in creation of unique, handmade books using various structures, media, techniques. Critical, historical, theoretical issues surrounding contemporary book arts.

ARTS 5403. Women's Images and Images of Women. (3 cr. §ARTS 3403. Prereq–1001 or #)
Women's place in Western art from the artist's perspective. Women as artists and the imagery they have created. Women as the object of imagery and the social and political attitudes those images convey. Survey of women artists from late-Renaissance through contemporary feminism; relevant issues.

ARTS 5405. Visual Narrative Structures. (4 cr. Prereq–[1001, one 1xxx art course] or #)
Visual/verbal investigation of structures of visual narratives. Contemporary efforts to integrate cogent images in visual texts. Development of methods for personal visual communication of cultural, spiritual, aesthetic, environmental experiences. Historical/cultural focuses. Studio work.

ARTS 5441. Professional Practices. (3 cr. Prereq–Grad or #)
Intensive writing seminar provides a context for theoretical issues, business practices, and professional skills required for career management and development in the visual arts.

ARTS 5444. Bachelor of Fine ARTS Exhibition. (1 cr; S-N only. Prereq–BFA candidate, sr, #)
Final solo or small group exhibition and artist's statement developed in consultation with faculty adviser. Visual documentation of work and statement as appropriate to media.

ARTS 5490. Workshop in Art. (1-4 cr [max 12 cr])
Selected topics and intensive studio activity. Topics vary yearly.

ARTS 5510. Advanced Printmaking. (4 cr [max 12 cr]. Prereq–3510 or #)
In-depth research of personal imagery using a broad range of historical and contemporary applications. Development of imagery using color, photo-mechanical, digital processes. Cross-media approaches.

ARTS 5520. Advanced Printmaking: Relief and Lithography. (4 cr [max 12 cr]. Prereq–3502 or #)
Relief printing, lithography for creative expression. Studio practice with stone, metal, wood. Developing personal visual language/aesthetics. Historical/contemporary awareness, evolving technologies/strategies.

ARTS 5550. Advanced Papermaking. (4 cr [max 12 cr]. Prereq–3505 or #)
Distinct expressive qualities of handmade paper, its versatility as contemporary art form. Independent research pursued in consultation with instructor.

ARTS 5610. New Media: Making Art Interactive. (4 cr [max 12 cr]. Prereq–3601 or #)
Conceptual/aesthetic development with digital, interactive art. Experimental approaches to interactive technologies. Projects with responsive/tangible media. Theory/history of new media.

ARTS 5620. Narrative Digital Video. (4 cr [max 12 cr]. Prereq–3602)
Individual, advanced, creative projects with narrative forms of video art. Documentary, live action, memoir. Relationships between conceptual, aesthetic, and artistic process.

ARTS 5630. Advanced Experimental Video. (4 cr [max 12 cr]. Prereq–3603 or #)
Experimental approaches in producing digital video within a contemporary art context. Using digital media technologies in installation, performance, and interactive video art. Emphasizes expanding personal artistic development. Theoretical issues, critical/historical readings/writings in media arts.

ARTS 5640. Advanced Animation. (4 cr [max 12 cr]. Prereq–3604 or #)
Two-/three-dimensional animation with digital technologies. Individual projects. Expansion of personal voice/visual clarity within framework of animated imagery and time-based artwork.

ARTS 5650. Advanced Sound Art. (4 cr [max 12 cr]. Prereq–3605)
Sound art practice/theory. Emphasizes individual creative projects using sound as primary material. History of experimental sound art from early 20th century to present. Critiques, readings, writing, public presentations.

ARTS 5660. The Body Electric: Sensing New Domains for Creative Expression. (4 cr [max 12 cr]; S-N only)
Cultural conceptions of the most personal of new media s hybrid domains of physical/virtual interplay. Readings of contemporary/historic conceptions of body/machine. Boundaries/membranes, response/reaction. The biological, the computational, the bionic. Advanced projects with interactive, sensing, and programmable technologies.

ARTS 5670. Interdisciplinary Media Collaborations. (3 cr [max 9 cr]. Prereq–Upper-division undergraduate or graduate student in art, creative writing, dance, music or theater)
Interdisciplinary, collaborative artist teams explore modes of creative expression at intersections of the arts. Students collaborate to co-author/produce works of art for pubic presentation. Emphazes integration of media arts with visual art, music, dance, and theater to produce interdisciplinary/collaborative art.

ARTS 5710. Advanced Photography. (4 cr [max 12 cr]. Prereq–Two semesters of 3xxx photography or #)
Design/implementation of individual advanced projects. Demonstrations, lectures, critique. Reading, writing, discussion of related articles/exhibitions.

ARTS 5810. Advanced Ceramics. (4 cr [max 12 cr]. Prereq–[3801, 3802, 3810] or #)
Critical discourse of aesthetics. History of, contemporary issues in clay and criticism. Independent, advanced projects.

ARTS 5821. Ceramic Materials Analysis. (4 cr. Prereq–3801 or 3802 or #)
Ceramic materials, their interrelationships. Advanced investigation of glazes, slip formulation, clay bodies in high/low temperature ranges. Individual interests related to students' aesthetic needs.

ARTS 5830. Advanced Ceramics: Mold Making. (4 cr [max 12 cr]. Prereq–3803 or #)
Advanced mold making for ceramics. Plaster mold fabrication, ceramic production, contemporary methods/concepts. Development of personal visual expression.

ARTS 5840. Advanced Neon. (4 cr [max 12 cr]. Prereq–3804 or #)
Emphasis on the development of personal sculptural sensibility. Studio practice with neon glass tubing and electrical components. A mixed media approach is encouraged.

ARTS 5990. Independent Study in Art. (1-4 cr [max 12 cr]. Prereq–major, #)
Independent study project designed by student in consultation with instructor.

Art History (ARTH)

Department of Art History

College of Liberal Arts

ARTH 1001. Introduction to Art History. (3 cr [max 4 cr])
History of art examined through selected monuments of major periods, from Paleolithic to modern times. Covers Western, other cultures.

ARTH 1002W. Why Art Matters. (4 cr)
Introduction to history of topics that investigate power/importance of art both globablly and in its diverse forms, from architecture and painting to video and prints. Sacred space, propaganda, the museum, art/gender, art/authority, tourism.

ARTH 1004W. Introduction to Asian Art. (4 cr. §ARTH 1004V)
Issues/themes of South Asian, Southeast Asian, and East Asian art from earliest times to present.

ARTH 1909W. Topics: Freshman Seminar. (3 cr. Prereq–Freshman)
Topics specified on One Stop Course Guide.

ARTH 1910W. Topics: Freshman Seminar. (3 cr; A-F only. Prereq–Freshman)
Topics specified on Onestop Course Guide.

ARTH 1921W. Introduction to Film Study. (4 cr. §CSCL 1921)
Fundamentals of film language, major theories of cinema. Detailed analysis of several films, including John Ford's Stagecoach, Jean-Luc Godard's Breathless.

ARTH 1940. Topics in Art History. (1-4 cr [max 4 cr])
Topics specified in Course Guide.

ARTH 3005. American Art. (4 cr)
Survey of American art from colonial to the present with special emphasis on the relationship of painting, sculpture, the decorative arts, architecture, costume, and material culture to current interpretations of American history.

ARTH 3008. History of Ancient Art. (4 cr. §CNES 3008)
Architecture, sculpture, and painting of selected early cultures; emphasis on influences contributing to the development of Western art.

ARTH 3009. History of Medieval Art. (4 cr)
Emphasis on principal monuments, their decoration and function (e.g. Old St. Peter's, Rome; Hagia Sophia, Istanbul; Palace Chapel, Aachen; St. Sernin, Toulouse; Cathedral of Chartres, Paris, Rheims).

ARTH 3011W. History of Renaissance and Baroque Art. (4 cr)
Major architects, sculptors, and painters in Western Europe from the 15th through the 18th centuries (e.g. Brunelleschi, Michelangelo, Raphael, Leonardo, Caravaggio, Bernini, Rembrandt, Rubens, Poussin, Watteau).

ARTH 3012. 19th and 20th Century Art. (3 cr)
Major monuments/issues of modern period. Sculpture, architecture, painting, prints. Neo-classicism, romanticism, realism, impressionism, evolution of modernism, symbolism, fauvism, cubism, dadaism, surrealism, abstract expressionism, pop art, conceptualism, postmodernism.

ARTH 3013. Introduction to EAST Asian Art. (3 cr [max 4 cr]. §EAS 3013)
A selective examination of works of art produced in China, Korea and Japan from the neolithic era to modern times. Nearly every major type of object and all major styles are represented.

ARTH 3014W. Art of India. (4 cr. §ALL 3014W)
Indian sculpture, architecture, and painting from the prehistoric Indus Valley civilization to the present day.

ARTH 3015W. Art of Islam. (4 cr)
Architecture, painting, and other arts from Islam's origins to the 20th century. Cultural and political settings as well as themes that unify the diverse artistic styles of Islamic art will be considered.

ARTH 3017. Islamic Culture. (4 cr)
Emphasis on visual arts and literature produced by the Muslim world from Spain to the Indian sub-continent. Analysis of original visual and literary sources will formthe basis for understanding diverse cultural developments.

ARTH 3035. Classical Myth in Western Art. (4 cr. §CNES 3035)
An exploration of the role of myth in the visual arts through examination of major figures and stories that became popular in the ancient world and have fascinated artists and audiences ever since.

ARTH 3142. Art of Egypt. (4 cr. §CNES 3142)
Arts and architecture of Egypt from prehistoric times to the emergence of modern Egypt, with emphasis on elements of continuity and change that have shaped Egyptian culture.

ARTH 3152. Art and Archaeology of Ancient Greece. (4 cr. §CNES 3152)
Introduction to the civilization of ancient Greece through art and material culture. Case studies of selected monuments and sites.

ARTH 3162. Roman Art and Archaeology. (4 cr. §CNES 3162)
Introduction to the art and material culture of the Roman World: origins, changes and continuities, "progress" or "decay" in the later Empire, legacy to the modern world.

ARTH 3201. The Olympic Games. (3 cr. §CLCV 1301, CLCV 3301)
Surveys the Olympic Games (776 B.C. to A.D. 338) and other ancient athletic festivals, including those for women participants. Greek art and literature serve as basic sources. Comparisons are made with modern athletic events.

ARTH 3340. Practicum in Archaeological Field and Computer Techniques. (3 cr. §ARTH 5340, CLCV 3340, CNES 3340, CNES 5340. Prereq–One course in ancient art/archaeology or #)
Methods for excavation of Old/New World sites. Meets at archaeometry/computer lab for part of semester and at selected site in Minnesota for day-long sessions for 9 to 10 weeks.

ARTH 3401. Art Now. (3 cr; A-F only)
Analysis of visual representations in fine arts and popular media, in context of social issues. Obscenity, censorship, democracy, technology, commerce, the museum, propaganda, social role of artist. Understanding the contemporary world through analysis of dominant aesthetic values.

ARTH 3422. History of Graphic Arts: 1780 to 1980. (4 cr)
History and theory of the creation of lithography, social caricature (e.g., Daumier, Gavarni), the revival of etching (e.g., Goya and mid-century practitioners, Whistler), and color lithography (e.g., Toulouse-Lautrec, Vuillard, Bonnard). Media changes of 20th century; the revolutionary nature of new media.

ARTH 3464. Art Since 1945. (4 cr)
Broad chronological overview of U.S./international art movements since 1945. Assessment of critical writings by major theoreticians (e.g., Clement Greenberg) associated with those movements. Theoretical perspective of postmodernism.

ARTH 3484. The Art of Picasso and the Modern Movement. (4 cr)
Works of Picasso in all media. Blue, Rose, Cubist, Classical, and later periods of Picasso's development against innovations in media; collage, utilization of found-objects, printmaking and ceramics. Autobiographical nature of imagery gives methodological basis for exploring frequently personalized themes.

ARTH 3575. The Art of Walt Disney in American Culture. (4 cr)
Walt Disney, his companies, and the influence of their products on 20th century American culture. Animation, architecture, city planning, the relationship between the fine arts and popular culture, and the creation of art under industrial conditions of collaboration and profit.

ARTH 3578. Arts of Africa. (4 cr. §AFRO 3578)
Surveys the diverse arts of Africa, from antiquity to present. Introduces visual arts of several civilizations and their relation to larger cultural issues (e.g., religion, cosmology, gender, identity, political power).

ARTH 3585. African American Art. (3 cr; A-F only. §AFRO 3585)
Four hundred year history of African American art. How/why African Americans created artwork at specific times, in specific places. Arts of African Americans within their own communities, National arts movements, and American life during historical junctures.

ARTH 3588. Architecture of Africa , Pre-Colonial to Present. (4 cr)
Introduces the history of architecture in West Africa, from eighth century to present. From the prosperity of early empires of Western Sudan (Ghana, Mali, Songhai), and the impact of Islam on traditional architecture, to colonial/post-colonial architecture.

ARTH 3921W. Art of the Film. (4 cr)
History of the motion picture as an art form; major films, directors, genres, and styles. Films discussed include *The Birth of a Nation, Citizen Kane, Bicycle Thief, Rashomon,* and *Jules and Jim*.

ARTH 3927. Documentary Cinema. (4 cr)
History of nonfiction filmmaking, from early forms of reportage and birth of documentary to emergence of "film-verite" and "guerrilla television" and work by independents (e.g., Errol Morris, Michael Moore).

ARTH 3930. Junior-Senior Seminar. (3 cr; A-F only. Prereq–[Jr or sr] ARTH major, #)
Major art-historical theme, artist, period, or genre. Topics specified in *Class Schedule*.

ARTH 3930H. Honors: Junior-Senior Seminar. (3 cr; A-F only. Prereq–Honors [jr or sr] ARTH major)
Major art-historical theme, artist, period, or genre.

ARTH 3940. Topics in Art History. (1-4 cr [max 21 cr])
Topics specified in *Class Schedule*.

ARTH 3971V. Honors: Major Project. (1 cr; A-F only. Prereq–Honors ARTH major, #)
Completion of research paper begun in a 5xxx course.

ARTH 3971W. Major Project. (1 cr; A-F only. Prereq–ARTH major, #)
Completion of research paper begun in a 5xxx course.

ARTH 3975. Directed Museum Experience. (1-2 cr [max 2 cr]; S-N only. Prereq–#)
Internship or docentship in an approved program in an art institution or museum. Open to both majors and nonmajors. Must consult with director of undergraduate studies.

ARTH 3993. Directed Study. (1-4 cr [max 12 cr]; A-F only. Prereq–#)

ARTH 3994. Directed Research. (1-4 cr [max 12 cr]; A-F only. Prereq–#)

ARTH 5101. Myths in Art: Cross-Cultural Comparison. (3 cr; A-F only)
Relationships of text/image, efficacy of each in conveying meaning. Properties of visual/verbal communication. Ways in which artists convey mythological meanings, how much these ways differ according to place/time. Students prepare/critique visual presentations through Web pages.

ARTH 5103. Hellenistic and Early Roman Art and Archaeology. (3 cr. §CNES 5103. Prereq–Clas/ARTH 3008, jr or #)
Sculpture, architecture, painting, and topography in developing centers of Hellenistic culture in the eastern Mediterranean, and in Etruscan and Roman towns from 400 B.C. to the beginnings of the Roman Empire.

ARTH 5108. Greek Architecture. (3 cr. §CNES 5108. Prereq–ArtH/Clas 3008, jr or sr or grad, or #)
Geometric through classical examples of religious and secular architecture and their setting at archaeological sites in Greece, Asia Minor, and Italy.

ARTH 5111. Prehistoric Art and Archaeology of Greece. (3 cr. §CNES 5111. Prereq–Jr or sr or grad student, Greek art/archaeology course or #)
Artistic and architectural forms of Neolithic period in Aegean area and Cycladic, Minoan, and Mycenaean cultures. Aims and methods of modern field archaeology; the record of human habitation in the Aegean area. Archaeological evidence as a basis for historical reconstruction.

ARTH 5112. Archaic and Classical Greek Art. (3 cr. Prereq–jr or sr or grad or #)
Sculpture, painting, architecture, and minor arts in Greek lands from the 9th through 5th centuries B.C. Examiniation of material remains of Greek culture, archaeological problems such as identifying and dating buildings; analysis of methods and techniques.

ARTH 5112. Archaic and Classical Greek Art. (3 cr. Prereq–Jr, Clas/ARTH 5111)
Sculpture, painting, architecture and minor arts in Greek lands from the 9th through 5th centuries B.C. Examination of material remains of Greek culture; archaeological problems such as identifying and dating buildings; analysis of methods and techniques. Emphasis on Periklean Athens.

ARTH 5120. Field Research in Archaeology. (3-6 cr [max 6 cr]. §ARTH 5120, CLCV 5120, CNES 5120. Prereq–#)
Field excavation, survey, and research at archaeological sites in the Mediterranean area. Techniques of excavation and exploration; interpretation of archaeological materials.

ARTH 5172. House, Villa, Tomb: Roman Art in the Private Sphere. (3 cr. §CNES 5172. Prereq–One intro art history course or #)
The architecture, painting, and sculpture of urban houses, country estates, and tombs in the Roman World. Relationships between public and private spheres, and literary and physical evidence; usefulness of physical evidence in illuminating gender roles.

ARTH 5182. Art and the State: Public Art in the Roman Empire. (3 cr. §CNES 5182. Prereq–One intro art history course or #)
Origins of Roman public art; use in maintaining community; exploitation by the first Emperor, Augustus; development and diffusion through the later Empire; varying capabilities to adjust to the demands of a Christian Empire.

ARTH 5234. Gothic Sculpture. (3 cr. Prereq–jr or sr or grad or #)
The origin, character, and development of Gothic sculpture in France, the German empire, and the Netherlands, 1150-1400. Emphasis on French sculpture of the cathedral age and the emergence of a court style in Paris and elsewhere in Europe (e.g. London, Prague).

ARTH 5252. History of Early Christian Art in Context. (4 cr. §CNES 5252. Prereq–One 3xxx ARTH course or #)
The role played by art in the formation of early Christian and Byzantine communities, and in establishing their relationships with the Pagan world and early Islam.

ARTH 5301. Visual Culture of the Atlantic World. (3 cr; A-F only)
Visual culture of Atlantic world, from Columbus to American Revolution. Visual objects, practices considered in context of Europe's colonization of Americas. Slavery, religious conflict, international commerce, production of scientific knowledge addressed in terms of their impact upon visual imagery.

ARTH 5302. Print Culture in Early Modern Europe. (3 cr; A-F only)
Cultural history of printed images in Europe from their emergence in 15th century through about 1750. Book illustration, reproductive printmaking. History of print connoisseurship. Prints and scientific knowledge. Role of print culture in major social/political events such as Protestant Reformation.

ARTH 5324. 15th-Century Painting in Northern Europe. (3 cr. Prereq–jr or sr or grad or #)
The origin, character, and development of painting in France, the Netherlandish area, and the German Empire during the years 1350 to 1500. Emphasis on the Flemish school (e.g., Van Eyck brothers, Campin, Van der Weyden) and its influences.

ARTH 5340. Practicum in Archaeological Field and Computer Techniques. (3 cr. §ARTH 3340, CLCV 3340, CNES 3340, CNES 5340. Prereq–One course in ancient art/archaeology or #)
Methods for excavation of Old/New World sites. Meets at archaeometry/computer lab for part of semester and at selected site in Minnesota for day-long sessions for 9 to 10 weeks.

ARTH 5411. Gender and Sexuality in Art Since 1863. (3 cr)
History of art from late 19th to early 21st century. How gender/sexuality have been central to that period?s artistic production, art criticism, and aesthetic theorization. How gender/sexuality are important themes for artists. How the writing of history reveals assumptions about gender/sex. Critical reading/writing.

ARTH 5413. Alternative Media: Video, Performance, Digital Art. (3 cr; A-F only. Prereq–3464 or #)
In-depth examination of development of alternative media in 20th/21st century art. Video technologies. Performance, time based art. Digital art.

ARTH 5417. Twentieth Century Theory and Criticism. (3 cr. Prereq–3464 or #)
Trends in 20th-century art theory, historical methodology, criticism. Key philosophical ideas of modernism/postmodernism: formalism, semiotics, poststructuralism, feminism, marxism, psychoanalysis, deconstruction.

ARTH 5454. Design Reform in the Era of Art Nouveau. (3 cr)
History of art nouveau in France, Belgium, England, Germany, Austria, Scotland, United States. Innovations in architecture, graphics, decorative arts; continental variants of the style. Major promoters and pioneers of modern design. Critical issues of design reform; texts integrated with principal monuments.

ARTH 5463. Early 20th-Century Painting and Sculpture. (3 cr)
Primary movements of early 20th century: fauvism, German expressionism, cubism, futurism, dadaism, surrealism, non-objective painting, constructivism, Orphism, early abstraction. Framed against postimpressionism and internationalism at turn of century.

ARTH 5466. Contemporary Art. (3 cr. Prereq–3464 or #)
Survey of the art and important critical literature of the period after 1970. Origins and full development of postmodern and subsequent aesthetic philosophies.

ARTH 5535. Style, Tradition, and Social Content in American Painting: Colonial Era to 1876. (3 cr)
America's colonial, Revolutionary era, and 19th-century painters' responses to the influence of European aesthetics. Key American painting types: portraiture, rural genre, and landscape from Copley and Gilbert Stuart to the Hudson River School and the chroniclers of the Western frontier.

ARTH 5536. Topical Studies in American Art. (3 cr)
Course description varies from year to year, depending on the current research interests of the instructor and the needs and interests ofadvanced undergraduate and graduate students in modern and American art.

ARTH 5546. American Architecture: 1840 to 1914. (3 cr)
American architecture from 1840 to 1914, examined in relation to European precedents and American sociohistorical conditions. Critical attention to problems of style, the architectural profession, vernacular vs. "high"architecture, technology, economics, urbanism, and social reform.

ARTH 5655. African American Cinema. (3 cr. §AFRO 4655)
African American cinematic achievements, from silent films of Oscar Micheaux through contemporary Hollywood and independent films. Class screenings, critical readings.

ARTH 5725. Ceramics in the Far East. (3 cr)
Selective examination of representative pottery and ceramic wares produced in China, Korea, and Japan from the Neolithic era to modern times. Nearly every major ceramic type is represented.

ARTH 5765. Early Chinese Art. (3 cr)
Develop a more effective way to understand the unique qualities of an individual work of art. Concentration is on accessible works of art in local private and museum collections.

ARTH 5766. Chinese Painting. (3 cr)
Major works from the late bronze age to the modern era that illustrate the development of Chinese landscape painting and associated literary traditions.

ARTH 5767. Japanese Painting. (3 cr)
Japanese pictorial arts from the late tomb period to the modern era; special attention to the development of indigenous traditions.

ARTH 5769. Connoisseurship in Asian Art. (3 cr)
A selective examination of representative works of art produced in China from the Neolithic era to the Han Dynasty. Major archaeological sites and examples of art in local collections.

ARTH 5775. Formation of Indian Art: 2500 BCE to 300 CE. (3 cr)
Sculpture/architecture, from Indus Valley civilization through Kushana period.

ARTH 5776. Redefining Tradition: Indian Art, 400 to 1300. (3 cr)
India's art/architecture, from earliest free-standing temples through 13th century. Focuses on temples, associated sculpture. Mural painting, beginnings of Islamic architecture in India.

ARTH 5777. The Diversity of Traditions: Indian Art 1200 to Present. (3 cr. Prereq–Art history course or #)
Issues presented by sculpture, architecture and painting in India from the prehistoric Indus Valley civilization to the present day.

ARTH 5781. Age of Empire: The Mughals, Safavids, and Ottomans. (3 cr)
Artistic developments under the three most powerful Islamic empires of the 16th through 19th centuries: Ottomans of Turkey; Safavids of Iran; Mughals of India. Roles of religion and state will be considered to understand their artistic production.

ARTH 5785. Art of Islamic Iran. (3 cr)
Architecture, painting, and related arts in Iran from the inception of Islam (7th century) through the 20th century. Understanding the nature of Islam in Persianate cultural settings and how artistic production here compares to the Islamic world.

ARTH 5925. History of Photography as Art. (3 cr)
Origins and development of photography, with attention to technology and cultural impact. Major aesthetic achievements in photography from its beginning to present.

ARTH 5927. Documentary Cinema. (4 cr)
History of nonfiction filmmaking, from early forms of reportage and birth of documentary to emergence of "film-verite" and "guerrilla television" and work by independents (e.g., Errol Morris, Michael Moore).

ARTH 5940. Topics: Art of the Film. (3 cr)
Topics in film history including individual directors (e.g., Hitchcock, Welles), genres (e.g., westerns, musicals), and other topics (e.g., American independent filmmaking, film noir).

ARTH 5950. Topics: Art History. (2-4 cr [max 12 cr])
Topics specified in *Class Schedule*.

ARTH 5993. Directed Study. (1-4 cr [max 12 cr]; A-F only. Prereq–#)

ARTH 5994. Directed Research. (1-4 cr; A-F only. Prereq–#)

Asian American Studies (AAS)

Department of American Studies

College of Liberal Arts

AAS 1101. Imagining Asian America. (3 cr)
Issues in Asian American Studies. Historical/recent aspects of the diverse/multifaceted vision of Asian America, using histories, films, memoirs, and other texts as illustrations.

AAS 3001. Contemporary Perspectives on Asian America. (3 cr)
Interdisciplinary overview of Asian American experiences/identities. Emphasizes post-1965 migration/community. History, cultural productions, and contemporary concerns of Americans of Chinese, Japanese, Korean, South Asian, Filipino, and Southeast Asian ancestry.

AAS 3270. Service Learning in the Asian Community. (1-4 cr [max 4 cr]. Prereq–#)
Students engage in service learning among members of local Asian communities. Readings, mentoring, English language instruction. Other activities as deemed appropriate by instructor and sponsoring agency.

AAS 3409W. Asian American Women's Cultural Production. (3 cr)
Diversity of cultures designated "Asian American." Understanding women's lives in historical, cultural, economic, and racial contexts.

AAS 3501. Asian America Through ARTS and Culture. (4 cr)
Interdisciplinary questions of Asian American experience, identity, and community. Literature, dance, music, photography, film, theater, other cultural forms. Students work with local Asian American arts groups/organizations. Students express their own cultural contradictions through writing and other forms of artistic expression and attend local arts events.

AAS 3877. Asian American History, 1850 to Present. (3 cr)
Asian American history and contemporary issues, from 1850 to present. Immigration, labor, anti-Asian movements, women/families, impact of World War Two, new immigrant/refugee communities, civil rights, Asian American identity/culture.

AAS 3920. Topics in Asian American Studies. (2-4 cr [max 8 cr]. Prereq–jr or sr)
Topics specified in *Class Schedule*.

AAS 3993. Directed Studies in Asian American Studies. (1-9 cr [max 9 cr]. Prereq–#)
Guided individual reading or study.

AAS 4231. The Color of Public Policy: African Americans, American Indians, and Chicanos in the United States. (3 cr. §AFRO 4231, AMIN 4231, CHIC 4231)
Structural or institutional conditions through which people of color have been marginalized in public policy. Critical evaluation of social theory in addressing the problem of contemporary communities of color in the United States.

AAS 4311. Asian American Literature and Drama. (3 cr; A-F only)
Literary/dramatic works by Asian American writers. Historical past of Asian America through perspective of writers such as Sui Sin Far and Carlos Bulosan. Contemporary artists such as Frank Chin, Maxine Hong Kingston, David Henry Hwang, and Han Ong. Political/historical background of Asian American artists, their aesthetic choices.

AAS 4920. Topics in Asian American Studies. (2-4 cr [max 8 cr])
Topics specified in *Class Schedule*.

Asian Languages and Literatures (ALL)

Department of Asian Languages and Literatures

College of Liberal Arts

ALL 1001. Asian Film and Animation. (3 cr)
Various film styles within Asian film/animation production. Ways of analyzing film. Work of 20th-century directors in Asia.

ALL 1275. Buddhism in EAST Asia. (3 cr)
Introduction to traditions of Buddhism in China, Korea, and Japan. Arrival of Buddhism in East Asia, impact on those cultures. Modes of Buddhist transmission/interaction within East Asia. Forms of Buddhist practice. Development of monastic communities. Evolution of Buddhist doctrinal/devotional schools.

ALL 1335W. Chinese Ways of Living: Philosophical and Literary Approaches. (3 cr)
Premodern Chinese conceptions of the good and ethical life. Primary texts. Personal liberation philosophy of Zhuangzi. Han Fei zi s political legalism. Buddhist popular piety. Chan (Zen) approaches to enlightenment. Ethical/moral uses of poetry. Neo-Confucian ideals of self-cultivation. Modern Confucianism/Buddhism.

ALL 1441. Popular Music and Media in Modern Japan. (3 cr)
Traditional forms of Japanese music in relation to social/historical change. Focuses on transformation in modes of music associated with introduction of phonographs/radio. Rise of Japanese recording industry, popular music it produced. Musicology, music history, cultural history, gender studies, postcolonial studies.

ALL 1904. Freshman Seminar. (3 cr [max 6 cr]; A-F only. Prereq–Freshman)
Topics specified in *Class Schedule* and *Course Guide*.

ALL 1905. Freshman Seminar. (3 cr [max 6 cr]; A-F only. Prereq–Freshman)
Topics specified in *Class Schedule* and *Course Guide*.

ALL 1909W. Freshman Seminar. (3 cr [max 6 cr]; A-F only. Prereq–Freshman)
Topics specified in *Class Schedule* and *Course Guide*.

ALL 1910.W Freshman Seminar. (3 cr [max 6 cr]; A-F only. Prereq–Freshman)
Topics specified in *Class Schedule* and *Course Guide*.

ALL 3001. Reading Asian Cultures. (3 cr; A-F only)
Introduction to primary Asian texts in translation. Emphasizes introducing/applying various methods of interpretation to a particular text in sequence. Close reading, methodological rigor. Practice, application.

ALL 3014W. Art of India. (4 cr. §ARTH 3014W. Prereq–§ARTH 3014W)
Indian sculpture, architecture, and painting, from prehistoric Indus Valley civilization to present.

ALL 3110. Study of an Asian Language. (1-5 cr [max 10 cr]. Prereq–Δ)
Study of an Asian language in another country or at other non-campus locations. Students study in situations complementary to regular University course offerings.

ALL 3220. Study Abroad Topics in Asian Culture. (1-4 cr [max 12 cr]; A-F only)
Part of University of Minnesota sponsored study abroad experience.

ALL 3232W. "Short Poetry in China and Japan. (3 cr)
Short poetic forms of China and Japan. Chinese quatrains and octets. Japanese tanka and haiku. Translations by modern poets. Texts in original languages (with provided glosses). Art of translation. Translators conceptions of East Asian exoticism.

ALL 3265W. The Fantastic in East Asia: Ghosts, Foxes, and the Alien. (3 cr. Prereq–Some coursework in East Asia recommended)
How the strange/alien is constructed in premodern Chinese/Japanese literature. East Asian theories of the strange and their role in the classical tale, through the works of Pu Songling, Ueda Akinari, and others. Role of Buddhist cosmology/salvation in other works (e.g., Journey to the West, drama).

ALL 3270. Service Learning in the Asian Community. (1-4 cr [max 8 cr]. Prereq–#)
Students engage in service learning among members of local Asian communities. Readings, mentoring, English language instruction. Other activities as deemed appropriate by instructor and sponsoring agency.

ALL 3300. Topics in Chinese Literature. (1-3 cr [max 9 cr])
Selected topics in Chinese literature. Topics specified in the *Class Schedule*.

ALL 3320. Topics in Chinese Culture. (1-3 cr [max 9 cr])
Selected topics in Chinese culture. Topics specified in the *Class Schedule*.

ALL 3333. Gender and Sexuality in Traditional Chinese Literature. (3 cr)
How writers have written about gender in traditional China. Traditional Chinese attitudes toward sexuality. Poetry from early period, "stories of the strange," later fiction/drama. Transformation of these themes in popular cinema.

ALL 3336. Revolution and Modernity in Chinese Literature and Culture. (3 cr)
Introduction to modern Chinese literature, visual culture, and critical thought from beginning of 20th century to end of Mao era. Examples of literature/culture, parallel readings of Chinese critical essays. Readings are in English translation.

ALL 3337. Chinese Literature and Popular Culture Today. (3 cr)
Introductory survey of contemporary Chinese literature and popular culture from end of Mao era in 1979 to present. Creative results of China s "opening and reform." Recent commercialization/globalization of culture. Literature, visual culture, popular music.

ALL 3356W. Chinese Film. (3 cr)
Survey of Chinese cinema from China (PRC), Taiwan, and Hong Kong. Emphasizes discussion/comparison of global, social, economic, sexual, gender, psychological, and other themes as represented through film.

ALL 3361W. Maps, Pictures, and Writing in the Representation of Taiwan. (3 cr)
How visual (maps, pictures, and photographs) and written (travelogues, stories, and essays) media are used to contribute to formation of identity in representating people, place, and history of Taiwan, in historical/contemporary contexts.

ALL 3363. Imagined Worlds in Ming Qing China. (3 cr)
Imaginative worlds (fictional, religious, erotic) that were available to men and women in China of the Ming and Qing dynasties. Fiction, other texts, visual materials. Ways in which texts were produced/distributed.

ALL 3371. History of Chinese Cities and Urban Life. (3 cr; A-F only)
Introduction to traditional Chinese cities, their modern transformation. Ideal city plan in Confucian classics compared with physical layout of some major cities. Models about Chinese cities, influence of the models on our understanding of Chinese history/society.

ALL 3373. Religion and Society in Imperial China. (3 cr)
Introduction to religious traditions of imperial China (Buddhism, Daoism, Confucianism, "popular" religion), their relation to society. Role of gender. Conceptualizing relations with the divine. Ritual and its goals. Position of religious specialists such as monks and Daoist priests. Primary/secondary readings.

ALL 3400. Topics in Japanese Literature. (3 cr [max 9 cr])
Selected topics in Japanese literature. Topics specified in the *Class Schedule*.

ALL 3420. Topics in Japanese Culture. (1-3 cr [max 9 cr])
Selected topics in Japanese culture. Topics specified in the *Class Schedule*.

ALL 3433W. Traditional Japanese Literature in Translation. (3 cr. Prereq–No knowledge of Japanese necessary)
Survey of texts in different genres, from 8th to early 19th centuries, with attention to issues such as "national" identity, gender/sexuality, authorship, and popular culture.

ALL 3436. Postwar Japanese Literature in Translation. (3 cr. Prereq–Basic knowledge of modern Japanese history helpful, knowledge of Japanese language not required)
Survey of ideas/styles of recent Japanese literature. Writers include Dazai Osamu, Ibuse Masuji, Oe Kenzaburo, Mishima Yukio, and Yoshimoto Banana. All readings in English translation.

ALL 3437. Early 20th Century Japanese Literature in Translation. (3 cr)
Survey of the principal authors and genres of the period spanning Japan's opening to the West (1860s) to World War II. Writers include Natsume Soseki, Shiga Naoya, Kawabata Yasunari, and Tanizaki Junichiro.

ALL 3441W. Japanese Theater. (3 cr)
Japanese performance traditions. Emphasizes noh, kabuki, and bunraku in their literary/cultural contexts. Relationship between these pre-modern traditions and modern theatrical forms (e.g., Takarazuka Revue).

ALL 3456. Japanese Film. (3 cr)
Themes, stylistics, and genres of Japanese cinema through work of classic directors (Kurosawa, Mizoguchi, and Ozu) and more recent filmmakers (Itami, Morita). Focuses on representations of femininity/masculinity.

ALL 3457. War and Peace in Japan Through Popular Culture. (4 cr; A-F only. Prereq–Some knowledge of modern Japanese history or #)
War-related issues in Japan. Animation films, comics from 1940s to 1990s. Mobilization of culture for WWII. Conflict between constitutional pacifism and national security. Japan's role in cold war and post-cold war worlds.

ALL 3500. Topics in Korean Literature. (1-3 cr [max 9 cr])
Selected topics in Korean literature. Topics specified in the *Class Schedule*.

ALL 3520. Topics in Korean Culture. (1-3 cr [max 9 cr])
Selected topics in Korean culture. Topics specified in the *Class Schedule*.

ALL 3632. Readings in Indian Epic Traditions: Islamic Epic and Romance. (3 cr)
Literary traditions of epic/romance that arose in Islamic societies of Central/Southern Asia. How genres of love/war interacted with political, religious, and cultural authorities over centuries. Virtue, constructions of fantasy/understandings of reality in tales of heroes, beautiful princesses, evil kings, fairies, Jinns, magicians, and tricky secret agents.

ALL 3637W. Modern South Asian Literature. (3 cr; A-F only)
Survey of 20th century literature from South Asian countries, including India, Pakistan, and Sri Lanka. All readings in English. Focuses on colonialism, post-colonialism, power, and representation.

ALL 3676. Culture and Society of India. (3 cr. §ANTH 3023, GLOS 3961)
Contemporary society/culture in South Asia from anthropological perspective with reference to nationalism; postcolonial identities; media and public culture; gender, kinship, and politics; religion; ethnicity; and Indian diaspora.

ALL 3720. Topics in Hmong Culture. (1-3 cr [max 9 cr])
Selected topics in Hmong culture. Topics specified in the *Class Schedule*.

ALL 3736. Hmong American Literature. (3 cr)
Emerging literature of Hmong (American) community. How Hmong literature fits into Asian, American, and Asian American literatures. Its definitions/borders. Students read, meet writers/artists, and write reflectively, analytically, and creatively.

ALL 3900. Topics in Asian Literature. (3 cr [max 9 cr])
Topics specified in *Class Schedule*.

ALL 3920. Topics in Asian Culture. (3 cr [max 9 cr])
Topics specified in *Class Schedule*.

ALL 3990. Directed Study. (1-3 cr [max 12 cr]. Prereq–#, Δ, ❑)
Individual reading/study, with guidance of a faculty member, on topics not covered in regular courses.

ALL 4900W. Major Project. (1 cr; A-F only. Prereq–[ALL major, sr, #])
Directed research/writing on topic selected according to individual interest and in consultation with faculty adviser.

ALL 5220. Pedagogy of Asian Languages and Literatures. (1-3 cr [max 9 cr] Prereq–Grad student)
Second language acquisition theory, methods, testing, and technology applicable to teaching of modern Asian languages/literatures.

ALL 5265. Traditional Poetics and Aesthetics in EAST Asia. (4 cr. Prereq–Some knowledge of EAST Asian culture/literature suggested)
Introduction to traditional theories of poetics/aesthetics in East Asia. Emphasizes China and Japan. Chinese interpretations of classic Poetry, their impact on conception of poetry in general. Correspondences of poetic/painting theory. Impact of Zen Buddhism on aesthetics. Japanese court treatises on poetry.

ALL 5333. Poetry and Power in Early China: Book of Songs and Songs of the South. (4 cr. Prereq–Upper div undergrad or grad student)
How to read/analyze poems from early anthologies in terms of their display/invocation of different types of cultural power. Power that poems have held over Chinese literary tradition in subsequent millennia, their literary influence/position in intellectual/political lives of Chinese readers. Studies that relate to the poetry and social/material culture.

ALL 5343. Lovers, Clowns, and Acrobats: An Introduction to Chinese Drama. (4 cr)
Traditional Chinese drama/theater. Students read/discuss major masterpieces of Chinese drama in English translation. Major secondary scholarship. Theatrical practices of modern opera (especially Beijing opera) through in-class viewings. Focuses on representation of gender/romance.

ALL 5356. Gender and Sexuality in Chinese Film. (4 cr. Prereq–Upper div undergrad or grad student)
How gender/sexuality have been depicted, constructed, and subverted in Chinese cinemas (including mainland China, Hong Kong, Taiwan) from 1930s to present. Weekly film screenings, readings on Chinese film, key works of feminist film theory.

ALL 5357. Chinese Cinematic Realisms. (4 cr)
Various styles of realism in Chinese cinemas (mainland, Taiwan) from silent era to present. Theories of realism, conceptions of "the Real" applied in close readings of major films, placed in historical context. China's negotiation of modernity during 20th century.

ALL 5366. The Nation in Modern Chinese Film and Literature. (4 cr. Prereq–Jr or sr or grad student)
Chinese nationhood as represented/negotiated in film/literature from early 20th Century to present. How China was re-imagined as a modern nation in culture, from Republican era to Mao era to the reform era. How alternative national visions of nationhood arose in Hong Kong and Taiwan.

ALL 5374W. Representing the Past: Chinese Myth, Legend, and Ideology. (4 cr)
Analysis of texts that contain early Chinese myths, legends, and historical narratives in their construction of an understandable world. How such materials have been incorporated into different cultural formations from later periods, including contemporary popular culture. How they have figured into the construction of China and Chineseness in 20th Century.

ALL 5433. Women's Writing in Premodern Japan in Translation. (4 cr; A-F only)
Genji monogatari, a lengthy narrative, Makura no soshi, a collection of vignettes, and poetry. Gendered writing system/authorship, narrative techniques. Sexuality/figure of author. Strategies of fictionality.

ALL 5436. Literature by 20th-Century Japanese Women in Translation. (4 cr)
Literary and historical exploration of selected works by Japanese women writers in a variety of genres. All literary texts read in English.

ALL 5466. Japanese Popular Culture in a Global Context. (4 cr)
What happens when one nation's popular culture begins to permeate others. Japanimation, manga, fashion, and music. Relationship of popular culture to nation(alism), ethnicity, gender, and identity. Effects of popular culture on consumers, socialization. Ways that consumption affects us personally.

ALL 5476. Japanese Minority Literatures. (4 cr; A-F only. Prereq–One 3xxx course in modern [Meiji or later] Japanese literature)
Fiction/poetry by Okinawans, zainichi (Japanese of Korean descent) writers, and authors from outcaste burakumin. Interrogation of "minority literature" as theoretical construct. Alteration of what constitutes "Japanese literature." Relationships between a group's historical experiences and literary representation.

ALL 5477. Kurosawa, Masculinity, and Cold War. (4 cr. Prereq–Advanced undergrad or grad student)
Akira Kurosawa?s work as a film director. Emphasizes revising dominant interpretations of Japanese film/masculinity in context of pre-WWII Japanese and Cold War Japanese-U.S. situation. Politics of culture, class, social agency, and gender coding.

ALL 5636. South Asian Women Writers. (4 cr; A-F only. Prereq–Grad student or advanced undergrad)
Survey of South Asian women's writing, from early years of nationalist movement to present. Contemporary writing includes works by immigrant writers. Concerns, arguments, and nuances in works of women writing in South Asia and diaspora.

ALL 5900. Topics in Asian Literature. (4 cr [max 16 cr])
Topics specified in *Class Schedule*.

ALL 5920. Topics in Asian Culture. (4 cr [max 16 cr])
Topics specified in *Class Schedule*.

ALL 5990. Directed Study. (1-4 cr [max 16 cr]. Prereq–#, Δ, ❑)
Individual reading/study, with guidance of a faculty member, on topics not covered in regular courses.

Astronomy (AST)

Department of Astronomy

Institute of Technology

AST 1001. Exploring the Universe. (4 cr. §AST 1005, AST 1011H)
The human place in the Universe. Study of Earth, other planets, sun, stars, galaxies. Background and fragility of life on Earth. Scale, origin, history of universe and our relationship to it.

AST 1005. Descriptive Astronomy. (3 cr. §AST 1001, AST 1011H. Prereq–non-science major)
Twentieth century astrophysics, current frontiers of astrophysical research.

AST 1011H. Exploring the Universe, Honors. (4 cr. §AST 1001, AST 1005. Prereq–high school trigonometry, high school physics or chemistry)
The human place in the universe. Study of Earth, other planets, sun, stars, galaxies. Background and fragility of life on Earth. Scale, origin, history of universe and our relationship to it. Honors version of Ast 1001.

AST 1901. Freshman Seminar. (1-3 cr [max 3 cr]. Prereq–Freshman)
Topics vary. See *Class Schedule*.

AST 1905. Freshman Seminar. (1-3 cr [max 3 cr]. Prereq–Freshman)
Topics vary. See *Class Schedule*.

AST 1910W. Freshman Seminar, Writing Intensive. (1-3 cr [max 3 cr]. Prereq–Freshman)
Topics vary. See *Class Schedule*.

AST 2001. Introduction to Astrophysics. (4 cr. Prereq–1 yr calculus, PHYS 2303 or #)
Physical principles and study of solar system, stars, galaxy, universe. How observations and conclusions are made.

AST 2990. Directed Studies. (1-5 cr [max 5 cr]. Prereq–1 yr calculus, PHYS 1302, #)
Independent, directed study in observational and theoretical astrophysics. Arranged with faculty member.

AST 4001. Astrophysics I. (4 cr; A-F only. Prereq–2001, PHYS 2601)
Astrophysics of stars and stellar populations. Stellar formation, evolution, interiors/atmospheres. Stellar populations, galactic distribution of stars.

AST 4002. Astrophysics II. (4 cr; A-F only. Prereq–2001, PHYS 2601)
Astrophysics of galaxies and the universe. Diffuse matter, galactic structure, and evolution. Clusters of galaxies. Introductory cosmology, evolution of the universe.

AST 4101. Computational Methods in the Physical Sciences. (4 cr. Prereq–Upper div CLA or upper div IT or grad or #)
Introduction to using computer programs to solve problems in physical sciences. Selected numerical methods, mapping problems onto computational algorithms. Arranged lab.

AST 4299H. Senior Honors Astrophysics Research Seminar. (1 cr [max 2 cr]. Prereq–Upper div honors student in IT or CLA, inst consent)
Based on department's research seminar.

AST 4990. Directed Studies. (1-5 cr [max 5 cr]. Prereq–2001, #)
Independent, directed study in observational and theoretical astrophysics. Arranged with faculty member.

AST 4994W. Directed Research. (3-5 cr [max 5 cr]. Prereq–#)
Independent research in observational or theoretical astrophysics. Senior Thesis for undergraduate astrophysics majors. Arranged with faculty member.

AST 5012. The Interstellar Medium. (4 cr. Prereq–2001, PHYS 2601 or #)
Survey of physical processes in the interstellar medium. Dynamic processes, excitation processes, emission and absorption by gas and dust. Hot bubbles, HII regions, molecular clouds.

AST 5022. Relativity, Cosmology, and the Universe. (4 cr. §PHYS 5022. Prereq–[2001, PHYS 2601] or #)
Large-scale structure/history of universe. Introduction to Newtonian/relativistic world models. Physics of early universe, cosmological tests, formation of galaxies.

AST 5201. Methods of Experimental Astrophysics. (4 cr. Prereq–Upper div IT or grad or #)
Contemporary astronomical techniques and instrumentation. Emphasizes data reduction and analysis, including image processing. Students make astronomical observations at O'Brien Observatory and use department's computing facilities for data analysis. Image processing packages include IRAF, AIPS, IDL, MIRA.

Bio-based Products (BP)

Department of Bio-based Products

College of Food, Agricultural and Natural Resource Sciences

BP 1001. Bio-based Products Orientation. (1 cr; S-N only)
Introduction to professions/careers related to bio-based products. One half-day field trip required.

BP 1002. Wood and Fiber Science. (3 cr; A-F only. §BP 5202)
Wood as a bio-material. Wood's anatomical/cellular structure compared with other plant-derived materials. Wood's physical properties/characteristics in various applications. Non-wood fiber, bio-product characteristics.

BP 1003. Wood and Fiber Science Lab. (1 cr; A-F only. Prereq–recommend concurrent enrollment in BP 1002)
Structure/properties of wood and agricultural plants and of fibers derived from them.

BP 1005. Introduction to Pulp and Paper Technology. (3 cr)
Technology of pulp/paper manufacturing. Terminology, key parameters. Stepwise description of processes, from harvesting of trees through fiber production and papermaking. Vista based online course.

BP 1302. Wood as a Raw Material. (3 cr. Prereq–#; cr not granted to CNR majors; distance learning)
Physical/chemical nature of wood and wood fiber. Raw material requirements, manufacturing processes, product characteristics for principal forest products. World wood supply, consumption trends.

BP 1901. Freshman Seminar. (3 cr [max 6 cr]. Prereq–Freshman)
Issues/topics related to natural resources and the environment. Topics vary each semester.

BP 1906W. Freshman Seminar. (3 cr. Prereq–Fr)
Issues/topics related to natural resources and the environment. Topics vary each semester.

BP 3001. Statics, Mechanics, and Structural Design. (4 cr; A-F only. Prereq–General physics, algebra, trigonometry)
Fundamental statics and engineering principles of structural materials. Safe/efficient engineering design skills. Emphasizes structural bio-based products.

BP 3101. Introductory Statics and Structures for Construction Management. (3 cr; A-F only. Prereq–Working knowledge of [trigonometry, geometry, algebra])
Statics, engineering wood design principles, mechanical properties of wood. Design techniques for individual components. Trusses, beams, columns. Using conventional lumber products, engineered wood products, and steel. Simple structures explored through examples, assignments.

BP 3102. Residential Indoor Air Quality. (3 cr; A-F only. §BP 5102. Prereq–[Jr, one yr of college-level [physics or chemistry or biology]] or #)
Indoor air pollution issues found in residential structures, especially in north central region of the United States. Pollutant descriptions, including measurement techniques and typical ranges of concentrations. Health effects 3) Pathways and transport mechanisms. Control strategies, including mitigation and prevention.

BP 3393. Directed Study. (1-3 cr [max 12 cr]. Prereq–#)
Opportunity to pursue projects not available through independent study or extra credit. In consultation with an adviser, students develop a prospectus and complete progress reports and a final report on the project.

BP 3396. Industrial Internship (Industrial Assignment). (1 cr; A-F only. Prereq–WPS cooperative ed student)
Industrial work assignment in forest products cooperative education program. Evaluation based on formal report written by student at end of each semester of work assignment.

BP 3411. Introduction to Residential Construction. (2 cr)
Housing/construction terminology, building materials/components. Design, construction, and sales process: basic building science concepts, blueprint reading, computer-aided design, construction site logistics.

BP 3412. Introduction to Residential Building Materials Estimating. (1 cr; A-F only)
Residential construction terminology. Estimating procedures, including blueprint reading and piece-by-piece building material ?take-off? from construction plans. Held second half of semester.

BP 3503. Marketing of Bio-based Products. (4 cr; A-F only. §BP 5503)
Intro to marketing function as it relates to current/emerging bio-based products industries (building materials, paper, fuels, etc.). Product positioning, pricing, promotion, and channel management within strategic planning and environmental marketing management.

BP 4001. Chemistry of Plant Materials. (4 cr; A-F only. §ECON 3031, ECON 4031. Prereq–CHEM 2302, [jr or sr or #])
Chemical principles underlying structure, properties, processing, and performance of plant materials.

BP 4200H. Honors Seminar. (1 cr; A-F only. Prereq–BP upper div honors, #)
Current topics presented by faculty/students. Lecture/discussion.

BP 4301. Surface and Colloid Science in Bio-based Products Manufacturing. (3 cr. §BP 5301. Prereq–CHEM 3501, [jr or sr or #])
Principles of surface/colloid science, their application to understanding manufacturing/performance of bio-based products.

BP 4302. Organisms Impacting Bio-based Products. (3 cr. §BP 5302. Prereq–1002 or WPS 1301 or #)
Organisms of importance to bio-based products. Deterioration, control, bioprocesses for benefit.

BP 4303. Bio-Based Materials Science. (3 cr. §BP 5303. Prereq–CHEM 3501, [jr or sr or #])
Basic principles of materials science, their application to bio-based materials.

BP 4305. Pulp and Paper Technology. (3 cr. §BP 5305. Prereq–Jr or #)
Pulping processes, fiber refining/processing, paper manufacturing, fiber/paper properties, paper recycling. Water requirements, effluent treatment. Chemical/mechanical pulping, pulp preparation, secondary fiber, de-inking, wet end additives. Lab problems/exercises supplemented by lectures. Online course.

BP 4313. Pulp and Paper Unit Operations. (4 cr. §BP 5313. Prereq–4305 or #)
Application of principles of momentum, heat, and mass transfer to unit operations in pulp/paper industry. Fluid transport, filtration, sheet formation, sedimentation, drainage, pressing, heat exchange, evaporation, washing, bleaching, humidification/drying, chemical/energy recovery. Computer simulation of multiple-stage systems. Online course.

BP 4314. Papermaking Processes and Process Engineering Laboratory. (3 cr. §BP 5314. Prereq–#)
Theory/practice of design/operation of paper machines and associated finishing/converting equipment. Experiments illustrate/apply principles of momentum, heat, and mass transfer. Operation/performance optimization of pilot-plant paper machine. Process engineering studies of industrial production systems. Online course.

BP 4320. Applied Statistics for Process Industries: Measurement, Analysis, and Control. (3 cr. §BP 5320. Prereq–MATH 1272 or #)
Presented through the Internet. Basic concepts and most frequently used methods in statistical process control, analysis of variances, experiment design, and regression analysis. Online course.

BP 4355. Design of Wood Structures. (3 cr. Prereq–3001 or WPS 4301 or CE student or #)
Design of wood structures using Allowable Stress Design. Wood properties/characteristics important to structural design. Heavy/light frame wood construction.

BP 4362. Pulping and Bleaching. (4 cr. §BP 5362. Prereq–BP 4305 or WPS 4305)
Chemistry/technologies in producing paper-making raw material. Focuses on wood pulping/bleaching, including non-wood fibers and recycled fiber materials. Online course.

BP 4401. Bio-based Products Engineering. (4 cr; A-F only. §BP 5401. Prereq–CHEN 4001, CE 3502, [jr or sr or #])
Unit operations of bio-based products engineering/manufacture.

BP 4402. Bio-based Products Engineering Lab I. (1 cr; A-F only. §BP 5402. Prereq–CHEM 2302, [jr or sr or #])
Laboratory exercises in bio-based products engineering.

BP 4403. Bio-based Products Engineering Lab II. (1 cr; A-F only. §BP 5403. Prereq–CHEM 2302, [jr or sr or #])
Lab exercises in bio-based products engineering.

BP 4404. Bio-based Composites Engineering. (3 cr; A-F only. §BP 5404. Prereq–3001, CHEM 3501, [jr or sr or #])
Properties of bio-based composites.

BP 4405. Process Control and Simulation. (3 cr. §BP 5405. Prereq–CHEN 4001, CE 3502, j[jr or sr or #])
Fundamental principles in system dynamics and control. Emphasizes process systems, problems faced by process engineers.

BP 4406. Understanding Wood. (2 cr. Prereq–UC only)
For woodworking professionals and serious craftspersons. Cellular structure of wood, identification of hardwoods and softwoods, interaction of water and wood. No prior technical training in wood properties is needed, although general experience with woodworking is helpful.

BP 4407. Bio-based Products Manufacturing and Applications I. (2 cr. §BP 5407. Prereq–1002 or #)
Manufacturing and product service considerations for wood/bio-based products. Chemistry of plant-based materials. Process of papermaking.

BP 4411. Application and Performance of Wood-based Composites in Services. (2 cr; A-F only. Prereq–[1002 or WPS 1301 or 4406 or WPS 4406 or #], [UC or CEE])
Physical/mechanical properties of composites. Composite applications/installations.

BP 4412W. Bio-based Products Manufacturing and Applications II. (3 cr. §BP 5412. Prereq–1002, upper div BP)
Manufacturing processes, end-use applications of bio-based products.

BP 4413. Systems Approach to Residential Construction. (3 cr. §BP 5413. Prereq–[4413, upper div BP] or #)
Dynamic/interrelated issues of energy, moisture control, indoor air quality in residential bldgs. Emphasizes design, construction, and operational aspects to provide an energy efficient, durable structure/healthy living environment. Special consideration to interaction between moisture and wood products within building system.

BP 4414. Advanced Residential Building Science. (3 cr. §BP 5414. Prereq–3001 or WPS 4301)
Theory, advanced applications for residential buildings. Focuses on heat/mass transfer.

BP 4415. Advanced Residential Building Science Lab. (1 cr; A-F only. §BP 5415. Prereq–[[3001, 4302, 4413W] or #] or [[WPS 4301, 4303, 4333] or #], [4414 or WPS 4334])
Exercises on advanced applications of heat/mass transfer to predict performance of residential buildings.

BP 4416. Building Testing and Diagnostics. (2 cr. §BP 5416. Prereq–4413W or WPS 4333)
Theoretical basis for performance testing. Diagnostics applications for residential structures. Focuses on existing structures and retrofit/remedial applications. Digital differential pressure gauges, blower doors, airflow hoods/grids, duct pressure testing, infrared thermography. Hands-on sessions for equipment use, problem solving.

BP 4491. Senior Topics: Independent Study. (1-4 cr [max 4 cr]. Prereq–Sr, #)
Independent study in student's area of interest.

BP 4501. Process and Product Design I. (2 cr. Prereq–[4001, 4301, 4303, [4401 or ¶4401], [4403 or ¶4403], fr writing req, [jr or sr]] or #)
Students develop, formulate, and complete an open-ended, engineering process-design project at conceptual level.

BP 4502W. Process and Product Design II. (3 cr. Prereq–4501, [jr or sr])
Students develop, select, formulate, and complete an open-ended, comprehensive engineering process/product design project.

BP 4504W. Bio-based Products Development and Management. (3 cr; A-F only. §BP 5504. Prereq–Jr or sr or #)
Concepts of new-product development and product management, their application to bio-based products.

BP 4801H. Honors Research. (2 cr; A-F only. Prereq–BP upper div honors)
First semester of independent research project supervised by faculty member.

BP 4802H. Honors Research. (2 cr; A-F only. Prereq–BP upper div honors, #)
Complete honors thesis. Oral report.

BP 5001. Chemistry of Plant Materials. (4 cr; A-F only. Prereq–Grad student or #)
Chemical principles underlying structure, properties, processing, and performance of plant materials.

BP 5002. Fundamentals of Bio-renewable Resources. (3 cr; A-F only. Prereq–Grad student or sr who has undergrad training in engineering or physical or biological science or degrees in agriculture or economics)
Science/engineering of converting bio-renewable resources into bioenergy and biobased products. Defining resource base. Physical/chemical properties of biorenewable resources. Biobased products. Methods of production for biorenew resources. Processing technologies for fuels, chemicals, fibers, and energy. Environmental impacts. Ecconomics of biobased products and bioenergy.

BP 5102. Residential Indoor AIR Quality. (3 cr; A-F only. §BP 3102. Prereq–Grad student or #)
Indoor air pollution issues found in residential structures, especially in the north central region of the United States. Pollutant descriptions, including measurement techniques and typical ranges of concentrations. Health effects. Pathways, transport mechanisms. Control strategies including mitigation and prevention.

BP 5202. Wood and Fiber Science. (3 cr; A-F only. §BP 1002)
Wood as a bio-material. Wood's anatomical/cellular structure compared with other plant-derived materials. Wood's physical properties/characteristics in various applications. Non-wood fiber, bio-product characteristics.

BP 5301. Surface and Colloid Science in Bio-based Products Manufacturing. (3 cr. §BP 4301. Prereq–Grad student or #)
Principles of surface and colloid science, their application tomanufacturing/performance of bio-based products.

BP 5302. Organisms Impacting Bio-based Products. (3 cr. §BP 4302. Prereq–Grad student or #)
Organisms and their importance to bio-based products: deterioration, control, bioprocesses for benefit.

BP 5303. Bio-Based Materials Science. (3 cr. §BP 4303. Prereq–Grad student or #)
Basic principles of materials science, their application to bio-based materials.

BP 5305. Pulp and Paper Technology. (3 cr. §BP 4305. Prereq–Grad student or #)
Pulping processes, fiber refining/processing, paper manufacturing, fiber/paper properties, paper recycling. Water requirements, effluent treatment. Chemical/mechanical pulping, pulp preparation, secondary fiber, de-inking, wet end additives. Lab problems/exercises supplemented by lectures. Online course.

BP 5313. Pulp and Paper Unit Operations. (4 cr. §BP 4313. Prereq–Grad student or #)
Application of principles of momentum, heat, and mass transfer to unit operations in pulp/paper industry. Fluid transport, filtration, sheet formation, sedimentation, drainage, pressing, heat exchange, evaporation, washing, bleaching, humidification/drying, chemical/energy recovery. Computer simulation of multiple-stage systems. Online course.

BP 5314. Papermaking Processes and Process Engineering Laboratory. (3 cr. §BP 4314. Prereq–Grad student or #)
Theory/practice of design/operation of paper machines and associated finishing/converting equipment. Experiments illustrate/apply principles of momentum, heat, and mass transfer. Operation/performance optimization of pilot-plant paper machine. Process engineering studies of industrial production systems. Online course.

BP 5320. Applied Statistics for Process Industries: Measurement, Analysis, and Control. (3 cr. §BP 4320. Prereq–Grad student or #)
Presented through the Internet. Basic concepts and most frequently used methods in statistical process control, analysis of variances, experiment design, and regression analysis. Online course.

BP 5362. Pulping and Bleaching. (4 cr. §BP 4362. Prereq–Grad student or #)
Chemistry/technologies in producing paper-making raw material. Focuses on wood pulping/bleaching, including non-wood fibers and recycled fiber materials. Online course.

BP 5401. Bio-based Products Engineering. (4 cr; A-F only. §BP 4401. Prereq–Grad student or #)
Unit operations of bio-based products engineering/manufacture.

BP 5402. Bio-based Products Engineering Lab I. (1 cr; A-F only. §BP 4402. Prereq–Grad student or #)
Laboratory exercises in bio-based products engineering.

BP 5403. Bio-based Products Engineering Lab II. (1 cr; A-F only. §BP 4403. Prereq–Grad student or #)
Laboratory exercises in bio-based products engineering.

BP 5404. Bio-based Composites Engineering. (3 cr; A-F only. §BP 4404. Prereq–Grad student or #)
Properties of bio-based composites.

BP 5405. Process Control and Simulation. (3 cr. §BP 4405. Prereq–Grad student of #)
Fundamental principles in system dynamics/control. Emphasizes process systems and problems faced by process engineers.

BP 5407. Bio-based Products Manufacturing and Applications I. (2 cr. §BP 4407. Prereq–Grad student or #)
Manufacturing and product service considerations for wood/bio-based products. Chemistry of plant-based materials. Process of papermaking.

BP 5412. Manufacturing and Applications of Bio-based Products. (4 cr. §BP 4412W. Prereq–Grad student or #)
Manufacturing processes, end-use applications of bio-based products.

BP 5413. A Systems Approach to Residential Construction. (3 cr. §BP 4413. Prereq–Grad student or #)
Dynamic/interrelated issues of energy, moisture control, indoor air quality in residential bldgs. Emphasizes design, construction, and operational aspects to provide an energy efficient, durable structure, and healthy living environment. Interaction between moisture and wood products within building system.

BP 5414. Advanced Residential Building Science. (3 cr. §BP 4414. Prereq–Grad student or #)
Building science theory, advanced applications for residential buildings. Focuses on heat/mass transfer.

BP 5415. Advanced Residential Building Science Lab. (1 cr; A-F only. §BP 4415. Prereq–Grad student or #)
Concurrent with 4334. Exercises on advanced applications of heat/mass transfer to predict performance of residential buildings.

BP 5416. Building Testing & Diagnostics. (2 cr. §BP 4416. Prereq–Grad student or #)
Theoretical basis for performance testing. Diagnostics applications for residential structures. Focuses on existing structures and retrofit/remedial applications. Digital differential pressure gauges, blower doors, airflow hoods/grids, duct pressure testing, infrared thermography. Hands-on sessions for equipment use, problem solving.

BP 5503. Marketing of Bio-based Products. (4 cr; A-F only. §BP 3503. Prereq–Grad student or #)
Introduction to marketing function as it relates to current/emerging bio-based products industries (building materials, paper, fuels, etc.). Product positioning, pricing, promotion, and channel management within strategic planning and environmental marketing management.

BP 5504. Bio-based Products Development and Management. (3 cr; A-F only. §BP 4504W. Prereq–Grad student or #)
Concepts of new product development and product management and their application to bio-based products.

Biochemistry (BioC)

Department of Biochemistry, Moleccular Biology, and Biophysics

College of Biological Sciences

BIOC 1001. Elementary Biochemistry. (3 cr. Prereq–High school CHEM or college general chem)
Chemistry and biochemistry as they apply to the organization, function, and regulation of living systems, especially humans. Suitable for undergraduates who desire an introduction to biochemistry including students in health science programs such as dental hygiene or occupational therapy.

BIOC 2011. Biochemistry for the Agricultural and Health Sciences. (3 cr. §BIOC 1012, BIOC 3001. Prereq–CHEM 1011, BIOL 1009; not for biology majors)
Survey of organic chemistry/biochemistry outlining structure/metabolism of biomolecules, metabolic regulation, and principles of molecular biology.

BIOC 3021. Biochemistry. (3 cr. §BIOC 6021. Prereq–[BIOL 1002 or 1009], CHEM 2301)
Fundamentals of biochemistry including structure and function of proteins, nucleic acids, lipids and carbohydrates; metabolism and regulation of metabolism; quantitative treatments of chemical equilibria, enzyme catalysis and bioenergetics; the chemical basis of genetic information flow.

BIOC 3960. Research Topics in Biochemistry. (1 cr [max 2 cr]; S-N only. Prereq–3021 or ¶3021 or or 4331 ¶4331 or #)
Lectures, discussion on current research in the department.

BIOC 4025. Laboratory in Biochemistry. (2 cr. Prereq–3021 or 4331 or BIOL 3021)
Theory, principles, and practical use of fundamental techniques in modern biochemistry laboratories.

BIOC 4125. Laboratory in Molecular Biology and Biotechnology. (3 cr; A-F only. §BIOC 4185, BIOL 4125, BIOL 4185. Prereq–[3021 or BIOL 3021 or or BIOL 4003], [4025 or GCD 4015 or GCD 4025 or MICB 3301])
Basic recombinant DNA techniques: methods for growing, isolating, and purifying recombinant DNA and cloning vectors, DNA sequencing and sequence analysis, gene expression, Polymerase Chain Reaction (PCR), other current techniques.

BIOC 4185. Laboratory in Molecular Biology and Biotechnology. (3 cr; A-F only. §BIOC 4125, BIOL 4125, BIOL 4185. Prereq–Enrollment in summer undergrad Research prog in life sciences [biochemistry or genetics course], intermed-level lab in [bioCHEM or genetics or cell BIOL or microbiol])
Basic recombinant DNA techniques: methods for growing, isolating, and purifying recombinant DNA and cloning vectors, DNA sequencing and sequence analysis, gene expression, Polymerase Chain Reaction (PCR), other current techniques.

BIOC 4331. Biochemistry I: Structure, Catalysis, and Metabolism in Biological Systems. (4 cr. Prereq–[[BIOL 1002 or 1009 or equiv], CHEM 2302 or equiv] or #)
Advanced survey of structure/catalysis, metabolism/bioenergetics.

BIOC 4332. Biochemistry II: Molecular Mechanisms of Signal Transduction and Gene Expression. (4 cr. Prereq–4331 or #)
Advanced survey of molecular biology, mechanisms of gene action, and biological regulation.

BIOC 4521. Introduction to Physical Biochemistry. (3 cr. Prereq–CHEM 1022, MATH 1272, PHYS 1202)
Introduction to physical chemical principles and their applications in biochemistry. Thermodynamics, kinetics, spectroscopy, and solution dynamics as applied to biochemical reactions and biopolymers.

BIOC 4793W. Directed Studies: Writing Intensive. (1-7 cr [max 7 cr]; S-N only. Prereq–#, Δ)
Individual study on selected topics or problems. Emphasizes readings, use of scientific literature. Written report.

BIOC 4794W. Directed Research: Writing Intensive. (1-6 cr [max 42 cr]; S-N only. Prereq–#, Δ)
Laboratory or field investigation of selected areas of research, including written report.

BIOC 4993. Directed Studies. (1-7 cr [max 7 cr]; S-N only. Prereq–#, Δ)
Individual study on selected topics or problems. Emphasizes selected readings, use of scientific literature.

BIOC 4994. Directed Research. (1-6 cr [max 42 cr]; S-N only. Prereq–#, Δ)
Laboratory or field investigation of selected areas of research.

BIOC 5001. Biochemistry, Molecular and Cellular Biology. (5 cr. §BIOC 6001. Prereq–Undergrad course in biochemistry, #)
Integrated course in biochemistry, molecular biology, cell biology, and developmental biology.

BIOC 5309. Biocatalysis and Biodegradation. (3 cr. §MICE 5309. Prereq–Chemistry through organic chemistry, knowledge of wordprocessing, e-mail, access to World Wide Web, access to college-level science library)
Assess validity of information on biocatalysis and biodegradation; learn fundamentals of microbial catabolic metabolism as it pertains to biodegradation of environmental pollutants; biocatalysis for specialty chemical synthesis; display of this information on the Web.

BIOC 5352. Microbial Biochemistry and Biotechnology: Proteins. (3 cr; A-F only. §MICB 5352. Prereq–[[3021 or 4331 or BIOL 3021 or or MICB 4111], [BIOL 3301 or MICB 3301]] or #)
Protein biotechnology. Microorganisms used as hosts for protein expression, protein expression, and engineering methods. Production of enzymes of industrial interest. Applications of protein biotechnology in bioelectronics. Formulation of therapeutic biopharmaceuticals.

BIOC 5353. Microbial Biochemistry and Biotechnology: Small Molecules. (3 cr; A-F only. Prereq–[[3021 or 4331 or BIOL 3021 or MICB 4111], [BIOL 3301 or MICB 3301]] or #)
Small molecule biotechnology. Screening strategies for drug discovery. Secondary metabolite and antibiotic biosynthesis. Combinatorial methods for generating new pharmaceutically active natural products. Production of organic acids and vitamins. Introduction to metabolic engineering.

BIOC 5361. Microbial Genomics and Bioinformatics. (3 cr. Prereq–College-level courses in [organic chemistry, biochemistry, microbiology])
Introduction to genomics. Emphasizes microbial genomics. Sequencing methods, sequence analysis, genomics databases, genome mapping, prokaryotic horizontal gene transfer, genomics in biotechnology, intellectual property issues.

BIOC 5401W. Advanced Metabolism and Its Regulation. (3 cr. Prereq–3021 or 4331 or BIOL 3021)
Underlying principles that determine metabolism of common/unusual compounds in plants, animals, microorganisms. Regulation of carbon, energy flow in whole organisms.

BIOC 5444. Muscle. (3 cr. §PHSL 5444. Prereq–Biol/BIOC 3021 or 4331 or PHSL 3061 or #)
Muscle structure/function: molecular mechanism by which force is generated.

BIOC 5527. Introduction to Modern Structural Biology. (4 cr. Prereq–[intro biochemistry, intro physics] or physical chemistry or #)
Methods employed in modern structural biology to elucidate macromolecular structures. Primary focus on X-ray diffraction, nuclear magnetic resonance (NMR) spectroscopy and mass spectrometry. Principles underlying structural biology and structure/function relationships.

BIOC 5528. Spectroscopy and Kinetics. (4 cr. Prereq–Intro physical chemistry or equiv; intro biochemistry recommended)
Biochemical dynamics from perspectives of kinetics and spectroscopy. Influence of structure, molecular interactions, and chemical transformations on biochemical reactions. Focuses on computational, spectroscopic, and physical methods. Steady-state and transient kinetics. Optical and magnetic resonance spectroscopies.

BIOC 5531. Macromolecular Crystallography I: Fundamentals and Techniques. (1 cr; S-N only. Prereq–[[One organic chemistry or biochemistry course], [two calculus or college physics courses]] or instr approval)
Macromolecular crystallography for protein structure determination/engineering. Determining macromolecule structure by diffraction.

BIOC 5532. Macromolecular Crystallography II: Techniques and Applications. (1 cr; S-N only. Prereq–5531)
Determining structure of macromolecule by diffraction. Using software in macromolecular crystallography.

Bioinformatics (BINF)

Department of Laboratory Medicine and Pathology

Medical School

BINF 5480. Bioinformatics Journal Club. (1 cr [max 12 cr]; S-N only)
Bioinformatics Journal Club

BINF 5490. Topics in Bioinformatics. (1-6 cr [max 12 cr]. Prereq–#)
Independent or group study in bioinformatics.

Biology (BIOL)

College of Biological Sciences

BIOL 1001. Introductory Biology I: Evolutionary and Ecological Perspectives. (4 cr. §BIOL 1009, BIOL 1009H)
Biological diversity from genetic variation to diversity of species/ecosystems. Genetic, evolutionary, and ecological processes governing biological diversity. Genetic, evolutionary, and ecological perspectives on issues concerning human diversity, human population growth, health, agriculture, and conservation. Lab.

BIOL 1002V. Introductory Biology II: Molecular, Cellular, and Developmental Perspectives. (5 cr; A-F only. Prereq–[1001 or equiv], CHEM 1021)
Chemistry of living things, cell structure/transport, energy processing in cells, introduction to primary metabolism, molecular genetics, cell physiology, cell cycles, principles of animal/plant development, regulation of development. Lab focuses on molecular scientific techniques, investigative designs. Discussion session focuses on scientific problem solving, experimental design, analysis of recent research.

BIOL 1002W. Introductory Biology II: Molecular, Cellular, and Developmental Perspectives. (5 cr; A-F only. Prereq–[1001 or equiv], CHEM 1021)
Chemistry of living things, cell structure/transport, energy processing in cells, introduction to primary metabolism, molecular genetics, cell physiology, cell cycles, principles of animal/plant development, regulation of development. Lab focuses on molecular scientific techniques, investigative designs.

BIOL 1009. General Biology. (4 cr. §BIOL 1001, BIOL 1009H. Prereq–high school chemistry; 1 term college chemistry recommended)
Major concepts of modern biology. Molecular structure of living things, energy recruitment/utilization, flow of genetic information through organisms/populations. Principles of inheritance, ecology, and evolution. Includes lab.

BIOL 1009H. Honors: General Biology. (4 cr. §BIOL 1001, BIOL 1009. Prereq–high school chemistry, honors; one term of college chemistry recommended)
Major concepts of modern biology. Molecular structure of living things, energy recruitment/utilization, flow of genetic information through organisms/populations. Principles of inheritance, ecology, and evolution. Includes lab.

BIOL 1011. General Biology for Institute of Technology Students. (4 cr. Prereq–High school chemistry; one term college chemistry recommended)
Major concepts of modern biology. Molecular structure of living things, energy recruitment/utilization, flow of genetic information through organisms/populations. Principles of inheritance, ecology, and evolution. Lecture component is concurrent with 1009 lecture.

BIOL 1020. Biology Colloquium. (1 cr [max 2 cr]; S-N only)
Introduction to the diverse fields of biology through seminars, lab tours, trips to Itasca Biological Station, and interaction with other biology students and faculty. Course may be repeated once.

BIOL 1041. Preparation for Graduate Programs in Science. (1 cr; S-N only. Prereq–#)
Necessary elements for excelling in mathematics, physical and biological sciences to prepare for graduate work in science. Required for new freshmen in the Mathematics and Science Tutorial (MST) Program.

BIOL 1093. Biology Colloquium: Directed Study. (1 cr; S-N only. Prereq–1020 and ¶1020)
Individual study or research undertaken by a student concurrently enrolled in Biol 1020 with oversight by a faculty sponsor.

BIOL 1101W. Heredity and Human Society. (3 cr. Prereq–no cr if taken after 4003 or GCB 3022)
Principles of heredity and their social and cultural implications.

BIOL 1105. Introduction to Biology, Society, and the Environment. (2 cr; A-F only)
Social context of biology, relevance of biology to social/environmental issues. How biology shapes and is shaped by current events, legislation, ethical concerns, and history. Case studies, discussion.

BIOL 1805. Nature of Life: Introducing New Students to the Biological Sciences. (2 cr. Prereq–Fr in College of Biological Sciences)
Biological sciences, from molecules to ecosystems and from laboratory science to field biology. Introduction to the College of Biological Sciences community and opportunities. Held at Itasca Biological Station and Laboratories. Transportation, board, and lodging fee.

BIOL 1901. Freshman Seminar for the Biological Sciences. (1-2 cr [max 2 cr]; A-F only. Prereq–Freshman)
Orientation to University environment. Special topics illustrate importance of biological issues.

BIOL 1903. Freshman Seminar for the Biological Sciences. (1-2 cr [max 2 cr]; A-F only. Prereq–Freshman)
Orientation to University environment. Special topics illustrate importance of biological issues.

BIOL 1905. Freshman Seminar for the Biological Sciences. (1-3 cr [max 3 cr] Prereq–Freshman)
Orientation to University environment. Special topics that illustrate the importance of biological topics/issues in modern society.

BIOL 1910W. Freshman Seminar for the Biological Sciences. (2 cr; A-F only. Prereq–Freshman)
Orientation to University environment. Special topics that illustrate the importance of biological topics/issues in modern society. Writing-intensive.

BIOL 1981. Intersections of Biology at Lake Itasca. (1 cr; A-F only. Prereq–[45 or fewer cr] or #)
Plant biochemistry, terrestrial ecology, aquatic ecology, ecological genetics, molecular biology. Ten-day course at Lake Itasca Forestry and Biological Station in north central Minnesota. Lab, field work.

BIOL 2005. Animal Diversity Laboratory. (1 cr. §BIOL 2012. Prereq–3211 or ¶3211)
Dissection and direct observation of representatives of major animal groups.

BIOL 2012. General Zoology. (4 cr. §BIOL 2005. Prereq–1009 or 1001)
Major animal groups (phyla). Applications of morphological, physiological, and developmental characteristics to define evolutionary relationships. Parasitic forms affecting human welfare. Lab requires dissection, including mammals.

BIOL 2022. General Botany. (3 cr; A-F only. §BIOL 2822. Prereq–1001 or 1009)
Principles of plant biology. Organization, function, growth/development, and reproductive biology of plants and plant-like organisms. Lab.

BIOL 2032. General Microbiology with Laboratory. (4 cr. §MICB 3301. Prereq–1002 or 1009, CHEM 1022, intended primarily for non-microbiology majors)
Fundamental principles of microbiology. Bacterial metabolism, growth, and genetics. Biology of viruses/fungi. Control of microorganisms. Host-microbe interactions. Microorganisms and disease. Applied microbiology. Includes lab.

BIOL 2201. Introduction to Computing in Biology. (1 cr; S-N only. Prereq–[1009 or 1002 or equiv], biological sciences major)
Hands-on use of microcomputers to show how computers manipulate data, prepare graphs/graphics, acquire/analyze scientific data, perform literature searches, prepare scientific presentations, communicate via network.

BIOL 2812. Field Zoology. (4 cr. Prereq–Beginning biology)
Major animal groups. Native Minnesota organisms in their natural habitat. Lecture, lab, and field experiences emphasize morphological, physiological, and developmental characteristics to define evolutionary relationships. Parasitic forms affecting human welfare. Labs require dissections, including mammals.

BIOL 2822. General botany. (3 cr; A-F only. §BIOL 2022. Prereq–[1001 or 1009], Δ)
Principles of plant biology. Organization, function, growth/development, and reproductive biology of plants and plant-like organisms. Lab, field work.

BIOL 2960H. Explorations in the Biological Sciences: Honors Colloquium. (1 cr; A-F only. Prereq–CBS honors program, soph, Δ)
Students explore various areas of biological research, interact with scientists and fellow students, and prepare an in-depth review paper.

BIOL 3002. Plant Biology: Function. (2 cr. Prereq–1002 or 1009, one sem chemistry with some organic content [e.g., CHEM 1011], ¶3005 or AGRO 3005 or HORT 3005)
How plants make and use food; mineral function and uptake; water relations; transport processes; growth and development.

BIOL 3005W. Plant Function Laboratory. (2 cr. Prereq–Concurrent enrollment 3002)
Various plant processes at subcellular, organ, whole plant levels. Lab, recitation.

BIOL 3007W. Plant Biology: Diversity and Adaptation. (4 cr. Prereq–1002 or 1009, CHEM 1021)
Evolution/diversity of plants, their adaptations for survival in varied environments. Includes lab.

BIOL 3211. Animal Physiology. (3 cr. Prereq–[1002 or 1009], CHEM 1021; ¶2005 strongly recommended)
Compares ways different animals solve similar physiological problems.

BIOL 3407. Ecology. (3 cr. §BIOL 3807, BIOL 5407, EEB 3001. Prereq–[1001 or 1009 or equiv], [MATH 1142 or MATH 1271 or equiv])
Principles of population growth/interactions and ecosystem function applied to ecological issues. Regulation of human populations, dynamics/impacts of disease, invasions by exotic organisms, habitat fragmentation, biodiversity. Lab.

BIOL 3409. Evolution. (3 cr. §BIOL 5409. Prereq–1002 or 1009)
Diversity of forms in fossil record and in presently existing biology. Genetic mechanisms of evolution. Examples of ongoing evolution in wild/domesticated populations and in disease-causing organisms. Lab.

BIOL 3411. Introduction to Animal Behavior. (3 cr. §BIOL 3811. Prereq–1002 or 1009 or #)
Biological study of animal behavior. Mechanism development, function, and evolution. Emphasizes evolution of adaptive behavior, social behavior in the natural environment. Lab.

BIOL 3503. Biology of Aging. (2 cr. Prereq–1002 or 1009)
Age-related changes in individuals/populations. Evolution of senescence. Genes that influence aging. Interventions. Prospects for an aging human society.

BIOL 3600. Directed Instruction. (1-2 cr [max 6 cr]; S-N only. Prereq–1020, upper div, application, #; up to 4 cr may apply to major)
Students assist with biology colloquium.

BIOL 3610. Internship: Professional Experience in Biological Sciences. (1-6 cr [max 6 cr]; S-N only. Prereq–Acceptance into CBS Internship Program, internship workshop, ❑)
Matches student's academic or career goals with opportunities in industry, non-profit organizations, and government agencies.

BIOL 3700. Undergraduate Seminar. (1 cr [max 3 cr]; S-N only)
Faculty members lead groups of students in discussions on topics of current interest.

BIOL 3807. Ecology. (4 cr; A-F only. §BIOL 3407, BIOL 5407, EEB 3001. Prereq–[1001 or 1009 or equiv], [MATH 1142 or MATH 1271 or equiv])
Principles of population growth/interactions and ecosystem function applied to ecological issues. Regulation of human populations, dynamics/impacts of disease, invasions by exotic organisms, habitat fragmentation, biodiversity. Lab, field work.

BIOL 3811. Introduction to Animal Behavior. (4 cr; A-F only. §BIOL 3411. Prereq–[1002 or 1009] or #)
Biological study of animal behavior. Mechanism development, function, and evolution. Emphasizes evolution of adaptive behavior, social behavior in the natural environment. Lab, field work.

BIOL 3820. Aquatic Toxicology. (2 cr. Prereq–Courses in [general biology, chemistry])
Principles of Aquatic Toxicology. Environmental, industrial, and natural chemicals. Fate/interactions of chemicals with organisms and the aquatic environment. Insectisides, endocrine distuptors, biomarkers/bioassays, molecular sensors, risk assessment.

BIOL 3960H. Honors Seminar. (1 cr [max 2 cr] Prereq–Limited to participation in CBS honors program, Δ)
Oral reports on topics of current interest to biologists. Progress reports on laboratory and field research by students.

BIOL 4003. Genetics. (3 cr. §GCD 3022. Prereq–BIOC 3021 or BIOC 4331)
Introduction to the nature of genetic information, its transmission from parents to offspring, its expression in cells and organisms, and its course in populations.

BIOL 4004. Cell Biology. (3 cr. Prereq–Biol/BIOC 3021 or BIOC 5331, BIOL 4003 or BIOC 4332)
Processes fundamental to cells emphasizing eukaryotic cells. Assembly and function of membranes and organelles. Cell division, cell form and movement, intercellular communication, transport, and secretion pathways. Some discussion of specialized cells including cancer cells and differentiated cells.

BIOL 4185. Recombinant DNA Laboratory. (3 cr; A-F only. §BIOC 4125, BIOC 4185, BIOL 4125. Prereq–[biochemistry or genetics course], [intermediate-level lab in biochemistry or genetics or cell biology or microbiology], enrollment in Summer Undergraduate Research Program in Life Sciences, o)
Basic recombinant DNA techniques. Methods for growing, isolating, and purifying recombinant DNAs and for cloning vectors.

BIOL 4501. Social Uses of Biology. (3 cr. Prereq–7 cr in sciences)
Influence of biological science on the quality of human life: agriculture, medicine, occupational health, environmental science, and theories of human nature. Responsibilities and roles of biologists in policy formulation in the scientific and political world.

BIOL 4850. Special Topics in Biology. (2-5 cr [max 10 cr] Prereq–Beginning biology)
Offered at Itasca Biological Station and Laboratories. Topics include telemetry/animal behavior, aquatic botany, and field evolution.

BIOL 4862. Biological Photography and Digital Imaging Techniques. (3 cr; A-F only. Prereq–1001 or 1009)
Field photography techniques for documentation of invertebrates, vertebrates, aquatic organisms, and habitats of Itasca area. Digital imaging equipment, software, related techniques. Building video files for the Web.

BIOL 4894. Directed Research at Itasca. (1-7 cr [max 7 cr]; S-N only. Prereq–#, Δ; max of 7 cr of [4894 or 4993 or 4994] may count toward major requirements)
Field investigation of selected areas of research at Itasca Field Station.

BIOL 4950. Special Topics in Biology. (1 cr [max 10 cr]. Prereq–[1009 or equiv or basic biology/genetics], #)
Science used to make genetically modified plants. Potential benefits/dangers of releasing these plants into the environment and including them in global food supply.

BIOL 5407. Ecology. (3 cr. §BIOL 3407, BIOL 3807, EEB 3001. Prereq–[[1001 or 1009 or equiv], [MATH 1142 or MATH 1271 or equiv], grad] or inst consent)
Principles of population growth/interactions and ecosystem function applied to ecological issues, including regulation of human populations, dynamics/impacts of disease, invasions by exotic organisms, habitat fragmentation, and biodiversity. Lab.

BIOL 5409. Evolution. (3 cr. §BIOL 3409. Prereq–[(1001 or 1009), grad] or #)
Diversity of forms in fossil record and in presently existing biology. Genetic mechanisms of evolution. Examples of ongoing evolution in wild/domesticated populations and in disease-causing organisms. Lab.

BIOL 5485. Introductory Bioinformatics. (3 cr. Prereq–4003 or ¶4003 or equiv)
Modern computational tools used in molecular biology and genomics research. When/how to use particular tools, how to interpret results. Principles and advantages/disadvantages of various methods.

BIOL 5511. Teaching the Biological Sciences. (3 cr; A-F only. Prereq–6 cr in the life sciences)
Methods and teaching styles used by outstanding university teachers including reviews and critiques from research on teaching. Opportunities for students to practice and evaluate teaching strategies.

BIOL 5910. Special Topics in Biology for Teachers. (1-4 cr [max 12 cr]. Prereq–BA or BS in science or science education or elementary education or K-12 licensed teacher)
Courses developed for K-12 teachers depending on topics or subtopics which might include any of the following: plant biology, animal biology, genetics, cell biology, biochemistry, microbiology.

BIOL 5913. Biology for Teachers: Monarchs in the Classroom. (3 cr. Prereq–[[Elementary or middle school or high school or preservice] teacher or #], application)
Two-week summer workshop. Week one focuses on monarch butterfly biology taught through fieldwork, labs, lecture, and research projects. A 2- to 3-week break follows, when students raise monarchs, conduct simple experiments. Week two focuses on designing classroom activities/projects based on monarch biology. Follow-up meetings held during academic year.

Biomedical Engineering (BMEN)

Biomedical Engineering Institute

Institute of Technology

BMEN 1601. Biomedical Engineering Undergraduate Seminar I. (1 cr)
Introduction to biomedical engineering from academic/industrial perspectives. Survey of current/emerging areas.

BMEN 2401. Programming for Biomedical Engineers. (2 cr. Prereq–MATH 1272, PHYS 1302)
Introduction to structured programming in biomedical engineering. Development of programming skills/logic relevant for numerical methods used for analyzing biomedical signals and solving algebraic/differential equations using Matlab. Programming logic/structured programming, introduction to scientific computation motivated by signal representations. Weekly lecture, computer lab modules.

BMEN 2501. Cellular and Molecular Biology for Biomedical Engineers. (4 cr; A-F only. Prereq–CHEM 1022, MATH 1372, PHYS 1302, [Δ or ❑])
Fundamentals of cellular/molecular biology. Chemistry of proteins, lipids, and nucleic acids. Applications to biomedical engineering. Function/dynamics of intracellular structures and differeniated animal cells. Emphasizes application of physical/chemical fundamentals to modeling cellular/subcellular processes. Lecture/lab.

BMEN 2602. Biomedical Engineering Undergraduate Seminar II. (1 cr. Prereq–2601 or Δ)
Continuation of 2601. Emphasizes biomedical engineering design and numerical analysis.

BMEN 3001. Biomechanics. (4 cr; A-F only. Prereq–MAth 2374, PHYS 1302, [BME upper div or Δ])
Statics, dynamics, and deformable body mechanics applied to biological/biomedical problems. Mechanical properties of biological and commonly used biomedical engineering materials. Techniques for numerical solution of biomechanics problems. Lecture/laboratory.

BMEN 3002. Biomechanics Laboratory. (1 cr; A-F only. Prereq–Math 2374, PHYS 1302, [BME upper div or Δ]; not intended for students taking 3001)
Laboratory experiments in statics, dynamics, and deformable body mechanics applied to biological/biomedical problems.

BMEN 3101. Biomedical Transport Processes. (4 cr; A-F only. Prereq–Math 2374, PHYS 1302, [BMEN upper div or Δ])
Principles of momentum, heat, and mass transfer illustrated with applications in physiological processes. Fluid mechanics, heat condition, mass diffusion, convection. Lecture/laboratory.

BMEN 3201. Bioelectricity and Bioinstrumentation. (4 cr; A-F only. Prereq–[Math 2263 or Math 2374], PHYS 1302, [BMEN upper div or Δ])
Principles of electrical phenomena, instruments relevant to biomedical applications. Lecture/laboratory.

BMEN 3202. Bioelectricity and Bioinstrumentation Laboratory. (1 cr; A-F only. Prereq–Math 2374, PHYS 1302, [BME upper div or Δ]; not intended for students taking 3201)
Laboratory experiments in electrical phenomena. Instruments relevant to biomedical applications.

BMEN 3301. Biomaterials. (4 cr; A-F only. Prereq–[Math 2263 or Math 2374], PHYS 1302, [BMEN upper div or Δ])
Principles of biomaterials. Organic chemistry and biochemistry of natural/artificial biomaterials. Physical characterization and mechanical testing. Biomedical applications. Lecture/laboratory.

BMEN 3701. Physiology Lab. (2 cr; A-F only. §PHSL 3061, PHSL 3063, PHSL 3701. Prereq–[Math 2263 or Math 2374], PHYS 1302, [BMEN upper div or Δ])
Laboratory experiments in physiology. Emphasizes quantitative aspects, including analysis of organ systems.

BMEN 4001W. Biomedical Engineering Design I. (3 cr [max 4 cr]; A-F only. Prereq–2501, 3001, 3101, 3201, 3301, 3701)
Design/analysis of biomedical devices/technologies. Students work in teams on open ended design project, present completed work at design show.

BMEN 4002W. Biomedical Engineering Design II. (3 cr; A-F only. Prereq–4001W)
Continuation of 4001W.

BMEN 4710. Directed Research. (1-4 cr [max 4 cr]; A-F only. Prereq–#, Δ)
Independent laboratory research under faculty supervision.

BMEN 4720. Directed Study. (1-4 cr [max 4 cr]; A-F only. Prereq–#, Δ)
Directed study under faculty supervision.

BMEN 4910. Special Topics in Biomedical Engineering. (1-4 cr [max 4 cr]; A-F only. Prereq–#)
New or experimental special topics.

BMEN 5001. Advanced Biomaterials. (3 cr; A-F only. Prereq–3301 or MATS 3011 or grad student or #)
Commonly used biomaterials. Chemical/physical aspects. Practical examples from such areas as cardiovascular/orthopedic applications, drug delivery, and cell encapsulation. Methods used for chemical analysis and for physical characterization of biomaterials. Effect of additives, stabilizers, processing conditions, and sterilization methods.

BMEN 5041. Tissue Engineering. (3 cr. Prereq–IT upper div or grad student or med student or #)
Fundamentals of wound healing and tissue repair; characterization of cell-matrix interactions; case study of engineered tissues, including skin, bone marrow, liver, vessel, and cartilage; regulation of biomaterials and engineered tissues.

BMEN 5101. Advanced Bioelectricity and Instrumentation. (3 cr. Prereq–[IT upper div, grad student] or #)
Instrumentation, computer systems, and processing requirements for clinical physiological signals. Electrode characteristics, signal processing, and interpretation of physiological events by ECG, EEG, and EMG. Measurement of respiration and blood volume/flow.

BMEN 5102. Bioelectric Measurements and Therapeutic Devices II. (3 cr. Prereq–5101 or #)
Theory/application of electrical stimulation in areas of therapeutic/functional neuromuscular stimulation and pain control, cardiac pacing, defibrillation, tissue healing, and electrotherapy. Safety of electric fields. Electrical tissue impedance measurements.

BMEN 5151. Biomedical MEMS. (4 cr; A-F only. Prereq–Analog circuit principles, basic electromagnetic theory)
Survey of solid-state biomed transducers. Physical principles of operation and technology implementation of microsensors/microactuators. Physical, chemical, and biomed sensors. Actuators for surgery. Other precision positioning applications, materials, and fabrications. Emphasizes recent advances in biomed microelectromechanical systems.

BMEN 5201. Advanced Biomechanics. (3 cr. Prereq–[[3001 or equiv], [IT upper div or grad student]] or #)
Introduction to biomechanics of musculoskeletal system. Anatomy, tissue material properties. Kinematics, dynamics, and control of joint/limb movement. Analysis of forces/motions within joints. Application to injury, disease. Treatment of specific joints, design of orthopedic devices/implants.

BMEN 5212. Tissue Mechanics. (2 cr; A-F only. Prereq–5201 or AEM 5501)
Fundamental principles of continuum mechanics applied to physiological systems. Systematic consideration of individual tissues and organs. Relationships among histology, anatomy, physiology, and mechanical function in these tissues. Changes in mechanical properties related to pathology. Emphasizes tissues in the cardiovascular system.

BMEN 5311. Advanced Biomedical Transport Processes. (3-4 cr [max 4 cr]. §CHEN 5753, ME 5381. Prereq–IT upper div or grad student or #; [CHEN 5103 or ME 5342] recommended)
Introduction to biological fluid, mass, and heat transport. Mass transferacross membranes. Fluid flow in vessels/interstitium. Heat transfer in cells, tissues, and body. Applications to blood oxygenation, respiration, drug delivery, and tissue engineering.

BMEN 5351. Cell Engineering. (3 cr. Prereq–[2501 or 5501], CSCI 1107, [Math 2243 or Math 2373], [IT upper div or grad student or #])
Engineering approaches to cell-related phenomena important to cell/tissue engineering. Receptor/ligand binding. Trafficking/signaling processes. Applications to cell proliferation, adhesion, and motility. Cell-matrix interactions.

BMEN 5371. Biomedical Applications of Heat Transfer in Humans. (3-4 cr [max 4 cr]. Prereq–PHSL 3061, PHSL 3071, PHSL 5061)
Overview of physiology underlying thermoregulation in humans, clinical applications of heat transfer in humans, framework for design project.

BMEN 5401. Advanced Functional Biomedical Imaging. (3 cr; A-F only. Prereq–IT upper div or grad student or #)
Functional biomedical imaging modalities. Principles/applications of representative functional imaging technologies that offer high spatial resolution or temporal resolution. Emphasizes principles and methodological foundations of bioelectromagnetic imaging and magnetic resonance imaging. Other functional biomedical imaging modalities.

BMEN 5444. Muscle. (3 cr)
Muscle structure/function: molecular mechanism by which force is generated.

BMEN 5501. Biology for Biomedical Engineers. (3-4 cr [max 4 cr]. Prereq–Engineering upper div or grad student)
Concepts of cell/tissue structure/function. Basic principles of cell biology. Tissue engineering, artificial organs.

BMEN 5502. Pathobiology of Medical Devices. (3 cr; A-F only. Prereq–IT upper division or grad student)
Biological response to biomaterials presented in context of fundamental principles of cell injury, adaptation, repair, or death. Diversity of medical uses of biomaterials, by organ system. Unique features of specific biological systems in which medical devices are used.

BMEN 5910. Special Topics in Biomedical Engineering. (1-4 cr [max 4 cr])

BMEN 5920. Special Topics in Biomedical Engineering. (2-3 cr [max 6 cr])

Biosystems and Agricultural Engineering (BAE)

Institute of Technology

College of Food, Agricultural and Natural Resource Sciences

BAE 1011. Biosystems and Agricultural Engineering Orientation. (1 cr; S-N only)
Introduction to biosystems and agricultural engineering profession through readings and discussions by faculty, practicing engineers, and students; curriculum and intern, undergraduate research, and honors opportunities. Ethics, safety, environmental issues.

BAE 2113. Introduction to Design. (3 cr; A-F only. Prereq–MATH 1271)
Creativity, problem formulation, identification of alternative solutions, safety/health considerations, economic feasibility. Engineering economics. Engineering graphics, computer drafting. Projects involving written, graphic, and oral presentations.

BAE 3013. Engineering Principles of Molecular and Cellular Processes. (3 cr; A-F only. Prereq–BIOL 1009, [CHEM 1022 or ¶CHEM 1022])
Applied engineering principles in biological processes, classification of microbes of industrial importance, parameters for cellular control, modeling of cell growth/metabolism, enzymatic catalysis, bioreactor design, product recovery operations design, case studies.

BAE 3023. Engineering Principles of Soil-Water-Plant Processes. (3 cr. Prereq–BIOL 1009, [CE 3502 or ¶CE 3502])
Physical, thermal, texture, strength, and moisture properties of soil. Saturated/unsaturated moisture movement. Energy/water balances in soil-plant systems. Plant stresses from drought, flooding, temperature, radiation, compaction, pollution. Engineering/management impacts on soil-water-plant systems.

BAE 3093. Directed Studies. (1-5 cr [max 5 cr]. Prereq–#)
Independent study of topic(s) involving physical principles as applied to agricultural production and land resources.

BAE 4013. Transport in Biological Systems. (4 cr; A-F only. Prereq–[3013 or ¶3013 or CHEN 3701], CE 3502, [ME 3331 or CHEN 4101], upper div IT)
Application of thermodynamics, fluid flow, heat/mass transfer to design problems involving biological processes and materials at cell, organism, and system level. Agricultural, environmental, food, and bioprocess applications. Solution of equations involving computer programming assignments. Hands-on instruction in Visual Basic.

BAE 4023. Instrumentation and Control for Biological Systems. (3 cr; A-F only. Prereq–EE 3005 or ¶EE 3005, STAT 3021, upper div IT)
Measurement of motion, force, pressure, flow, temperature, size, shape, color, texture, rheology, moisture, water mobility, fat, and pH. Linking physical and biological control systems.

BAE 4114W. Capstone Design Project. (4 cr; A-F only. Prereq–2113, [upper div IT or sr] or #)
Design concepts, design process. Case studies involving engineering design. Health, safety, and ethical issues facing engineers. Proposal for capstone design team project, including oral presentation of written proposal. Comprehensive design project, including written report, poster, and oral presentation of final design.

BAE 4313. Design of Machine Systems. (3 cr; A-F only. Prereq–AEM 2021, AEM 3031, [CE 3502 or ¶CE 3502], upper div IT)
Case studies of machines/processes. Design for world markets; crop production (tractors, harvesters, implements). Food-/crop-processing systems (pumping, conveying). Animal systems (milking parlor design, waste-handling machines).

BAE 4323. Machinery Elements. (3 cr. Prereq–AEM 2021, AEM 3031, [CE 3502 or ¶CE 3502], upper div IT)
Building blocks for machines used in crop production and food processing. Power from diesel engines, electric/hydraulic motors. Performance characteristics, efficiency. Machine-control systems modeling (electro-hydraulic), machinery/hydraulic circuit design, safety.

BAE 4523. Water Management Engineering. (3 cr; A-F only. Prereq–3023 or CE 3301, CE 3502, upper div IT)
Applying engineering principles to management of water for production and environmental protection in agricultural systems. Designing facilities to irrigate/drain croplands and enhance water quality.

BAE 4533. Agricultural Waste Management Engineering. (3 cr; A-F only. Prereq–3023, upper div IT)
Sources and characteristics of agricultural wastes, including livestock, food processing, and domestic wastes. Physical, biological, chemical, rheological, and microbiological properties. Effects on environment. Collection, storage, treatment (aerobic and anaerobic), and use/disposal. Land application.

BAE 4713. Bioprocess Engineering. (3 cr; A-F only. Prereq–[4013 or ¶4013], upper div IT)
Fermentation/separation as applied to biological systems. Product recovery in bioproduct technology. Topics in bioremediation. Modeling of separation processes in biological systems.

BAE 4723. Food Process Engineering. (3 cr; A-F only. Prereq–[4013 or ¶4013], upper div IT)
Application of principles of heat transfer and fluid flow to design of food processing operations such as thermal/aseptic processing, freezing, pumping, drying, evaporation, extrusion. Marketing, government regulation, nutrition issues.

BAE 4744. Engineering Principles for Biological Scientists. (4 cr; A-F only. §FSCN 4331. Prereq–[MATH 1142 or MATH 1271], PHYS 1101; intended for non engineering students)
Material/energy balances applied to processing systems. Principles of fluid flow, thermodynamics, heat, mass transfer applied to food and bioprocess unit operations such as pumping, heat exchange, refrigeration/freezing, drying, evaporation, and separation.

BAE 4900. Intern Reports. (2 cr [max 4 cr]; S-N only. Prereq–IT or COAFES student in BAE, #)
Reports on intern work assignments reviewed by faculty and industry advisers.

BAE 5095. Special Problems. (1-5 cr [max 5 cr]. Prereq–#)
Advanced individual-study project. Application of engineering principles to specific problem.

BAE 5203. Environmental Impacts of Food Production. (3 cr; A-F only. Prereq–intended for non-engineering students; Credit will not be granted if credit has been received for AGET 5203)
Crop production intensity, animal raising options, food processing waste alternatives, pest control.

BAE 5212. Safety and Environmental Health Issues in Plant and Animal Production and Processing. (3 cr; A-F only. Prereq–Grad student or sr or #; Credit will not be granted if credit has been received for AGET 5212)
Safety/health issues in food production, processing and horticultural work environments using public health, injury control, and health promotion frameworks: regulation, engineering, education. Traumatic injury, occupational illness, ergonomics, pesticide health effects, biotechnology, air contaminants.

BAE 5513. Watershed Engineering. (3 cr; A-F only. Prereq–3023, upper div IT)
Application of engineering principles to managing surface runoff from agricultural, range, and urban watersheds. Design of facilities and selection of land use practices for controlling surface runoff to mitigate problems of flooding and degradation of surface-water quality.

Business Administration (BA)

Curtis L. Carlson School of Management

BA 1001. Introduction to Information Technology. (1 cr; S-N only)
Assess computing skills. Identify resources to develop skills in word processing, spreadsheets, presentation software, e-mail, LUMINA, remote access, and Web. Self-paced.

BA 1905. Freshman Seminar. (3 cr [max 6 cr] Prereq–Fr)
Topics vary.

BA 1910.W Freshman Seminar, WI. (2-3 cr [max 9 cr]; A-F only. Prereq–Freshman)
Topics vary. See *Class Schedule*.

BA 1998. Independent Study. (1-4 cr. Prereq–#)
Special project or independent study.

BA 3000. Career Skills. (1 cr; A-F only. Prereq–CSOM pre-major with 30 credits or upper division major)
Career planning. Use of Carlson School of Management's Business Career Center. Students gain awareness, knowledge, skills associated with career/job search process.

BA 3033V. Honors: Business Communication. (3 cr; A-F only. Prereq–60 cr, CSOM honors)
Written/oral communication skills for effective participation in contempory organizations. From basic principles to communication strategy. Communication technology. Cases, simulations of "real-world" situations. Student small groups meet with instructor three times for presentation coaching/feedback. Recitation times are arranged with instructor at start of semester.

BA 3033W. Business Communication. (3 cr; A-F only. Prereq–Fr composition, CSOM upper-div, at least 60 cr)
Written/oral communication skills for effective participation in contempory organizations. From basic principles to communication strategy. Communication technology. Cases, simulations of "real-world" situations. Student small groups meet with instructor three times for presentation coaching/feedback. Recitation times are arranged with instructor at start of semester.

BA 3101W. Global Seminar: Supplemental Writing. (1 cr [max 2 cr]; A-F only. Prereq–Current enrollment in 3100)
Projects developed by instructor of Global Seminar. Students analyze/process intercultural experience of studying abroad. Individualized feedback/coaching in writing skills. Taught during intersession. Writing intensive, if concurrently enrolled in 3100.

BA 3200H. Securian Foundation Leadership Colloquium. (2 cr. Prereq–Honors)
How to cultivate, evaluate, and apply leadership concepts in all phases of life. Emphasizes real leadership experiences. Ethical leadership, leadership communication, management vs leadership, motivation/empowerment, leading in a diverse environment, leading during change.

BA 3701H. Healthcare Marketplace: Principals and Agents in a Trillion-Dollar Economy. (4 cr. Prereq–honors student)
Introduction to healthcare sector markets for goods/services. Physician services, hospital services, insurance, long-term care, pharmaceuticals, medical devices, information technology. Lectures, recitations, presentations from healthcare business leaders.

BA 3900. Topics. (1-4 cr [max 12 cr])
Topics in business vary.

BA 3990H. Honors Topics. (2-4 cr [max 8 cr]; A-F only. Prereq–Honors)
Topics vary.

BA 3998. Independent Study. (1-6 cr [max 16 cr]. Prereq–CSOM upper div, #)
Student-initiated project or independent study.

BA 3999. Internship Seminar. (1 cr; S-N only. Prereq–30 cr, approved internship, #)
Integrates students' internship experiences with in-class discussions, relevant readings/assignments on issues related to world of work, workplace, and transition from college to work.

BA 4000H. Honors Seminar. (4 cr; A-F only. Prereq–CSOM honors, 2nd sem sr)
Capstone course for Carlson honors program. Organizational or cross-functional topics.

Business and Industry Education (BIE)

Department of Work and Human Resource Education

College of Education and Human Development

BIE 1396. Supervised Career and Technical Education Teaching. (4 cr; S-N only. Prereq–❑)
Supervised teaching for beginning teachers, or teaching activities for preservice teachers.

BIE 3061. Professional Sales Management. (3 cr; A-F only)
Examination of the sales manager's role in training and mentoring sales representatives in strategic selling, customer-oriented service, and problem-solving tactics. Includes recruitment, hiring, training, and retention of a sales force.

BIE 3111. Exploring Technology Systems. (3 cr)
Communication, information, construction, manufacturing, design, technical drawing, biotechnology, energy, power, and transportation technologies. Students develop problem solving and manipulative skills as well as understanding of the principles and processes through hands-on activities in a multiple activity laboratory.

BIE 3112. Technical Drawing and Production Technologies. (3 cr; A-F only. §AFEE 3112)
Instruction and laboratory experiences in technical drawing and design technologies; production technologies related to construction and manufacturing. Students will develop manipulative skills and techniques and an understanding of principles and processes of the technologies through hands-on work and lab activities.

BIE 3113. Manufacturing Technology. (3 cr. Prereq–Concurrent enrollment 3111)
Manufacturing concepts, principles, and applications. Automated manufacturing, including computer integrated manufacturing and robotics. Design, operation, and management of manufacturing systems/products. Lab.

BIE 3114. Construction Technology. (3 cr. Prereq–Concurrent enrollment 3111)
Introduction to principles, concepts, and techniques involved in civil, commercial, and residential construction. Laboratory experiences in planning, designing, organizing, producing, and testing structures.

BIE 3122. Communication and Information Technology. (3 cr; A-F only. Prereq–Concurrent enrollment 3121)
Information/communication systems, electronic publishing, printing technology, broadcast/recording technologies, telephone/online communication, photography, multimedia, and computer technology. Lab.

BIE 3123. Energy, Power, and Transportation Technology. (3 cr; A-F only. Prereq–Concurrent enrollment 3121)
Mechanical, fluid, and electrical power/technologies associated with transportation of people/materials. Lecture, lab.

BIE 3151. Technical Development: Advanced. (1-32 cr [max 32 cr]. Prereq–#)
Work experience in business/industry.

BIE 3993. Directed Study: BIE. (1-4 cr [max 4 cr])
Self-directed study preceded by classroom instruction in basic research procedures.

BIE 5001. Teaching Marketing Promotion. (3 cr; A-F only)
Materials, methods, and approaches to teaching marketing promotion. Covers the basic elements of the marketing mix: advertising, promotion, public relations, direct selling, visual merchandising, and direct marketing.

BIE 5011. Introduction to Computer Applications. (3 cr)
Instructional uses of computers and representative business/marketing education applications, including word processing, databases, spreadsheets, and graphics.

For definitions of course numbers, symbols, and abbreviations, see page 300.

BIE 5012. Advanced Word Processing. (3 cr. Prereq–5011 or equiv)
Develop/apply solution methods for office problems using word processing software including advanced editing, printing, and desktop publishing capabilities.

BIE 5013. Spreadsheet Analysis Using Computers. (3 cr. Prereq–5011 or equiv)
Using spreadsheets to analyze data, monitor business records, and create models.

BIE 5014. Database Computer Applications. (3 cr. Prereq–5011 or equiv)
Business needs for computerized databases. Using database software to develop, maintain, and prepare reports.

BIE 5015. Integrated Computer Applications in Business and Marketing Education. (3 cr. Prereq–[5011, 5012, 5013, 5014] or equiv)
Realistic business computer problems requiring integration of two or more application packages. Pedagogical issues of learning/teaching advanced computer applications.

BIE 5080. Special Topics in Business and Industry Education. (1-4 cr [max 4 cr])
Content varies by offering.

BIE 5101. Technological Problem Solving. (3 cr; A-F only. Prereq–3111, 3112, 3121, 3122)
Capstone technology education course in which students research problems relative to various technological systems and develop solution(s) to the identified problems.

BIE 5151. Technical Development: Specialized. (1-12 cr [max 12 cr]; A-F only. Prereq–#)
Students select/study technical processes/principles based on subjects they plan to teach, integrate specialized technical instruction in advanced/emerging areas.

BIE 5321. Vocational Guidance in Business and Industry Education. (2 cr; A-F only)
Self assessment, use of occupational and labor market information, job seeking skills, work and work satisfaction. For industrial teachers and trainers in school and industry settings.

BIE 5325. Foundations of Industrial Education. (3 cr)
Social, economic, psychological, philosophical, legislative, and pedagogical foundations of industrial education in the United States. Comparison with selected foreign countries. Analysis of contemporary trends against backdrop of early foundations.

BIE 5344. Facilities Management in Business and Industry. (3 cr; A-F only. Prereq–3112)
Planning, evaluating, and managing industrial education shop and lab facilities.

BIE 5365. Curriculum Development in Technology Education. (3 cr)
Conceptualization and derivation of content for the K-12 technology curriculum. Comparison of U.S. approaches to technology curriculum with selected countries.

BIE 5440. Business and Industry Observation and Seminar. (1-3 cr [max 6 cr])
Current operating practices and career opportunities in business and industry. Planned experiences in work environments and related seminars.

BIE 5452. Methods of Teaching Business and Marketing Concepts. (3 cr; A-F only)
Recent research/developments in teaching business concepts related to economics, business organization/management, business law, entrepreneurship, marketing, international business, information systems, accounting, risk management, and personal finance.

BIE 5457. Methods of Teaching Business Employment and Marketing Employment. (3 cr; A-F only)
Recent research/developments in teaching for business employment. Administrative support positions, accounting/information processing, marketing, sales, computer operations, other occupations using desktop computing.

BIE 5463. Methods in Teaching Keyboarding and Word Processing. (2 cr; A-F only)
Implementing keyboarding and word processing; effective teaching strategies; expected learner outcomes; evaluation methods; selecting hardware; instructional materials (including print, software, Internet); organizing and managing labs.

BIE 5475. Curriculum Development for Business and Marketing Education. (3 cr; A-F only)
Introduction to conceptual models for design/delivery of business/marketing education programs in secondary/postsecondary schools, in adult education settings, and in business/industry. Preparing programs of instruction for secondary/postsecondary level. Making decisions regarding course content.

BIE 5596. Occupational Experience in Business and Industry. (1-10 cr [max 10 cr]; S-N only. Prereq–#)
Observation/employment in business/industry to develop technical/occupational competencies. Includes 100 clock hours of supervised work experience per credit.

BIE 5597. Internship: Business and Industry Education. (1-8 cr [max 12 cr]; S-N only. Prereq–#)
Practical experience in business or industry as a professional educator or supervisor. Requires an integrative paper.

BIE 5605. Critical Issues in Business and Industry. (3 cr)
Identification and analysis of major current issues in business and industry education.

BIE 5662. Computer Training in School and Industry Settings. (3 cr. §HRD 5662. Prereq–5011 or equiv)
Alternative teaching practices for business applications software: word processors, spreadsheets, graphics, desktop publishing, databases, and communications; public school and industry settings.

BIE 5796. Field Based Projects in Business and Industry. (1-4 cr [max 4 cr]; S-N only)
Curricular, instructional, developmental, or evaluative problems and projects applicable to local school or business and industry situations.

BIE 5801. The Business of Tourism. (3 cr; A-F only)
Introduction to major theories, concepts, skills, and techniques influencing tourism business/industry.

BIE 5802. Education and Human Resource Development Through Tourism. (3 cr; A-F only)
Policies/practices of education and human resource development in tourism industry.

BIE 5803. Tourism Studies Capstone Seminar. (3 cr; S-N only. Prereq–Tourism studies major)
Students present, critique, and discuss implications of supporting programs for tourism.

BIE 5993. Directed Study in Business and Industry. (1-4 cr [max 4 cr])
In-depth individual inquiry in the content areas related to business and industry.

Business Law (BLAW)

Department of Accounting

Curtis L. Carlson School of Management

BLAW 3058. The Law of Contracts and Agency. (4 cr; A-F only. Prereq–40 or more credits)
Origin of law, its place in and effect on society; history and development of law; system of courts; legal procedure. Law of contracts as the basic law affecting business transaction. Laws affecting the sale of goods and contracts and the law of agency.

Center for Spirituality and Healing (CSPH)

Health Sciences

CSPH 1001. Principles of Holistic Health and Healing. (2 cr)
Principles/measures of holistic health that promote health and well being. Theory, how holistic health is incorporated into health care delivery system. Application/integration of holistic health into daily personal life.

CSPH 5000. Explorations in Complementary Therapies and Healing Practices. (1-4 cr [max 12 cr]. Prereq–Jr or sr or grad student or #)
Research/practice on therapies, delivery of complementary therapies, regulatory issues.

CSPH 5101. Introduction to Complementary Healing Practices. (3 cr. Prereq–Jr or sr or grad student or #)
Cultural contexts of healing traditions. Complementary therapies presented by practitioners, including traditional Chinese medicine, meditation, mind-body healing, spiritual practices, energy healing, naturopathy, herbalism, movement therapies, homeopathy, manual therapies, and nutrition.

CSPH 5102. Art of Healing: Self as Healer. (1 cr. Prereq–Jr or sr or grad student or #)
Introduction to individual transformational journey as part of health science education. Students become aware of their responsibility/resources to facilitate development of the self. Research data, experience of self that is part psychoneuroimmunology, mind-body-spirit approaches. Lecture, scientific literature, meditation, imagery, drawing, group interaction.

CSPH 5111. Ways of Thinking about Health. (2 cr. Prereq–Jr or sr or grad student or #)
Cultural contexts explored through field-trip immersion experiences. Aspects of different health care systems: Indigenous North American, Vedic, Traditional Chinese, biomedicine. Writing assignment.

CSPH 5115. Cultural Knowledge, Health, and Contemporary Cultural Communities. (3 cr. Prereq–Jr or sr or grad student or #)
How personal cultural experience affects one's view of health, illness, and healing and one's professional practice. Wisdom of cultural communities. Cultural construct underpinning the medical system. Role of culture in interaction between practitioner and patient. Reconnecting to cultural heritage in healing.

CSPH 5201. Spirituality and Resilience. (2 cr. Prereq–Jr or sr or grad student or #)
Links between resilience and spirituality. Applications of resilience/health realization model to students' personal/professional lives. Review of literature, theory, and research.

CSPH 5211. Peacemaking and Spirituality: A Journey Toward Healing and Strength. (2-3 cr [max 3 cr]; A-F only. Prereq–Jr or sr or grad student or #)
Influence of spirituality upon process of resolving conflict and making peace in intense interpersonal/intrapersonal conflicts in multiple health care and social work settings, including in families, between patients/clients and nurses/social workers, within communities, among friends, between co-workers, or within ourselves.

CSPH 5215. Forgiveness and Healing: A Journey Toward Wholeness. (2 cr. Prereq–Jr or sr or grad student or #)
Impact of forgiveness on process of inter-/intra-personal healing. Forgiveness/healing in health care and social work settings from multiple spiritual/secular traditions.

CSPH 5221. Significant Spiritual Texts of the 20th Century. (3 cr. Prereq–Jr or sr or grad student or #)
Diverse "spiritual classics" (i.e., elements of western canon that have proven over time to be resources of values). Resources of meaning for inner-life healers. How to establish a personal library for life-long journey of spiritual development.

CSPH 5225. Meditation: Integrating Body and Mind. (2 cr. Prereq–Jr or sr or grad student or #)
Meditation as a physical, emotional, intellectual, and spiritual inquiry. Students examine a variety of texts and develop ability to enter a state of calm, meditative awareness.

CSPH 5226. Advanced Meditation: Body, Brain, Mind, and Universe. (1 cr. Prereq–[5225, [jr or sr or grad student]] or #)
Students work to integrate meditation practice into daily life, cultivating awareness of the fundamental oneness of body, brain, mind, and universe. Mind-body interactions in health. "Hard problem" of consciousness in brain science. Emergence of compassion, wisdom, and healing in non-discursive awareness.

CSPH 5301. Cultures, Faith Traditions, and Health Care. (2 cr; A-F only. Prereq–Jr or sr or grad student or #)
Culturally/spiritually based health care practices of selected native/immigrant populations in Minnesota. Clinical implications. Personal/professional conflicts for delivery of competent care to culturally diverse groups by those trained in Western health care.

CSPH 5311. Introduction to Traditional Chinese Medicine. (2 cr; A-F only. Prereq–Jr or sr or grad student or #)
Philosophical roots of Shamanism, Confucianism, Taoism, and Buddhism. Influence of these philosophies on Chinese medicine. Evolution of concepts of the tao, Yin-Yang, microcosm, macrocosm. Development of herbal medicine, Tui Na, Qi Gong, acupuncture, moxibustion. Traditional Chinese medicine etiology of disease, physiology, diagnosis, therapy, disease prevention, ethics, psychology, cosmology.

CSPH 5315. Traditional Tibetan Medicine: Ethics, Spirituality, and Healing. (2 cr. Prereq–Jr or sr or grad student or #)
Ethics, spirituality, and healing from perspective of traditional Tibetan medicine. Belief that illness results from imbalance and that treating illness requires correcting underlying imbalance. How to apply these principles, integrate them into clinical practice, and consult with a traditional Tibetan doctor.

CSPH 5317. Yoga: Ethics, Spirituality, and Healing. (2 cr. Prereq–[5101, 5315] or #)
Ethics, spirituality, and healing from perspective of yoga, an ancient Indian discipline. Students test the claim that systematic yoga practice leads to optimal health. Evaluating yoga's philosophy, scientific evidence, practical application. Students propose research-based programs for integrating yoga into personal/professional life.

CSPH 5321. Public Health Priorities in the Developing World. (2 cr. §INMD 7567. Prereq–Jr or sr or grad student or #)
Primary public health problems, priorities, and interventions in developing countries. Issues related to culture/indigenous health systems and of concern to health care providers who work abroad or with refugee communities in countries of resettlement.

CSPH 5325. Latinos: Culture and Health. (3 cr. Prereq–jr or sr or grad student or #)
How Latino world view (cosmovision) affects health and compares with U.S. perspective. Differences in perception of time, family involvement, community "belonging," gender roles, and communication styles. Folkloric beliefs. Specific issues such as AIDS, pregnancy, women's issues, pharmacy, and nutrition. Health issues of workers. Cultural competency.

CSPH 5331. Foundations of Shamanism and Shamanic Healing. (2 cr; S-N only. Prereq–Jr or sr or grad student or #)
3 Ω-day retreat intensive. Shamanic philosophies, ritual etiquette, Core beliefs common to all shamanic healing practices. Cross-cultural healing beliefs/practices, unique psychology for understanding them, their use with contemporary healing practices and for personal growth.

CSPH 5332. Global Healing Traditions: Amazonia Plant Spirit Medicine. (2 cr; S-N only. Prereq–[5331, [grad student or jr or sr in health science or practicing health professional]] or #)
Non-biomedical traditional healing paradigms as practiced in other parts of the world. Focuses on indigenous healing practices in Peru as directed by a local shaman.

CSPH 5401. People, Plants, and Drugs: Introduction to Ethnopharmacology. (3 cr. Prereq–Jr or sr or grad student or #)
Biologically active substances used in traditional cultures. Ethnopharmacology's past, current, and potential contributions to human knowledge. Concrete examples.

CSPH 5405. Plants in Human AffAIRs. (4 cr. Prereq–Jr or sr or grad student or #)
Twelve-day, intensive course. Introduction to ethnobotany/ethnopharmacology. Lectures, field trips, presentations by local experts.

CSPH 5411. Dietary Supplements: Regulatory, Scientific, and Cultural Perspectives. (3 cr. Prereq–Jr or sr or grad student or #)
Concepts/principles of dietary supplements, RDA, dose-response, risk assessment. Laws/regulations concerning dietary supplements. Vitamin/mineral supplements. Philosophy/use of botanicals/nutraceuticals and common herbal supplements in western medicine. Use of supplements and evidence-based recommendations as influenced by culture.

CSPH 5421. Botanical Medicines in Complementary Healthcare. (3 cr. Prereq–Jr or sr or grad student or #)
Widely-used botanical medicines from biomedical perspective. Alternative therapeutic systems presented according to bodily systems/processes. Evidence for therapeutic use. Botanical characteristics, traditional uses, chemical properties, dosage, hazards/safety issues, quality control.

CSPH 5431. Functional Nutrition: An Expanded View of Nutrition, Chronic Disease, and Optimal Health. (2 cr. Prereq–[Jr or sr or grad student] in Health Sciences or #)
Principles of nutrition related to metabolic function. Model attempts to reduce chronic disease by looking for underlying causes/triggers and to intervene to restore function and achieve optimal health. Emphasizes importance of nutrition as a component of self-care.

CSPH 5501. Therapeutic Use of Plant Essential Oils. (3 cr. Prereq–Jr or sr or grad student or #; intended for students in health sciences or practicing health professionals; [basic science, health science knowledge, computer skills, internet skills] recommended)
Fundamentals of essential oil therapy for licensed health professionals. History, scientific basis, practice issues, use of 30 essential oils in clinical practice. Controlled use of essential plant oils for specific, measurable physiological/psychological therapeutic outcomes. Topical application, inhalation.

CSPH 5511. Interdisciplinary Palliative Care: An Experiential Course in a Community Setting. (2 cr)
Multidisciplinary student teams partner with interdisciplinary community hospice teams in delivery of care to patients in a variety of settings. Series of seminars employs self-analysis/case studies.

CSPH 5521. Therapeutic Landscapes. (3 cr. Prereq–[Jr or sr or grad student] in [health sciences or therapeutic recreation or horticulture or landscape architecture] or health professional or #)
Principles of therapeutic design for specific population requirements. Therapeutic landscape design. Incorporates interdisciplinary interaction between horticulture, landscape architecture, and health science departments.

CSPH 5522. Therapeutic Horticulture. (3 cr. Prereq–5101 or HORT 5072 or #)
Central elements of therapeutic horticulture in context of multiple health care settings. Evidence-based history, principles, precepts, and practical application of therapeutic horticulture. Various plant/plant-related modalities from current research findings are related to populations, using therapeutic horticulture as a treatment intervention.

CSPH 5523. Applications in Therapeutic Horticulture. (2 cr. Prereq–CSPH 5521 or CSPH 5522)
How to develop comprehensive program plans in therapeutic horticulture. Evidence-based principles, facilitation techniques in therapeutic horticulture. Systematic programming through documentation, assessment, program development techniques, and evaluation. Leadership training, program plan components, book reviews, reading assignments, comprehensive exam.

CSPH 5533. Introduction to Energy Healing. (2 cr. Prereq–Jr or sr or grad student or #)
Healing techniques (Therapeutic Touch, Reiki, acupuncture, reflexology, magnets, homeopathy) that use energetic systems in the body to enhance the body's ability to heal. Scientific theories. Students interact with practitioners and have the opportunity to experience feeling "energy."

CSPH 5535. Reiki Healing. (1 cr. Prereq–Jr or sr or grad student or #)
History, principles, precepts, and practical application of Reiki energy healing. Alternative energy healing modalities, current research findings. Activation of the Reiki energy, hand positions to perform a treatment. Students provide Reiki treatments, discuss findings.

CSPH 5536. Advanced Reiki Healing: Level II. (1 cr. Prereq–5535, #)
Principles/application of Reiki energy healing. Four levels of healing. Emphasizes healing at spiritual level. Activation of Reiki energy. Symbols that allow for energy transfer through space/time. Using second level Reiki energy for both distance healing and standard Reiki treatment. Students provide Reiki treatments, discuss findings. Current literature, research findings.

CSPH 5541. Integrative Psychotherapy. (3 cr. Prereq–5102, [grad student or #])
In depth, experiential-based training. Support for students to practice integrative psychotherapy, mindfulness meditation, and related mind/body approaches to clinical work. Multiple client/patient populations, issues, and settings.

CSPH 5545. Mind-Body Healing Therapies. (2 cr; A-F only. Prereq–Grad student or jr or sr or #)
Philosophies/paradigms. Four modalities commonly used in allopathic nursing, medicine and other health professions (biofeedback, hypnosis, imagery/visualization, meditation). Experiential and group discussion format.

CSPH 5555. Introduction to Body and Movement-based Therapies. (2 cr. Prereq–Jr or sr or grad student or #)
Theories/approaches of selected somatic therapies, including dance, movement, and body-based therapies. Historic/theoretical perspectives on use of movement, dance, and somatic re-patterning. Demonstrations of techniques. Application of techniques to specific populations/settings.

CSPH 5601. Music, Health and Healing. (2 cr. Prereq–Jr or sr or grad student or #)
Music therapy, music medicine, music psychotherapy. Techniques/interventions. Hypotheses/rationale related to interventions. Related research.

CSPH 5611. Healthy Humor. (1 cr. Prereq–Jr or sr or grad student or #)
Use of humor to enhance communication, treatment, and relationships with patients. How to create a positive work environment and outlook. Physiologic effects/benefits of humor/laughter. Humor and spirituality. Connection between positive outlook and health.

CSPH 5701. Fundamentals of Health Coaching I. (4 cr. Prereq–Admitted to Complementary Therapies and Healing Practice certificate program's health coaching track or #)
Tenets of health coaching model. Tools for self development, deep listening, and communication. Building blocks for optimal health from holistic perspective. How to identify/benchmark stages/ patterns of change, interface with interdisciplinary health care providers, and educate clients on self-care practices.

Central Asian Studies (CAS)

Institute of Linguistics, ESL, and Slavic Languages and Literatures

College of Liberal Arts

CAS 1904. Freshman Seminar. (3 cr; A-F only. §MELC 1904)
Topics vary. See *Class Schedule*.

CAS 3511. Ancient Iran. (3 cr. §MELC 3511)
Development of ancient Iranian culture under the Achaemenians and Sassanians; the impact of the Zoroastrian religion on Iranians and of Hellenism on the east, especially on domains such as Bactria; Iran's contribution to the flourishing cultures of the Silk Road.

CAS 3512. Modern Iran. (3 cr. §MELC 3512)
The development of medieval Iranian culture under the Arab, Turkish, and Mongol rules. Study two major trends: Islamization beginning after the Arab conquest to A.D. 1500; westernization from the Safavids to the Islamic Republic in 1979.

CAS 3526. Islam and Communism. (3 cr. §CAS 5526, MELC 3526, MELC 5526)
Development of medieval Islamic culture in Transoxiana; formation of Sufi orders; rise and development of Communist ideology; introduction of socialist principles into Central Asia; clash of Islamic principles with Communist dicta; Pan-Islamism; Pan-Turkism.

CAS 3531. Central Asian Culture and Literature. (3 cr. §GLOS 3641, MELC 3531)
Dynamics of life in contemporary Afghanistan, Iran, and Central Asia. Emphasizes role of ethnicity/ ideology. Central Asian fictional illustrations of impact of sovietization on Islamic traditions.

CAS 3532. Russia and Central Asia. (3 cr. §CAS 5532, MELC 3532, MELC 5532)
Rise and fall of the Mongol Empire, formation of the Chaghatai Khanate and the Golden Horde. Russian expansion into Central Asia and rivalry with Britain. Russia and the Central Asian republics during and after the Soviet period.

CAS 3533. Islam and the West. (3 cr. §GLOS 3643, MELC 3533)
Cultural/intellectual trends that have defined the fundamental differences between Islam and the West. Development of the historical, philosophical, and intellectual mindset of both spheres. Factors that have contributed and continue to contribute to tension, anxiety, and hatred between the Muslim world and Europe and the United States.

CAS 3601. Persian Fiction in Translation. (3 cr. §CAS 5601, MELC 3601, MELC 5601)
Impact of westernization on Iran, from 1920s to present. Materials produced by Iranian writers, film makers, and intellectuals. Internal/external forces that bind contemporary Iranian society to world civilization. Works of Hedayat (especially Blind Owl), Chubak, Al-i Ahmad, Daneshvar, and Behrangi are analyzed/interpreted.

CAS 3602. Persian Poetry in Translation. (3 cr. §CAS 5602, MELC 3602, MELC 5602)
Major poetic works of Iran in translation dealing with life at the medieval courts, Sufic poetry, and "new" poetry. Rudaki, Khayyam, Rumi, Hafiz, Yushij, and Farrukhzad are among the poets whose works are examined.

CAS 3900. Topics in Central Asian Studies. (1-4 cr [max 16 cr]; A-F only. §MELC 3900)
Topics vary. See Class Schedule or contact department for details.

CAS 5311. Medieval Sages. (3 cr. §MELC 5311. Prereq–background in Iranian, Central Asian, or Islamic studies recommended)
Study and discussion of the intellectual life of the region from the rise of the Ghaznavids (A.D. 1000) to the fall of the Timurids (A.D. 1500). Ibn Sina (Avicenna), al-Biruni, al-Ghazali, Rumi, Sa'di, and Firdowsi are among the sages whose lives are examined.

CAS 5526. Islam and Communism. (3 cr. §CAS 3526, MELC 3526, MELC 5526)
Development of medieval Islamic culture in Transoxiana; formation of Sufi orders; rise and development of Communist ideology; introduction of socialist principles into Central Asia; clash of Islamic principles with Communist dicta; Pan-Islamism; Pan-Turkism.

CAS 5532. Russia and Central Asia. (3 cr. §CAS 3532, MELC 3532, MELC 5532)
Rise and fall of the Mongol Empire, formation of the Chaghatai Khanate and the Golden Horde. Russian expansion into Central Asia and rivalry with Britain. Russia and the Central Asian republics during and after the Soviet period.

CAS 5601. Persian Fiction in Translation. (3 cr. §CAS 3601, MELC 3601, MELC 5601. Prereq–§: 3601, MELC 5601)
Impact of westernization on Iran, from 1920s to present. Materials produced by Iranian writers, film makers, and intellectuals. Internal/external forces that bind contemporary Iranian society to world civilization. Works of Hedayat (especially Blind Owl), Chubak, Al-i Ahmad, Daneshvar, and Behrangi are analyzed/interpreted.

CAS 5602. Persian Poetry in Translation. (3 cr. §CAS 3602, MELC 3602, MELC 5602)
Major poetic works of Iran dealing with life at the medieval courts, Sufic poetry, and "new" poetry are studied. Rudaki, Khayyam, Rumi, Hafiz, Yushij, and Farrukhzad are among the poets whose works are examined.

CAS 5994. Directed Research. (1-10 cr [max 10 cr]. Prereq–#, Δ, ❑)
Directed Research

Chemical Engineering (CHEN)

Department of Chemical Engineering and Materials Science

Institute of Technology

CHEN 1001. Advances in Chemical Engineering and Materials Science. (1 cr [max 2 cr]; S-N only. §MATS 1001. Prereq–Recommended for [chemical engineering, materials science/engineering] majors)
Survey of important advances in chemical engineering, materials science/engineering. Design problems, career opportunities. Lectures, demonstrations, interactive exercises.

CHEN 3041. Industrial Assignment I. (2 cr; A-F only. §MATS 3041. Prereq–CHEN upper Div, completion of required courses in CHEN prog through fall sem of 3rd yr, GPA of at least 2.80, registered in co-op prog)
Industrial work assignment in engineering co-op program. Formal written report.

CHEN 3045. Chemical Engineering Industrial Internship. (1-2 cr [max 2 cr] Prereq–Proposed plan approved by FI/CC, report signed by industrial supervisor describing engineering work completed)
Industrial internship, three to eight months.

CHEN 3701. Introduction to Biomolecular Engineering I. (3 cr; A-F only. Prereq–[4001 or equiv], [CHEM 2302 or ¶CHEM 2302], [Math 2373 or equiv]; high school biology recommended)
Fundamentals of biological systems, from biomolecules to interplays of biomolecules that give rise to "processes" of life. Students apply chemical engineering principles to analysis of living systems.

CHEN 4001. Material and Energy Balances. (4 cr; A-F only. Prereq–[CHEM 2302 or ¶CHEM 2302], [CHEM 3501 or ¶CHEM 3501 or equiv], [Math 2273 or ¶Math 2373 or equiv], [Math 2374 or ¶Math 2374 or equiv], PHYS 1302)
Description/analysis of chemical engineering systems: units/dimensions, materials balances on systems with/without chemical reactions, elementary phase equilibria/diagrams, energy balances. Elementary treatment of multistage steady-state equilibrium operations.

CHEN 4005. Transport Phenomena: Momentum and Heat. (4 cr; A-F only. Prereq–[4001 or [transfer student, Δ]], upper div CHEN major)
Fluid statics/dynamics and their applications to chemical engineering systems, conduction, and diffusion. Principles/applications of heat transfer in chemical engineering systems.

CHEN 4006. Mass Transport and Separation Processes. (4 cr; A-F only. Prereq–[4001 or Δ], 4005, 4101, [upper div CHEN major or Δ)
Introduction to principles of mass transfer. Mass transfer operations used in separation processes, unit operations.

CHEN 4041. Industrial Assignment II. (2 cr; A-F only. §MATS 4041. Prereq–3041, completion of required courses in CHEN prog through fall sem of 4th year, GPA of at least 2.80, registration in co-op prog)
Industrial assignment in engineering co-op program. Application of chemical engineering principles to engineering design problems in an industrial work environment. Formal written report.

CHEN 4101. Chemical Engineering Thermodynamics. (4 cr; A-F only. Prereq–[4001 or [transfer student, Δ]], CHEM 3501, [upper div CHEN major or Δ])
Applications of concepts of thermodynamics and chemical equilibrium to problems in chemical engineering.

CHEN 4102. Reaction Kinetics and Reactor Engineering. (4 cr; A-F only. Prereq–4001, 4101, [upper div CHEN major or Δ])
Chemical equilibrium and chemical kinetics applied to chemical engineering systems. Behavior/design of chemical reactors, interaction between chemical and physical rate processes. Mathematical modeling, design of reactors.

CHEN 4201. Numerical methods in CHEN applications. (3 cr; A-F only. Prereq–[4001 or Δ], [4005 or equiv], [4006 or ¶4006 or equiv], [upper div CHEN major or Δ])
Numerical methods and applications in heat/mass transfer and advanced chemical engineering applications.

CHEN 4214. Polymers. (3 cr. Prereq–Grade of at least C in MATS 3011, CHEN major upper division or #)
Polymer structure-property relations: structure/ morphology of crystalline/amorphous states. Crystallization kinetics. Vitrification and the glass transition. Mechanical properties, failure, permeability, optical/electrical properties, polymer composites, effect of processing on properties.

CHEN 4401W. Chemical Engineering Lab I. (3 cr; A-F only. Prereq–[4005, 4006, 4101, 4102, 4001, 4201, CHEM 2311, CHEM 4121, English composition requirement, upper div CHEN major] or Δ)
Principles/techniques of efficient design, structure, measurement, planning, analysis, and presentation of experiments and experimental results. Problems in energy balances, fluid flow, heat transfer, and mass transfer. Design of new systems using experimental data obtained in lab. Oral/written presentations.

CHEN 4402W. Chemical Engineering Lab II. (2 cr. Prereq–4006, 4101, 4401W, upper div CHEN major)
Principles/techniques of efficient design, structure, measurement, planning, analysis, and presentation of experiments and experimental results. Experimental problems in energy balances, fluid flow, heat transfer, and mass transfer. Design of new systems using data obtained in lab. Oral/written presentations.

CHEN 4501W. Chemical Engineering Process Design. (3 cr. Prereq–[4005, 4006, 4101, 4102, 4001, 4201, CHEM 2311, CHEM 4121, fr writing requirement, upper div CHEN major] or Δ)
Engineering economics of process evaluation, including time/bases for cost estimation. Engineering design through group projects. Case studies.

CHEN 4502W. Chemical Engineering Process Design II. (2 cr; A-F only. Prereq–4501W, [upper div CHEN major or Δ])
Continue review from 4501 of unit processes/operations, introducing detail for design, cost analysis, control, operability, modifications, and alternatives. Case studies, special topics.

CHEN 4593. Directed study. (1-4 cr [max 4 cr]. Prereq–CHEN major upper division, #)
Directed study under faculty supervision.

CHEN 4594. Directed Research. (1-4 cr [max 4 cr])
Independent lab research under faculty supervision.

CHEN 4601. Process Control. (3 cr; A-F only. Prereq–4102, [upper div CHEN major or Δ])
Analysis of dynamic behavior/design of linear control systems for chemical processes. Dynamic response and stability of linear ODE systems, tuning of PID controllers, synthesis of feedback, feedforward/feedback controller.

CHEN 4701. Advanced Undergraduate Applied Math I: Linear Analysis. (3 cr; A-F only. §CHEN 8201. Prereq–4102, CHEN major upper division)
Integrated approach to solving linear mathematical problems (linear algebraic equations, linear ordinary/partial differential equations) using theoretical/numerical analysis based on linear operator theory. Undergraduate version of 8201.

CHEN 4702. Advanced Undergraduate Rheology. (2 cr; A-F only. Prereq–4002, #)
Deformation/flow of non-Newtonian/viscoelastic fluids, plastic materials, perfectly elastic solids. Phenomenological/molecular interpretation of rheology of elastomers, polymer melts, polymer solutions. Application of rheology to polymer processing. Undergraduate version of 8102.

CHEN 4703. Advanced Undergraduate Applied Math II: Nonlinear Analysis. (3 cr; A-F only. Prereq–CHEN 4002, CHEN major upper division; grad-level course in linear analysis recommended)
Nonlinear mathematical problems (nonlinear ordinary/partial differential equations) using theoretical/numerical analysis. Undergraduate version of 8202.

CHEN 4704. Advanced Undergraduate Physical Rate Processes I: Transport. (3 cr; A-F only. Prereq–4002, CHEN major upper division)
Survey of mass transfer, dilute/concentrated diffusion, Brownian motion. Diffusion coefficients in polymers, of electrolytes, at critical points. Multicomponent diffusion. Mass transfer correlations/predictions. Mass transfer coupled with chemical reaction. Undergraduate version of 8301.

CHEN 4706. Advanced Undergraduate Physical and Chemical Thermodynamics. (3 cr; A-F only. Prereq–CHEM 3502, 4101, 4002, CHEN major upper division; recommend background in undergraduate engineering or chemistry courses in thermodynamics)
Principles of classical thermodynamics, introduction to nonequilibrium thermodynamics. Applications in chemical engineering, materials science. Undergraduate version of 8401.

CHEN 4707. Advanced Undergraduate Statistical Thermodynamics and Kinetics. (3 cr; A-F only. Prereq–4002, 4101, CHEM 3501, CHEM 3502, CHEN major upper division)
Introduction to statistical mechanical description of equilibrium/non-equilibrium properties of matter. Emphasizes fluids, classical statistical mechanics. Undergraduate version of 8402.

CHEN 4708. Advanced Undergraduate Chemical Rate Processes: Analysis of Chemical Reactors. (3 cr; A-F only. Prereq–4102, CHEN major upper division)
Design of reactors for heat management, with catalytic processes, through detailed analysis of steady state, transient behavior. Polymerization, combustion, solids processing, environmental modeling. Design of multiphase reactors. Undergraduate version of 8501.

CHEN 5104. Coating Process Fundamentals. (2 cr; A-F only. Prereq–4003, 4102)
Viscous flow, rheology of polymer solutions and of particulate suspensions. Capillarity, wetting. Electrostatic effects. Phase change, colloidal transformations, mass/heat transfer in drying. Kinetics in curing. Stress, property development in solidifying polymeric coatings. Illustrations drawn from theoretical modeling, flow visualization, and stopped-process microscopy.

CHEN 5221. Introduction to Polymer Chemistry. (3 cr; A-F only. §CHEM 4221, CHEM 8221, MATS 5221, MATS 8221. Prereq–[CHEM 2302, CHEM 3501] or #)
Condensation, radical, ionic, emulsion, ring-opening, metal-catalyzed polymerizations. Chain conformation, solution thermodynamics, molecular weight characterization, physical properties.

CHEN 5531. Electrochemical Engineering. (3 cr. §MATS 5531. Prereq–[MATS 3011 or #], [upper div IT or grad student])
Fundamentals of electrochemical engineering. Electrochemical mass transfer electrokinetics, thermodynamics of electrochemical cells, modern sensors. Formation of thin films and microstructured materials. Computer-based problems.

CHEN 5595. Special Topics. (1-4 cr [max 4 cr])
New or experimental special topics.

CHEN 5751. Biochemical Engineering. (3 cr; A-F only. Prereq–4002, ¶4003, ¶4102)
Chemical engineering principles applied to analysis/design of complex cellular/enzyme processes. Quantitative framework for design of cells for production of proteins, synthesis of antibodies with mammalian cells, or degradation of toxic compounds in contaminated soil.

CHEN 5752. Quantitative Biology for Engineers. (3 cr; A-F only. §CHEN 8752. Prereq–Engineering background, #)
Biological fundamentals of biotechnology. Structural basis of biological systems. Communication between cells/environment. Gene expression. Proteins and their functional classes. Metabolic pathways and their reactions. From gene/genome to physiology. Genomics/proteomics as technologies. Biotechnology and society: ethics, law, public policy. Biotechnology-based commercial enterprises.

CHEN 5753. Biological Transport Processes. (3-4 cr [max 4 cr]; A-F only. §BMEN 5311, ME 5381. Prereq–4003 or ME 3322)
Introduction to fluid, mass, and heat transport in biological systems. Mass transfer across membranes, fluid flow in capillaries, interstitium, veins and arteries. Heat transfer in single cells and tissues. Whole organ and body heat transfer issues. Blood flow and oxygenation. Heat and mass transfer in respiratory system. Biotransport issues in artificial organs, membrane oxygenators, and drug delivery applications.

CHEN 5754. Food Processing Technology. (3 cr; A-F only. Prereq–4002)
Introduction to food processing as it interfaces with engineering. Case studies. Engineering economics and practical design problems in food processing. Heat transfer; freezing, conduction (unsteady state); thermal processing; extruder design; protein processing; order-of-magnitude estimating; and economic concepts such as ROI, discounted cash flow, and capital estimating.

CHEN 5759. Principles of Mass Transfer in Engineering and Biological Engineering. (2 cr; A-F only. Prereq–4002)
Principles of mass transfer in gases, liquids, biological and macromolecular solutions, gels, solids, membranes, and capillaries. Porous solids interaction between mass transfer and chemical reaction. Applications in biological, environmental, mineral, and chemical engineering systems.

CHEN 5771. Colloids and Dispersions. (3 cr; A-F only. Prereq–Physical chemistry)
Preparation, stability, coagulation kinetics or colloidal solutions. DLVO theory, electrokinetic phenomena. Properties of micelles, other microstructures.

Chemistry (CHEM)

Department of Chemistry

Institute of Technology

CHEM 1011. Introductory Chemistry: Lecture and Laboratory. (4 cr. Prereq–[high school chemistry or equiv], two yrs high school math, not passed CHEM placement exam; high school physics recommended)
Elementary organic chemistry. Matter/energy, atoms, compounds, solutions, chemical reactions, mole/chemical calculations, gases, liquids, solids, chemical bonding, atomic/molecular structure, acids, bases, equilibria. Physical/chemical properties of hydrocarbons and organic compounds containing halogens, nitrogen, or oxygen. Emphasizes problem solving.

CHEM 1015. Introductory Chemistry: Lecture. (3 cr. Prereq–[High school chemistry or equiv], two yrs high school math, not passed CHEM placement exam; high school physics recommended)
Broad survey of chemical concepts. Matter and energy, atoms, compounds, solutions, chemical reactions, mole and chemical calculations, gases, liquids, solids, chemical bonding, atomic and molecular structure, acids, bases, equilibria. Physical and chemical properties of hydrocarbons and organic compounds containing halogens, nitrogen, or oxygen. Problem solving emphasized.

CHEM 1017. Introductory Chemistry: Laboratory. (1 cr. Prereq–1015, Δ)
Same curricular content as lab component of 1011.

CHEM 1021. Chemical Principles I. (4 cr. §CHEM 1031H. Prereq–Grade of at least C- in [1011 or 1015] or passing placement exam; intended for science or engineering majors)
Atomic theory, periodic properties of elements. Thermochemistry, reaction stoichiometry. Behavior of gases, liquids, and solids. Molecular/ionic structure/bonding. Organic chemistry and polymers. Energy sources, environmental issues related to energy use.

CHEM 1022. Chemical Principles II. (4 cr. §CHEM 1032H. Prereq–1021 or equiv)
Chemical kinetics; radioactive decay; chemical equilibrium; solutions; acids and bases; solubility; second law of thermodynamics; electrochemistry and corrosion; descriptive chemistry of the elements; coordination chemistry; biochemistry; applications of chemical principles to environmental problems.

CHEM 1031H. Honors Chemistry I. (4 cr; A-F only. §CHEM 1021. Prereq–IT honors student or o, permission from IT honors office])
Advanced introduction to atomic theory. Periodic properties of elements. Behavior of gases, liquids, and solids. Molecular/ionic structure, bonding. Aspects of organic chemistry, spectroscopy, and polymers. Energy sources, environmental issues. Mathematically demanding quantitative problems. Writing for scientific journals. Lecture, lab.

CHEM 1032H. Honors Chemistry II. (4 cr; A-F only. §CHEM 1022. Prereq–[1301 or equiv], [IT honors student or consent of IT honors office])
Advanced introduction. Chemical kinetics/reaction mechanisms, chemical/physical equilibria, acids/bases, entropy/second law of thermodynamics, electrochemistry/corrosion; descriptive chemistry of the elements; coordination chemistry; biochemistry; applications of chemical principles to environmental problems. Lab emphasizes writing for scientific journals.

CHEM 1905. Freshman Seminar. (1-3 cr [max 3 cr]; A-F only. Prereq–Freshman)
Topics vary. See freshman seminar topics.

CHEM 1910W. Freshman Seminar: Writing Intensive. (1-3 cr [max 4 cr]; A-F only. Prereq–Freshman)
Topics vary. See freshman seminar topics.

CHEM 2094. Directed Research. (1-3 cr [max 3 cr]. Prereq–#)
Learning experience in areas not covered by regular courses. Individually arranged with faculty member.

CHEM 2101. Introductory Analytical Chemistry Lecture. (3 cr. Prereq–1022 or equiv)
Primarily for chemistry majors. Methods/concepts of measurement by chemical/instrumental analysis, including titrimetry, quantitative spectrophotometric analysis, chromatographic separations, equilibrium/rate methods.

CHEM 2111. Introductory Analytical Chemistry Lab. (2 cr. Prereq–2101 or ¶2101)
Lab for 2101. High precision methods, acidimetry and complexometry, single and multicomponent analysis by spectrophotometry, analysis of mixtures by ion exchange and gas chromatography, enzymatic and rate methods.

CHEM 2301. Organic Chemistry I. (3 cr. Prereq–Grade of at least C- in [1022 or 1032H] or equiv)
Important classes of organic compounds, their constitutions, configurations, conformations, and reactions. Relationships between molecular structure and chemical reactivity/properties. Spectroscopic characterization of organic molecules.

CHEM 2302. Organic Chemistry II. (3 cr. Prereq–2301)
Reactions, synthesis, and spectroscopic characterization of organic compounds, organic polymers, and biologically important classes of organic compounds such as lipids, carbohydrates, amino acids, peptides, proteins, and nucleic acids.

CHEM 2311. Organic Lab. (4 cr. Prereq–2302 or ¶2302)
Lab techniques in synthesis, purification, and characterization of typical organic compounds.

CHEM 2312. Honors Organic Lab. (5 cr; A-F only. Prereq–[2301 or ¶2301], [CHEM or ChemE or BioC] major, #)
Honors organic chemistry lab.

CHEM 2910. Special Topics in Chemistry. (1 cr [max 6 cr]; S-N only. Prereq–1 sem 1xxx chemistry or #)
Topics in chemistry. Opportunities and current research.

CHEM 2920. Special Topics In Chemistry. (1 cr [max 6 cr]; S-N only. Prereq–1 sem 1xxx chemistry or #)
Topics in chemistry. Opportunities and current research.

CHEM 3001. Chemical Literature and Information Retrieval. (1 cr; S-N only. Prereq–2302 or ¶2302 or #)
Forms of chemical literature, relationships among them. Major information sources in chemistry. Basic search techniques for print/electronic sources, choosing sources most appropriate for various information needs.

CHEM 3501. Introduction to Thermodynamics, Kinetics, and Statistical Mechanics. (3 cr. Prereq–[1022 or 1032H], [MATH 2263 or MATH 2374], [PHYS 1302 or PHYS 1402V])
Physical chemistry as it relates to macroscopic descriptions of chemical systems. Chemical thermodynamics, phase equilibria, chemical equilibria. Statistical mechanics. Phenomenological reaction kinetics. Kinetic theory of gases. Collision and statistical theories of reaction rates.

CHEM 3502. Introduction to Quantum Mechanics and Spectroscopy. (3 cr. Prereq–One yr college chemistry, one yr college physics, one yr college calculus)
Introduction to microscopic descriptions of chemical systems. Elementary quantum theory. Applications to atomic/molecular structure. Molecular spectroscopy. Quantum statistical mechanics. While a course in differential equations is not required, solutions to several such equations are discussed.

CHEM 4001. Chemistry of Plant Materials. (4 cr; A-F only. Prereq–2302, [jr or sr or #])
Chemical principles underlying structure, properties, processing, and performance of plant materials.

CHEM 4011. Mechanisms of Chemical Reactions. (3 cr. Prereq–2302 or equiv)
Reaction mechanisms and methods of study. Mechanistic concepts. Gas phase reactions. "Electron pushing" mechanisms in organic and enzymatic reactions. Kinetic schemes and other strategies.

CHEM 4021. Computational Chemistry. (3 cr. Prereq–3502 or equiv)
Theoretical methods for study of molecular structure, bonding, and reactivity. Ab initio and semi-empirical calculations of molecular electronic structure. Theoretical determination of molecular electronic structure and spectra; relation to experimental techniques. Molecular mechanics. Structure determination for large systems. Molecular properties and reactivity. Computational tools. Critical assessment of methods and theoretical work in the literature. Lab.

CHEM 4066. Chemistry of Industry. (3 cr. Prereq–CHEM sr or grad student or #)
Industrial and polymer chemistry technology. Relation of basic properties to industrial utility. Economics, social problems, industrial environment.

CHEM 4094W. Directed Research. (1-5 cr [max 75 cr]. Prereq–Any 3xxx or 4xxx CHEM course, #)
Learning experience in areas not covered by regular courses. Individually arranged with faculty member.

CHEM 4101. Intermediate Analytical Chemistry Lecture. (3 cr; A-F only. Prereq–2101, 2111, 2311, ¶3501)
Basic electronic, optical, computer technologies employed in design of chemical instrumentation. Advanced topics in spectroscopy (e.g., FT-nmr, FT-IR, atomic absorption/emission). Electrochemistry. Mass spectrometry.

CHEM 4111W. Intermediate Analytical Chemistry Lab. (2 cr; A-F only. Prereq–4101, chemistry major)
Instrumental techniques, including spectroscopic methods, electrochemical methods, and analysis based on separation. Emphasizes use of computers in data collection and reduction.

CHEM 4121. Process Analytical Chemistry. (3 cr; A-F only. Prereq–2302, 2311, 3501, chemical engineering major)
Strategies and techniques for analysis. Use of modern instruments, including spectrophotometry, chromatography and electrochemistry.

CHEM 4201. Materials Chemistry. (3 cr. §CHEM 8201. Prereq–[[3502 or equiv], 4701] or #)
Crystal systems/unit cells, phase diagrams, defects/interfaces, optical/ dielectric properties, electrical/thermal conductivity, X-ray diffraction, thin film analysis, electronic structure, polarons/phonons, solid state chemistry, liquid/molecular crystals, polymers, magnetic/optical materials, porous materials, ceramics, piezoelectric materials, biomedical materials, catalysts.

CHEM 4221. Introduction to Polymer Chemistry. (3 cr. §CHEM 8221, CHEN 5221, MATS 5221, MATS 8221. Prereq–[2302, 3501] or #)
Condensation, radical, ionic, emulsion, ring-opening, metal-catalyzed polymerizations. Chain conformation, solution thermodynamics, molecular weight characterization, physical properties.

CHEM 4223W. Polymer Laboratory. (2 cr. §MATS 5223W. Prereq–§MATS 5223; 5221 or 8221 or CHEN 4214 or #)
Synthesis, characterization, and physical properties of polymers. Free radical, condensation, emulsion, anionic polymerization. Infrared spectroscopy/gel permeation chromatography. Viscoelasticity, rubber elasticity, crystallization.

CHEM 4301. Surface and Colloid Science in Bio-based Products Manufacturing. (3 cr. Prereq–3501, [jr or sr or #])
Principles of surface/colloid science, their application to understanding manufacturing/performance of bio-based products.

CHEM 4311W. Advanced Organic Chemistry Lab. (2 cr. Prereq–2311)
Reactions, techniques, and instrumental methods in synthetic organic chemistry.

CHEM 4321. Organic Synthesis. (3 cr. Prereq–[2302 or equiv], #)
Fundamental concepts, reactions, reagents, structural/stereochemical issues, and mechanistic skills for organic chemistry.

CHEM 4322. Advanced Organic Chemistry. (3 cr. Prereq–[2302 or equiv], #)
Topics vary by instructor. Examples: natural products, heterocycles, asymmetric synthesis, organometallic chemistry, polymer chemistry.

CHEM 4352. Physical Organic Chemistry. (3 cr. Prereq–2302, [5011 or 8011])
Fundamental concepts and mechanistic tools for analysis of organic reaction mechanisms. Solvation, reactive intermediates, gas phase chemistry, photochemistry or strained-ring chemistry or both.

CHEM 4361. Interpretation of Organic Spectra. (3 cr. Prereq–[2302 or equiv], #)
Application of nuclear magnetic resonance, mass, ultraviolet, and infrared spectral analyses to organic structural problems.

CHEM 4411. Introduction to Chemical Biology. (3 cr. Prereq–2302 or equiv)
Chemistry of amino acids, peptides, proteins, lipids, carbohydrates, and nucleic acids. Structure, nomenclature, synthesis, and reactivity. Techniques to characterize biomolecules.

CHEM 4412. Chemical Biology of Enzymes. (3 cr. Prereq–2302 or equiv)
Enzyme classification with examples from current literature; strategies to decipher enzyme mechanisms; chemical approaches to control enzyme catalysis.

CHEM 4413. Nucleic Acids. (3 cr. Prereq–2302 or equiv)
Chemistry and biology of nucleic acids. Structure, thermodynamics, reactivity, DNA repair, chemical oligonucleotide synthesis, antisense approaches, ribozymes, techniques for nucleic acid research, interactions with small molecules and proteins.

CHEM 4511W. Advanced Physical Chemistry Lab. (2 cr. Prereq–3501-3502, chemistry major)
Experiments illustrating principles and methods of thermodynamics, reaction kinetics, and quantum mechanics.

CHEM 4701. Inorganic Chemistry. (3 cr. Prereq–2311, [3501 or ¶3501 or 3502 or ¶3502])
Advanced introduction to inorganic chemistry. Periodic trends. Structure and bonding concepts in compounds where s and p electrons are important. Descriptive chemistry of solids and transition metal compounds. Emphasizes transition metal chemistry. Advanced topics in main group and materials chemistry.

CHEM 4711W. Advanced Inorganic Chemistry Lab. (2 cr; A-F only. Prereq–4701, CHEM major)
Lab experiments in inorganic/organometallic chemistry illustrating synthetic/spectroscopic techniques.

CHEM 4715. Physical Inorganic Chemistry. (3 cr. Prereq–4701 or equiv, CHEM major or #)
Physical methods (e.g., IR, UV-VIS, ESR, Mossbauer and mass spectroscopy, magnetic measurements, X-ray diffraction) and concepts applied to inorganic and organometallic systems.

CHEM 4725. Organometallic Chemistry. (3 cr. Prereq–4701 or equiv, CHEM major or #)
Synthesis, reactions, structures, and other properties of main group and transition metal organometallic compounds; electronic and structural theory, emphasizing their use as stoichiometric and homogeneous catalytic reagents in organic and inorganic systems.

CHEM 4735. Bioinorganic Chemistry. (3 cr. Prereq–4701 or equiv, CHEM grad or #)
Role of metal ions in biology. Emphasizes structure, function, and spectroscopy of metalloproteins and their synthetic analogs.

CHEM 4745. Advanced Inorganic Chemistry. (3 cr. Prereq–4701, CHEM major, #)
Topics in main group and transition metal chemistry. Emphasizes synthesis, structure, physical properties, and chemical reactivity.

CHEM 5210. Materials Characterization. (4 cr; A-F only. Prereq–Grad student or #)
Modern tools/techniques for both bulk- and thin-film characterization. Topics may include ion-solid interactions, Rutherford back scattering, secondary ion mass spectrometry, solid-state NMR, x-ray photoelectron spectroscopy, small-angle x-ray/neutron scattering, transmission/scanning electron/probe microscopy, near-field scanning optical microscopy, porosimetry, adsorption techniques, and ellipsometry.

CHEM 5245. Introduction to Drug Design. (3 cr; A-F only. §MEDC 5245, PHAR 6245. Prereq–2302 or equiv)
Concepts that govern design/discovery of drugs. Physical, bioorganic, medicinal chemical principles applied to explain rational design and mechanism of action drugs.

CHEM 5501. Introduction to Thermodynamics, Kinetics, and Statistical Mechanics. (3 cr; A-F only. Prereq–[1022 or 1032H], [Math 2263 or Math 2374], [PHYS 1302 or PHYS 1402V])
Physical chemistry as it relates to macroscopic descriptions of chemical systems. Chemical thermodynamics, phase equilibria, chemical equilibria. Statistical mechanics. Phenomenological reaction kinetics. Kinetic theory of gases. Collision, statistical theories of reaction rates.

CHEM 5502. Introduction to Quantum Mechanics and Spectroscopy. (3 cr; A-F only. Prereq–Grad student, one yr college chemistry, one yr college physics, one yr college calculus, Δ)
Microscopic descriptions of chemical systems. Quantum theory. Applications to atomic/molecular structure. Molecular spectroscopy. Quantum statistical mechanics. Discussion of solutions to several differential equations.

CHEM 5541. Dynamics. (3 cr. §CHEM 8541. Prereq–Undergrad physical CHEM course, #)
Hamilton's/Lagrange's equations of motion. Normal modes and molecular rotation. Langevin equation and Brownian motion. Time correlation functions, collision theory, cross-sections, energy transfer. Molecular forces and potential energy surfaces. Classical electrostatics.

CHEM 5551. Quantum Mechanics I. (3 cr. §CHEM 8551. Prereq–Undergrad physical CHEM course, #)
Review of classical mechanics. Postulates of quantum mechanics, with applications to determination of single particle bound state energies and scattering cross-sections in central field potentials. Density operator formalism, with applications to description of two-level systems, two-particle systems, entanglement, and Bell inequality.

CHEM 5755. X-Ray Crystallography. (4 cr; A-F only. Prereq–CHEM grad student or #)
Essentials of crystallography as applied to modern, single crystal X-ray diffraction methods. Practical training in use of instrumentation in X-ray crystallography facility in Department of Chemistry. Date collection, correction/refinement, structure solutions, generation of publication materials, use of Cambridge Crystallographic Structure Database.

Chicano Studies (CHIC)

Department of Chicano Studies

College of Liberal Arts

CHIC 1102. Latinos in the United States: Culture and Citizenship. (3 cr)
Historical/cultural knowledge on the complex/multi-layered relationship that Latinos have to the U.S., their country of origin. Influence of social, cultural, and political dynamics on Latino identity, politics, and sense of belonging in the U.S. Cultural citizenship.

CHIC 1102H. Latinos in the United States: Culture and Citizenship. (3 cr)
Historical/cultural knowledge on the complex/multi-layered relationship that Latinos have to the U.S., their country of origin. Influence of social, cultural, and political dynamics on Latino identity, politics, and sense of belonging in the U.S. Cultural citizenship.

CHIC 1112. Introduction to Chicana/o Studies: Critical Paradigms. (3 cr)
Prevailing paradigms of analysis, methodologies of research, and guiding theoretical concepts that have shaped Chicano Studies. Chicano history, culture, and meanings, including (im)migration, repatriation, community formation, Chicano movement. Contemporary trends in art and culture.

CHIC 1275. Service Learning in the Chicano/Latino Community. (3 cr. §CHIC 3275)
Hands-on, minds-on engagement in service learning. Integration of community service and related academic study. Students work as tutors/mentors in a Chicano-Latino based K-12 educational setting (school or after school program).

CHIC 1901. Freshman Seminar. (3 cr; A-F only. Prereq–Freshman)
Topics specified in *Class Schedule*.

CHIC 1902. Freshman Seminar. (3 cr)

CHIC 1907W. Freshman Seminar. (3 cr. Prereq–Fr)
Topic specified in *Class Schedule*.

CHIC 1908W. Freshman Seminar. (3 cr; A-F only. Prereq–Freshman)
Topics specified in *Class Schedule*.

CHIC 3212. La Chicana. (3 cr. §WOST 3410)
This class centers on Chicanas or politically defined women of the Mexican American community. Our method is interdisciplinary. It emphasizes the importance of historical context and cultural process to any discussion of the Chicana experience.

CHIC 3213. Chicano Music and Art. (3 cr; A-F only)
Survey of diverse forms of cultural expressiveness in Mexican American music/art. History of various types of artistic production and musical forms in their regional specificity. Social/economic implications of several genres, styles, and traditions.

CHIC 3221. Introduction to Chicana/o Cultural Studies: Barrio Culture and the Aesthetics of Everyday Life. (3 cr)
Cultural studies approach to investigating aesthetic dimensions of experience that inform and are informed by dynamic relationship between culture, class, ethnicity, and power.

CHIC 3223. Chicana/o and Latina/o Representation in Film. (3 cr)
Introduction to Chicana/o and Latina/o visual representation. Depiction of Latina/o experience, history, and culture in film. Analyzing independent/commercial films as texts that illuminate deeply held beliefs around race, class, ethnicity, gender, and national origin.

CHIC 3275. Service Learning in the Chicano/Latino Community. (3 cr. §CHIC 1275)
Hands-on, minds-on engagement in practice/theory of service learning. Integration of community service and related academic study. Students work as tutors/mentors in a Chicano-Latino based K-12 educational setting (school or after school program).

CHIC 3310. Chicanas/os and the Law. (3 cr)
Surveys the status of Chicanas and Chicanos in the law. A wide realm of case law and articles introduce key issues. Examines history, inequality, education, employment, affirmative action, criminal law, immigration, housing, and environmental racism.

CHIC 3352. Transnational Chicana/o Theory: Global Views/Borderland Spaces. (3 cr)
Demographic realities, political/economic shifts, cultural exchanges that characterize U.S.-Mexico borderland spaces in global economy. Historically contextualized, transnational approach to cultures, politics, and economics of U.S.-Mexico Borderlands. Dnamics of borderland spaces.

CHIC 3374. Migrant Farmworkers in the U.S.: Families, Work, and Advocacy. (3 cr)
Social, economic, and legal realities of migrant workers. Demographic shifts, laws, and policies. Farmworker movements and other responses to conditions facing migrants in contemporary economy. Gendered nature of work. Way in which commodities are produced and resistance expressed within structures/traditions of an increasingly globalized system.

CHIC 3375. Folklore of Greater Mexico. (3 cr)
Scholarly survey and exploration of the sociocultural function of various types of folklore in Greater Mexico. Students analyze the ways in which folklore constructs and maintains community, as well as resists and engenders cultural shifts.

CHIC 3444. Chicana and Chicano History: 1821-1945. (3 cr. §HIST 3441, HIST 3444, LAS 3441)
Experiences of people of Mexican descent in the United States. Important eras in histories of Mexico, the United States, and Mexican Americans. Central role of Chicana/os in U.S. history, culture, and politics.

CHIC 3446. Chicana/o History II: WWII, El Movimiento, and the New Millenium. (3 cr)
Experiences of people of Mexican descent in the U.S. Notions of citizenship from WWII. Chicano civil rights movement. Impact of immigration patterns/legislation. Cultural wars, changing demographics. Social, economic, and political changes that influenced day-to-day life of Mexican Americans. Meaning of racialized Mexican identity. How different groups of Mexicans have understood their relationships to other Americans and other Latino groups.

CHIC 3452. Xicana/Indigena Studies: History, Culture, and Politics. (3 cr)
Historical, cultural, and political processes that have impacted Chicanas/os and their understanding of being indigenous to North American continent and Southwestern U.S. History as dynamic process intimately related to present/future constructions of Mexican American identities and sociopolitical perspectives.

For definitions of course numbers, symbols, and abbreviations, see page 300.

CHIC 3507W. Introduction to Chicana/o Literature. (3 cr)
Cultural, intellectual, and socio-political traditions of Mexican Americans as they are represented in creative literature. Various genres/forms of creative cultural expression and their significance as representations of social, cultural, and political life in the United States. Novels, short stories, drama, poetry.

CHIC 3672. Chicana/o Experience in the Midwest. (3 cr)
Lived experience of Chicano/as in Midwest. Art, music, and spoken word as media for how Chicano/as convey that experience. How/why groups, affiliations, and organizations form in alliance/competition. How living in Midwest impacts those relationships.

CHIC 3712. Chicanas(os): Psychological Perspectives. (3 cr)
Textual analysis of Chicana/Latina writings with special emphasis on the psychological motivations of the subjects pertaining to race, class, and gender relationships.

CHIC 3752. Chicanas and Chicanos in Contemporary Society. (3 cr)
Introduction to sociological analysis of theoretical/methodological approaches to Chicano/a and Latina/o communities. Socioeconomic conditions, education, cultural change, the family, gender relations, political experiences. Theories, issues, methods of sociological research. Debates regarding qualitative/quantitative research methods.

CHIC 3852. Chicana/o Politics. (3 cr. §POL 3752)
Foundations/contradictions of contemporary Chicano politics. Policy issues that concern Latinos, successes/failures of Latino empowerment strategies, electoral impact of Latino votes. Question of whether there is a Latino politic/community.

CHIC 3900. Topics in Chicano Studies. (3 cr [max 6 cr]; A-F only)
Topics vary by section of course.

CHIC 3993. Directed Studies. (1-9 cr [max 16 cr]. Prereq–#)
Guided individual reading, research, and study. Students often do preliminary readings and research in conjunction with plans for education abroad programs.

CHIC 4231. The Color of Public Policy: African Americans, American Indians, and Chicanos in the United States. (3 cr. §AAS 4231, AFRO 4231, AMIN 4231)
Examination of the structural or institutional conditions through which people of color have been marginalized in public policy. Critical evaluation of social theory in addressing the problem of contemporary communities of color in the United States.

CHIC 4232. Chicana/o - Latina/o Gender and Sexuality Studies. (3 cr)
Critical thinking of Chicanas/os and Latinas/os around construction of gender. Politics of sexual identity. How the self is gendered in relationship to sexual, racial, class, and national identities under different social structural conditions. Way in which the "borders" that define/confine sexual norms shift over time.

CHIC 4275. Theory in Action: Community Engagement in a Social Justice Framework. (3 cr)
Sociopolitical issues in Latina/o community. Various theories advocating a more just society. Problem-solving approaches. What it means to be a responsible/ethical citizen. Need for communication/understanding between members of diverse/unequal groups in working toward social transformation.

CHIC 4401. Chicana/Latina Cultural Studies. (3 cr. §WOST 4401)
Diversity of cultures that are called "Hispanic"; women in these cultures; Chicanas and Latinas living in the United States or migrating from their home nations to the United States.

CHIC 4900W. Proseminar: Senior Project. (1 cr)
Students work closely with a faculty member to complete their senior project.

CHIC 4901W. Senior Paper. (2 cr. Prereq–¶4900)
Capstone experience. Students produce original research paper or creative project on a topic determined in consultation with a faculty adviser.

CHIC 5374. Migrant Farmworkers in the U.S.: Families, Work, and Advocacy. (3 cr)
Social, economic, and legal realities of migrant workers. Demographic shifts, laws, and policies. Farmworker movements and other responses to conditions facing migrants in contemporary economy. Gendered nature of work. Way in which commodities are produced and resistance expressed within structures/traditions of an increasingly globalized system.

CHIC 5920. Topics in Chicana(o) Studies. (3 cr. Prereq–Sr or grad student)
Multidisciplinary themes in Chicano studies. Issues of current interest.

CHIC 5993. Directed Studies. (1-3 cr [max 16 cr]. Prereq–#)
Guided individual reading, research, and study for completion of the requirements for a senior paper or honors thesis.

Child Psychology (CPSY)

Institute of Child Development

College of Education and Human Development

CPSY 1905. Freshman Seminar. (1-3 cr [max 6 cr]. Prereq–Fr)
Interdisciplinary seminar. Topics specified in *Class Schedule*.

CPSY 2301. Introductory Child Psychology. (4 cr. Prereq–4 cr intro psych)
Introduction to the science of child behavior; review of theory and research.

CPSY 3301. Introductory Child Psychology for Social Sciences. (4 cr)
The science of child behavior; review of theory and research. Designed for majors in psychology, sociology, and related disciplines; not suggested for child psychology majors.

CPSY 3308. Introduction to Research Methods in Child Psychology. (4 cr; A-F only. Prereq–2301, PSY 1001)
Techniques used in the study of child development; emphasis on collection, organization, and analysis of data.

CPSY 3360. Child Psychology Honors Seminar. (2 cr; A-F only. Prereq–CPSY honors student)
Acquaints students with the various research projects and activities in the Institute for Child Development and in related departments. Faculty are invited to discuss their research projects with seminar participants.

CPSY 4302. Infant Development. (4 cr; A-F only. Prereq–2301 or #)
Perceptual, motor, emotional, social, and cognitive development during the first two years of life; the developing infant in his or her social and physical environment.

CPSY 4303. Adolescent Psychology. (4 cr; A-F only. Prereq–PSY 1001)
Overview of development in the second decade of life. Interactions of adolescents with family, school, and society.

CPSY 4310. Special Topics in Child Development. (1-4 cr [max 12 cr]. Prereq–2301)
Topics/credits vary.

CPSY 4311. Behavioral and Emotional Problems of Children. (4 cr; A-F only. Prereq–Intro psych)
Behavioral and emotional problems of children and adolescents; psychopathology contrasted to normal development; symptoms, causes, course, and prevention of common disorders, excluding physical and sensory handicaps.

CPSY 4313. Disabilities and Development. (4 cr. Prereq–PSY 1001)
Surveys all areas of exceptionality. Mental, hearing, vision, physical, speech, language handicaps. Learning disabilities. Autism. Emotional/behavior disorders. Giftedness.

CPSY 4329. Biological Foundations of Development. (4 cr; A-F only. Prereq–2301 or equiv)
Evolutionary theory and behavioral genetics applied to understanding of development of human behavior; formation of species-typical adaptive behavior and individual differences in infancy, childhood, and adolescence. This course is only offered Fall semesters.

CPSY 4331. Social and Personality Development. (4 cr; A-F only. Prereq–2301, PSY 1001)
Development of social relations and personality; research, methodology, and contrasting theoretical perspectives. Survey of findings on interpersonal relationships, the concept of self, prosocial and antisocial behavior, and acquisition of social roles.

CPSY 4334W. Children, Youth in Society. (4 cr; A-F only. Prereq–2301)
Child development principles relative to social policy decision making. Issues in applying theories, findings to problems (e.g., media influences, mainstreaming, day care, child abuse, effects of peers).

CPSY 4336W. Development and Interpersonal Relations. (4 cr; A-F only. Prereq–2301 or equiv, 4331)
Processes and functions of interactions with parents and peers; analysis of theory and research on developmental changes and influences.

CPSY 4341. Perceptual Development. (4 cr. Prereq–2301)
Perceptual learning and the development of sensory and perceptual processes.

CPSY 4343. Cognitive Development. (4 cr; A-F only. Prereq–2301)
Cognitive processes; relevant theory, research literature, and methodology.

CPSY 4345. Language Development and Communication. (4 cr; A-F only. Prereq–2301)
Structure and function of language; factors influencing development; methodological problems, language scales, theories.

CPSY 4347W. Senior Project. (2 cr; A-F only. Prereq–CPSY sr)
Current literature on self-selected developmental topic. Students write a literature review.

CPSY 4993. Directed Instruction in Child Psychology. (1-4 cr [max 8 cr]; S-N only. Prereq–4 cr CPsy, #)
Students serve as teaching assistants or peer advisers.

CPSY 4994. Directed Research in Child Psychology. (1-4 cr [max 8 cr]. Prereq–4 cr in CPsy, #, Δ)
Individual empirical investigation. Students help plan/implement scientific studies, gain experience/expertise in methodology of research.

CPSY 4994V. Directed Research in Child Psychology (Honors Thesis). (1-6 cr [max 6 cr]. Prereq–4 cr in CPsy, CPSY honors, #, Δ)
Individual empirical investigation. Students help plan/implement scientific studies while gaining experience/expertise in research methodology.

CPSY 4996. Field Study in Child Psychology. (1-4 cr [max 8 cr]; S-N only. Prereq–4 cr CPsy, #)
Independent reading. Varies depending on student's specific area of interest. Students receive credit while interning in metropolitan area.

CPSY 5251. Social and Philosophical Foundations of Early Childhood Education. (3 cr. Prereq–[MEd student in ECE or ECSE] or #)
Surveys imagery, history, philosophy, and psychology of early childhood education. Analyzing/interpreting trends in early education, including diversity, special needs, legislation, public policy, and educationally appropriate practice.

CPSY 5252. Facilitating Social and Physical Learning in Early Childhood Education. (3 cr. Prereq–Student in early childhood ed or early childhood special ed)
Current theoretical/empirical literature and developmental knowledge as basis for planning, implementing, and evaluating social/physical growth/development of young children. For students obtaining ECE/ECSE licensure.

CPSY 5253. Facilitating Cognitive and Creative Learning in Early Childhood Education. (3 cr; A-F only. Prereq–MEd student in early childhood ed or early childhood special ed, or #)
Overview of cognitive, creative, and language characteristics of children ages 0-8 years and of how teachers can plan curriculum to facilitate children's development in these areas.

CPSY 5281. Student Teaching in Early Childhood Education. (3-6 cr [max 6 cr]; S-N only. Prereq–MEd student in early childhood ed or early childhood special ed)
Application of theory/research relating to teaching preschool children. For individuals obtaining ECE licensure.

CPSY 5413. Early Childhood and Public Policy. (3 cr)
State, federal, and international policies and legislative activity touching first five years of a child's life. Family, community, and institutional roles in promoting children's social, cognitive, and emotional development. Issues related to health, mental health, poverty, developmental delays, and special needs.

CPSY 5414. Individualized Learning Experience in Early Childhood and Public Policy. (1-3 cr [max 3 cr]. Prereq–Early Childhood Policy Certificate student, #)
Individualized, applied learning experience. Focuses on early childhood policy development, research, or evaluation. Students attend an early childhood policy lecture series and participate in small discussion groups and follow-up activities.

Chinese (CHN)

Department of Asian Languages and Literatures

College of Liberal Arts

CHN 1011. Beginning Modern Chinese. (6 cr. §CHN 4001)
Speaking and reading modern standard Chinese through structured practice.

CHN 1012. Beginning Modern Chinese. (6 cr. §CHN 4002. Prereq–1011 or equiv or #)
Speaking and reading modern standard Chinese through structured practice.

CHN 1015. Accelerated Beginning Modern Chinese. (5 cr. Prereq–Oral/aural skills or speaker of other Chinese dialect recommended)
Reading, writing, standard pronunciation. Meets with 4005.

CHN 1016. Accelerated Intermediate Modern Chinese. (5 cr. Prereq–1012 or 1015; oral/aural skills or speaker of other Chinese dialect recommended)
Continuation of CHN 1015. Mandarin Chinese course designed primarily for students with oral/aural skills but with little or no exposure to reading and writing. Also for speakers of other Chinese dialects and others with prior experience. Concentration on reading, writing, and standard pronunciation. Equivalent to two semesters, Chinese 3021-3022. Upon completion, student may enter Advanced Modern Chinese, Chinese 3031.

CHN 3021. Intermediate Modern Chinese. (5 cr. §CHN 4003. Prereq–1012 or 1015 or equiv or #)
Modern standard Chinese skills developed further through conversations, writing, and reading.

CHN 3022. Intermediate Modern Chinese. (5 cr. Prereq–3021)
Modern standard Chinese skills developed further through conversation and reading.

CHN 3031. Advanced Modern Chinese. (4 cr. Prereq–3022 or equiv or #)
Reading and analysis of 20th-century texts.

CHN 3032. Advanced Modern Chinese. (4 cr. Prereq–3031 or equiv or #)
Reading and analysis of 20th-century texts.

CHN 3041. Business Chinese. (4 cr. Prereq–3032 or equiv or #)
Reading and analysis of commercial and business texts.

CHN 3111. Introductory Classical Chinese. (3 cr. Prereq–3022 or equiv or #)
Study of classical Chinese through reading and analysis of representative texts.

CHN 3112. Introductory Classical Chinese. (3 cr. Prereq–3111)
Study of classical Chinese through reading and analysis of representative texts.

CHN 3161. Media Cultures in Modern China. (3 cr. Prereq–Soph or higher; Chinese language not required, background in modern Chinese history recommended)
Relations among media technologies, cultural identities, and politics in China from 19th century to present. Emphasizes photography, graphic arts, popular music/recording. Some attention to cinema and popular fiction. Ways of analyzing popular/mass culture.

CHN 3201. Chinese Calligraphy. (2 cr)
Appreciation and execution of Chinese calligraphy through guided practice.

CHN 3202. Intermediate Chinese Calligraphy. (2 cr. Prereq–3201 or #)
Advanced techniques of composing Chinese characters using regular style of Chinese calligraphy.

CHN 3290. Chinese Language Teaching Tutorial. (1 cr [max 2 cr] Prereq–Grade of A in 3032)
Students tutor beginning students of Chinese and are part of department's Chinese language team.

CHN 4001. Beginning Modern Chinese. (3 cr. §CHN 1011. Prereq–[passing score on GPT in another language or grad student])
Speaking/reading modern standard Chinese through structured practice. Meets with 1011.

CHN 4002. Beginning Modern Chinese. (3 cr. §CHN 1012. Prereq–4001, [passing score on GPT in another language or grad student])
Speaking/reading modern standard Chinese through structured practice. Meets with 1012.

CHN 4003. Intermediate Modern Chinese. (3 cr. §CHN 3021. Prereq–4002; [passing score on GPT in another language or grad student])
Modern standard Chinese skills developed through conversations, writing, and reading. Meets with 3021.

CHN 4004. Intermediate Modern Chinese. (3 cr. Prereq–4003, [passing score on GPT in another language or grad student])
Modern standard Chinese skills developed through conversation and reading. Meets with 3022.

CHN 4005. Accelerated Beginning Modern Chinese. (3 cr. Prereq–#; oral/aural skills or other Chinese dialect recommended)
Mandarin Chinese. Reading, writing, standard pronunciation.

CHN 4006. Accelerated Intermediate Modern Chinese. (3 cr. Prereq–1012 or 1015 or #; oral/aural skills or other Chinese dialect recommended)
Continuation of 1015. Mandarin Chinese. Reading, writing, standard pronunciation.

CHN 4007. Advanced Modern Chinese. (3 cr. Prereq–4004, [passing score on GPT in another language or grad student])
Reading/analysis of 20th-century texts. Meets with 3031.

CHN 4008. Advanced Modern Chinese. (3 cr)
Reading/analysis of 20th-century texts. Meets with 3032.

CHN 4011. Chinese Traditional Literature in Translation I. (4 cr)
Representative works of Chinese literature in translation from ancient times until the end of the T'ang dynasty.

CHN 4012W. Chinese Traditional Literature in Translation II. (4 cr)
Representative works of Chinese literature in translation from end of T'ang dynasty until end of 19th Century.

CHN 4023. 20th-Century Chinese Literature in Translation. (4 cr. Prereq–Background in modern Chinese history desirable; knowledge of Chinese language not required)
Main trends in Chinese literature from May 4th, 1919 to 1979, including Taiwanese literature.

CHN 4024. Contemporary Chinese Literature in Translation. (4 cr. Prereq–Background in modern Chinese history desirable; knowledge of Chinese language not required)
Main trends in Chinese literature from 1979 to the present.

CHN 4121. History of the Chinese Language. (4 cr. Prereq–3111)
Sources and methods in the study of the historical development of the Chinese language.

CHN 4125. Structure of Modern Chinese. (4 cr. Prereq–3022 or equiv or #)
Analysis of the grammatical structures of modern standard Chinese.

CHN 4234. Chinese Poetry in Translation. (4 cr. Prereq–No knowledge of Chinese required)
Major themes, genres, and technical conventions of Chinese poetry from the classical age of poetry to the modern period.

CHN 4241. Filmic Construction of Modernity in China. (4 cr)
A survey of important films made after the Cultural Revolution with a special emphasis on the critically acclaimed "Fifth Generation" filmmakers.

CHN 4292. Directed Reading. (1-5 cr [max 5 cr]. Prereq–#, Δ, ❑)
Guided individual reading or study.

CHN 5011. Research Methods. (4 cr. Prereq–3032 or 3112)
Introduction to the sources and approaches of research in language and literature.

CHN 5015. Chinese Philosophical/Historical Texts. (4 cr. Prereq–3112)
Readings from major texts in Chinese philosophical and historical traditions.

CHN 5018. Chinese Religious Texts. (4 cr. Prereq–3112)
Traditional Chinese religious systems through selected texts.

CHN 5040. Readings in Chinese Texts. (2-4 cr [max 12 cr]; A-F only. Prereq–3032 or equiv or #)
Students read authentic materials of various types to increase reading/speaking ability. Topics specified in *Class Schedule*.

CHN 5120. Topics in Chinese Linguistics. (4 cr [max 8 cr]. Prereq–4121 or 4125)
Studies of the structure and change in the Chinese language.

CHN 5230. Topics in 20th-Century Chinese Literature. (4 cr [max 8 cr]. Prereq–3032)
Studies of representative literary works from May 4, 1919 to the present.

CHN 5240. Topics in Chinese Poetry. (4 cr [max 8 cr]. Prereq–3112)
Selected major Chinese poets and poetic forms.

CHN 5242W. Chinese Classical Drama and Theatre. (4 cr)
A multimedia course on traditional Chinese theatre.

CHN 5250. Topics in Chinese Fiction. (4 cr [max 8 cr]. Prereq–3032 or 3112)
Studies of traditional and modern Chinese fiction.

CHN 5260. Topics in Premodern Chinese Prose. (4 cr [max 8 cr])
Studies of representative Chinese prose writings of the pre-modern period.

CHN 5393. Directed Study. (1-5 cr [max 18 cr]. Prereq–#, Δ, ❑)
Guided individual reading or study.

Civil Engineering (CE)

Department of Civil Engineering

Institute of Technology

CE 5. Refresher Course for Civil Engineers. (0 cr; S-N only. Prereq–BCE or equivalent degree or completion of PARTS I and II of the State Board ExAMINation)
Review of civil engineering fundamentals required to pass the Minnesota Professional Engineering Examination in civil engineering.

CE 1101. Civil Engineering Orientation. (1 cr; S-N only)
Introduction to the Civil Engineering Department and civil engineering practice. Presented by faculty members and professional engineers.

CE 3101. Computer Applications in Civil Engineering I. (3 cr; A-F only. Prereq–MATH 1272, IT)
Introduction to computer tools/methods for solving civil engineering problems. Spreadsheets, Autocad, Mathcad, Visual Basic. Numerical integration, curve fitting, linear/nonlinear equations, differential equations.

CE 3102. Uncertainty and Decision Analysis in Civil Engineering. (3 cr; A-F only. Prereq–[MATH 1371, MATH 1372] or equiv)
Stochastic models and their usefulness in reasoning about uncertainty in civil engineering. Techniques for identifying, fitting, and validating models using data samples. Testing hypotheses about, and bounding the uncertainty attached to, important engineering parameters. Applications to problems arising in construction, environmental, geotechnical, structural, transportation, and water resources engineering.

CE 3111. CADD for Civil Engineers. (2 cr. Prereq–3201)
Introduction to AutoCAD and land development desktop software. Students complete all tasks to design two-lane roadway using civil engineering design software, including topography, plan/profile, contours, cross sections, and quantity calculations.

CE 3201. Transportation Engineering. (3 cr. Prereq–PHYS 1301)
Apply laws of motion to describe vehicle performance and determine constraints for highway designs. Traffic flow principles and their relation to capacity and level of service. Introduction to geometric design, pavement design, and transportation planning.

CE 3202. Surveying and Mapping. (2 cr; A-F only. Prereq–IT or #; MATH 1271, 1272)
Theory of precision measurements of distance, elevation, angle, and direction of points and lines above, on, or beneath the earth's surface; establishing such points or lines. Elements of coordinate systems, datum planes, and maps.

CE 3301. Soil Mechanics I. (3 cr; A-F only. §GEOE 3301. Prereq–IT, AEM 3031)
Index properties and soil classification. Effective stress. Permeability and seepage. Elasticity theory. One-dimensional compression and consolidation; settlements. Compaction; cut and fill problems.

CE 3401. Linear Structural Analysis. (3 cr; A-F only. Prereq–Grade of at least C- in AEM 3031, IT)
Analysis of determinate/indeterminate trusses and frames and of deformation by virtual work. Application of energy, slope-deflection, and moment distribution methods to indeterminate structures. Influence lines. Design.

CE 3402. Construction Materials. (3 cr; A-F only. Prereq–Grade of at least C- in AEM 3031, IT)
Basic concepts of behavior mechanisms for construction materials such as concrete, metals, asphalt, plastics, and wood. Standard specifications for material properties. Techniques for testing.

CE 3406. Construction Materials for Managers. (3-4 cr; A-F only. Prereq–[AEM 2011 or WPS 4301], construction management major)
Basic concepts of physical properties and behavior mechanisms for construction materials such as concrete, steel, aluminum, and wood. Standard specifications for material properties. Laboratory techniques for evaluation of each material.

CE 3501. Environmental Engineering. (3 cr; A-F only. Prereq–CHEM 1022, PHYS 1302)
Introduction to environmental engineering. Quantitative approach to environmental problems. Scientific background for understanding roles of engineers and scientists.

CE 3502. Fluid Mechanics. (4 cr; A-F only. Prereq–[AEM 2012 or AEM 3031], Math 2373, [IT or ForP major])
Fluid statics/dynamics. Kinematics of fluid flow, equations of motion, pressure-velocity relationships, viscous effects, boundary layers. Momentum/energy equations. Lift/drag. Flow in pipes and pipe systems. Hydraulic machinery. Fluid measurements.

CE 4011. Special Topics. (1-4 cr [max 12 cr] Prereq–Upper div IT)
Topics/credits vary.

CE 4101W. Project Management. (3 cr. Prereq–Upper div IT or construction management)
Survey of engineering project management, economics. Project planning, scheduling, and controlling. Budgeting, staffing, task cost control. Communicating with, motivating, leading, and managing conflict among team members. Engineering economics.

CE 4102W. Capstone Design. (3 cr; A-F only. Prereq–3201, 3202, 3301, 3401, 3402, 3501, 3502)
Teams formulate/solve civil engineering problems. >From conceptual stage through preliminary planning, public hearings, design, environmental impact statements, final plans/specifications, and award of contracts.

CE 4111. Engineering Systems Analysis. (3 cr. §GEOE 4111. Prereq–Upper div IT)
"Systems" approach to problems. Operations research—decision engineering, network analysis, simulation, linear programming, and expert systems—is used to represent systems and assess trade-offs.

CE 4121. Computer Applications in Civil Engineering II. (3 cr; A-F only. §GEOE 4121. Prereq–CE or upper div GeoE, 3101, Math 2243, Math 2263)
Advanced application of computer tools and methods in solving partial differential equations from civil engineering problems. The major tools are Spreadsheet and Visual Basic programming. Methods include finite differences, boundary element, finite element, and control volume finite element.

CE 4170. Independent Study I. (1-4 cr [max 4 cr]. Prereq–#)
Special studies in planning, designing, or analyzing civil engineering systems. Lab problems, literature studies, or reports supervised by staff.

CE 4180. Independent Study II. (1-4 cr [max 4 cr]. Prereq–#)
Special studies in the planning, design, or analysis of civil engineering systems. Individual lab research problems, literature studies, reports. Supervised by staff.

CE 4190. Engineering Co-op Assignment. (2-6 cr [max 6 cr]; S-N only. Prereq–Upper div CE, approval of department co-op director)
Formal written report of work during six-month professional assignment.

CE 4201. Highway Design. (3 cr; A-F only. Prereq–CE or upper div GEOE or grad, 3202, 3201 or #)
Vertical and horizontal alignment, earthwork computations, highway capacity, forecast of traffic volume demand, impact of vehicle type on geometric design, intersection design.

CE 4211. Traffic Engineering. (3 cr. Prereq–3201 or STAT 3021 or equiv)
Principles of vehicle/driver performance as they apply to safe/efficient operation of highways. Design/use of traffic control devices. Capacity/level of service. Trip generation, traffic impact analysis. Safety/traffic studies.

CE 4231. Pavement Engineering. (3 cr. Prereq–[3201, 3301, 3402, [upper div IT or grad student]] or #)
Concepts/principles in rigid/flexible pavement design. Traffic loads, soil considerations, material characteristics for highway/airfield pavement design.

CE 4232. Cemented Materials. (3 cr. Prereq–Upper div IT or grad, CE 3402 or #)
Characteristics of and lab testing for mineral aggregates: cement, mortar, fresh/hardened concrete, and asphalt-cement mixtures. Construction and long-term performance of mixtures.

CE 4301. Soil Mechanics II. (3 cr; A-F only. §GEOE 4301. Prereq–[[3301 or GEOE 3301], upper div IT] or #)
Traction and stress. Mohr-Coulomb failure criterion. Experiments on strength and on angle of internal friction. Earth pressure theories, rigid/flexible retaining walls. Bearing capacity of shallow foundations. Stability of slopes.

CE 4311. Rock Mechanics . (4 cr; A-F only. Prereq–3301 or GEOE 3301 or #)
Site investigation/classification. In-situ stresses. Strength/failure criteria of rock/interfaces. Stereographic projections. Kinematic analysis of rock slopes. Block size/stability. Reinforcement. Methods of stress analysis. Pillar design, stiffness effects. Elastoplastic analysis. Rock-support interaction. Numerical modeling of support systems. Lab testing of rock.

CE 4341. Engineering Geostatistics. (3 cr; A-F only. §GEOE 4341. Prereq–CE, GEOE or upper div Geo or grad, STAT 3021 or #)
Problem solving and decision making in civil and geological engineering using applied statistics. Emphasizes spatially correlated data, e.g., geologic site characterization, spatial sampling design.

CE 4351. Groundwater Mechanics. (3 cr; A-F only. §GEOE 4351. Prereq–Upper div IT or grad, CE 3502 or #)
Shallow confined and unconfined flows. Two-dimensional flow in vertical plane, transient flow. Flow toward wells. Determination of streamlines and pathlines in two and three dimensions. Introduction to contaminant transport. Elementary computer modeling.

CE 4352. Groundwater Modeling. (3 cr; A-F only. §GEOE 4352. Prereq–Upper div IT or grad, CE 4351, GEOE 4351 or #)
Analytic element method. Mathematical and computer modeling of single and multiple aquifer systems. Field problems. Theory and application of contaminant transport models, including capture zone analysis.

CE 4401. Steel and Reinforced Concrete Design. (4 cr; A-F only. Prereq–Grade of at least C- in 3401, ¶3402, [upper div IT or grad student])
Limit-states design. Steel: tension, compression, flexure, combined compression/flexure, connections. Concrete: beams in flexure/shear, one-way slabs, T-beams, development length, serviceability.

CE 4411. Matrix Structural Analysis. (3 cr; A-F only. Prereq–[Grade of at least C- in [3101, 3401] or in a CSCI programming course], [upper div IT or grad student]] or #)
Analysis of linear structural systems by matrix methods, stiffness, and flexibility methods. Introduction to computerized structural analysis of trusses/frames, including coding in programming language.

CE 4412. Reinforced Concrete Design II. (3 cr; A-F only. Prereq–[Grade of at least C- in 4401, [upper div IT or grad student]] or #; 4411 recommended)
Advanced design of reinforced concrete structures: footings, retaining walls, columns with slenderness effects and biaxial loading, torsion, continuous systems, two-way floor systems.

CE 4413. Steel Design II. (3 cr; A-F only. Prereq–[Grade of at least C- in 4401, [upper div IT or grad student]] or #; 4411 recommended)
Design of steel and composite steel/concrete structures, including multistory frames and plate-girders bridges. Beam-columns, torsion, connections, frames.

CE 4414. Prestressed Concrete Design. (3 cr; A-F only. Prereq–[Grade of at least C- in 4401, [upper div IT or grad student]] or #; 4412 recommended)
Design of prestressed concrete structures. Time dependent effects, behavior, flexure, shear, torsion, deflections, continuous systems.

CE 4415. Masonry Structures. (3 cr; A-F only. Prereq–[Grade of at least C- in 3401, [upper div IT or grad student]] or #; 4401 recommended)
Masonry materials and their production. Mortars, grouts. Design of unreinforced, reinforced, and prestressed masonry structural systems. Walls, columns, lintels, arches. Codes/specifications, testing, inspection.

CE 4501. Hydrologic Design. (4 cr; A-F only. Prereq–3502)
Hydrologic cycle: precipitation, evaporation, infiltration runoff. Flood routing through rivers and reservoirs. Statistical analysis of hydrologic data and estimation of design flows. Open channel flow, flow through conduits. Detention basin design, hydraulic structure sizing, estimation of risk of flooding.

CE 4502. Water and Wastewater Treatment. (3 cr; A-F only. Prereq–3501)
Theory of chemical, physical, and biological processes in treating water and wastewater. Sequencing of processes. Design of treatment facilities.

CE 4511. Hydraulic Structures. (4 cr; A-F only. Prereq–4501)
Hydraulic design procedures for culverts, dams, spillways, outlet works, and river control works. Drop structures, water intakes, bridge crossings. Offered alt yrs.

CE 4512. Open Channel Hydraulics. (4 cr; A-F only. Prereq–IT or grad, 3502 or #)
Theories of flow in open channels, including gradually varied and rapidly varied flows, steady and unsteady flows. Computational methods for unsteady open channel flows, applications to flood routing. Introduction to moveable bed mechanics.

CE 4531. Environmental Process Engineering. (3 cr; A-F only. Prereq–3501, ¶4541)
Physical principles that influence behavior of engineered and natural environmental systems. Flow behavior through reactors, mass transfer, interfacial effects, stability, kinetics.

CE 4561. Solid Hazardous Wastes. (3 cr. Prereq–IT or grad, CHEM 1022, 3501 or #)
Solid and hazardous waste characterization; regulatory legislation; waste minimization; resource recovery; chemical, physical, and biological treatment; thermal processes; disposal practices. Analysis and design of systems for treatment and disposal.

CE 4562. Environmental Remediation Technology. (3 cr; A-F only. Prereq–[3501, 4501] or #)
Technologies designed for removal of pollutants from groundwater and soils. Advances in technological design. Emerging technologies such as in situ bioremediation, phytoremediation. Role of environmental biotechnology in pollution abatement.

CE 4591. Environmental Law for Engineers. (3 cr; A-F only. Prereq–Upper div IT or grad or #)
Environmental regulatory law relevant to civil and environmental engineering; specific provisions of federal statutory and regulatory laws such as NEPA, CWA, RCRA, CAA, and CERCLA.

CE 5094. Civil Engineering Research. (1-4 cr [max 4 cr]. Prereq–#)
Research or independent study in concrete, structural steel, soils, hydraulics, hydrology/municipal, environmental, or transportational problems. Investigations, reports, tests, designs.

CE 5170. Internet Based Study. (1-5 cr [max 15 cr]; A-F only. Prereq–Upper div IT)
Internet based teaching with bi-weekly exercises on topic of concern.

CE 5180. Special Topics. (1-4 cr [max 4 cr]; A-F only. Prereq–#)
Topics vary depending on faculty and student interests.

CE 5211. Traffic Engineering. (3 cr. Prereq–3201, STAT 3021 or equiv)
Principles of vehicle and driver performance as they apply to the safe and efficient operation of highways. Design and use of traffic control devices. Capacity and level of service. Trip generation and traffic impact analysis. Safety and traffic studies.

CE 5212. Transportation Policy, Planning, and Deployment. (3 cr. Prereq–3201 or equiv)
Techniques of analysis and planning for transportation services. Demand-supply interactions. Evaluating transportation alternatives. Travel demand forecasting. Integrated model systems. Citizen participation in decision-making.

CE 5214. Transportation Systems Analysis. (3 cr. Prereq–3201)
Systems approach, its application to transportation engineering/planning. Prediction of flows and level of service. Production functions, cost optimization, utility theory, demand modeling, transportation network analysis, equilibrium assignment, decision analysis, multidimensional evaluation of transportation projects.

CE 5231. Pavement Management and Rehabilitation. (3 cr. Prereq–Upper div IT or grad, CE 4231 or #)
Concepts and practices in monitoring, maintaining, and rehabilitating flexible and rigid pavement systems. Manual and automated means of pavement assessment, structural and functional definitions of pavement performance, decision-making processes, and optimization.

CE 5232. Advanced Portland Cement Concrete. (3 cr. Prereq–Upper div IT or grad, CE 4232 or #)
Advanced topics in cement chemistry and selection of materials for and design of portland cement concrete mixtures. Lab assignments pertaining to mixture design and short-term and long-term behavior. Use of admixtures and fiber reinforcement. Effects of proportionment of standard materials.

CE 5233. Advanced Bituminous Materials. (3 cr. Prereq–Upper div IT or grad, CE 3402 or #)
Advanced topics in selection and design of bituminous materials. Asphalt cement, rheology, emulsions, chip seals, hot-mix asphalt design, viscoelastic characterization. Lab assignments pertaining to rheology, mixture design and viscoelastic behavior.

CE 5311. Experimental Geomechanics. (3 cr; A-F only. §GEOE 5311. Prereq–Upper div IT or grad, 4301, GEOE 4301 or #)
Machine stiffness, closed-loop testing. Small-strain theory. Measurement of deformation: strain gages, LVDTs, accelerometers, and associated circuits. Direct and indirect testing. Material behavior: experiments on anisotropic, damaged, and fluid-filled solids.

CE 5321. Geomechanics. (3 cr; A-F only. §GEOE 5321. Prereq–Upper div IT or grad, 4301 or GEOE 4301)
Elasticity theory and solution of elastic boundary value problems. Wave propagation in unbounded elastic media. Elements of fracture mechanics and applications. Elements of poroelasticity and applications.

CE 5331. Geomechanics Modeling. (3 cr; A-F only. §GEOE 5331. Prereq–Upper div IT or grad, 4301 or #)
Soil and rock response in triaxial testing; drained and undrained behavior; elastic and plastic properties. Modeling stresses, strains, and failure in geomechanics problems.

CE 5341. Wave Methods for Nondestructive Testing. (4 cr; A-F only. Prereq–[AEM 2021, AEM 3031] or #)
Introduction to contemporary methods for nondestructive characterization of objects of civil infrastructure (e.g., highways, bridges, geotechnical sites). Imaging technologies based on propagation of elastic waves such as ultrasonic/resonant frequency methods, seismic surveys, and acoustic emission monitoring. Lecture, lab.

CE 5351. Advanced Mathematics for Civil Engineers. (3 cr; A-F only. Prereq–[[Math 2263 or Math 2374 or equiv], [sr or grad student] in civil engineering]] or #)
Emphasizes skills relevant for civil engineers. Mathematical principles explained in an engineering setting. Applications from various areas in civil engineering.

CE 5411. Applied Structural Mechanics. (3 cr; A-F only. Prereq–[Grade of at least C- in 4401, [upper div IT or grad student]] or #)
Principal stresses and failure criteria in 3 dimensions. Introduction to plane elasticity, energy methods, torsion of beams, and bending of unsymmetrical beams.

CE 5541. Environmental Water Chemistry. (3 cr [max 4 cr]; A-F only. Prereq–3501, CHEM 1021, CHEM 1022)
Introduction to water chemistry. Physical chemical principles, geochemical processes controlling chemical composition of waters, behavior of contaminants that affect the suitability of water for beneficial uses.

CE 5542. Experimental Methods in Environmental Engineering. (3 cr; A-F only. Prereq–3501, CHEM 1021, CHEM 1022)
Tools necessary to conduct research in environmental engineering and chemistry. Theory of operation of analytical equipment. Sampling and data handling methods, statistical analyses, experimental design, laboratory safety. Lecture, laboratory.

CE 5551. Environmental Microbiology Laboratory. (4 cr; A-F only. Prereq–3501, [upper div or grad] student)
Role of microorganisms in environmental bioremediation, pollution control, water/wastewater treatment, biogeochemistry, and human health. Basic microbiological techniques: isolation, identification/enumeration of bacteria, BOD, biodegradation kinetics, disinfection. Lecture, lab.

CE 5581. Water Resources: Individuals and Institutions. (3 cr; A-F only)
Control of water resources by natural system functions, user actions, and influence of social, economic, and political institutions. Water resource policy in the United States. Case studies (e.g., flood/drought management).

Classical and Near Eastern Studies (CNES)

Department of Classical and Near Eastern Studies

College of Liberal Arts

CNES 1001. World of the Bible: Religions, Empires, and Discourses of Power. (3 cr)
Hebrew Bible (Old Testament), its cultural background in Ancient Near East. Comparative study of Ancient Near Eastern and biblical literature, religion, lifestyles, and law. Nature of myth, concepts of divine. Origins, authorship, and transmission of texts that constitute Hebrew Bible.

CNES 1002. World of Greece. (3 cr)
Ancient Greek civilization, from second millenium BCE to Roman period. Art/archaeology, philosophy, science, literature, social/political institutions. Focuses on connections with contemporary cultures corresponding to Ancient Near East.

CNES 1003. World of Rome. (3 cr)
Roman civilization, from Etruscan origins to late antiquity. Cultural diversity of Mediterranean civilization. Ways of life, social, and political institutions as evidenced by literature, art, architecture, history, and material culture.

CNES 1042. Greek and Roman Mythology. (4 cr. §CNES 1042H. Prereq–§: CLAS 1042, 1042H)
Introduction to the stories and the study of Greek and Roman mythology.

CNES 1042H. Honors Course: Greek and Roman Mythology. (4 cr. §CNES 1042. Prereq–Honors or #)
Introduction to stories/study of Greek/Roman mythology.

CNES 1043. Introduction to Greek and Roman Archaeology. (4 cr)
Role that material culture, including art/architecture, plays in forming our picture of Classical past. Relationship between archaeology and other disciplines dealing with past. Selected sites, motives/methods of research. How results are used by archaeologists and general public.

CNES 1044. Introduction to Near Eastern Archaeology. (3 cr)
Near Eastern peoples before Greco-Roman times, how archaeology discovered them. Cultural history going back 10,000+ years, including rise of farming, domestic life, states, and empires. Art, ideas, and architecture of Egypt, Babylonia, Persia, and other civilizations.

CNES 1046. Technical Terminology for the Health Professions. (3 cr. Prereq–§: CLAS 1148)
Greek and Latin prefixes, suffixes, and roots basic to the vocabulary of health professions; taught through computer-assisted instruction.

CNES 1082. Jesus in History. (3 cr. §RELA 1082)
Jesus of Nazareth in his original setting. Modern approaches to the historical Jesus. Perspectives/needs of early gospel writers, effects on portrayals of Jesus. Shifting representations of Jesus in new historical/cultural situations. Meets with Clas 1082.

CNES 1082H. Honors Course: Jesus in History. (4 cr. §RELA 1082H. Prereq–honors)
Jesus of Nazareth in his original setting. Modern approaches to the historical Jesus. Perspectives/needs of early gospel writers, effects on portrayals of Jesus. Shifting representations of Jesus in new historical/cultural situations. Meets with 1082.

CNES 1201. The Bible: Context and Interpretation. (3 cr. §CNES 3201, JWST 1201, JWST 3201, RELA 3201)
Survey of literary and historical narrative texts from Pentateuch, Joshua, Judges, Samuel, Kings, and Ruth. Art of biblical narrative, major themes of biblical stories. Comparison with other Ancient Near Eastern literatures. Literary conventions of biblical writers.

CNES 1905. Freshman Seminar. (3 cr)
Topics specified in *Class Schedule*.

CNES 1909W. Freshman Seminar. (3 cr)
Topics specified in *Class Schedule*.

CNES 1910W. Freshman Seminar. (3 cr. Prereq–Fr or up to 30 cr)
Topics specified in *Class Schedule*.

CNES 3008. History of Ancient Art. (4 cr. §ARTH 3008)
Architecture, sculpture, and painting of selected early cultures; emphasis on influences on the development of Western art.

CNES 3035. Classical Myth in Western Art. (4 cr. §ARTH 3035)
Role of myth in visual arts. Major figures/stories that became popular in ancient world and have fascinated artists/audiences ever since.

CNES 3070. Topics in Ancient Religion. (3 cr [max 18 cr]. §RELA 3070)
Study of a specific aspect of religion in Classical and Near Eastern antiquity such as healing cults, magic and divination, Gnosticism, or prophecy and authority. Topics specified in the *Class Schedule*.

CNES 3071. Greek and Hellenistic Religions. (3 cr. §CNES 5071, RELA 3071, RELA 5071)
Greek religion from the Bronze Age to Hellenistic times. Sources include literature, art, and archaeology. Homer and Olympian deities, ritual performance, prayer/sacrifice, temple architecture, death and the afterlife, mystery cults, philosophical religion, Near Eastern salvation religions.

CNES 3072. The New Testament. (3 cr. §CNES 5072, RELA 3072, RELA 5072. Prereq–§: CLAS 3072)
Early Jesus movement in its cultural and historical setting. Origins in Judaism; traditions about Jesus. The apostle Paul, his controversies and interpreters. Questions of authority, religious practice, and structure; emergence of the canon of scripture. Contemporary methods of New Testament study; biblical writings as history and narrative.

CNES 3073. Roman Religion and Early Christianity. (3 cr)
Etruscan, Republican religion. Appeal of non-Roman cults. Ruler worship. Christians in Asia Minor, Egypt, and the West. Popular piety, Christian and non-Christian. Rabbinic Judaism. Varieties of Christianity in 2nd and 3rd centuries. Influence of Greco-Roman culture on emerging church. Constantine and Julian.

CNES 3081W. Classical Epic in Translation. (3 cr. §CNES 5081)
Homer's Iliad and Odyssey, Virgil's Aeneid. Cultural context of epic. Development of the hero. Epic style. Poetics of epic.

CNES 3082W. Greek Tragedy in Translation. (3 cr)
Origins of tragedy. Ancient theatres. Selected plays of Aeschylus, Sophocles, and Euripedes.

CNES 3104. Ancient Rome: Kings and Consuls. (3 cr)
Roman Republic, from its origins to Caesar's death.

CNES 3105. Ancient Rome: The Age of Augustus. (3 cr. Prereq–§: CLAS 1005)
Transition from republic to empire. Political strategies of Augustus (first emperor). "Golden age" of Latin literature. Monuments.

CNES 3107. Age of Constantine the Great. (3 cr)
Change/continuity in Roman Empire from its 2nd-century zenith through 3rd-century crisis, first Christian emperor (306 to 337 A.D.), and beyond. Replacement of classical paganism by Christianity. Beginnings of monasticism. Superpower relations between Roman, Persian empires. Meets with 1023.

CNES 3108. Age of St. Augustine of Hippo. (3 cr. §CLAS 1024. Prereq–§: CLAS 3024)
Cultural diversity (A.D. 363 to circa 500 A.D.). Replacement of Roman Empire in Western Europe by barbarian kingdoms, consolidation of Constantinople as capital in the East. Literature, art, thought resulting from new dominance of Christianity, particularly Augustine of Hippo. Meets with 1024.

CNES 3142. Art of Egypt. (4 cr. §ARTH 3142)
Arts and architecture of Egypt, from prehistoric times to emergence of modern Egypt. Emphasizes elements of continuity and of change that have shaped Egyptian culture.

CNES 3152. Art and Archaeology of Ancient Greece. (4 cr. §ARTH 3152. Prereq–§: CLAS 3152)
Introduction to civilization of ancient Greece as revealed through art and material culture. Case studies of selected monuments/sites.

CNES 3162. Roman Art and Archaeology. (4 cr. §ARTH 3162. Prereq–§: CLAS 3162)
Introduction to art and material culture of Roman world: origin, change, continuity. "Progress" or "decay" in the later Empire, its legacy to modern world.

CNES 3172. Archaeology of Israel. (3 cr)
Archaeological data relevant to the Old Testament. Major sites in the Holy Land and other areas of the Mediterranean and Near East. Evidence of pottery, inscriptions, manuscripts, and coins. Excavation methods. Archaeology as a tool for study of ancient religions.

CNES 3201. The Bible: Context and Interpretation. (3 cr. §CNES 1201, JWST 1201, JWST 3201, RELA 3201. Prereq–Knowledge of Hebrew not required)
Survey in English of literary/historical narrative texts from Pentateuch, Joshua, Judges, Samuel, Kings, and Ruth. Art of biblical narrative. Major themes of biblical stories. Comparison with other Ancient Near Eastern literatures. Literary conventions of biblical writers.

CNES 3202. Prophecy in Ancient Israel. (3 cr. §ANE 1002, RELA 3202. Prereq–1001 or 1201 or 3201 or #)
Survey of Israelite prophets. Emphasizes Amos, Hosea, Isaiah, Jeremiah, Ezekiel, and Second Isaiah. Prophetic contributions to Israelite religion. Personality of prophets. Politics and prophetic reaction. Textual analysis and biblical scholarship. Prophecy viewed cross-culturally.

CNES 3203. The Bible: Wisdom, Poetry, and Apocalyptic. (3 cr. §ANE 1003, RELA 3203. Prereq–Knowledge of Hebrew not required)
Survey of books of Psalms, Proverbs, Job, Song of Songs, Lamentations, Ecclesiastes (Qoheleth). Characteristics of biblical poetry. Conceptions of Israelite wisdom writing. Traits of early Jewish apocalyptic writing.

CNES 3321. Ships and Seafaring: An Introduction to Nautical Archaeology. (3 cr)
Archaeology of ships, from Mediterranean to Great Lakes. Method/theory of underwater archaeology. Examples from antiquity to modern times: Egyptian solar barges, ancient warships, oceanic freighters. Aspects of nautical culture, including routes/trade, using evidence of ship construction, materials, cargoes.

CNES 3340. Practicum in Archaeological Field and Computer Techniques. (3 cr. §ARTH 3340, ARTH 5340, CLCV 3340, CNES 5340. Prereq–CLCV major or # or 1 course in ancient art and archaeology)
Methods used for excavation of Old and New World sites. Meets at archaeometry/computer lab for part of the semester and at a selectedsite in Minnesota for day-long sessions for 9 to 10 weeks.

CNES 3502. Ancient Israel: From Conquest to Exile. (3 cr. §CNES 5502, HIST 3502, RELA 3502. Prereq–Knowledge of Hebrew not required, 3501 recommended)
Israelite history in context of what is known from Egyptian, Canaanite, and Mesopotamian sources. Focuses on issues raised by archaeological data related to Israelite conquest of Canaan.

CNES 3503. History and Development of Israelite Religion I. (3 cr. §ANE 3503, ANE 5503, CNES 5503, RELA 3503, RELA 5503)
Survey of the evolution of Israelite religion. Cultic practices. Law and religion. Prophecy. Religion and historiography. Relationship to surrounding religious systems.

CNES 3535. Death and the Afterlife in the Ancient World. (3 cr. §CNES 5535, RELA 3535, RELA 5535)
Beliefs, attitudes, and behaviors related to death and the afterlife found in the cultures of the ancient Mediterranean and Near East. Literature, funerary art/epitaphs. Archaeological evidence for burial practices and care of dead.

CNES 3951W. Major Project. (4 cr. Prereq–[Three 3xxx ANE courses, [major in ANE or CNEA or RelS]] or #)
Research project pertaining to the study of the ancient world, using documents or other primary sources along with secondary sources. Students select project in consultation with a faculty member.

CNES 3993. Directed Studies. (1-4 cr [max 16 cr])
Guided individual reading or study.

CNES 4051. Ancient Near East and Egypt: Neolithic to 1500 BCE. (3 cr; A-F only. §HIST 4051. Prereq–Previous coursework in ancient history recommended)
Lands of Western Asia and Northeast Africa from Neolithic through Middle Bronze Age. Interdependent technological/political developments such as agriculture, state formation, and writing. Use of literature/art as vehicles for articulating concepts. Changing relationships among cultures/polities of ancient Near East and regions beyond.

CNES 4052. Ancient Near EAST and Egypt: 1500 to 323 BCE. (3 cr; A-F only. §HIST 4052. Prereq–4051 or prev coursework in ancient history recommended)
Lands of Western Asia and Northeast Africa from Late Bronze Age to death of Alexander in 323 BCE. Growth/decline of empires. Diplomatic relations and sociopolitic transformations among Late Bronze and Iron Age states. New military technologies. Developments in religion/theology.

CNES 5013. Introduction to Roman Law. (3 cr)
Survey of Roman law from social and historical perspectives. Basic concepts of Roman private law and legal procedure.

CNES 5051. Before Herodotus: History and Historiography of Mesopotamia and theAncient Near East. (3 cr; A-F only. §HIST 5051. Prereq–Prev coursework in Ancient Near Eastern history recommended)
Historical method/sources for Ancient Near Eastern history. Seminar. Emphasizes historical tradition and historiographic texts of Mesopotamia and neighboring regions of Ancient Near East. Secondary emphasis on their relationship to the works of classical historians such as Herodotus. Use of these sources in modern historiography of Ancient Near East.

CNES 5070. Topics in Ancient Religion. (3 cr [max 18 cr]. §RELA 5070. Prereq–Sr or grad student or #)
Specific aspect of religion in Classical and Near Eastern antiquity, such as healing cults, magic/divination, Gnosticism, or prophecy/authority. Topics specified in *Class Schedule*.

CNES 5071. Greek and Hellenistic Religions. (3 cr. §CNES 3071, RELA 3071, RELA 5071. Prereq–#)
Greek religion from the Bronze Age to Hellenistic times. Sources include literature, art, and archaeology. Homer and Olympian deities; ritual performance; prayer and sacrifice; temple architecture; death and the afterlife; mystery cults; philosophical religion; Near Eastern salvation religions. Meets with 3071.

CNES 5072. The New Testament. (3 cr. §CNES 3072, RELA 3072, RELA 5072)
Early Jesus movement in its cultural and historical setting. Origins in Judaism; traditions about Jesus. Apostle Paul, his controversies and interpreters. Questions of authority, religious practice, and structure; emergence of the canon of scripture. Contemporary methods of New Testament study; biblical writings as history and narrative. Meets with 3072.

CNES 5073. Roman Religion and Early Christianity. (3 cr. §RELA 5073)
Etruscan, Republican religion. Appeal of non-Roman cults. Ruler worship. Christians in Asia Minor, Egypt, and the West. Popular piety, Christian and non-Christian. Rabbinic Judaism. Varieties of Christianity in 2nd and 3rd centuries. Influence of Greco-Roman culture on emerging church. Constantine and Julian. Meets with 3073.

CNES 5080. New Testament Proseminar. (3 cr [max 18 cr]. §RELA 5080. Prereq–1082 or 3072 or equiv)
Study of some specific aspect of the New Testament and related literature. The class is organized as a discussion seminar. Topics specified in *Class Schedule*.

CNES 5081. Classical Epic in Translation. (3 cr. §CNES 3081W)
Homer's Iliad and Odyssey. Virgil's Aeneid. Cultural context of epic. Development of the hero. Epic style. Poetics of epic.

CNES 5082W. Greek Tragedy in Translation. (3 cr)
Origins of tragedy. Selected plays of Aeschylus, Sophocles, and Euripides.

CNES 5083. Ancient Comedy. (3 cr)
Greek/Roman comic drama (e.g., Aristophanes, Menander, Plautus, Terence).

CNES 5103. Hellenistic and Early Roman Art and Archaeology. (3 cr. §ARTH 5103. Prereq–Jr, Clas/ARTH 3008 or #)
Sculpture, architecture, painting, and topography in developing centers of Hellenistic culture in eastern Mediterranean and in Etruscan and Roman towns, from 400 B.C. to the beginnings of the Roman Empire.

CNES 5108. Greek Architecture. (3 cr. §ARTH 5108. Prereq–Jr, Clas/ARTH 3008 or #)
Geometric through classical examples of religious and secular architecture and their setting at archaeological sites in Greece, Asia Minor and Italy.

CNES 5111. Prehistoric Art and Archaeology of Greece. (3 cr. §ARTH 5111. Prereq–Jr, Greek art or archaeology course or #)
Artistic and architectural forms of Neolithic period in Aegean area and Cycladic, Minoan, and Mycenaean cultures. Aims and methods of modern field archaeology; the record of human habitation in the Aegean area. Archaeological evidence as a basis for historical reconstruction.

CNES 5112. Archaic and Classical Greek Art. (3 cr. Prereq–Jr, Clas/ARTH 5111)
Sculpture, painting, architecture and minor arts in Greek lands from the 9th through 5th centuries B.C. Examination of material remains of Greek culture; archaeological problems such as identifying and dating buildings; analysis of methods and techniques. Emphasis on Periklean Athens.

CNES 5120. Field Research in Archaeology. (3-6 cr [max 6 cr]. §ARTH 5120, CLCV 5120. Prereq–#)
Field excavation, survey, and research at archaeological sites in the Mediterranean area. Techniques of excavation and exploration; interpretation of archaeological materials.

CNES 5172. House, Villa, Tomb: Roman Art in the Private Sphere. (3 cr. §ARTH 5172. Prereq–Intro art history course or #)
Architecture, painting, and sculpture of urban houses, country estates, and tombs in Roman world. Relationships between public/private spheres and literary/physical evidence. Usefulness of physical evidence in illuminating gender roles.

CNES 5182. Art and the State: Public Art in the Roman Empire. (3 cr. §ARTH 5182. Prereq–Intro art history course or #)
eOrigins of Roman public art. Use in maintaining community. Exploitation by first emperor, Augustus. Development/diffusion through later empire. Varying capabilities to adjust to demands of a Christian Empire.

CNES 5251. Archaeology of Herodian Israel. (3 cr; A-F only. §RELA 5251, RELS 5251. Prereq–One course in [archaeology or ancient history] or grad student)
Archaeological sites in Israel dating to era of Herod the Great (37-4 BC). Palaces and religious edifices. Remains from Jewish/gentile settlements throughout the kingdom. Course readings consist of contemporary literary sources and excavation reports.

CNES 5252. History of Early Christian Art in Context. (4 cr. §ARTH 5252. Prereq–3xxx art history course or #)
Role played by art in formation of early Christian/Byzantine communities and in establishing their relationships with Pagan world and early Islam.

CNES 5340. Practicum in Archaeological Field and Computer Techniques. (3 cr. §ARTH 3340, ARTH 5340, CLCV 3340, CNES 3340. Prereq–CLCV major or ancient art and archaeology course or #)
Methods used for excavation of Old and New World sites. Meets at archaeometry/computer lab for part of the semester and at a selectedsite in Minnesota for day-long sessions for 9 to 10 weeks. Meets with 3340.

CNES 5502. Ancient Israel: From Conquest to Exile. (3 cr. §CNES 3502, HIST 3502, RELA 3502. Prereq–Knowledge of Hebrew not required; 5501 recommended)
Israelite history in context of what is known from Egyptian, Canaanite, and Mesopotamian sources. Focuses on issues raised by archaeological data related to Israelite conquest of Canaan.

CNES 5503. History and Development of Israelite Religion I. (3 cr. §ANE 3503, ANE 5503, CNES 3503, RELA 3503, RELA 5503)
Survey of the evolution of Israelite religion. Cultic practices. Law and religion. Prophecy. Religion and historiography. Relationship to surrounding religious systems.

CNES 5535. Death and the Afterlife in the Ancient World. (3 cr. §CNES 3535, RELA 3535, RELA 5535)
Beliefs, attitudes, and behaviors related to death and afterlife found in cultures of ancient Mediterranean and Near East. Literature, funerary art/epitaphs. Archaeological evidence for burial practices and care of dead.

CNES 5701. Alphabetic Epigraphy of the Ancient Near East. (3 cr)
Survey of comparative Semitic linguistics. Emphasizes Northwest Semitic. Reading of Phonecian, Moabite, and Judean inscriptions.

CNES 5713. Introduction to Ugaritic. (3 cr. Prereq–Adv Hebrew, previous study of biblical texts or #)
Ugaritic alphabetic cuneiform script, morphology, and syntax. Reading of representative samples of Ugaritic literature. Attention to linguistic and cultural issues and links to biblical and other Ancient Near Eastern texts.

CNES 5794. Introduction to Classical and Near Eastern Studies. (1 cr; S-N only. Prereq–Grad major or minor or #)
Introduction to core research materials and reference materials in the various disciplines which make up classical studies.

CNES 5940. Topics in Classical Literature. (3 cr [max 9 cr]. Prereq–Two literature courses or #)
Additional work for graduate credit. Topics specified in *Class Schedule*. Meets with 3940.

CNES 5950. Aspects of Classical Culture. (1-3 cr [max 12 cr])
Topics specified in *Class Schedule*. Meets with 3950.

CNES 5993. Directed Studies. (1-4 cr [max 12 cr]. Prereq–#, Δ, ❑)
Guided individual reading or study.

CNES 5994. Directed Research. (1-12 cr [max 12 cr]. Prereq–#, Δ, ❑)
Guided individual research.

CNES 5996. Directed Instruction. (1-12 cr [max 12 cr]. Prereq–#, Δ, ❑)
Guided individual research.

Classical Civilization (CLCV)

Department of Classical and Near Eastern Studies

College of Liberal Arts

CLCV 1301. The Olympic Games. (3 cr. §ARTH 3201, CLCV 3301)
Surveys the Olympic Games (776 B.C. to A.D. 338) and other ancient athletic festivals, including those for women participants. Greek art and literature serve as basic sources. Comparisons are made with modern athletic events.

CLCV 3301. The Olympic Games. (3 cr. §ARTH 3201, CLCV 1301)
The Olympic Games (776 B.C. to A.D. 338) and other ancient athletic festivals, including those for women participants. Greek art and literature serve as basic sources. Comparisons are made with modern athletic events.

CLCV 3340. Practicum in Archaeological Field and Computer Techniques. (3 cr. §ARTH 3340, ARTH 5340, CNES 3340, CNES 5340. Prereq–CLCV major or # or one course in ancient art and archaeology)
Methods used for excavation of Old and New World sites. Meets at archaeometry/computer lab for part of the semester and at a selectedsite in Minnesota for day-long sessions for 9 to 10 weeks.

CLCV 3510. Great Books. (3 cr [max 9 cr]. Prereq–Jr or sr or #)
Intensive study of major works of classical antiquity and later (written in or translated into English), related by kind, theme, style, or perspective. Sometimes including works from non-Western cultures.

CLCV 3711. Classics of Literary Criticism. (3 cr. Prereq–1 course in literature, 2nd course in literature or philosophy or #)
Principles of criticism as expounded and employed in major critical works by writers such as Plato, Aristotle, Horace, Longinus, Sir Philip Sidney, John Dryden, Samuel Johnson, David Hume, William Wordsworth, Samuel Taylor Coleridge, and T. S. Eliot.

CLCV 3940. Proseminar: Classical Traditions in Western Culture. (3-4 cr [max 6 cr]. Prereq–CLCV major or #)
The nature of Greco-Roman classical traditions manifested in various cultural spheres: language and literature, fine arts, history, science, philosophy, theology, and other disciplines; the political, social, educational, and religious life of society. The perspective, scope, breadth, and depth of the course will vary.

CLCV 3950. Topics in Classical Civilization. (3-4 cr [max 9 cr])
Topics specified in the *Class Schedule*.

CLCV 3993. Directed Studies in Classical Civilization. (1-4 cr [max 4 cr])

CLCV 3994. Directed Research in Classical Civilization. (1-4 cr [max 4 cr])

CLCV 3996. Directed Instruction in Classical Civilization. (1-4 cr [max 4 cr])

CLCV 5120. Field Research in Archaeology. (3 cr. §ARTH 5120, CNES 5120)
Field excavation, survey, and research at archaeological sites in Minnesota. Techniques of excavation/exploration. Interpretation of archaeological materials.

Classics (CLAS)

Department of Classical and Near Eastern Studies

College of Liberal Arts

Clas 3173. Honors Course: Roman Religion and Early Christianity. (4 cr)
Etruscan, Republican religion. Appeal of non-Roman cults. Ruler worship. Christians in Asia Minor, Egypt and the West. Popular piety, Christian and non-Christian. Rabbinic Judaism. Varieties of Christianity in 2nd and 3rd centuries. Influence of Greco-Roman culture on emerging church. Constantine and Julian. Honors recitation meets once a week for an additional recitation section. Meets with RelA 3173.

Clinical Laboratory Science (CLS)

Department of Laboratory Medicine and Pathology

Medical School

CLS 5064. Introduction to Clinical Immunohematology.. (2 cr; A-F only. §MEDT 4064. Prereq–#)
Principles of blood grouping, antibody identification, compatibility testing, serology, and immunology.

CLS 5065. Introduction to Clinical Immunohematology: Laboratory. (2 cr; A-F only. §MEDT 4065. Prereq–#)
Exercises illustrating techniques in blood grouping, antibody identification, compatibility testing, and detection of antibodies by serological and immunological methods.

CLS 5090. Special Laboratory Methods. (1-2 cr [max 2 cr]; A-F only. §MEDT 4090. Prereq–#)
Assignment on an individual basis to one of a variety of special areas of experience in the clinical lab.

CLS 5100. Virology, Mycology, and Parasitology for Medical Technologists. (2 cr; A-F only. §MEDT 4100. Prereq–microbiology course with lab, bioCHEM course)
Lab diagnosis of viral, fungal, and parasitic infections. Lecture.

CLS 5104. Principles of Diagnostic Microbiology: Lecture. (2 cr; A-F only. §MEDT 4104. Prereq–One microbiology course with lab, one biochemistry course, #)
Current techniques used in lab diagnosis of infectious disease. Isolating/identifying bacteria and yeasts. Antimocrobial susceptibility testing. Lecture.

CLS 5105. Principles of Diagnostic Microbiology: Laboratory. (2 cr; A-F only. §MEDT 4105. Prereq–One microbiology course with lab, one biochemistry course, #)
Current techniques used in lab diagnosis of infectious disease. Isolating/identifying bacteria/ yeasts. Antimicrobial testing. Laboratory.

CLS 5120. Seminar: Clinical Laboratory Science. (1 cr [max 3 cr]; S-N only. Prereq–#)
Current literature. Presentation/discussion of research.

CLS 5121. Journal Presentations. (1 cr [max 2 cr]; S-N only. Prereq–1st yr CLS grad student)
Critical analysis, evaluation, discussion of current journal articles in student's specialty area.

CLS 5125. Practicum Teaching. (1-2 cr [max 2 cr]; A-F only. Prereq–#)
Supervised teaching experience, develop skills using instructional materials, tests, and measurements.

CLS 5127. Introduction to Management and Education I. (1 cr; A-F only. §MEDT 4127W. Prereq–#)

CLS 5129. Elements of Laboratory Administration. (2 cr; A-F only. Prereq–#)
Leadership styles, employee selection and evaluation, communications, motivation, morale, discipline, job descriptions, record keeping, budgets, cost accounting, purchasing, product evaluation, lab safety, labor relations, government regulations.

CLS 5130. Practicum in Laboratory Administration. (2 cr; A-F only. Prereq–#)
Supervised experience and assignment of specific problems related to lab service and management in health care institutions.

CLS 5140. Techniques for Teaching. (2 cr; A-F only. Prereq–#)
Developing objectives, classroom activities, and evaluation criteria for medical technology education.

CLS 5155. Advanced Clinical Hematology. (3 cr; A-F only. Prereq–#)
Observation, study, and practice in special problems, advanced techniques, and methodology.

CLS 5165. Advanced Clinical Immunohematology. (3 cr; A-F only. Prereq–#)
Observation, study, and practice in special problems, advanced techniques, and methodology.

CLS 5175. Advanced Clinical Chemistry. (3 cr; A-F only. Prereq–#)
Observation, study, and practice in special problems, advanced techniques, and methodology.

CLS 5251. Hematology I: Basic Techniques. (3 cr; A-F only. §MEDT 4251. Prereq–#)
Theory and application of basic principles and techniques in clinical hematology and hemostasis. Lecture and lab.

CLS 5252. Hematology II: Morphology and Correlation. (2 cr; A-F only. §MEDT 4252. Prereq–5251 or MEDT 4251)
Fundamentals of blood and bone marrow examination emphasizing microscopic identification of immature and abnormal cells. Clinical correlation of lab findings in hematology and hemostasis. Lecture and lab.

CLS 5253. Hemostasis. (1 cr; A-F only. §MEDT 4253. Prereq–5251 or MEDT 4251)
Theory and application of specific concepts and techniques in hemostasis and coagulation. Lecture and lab.

CLS 5310. Clinical Chemistry I: Lecture. (2 cr; A-F only. §MEDT 4310. Prereq–organic CHEM course with lab bioCHEM course, #)
Principles and theory of clinical chemistry for assessing renal and metabolic disease/dysfunction, electrolyte balance, and acid-base balance. Principles and processes for quality management in the clinical lab.

CLS 5311. Clinical Chemistry I: Laboratory Applications. (2 cr; A-F only. §MEDT 4311. Prereq–One organic chemistry course with laboratory; one biochemistry course, #)
Application of clinical chemistry principles and laboratory techniques in the analysis of urine, plasma, and body fluids. Emphasis on laboratory tests to evaluate renal function, electrolytes, and acid-base balance. Introduction to principles and processes for managing test quality. Laboratory.

CLS 5320. Clinical Chemistry II: Lecture. (2 cr; A-F only. §MEDT 4320. Prereq–organic CHEM course with lab, biochem course, 5310 or MEDT 4310, #)
Principles and theory of clinical chemistry for assessing metabolic disease/dysfunction involving hormones, enzymes, lipids/lipoproteins, cardiac function, liver, and digestive tracts. Emphasis on measurement methods and physiological significance.

CLS 5321. Clinical Chemistry II: Laboratory Applications. (2 cr; A-F only. §MEDT 4321. Prereq–organic CHEM course with lab, biochem course, 5310 or MEDT 4310, #)
Application of clinical chemistry principles and lab techniques in analyzing serum, plasma, and urine. Focus on tests to evaluate selected disorders. Developing lab and instrumentation use skills with emphasis on quality control and technique.

CLS 5768. Advanced Hematology. (5-10 cr [max 30 cr]; A-F only. Prereq–#)
Practical experience collecting bone marrow from patients. Diagnosing hematological diseases by evaluating and interpreting cells from clinical specimens of bone marrow, peripheral blood, and, if applicable, lymph nodes.

CLS 5864. Research Seminar. (1 cr [max 10 cr]; S-N only. Prereq–#)
Departmental research seminar series.

CLS 5865. Departmental Seminar. (1 cr [max 10 cr]; S-N only. Prereq–#)
Departmental clinical lab research seminar series.

College of Food, Agricultural & Natural Resource Sciences (CFAN)

CFAN 1000H. Honors Colloquium. (2 cr [max 8 cr] Prereq–Admission to honors program or #)
Topics vary by semester.

CFAN 1501. Biotechnology, People, and the Environment. (3 cr; A-F only)
Basic concepts in genetic engineering as a foundation for studying the impact of biotechnology on agriculture, medicine, industry, and the environment. Controversial aspects of biotechnology related to public policy issues are discussed.

CFAN 1901. Topics: Freshman Seminar. (1-3 cr [max 3 cr]; A-F only. Prereq–Freshman)
Interdisciplinary seminar. Topics specified in *Class Schedule*.

CFAN 1902. Topics: Freshman Seminar. (3 cr. Prereq–Freshman)
Interdisciplinary seminar. Topics specified in *Class Schedule*.

CFAN 1902H. Freshman Seminar. (3 cr. Prereq–Fr)
Topics will vary. See *Class Schedule*.

CFAN 1903. Topics: Freshman Seminar. (1-3 cr [max 3 cr]; A-F only. Prereq–Freshman)
Interdisciplinary seminar. Topics specified in *Class Schedule*.

CFAN 1904. Topics: Freshman Seminar. (1-3 cr [max 3 cr]; A-F only. Prereq–Freshman)
Interdisciplinary seminar. Topics specified in *Class Schedule*.

CFAN 1905. . (1-3 cr [max 3 cr]; A-F only. Prereq–Fr)
Freshman Seminar: Topics vary.

CFAN 1908W. Topics: Freshman Seminar. (3 cr; A-F only. Prereq–Freshman)
Interdisciplinary seminar. Topics specified in *Class Schedule*.

CFAN 1910W. Freshman Seminar: Topics. (1-3 cr [max 3 cr]; A-F only. Prereq–Freshman)
Interdisciplinary seminar. Topics specified in *Class Schedule*.

CFAN 3000. Directed Studies in International Agriculture. (1-4 cr [max 8 cr]; A-F only. Prereq–#)
Oral presentations, discussion of students' research papers. Literature review of selected topics. Discussions with students/staff about their experiences in international agriculture.

CFAN 3001. Pests and Crop Protection. (3 cr; A-F only. Prereq–BIOL 1009 or equiv or #)
Introduction to biology/identification of insects, weeds, and diseases that affect agricultural crops. Management of these organisms based on principles of integrated pest management.

CFAN 3100H. Honors Experience. (2-3 cr [max 6 cr]; A-F only. Prereq–Approved proposal by COAFES honors program committee)
Developed by student and COAFES faculty mentor. May include foreign study-travel, research, position or policy paper, or any experience demonstrating advanced study/service/understanding.

CFAN 3101H. Honors Seminar. (1-3 cr [max 9 cr]; A-F only. Prereq–COAFES honors)
Junior/senior course.

CFAN 3500. International Field Studies Seminar. (3 cr; A-F only. Prereq–#)
Interface of agriculture with various natural resource, environmental, economic, food safety, public policy, ethical issues transcending national borders. Seminars take place in other countries or regions of world, providing global perspective. Active learning, lectures, discussion tutorials, field trips, reports, exams.

CFAN 3900. Topics in International Agriculture. (2-4 cr [max 25 cr]; A-F only. Prereq–#)
International, on-site, classroom, and field-study of agricultural systems. Sites vary. Can include language study.

CFAN 4009W. Undergraduate Senior Thesis: Science in Agriculture. (1-6 cr [max 12 cr]; A-F only. Prereq–jr or sr major in ScAg, #)
Research and thesis experience conducted under supervision of a COAFES faculty member. Recommended course length is one full year. A written bound thesis and oral presentation of research results is required.

CFAN 4201. Strategic Career Planning. (1 cr. Prereq–Jr or sr or grad student)
Self exploration, networking, industry research, job/internship search, resumes, cover letters, interviewing, salary negotiation, goal setting.

CFAN 5000. Special topics for K-12 Educators: Agricultural, Food, and Environmental Sciences and Technologies. (1-3 cr [max 6 cr]. Prereq–#)
Students engage in instruction and applications that lead to new understandings, techniques, and materials for teaching about the science, technology and utilization of plants, animals, foods, natural resources, and the environment for the benefit of society and our ecosystems.

College of Liberal Arts (CLA)

CLA 1001. Introduction to CLA Student Life. (1 cr; S-N only)
Time management, study skills. Devising a four-year graduation plan. Portfolio planning. Major/career planning. Study abroad. Special learning opportunities. Wellness and finance. Academic/co-curricular resources.

CLA 1003. Introduction to Student-Athlete Life. (2 cr. Prereq–First-year student-athlete)
Time management, study skills. Devising a four-year graduation plan. Portfolio planning. Major/career planning. Study abroad. Special learning opportunities. Wellness/finance. Academic/co-curricular resources. Balancing both student and student-athlete.

CLA 1050. Faculty Mentor Freshman Seminar. (2 cr; A-F only. Prereq–Δ, Faculty Mentor Program)
Discussions led by faculty mentors on liberal education, nature of University life, major exploration, study skills appropriate to various disciplines.

CLA 1301. SEAM First Year Seminar. (2 cr; A-F only. Prereq–SEAM)
Exploration of issues related to students' academic/career interests. Multiculturalism, other skills. Small-group discussions.

CLA 1302. SEAM First-Year Colloquium. (2 cr; A-F only. Prereq–SEAM)
Introduction to resources that enhance academic/professional interests. Focus on multiculturalism. Small group discussions led by professional staff, guest speakers.

CLA 1901. Topics: Freshman Seminar. (1-4 cr [max 4 cr]; A-F only. Prereq–Freshman)
Interdisciplinary seminar. Topics specified in *Class Schedule*.

CLA 1902. Topics: Freshman Seminar. (1-4 cr [max 4 cr]; A-F only. Prereq–Freshman)
Interdisciplinary seminar. Topics specified in *Class Schedule*.

CLA 1903. Topics: Freshman Seminar. (1-4 cr [max 4 cr]; A-F only. Prereq–Freshman)
Interdisciplinary seminar. Topics specified in *Class Schedule*.

CLA 1904. Topics: Freshman Seminar. (1-3 cr [max 3 cr]; A-F only. Prereq–Freshman)
Interdisciplinary seminar. Topics specified in *Class Schedule*.

CLA 1905. Topics: Freshman Seminar. (3 cr; A-F only. Prereq–Freshman)
Freshman seminar. Topics specified in *Class Schedule*.

CLA 1906W. Topics: Freshman Seminar. (1-4 cr [max 4 cr]; A-F only. Prereq–Freshman)
Interdisciplinary seminar. Topics specified in *Class Schedule*.

CLA 1907W. Topics: Freshman Seminar. (1-4 cr [max 4 cr]; A-F only. Prereq–Freshman)
Interdisciplinary seminar. Topics specified in *Class Schedule*.

CLA 1908W. Topics: Freshman Seminar. (1-4 cr [max 4 cr]; A-F only. Prereq–Freshman)
Interdisciplinary seminar. Topics specified in *Class Schedule*.

CLA 1909W. Topics: Freshman Seminar. (1-4 cr [max 4 cr]; A-F only. Prereq–Freshman)
Interdisciplinary seminar. Topics specified in *Class Schedule*.

CLA 1910W. Topics: Freshman Seminar. (1-4 cr [max 4 cr]; A-F only. Prereq–Freshman)
Interdisciplinary seminar. Topics specified in *Class Schedule*.

CLA 3001. Success Strategies for Transfer Students. (1 cr; S-N only)
Effective learning/academic skills, academic/career goals, use of advanced technology in University learning. Academic/career options available at the University. Students develop comprehensive educational plan, identify their long-range educational goals, and learn how to evaluate/select courses to meet goals.

CLA 3500. Topics. (2-4 cr [max 8 cr])
Topics specified in *Class Schedule*.

CLA 5300. Topics by Visiting Winton Chair. (1-5 cr [max 10 cr])
Topics specified in *Course Guide*.

CLA 5500. Topics. (3-5 cr [max 10 cr])
Topics specified in Course Catalog.

Communication Studies (COMM)

Department of Communication Studies

College of Liberal Arts

COMM 1101. Introduction to Public Speaking. (3 cr. §COMM 1101H, PSTL 1461, RHET 1223)
Oral communication processes/elements. Criticism of and response to oral discourse. Individual speaking.

COMM 1101H. Honors: Introduction to Public Speaking. (3 cr. §COMM 1101, PSTL 1461, RHET 1223. Prereq–honors)
Oral communication processes/elements. Criticism of, response to oral discourse. Individual speaking.

COMM 1102. Introduction to Communication. (3 cr)
Verbal and nonverbal communication: public address, interpersonal, organizational, intercultural, and electronic. Ways in which new communication technologies influence and are influenced by existing forms of communication.

COMM 1102H. Honors: Introduction to Communication. (3 cr. Prereq–honors)
Verbal/nonverbal communication: public address, interpersonal, organizational, intercultural, electronic. Ways in which new communication technologies influence/are influenced by existing forms of communication.

COMM 1313V. Honors: Analysis of Argument. (3 cr. Prereq–honors)
Strategies for analyzing, evaluating, generating arguments. Problems in listening/responding to argument.

COMM 1313W. Analysis of Argument. (3 cr)
Strategies for analyzing, evaluating, generating arguments. Problems in listening/responding to argument.

COMM 1902. Freshman Seminar. (3 cr [max 6 cr]; A-F only. Prereq–Freshman)
Freshman seminar. Topics specified in *Class Schedule*.

COMM 1905. Freshman Seminar. (3 cr [max 6 cr]; A-F only. Prereq–Fr)
Topics specified in *Class Schedule*.

COMM 1907W. Freshman Seminar. (3 cr [max 6 cr]; A-F only. Prereq–Freshman)
Topics specified in *Class Schedule*.

COMM 1908W. Freshman Seminar. (3 cr [max 6 cr]; A-F only. Prereq–Freshman)
Topics specified in *Class Schedule*.

COMM 1909W. Freshman Seminar. (3 cr [max 6 cr]; A-F only. Prereq–Freshman)
Topics specified in *Class Schedule*.

COMM 3110. Topics in Speech-Communication. (3 cr [max 15 cr]. Prereq–[3211 or 3401 or 3601 [whichever is relevant to topic])
Cases illustrating speech-communication theory, underlying issues.

COMM 3131. Leadership Theory and Practice. (3 cr; S-N only. Prereq–Student hired for leadership position in New Student Programs, #)
Preparation for New Student Program leadership position. Attitudes/skills with leadership and student life issues. Building authentic community.

COMM 3190H. Honors Course: Research Seminar in Communication. (3 cr [max 6 cr]; A-F only. Prereq–Honors candidate in comm, #, Δ)
Students conduct original research in rhetoric, communication theory, or media for honors thesis. Theory, methods, research writing.

COMM 3201. Introduction to Electronic Media Production. (4 cr; A-F only)
Production/criticism of messages for electronic media. Theory/practice in planning, scripting, production, and criticism in various electronic media. Student productions in lab.

COMM 3204. Advanced Electronic Media Production. (4 cr; A-F only. Prereq–3201 or #)
Video as communicative medium integrating visual/aural aesthetics. Creation of broadcast-quality production integrating message creation, audience analysis, argument development, and visual/audio scripting. Utilization of media aesthetics to develop/shape production content.

COMM 3211. Introduction to U.S. Electronic Media. (3 cr)
Historical development and current issues in electronic media technologies and programming. Effects of governmental, industrial, and public organizations on message content. Problem areas of electronic media.

COMM 3401. Introduction to Communication Theory. (3 cr. Prereq–1101)
Social scientific theory in communication. Communication history; logic of scientific theories and communication types of theories in interpersonal, small group, organizational, intercultural, and electronically mediated communication.

COMM 3402. Introduction to Interpersonal Communication. (3 cr)
Nature and function of communication between individuals in formal and informal relationships. Communicative interactions from theoretical and practical viewpoints.

COMM 3404. Language Borderlands. (3 cr)
Effect of multilingualism on self identity and sense of community. Subjective and social dimensions of being multilingual. Experience of language loss.

COMM 3405. Language and Gender. (3 cr. §WOST 3305. Prereq–One women's studies course)
Gender/communication. Interdisciplinary theory. Role of communication in creating, maintaining, reinforcing, and changing gender relations in society.

COMM 3406. Language and Sexual Diversity. (3 cr)
Language use in lesbian, gay, bi-sexual, and transgender communities. Ways in which sexual diversity affects language use.

COMM 3409. Nonverbal Communication. (3 cr)
Nonverbal communication in interpersonal communication process. Nonverbal codes (touch, space, smell, eye contact) and their communicative functions (impression management, flirting, persuading, lying) in relational contexts (intimate relationships, friendships, work relationship). Theories, practices.

COMM 3411. Introduction to Small Group Communication. (3 cr)
Cooperative thinking in task-oriented groups. Planning, preparing for, and participating in small groups in private and public contexts.

COMM 3422. Interviewing and Communication. (3 cr; A-F only. Prereq–1101 or #)
Application of communication concepts in information interview process. Practical experience in planning, conducting, and evaluating informational, journalistic/elite, helping, persuasive, appraisal, and employment interviews. Class training and field experience.

COMM 3431. Persuasion Theories. (3 cr. Prereq–Soph recommended)
Sociological, psychological, and communication perspectives. Theoretical knowledge applied to persuasion problems.

COMM 3441. Introduction to Organizational Communication. (3 cr. Prereq–1101 or equiv)
Functions of communication in work groups, in organizational hierarchies, and between organizations.

COMM 3451W. Intercultural Communication: Theory and Practice. (3 cr. Prereq–Planning an intercultural experience)
Theories of and factors influencing intercultural communication. Development of effective intercultural communication skills.

COMM 3452W. Communication and the Intercultural Reentry. (3 cr. Prereq–Return from an intercultural experience)
Intercultural experience explored through stories and story telling, participant observation, and social scientific theory. Constructs include identity, learning styles, cultural adaptation, values, ethics.

COMM 3601. Introduction to Rhetorical Theory. (3 cr. Prereq–1101)
Theoretical systems intended to explain or direct the creation of public discourse. Traditional rhetoric to contemporary perspectives. Using theory to explain the practice of public discourse.

COMM 3605W. Persuasive Speaking and Speech Writing. (3 cr. Prereq–Soph)
Performance and composition with critical inquiry into rhetoric theories. Develops writing, thinking, and speaking skills.

COMM 3615. Argumentation. (3 cr. Prereq–Soph)
Argument(s) in relation to logic, dialectics, and rhetorical performance. Structured reasoning, informal conversation, familial arguments, debates in technical professions, communication ethics, and public/social argumentation.

COMM 3625. Communication Ethics. (3 cr; A-F only. Prereq–1101)
Applying concepts/theories from philosophy and social science to ethical issues in interpersonal, group, organizational, intercultural, and media communication.

COMM 3631. Freedom of Speech. (3 cr)
Communication theories and principles that underlie the concept of freedom of speech in the United States. A variety of contexts and practices are examined in order to understand how communicative interaction should be described and, when necessary, appropriately regulated.

COMM 3970. Directed Study. (1-3 cr [max 6 cr]. Prereq–One COMM course, #, Δ, ❑)
Guided individual reading or study.

COMM 3980. Directed Instruction. (3 cr [max 6 cr]; S-N only. Prereq–#, Δ)
Supervised planning/teaching of undergraduate courses.

COMM 3990. Research Practicum. (1-3 cr [max 6 cr])
How communication research is designed, implemented, and published. Focus is on working with senior faculty on their current research projects.

COMM 3995W. Major Project. (1-2 cr [max 2 cr]; S-N only. Prereq–COMM major, #)
Individualized instruction leading to completion of senior project.

COMM 4231. Comparing Electronic Media Systems. (3 cr. Prereq–3211 or #)
Historical, political, and sociological aspects of electronic media systems throughout the world, including United States, Canada, Great Britain, France, Germany, and Russia. Regulation and impact on political, social, and economic development.

COMM 4235. Electronic Media and Ethnic Minorities—A World View. (3 cr)
Representation and involvement of various ethnic groups (e.g., African-Americans, Native Americans in United States and Canada, Maori, Turks in Europe) in radio, TV, cable, Internet. Roles of government, industry, public organizations, and minority groups in regulating, managing, and financing ethnic media activities.

COMM 4291. New Telecommunication Media. (3 cr; A-F only. Prereq–3211 or #)
Development and current status of new telecommunication media such as cable TV, satellites, DBS, MDS, and video disk/cassettes. Technology, historical development, regulation, and programming of these media and their influence on individuals, organizations, and society.

COMM 4407. Communication and Conflict. (3 cr; A-F only. Prereq–3401 or #)
Aspects of conflict common across types of relationships. Theories as alternative lenses to illuminate aspects of conflict. Communication strategies to manage or resolve conflict.

COMM 4452W. Intercultural Interaction: Theory and Application. (3 cr)
Small group interaction across cultures for both international and U.S. students. Discussion, simulations, readings.

COMM 4471. Communication in Marriage and Family. (3 cr. Prereq–3401 or 3402 or #)
Contemporary theories of marriage/family communication using life-cycle approach. Role/function of communication in changing relational contexts. Ways of improving marriage/family relationships.

COMM 4602W. Contemporary Political Persuasion. (3 cr. Prereq–1101, 3431 or #)
Contemporary political speech. Ideologies in political persuasion.

COMM 4616. African American Civil Rights Rhetoric. (3 cr. Prereq–Jr)
Uses the struggle of African Americans to explore and analyze philosophical concepts, political issues, moral complexities, and discursive characteristics of civil rights rhetoric.

COMM 4621W. Rhetoric of Feminism. (3 cr. Prereq–4615 or #)
History and criticism of the rhetoric of feminism from 19th century to the present.

COMM 5110. Special Topics in Communication Theory. (3 cr [max 6 cr])
Advanced theoretical problems. See department office for current offering.

COMM 5210. Contemporary Problems in U.S. Electronic Media. (3 cr. Prereq–3211)
Problems affecting U.S. commercial and educational electronic media. Audiences; race/gender issues; regulation.

COMM 5220. Television Genres. (3 cr)
Nature, historical development, and influence on society of specific genres of television programming: drama, situation comedy, mystery, soap opera. Program genre change over time and how society, government regulation, and economics of production influence that historical process.

COMM 5233W. Electronic Media and National Development. (3 cr)
Use of electronic media to change social, political, economic, and cultural life. Use by developing nations to improve agricultural practices, hygienic standards, literacy, and awareness of civic responsibility.

COMM 5261. Political Economy of Media Culture. (3 cr. Prereq–3211 or #)
Organizational practices of media communicators. Media content as link between communicators and audiences. How viewers use/process media content.

COMM 5401. Advanced Theories of Communication. (3 cr. Prereq–3401 or grad)
Survey of major theoretical approaches to communication including, positivism, constructivism, and systems.

COMM 5402. Advanced Interpersonal Communication. (3 cr. Prereq–3401 or 3402)
Social scientific approaches to interpersonal communication. Theory, research findings.

COMM 5404. Language and Culture. (3 cr. Prereq–3401 or #)
How language/communication transmit cultural knowledge, attitudes, and beliefs. Connections among language, thought, and culture. Social/ethnic perspectives on study of language/communication.

COMM 5406. Communication and Gender. (3 cr. §WOST 5300. Prereq–One women's studies course, #)
How gender affects verbal communication. Development of analytical skills through readings, exercises, research that raise awareness of the power of language and the influence of gender prescriptions. Comparisons across languages where possible.

COMM 5408. Social Cognition. (3 cr)
Role of cognitive processing in communication studies. Models include perception, attention, memory and their use in communication. Evaluation of social cognition theory and research.

COMM 5411. Small Group Communication Research. (3 cr; A-F only. Prereq–3411 or #)
Survey of small group communication research; theory and practice. Group decision-making and leadership.

COMM 5421. Quantitative Methods in Communication Research. (3 cr; A-F only. Prereq–3401 or #)
Social scientific methods used in studying human communication. Optional data processing laboratory for additional credit.

COMM 5431. The Process of Persuasion. (3 cr. Prereq–3431)
Communication campaigns (e.g., advertising, political) illustrating persuasive processes and theories. Research paper required.

COMM 5441. Communication in Human Organizations. (3 cr. Prereq–9 cr social science, 3441 or #)
Communication in organizational settings. Organizational structure and dynamics and their effect upon the communication process. Individual projects.

COMM 5451W. Intercultural Communication Processes. (3 cr)
Theory and research on cultural differences in values, norms, behaviors, and perceptions that affect communication across cultures internationally and domestically.

COMM 5461. Conversation Analysis. (3 cr. §LING 5461. Prereq–LING 3001 or LING 5001)
Discourse processes in dyadic and multiparty conversation. Application of concepts through analysis of conversations.

COMM 5462. Field Research in Spoken Language. (3 cr. §LING 5462. Prereq–5461, LING 3001 or LING 5001)
Transcribing and analyzing verbal communication and movement related to it. Applying concepts to recorded conversations.

COMM 5611. Survey of Rhetorical Theory. (3 cr. Prereq–1101)
Survey of rhetorical theory from ancient to contemporary period; application of theory to public discourse.

COMM 5615W. Introduction to Rhetorical Criticism. (3 cr. Prereq–1101; 3601 recommended)
Analysis of public discourse using various theoretical perspectives.

COMM 5617. History and Criticism of U.S. Public Discourse: 1630-1865. (3 cr. Prereq–Jr)
How discourse has been used to establish or maintain power. Speeches and public debates used to examine American public address from 17th century (e.g., Puritan sermons) to the Civil War.

COMM 5618. History and Criticism of U.S. Public Discourse: 1865-1950. (3 cr. Prereq–Jr)
How discourse has been used to establish or maintain power. Speeches and public debates used to examine U.S. public address from the mid 19th century to 1950.

COMM 5970. Directed Study. (1-3 cr [max 6 cr]; S-N only. Prereq–Nine 3xxx-5xxx Spch cr, #, Δ, o)
Guided individual reading or study.

COMM 5994. Communication Research Practicum. (1-3 cr [max 9 cr]; S-N only. Prereq–#)
Students participate in research group.

Comparative Literature (CL)

Department of Cultural Studies and Comparative Literature

College of Liberal Arts

CL 5331. Discourse of the Novel. (3 cr. §CSCL 5331)
Comparative study of the novel (eighteenth century to present): its relation to ordinary language practices, emergent reading publics, technologies of cultural dissemination, problems of subjectivity; its role in articulating international cultural relations.

CL 5555. Introduction to Semiotics. (3 cr. §CSCL 5555)
Problems of the nature of the sign; sign function; sign production; signifying systems as articulated in philosophy, linguistics, anthropology, psychoanalysis, and art theory. Applying semiotics to various signifying practices (e.g., literature, cinema, daily life).

CL 5751. Basic Concepts of Cinema. (4 cr. §CSCL 5751, CSDS 5751)
Cinema as object of theoretical/historical analysis. Emphasizes concepts that have transformed scope/aim of film analysis since 1960s. Readings of filmic/theoretical texts.

CL 5910. Topics in Comparative Literature. (3 cr [max 24 cr])
Topics specified in *Class Schedule*.

CL 5992. Directed Reading in Comparative Literature. (1-3 cr [max 9 cr]. Prereq–#)
Guided individual reading and study.

Comparative Studies in Discourse and Society (CSDS)

Department of Cultural Studies and Comparative Literature

College of Liberal Arts

CSDS 5301. Society, Ideology, and the Production of Art. (3 cr. §CSCL 5301)
Recent critical theories of relation of arts to social/ideological forces. Selected artifices from Western culture (e.g., Renaissance to 20th century; high, popular, mass culture). Music, visual art, literature.

CSDS 5302. Aesthetics and the Valuation of Art. (3 cr. §CSCL 5302)
Society, ideology, aesthetic value in light of recent critical theories of visual art, music, literature. Mediations of place, social class, gender, ideology on aesthetic judgment in post-renaissance Western culture.

CSDS 5555. Introduction to Semiotics. (3 cr)
Problems of the sign. Sign function/production. Signifying systems as articulated in philosophy, linguistics, anthropology, psychoanalysis, and art theory. Applying semiotics to various signifying practices (e.g., literature, cinema, daily life).

CSDS 5751. Basic Concepts of Cinema. (4 cr. §CL 5751, CSCL 5751)
Cinema as object of theoretical/historical analysis. Emphasizes concepts that have transformed scope/aim of film analysis since 1960s. Readings of filmic/theoretical texts.

CSDS 5910. Topics in Comparative Studies in Discourse and Society. (3 cr [max 24 cr])
Themes in comparative, sociohistorical analysis of discursive practices. Individually or team taught. Topics specified in *Class Schedule*.

CSDS 5993. Directed Study. (1-3 cr [max 9 cr]. Prereq–#)
Guided individual reading and study.

Computer Science (CSCI)

Department of Computer Science

Institute of Technology

CSCI 1001. Overview of Computer Science. (4 cr. Prereq–None)
Foundations/limits of today's computing/information technology. How to reason about applications and technological advances. Policy issues. Algorithms for automating solutions. Abstraction in design/problem solving. Concepts of computer databases, networks, expert systems human-computer interaction, Internet, Web, desktop software, and personal computers.

CSCI 1103. Introduction to Computer Programming in Java. (4 cr)
Programming and problem solving fundamentals. Significant portions of Java programming language. Students design/write Java programs relating to various subjects. Substantial programming projects, integral weekly lab.

CSCI 1107. Introduction to FORTRAN Programming for Scientists and Engineers. (3 cr. Prereq–MATH 1271 or MATH 1371 or #)
Algorithm development and principles of computer programmingusing FORTRAN. Emphasizes numerical methods for science and engineering applications.

CSCI 1109. C# Programming. (1-3 cr [max 3 cr])
Provides credit for transfer students who have taken a freshman or sophomore-level C# class.

CSCI 1113. Introduction to C/C++ Programming for Scientists and Engineers. (4 cr. Prereq–MATH 1271 or MATH 1371)
Programming for scientists/engineers. C/C++ programming constructs, object-oriented programming, software development, fundamental numerical techniques. Exercises/examples from various scientific fields.

CSCI 1121. Introduction to the Internet 1. (4 cr; A-F only)
Concepts of the internet, analog vs digital communication, networking, packet switching, software protocols. E-mail, search engines, file transfer (ftp), remote login (Telnet). Creating Web pages using HTML and Cascading Style Sheets. Advanced programming concepts such as Java, Perl, and CGI.

CSCI 1901. Structure of Computer Programming I. (4 cr. Prereq–¶MATH 1271 or equiv or #)
Principles of programming. Different programming paradigms (message-passing, data-driven, event-driven). Students develop algorithms/data types using language such as Scheme and techniques such as abstraction, procedures, recursion, iteration.

CSCI 1902. Structure of Computer Programming II. (4 cr. Prereq–1901 or #)
Object-oriented programming using language such as C++ or Java. Builds on 1901, presenting additional data structures/algorithms. Object-oriented approach to implement data structures/operations as abstract data types.

CSCI 2011. Discrete Structures of Computer Science. (4 cr. Prereq–MATH 1272 or MATH 1372 or #)
Foundations of discrete mathematics. Sets, sequences, functions, big-O, propositional and predicate logic, proof methods, counting methods, recursion and recurrences, relations, trees/graph fundamentals.

CSCI 2021. Machine Architecture and Organization. (4 cr. Prereq–1902 or #)
Introduction to hardware/software components of a computer system: data representation, boolean algebra, machine-level programs, instruction set architecture, processor organization, memory hierarchy, virtual memory,compiling, linking. Programming in C.

CSCI 2031. Introduction to Numerical Computing. (4 cr. §CSCI 5301. Prereq–Math 2243 or #)
Introduction to numerical computing for CSci, mathematics, and science/engineering students. Uses Mathematica or Matlab to cover numerical error, root finding, systems of equations, interpolation, numerical differentiation and integration, least squares, and differential equations.

CSCI 2121. Introduction to the Internet 2. (4 cr; A-F only. Prereq–1121)
Programming for the Internet using HTML, JavaScript, and Perl. CGI, database programming with Perl. Database concepts such as relational vs object oriented database technologies, querying data using SQL. Interfacing databases to the Web. E-commerce, emerging trends such as XML.

CSCI 2980. Special Topics in Computer Science. (1-4 cr; A-F only. Prereq–#)
Special topics. Lectures, informal discussions.

CSCI 3003. Introduction to Computing in Biology. (3 cr. Prereq–1002H or BIOL 1002 or 1009H or BIOL 1009 or equiv or #)
Emphasizes computing tasks common in biology. Programming techniques: variables, flow control, input/output, strings, pattern matching, arrays, hash tables, functions, subroutines. Concepts in computing: algorithms, complexity, documentation, regular expressions/grammars, local variables, encapsulation. Students complete lab projects in Perl language.

CSCI 3081W. Program Design and Development. (4 cr. §CSCI 4081W, CSCI 4089. Prereq–[1902, 2021] or #)
Principles of programming design/analysis. Concepts in software development. Uses C/C++ language to illustrate key ideas in program design/development, data structures, debugging, files, I/O, state machines, testing, and coding standards.

CSCI 3921W. Social, Legal, and Ethical Issues in Computing. (3 cr. Prereq–At least soph or #)
Impact of computers on society. Computer science perspective of ethical, legal, social, philosophical, political, and economic aspects of computing.

CSCI 3970. Industrial Student Co-op Assignment. (2 cr [max 4 cr]; S-N only. Prereq–CSci, in co-op program, #)
Industrial work assignment in a co-op program involving advancedcomputer technology. Reviewed by a faculty member. Grade based on final written report.

CSCI 3980. Undergraduate Colloquium. (1 cr [max 2 cr]. Prereq–Upper div CSci; can be repeated for cr)
Current computing trends and hot topics; industrial and career related topics; research topics; research projects and undergraduate researchopportunities; graduate school options.

CSCI 4011. Formal Languages and Automata Theory. (4 cr. Prereq–1902 and 2011 or #; cannot be taken for grad CSCI cr)
Logical and mathematical foundations of Computer Science. Theoretical models and their applications. Formal languages, models of computation, computability, undecidability, computational complexity. Emphasizes grammars, parsing, interpreters, and compilers.

CSCI 4041. Algorithms and Data Structures. (4 cr. Prereq–1902 and 2011 or #; cannot be taken for grad CSCI cr)
Rigorous analysis of algorithms and their implementation. Algorithm analysis, sorting algorithms, binary trees, heaps, priority queues, heapsort, balanced binary search trees, AVL trees, hash tables and hashing, graphs, graph traversal, single source shortest path, minimum cost spanning trees.

CSCI 4061. Introduction to Operating Systems. (4 cr. Prereq–2021 or EE 2361; no cr for grads in CSci)
Foundations of operating systems. History/evolution of operating systems, shells, tools, memory organization, file system overview, I/O, concurrent processes, interprocess communication.

CSCI 4107. Introduction to Computer Graphics Programming. (3 cr. §CSCI 5107. Prereq–4041 or #; cannot be taken for grad CSCI cr)
Theory/practice of computer graphics programming using C/C++ and OpenGL. Practical concepts in computer graphics modeling, rendering, and animation. Emphasizes effective use of graphics toolkits.

CSCI 4131. Internet Programming. (3 cr. §CSCI 5131. Prereq–4061, 4211 recommended, cannot be taken for grad CSCI cr)
Issues in internet programming. Internet history, architecture/protocols, network programming, Web architecture. Client-server architectures and protocols. Client-side programming, server-side programming, dynamic HTML, Java programming, object-oriented architecture/design, distributed object computing, Web applications.

CSCI 4203. Computer Architecture. (4 cr. §EE 4363, EE 5361. Prereq–2021 or #)
Introduction to computer architecture. Aspects of computer systems, such as pipelining, memory hierarchy, and input/output systems. Performance metrics. Examins each component of a complicated computer system.

CSCI 4211. Introduction to Computer Networks. (3 cr. §CSCI 5211. Prereq–4061 or #; basic knowledge of [computer architecture, operating systems] recommended, cannot be taken for grad CSCI cr)
Concepts, principles, protocols, and applications of computer networks. Layered network architectures, data link protocols, local area networks, routing, transport, network programming interfaces, networked applications. Examples from Ethernet, Token Ring, TCP/IP, HTTP, WWW.

CSCI 4707. Practice of Database Systems. (3 cr. §CSCI 5707, INET 4707. Prereq–4041 or #)
Concepts, conceptual data models, case studies, common data manipulation languages, logical data models, database design, facilities for database security/integrity, applications.

CSCI 4921. History of Computing. (3 cr. §HSCI 4321)
Developments in last 150 years; evolution of hardware and software; growth of computer and semiconductor industries and their relation to other businesses; changing relationships resulting from new data-gathering and analysis techniques; automation; social and ethical issues.

CSCI 4950. Senior Software Project. (3 cr [max 6 cr] Prereq–Upper div CSci, #)
Student teams develop a software system, distribute system to users, and extend/maintain it in response to their needs. Software engineering techniques. Software development, team participation, leadership.

CSCI 4970W. Advanced Project Laboratory. (3 cr [max 9 cr]. Prereq–Upper div CSci, 4061, #; cannot be taken for grad cr)
Formulate and solve open-ended project: design, implement, interface, document, test. Team work strongly encouraged. Arranged with CSci faculty.

CSCI 4980. Special Topics in Computer Science for Undergraduates. (1-3 cr [max 9 cr]; A-F only. Prereq–Undergrad, #; no cr for grads in [CSCI or CompE])
Lectures and informal discussions on current topics in computer science.

CSCI 5103. Operating Systems. (3 cr. Prereq–4061 or #)
Conceptual foundation of operating system designs and implementations. Relationships between operating system structures and machine architectures. UNIX implementation mechanisms as examples.

CSCI 5104. System Modeling and Performance Evaluation. (3 cr. Prereq–5103 or #)
Techniques for modeling computing systems for performance evaluation through analytical/simulation techniques. How to model computing systems and communications protocols to evaluate their performance under different operating conditions.

CSCI 5105. Foundations of Modern Operating Systems. (3 cr. Prereq–5103 or #)
Advanced concepts that build foundations of modern operating systems. Advanced scheduling algorithms, distributed communication/synchronization, consistency/replication models, distributed file systems, security, protection/virtualization, OS architectures.

CSCI 5106. Programming Languages. (3 cr. Prereq–4011 or #)
Design and implementation of high-level languages. Course has two parts: (1) language design principles, concepts, constructs; (2) language paradigms, applications. Note: course does not teach how to program in specific languages.

CSCI 5107. Fundamentals of Computer Graphics 1. (3 cr. §CSCI 4107. Prereq–[4041 or #], fluency in C/C++, mastery of basic concepts in linear algebra)
Fundamental algorithms in computer graphics. Emphasizes programming projects in C/C++. Scan conversion, hidden surface removal, geometrical transformations, projection, illumination/shading, parametric cubic curves, texture mapping, antialising, ray tracing. Developing graphics software, graphics research.

CSCI 5108. Fundamentals of Computer Graphics II. (3 cr. Prereq–5107 or #)
Advanced topics in image synthesis, modeling, and rendering. Image processing, image warping, global illumination, non-photorealistic rendering, texture synthesis. Parametric cubic surfaces, subdivision surfaces, acceleration techniques, advanced texture mapping. Programming is in C/C++.

CSCI 5109. Visualization. (3 cr. Prereq–1902, 4041 or equiv or #)
Fundamental theory/practice in data visualization. Emphasizes programming applications. Volume visualization, vector field visualization, information visualization, multivariate visualization, visualization of large datasets, visualization in immersive virtual environments, and perceptual issues in effective data representation. Projects are implemented in C++ using VTK or similar visualization API.

CSCI 5115. User Interface Design, Implementation and Evaluation. (3 cr. Prereq–4041 or #)
Theory, design, programming, and evaluation of interactive application interfaces. Human capabilities and limitations, interface design and engineering, prototyping and interface construction, interface evaluation, and topics such as data visualization and World Wide Web. Course is built around a group project.

CSCI 5116. GUI Toolkits and Their Implementation. (3 cr. Prereq–5115 or 5107 or #)
Structure and design of user interface toolkits and frameworks. Aspects of GUI toolkits (e.g., window system protocols, event processing, geometry management, resource management, data management, constraints). Course is built around implementation assignments and case studies of toolkits.

CSCI 5131. Advanced Internet Programming. (3 cr. §CSCI 4131. Prereq–5106 or 5211 or #; [4081 or 5801], 5707 recommended)
Issues in internet programming: Java programming, concurrent programming, workflow, distributed databases, security, collaborative computing, object-oriented architecture/design, network publishing, messaging architecture, distributed object computing, internets.

CSCI 5143. Real-Time and Embedded Systems. (3 cr. Prereq–[4061 or #], experience with C language)
How to control robots and video game consoles. Lecture, informal lab.

CSCI 5161. Introduction to Compilers. (3 cr. Prereq–4011 or #)
Theories and mechanisms of programming language processing tools. Generalcompiler organization: lexical scanner, syntax parser, symbol table, internal program representation, code generator. Relationship between design and implementation. Run-time memory management mechanism.

CSCI 5204. Advanced Computer Architecture. (3 cr. Prereq–4203 or EE 4363)
Instruction set architecture, processor microarchitecture, memory, I/O systems. Interactions between computer software and hardware. Methodologies of computer design.

CSCI 5211. Data Communications and Computer Networks. (3 cr. §CSCI 4211. Prereq–[4061 or #], basic knowledge of [computer architecture, operating systems, probability])
Fundamental concepts, principles, protocols, and applications of computer networks. Layered network architectures, data link protocols, local area networks, network layer/routing protocols, transport, congestion/flow control, emerging high-speed networks, network programming interfaces, networked applications. Case studies using Ethernet, Token Ring, FDDI, TCP/IP, ATM, Email, HTTP, and WWW.

CSCI 5221. Advanced Computer Networks. (3 cr. Prereq–4211 or 5211 or equiv; intro course in computer networks recommended)
design principles and protocol mechanisms, network algorithmics and implementation techniques, advanced network architectures, state-of-art and emerging networking technologies and applications, network modeling, simulation and experiments.

CSCI 5271. Introduction to Computer Security. (3 cr. Prereq–4061 or equiv or #)
Concepts of computer, network, and information security.Risk analysis, authentication, access control, security evaluation, audit trails, cryptography, network/database/application security, viruses, firewalls.

CSCI 5283. Computer-Aided Design I. (3 cr. Prereq–2021 or #)
CAD for digital systems. Emphasizes VLSI. Hardware description languages, synthesis, simulation, test generation.

CSCI 5302. Analysis of Numerical Algorithms. (3 cr. Prereq–2031 or #)
Additional topics in numerical analysis: interpolation, approximation, extrapolation, numerical integration/differentiation, numerical solutions of ordinary differential equations.

CSCI 5304. Computational Aspects of Matrix Theory. (3 cr. Prereq–5302 or #)
Perturbation theory for linear systems and eigenvalue problems. Direct and iterative solution of large linear systems. Decomposition methods. Computation of eigenvalues and eigenvectors. Singular value decomposition. LAPACK and other software packages. Methods for sparse and large structured matrices.

CSCI 5403. Computational Complexity. (3 cr. Prereq–4041 or #)
Computational models, complexity measures in each model, and related complexity classes.

CSCI 5421. Advanced Algorithms and Data Structures. (3 cr. Prereq–4041 or #)
Fundamental paradigms of algorithm and data structure design. Divide-and-conquer, dynamic programming, greedy method, graph algorithms, amortization, priority queues and variants, search structures, disjoint-set structures. Theoretical underpinnings. Examples from various problem domains.

CSCI 5451. Introduction to Parallel Computing: Architectures, Algorithms and Programming. (3 cr. Prereq–4041 or #)
Parallel architectures design, embeddings, routing, examples of parallel computers, fundamental communication operations, performance metrics, parallel algorithms for sorting, matrix problems, graph problems, dynamic load balancing, types of parallelisms, parallel programming paradigms, message passing programming in MPI, data parallel programming in HPF, shared-address space programming in threads.

CSCI 5471. Modern Cryptography. (3 cr. Prereq–[2011, 4041, [familiarity with number theory or finite fields]] or #)
Introduction to cryptography. Theoretical foundations, practical applications. Threats, attacks, and countermeasures, including cryptosystems and cryptographic protocols. Secure systems/networks. History of cryptography, encryption (conventional, public key), digital signatures, hash functions, message authentication codes, identification, authentication, applications.

CSCI 5481. Computational Techniques for Genomics. (3 cr. Prereq–4041 or #)
Techniques to analyze biological data generated by genome sequencing, proteomics, cell-wide measurements of gene expression changes. Algorithms for single/multiple sequence alignments/assembly. Search algorithms for sequence databases, phylogenetic tree construction algorithms. Algorithms for gene/promoter and protein structure prediction. Data mining for micro array expression analysis. Reverse engineering of regulatory networks.

CSCI 5511. Artificial Intelligence I. (3 cr. Prereq–2011 or #)
Introduction to AI. Problem solving, search, inference techniques. Logic and theorem proving. Knowledge representation, rules, frames, semantic networks. Planning and scheduling. Lisp programming language.

CSCI 5512W. Artificial Intelligence II. (3 cr. §CSCI 5519. Prereq–5511 or #)
Advanced topics in AI for solving complex problems. Machine learning (symbolic/neural networks approaches), genetic algorithms, reasoning with uncertainty, utility theory and decision theoretic methods, natural language processing, perception robotics, introduction to Prolog programming language.

CSCI 5519. Artificial Intelligence II (non-WI). (3 cr. §CSCI 5512W. Prereq–prereq 5511 or #)
Advanced topics in AI for solving complex problems. Machine learning (symbolic and neural networks approaches), genetic algorithms, reasoning with uncertainty, utility theory and decision theoretic methods, natural language processing, perception robotics, introduction to Prolog programming language.

CSCI 5521. Pattern Recognition. (3 cr. Prereq–[2031, STAT 3021] or #)
Problems of pattern recognition, feature selection, measurement techniques. Classification methods: statistical decision theory, nonstatistical techniques. Automatic feature selection and data clustering. Syntactic pattern recognition. Mathematical pattern recognition and artificial intelligence. Applications in information retrieval and WWW data mining.

CSCI 5523. Introduction to Data Mining. (3 cr. Prereq–4041 or equiv or #)
Data pre-processing techniques, data types, similarity measures, data visualization/exploration. Predictive models (e.g., decision trees, SVM, Bayes, K-nearest neighbors, bagging, boosting). Model evaluation techniques, Clustering (hierarchical, partitional, density-based), association analysis, anomaly detection. Case studies from areas such as earth science, the Web, network intrusion, and genomics. Hands-on projects.

CSCI 5525. Machine Learning. (3 cr. Prereq–Grad student or #)
Models of learning. Supervised algorithms such as perceptrons, logistic regression, and large margin methods (SVMs, boosting). Hypothesis evaluation. Learning theory. Online algorithms such as winnow and weighted majority. Unsupervised algorithms, dimensionality reduction, spectral methods. Graphical models.

CSCI 5541. Natural Language Processing. (3 cr. Prereq–5511 or #)
Elements of linguistic analysis for speech and unstructured text. Phonology, syntactic parsing, semantic interpretation, information extraction. Techniques for modeling uncertainty in linguistic analysis: probabilistic models, Hidden Markov Models (HMMs), Dynamic Bayes Nets (DBNs), Probabilistic Context-Free Grammars (PCFGs), Discounting and backoff smoothing, Maximum entropy modeling. Elements of information theory: entropy, perplexity, metrics for comparing models.

CSCI 5551. Introduction to Intelligent Robotic Systems. (3 cr. Prereq–5511 or #)
Transformations, kinematics/inverse kinematics, dynamics, control. Sensing (robot vision, force control, tactile sensing), applications of sensor-based robot control, robot programming, mobile robotics, and microrobotics.

CSCI 5552. Sensing and Estimation in Robotics. (3 cr. Prereq–[5551, STAT 3021] or #)
Bayesian estimation, maximum likelihood estimation, Kalman filtering, particle filtering. Sensor modeling and fusion. Mobile robot motion estimation (odometry, inertial,laser scan matching, vision-based) and path planning. Map representations, landmark-based localization, Markov localization, simultaneous localization/mapping (SLAM), multi-robot localization/mapping.

CSCI 5561. Computer Vision. (3 cr. Prereq–5511 or #)
Issues in perspective transformations, edge detection, image filtering, image segmentation, and feature tracking. Complex problems in shape recovery, stereo, active vision, autonomous navigation, shadows, and physics-based vision. Applications.

CSCI 5707. Principles of Database Systems. (3 cr. §CSCI 4707, INET 4707. Prereq–4041 or #)
Concepts, database architecture, alternative conceptual data models, foundations of data manipulation/analysis, logical data models, database designs, models of database security/integrity, current trends.

CSCI 5708. Architecture and Implementation of Database Management Systems. (3 cr. Prereq–4707 or 5707 or #)
Techniques in commercial/research-oriented database systems. Catalogs. Physical storage techniques. Query processing/optimization. Transaction management. Mechanisms for concurrency control, disaster recovery, distribution, security, integrity, extended data types, triggers, and rules.

CSCI 5801. Software Engineering I. (3 cr. Prereq–[1902, 2011] or #)
Advanced introduction to software engineering. Software life cycle, development models, software requirements analysis, software design, coding, maintenance.

For definitions of course numbers, symbols, and abbreviations, see page 300.

CSCI 5802. Software Engineering II. (3 cr. Prereq–5801 or #)
Introduction to software testing, software maturity models, cost specification models, bug estimation, software reliability models, software complexity, quality control, and experience report. Student groups specify, design, implement, and test partial software systems. Application of general software development methods and principles from 5801.

CSCI 5980. Special Topics in Computer Science. (1-3 cr [max 9 cr]. Prereq–#; may be repeated for cr)
Lectures and informal discussions on current topics in computer science.

CSCI 5991. Independent Study. (1-3 cr [max 9 cr]. Prereq–#; may be repeated for cr)
Independent study arranged with CS faculty member.

CSCI 5994. Directed Research. (1-3 cr [max 9 cr]. Prereq–#; may be repeated for cr)
Directed research arranged with faculty member.

CSCI 5996. Curricular Practical Training. (1 cr [max 3 cr]; S-N only. Prereq–[CSCI or CompE] major, #)
Industrial work assignment involving advanced computer technology. Reviewed by faculty member. Grade based on final report covering work assignment.

Construction Management (CMGT)

College of Continuing Education

CMGT 2019. AutoCAD for Construction Managers. (2 cr; S-N only. Prereq–30 sem cr)
AutoCAD software skills. Techniques of computer-aided design and drafting (CAD) at job entry level. Lecture, lab.

CMGT 3001. Introduction to Construction. (3 cr)
Introduction to construction/processes that shape our environment. Construction types and their differences. Key participants and their vocabulary. Delivery systems. Construction specialists and their roles. Construction plan reading. Construction management. Lectures, field trips.

CMGT 3011. Construction Plan Reading. (2 cr)
Intro to construction plan reading and construction documents (using architectural, civil, mechanical, electrical drawings and project manual). Read, understand, and interpret commercial construction plans and project manuals, including notes, symbols, and plan layout.

CMGT 4011. Construction Documents and Contracts. (3 cr. Prereq–3001, 45 sem cr)
Definition, interpretation, and utilization of drawings. Specifications, agreements, bidding forms, general conditions. Bonds, contracts, subcontracts, and related documents. Appropriate provisions for minority business participation, such as tax exempt status and wage rates.

CMGT 4012. Risk Management, Bonds, and Insurance. (2 cr. Prereq–3001, 45 sem cr)
Identification/evaluation of property, liability, and financial risks of a construction project. Tools of risk control/financing. Review of insurance coverage, contract bonds, and underwriting factors.

CMGT 4013. Legal and Ethical Issues in Construction. (3 cr. Prereq–4011 or equiv or #)
Role of construction management professional in society. Principles of conduct for construction management professional, goals in professional performance/behavior, reviews of mandatory requirements.

CMGT 4016. Construction Software. (2 cr; A-F only)
Current/future uses of technology by owners, general contractors, subcontractors, and facilities management personnel. Networking, databases, wireless communication, software selection, Web-based project management, online plan rooms. Hands-on, workshop environment.

CMGT 4018. E-Business in Construction. (2 cr; A-F only)
Selection/implementation of Web-based project management tools. Software such as Bidcom, E-builder, Bricsnet, Constructware, Frametech. Hands-on work with live building sites. Digital technologies in construction industry. Wire/wireless communication, online plan/bid rooms, mobile computing, video conferencing.

CMGT 4021. Construction Planning and Scheduling. (3 cr. Prereq–3001, [3011 or CE 4101], 45 sem cr)
Project planning, scheduling, and control. Considering/understanding alternatives. Industry techniques. Introduction to critical path method. Using commercial software on personal computers. Updating/analyzing project schedules.

CMGT 4022. Construction Estimating. (3 cr. Prereq–3001, [3011 or CE 4101], 45 sem cr)
Purposes/uses of various estimates. Performing quantity take-off, organizing bidding process. Requesting/analyzing subcontractor proposals. Unit pricing. Using published resources. Preparing systems-based estimates. Related software, spreadsheets, custom applications. Linkages among estimates, budgets, cost control systems, and cost records.

CMGT 4023. Value Engineering. (2 cr)
Step by step approach. Defining building system/materials functions. Allocating cost to functions. Defining alternative methods to perform functions. Evaluating methods for best value. Five phases of function analysis (value engineering): information, creative, evaluation, planning, implementation.

CMGT 4024. Estimating and Value Engineering. (4 cr; A-F only. Prereq–CMSV 2860 [available at NHCC])
Purposes/uses of various kinds of estimates. Performing quantity take-off. Organizing bidding. Requesting/analyzing subcontractor proposals. Unit pricing. Using published resources. Preparing systems-based estimates. Personal computer programs, spreadsheets, custom applications. Defining building system, materials function. Allocating cost. Defining alternative methods for performing. Evaluating to yield best value.

CMGT 4025. Computer-Based Construction Planning and Scheduling. (2 cr; A-F only. Prereq–[4021, upper div] or #)
Project planning, scheduling, and control. Considering/understanding alternatives. Industry techniques such as critical path method. Updating/analyzing project schedules.

CMGT 4026. Computer-Based Construction Estimating. 2 cr; A-F only. Prereq–4022)
Various kinds of estimates via computer. Techniques for performing quantity take-off, organizing bidding process, requesting/analyzing subcontractor proposals, unit pricing, utilizing published resources, and preparing systems-based estimates. Personal computer programs, spreadsheets, custom applications. Linkages between estimates, budgets, cost control systems, and historical cost records.

CMGT 4027. Computer-Based Project Management. (2 cr. Prereq–CE 4101 or equiv or #)
Practical application of construction project management using computer software. Students manage one or two real projects through all phases of construction. Planning, scheduling, budgeting, estimating, staffing projections, cost control, communication tools.

CMGT 4031. Construction Safety and Loss Control. (3 cr. Prereq–3001, 45 sem cr)
Introduction to construction safety, health, and loss control. Hazard recognition. Control procedures. Management systems for measuring/evaluating loss-control performances in construction industry.

CMGT 4041. Specifications and Technical Writing for Construction Professionals. (3 cr. Prereq–4011 or ¶4011)
Develop/enhance appropriate oral/written communication necessary for use in the construction process from planning phase through contract closeout. Develop construction-specific practical applications to facilitate the process and avoid common pitfalls.

CMGT 4051. Construction Materials for Managers. (3 cr. Prereq–3001, [AEM 2011 or BP 3001 or BP 3101], 45 sem cr)
Concepts of physical properties. Behavior mechanisms for construction materials such as concrete, aggregate, steel, and wood. Standard specifications for material properties. Lab techniques for evaluation of each material.

CMGT 4111. Construction Productivity Management. (2 cr. Prereq–4021, 4022, CE 4101)
How to manage/supervise a project to maximize effectiveness/efficiency. Applying theoretical concepts of improving productivity in people, materials, equipment, and processes via on-going case study. Leadership/communication as applied to construction industry.

CMGT 4193. Directed Study. (1-4 cr [max 16 cr]. Prereq–CMGT major or minor or certificate student)
Topic arranged with BAS construction management academic adviser.

CMGT 4196. Construction Management Internship. (1-4 cr [max 12 cr] Prereq–[CMGT major or minor or certificate student], [jr or sr], Δ)
Hands-on work experiences in a construction company, applying coursework in the work place, contributing knowledge of best practices, and participating in career development exercises.

CMGT 4201. Construction Accounting. (3 cr. Prereq–3001, ACCT 2050, ABUS 4101)
Unique characteristics and dissimilarities crucial for all parties involved to understand/manage the construction process. Unique aspects of construction financial accounting, managerial accounting, tax planning, and auditing.

CMGT 4550. Topics in Construction Management. (3 cr [max 9 cr]; A-F only)
Topics in construction management.

CMGT 4572. Structural Frames and Building Design/Construction. (3 cr; A-F only. Prereq–3001, [AEM 2011 or BP 3001 or BP 3101])
Basic contemporary structural systems in masonry, steel, and wood framing systems. Forms/performance of systems.

CMGT 4901. Communication and the Construction Process. (2 cr. Prereq–45 sem cr)
Traces construction project from client's idea to completion. Interaction skills that construction managers need to deliver a building project through the hoops, hurdles, and pitfalls of its lifecycle. Managerial written/oral communication skills/techniques. Guest speakers, student debates in mock situations.

Coptic (COPT)

Department of Classical and Near Eastern Studies

College of Liberal Arts

COPT 5001. Elementary Coptic. (3 cr)
Introduction to Coptic grammar and vocabulary, chiefly in the Sahidic dialect.

COPT 5002. Elementary Coptic. (3 cr. Prereq–5001 or equiv)
Reading a variety of Coptic literature, such as Gnostic, martyrological, or monastic texts.

This is COPT to FR of the Course Description section of the 2006-2008 Undergraduate Catalog for the University of Minnesota, Twin Cities campus.

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Department of Cultural Studies and Comparative Literature

College of Liberal Arts

CSCL 1001. Introduction to Cultural Studies: Rhetoric, Power, Desire. (4 cr)
Ways of reading texts, artistic forms, everyday practices that define ongoing conflicts over meaning, value, truth. Examples from visual arts, music, film, literature, myth, ritual, built environment.

CSCL 1101. Literature. (4 cr)
Introduction to literature across time, national boundaries. Basic genres, including poetry, novel, drama, historical/philosophical writing. Key questions: What is literature? What forms does it take? Why does literature matter?

CSCL 1201. Introduction to Cinema and Media Culture. (4 cr. §SCMC 1201)
Critical anlysis of media, particularly film. Emergence/prominence of the visual in contemporary culture. Formal film analysis/theory. Issues of production/reception.

CSCL 1301W. Reading Culture: Theory and Practice. (4 cr)
Culture and cultural conflict. Reading cultural theory/texts such as film, literature, music, fashion, commercial art, and built environment.

CSCL 1401W. Reading Literature: Theory and Practice. (4 cr)
How can we read/understand different ways that literature is meaningful? Emphasizes practice in reading a broad spectrum of world literature, literary theory.

CSCL 1501W. Reading History: Theory and Practice. (4 cr)
What is history? How can we understand its meanings/uses? Emphasizes practice in reading cultural texts from various historical perspectives.

CSCL 1903. Freshman Seminar. (3 cr [max 6 cr]; A-F only. Prereq–Freshman)
Topics specified in *Class Schedule*.

CSCL 1904. Freshman Seminar. (3 cr; A-F only. Prereq–Freshman)
Topics specified in *Class Schedule*.

CSCL 1905. Freshman Seminar. (3 cr; A-F only. Prereq–Freshman)
Topics specified in *Class Schedule*.

CSCL 1907W. Freshman Seminar. (3 cr; A-F only. Prereq–Freshman)
Topics specified in *Class Schedule*.

CSCL 1909W. Freshman Seminar. (3 cr [max 6 cr]; A-F only. Prereq–Fr)
Topics specified in *Class Schedule*.

CSCL 1910W. Freshman Seminar. (3 cr [max 6 cr]; A-F only. Prereq–Freshman)
Topics specified in *Class Schedule*.

CSCL 1921. Introduction to Film Study. (4 cr. §ARTH 1921W)
Fundamentals of film analysis and an introduction to the major theories of the cinema, presented through detailed interpretations of representative films from the international history of the cinema.

CSCL 2910H. Topics in Cultural Studies and Comparative Literature. (3 cr [max 6 cr] Prereq–Honors)
Topics specified in *Class Schedule*.

CSCL 3000. Topics. (1-3 cr [max 2 cr])
Selected topics.

CSCL 3115. Cinema and Ideology. (4 cr)
The cinema as a social institution with emphasis on the complex relations it maintains with the ideological practices that define both the form and the content of its products. Specific films used to study how mass culture contributes to the process of shaping beliefs and identities of citizens.

CSCL 3172. Music as Discourse. (3 cr)
Close examination of widely varying musical forms and styles, "classical" and "popular," in relation to human subjectivity and configurations of culture, ideology, and power.

CSCL 3173W. The Rhetoric of Everyday Life. (3 cr)
How discourse reproduces consciousness and persuades us to accept that consciousness and the power supporting it. Literary language, advertising, electronic media; film, visual and musical arts, built environment and performance. Techniques for analyzing language, material culture, and performance.

CSCL 3174. Poetry as Cultural Critique. (3 cr)
Examines the status of "poetry" in several cultures of the Americas bringing together techniques of close reading and broad cultural inquiry.

CSCL 3175. Comedy: Text and Theory. (3 cr)
Comedy as a discursive/political practice. Jokes, stand-up routines, plays, films, satire, and social ritual. Philosophical, literary, psychological, anthropological, feminist, and postmodern theory.

CSCL 3176. Oppositional Cinemas. (4 cr)
The ways diverse national cinemas engage the international hegemony of Hollywood cinema. The cinematic struggle against cultural imperialism and the role of race, class, and gender in the domain of international cultural politics.

CSCL 3177. On Television. (4 cr)
Key debates in the history, theory, and criticism of television. Focuses on critical/creative "readings" of television's past/present forms. TV's influence on film, music, and digital media.

CSCL 3179. Reading Literary Movements. (3 cr)
Literary movement that emerge when a group of writers puts forth a new definition of literature. Literary movemens created by scholars after the fact. Focuses on one or two related movements (e.g., surrealism and dadaism).

CSCL 3181. EAST Asian Cinemas. (4 cr)
East Asian cinemas. Structure/content of films from China, Japan, Hong Kong, Taiwan, Korea, Thailand, Vietnam. Historical representation, aesthetic strategies, narrative content. Race, class, gender, revolution, colonialism.

CSCL 3321W. Theories of Culture. (3 cr)
Examination of three prevalent theoretical perspectives on culture — philosophical, anthropological, and aesthetic — as they converge in the work of writers who have contributed to our contemporary conception of cultural diversity.

CSCL 3331. Science and the Humanities. (3 cr)
The sciences and humanities battle over "truth" and "reality," while technology recasts the world of knowledge and work. The question of texts-as-truth also facilitates the ongoing religious attacks on science in this millennial moment.

CSCL 3361. Visions of Nature: The Natural World and Political Thought. (4 cr. §EEB 3361)
Theories about organization of nature, human nature, and their significance for development of ethics, religion, political/economic philosophy, civics, and environmentalism in Western/other civilizations. Lecture/discussion, film assignments.

CSCL 3366W. Landscape, Nature, Society. (3 cr)
Importance of the concept of nature in Anglo-american culture in the period 160-1875. Focuses on role of property relations, travel and exploration, religion, and philosophy. Topics include "the Garden in the Wilderness," English landscape gardens, American painters of the West, and the sublime.

CSCL 3412W. Psychoanalysis and Literature Part I: The Essential Freud. (3 cr)
Theoretical writings of Sigmund Freud; basic concepts of psychoanalytic criticism; dream and interpretation; genre of the case study; Freud's ideas concerning the constitution of ethnicity, culture, identity, and gender; fantasy vs. reality; psychoanalysis of the author/character/culture.

CSCL 3413W. Psychoanalysis and Literature Part II: Post Freudian Criticism. (3 cr)
Impact of psychoanalytic discourses on literary studies and vice versa. Archetypal of Jung; structural of Lacan; post-structural of Derrida and Kristeva; feminist psychoanalysis of Mitchell; self/object of Kernberg and Kohut; the unconscious and society of Deleuze and Guattari.

CSCL 3421. Culture and the Production of Modern Identity I: 1600-1750. (3 cr)
History of cultural, perceptual and/or conceptual changes in Western societies, 1600 to 1750, concerning new and conflicting understandings of the human imagination, subjectivity, identity, and the body; addressed through philosophy, literature, visual arts, music, pedagogical and medical treatises, and manners.

CSCL 3422. Culture and the Production of Modern Identity II: 1750-1900. (3 cr)
History of cultural, perceptual and/or conceptual changes in Western societies, 1750 to 1900, concerning new and conflicting understandings of the human imagination, subjectivity, identity, and the body; addressedthrough philosophy, literature, visual arts, music, pedagogical and medical treatises, and manners.

CSCL 3456W. Sexuality and Culture. (3 cr)
Historical/critical study of forms of modern sexuality (heterosexuality, homosexuality, romance, erotic domination, lynching). How discourses constitute/regulate sexuality. Scientific/scholarly literature, religious documents, fiction, personal narratives, films, advertisements.

CSCL 3458W. The Body and the Politics of Representation. (3 cr)
Western representation of the human body, 1500 to present. Body's appearance as a site and sight for production of social and cultural difference (race, ethnicity, class, gender). Visual arts, literature, music, medical treatises, courtesy literature, erotica.

CSCL 3461. Monsters, Robots, Cyborgs. (3 cr)
Historical/critical reading of figures (e.g., uncanny double, monstrous aberration, technological hybrid) in mythology, literature, and film, from classical epic to sci-fi, cyberpunk, and Web.

CSCL 3472. Gay Men and Homophobia in American Culture. (3 cr)
The historical experience of gay men, the social construction of same-sex desire in American society since 1700, studied in a broad context of cultural history and discourse, including literature and the arts, journalism, science and medicine, religion, and law.

CSCL 3557W. Close Reading. (3 cr)
History/theory of 'close reading' (i.e., the most intense encounter between reader and text) exemplified through critical texts. Students perform close readings of various texts.

CSCL 3621W. Colonial and Postcolonial Literatures and Theory: 1700 to the Present. (3 cr)
Readings in colonial/postcolonial literatures/theory from at least two world regions: Africa, the Americas, the Arab world, Asia, Europe, and the Pacific. Cultural/psychological dynamics and political economy of world under empire, decolonization, pre- vs. post-coloniality, globalization.

CSCL 3631. Jewish Writers and Rebels in German, Austrian, and American Culture. (3 cr. §GER 3631, JWST 3631. Prereq–No knowledge of German required; cr toward major or minor requires reading in German)
Literary/cultural modes of writing used by Jewish writers in Germany, Austria, and America to deal with problems of identity, anti-Semitism, and assimilation. Focus on 20th century. All readings (novels, poetry, stories) in English.

For definitions of course numbers, symbols, and abbreviations, see page 300.

CSCL 3771. Basic Concepts of Literary Study. (3 cr)
Concepts used when carrying out work of reading/interpretation. How analysis works: aspects of distinction between text text/context, other concepts. How to understand/justify literary interpretation. Course does not engage in the reading of literature.

CSCL 3910. Topics in Cultural Studies and Comparative Literature. (3 cr [max 24 cr])
Topics specified in *Class Schedule*.

CSCL 3910H. Topics in Cultural Studies and Comparative Literature: Honors. (3 cr [max 12 cr])
Topics specified in *Class Schedule*.

CSCL 3920. Topics in Cultural Studies and Comparative Literature. (2 cr [max 3 cr])
Topics specified in *Class Schedule*.

CSCL 3979. Issues in Cultural Pluralism. (3 cr)
Critical/comparative basis for study of racial, ethnic, and cultural communities, primarily in the U.S. Perspectives on identity, citizenship, democracy, and power.

CSCL 3993. Directed Study. (1-3 cr [max 3 cr]. Prereq–#, Δ, ❑)
Guided individual reading or study.

CSCL 4944H. Honors Thesis. (3 cr [max 33 cr]. Prereq–Candidate for magna or summa honors in CSCL, consent of CSCL honors advisercollege approval)
Magna or summa honors thesis.

CSCL 4993. Directed Study. (1-3 cr [max 6 cr]; A-F only)
Guided individual study.

CSCL 5147. Teaching as Dialogue. (3 cr)
Teaching and the teacher are the subject. Entering into dialogue is the method. Issues with the politics of teaching, the means of entering into dialogue, questions of judgment, and the idea of self-teaching as the goal of teaching.

CSCL 5154W. Theoretical Constructions of Space. (3 cr)
Inquiry into theories of space drawn from various disciplines including anthropology, architecture, geography, history, landscape design, philosophy, planning, and sociology. Focus on sociopolitical interests that are served and sustained; emphasis on opportunities and implications for personal identity.

CSCL 5256W. Suburbia. (3 cr)
Suburbia from origins in 18th-century England to the present. Historical changes and present challenges, especially in America. Ideology, mythology, planning, development, geography, transportation, the family. Specific sites and designs; representations in film, television, popular literature, and music.

CSCL 5301. Society, Ideology, and the Production of Art. (3 cr. §CSDS 5301)
Recent critical theories on the relation of the arts to social and ideological forces; selected artifices from Western culture (Renaissance to 20th century; high, popular, and mass culture). Music, visual art, literature.

CSCL 5302. Aesthetics and the Valuation of Art. (3 cr. §CSDS 5302)
Society, ideology, and aesthetic value considered in light of recent critical theories of visual art, music, and literature. Meditations of place, social class, gender and ideology on aesthetic judgment in post-Renaissance Western culture.

CSCL 5331. Discourse of the Novel. (3 cr. §CL 5331)
Comparative study of the novel, 18th century to present. Its relations to ordinary language practices, emergent reading publics, technologies of cultural dissemination, problems of subjectivity, and its role in articulating international cultural relations.

CSCL 5555. Introduction to Semiotics. (3 cr. §CL 5555)
Problems of the nature of the sign; sign function; sign production; signifying systems as articulated in philosophy, linguistics, anthropology, psychoanalysis, and art theory. Application of semiotics to various signifying practices (literature, cinema, daily life).

CSCL 5711. Sociocriticism. (3 cr)
Sustained consideration of the modern tradition of sociological reflection on literature. Early and late Birmingham School, Frankfurt School, Bakhtin circle, and the various French initiatives associated with both Les Temps Modernes and Tel Quel.

CSCL 5835. Richard Wagner's "Der Ring des Nibelungen": Music, Myth, and Politics. (3 cr. Prereq–#)
Literary and musical analysis and historical context of the four works of Wagner's "Ring": Das Rheingold, Die Walküre, Siegfried, Götterdämmerung. Critical assessment of Wagner's achievement and influence.

CSCL 5910. Topics in Cultural Studies and Comparative Literature. (3 cr [max 24 cr])
Topics specified in *Class Schedule*.

CSCL 5993. Directed Study. (1-3 cr [max 9 cr]. Prereq–#, Δ, ❑)
Guided individual reading or study.

Curriculum and Instruction (CI)

Department of Curriculum and Instruction

College of Education and Human Development

CI 1001. Introduction to the Elementary School. (3 cr; A-F only)
Three modules focus on important aspects of contemporary urban elementary school teaching: the principal's role, the teacher's role, and the students. Central to each module are school-based visits, observations, and interviews.

CI 3401. Children s Literature: Pre-K Through Grade 5. (3 cr; A-F only. Prereq–Jr or sr or #)
Introduction to children s literature as field of study and as part of pre-K through elementary school curriculum. Classic and recently published books in all genres. Research in children s reading interests/responses to literature. Methods of implementing literature-based instruction/assessment.

CI 5111. Introduction to Elementary School Teaching. (3 cr; A-F only. Prereq–Foundations of ed major or elem ed initial lic)
Curriculum organization, instruction, management, assessment, professional decision making.

CI 5181. Clinical Experience in Elementary School Teaching. (3-8 cr [max 16 cr]; S-N only. Prereq–Foundations of education and elem ed initial licensure only)
Students spend full days in the elementary classroom gradually assuming responsibility for teaching the class. Students prepare a portfolio based on criteria given. One seminar per week.

CI 5401. Literature for the Elementary School. (3 cr; A-F only. Prereq–Children's lit course or #)
Evaluative survey of books for children. Research related to children's reading interests. Response to literature, instructional strategies.

CI 5415. Literacy Development in the Primary Grades. (3 cr; A-F only. Prereq–Elem teaching exper or #)
Theory/practice of integrated teaching of reading, literature, writing, and language in primary classroom settings. Uses national/state language arts standards and assessment protocols to examine primary literacy curricula.

CI 5504. Elementary School Science: Materials and Resources. (3 cr. Prereq–Elem tchg exper or #)
Examination of the teacher's role in inquiry teaching; the current science curriculum; and resources for teaching science in the elementary school.

CI 5701. Teaching Social Studies in the Elementary School. (2 cr; A-F only. Prereq–5111 or equiv, elem ed initial licensure only)
Content and organization of elementary social studies programs; programs of understanding, improving the learning situation, and effective use of materials.

CI 5821. Teaching Mathematics in the Elementary School. (2 cr; A-F only. Prereq–Elem ed initial licensure only)
Principles of learning pertinent to the modern program of mathematics in elementary grades. Objectives, content, philosophy, instructional materials, and methods of instruction and evaluation.

Dance (DNCE)

Department of Theatre Arts and Dance

College of Liberal Arts

DNCE 1001. Modern Dance Technique 1. (1 cr)
Expressive body movement: alignment, proprioceptiveness, body mechanics, weight, momentum, line, and intent.

DNCE 1002. Modern Dance Technique 2. (1 cr. Prereq–1001, Δ)
Continuation of 1001. Expressive body movement: alignment, proprioceptiveness, body mechanics, weight, momentum, line, and intent.

DNCE 1010. Modern Dance Technique 3. (2 cr [max 4 cr]. Prereq–Δ)
Continuation of physical training. Theory of space, time, and energy. Correct placement, power from pelvic center, rotation/turnout, muscular tonality, articulation of joints, clarity of emotional intent, physical stretch, strength, and stamina.

DNCE 1020. Modern Dance Technique 4. (2 cr [max 4 cr]. Prereq–1010, Δ)
Continuation of 1010. Correct placement, power from pelvic center, rotation/turnout, muscular tonality, articulation of joints, clarity of emotional intent, physical stretch, strength, and stamina.

DNCE 1101. Ballet Technique 1. (1 cr)
Principles, basic technique, and vocabulary of ballet; barre, center, and allegro.

DNCE 1102. Ballet Technique 2. (1 cr. Prereq–1101, Δ)
Continuation of 1101. Principles, basic technique, and vocabulary of ballet; barre, center, and allegro.

DNCE 1110. Ballet Technique 3. (2 cr [max 4 cr]. Prereq–Δ)
Continuation of ballet training. Correct placement, line and historical development; barre, center, and allegro.

DNCE 1120. Ballet Technique 4. (2 cr [max 4 cr]. Prereq–1110, Δ)
Continuation 1110. Ballet training; correct placement, line and historical development. Barre, center, and allegro.

DNCE 1201. Jazz Technique 1. (1 cr)
Jazz dance technique and its origins. Warm-up, center-floor work, and across-the-floor combinations.

DNCE 1202. Jazz Technique 2. (1 cr. Prereq–1201, Δ)
Continuation of 1201. Jazz dance technique and its origins. Warm-up, center-floor work, and across-the-floor combinations.

DNCE 1210. Jazz Technique 3. (1 cr [max 2 cr]. Prereq–Δ; , audition)
Jazz technique. Body isolations, placement, and musicality.

DNCE 1220. Jazz Technique 4. (1 cr [max 2 cr]. Prereq–1210, Δ)
Continuation of 1210. Jazz technique; body isolations, placement, and musicality.

DNCE 1301. Tap Technique 1. (1 cr)
Learning fundamental terms, basic rhythm structures, stock steps, and standard time steps.

DNCE 1302. Tap Technique 2. (1 cr. Prereq–1301 or #)
Fundamental terms, basic rhythms and syncopation, stock steps, and standard time steps; clarity of sound and rhythm.

DNCE 1311. International Folk Dance 1. (1 cr)
Basic folk steps including the schottische, polka, waltz, and grapevine; technical emphasis on footwork and partnering.

DNCE 1312. International Folk Dance 2. (1 cr. Prereq–1311, Δ)
Continuation of 1311. Basic folk steps including the schottische, polka, waltz, and grapevine; technical emphasis on footwork and partnering.

DNCE 1313. African Based Movement. (1 cr)
Varied movement of African diaspora, primarily but not limited to West African region and continent of Africa. Traditional movement. Movement inspired by Africa, the Caribbean, and African diaspora at large. In-class movement participation, one movement midterm, one two-page paper.

DNCE 1315. Flamenco. (1 cr)
Basic terminology and movement styles of Spanish Flamenco dance technique. Focuses on arm movements and footwork. Basic choreography. One class period is devoted to viewing videos of traditional Flamenco dance.

DNCE 1317. Arabic Dance. (1 cr)
Basic movements/stylings of dances of Arabic-speaking world. Emphasizes classical women's performing dances of traditional/contemporary movements in Egypt, the Levant, the Arabian Peninsula, North Africa, and Turkey. Body awareness, conditioning, cultural context of movements/dances.

DNCE 1321. Ballroom 1. (1 cr)
Principles of partnering. Elementary steps of the foxtrot, waltz, swing, cha-cha, rumba, and tango.

DNCE 1322. Ballroom 2. (1 cr. Prereq–1321, Δ)
Continuation of 1321. Elementary steps of the foxtrot, waltz, swing, cha-cha, rumba, tango, mamba, and bolero. Partnering, style, and phrasing.

DNCE 1323. Swing Dance. (1 cr)
Traditional swing dances popular in the United States from 1930s through early 1960s. Each week new movements/figures are taught and previous dances reviewed. Students are expected to change partners.

DNCE 1325. Latin Dance. (1 cr)
Basic vocabulary, lead/follow techniques of most popular Latin social dance styles. Salsa, Chacha, Rumba, Merengue. First half of class focuses on basic footwork/partnering; second half focuses on rhythm and musical styling.

DNCE 1331. Yoga. (1 cr)
Theory/practice of Yoga. Standing postures, forward bends, twists, balancing, seated postures, inversions, back bends, guided relaxation/meditation. Proper alignment, weight placement, body awareness, relaxation, breathing techniques. Midterm paper, movement demonstration final.

DNCE 1332. Yoga for Dancers. (1 cr. Prereq–Dance major, Δ)
Physical experience and related aesthetic topics. Historical aspects. Philosophical ideas of yoga. Improving body mechanics through alignment, flexibility, and strength. Developing mental focus/control. Reinforcing positive body language.

DNCE 1335. T'ai Chi Ch'uan. (1 cr)
Ancient Chinese slow-motion exercise. Helping body/mind to become relaxed/centered. Natural movement patterns, deep breathing, tranquil stress-free mind. Self-defense applications of movements. Non-competitive, non-aggressive.

DNCE 1347. Stott Pilates Conditioning. (1 cr)
Essential mat work of Pilates method. Contemporary approach to mind-body system of exercise pioneered by Joseph Pilates. Neuro-muscular resistance exercises to develop strong, flexible muscles and better alignment for optimal physical/mental well-being.

DNCE 1349. Contact Improvisation. (1 cr)
Safe, clear introduction to principles of contact improvisation. Rolling point of contact, supporting/being supported, falling/recovering, connecting with center as source/support for movement. Classes include warm-up.

DNCE 1362. Dance for Musical Theatre. (2 cr; A-F only. §TH 1362)
Movement based lab. Dance skills in musical theatre performance. Focuses on various styles/disciplines of dance throughout its culturally diverse heritage. Character development necessary to execution of various dance styles.

DNCE 1401. Introduction to Dance. (3 cr)
Modern dance, ballet, and world dance, primarily in the 20th century. Dance forms, choreographers, and dance issues through lecture, discussion, and viewing of live and taped performance.

DNCE 1402. Dance History. (3 cr. Prereq–1401)
"Ways of knowing" in dance history by reading the works of critics, historians, and philosophers who address questions concerning the nature of dance.

DNCE 1500. Topics in Dance. (1-3 cr [max 10 cr])
Topics specified in *Class Schedule*.

DNCE 1601. Dance Improvisation. (1 cr; A-F only. Prereq–Concurrent registration in a modern dance technique course, Δ)
Individual ways of moving linked to fundamental elements of dance: time, space, and energy. Metered time, musical phrasing. Movement speed, shape, and quality. Creative process, individual movement vocabulary, structural devices in dance.

DNCE 1626. Music for Dance. (3 cr. Prereq–Δ)
Elements of music theory, form, analysis, and history necessary for the potential dancer, choreographer, and musician to better understand each art.

DNCE 3010. Modern Dance Technique 5. (2 cr [max 4 cr]. Prereq–Δ; audit registration not permitted)
Application of principles of space, time, energy. Alignment, power from pelvic center, rotation/turnout, muscular tonality, joint articulation, clarity of intent, stretch, strength, stamina.

DNCE 3020. Modern Dance Technique 6. (2 cr [max 4 cr]. Prereq–3010, Δ)
Continuation of 3010. Application of principles of space, time, energy. Alignment, power from pelvic center, rotation/turnout, muscular tonality, joint articulation, clarity of intent, stretch, strength, stamina.

DNCE 3110. Ballet Technique 5. (2 cr [max 4 cr]. Prereq–Δ; audit registration not permitted)
Continuation of beginning technique. Stretch, strength, balance, musicality. Longer phrases in adagio/allegro work. More complex elevations in petit allegro. Practical work conducted in context of study of technical development of ballet.

DNCE 3120. Ballet Technique 6. (2 cr [max 4 cr]. Prereq–3110, Δ; audit registration not permitted)
Continuation of 3110. Ballet technique. Stretch, strength, balance, musicality. Longer phrases in adagio/allegro work. More complex elevations in petit allegro.

DNCE 3210. Jazz Technique 5. (1 cr [max 2 cr]. Prereq–Δ; audit registration not permitted)
Continuation of jazz technique. Rhythm structures, longer phrases, greater physical speed, attack/control.

DNCE 3220. Jazz Technique 6. (1 cr [max 2 cr]. Prereq–3210, Δ; audit registration not permitted)
Continuation of 3210. Jazz technique. Rhythm structures, longer phrases, greater physical speed, attack/control.

DNCE 3301. Tap Technique 3. (1 cr. Prereq–1302 or #)
Tap techniques and creative development through improvisational studies.

DNCE 3302. Tap Technique 4. (1 cr. Prereq–3301 or #)
Tap techniques and rhythm structures.

DNCE 3337. Body Mind Centering. (2 cr)
Improvisational movement explorations, hands-on re-patterning work. Direct experience of the way mind (desire, attention, intention) is expressed through various body systems. Students use imagery, touch, and anatomical information to access a range of inner sensations and movement experiences. Emphasizes each individual's unique experience of the body.

DNCE 3401W. Dance History 1. (3 cr)
History/theory of dance in varied forms/aspects. From origins of dance as movement-form, through early Renaissance. First half of year-long survey.

DNCE 3402W. Dance History 2. (3 cr. Prereq–3401)
History/theory of dance in varied forms/aspects. From development of ballet, through 20th century modern dance. Second half of year-long survey.

DNCE 3433. Articulate Body. (3 cr. Prereq–DNCE major, Δ)
Lectures and movement sessions in biodynamic considerations for optimal dance performance and metabolistic demands of dance.

DNCE 3487W. Ethnic Dance Traditions in American Society. (3 cr)
Traditional dances as preserved and transformed by Native Americans, African-Americans, Latinos, Asian-Americans, and European-Americans in the United States. Interpretation of roles of dance in these cultures.

DNCE 3488W. Dance as Cultural Practice. (3 cr)
Study of dance as art, ritual, social activity, and entertainment in selected cultures of Asia, Africa, Eastern Europe, the Middle East, and the Americas.

DNCE 3500. Topics in Dance. (1-3 cr [max 10 cr])
Topics specified in *Class Schedule*.

DNCE 3601. Dance Composition 1. (3 cr. Prereq–1020, 1601, concurrent regis in a modern dance technique course, Δ)
Movement, vocabulary in relation to theme, space, time, energy, and body parts; solo, duet, and trio forms.

DNCE 3602. Dance Composition 2. (3 cr. Prereq–3601, Δ, concurrent regis in a modern dance technique course)
Movement, vocabulary in relation to theme, space, time, energy, and body parts. Solo, duet, and trio forms.

DNCE 3621. Dance Production I. (2 cr; A-F only. Prereq–Dance major, Δ)
Technical/administrative aspects of dance production. Lighting, costumes, sound, marketing, stage management, fundraising, publicity. Emphasizes practical project management and personal management skills.

DNCE 3622. Dance Production II. (2 cr; A-F only. Prereq–3621, dance major, Δ)
Continuation of 3621. Students produce the spring Student Dance Concert.

DNCE 3700. Performance. (1 cr [max 4 cr]. Prereq–Concurrent enrollment in a technique course, audition, Δ)
Creation or reconstruction of a dance theatre work under the direction of a guest artist or faculty member. Work is performed at the end of the rehearsal period.

DNCE 3901. Survival Strategies in Dance. (3 cr; A-F only. Prereq–Dance major, Δ)
Strategies fundamental to a dancer's survival. Injury prevention/care. Development of healthy dietary and muscular/skeletal habits. Career tracks.

DNCE 4443. Philosophy and Aesthetics. (3 cr. Prereq–3402, Δ)
Major developments in Western philosophic thought on dance and dance theory from its beginnings to the present.

DNCE 4454W. (Re)Writing the Dancing Body. (3 cr)
Modes of verbal expression that best capture the meaning created by primarily non-verbal artistic forms. Chapters from text and issues are discussed/debated in class. Writing during every class period.

DNCE 4601. Dance Composition 3. (3 cr. Prereq–3602, concurrent regis in a modern dance technique course, Δ)
Continuation of movement vocabulary through improvisation, analysis of form and structure, experimentation with tone and performance persona. Effects of lights/costumes/text/props/music; development of larger ensemble works.

DNCE 4602. Dance Composition 4. (3 cr. Prereq–4601, ¶modern dance technique course, Δ)
Continuation of 4601. Movement vocabulary through improvisation, analysis of form and structure, experimentation with performance persona, and the effects of technical elements. Development of larger ensemble works.

DNCE 4901. Senior Seminar. (2 cr; S-N only. §TH 4901. Prereq–Sr, [DNCE or Th major]; offered fall semester only)
Development of senior project, alone or in groups, under guidance of faculty members.

DNCE 5010. Modern Dance Technique 7. (2 cr [max 4 cr]. Prereq–Δ; audit registration not permitted)
Continuation of technical development. Performance range/style. Students study with various guest artists.

DNCE 5020. Modern Dance Technique 8. (2 cr [max 4 cr]. Prereq–5010, Δ; audit registration not permitted)
Continuation 5010. Performance range/style. Students study with various guest artists.

DNCE 5110. Ballet Technique 7. (1 cr [max 2 cr]. Prereq–Δ; audit registration not permitted)
Continuation of ballet technique. Musicality, performance, stylistic differences. Practical work conducted within context of choreographic/aesthetic development of ballet.

DNCE 5120. Ballet Technique 8. (1 cr [max 2 cr]. Prereq–5110, Δ; audit registration not permitted)
Continuation of 5110. Musicality, performance, stylistic differences. Practical work conducted within context of choreographic/aesthetic development of ballet.

DNCE 5210. Jazz Technique 7. (1 cr [max 2 cr]. Prereq–Δ; audit registration not permitted)
Continuation of jazz technique. Syncopation, performance projection. Specific styles: swing, bebop, lyrical, funk, latin.

DNCE 5220. Jazz Technique 8. (1 cr [max 2 cr]. Prereq–5210, Δ; audit registration not permitted)
Continuation of 5210. Syncopation, performance projection. Specific styles: swing, bebop, lyrical, funk, latin.

DNCE 5337. Body-Mind Centering II. (2 cr. Prereq–[3337 or equiv], #)
Embodied consciousness. How knowledge is created. How mind/body are indissolubly linked. How body gives rise to states of consciousness that influence and often unconsciously control opinions, feelings, thoughts, and actions.

DNCE 5500. Topics in Dance. (1-3 cr [max 10 cr])
Topics specified in *Class Schedule*.

DNCE 5601. Dance Composition 5. (1 cr. Prereq–4601, 4602, Δ)
Final part of six-semester sequence in dance composition. Exploration of movement through independently scheduled rehearsals. Choreographic concepts. Tools in dance creation, development/refinement of movement, structure of group choreography.

DNCE 5700. Performance. (1 cr [max 4 cr]. Prereq–¶technique course, Δ)
Technique, improvisation, choreography, music, design, and technical production as they relate to dance performance.

DNCE 5858. Teaching Dance. (4 cr. Prereq–1020, Δ, #)
Methods, principles, and techniques of teaching dance.

DNCE 5970. Directed Studies. (1-4 cr [max 10 cr]. Prereq–#, Δ, ❑)
Guided individual study.

Danish (DAN)

Department of German, Scandinavian, and Dutch

College of Liberal Arts

DAN 1001. Beginning Danish. (5 cr. §DAN 4001)
Emphasis on working toward novice-intermediate low proficiency in all four language modalities (listening, reading, speaking, writing). Topics include everyday subjects (shopping, directions, family, food, housing, etc.).

DAN 1002. Beginning Danish. (5 cr. §DAN 4002. Prereq–1001)
Continues the presentation of all four language modalities (listening, reading, speaking, writing), with a proficiency emphasis. Topics include free-time activities, careers, and the Danish culture.

DAN 1003. Intermediate Danish. (5 cr. §DAN 4003. Prereq–1002)
Emphasis on intermediate proficiency in listening, reading, speaking, and writing. Contextualized work on grammar and vocabulary is combined with authentic readings and essay assignments.

DAN 1004. Intermediate Danish. (5 cr. §DAN 4004. Prereq–1003)
Emphasis on developing intermediate mid-high proficiency in listening, reading, speaking, and writing. Contextualized work on grammar and vocabulary is supported by work with authentic readings and essay assignments.

DAN 3011. Advanced Danish. (3 cr. Prereq–1004 or 4004)
Fiction, film, journalistic and professional prose. Grammar, vocabulary building exercises. Review of oral/written modes of communication.

DAN 3012. Advanced Danish. (3 cr. Prereq–1004 or 4004)
Novels, short stories, plays, articles. Structural, stylistic, vocabulary building exercises.

DAN 4001. Beginning Danish. (2 cr. §DAN 1001. Prereq–1004 in another language or passing score on LPE or grad student)
Meets concurrently with 1001 See 1001 for course description.

DAN 4002. Beginning Danish. (2 cr. §DAN 1002. Prereq–1004 in another language or passing score on LPE or grad student)
Meets concurrently with 1002. See 1002 for description.

DAN 4003. Intermediate Danish. (2 cr. §DAN 1003. Prereq–1004 in another language or passing score on LPE or grad student)
Meets concurrently with 1003. See 1003 for description.

DAN 4004. Intermediate Danish. (2 cr. §DAN 1004. Prereq–1004 in another language or passing score on LPE or grad student)
Meets concurrently with 1004. See 1004 for description.

Dental Hygiene (DH)

Preventive Sciences

School of Dentistry

DH 1191. Dental Hygiene Care Process. (6 cr; A-F only. Prereq–DH student)
Assessment principles related to medical and oral health status, dental hygiene clinical procedures, and development of instrumentation and hypertension screening skills.

DH 1203. Dental Specialties. (2 cr; S-N only. Prereq–DH student)
Various dental specialties and the dental hygienist's role in services provided.

DH 2111. Dental Anatomy. (2 cr; A-F only. Prereq–DH student)
All deciduous and permanent teeth, including tooth form, function, and relationship to oral health. Calcification, eruption, and exfoliation patterns. Ideal static occlusion, dental terminology, and tooth annotation systems. Lab includes identification/annotation of teeth and restoration, in wax, of portions of a typodont tooth.

DH 2121. The Dental Hygiene Care Process Clinical Application I. (5 cr; A-F only. Prereq–DH student)
Dental hygiene care process, assessment principles related to medical and oral health status, dental hygiene clinical procedures, and development of instrumentation skills.

DH 2132. Head and Neck Anatomy. (1 cr; A-F only. Prereq–DH student)
Anatomical structures of head/neck as they relate to practice of dental hygiene.

DH 2191. Independent Study. (0-6 cr [max 6 cr]. Prereq–DH student)
Individually arranged study, instruction, or research with faculty to meet student needs/interests.

DH 2210. General and Oral Pathology. (2 cr; A-F only. Prereq–DH student)
Topics in pathology related to dentistry and oral cavity. Oral benign/malignant tumors. Infectious, inflammatory, and immunologically mediated lesions/diseases.

DH 2211. Oral Histology and Embroyology. (2 cr; A-F only. §DENT 5315. Prereq–DH student)
Development of orofacial region. Structural microscopic anatomy of oral hard/soft tissues applicable for rendering clinical treatment.

DH 2212. Dental Hygienist-Patient Relationship. (2 cr; A-F only. Prereq–DH student)
Use of clinical research and evidence-based clinical decision making when communicating scientifically based clinical therapy and treatment modalities. Promotion of active participation by patient in clinical decision making.

DH 2221. Periodontology. (3 cr; A-F only. Prereq–DH student)
Periodontal diseases. Etiology, assessment, and treatment options. Clinical experience in debridement, root planing, and placing periodontal dressings.

DH 2222. Dental Hygiene Care Process Clinical Application II. (1-4 cr [max 4 cr]; A-F only. Prereq–DH student)
School of Dentistry clinical systems. Various medical/emergency conditions affecting patient care and preventive strategies for dental diseases. Skill development in fluoride, sealant, and air polishing techniques. Evaluation of products used in treatment of dental caries and periodontal diseases.

DH 2231. Cariology. (2 cr; A-F only. Prereq–DH student)
Dental caries. Etiology, pathology, and prevention.

DH 2233. Dental Hygiene Care Process: Clinical Application. (1 cr; S-N only. Prereq–DH student)
Clinical experience in dental hygiene patient care.

DH 2235. Oral and Maxillofacial Radiology. (2 cr; A-F only. Prereq–DH student)
General principles of radiology, radiation physics, dosimetry, biology, radiation protection, regulations, recent concepts of imaging.

DH 3111. Biomaterials and the Principles of Restorative Techniques I. (5 cr; A-F only. Prereq–DH student)
Principles of biomaterials, restorative techniques. Lecture, preclinical experiences.

DH 3112. General and Oral Pathology. (2 cr; A-F only. Prereq–DH student)
Circulatory disturbances, inflammation, and tumors. Emphasizes diseases affecting oral cavity, dental caries, periodontal diseases, oral neoplasias, and similar problems.

DH 3123. The Dental Hygiene Care Process Clinical Application III. (4 cr; A-F only. Prereq–DH student)
Dental hygiene treatment planning, alternative instruments and advanced skills related to implementation of dental hygiene care. Clinical experience in dental hygiene patient care and dental dietary counseling.

DH 3126. Oral and Maxillofacial Radiology Clinic I. (0 cr; A-F only. Prereq–DH student)
Exposing patient radiographs, interpretation, panoramic/extraoral technique, quality assurance procedures.

DH 3131. Periodontology I Lecture. (1 cr; A-F only. §DENT 5611. Prereq–DH student)
Periodontal anatomy. Physiology/etiology of periodontal diseases. Clinical, histopathological, and pathogenesis of gingivitis/periodontitis. Role of genetics, tobacco use, and systemic disorders. Preventive/therapeutic procedures associated with diagnosis, prognosis, treatment planning, and initial phase of periodontal therapy.

DH 3132. Applied Nutrition in Dental Hygiene Care. (1 cr; A-F only. Prereq–DH student)
Principles of diet/nutrition applied to dental hygiene patient care. Skills in dental dietary counseling.

DH 3133. Pharmacology. (2 cr; A-F only. Prereq–DH student)
Principles of pharmacology, physical/chemical properties of drugs,modes of administration, therapeutic/adverse effects, drug actions/interactions.

DH 3134. Dental Hygiene Care for Pediatric Patients. (1.5 cr; A-F only. Prereq–DH student)
Knowledge, skills, and attitudes required for providing dental hygiene care for pediatric patients.

DH 3135. Oral and Maxillofacial Radiology: Theory, Principles, and Radiographic Analysis. (2 cr; A-F only. Prereq–DH student)
Atomic radiations. Characteristics, production, and control of radiographs. Radiographic exposures, recent concepts. Radiation biology, dosimetry, protection, regulations. Discrepancies and technical errors in intraoral radiographs. Radiographic anatomy. Radiographic evidence of deviations from normal anatomic variations.

DH 3136. Patient Care Group I (PCGs). (1 cr; A-F only)
Small-group, cooperative learning integrating dental and dental hygiene students. Application of patient care skills taught in other courses. Focuses on communiction skills, patient management, team work, collegiality, and practice philosophy necessary for practice of dental hygiene.

DH 3191. Independent Study. (0 cr. Prereq–DH student)
Individually arranged study, instruction, or research with faculty to meet student needs/interests.

DH 3203. Dental Hygiene Care for Special Needs Patients I. (2 cr; A-F only)
Knowledge, skills, and attitudes required for providing dental hygiene care for pediatric/orthodontic and geriatric patients and individuals with disabilities.

DH 3221. Local Anesthesia and Pain Management. (2 cr; A-F only)
Concepts in administration of local anesthesia, nitrous oxide-oxygen sedation, and other methods of pain management. Anatomy, physiology, pharmacology, patient assessment, indications and contraindications, selection of agents, injection techniques, complications, emergency management, and legal/ethical considerations. Lecture, lab, clinic.

DH 3224W. The Dental Hygiene Care Process Clinical Application IV. (1-4 cr [max 4 cr]; A-F only)
Evaluation of dental hygiene patient care and assurance of quality in the dental hygiene profession. Clinical experience in dental hygiene patient care.

DH 3225. Extramural Clinical Dental Hygiene. (0-6 cr [max 6 cr]; S-N only. Prereq–#)
Students participate in educational/clinical experiences with diverse patient populations in community outreach clinics.

DH 3226. Extramural Clinical Dental Hygiene. (0-6 cr [max 6 cr]; A-F only. Prereq–#)
Students participate in educational/clinical experiences with migrant worker health care program.

DH 3227. Oral and Maxillofacial Radiology Clinic II. (0 cr; A-F only. Prereq–DH student)
Exposing patient radiographs, interpretation, panoramic/extraoral technique, and quality assurance procedures.

DH 3231W. Research Methods in Dental Hygiene. (3 cr; A-F only. Prereq–DH student)
Develop skills in scientific method and analyzing research findings; emphasis on types of research, problem selection, hypothesis writing, research planning and design, data collection and measuring techniques, analysis and interpretation of data, and writing the research proposal.

DH 3235. Dental Hygiene Care for the Geriatric Patient and the Patient With Special Needs . (2 cr; A-F only. Prereq–DH student)
Knowledge, skills, and attitudes required for providing dental hygiene care for geriatric patients and patients with special needs.

DH 3237. Patient Care Group II (PCGs). (1 cr; A-F only)
Small-group, cooperative learning integrating dental and dental hygiene students. Application of patient care skills taught in other courses. Focuses on communication skills, patient management, team work, collegiality, and practice philosophy necessary for practice of dental hygiene.

DH 4125W. The Dental Hygiene Care Process Clinical Application V. (1-7 cr [max 7 cr]; A-F only. Prereq–DH student)
Adapt dental hygiene care process to meet preventive/treatment needs of traditional and special needs patients. Analyze patient preventive/treatment need through case presentation. Community service, cultural diversity, family violence issues. New products, techniques, research.

DH 4128. Oral and Maxillofacial Radiology Clinic III. (0 cr; A-F only. Prereq–DH student)
Exposing patient radiographs, interpretation, panoramic/extraoral technique, quality assurance procedures.

DH 4131. Epidemiology, Prevention, Dental Public Health, and Community Outreach. (3 cr; A-F only. §DENT 5401. Prereq–DH student)
Epidemiological methods of investigation and patterns of oral diseases. Scope/content of the specialty of dental public health. Public health process as related to community setting.

DH 4132W. Ethics, Jurisprudence, and Principles of Practice. (2 cr; A-F only. Prereq–DH student)
Career planning, team building, employment seeking, jurisprudence, and ethical decision making.

DH 4137. Patient Care Group III (PCGs). (1 cr §DENT 6434. Prereq–DH student)
Small class discussions with senior dental and senior dental hygiene students. Integration of more advanced clinical procedures into patient care. Advanced principles of patient management, practice management, and dental marketing. Development of a philosophy of practice. Mentoring the transition from dental and dental hygiene school to practice and planning for lifelong learning.

DH 4191. Independent Study. (0-6 cr [max 6 cr]. Prereq–DH student)
Individually arranged study, instruction, or research with faculty to meet student needs/interests.

DH 4211. Principles of Restorative Techniques II. (3 cr)
Restorative Techniques. Clinical experiences.

DH 4226. Dental Hygiene Care Process Clinical Application VI. (1-5 cr [max 5 cr]; A-F only. Prereq–DH student)
Adapt dental hygiene care process to meet preventive/treatment needs of traditional and special needs patients. Analyze patient preventive/treatment need through case presentation. Community service, cultural diversity, family violence issues. New products, techniques, research.

DH 4227. Advanced Dental Hygiene Clinical Experience I. (0-6 cr [max 6 cr]. Prereq–DH student)
Development of skills in sonic/ultrasonic scaling/assessment, treatment planning, documentation, implementation/evaluation of dental hygiene care.

DH 4228. Advanced Dental Hygiene Clinical Experience II. (0-6 cr [max 6 cr]. Prereq–DH student)
Development of skills in sonic/ultrasonic scaling/assessment, treatment planning, documentation, implementation/evaluation of dental hygiene care.

DH 4229. Oral and Maxillofacial Radiology Clinic IV. (3 cr; A-F only. Prereq–DH student)
Exposing patient radiographs, interpretation, panoramic/extraoral technique, quality assurance procedures.

DH 4231. Periodontology III Lecture. (1 cr; A-F only. §DENT 6613. Prereq–DH student)
Clinical procedures associated with surgical phase of periodontal therapy. Evaluation of periodontal treatment, maintenance phase, and relationship between periodontics and other dentistry disciplines. Roles of clinical research in periodontics.

DH 4232. Community Outreach. (1 cr; S-N only. Prereq–DH student)
Dental hygiene education in various community settings.

DH 4233. Legislative, Social, Economic, and Practice Factors in Oral Health. (2 cr; A-F only. Prereq–DH student)
Current status/trends in dentistry in relation to health care promotion, regulation, and delivery and political/legislative process.

DH 4238. Patient Care Group IV. (1 cr; S-N only. §DENT 6435. Prereq–DH student)
Small class discussions with senior dental and senior dental hygiene students. Integration of more advanced clinical procedures into patient care. Advanced principles of patient management, practice management, and dental marketing. Development of a philosophy of practice. Mentoring the transition from dental and dental hygiene school to practice/planning for lifelong learning.

DH 4241. Extramural Clinical Dental Hygiene. (0-6 cr [max 6 cr]; A-F only. Prereq–#)
Students participate in educational/clinical experiences with diverse patient populations in community outreach clinics.

DH 4242. Extramural Clinical Dental Hygiene. (0-6 cr [max 6 cr]; A-F only. Prereq–#)
Students participate in educational/clinical experiences with Jamaica Mission Program.

DH 4250. Dental Hygiene Community Outreach Elective. (0-8 cr [max 8 cr]; S-N only. Prereq–DH student)
Individually arranged dental hygiene clinical experience in community outreach clinics.

DH 4292. Curriculum Development in Dental Hygiene. (3 cr)
Curriculum development /management. Competency based education and outcomes assessment. Role of accreditation in dental hygiene education.

DH 4293. Course Development in Dental Hygiene. (0-4 cr [max 4 cr]; A-F only)
Principles/practice of course development, testing, and evaluation.

DH 4294W Directed Research. (0-4 cr [max 4 cr])
Critical literature review and/or individual empirical research project leading to a written report, and/or intensive observation/participation in the clinical research center.

DH 4295. Instructional Methods in Dental Hygiene Education. (0-4 cr [max 4 cr]; A-F only)
Application of principles of learning, learning styles, teaching styles, and instructional methods. Microteaching of selected instructional skills.

DH 4296. Issues in Dental Hygiene. (0-3 cr [max 3 cr]; A-F only)
Issues, trends, and research related to dental hygiene. Current literature.

For definitions of course numbers, symbols, and abbreviations, see page 300.

DH 4297. Dental Hygiene Education: Supervised Teaching. (1-4 cr [max 4 cr]; A-F only)
Observation/participation in supervised teaching experience in dental hygiene education.

DH 4298W. Dental Hygiene Process of Care: Clinical Application. (1-4 cr [max 4 cr])
Clinical care of patients.

Design Institute (DESI)

College of Design

DESI 3010. Travels in Typography: Design Institute Seminar. (3 cr; A-F only)
Using collection in James Ford Bell Library, students study rare book/map collections and undertake hands-on exercises on history of type, including developments in typesetting, calligraphy, and letterpress printing.

DESI 3040. Introduction to Furniture Design: Design Institute Case Study Seminar. (3 cr; A-F only. Prereq–Design minor or #)
Furniture design as discipline, not as method. Material, sensual, and aesthetic, both sublime and mundane. Objects that mediate our environment. History, design criteria, technology, craft. Group case-study, research presentation, individual making/presenting of a concept-prototype.

DESI 3050. Streetlife Urban Design Seminar. (3 cr; A-F only)
The street as part of network of urban systems/fragments: sidewalks, private interiors, curbs, terraces, boulevards, parking lots, bus stops, public institutions, urban architectures, utility lines, storm/sewer systems, groundwater, satellite communication systems, gardens, and lighting. Readings in urban studies, geography, design, economics and art history. Students review case studies, envision possible transformations of streets/streetlife.

DESI 4001. Design Minor Seminar. (3 cr; A-F only. Prereq–Design minor)
Students share ideas/conclusions with one another and create a summary statement (eg., document, multimedia display, designed object) of a significant learning insight.

DESI 4002. Design Institute Seminar: Topics. (3 cr [max 6 cr]; A-F only)
Offerings vary. See Design Institute for descriptions.

DESI 4050. Design Institute Seminar: Mapcity. (3 cr [max 6 cr]; A-F only. Prereq–Design minor or #)
Develops alternative cartography that reveals the city in ways conventional maps do not. Classic texts explore urban representation and more recent material in cartographic criticism. Student mapmaking projects include producing a map of Twin Cities, alternative city atlas, and (as part of competition in conjunction with Twin Cities Design Celebration) wearable cartography. Readings, quizzes, projects presented in class.

DESI 5100. Design Institute Directed Study. (1-3 cr [max 9 cr]; A-F only)
Guided independent study in design.

Design, Housing, and Apparel (DHA)

Deprtment of Design, Housing, and Apparel

College of Design

DHA 1100H. First Year Honors Colloquium. (1-2 cr [max 4 cr]; A-F only. Prereq–Honors)
Diverse ways of knowing about world, fields of study organized to understand human evnironment, their place within academic/career pathways that cross within intellectual traditions/professional fields.

DHA 1101V. Honors: Introduction to Design Thinking. (4 cr)
Theories/processes that underpin design thinking. Interactions between humans and their natural, social, and designed environments where purposeful design helps determine quality of interaction. Design professions.

DHA 1101W. Introduction to Design Thinking. (4 cr; A-F only. §LA 1101W)
Theories/processes that underpin design thinking. Interactions between humans and their natural, social, and designed environments where purposeful design helps determine quality of interaction. Design professions.

DHA 1170. Special Topics in Design, Housing, and Apparel. (1-4 cr [max 16 cr]; A-F only)
In-depth investigation of specific topic, announced in advance.

DHA 1171. Freshman Seminar in Design, Housing, and Apparel. (1-3 cr [max 4 cr]; A-F only. Prereq–Fr)
Topic in design, housing, or apparel. Small-group seminar.

DHA 1201. Clothing Design, Merchandising, and the Consumer. (3 cr; A-F only)
An orientation to the apparel business covering the multiple steps in the process of creating and merchandising apparel, and the ethical positions reflected in decision making at each step.

DHA 1221. Clothing Assembly Fundamentals. (3 cr; A-F only. Prereq–Pre-clothing design major or #)
Methods/applications of clothing assembly, from micro to macro perspective.

DHA 1311. Foundations: Drawing and Design in Two and Three Dimensions. (4 cr; A-F only. Prereq–DHA major or premajor)
Design elements/principles in context of observational drawing. Integrative approach to two-dimensional design, three-dimensional design, and drawing. Broad conceptual framework for design exploration. Emphasizes perceptual aspects of visual forms.

DHA 1312. Foundations: Color and Design in Two and Three Dimensions. (4 cr; A-F only. Prereq–DHA major or pre-major)
Color theory and its application in two- and three-dimensional design. Emphasizes effective use of color by studying traditional color systems, perception, and interaction. Lectures, demonstrations, extensive studio work, critiques.

DHA 1315. Foundations: The Graphic Studio. (4 cr; A-F only. Prereq–[DHA major or pre-major] or #)
Graphic design process. Creative procedure, terminology, technology. Computer applications. Digital illustration, page layouts, image scanning/manipulation.

DHA 1601. Interior Design Studio I. (4 cr; A-F only. Prereq–DHA pre-major)
Theories used to solve interior design problems related to human behavior. Design process. Communication skills that are required for interior design profession.

DHA 1602. Interior Design Studio II. (4 cr; A-F only. Prereq–[DHA pre-major], 1601 with grade of at least C-)
Introduction to interior design programming as method for understanding behaviors/requirements of humans in spaces. Use of color in three-dimensional environments. Developing communication skills. Problem-solving.

DHA 1905. Freshman Seminar. (1-3 cr [max 6 cr]; A-F only. Prereq–Fr)
Special topics. Topics vary by term. See *Class Schedule*.

DHA 2100H. Freshman/Sophomore Honors Colloquium. (2 cr [max 4 cr]; A-F only. Prereq–[Fr or soph], honors)
Special Topics. Topics vary by term. See *Class Schedule*.

DHA 2211. Illustration for Clothing Design. (2 cr; A-F only. Prereq–Pass portfolio review or #)
Development of illustration skills specific to garments/textiles. Exploration of various traditional media/CAD applications. Critique/analysis of visual communication of clothing design concepts.

DHA 2213. Textile Analysis. (4 cr; A-F only. Prereq–DHA major or pre-major or #)
Physical, chemical, and biological characteristics of fibers, yarns, textile structures, and finishes. Their effect on performance/appearance of textile products, including clothing, interior, and industrial textiles.

DHA 2214. Softlines Analysis. (3 cr; A-F only. Prereq–1201, 2213)
Physical characteristics of softline products related to function for target market. Class experiences based on methods of analysis, including visual inspection, quality, construction, costing, and fit/sizing.

DHA 2221. Clothing Design Studio I. (4 cr; A-F only. Prereq–1201, [1221 or pass sewing proficiency exam], DHA [major or pre-major])
Theories/methods in designing clothing for various user groups. Relation of a 2-dimensional pattern shape to a 3-dimensional body. Introduction to flat-pattern draping.

DHA 2222. Clothing Design Studio II. (4 cr; A-F only. Prereq–2221 with a grade of at least C-, DHA major, pass portfolio review)
Design process in developing clothing for a specific user group. Advanced principles/methods of developing patterns for the body, including advanced flat pattern, draping, fitting. Computer-aided design tools for illustration, patternmaking.

DHA 2311. Drawing and Illustration. (3 cr; A-F only. Prereq–1311, 1312, [DHA major or premajor])
Advanced drawing skills. Illustration concepts/techniques. Illustration assignments for concepts, stories, and ideas.

DHA 2334. Computer Applications I: Digital Composition for Design. (3 cr; A-F only. Prereq–DHA major or pre-major, 1311, 1312, 1315)
Composition of visual elements in electronic realm. Use of computer to design for traditional media, digital environments.

DHA 2345. Typographic Design. (3 cr; A-F only. Prereq–DHA major, pass portfolio review)
History of typographic forms, principles of composition, expressive potential of type. Design process from problem-solving through exploration, experimentation, selection, critique, and refinement. Readings, research, exercises, design production.

DHA 2351. Graphic Design I: Text and Image. (3 cr; A-F only. Prereq–2345, DHA major, pass portfolio review)
Composition of visual information using grid structures to integrate text/image. Informational/expressive aspects of graphic design, hierarchical relationships of text elements. Methods of text layout that enhance communication.

DHA 2385W. Design and Factors of Human Perception. (4 cr; A-F only. Prereq–DHA major, pass portfolio review)
Introduction to human-factor variables of design. Color perception, type legibility, and other aspects of the human interface with designed objects. Students develop design prototypes. Methods to evaluate effectiveness of designed projects.

DHA 2401. Introduction to Housing. (3 cr; A-F only)
Physical, social, economic, psychological aspects of housing design/construction. Housing as process/product in context of the individual, the family, the community. Effects of federal, state, local governmental policies, economic trends.

DHA 2402. Residential Technology. (3 cr; A-F only)
Survey of technological systems in housing. Emphasizes consumption/conservation of natural resources and energy sources. Human factor considerations in kitchen design.

DHA 2463. Housing and Community Development. (3 cr; A-F only)
Meaning/significance of neighborhood/community, residential neighborhood change, impact of housing on neighborhood conditions. Gentrification, displacement, racial segregation, suburbanization, community-based revitalization.

DHA 2603. Interior Design Studio III. (4 cr; A-F only. Prereq–1602 with grade of at least C-, pass portfolio review, DHA major)
Expanding presentation skills, visual communication of design process. Design of interior environment as influenced by neighborhood, adjacent structures, regional context, diverse cultures.

DHA 2604. Interior Design Studio IV. (4 cr; A-F only. Prereq–[2603, 2612, 2621] with grade of at least C-, DHA major)
Relationship between exterior/interior design as it pertains to building construction. Methods/materials, principles of structure, building systems, construction details. Interface of electrical, HVAC, and plumbing systems in buildings.

DHA 2612. Interior Materials and Specifications. (4 cr; A-F only. Prereq–Pass portfolio review, DHA major)
Environmental issues, from global to interior spaces. Effect of building codes/legislation, social awareness. Functional/aesthetic relation of materials/resources to interior design.

DHA 2613. Lighting Design and Life Safety Issues. (4 cr; A-F only. Prereq–[DHA major, pass portfolio review] or #)
Lighting design technology, aesthetics, and human factors for interior spaces. Codes, standards, and legislation related to built environment.

DHA 2621. Computer Aided Design: Interior Design. (4 cr; A-F only. Prereq–[DHA major, pass portfolio review] or #)
Application of two- and three-dimensional computer drawing in design/visualization of interior space. AutoCAD software used on Windows-based system.

DHA 3170. Special Topics in Design, Housing, and Apparel. (1-4 cr [max 32 cr]; A-F only)
In-depth investigation of specific topic.

DHA 3196. Field Study: National or International. (1-10 cr [max 10 cr]; A-F only. Prereq–#)
Faculty-directed field study in a national or international setting.

DHA 3201. Strategic Career Planning. (1 cr; A-F only. Prereq–[Jr or sr or at least 60 cr], retail merchandising major)
Students research career opportunities related to retail industry, set career objectives based on an assessment of individual skills/interests, and identify job search skills to implement a transition from college to employment.

DHA 3217. Fashion Trends and Visual Analysis. (3 cr; A-F only. Prereq–2213)
Relation of fashion trends to visual analysis of apparel. Application to design/retail.

DHA 3223. Clothing Design Studio III. (4 cr; A-F only. Prereq–2222 with grade of at least C-, DHA major, pass portfolio review)
Study tailored/non-tailored clothing structures. Experiment with various materials/structures using traditional/innovative methods. Principles of manipulating materials/structures applied to series of garments.

DHA 3224. Clothing Design Studio IV. (4 cr; A-F only. Prereq–[2213, 3223] with grade of at least C-, DHA major)
Principles/theory of functional clothing design. Conduct/apply research in designing clothing for situations requiring thermal or impact protection, accommodation for mobility, or facilitation for bodily function.

DHA 3242. Retail Buying. (3 cr; A-F only. Prereq–1201, MATH 1031, [jr or sr], [DHA major or minor or Δ])
Principles/mathematics of merchandise inventory control, merchandise selection.

DHA 3243. Visual Merchandising. (3 cr; A-F only. Prereq–1101, 1201, [DHA major or minor or Δ])
Retail store environment. Physical/psychological effects that initiate/motivate consumer behavior. Merchandise display: creativity, department layout, fixturing, lighting, cross merchandising, visual resources, signing, maintenance.

DHA 3245. Multichannel Retailing. (3 cr; A-F only. Prereq–1201)
Overview of retailing. Emphasizes issues related to multichannel options available to consumers. Features both store based (e.g., specialty store, department store) and non-store based (e.g., Internet, catalog) issues of retailing.

DHA 3312. Color and Form in Surface Design. (3 cr; A-F only. Prereq–1311, 1312, [DHA major or pre-major])
Use of color/form representation in two-dimensional surface applications. Historical use of color and of spatial representation in visual communication.

DHA 3352. Graphic Design II: Identity and Symbols. (3 cr; A-F only. Prereq–2351, DHA major)
Representation of abstract ideas through symbols. Development of visual identity systems.

DHA 3353. Graphic Design III: Packaging and Display. (3 cr; A-F only. Prereq–3352 or ¶3352, DHA major)
Application of graphic design principles to three-dimensional projects. Principles of three-dimensional design/space applied to labeling/packaging.

DHA 3482. Our Home, Our Environment. (3 cr; A-F only. §ESPM 3601. Prereq–2402 or #)
Effects of people and their homes on the environment. Energy/resource efficiency, environmental responsibility, occupant health. Affordability issues with respect to housing. Design, construction, renovation, retrofitting, landscaping. Consumer options for lighting, weatherization, water use, emissions, waste reduction, recycling, air quality, hazardous materials, and housing growth.

DHA 3605. Interior Design Studio V. (4 cr; A-F only. Prereq–[2402, 2604, 2613] with grade of at least C-, DHA major)
Advanced interior design problems dealing with small to medium scale spaces. Emphasizes special-needs populations.

DHA 3606. Interior Design Studio VI. (4 cr; A-F only. Prereq–3605 with grade of at least C-, DHA major)
Interior design problems dealing with medium-scale spaces. Focuses on medium office design.

DHA 3614. Interior Design Ethics and Professional Practice. (4 cr; A-F only. Prereq–2604, pass portfolio review)
The business of interior design, professional ethics, and responsible design are emphasized. Students investigate their responsibility to their business, clients, colleagues, and the community at large. Professional portfolios and credentials will be discussed.

DHA 4001. Design Minor Seminar. (1 cr; A-F only. Prereq–Design minor)
Students share ideas/conclusions with one another, create a summary statement (e.g., document, multi-media display, designed object) of a significant learning insight.

DHA 4121. History of Costume. (4 cr; A-F only. Prereq–Jr or sr or grad student)
Survey of clothing/appearances in Western cultures, from 18th century to present. Role of gender, race, and class with respect to change in dress within historical moments and social contexts. Research approaches/methods in study/interpretation of dress.

DHA 4131W. History of Visual Communication. (4 cr; A-F only. Prereq–Intro history or art history course)
Historical analysis of visual communication with an emphasis on the technological, cultural, and aesthetic influences on graphic design. Examination of how historical events are communicated and perceived through graphic presentation and imagery.

DHA 4150H. Honors Seminar. (1-3 cr [max 6 cr]. Prereq–Honors)
Topics specified in *Class Schedule*.

DHA 4160H. Honors Capstone Project. (2 cr [max 4 cr] Prereq–DHA honors)
Individualizes honors experience by connecting aspects of major program with special academic interests.

DHA 4161. History of Interiors and Furnishings: Ancient to 1750. (4 cr; A-F only. Prereq–ARCH history course or #)
Study of European and American interiors and furnishings including furniture, textiles, and decorative objects.

DHA 4162. History of Interiors and Furnishings: 1750 to Present. (4 cr; A-F only. Prereq–4161 or #)
Study of European and American interiors and furnishings including furniture, textiles, and decorative objects.

DHA 4193. Directed Study in Design, Housing, and Apparel. (1-4 cr [max 4 cr]; A-F only. Prereq–Undergrad, #)
Independent study in Design, Housing, and Apparel under tutorial guidance.

DHA 4196. Internship in DHA. (1-4 cr [max 4 cr]; S-N only. Prereq–Completion of at least one-half of professional sequence, plan submitted and approved in advance by adviser and internship supervisor, written consent of faculty supervisor, #)
Supervised work experience relating activity in business, industry, or government to the student's area of study. Integrative paper or project may be required.

DHA 4212W. Dress, Society, and Culture. (3 cr; A-F only. Prereq–[[1101, jr] or grad student], [DHA major or minor or Δ])
Contemporary dress from diverse cultures within/outside USA analyzed using social science concepts. Dress as a nonverbal communication system.

DHA 4217. International Developments in Textiles and Apparel. (3 cr; A-F only. Prereq–[1201, APEC 1102, [jr or sr or grad student], [DHA major or minor or Δ])
Production, labor, trade, and marketing in textile, apparel, and related goods in global setting.

DHA 4225. Clothing Design Studio V. (4 cr; A-F only. Prereq–3224 with grade of at least C-, DHA major)
Market research information/implementation. Designing for specific audience, market, user group. Applying market research to design line of clothing. Research of promotional methods for design project.

DHA 4226. Clothing Design Studio VI. (4 cr; A-F only. Prereq–4225 with grade of at least C-, DHA major)
Synthesis of clothing design work based on concepts examined in previous studio classes. Principles of mass production applied to design projects completed in 4225. Implementation of public promotion of a clothing line. Individual strategies for promoting career goals. Exhibition/portfolio presentations.

DHA 4241. Retail Promotion. (3 cr; A-F only. Prereq–1201, [MKTG 3001 or equiv], [jr or sr])
Integration of communication/consumer behavior theories with elements of retail promotion. Advertising, sales promotions, point-of-purchase communications, personal selling.

DHA 4247. Advanced Buying and Sourcing. (3 cr; A-F only. Prereq–3242, [DHA major or minor or Δ])
Technology application for buying/sourcing. Applications include six-month dollar merchandise planning, assortment planning, market purchase and sales promotions planning, inventory management, costing, markdowns, timing, and sourcing.

DHA 4330. Surface Fabric Design Workshop. (4 cr [max 8 cr]; A-F only)
Studio experience in the development and production of surface design. Screen printing, batik, resist dying, shibori, cyanotypes, and dye transfers are included.

DHA 4334. Computer Applications II: Design for the Digital Environment. (3 cr; A-F only. Prereq–[2334 or #],[DHA major or DHA grad student or #], pass portfolio review)
Design of visual communication for electronic environments. Use of software to manipulate/create digital images/animation. Sound/video input combined with graphic images.

DHA 4340. Woven, Knit, and Non-Woven Fiber Design Workshop. (4 cr [max 8 cr]; A-F only)
Studio experiences in the development and production of woven, knit, and non-woven fiber projects. Explore several design methods and complete a major project using one of the structure techniques.

DHA 4345. Advanced Typographic Design. (4 cr; A-F only. Prereq–2351, [DHA major or grad student or #])
Expressive visual communication of words. Fundamental legibility of "invisible art," overt expression through type. Students complete extended typographic project.

DHA 4351. Design Process: Photography. (3 cr; A-F only. Prereq–1311, 1312, [DHA major or grad or pre-major])
Relationship between photography, design projects. Composition, developing of film, printing.

DHA 4352. Design Process: Bookmaking. (3 cr; A-F only. Prereq–[DHA major or grad student or #], pass portfolio review)
Construction of traditional/non-traditional book forms. Emphasizes material aspects of handmade books.

DHA 4354. Graphic Design IV: Integrative Campaign. (4 cr; A-F only. Prereq–3353, DHA major)
Multi-faceted graphic communication campaign project involving substantial investigation and concept development. Project supports a unified concept for an identified client and is aimed at a specific market or interest group.

DHA 4355. Graphic Design Portfolio. (2 cr; S-N only. Prereq–[4354 or 4365], DHA major)
Preparation of professional portfolio. Discussion of professional issues.

DHA 4365W. Graphic Design Senior Seminar. (4 cr; A-F only. Prereq–4354, DHA major)
Students complete senior research/design project involving social, conceptual, and technical aspects. Capstone course.

DHA 4461. Housing Development and Management. (3 cr; A-F only. Prereq–[2401, 2402, 2463] or grad student or #)
Housing development process/financing. Management of multifamily housing. Emphasizes housing for low-income families and special populations (e.g., elderly residients).

DHA 4465. Housing in a Global Perspective. (3 cr; A-F only. Prereq–[2401, 2463] or grad student or #)
Housing, its relationship to global patterns of social/economic development examined in comparative framework. Emphasizes housing low income populations in rapidly growing cities of developing countries.

DHA 4607. Interior Design Studio VII. (4 cr; A-F only. Prereq–3606 with grade of at least C-, 3614, DHA major)
Advanced interior design problems dealing with large scale spaces. Historic precedent, adaptive use, renovation.

DHA 4608. Interior Design Thesis. (4 cr; A-F only. Prereq–4615W with grade of at least C-, DHA major)
Comprehensive independent interior design project developed from student-conducted research/program developed in 4615W.

DHA 4615W. Interior Design Research. (2 cr; A-F only. Prereq–[4607 or ¶4607], DHA major)
Research methods for programming interior design solutions. Developing a comprehensive program. Issues that affect interior design research/practices.

DHA 5111. History of Decorative Arts. (4 cr; A-F only. Prereq–General art history survey course or #)
In depth study of textiles, ceramics, metal, and glass from selected historical periods. Focus on the Goldstein Gallery collections.

DHA 5123. Living in a Consumer Society. (3 cr. Prereq–Sr or grad student)
Consumerism within U.S. society. Commodification of health care, education, and production of news. Commercialization of public space/culture. What drives consumer society. How meaning is manufactured. What the lived experiences are of consumers today. Postmodern market. Alternatives to consumer society.

DHA 5170. Special Topics in Design, Housing, and Apparel. (1-4 cr [max 8 cr]; A-F only)
In-depth investigation of a single specific topic, announced in advance.

DHA 5185. Human Factors in Design. (3 cr. Prereq–Grad student or sr or #)
Theories/methods that influence the assessment of physical, social, and psychological human factors. Development of user needs with application to designed products that interact with human body.

DHA 5193. Directed Study in Design, Housing, and Apparel. (1-4 cr [max 4 cr]; A-F only. Prereq–#)
Independent study in design, housing, and apparel under tutorial guidance.

DHA 5196. Field Study: National/International. (1-10 cr [max 10 cr]; A-F only)
Faculty-directed field study in a national or international setting.

DHA 5215. Product Development: Softlines. (4 cr; A-F only. Prereq–2213 or clothing design major or retail merchandising major or grad student or #)
Product development for apparel and other sewn products. Developing products in a laboratory studio setting for effectiveness, reliability, and marketability. Team approach using merchandising and design principles to develop products for specific markets.

DHA 5216. Retail Promotion and Consumer Decision Making. (4 cr; A-F only. Prereq–[1201, 2213, [jr or sr or grad student], [DHA major or minor]] or Δ)
Consumer behavior theories/concepts as related to apparel. Application to understanding/developing retail promotional strategies: advertising/promotion.

DHA 5341. Interactive Design I. (3 cr; A-F only. Prereq–[[4334], [DHA major or grad student], pass portfolio review] or #)
Design of interactive multi-media projects. Experience developing interactive presentations and electronic publishing. Software includes hypermedia, scripting, digital output.

DHA 5342. Interactive Design 2: Interface Design. (3 cr; A-F only. Prereq–[[4384 or 5341], [DHA major or DHA grad student]] or #)
Introduction to design/usability of interface between humans and technology. Evaluation of visual elements that control/organize dealings with computers that are used to direct work. Students develop designs, evaluate their effectiveness through usability testing.

DHA 5382. Digital Sound and Video. (3 cr; A-F only. Prereq–[[4384 or 5341], [DHA major or grad student]] or #)
Design solutions involving time-based media. Emphasizes sound/video. Electronic publishing via Internet.

DHA 5383. Digital Illustration and Animation. (4 cr; A-F only. Prereq–[[4384 or 5341], [DHA major or DHA grad student], experience with computer illustration] or #)
Advanced computer design. Focuses on integration of design knowledge with Macintosh computer applications. Students use software to create digital illustration, 2D/3D digital animations. Technical/aesthetic investigation of processes inherent to 2D/3D motion graphics. Adobe Illustrator, After Effects, Macromedia Flash, 3D animation software.

DHA 5386. Fundamentals of Game Design. (3 cr; A-F only. Prereq–[[5341 or 4384], DHA major, [sr or grad student]] or #)
Games of all kinds. Theoretical/practical aspects of making games. Investigation of design process. Rules, strategies, methodologies. Analysis of interactivity, choice, action, outcome, rules in game design. Social interaction, story telling, meaning/ideology, semiotics. Signs and cultural meaning.

DHA 5388. Design Planning, Analysis, and Evaluation. (3 cr; A-F only. Prereq–[4354, DHA major] or grad or #)
Preliminary research, including theoretical, applied, and legal aspects. Planning/developmental models. Design prototyping, testing, and analysis.

DHA 5399W. Theory of Electronic Design. (3 cr; A-F only. Prereq–[DHA major, sr] or grad student or #; offered alternate yrs)
Theories, methodologies, histories of electronic design, its impact on visual communications. Digital artifacts, processes, paradigms.

DHA 5463. Housing Policy. (3 cr; A-F only. §PA 5261. Prereq–2401, 2463 or #)
Explore the institutional and environmental settings that make up housing policy in the United States. Examine competing ideas about solving the nation's housing problems through public intervention in the market. Federal and local public sector responses to housing problems will be evaluated.

DHA 5467W. Housing and the Social Environment. (4 cr; A-F only. Prereq–2401 or #)
Housing choices in context of social environment. Emphasizes special needs of elderly, disabled, minorities, large families, female-headed households, and low-income households. Students conduct a post-occupancy evaluation of housing.

DHA 5469. Understanding Housing: Assessment and Analysis. (3 cr; A-F only. Prereq–[2401, 2463] or #)
How to formulate housing research problems and analyze/present information about housing characteristics/conditions. Students develop housing-related research/grant proposals, use/design cartographic/graphic information about housing, and give a presentation on a research project.

DHA 5471. Housing Studies Certificate Seminar. (2 cr; A-F only. Prereq–Admitted to Housing Studies Certificate Prog)
Integrative seminar and "capstone" to Certificate program. Students prepare an individual career plan that focuses on application of housing studies to community/workplace.

DHA 5481. Housing for the Elderly and Special Populations. (3 cr; A-F only. Prereq–[2401, [jr or sr or grad student]] or #)
Introduction to changing housing needs of individuals/families across life span. Emphasizes housing needs of children, older adults, and persons with disabilities.

DHA 5484. Rural Housing Issues. (3 cr; A-F only. Prereq–2401, 2463 or #)
Housing issues in nonmetropolitan areas. The housing concerns of specific rural populations (e.g., low income, elderly persons, American Indians, migrant workers) are identified and comparisons with urban housing issues are made.

Dutch (DTCH)

Department of German, Scandinavian, and Dutch

College of Liberal Arts

DTCH 1001. Beginning Dutch. (5 cr. §DTCH 4001)
Emphasis on working toward novice-intermediate low proficiency in all four language modalities (listening, reading, speaking, writing). Topics include everyday subjects (shopping, directions, family, food, housing, etc.).

DTCH 1002. Beginning Dutch. (5 cr. §DTCH 4002. Prereq–1001)
Continues the presentation of all four language modalities (listening, reading, speaking, writing), with a proficiency emphasis. Topics include free-time activities, careers, and Dutch culture.

DTCH 1003. Intermediate Dutch. (5 cr. §DTCH 4003. Prereq–1002)
Emphasis on intermediate proficiency in listening, reading, speaking, and writing. Contextualized work on grammar and vocabulary is combined with authentic readings and essay assignments.

DTCH 1004. Intermediate Dutch. (5 cr. §DTCH 4004. Prereq–1003)
Emphasis on developing intermediate mid-high proficiency in listening, reading, speaking, and writing. Contextualized work on grammar and vocabulary is supported by work with authentic readings and essay assignments.

DTCH 3011. Conversation and Composition. (3 cr. Prereq–1004 or 4004 or #)
Practice/refinement of spoken/written Dutch. Composition, vocabulary. Reading, viewing, and discussion of Dutch/Flemish media reports. Grammar review, critical corrective grammatical skills.

DTCH 3012. Conversation and Composition. (3 cr. Prereq–3011)
Further practice and refinement of spoken and written Dutch beyond the intermediate level; development of compositional skills and vocabulary based on the reading, viewing, and discussion of relevant Dutch and Flemish media reports. Grammar review and development of critical corrective grammatical skills.

DTCH 3310. Studies in Dutch Literature. (3 cr [max 9 cr]. Prereq–Reading knowledge of Dutch)
In-depth study of authors or topics from various periods in Dutch literature (e.g., 19th-century Dutch novels, colonial novels, literature of Golden Age). All primary literature is read in the original.

DTCH 3510. Topics in Dutch Culture. (3 cr [max 9 cr]. Prereq–No knowledge of Dutch required)
A single topic or theme of Dutch or Flemish culture explored in depth. Past topics have included Dutch national character, origin of the Batavian myth, and images of Dutchness.

DTCH 3610. Dutch Literature in Translation. (3 cr [max 9 cr]. Prereq–No knowledge of Dutch required)
In-depth study of authors or topics from various periods in Dutch literature. All primary/secondary literature is read in English translation.

DTCH 3993. Directed Studies. (1-5 cr [max 12 cr]. Prereq–#, Δ, ❑)
Guided reading in or study of Dutch literature, culture, or advanced language skills.

DTCH 4001. Beginning Dutch. (2 cr. §DTCH 1001. Prereq–1004 in another language or passing score on LPE or grad student)
Meets concurrently with 1001. See DTCH 1001 for description.

DTCH 4002. Beginning Dutch. (2 cr. §DTCH 1002. Prereq–1004 in another language or passing score on LPE or grad student)
Meets concurrently with 1002. See 1002 for description.

DTCH 4003. Intermediate Dutch. (2 cr. §DTCH 1003. Prereq–1004 in another language or passing score on LPE or grad student)
Meets concurrently with 1003. See 1003 for description.

DTCH 4004. Intermediate Dutch. (2 cr. §DTCH 1004. Prereq–1004 in another language or passing score on LPE or grad student)
Meets concurrently with 1004. See 1004 for description.

DTCH 5490. Topics in Dutch Literature. (3 cr [max 9 cr])
Topic may focus on a specific author, group of authors, genre, period, or subject matter. Topics specified in *Class Schedule*.

DTCH 5993. Directed Studies. (1-4 cr [max 12 cr]. Prereq–#, Δ, ❑)
Guided individual reading or study.

East Asian Studies (EAS)

Institute of International Studies

College of Liberal Arts

EAS 1462. Introduction to East Asia in Modern Times: 1600-2000. (4 cr. §HIST 1462)
Formation/decline of early modern Asian empires. Western imperialism, Asian nationalism. Social revolution, economic modernization, cultural change in China, Japan, Korea, Vietnam, 1600-2000.

EAS 3013. Introduction to East Asian Art. (3 cr. §ARTH 3013)
A selective examination of representative works of art produced in China, Korea, and Japan from the neolithic era to modern times. Nearly every major type of object and all major styles are represented.

EAS 3211. East Asia. (3 cr. §EAS 3211, GEOG 3211, GEOG 3215, GEOG 5211, GEOG 5215)
Physical and human geography of Japan, mainland China and Taiwan, North and South Korea; population pressure, economic and urban development, and international relations.

EAS 3461. Introduction to East Asia I: The Imperial Age. (4 cr. §HIST 3461)
Comparative survey of early history of China, Japan, Korea, and Vietnam; early Chinese thought; diffusion of Confucianism, Buddhism, and other values throughout East Asia; political and social history of region to 1600.

EAS 3462. Introduction to East Asia II: 1600-2000. (3-4 cr. §HIST 3462)
Formation/decline of early modern Asian empires. Western imperialism and Asian nationalism. Social revolution, economic modernization, and cultural change in China, Japan, Korea, and Vietnam.

EAS 3464. China in the Song, Yuan, and Ming Dynasties. (3 cr. §HIST 3464, HIST 5464)
China during the Song (976-1279), Yuan (1279-1368) and Ming (1368-1644) dynasties, political institutions and social structures. Attention to primary sources and how historians ask and answer questions about the past.

EAS 3465W. China in the Ming and Qing Dynasties. (3 cr. §HIST 3465W, HIST 5465)
The political and social history of China from about 1600 until the end of the Qing dynasty in 1911. Topics include ethnicity, daily life, legal structures, city life, and peasantry.

EAS 3467W. State and Revolution in Modern China. (3 cr. §HIST 3467W, HIST 5467)
Modern China's political evolution including the Taiping Rebellion, Republican Revolution, rise of Nationalist and Communist parties, Maoist era; reform under Deng Xiaping, and the emergence of democracy in Taiwan.

EAS 3468. Social Change in Modern China. (3 cr. §HIST 3468, HIST 5468)
Opium War and opening of Treaty Ports in 19th century; missionary activity and cultural influence; changes in education system; women.s movement; early industrialization; socialism and collectivization after 1949; industrialization of Taiwan; PRC.s entry into the world trading system.

EAS 3471. Modern Japan, Meiji to the Present (1868-2000). (3 cr. §HIST 3471)
World War I, Japan's emergence as an industrial society, world power in the 1920s. Rise of militarism, World War II in the Pacific. Political reform, economic resurgence, cultural change in postwar era.

EAS 3472. Early Modern Japan. (3 cr. §HIST 3472)
Tradition/change in society/culture under Tokugawa shoguns (1600-1867). Growth of cities. Decline of samurai class. Response to Western intrusion.

EAS 3473. Family, School, and Work in Modern Japanese History. (3 cr)
Impact of economic, social, and cultural change on males and females in the family, the education system, the employment system from the 17th through 20th centuries.

EAS 3474. The Rise of Modern Japan: 1850s to 1900s. (3 cr; A-F only. §HIST 3474)
The Meiji Revolution from Commodore Perry to the eve of World War I; origins of constitutional monarchy, industrial economy, Western influences, and modern cultural change.

EAS 3940. Topics in Asian History. (1-4 cr [max 16 cr]. Prereq–Jr or sr or #)
Selected topics in Asian history not covered in regular courses.

EAS 3970. Supplemental Discussion in East Asian Studies. (1 cr [max 3 cr]. Prereq–¶3xxx course)
Extra discussion section with T.A.

EAS 4473. Chinese Politics. (3 cr. §EAS 4473, POL 4473)
Focuses on fundamental conflicts in Chinese society; the democracy movement, human rights, class divisions, gender struggles, environmental issues, and capitalist vs. socialist development strategies. Secondary topics include Chinese foreign relations and domestic and foreign political issues in Taiwan.

EAS 4662. Comparative East Asian Development: A New Model for Growth and Prosperity?. (3 cr; A-F only. Prereq–3661 or SOC 3661 or related Asian or sociology courses or East Asian experience or #)
Social and cultural reasons for the rapid growth and relative equity of Japan, South Korea, Taiwan, Hong Kong, Singapore and more recently, China. Relation of these examples to more general theories of development.

EAS 5940. Topics in Asian History. (1-4 cr [max 16 cr]. Prereq–Grad or intr consent)
Selected topics such as cultural, economic, intellectual, political, and social history.

Ecology, Evolution, and Behavior (EEB)

Department of Ecology, Evolution and Behavior

College of Biological Sciences

EEB 3001. Ecology and Society. (3 cr; A-F only. §BIOL 3407, BIOL 3807, BIOL 5407. Prereq–[Jr or sr] recommended; biological sciences students may not apply cr toward major)
Basic concepts in ecology. Organization, development, function of ecosystem. Population growth/regulation. Human effect on ecosystems.

EEB 3361. Visions of Nature: The Natural World and Political Thought. (4 cr. §CSCL 3361. Prereq–Soph or jr or sr; biological sciences students may not apply these credits toward the major)
Theories about the organization of nature, human nature, and their significance for the development of ethics, religion, political and economic philosophy, civics, and environmentalism in Western and other civilizations.

EEB 3963. Modeling Nature and the Nature of Modeling. (3 cr. §EEB 5963. Prereq–[MATH 1281, MATH 1282] or equiv or #)
Hands-on modeling experiences in context of biological applications. Reviews calculus concepts. Students carry out modeling steps, from developing the model, to analytical analysis, to developing computer code, to running the models.

EEB 4014. Ecology of Vegetation. (3 cr. Prereq–3407, BIOL 3007)
Methods of describing, sampling, classifying vegetation. Spatial/temporal variation of vegetation, ecosystem properties on landscapes. Theory of structure/dynamics of terrestrial communities, ecosystems. Analysis of quantitative data. Field trips to local ecosystem types.

EEB 4016W. Ecological Biogeography. (3 cr. Prereq–BIOL 3407)
Biotic regions of world in general and North America in detail. Ecological principles of distribution, interpretations of regional/temporal patterns in distribution of vegetation, taxonomic groups of plants/animals. Includes one weekend field trip.

EEB 4129. Mammalogy. (4 cr; A-F only. §FW 4129. Prereq–BIOL 1001 or BIOL 2012)
Evolutionary and biogeographic history of mammalia. Recognize, identify, and study natural history of mammals at the ordinal level, North American mammals at familial level, and mammals north of Mexico at generic level. Minnesota mammals at specific level. Includes lab.

EEB 4134. Introduction to Ornithology. (4 cr. Prereq–BIOL 1001 or BIOL 2012)
Structure, evolution, classification, distribution, migration, ecology, habitats, identification of birds. Lecture, lab, weekly field walks. One weekend field trip.

EEB 4329. Primate Ecology and Social Behavior. (3 cr; A-F only. Prereq–BIOL 1001 or BIOL 1009 or BIOL 3411 or ANTH 1001 or #)
Primates as a model system to explore basic questions in animal/human behavior. Factors influencing sociality and group composition. Mating systems. Prevalence of altruistic, cooperative, and aggressive behavior. Strength of social bonds in different species. Evolution of intelligence/culture.

EEB 4601. Limnology. (3 cr; A-F only. Prereq–CHEM 1022)
Description and analysis of lakes and other aquatic environments beginning with lake origins and progressing through lake physics, chemistry, and biology. Interrelationships among these topics and effects of human activities.

EEB 4605. Limnology Laboratory. (1 cr; A-F only. §GEO 4605. Prereq–4601 or #)
Field and lab methods used to obtain information on environmental conditions in aquatic environments and measure the abundance of aquatic organisms, especially plankton. Field/lab instruments, sampling devices, microscopy, water chemistry, data analysis.

EEB 4607. Plankton Ecology. (4 cr; A-F only. Prereq–4601 or GEO 4601)
Planktonic bacteria, algae, and animals in lakes, reservoirs, and oceans with special attention to processes that cause variations of abundance.

EEB 4609W. Ecosystem Ecology. (3 cr. Prereq–BIOL 3407 or #)
Regulation of energy and elements cycling through ecosystems. Dependence of cycles on kinds/numbers of species within ecosystems. Effects of human-induced global changes on functioning of ecosystems.

EEB 4611. Biogeochemical Processes. (3 cr. Prereq–[CHEM 2301, [BIOL 2032 or MICB 2032 or VPB 2032 or BIOL or 3301 or MICB 3301], PHYS 1201] or #)
Application of biochemistry, ecology, chemistry, and physics to environmental issues. Current issues in biogeochemistry. Impact of humans on biogeochemical processes in soils, lakes, oceans, estuaries, forests, urban/managed ecosystems, and extreme environments (e.g., early Earth, deep sea vents, thermal springs).

EEB 4631. Global Ecology. (4 cr; A-F only. Prereq–[college level ecology course, 2 semesters of [chemistry, high-school physics]] or #)
Interactions between biosphere/lithosphere, atmosphere/oceans throughout Earth history. How climate is influenced on long time scales (evolution of photosynthesis) and on decadal time scales (forest clearance). Earth as an interacting ecosystem. Evaluating future effects of accumulating greenhouse gases.

EEB 4793W. Directed Studies: Writing Intensive. (1-7 cr [max 7 cr]; S-N only. Prereq–#, Δ)
Individual study on selected topics or problems. Emphasizes readings, use of scientific literature. Written report.

EEB 4794W. Directed Research: Writing Intensive. (1-6 cr [max 42 cr]; S-N only. Prereq–#, Δ)
Laboratory or field investigation of selected areas of research, including written report.

EEB 4801. Field Limnology. (4 cr. Prereq–[CHEM 1022, [3001 or BIOL 3407]] or #)
Description/analysis of lakes, streams, and other aquatic environments. Lake origins, physics, chemistry, and biology. Focuses on how different forcings, including human ones, affect biological dynamics and interactions. Field work emphasizes comparative approach to differences in northern Minnesota s lakes, bogs, and streams.

EEB 4809. Field Ecosystem Ecology. (3 cr. Prereq–Beginning biology)
Introduction to ecosystem ecology. Emphasizes field application of ecosystem theory/techniques. Material/energy flow through ecosystems. How factors such as natural disturbances and human activities affect ecosystems. Productivity and trophic transfers in lakes, prairies, and forests. Impacts of fire. Bison grazing on grasslands. Forest competition/regeneration. Atmospheric nitrogen deposition. Paleo-ecological techniques for understanding long-term ecosystem dynamics.

EEB 4814. Plant Community Ecology. (4 cr; A-F only. Prereq–Ecology course)
Communities represented in Itasca Park and vicinity with emphasis on vegetation, patterns of distributions of communities, their interaction with environment and dynamic relationships, methods of community, and description and analysis.

EEB 4817. Vertebrate Ecology. (4 cr. Prereq–Beginning biology)
Field studies on vertebrate populations, their relationships to local environments, habitat analysis, and ecological research methods. Students work individually or in teams to investigate behavioral/ecological aspects of selected vertebrates. Lectures, field trips.

EEB 4825. Telemetry and Animal Behavior. (2 cr. Prereq–General biology)
Using latest techniques in radio telemetry to study animal behavior, especially animal movements and home ranges. Methods of attaching radio transmitters, locating radio-tagged animals, determining accuracy of positional data, calculating positions. Software for home range calculations/placement of data on a GIS base system.

EEB 4839. Field Studies in Mammalogy. (4 cr; A-F only. Prereq–[College-level biology course that includes study of animals or #], Δ)
Techniques for studying small mammals. lectures and field projects emphasize identification, distributions, community interactions, ecophysiology, and population ecology.

EEB 4842. Arctic Field Ecology. (4 cr; A-F only. Prereq–Basic courses in [ecology, organismal biology], approved application)
Arctic natural history/ecology explored via a four-week trip to Northwest Territories of Canada. Students travel by van, air, and inflatable canoes; design their own research projects; help with ongoing studies in landscape/riparian ecology; learn field skills/techniques associated with ecological studies in Arctic regions; and work directly with local Inuit people about traditional ecological knowledge.

EEB 4844. Field Ornithology. (4 cr; A-F only. Prereq–General biology including zoology, Δ)
Introduction to biology of breeding birds through use of field techniques at Lake Itasca Forestry and Biological Station. Daily field work emphasizes identification, behavioral observations, netting/censusing.

EEB 4993. Directed Studies. (1-7 cr [max 7 cr]; S-N only. Prereq–#, Δ)
Individual study on selected topics or problems. Emphasizes selected readings, use of scientific literature.

EEB 4994. Directed Research. (1-6 cr [max 42 cr]. Prereq–#, Δ)
Laboratory or field investigation of selected areas of research.

EEB 5001. Spatiotemporal Dynamics of Plant Communities. (3 cr. Prereq–[BIOL 3407, 4014] or #)
Dynamic nature of plant communities in times of environmental changes. Emphasizes species invasion as key for structure/dynamics of plant assemblages. Observational, theoretical, and experimental studies on spatiotemporal dynamics of plant communities under various changes in biological/environmental conditions, including human-induced Global Warming.

EEB 5008. Forest Response to Quaternary Climate Change. (2 cr; A-F only. Prereq–BIOL 3407, EEB 4631 or GEO 4631concurrent registration EEB 5009)
Forest responses to past climate change at the population, community, and ecosystem level. Response to natural and human disturbance, range shifts and invasions. Limitations to the speed of response to rapid climate change.

EEB 5009. Quaternary Vegetation History and Climate. (3 cr. Prereq–[[4631 or GEO 4631], BIOL 3407] or #)
History of vegetation/climate change in Quaternary period. Importance of mechanistic understanding on interpretation of historical events. Vegetation distribution/climate. Mechanisms of climate change and long-term vegetation dynamics. Vegetation and climate reconstructions. Modeling in paleoecology and paleoclimatology. Case studies in North America and other parts of globe. Human impacts on vegetation and climate.

EEB 5011. Pollen Morphology. (2 cr. Prereq–BIOL 3007, PBIO 4321 or #)
Morphology and nomenclature of pollen grains and pteridophyte spores, survey of pollen and spores of major plant families, lab techniques.

EEB 5013. Quaternary Plant Macrofossils. (2 cr. Prereq–PBIO 4321 or 4511 or #)
Morphology of seeds, fruits, and other macroscopic remains likely to occur in Quaternary deposits, survey of fossils of major plant families, lab techniques.

EEB 5033. Population and Quantitative Genetics. (4 cr; A-F only. Prereq–[[BIOL 4003 or GCD 3022], intro statistics] or #)
Fundamentals of quantitative genetics. Genetic/environmental influences on expression of quantitative traits. Approaches to characterizing genetic basis of trait variation. Processes that lead to change in quantitative traits. Applied/evolutionary aspects of quantitative genetic variation.

EEB 5042. Quantitative Genetics. (3 cr. Prereq–[BIOL 4003 or GCD 3022] or #; a course in statistics isrecommended)
Fundamentals of quantitative genetics. Genetic/environmental influences on expression of quantitative traits. Approaches to characterizing genetic basis of trait variation. Processes that lead to change in quantitative traits. Applied/evolutionary aspects of quantitative genetic variation.

EEB 5051. Analysis of Populations. (3 cr. §FW 5051. Prereq–Intro biology, intro statistics or #)
Factors involved in the regulation, growth, and general dynamics of populations. Data needed to describe populations, population growth, population models, and regulatory mechanisms.

EEB 5053. Ecology: Theory and Concepts. (4 cr. Prereq–BIOL 3407 or #)
Classical and modern mathematical theories of population growth, interspecific interactions, ecosystem dynamics and functioning, with emphasis on underlying assumptions and on effects of added biological reality on robustness of predictions, stability, interspecific interactions, ecosystem structure and functioning.

EEB 5122W. Plant Interactions with Animals and Microbes. (3 cr; A-F only. Prereq–BIOL 2012 or 3002, 3407 or 3409)
Ecological and environmental implications of mutualistic and antagonistic interactions between plants, animals and microbes at organismal, population, and community levels.

EEB 5124. Plant Physiological EcologyPlant Physiological Ecology. (4 cr)
Plant function, its plasticity/diversity in an ecological context. Impact of environmental stresses on major physiological processes of plants, including photosynthesis, respiration, water uptake/transport, and nutrient uptake/assimilation. Lab, field trip to Cedar Creek.

EEB 5146. Science and Policy of Global Environmental Change. (3 cr; A-F only. §FR 5146. Prereq–BIOL 3407 BIOL 5407 or equiv)
Critical issues underpinning global change and its biological implications. Current scientific literature in exploring evidence for human-induced global change and its potential effects on a wide range of biological processes. Emphasizes terrestrial ecosystems. Economic drivers, economic consequences. Local, national, and international laws and policies.

EEB 5221. Molecular and Genomic Evolution. (3 cr; A-F only. Prereq–[[BIOL 4003 or GCD 3022], grad student]] or #)
Molecular basis of evolutionary change. Current studies of selection and neutral evolutionary processes at molecular level. Evolution from gene to genome level: protein structure and function, multigene families, organelle genomes, genome organization. Lectures, discussions of current literature, and workshops where students practice analyses.

EEB 5321. Evolution of Social Behavior. (3 cr; A-F only. Prereq–BIOL 3411 or #)
Introduction to theories and concepts relating to behavior evolution, mating systems, and cooperative behavior in animals.

EEB 5322. Evolution and Animal Cognition. (3 cr. Prereq–BIOL 3411 or PSY 3061 or #)
Animal cognitive abilities. Learning, perception, memory, navigation, and communication from evolutionary/comparative perspective. Cognitive abilities as adaptations that solve specific environmental problems. Empirical methods for assessing cognitive abilities. Emphasizes parsimonious interpretations of data. Controversial topics such as animal intelligence, animal language and whether non-human animals have a "theory of mind."

EEB 5323. Neural and Endocrine Mechanisms Underlying Vertebrate Behavior. (2 cr; A-F only. Prereq–BIOL 3411 or BIOL 3101 or NSC 3101 or PHSL 3101 or #)
Selected aspects of the physiological basis of vertebrate behavior with emphasis on neural and endocrine integration and the effects of evolutionary pressures on it. Hormones and sex behavior, sensory perception, neuroethology of communication.

EEB 5327. Behavioral Ecology. (3 cr. Prereq–BIOL 3411 or #)
Evolutionary principles applied to aggressive competition, mate choice, cooperation, and parental investment. Optimization models used to examine foraging strategies, predator/prey interactions, and territoriality. Evolution of sex, sexual selection, dispersal. Evolutionary game theory.

EEB 5361. Visions of Nature: The Natural World and Political Thought. (4 cr. Prereq–Advanced studies in history, philosophy, or biology)
Theories about the organization of nature, human nature, and their significance for the development of ethics, religion, political and economic philosophy, civics, and environmentalism in Western and other civilizations. Graduate credit requires paper on conceptual topic on human ecology.

EEB 5371. Principles of Systematics. (3 cr. Prereq–Grad student or #)
Theoretical/practical procedures of biological systematics. Phylogeny reconstruction. Computer-assisted analyses, morphological and molecular approaches, species concepts/speciation, comparative methods, classification, historical biogeography, nomenclature, use/value of museums.

EEB 5609. Ecosystem Ecology. (3 cr. Prereq–[BIOL 3407 or BIOL 5407] or #)
Regulation of energy and elements cycling through ecosystems. Dependence of cycles on kinds/numbers of species within ecosystems. Effects of human-induced global changes on functioning of ecosystems.

EEB 5961. Decision Analysis and Modeling in Conservation Biology. (3 cr. Prereq–Grad student or #)
Decision analysis/modeling in conservation biology. Techniques, concepts, software.

EEB 5963. Modeling Nature and the Nature of Modeling. (3 cr. §EEB 3963. Prereq–[MATH 1281, MATH 1282] or equiv or #)
Hands-on modeling experiences in context of biological applications. Reviews calculus concepts. Students carry out modeling steps, from developing the model, to analytical analysis, to developing computer code, to running the models.

Economics (ECON)

Department of Economics

College of Liberal Arts

ECON 1101. Principles of Microeconomics. (4 cr. §APEC 1101, ECON 1101H, ECON 1104. Prereq–knowledge of plane geometry and advanced algebra)
Microeconomic behavior of consumers, firms, and markets in domestic and world economy. Demand and supply. Competition and monopoly. Distribution of income. Economic interdependencies in the global economy. Effects of global linkages on individual decisions.

ECON 1101H. Honors Course: Principles of Microeconomics. (4 cr. §APEC 1101, ECON 1101, ECON 1104. Prereq–MATH 1271)
Microeconomic behavior of consumers, firms, markets in domestic/world economy. Demand/supply. Competition/monopoly. Distribution of income. Effects of economic interdependencies, global linkages on individual decisions. Emphasizes algebra, geometry, basic logic, proofs.

ECON 1102. Principles of Macroeconomics. (4 cr. §APEC 1102, ECON 1102H, ECON 1105. Prereq–[1101 or equiv], knowledge of plane geometry and advanced algebra)
Aggregate consumption, saving, investment, and national income. Role of money, banking, and business cycles in domestic and world economy. International trade, growth, and development. U.S. economy and its role in the world economy. International interdependencies among nations.

ECON 1102H. Honors: Principles of Macroeconomics. (4 cr. §APEC 1102, ECON 1102, ECON 1105. Prereq–[1111 or equiv], MATH 1271, CSOM honors)
Aggregate consumption, saving, investment, and national income. Money, banking, and business cycles in domestic/global economy. International trade, growth, and development. Role of the United States in world economy, international interdependencies. Emphasizes economic models to explain macroeconomic phenomena.

ECON 1104. Principles of Microeconomics. (4 cr. §APEC 1101, ECON 1101, ECON 1101H. Prereq–MATH 1271)
Microeconomic behavior of consumers, firms, and markets in domestic/world economy. Demand and supply. Competition and monopoly. Distribution of income. Effects of economic interdependencies and global linkages on individual decisions. Use of calculus and mathematical models.

ECON 1105. Principles of Macroeconomics. (4 cr. §APEC 1102, ECON 1102, ECON 1102H. Prereq–[1104 or equiv], MATH 1271)
Aggregate consumption, saving, investment, national income. Role of money, banking, and business cycles in the domestic/world economy. International trade, growth, and development. U.S./world economy. International interdependencies among nations. Emphasizes calculus and mathematical reasoning.

ECON 1902. Freshman Seminar. (3 cr [max 6 cr]; A-F only. Prereq–Freshman)
Topics specified in *Class Schedule*.

ECON 1903. Freshman Seminar. (3 cr; A-F only. Prereq–Freshman)
Topics specified in *Class Schedule*.

ECON 1904. Freshman Seminar. (3 cr; A-F only. Prereq–Freshman)
Topics specified in *Class Schedule*.

ECON 1905. Freshman Seminar. (3 cr. Prereq–Freshman)
Topics specified in *Class Schedule*.

ECON 1910W. Freshman Seminar. (3 cr; A-F only. Prereq–Freshman)
Topics specified in *Class Schedule*.

ECON 3021. Survey of Economic Ideas. (3 cr. §ECON 4022. Prereq–1101, 1102 or equiv; not open to ECON majors)
A historical and analytical treatment of how important economic ideas developed over time, and their relationship to prevailing economic conditions and politics. Economic ideas from Adam Smith to the present.

ECON 3031. American Economic Problems. (3 cr. §BP 4001, ECON 4031. Prereq–1101, [1102 or equiv]; ECON majors consult first with CLA adviser)
American economic problems/relationships. Relevance of simple economic principles to economic problems in the United States.

ECON 3033. Current Economics Issues. (3 cr [max 6 cr]. §ECON 4033. Prereq–1101, 1102 or equiv; not open to ECON majors)
Current controversies over economic policies used to deal with some economic problems. Students focus in part on a specific issue of their choice. Different economic issues are discussed each time the course is offered (every three years).

ECON 3041. Prospective World Economy. (3 cr. §ECON 4041. Prereq–[1101, 1102] or equiv or ECON major with CLA adviser approval)
What economic future holds. What can be done about global issues. How to improve economic prospects of countries.

ECON 3101. Intermediate Microeconomics. (4 cr. §APEC 3001, ECON 3101H, ECON 3105. Prereq–1101, 1102 or equiv, MATH 1271 or equiv)
Behavior of households, firms, and industries under competitive and monopolistic conditions; factors influencing production, price, and other decisions of the firm; applications of the theory. Economic efficiency and distribution of well-being.

ECON 3101. Honors Course: Intermediate Microeconomics. (4 cr. §APEC 3001, ECON 3101, ECON 3105. Prereq–1101, 1102 or equiv, MATH 1271 or equiv, honors)
Behavior of households, firms, and industries under competitive and monopolistic conditions; factors influencing production, price, and other decisions of the firm; applications of the theory. Economic efficiency and distribution of well-being.

ECON 3102. Intermediate Macroeconomics. (4 cr. §APEC 3006, ECON 3102H. Prereq–3101 or equiv)
Determinants of national income, employment, and price level; effects of monetary and fiscal policies; emphasis on a general equilibrium approach. Applications of the theory, especially to current macroeconomic policy issues.

ECON 3102H. Honors Course: Intermediate Macroeconomics. (4 cr. §APEC 3006, ECON 3102. Prereq–3101 or equiv, honors)
Determinants of national income, employment, and price level; effects of monetary and fiscal policies; emphasis on a general equilibrium approach. Applications of economic efficiency and distribution of well-being.

ECON 3105. Managerial Economics. (4 cr. §APEC 3001, ECON 3101, ECON 3101H. Prereq–1101, [1102 or equiv], [MATH 1271 or equiv]; not open to ECON majors)
Theory of the firm. Managerial decision problems. Demand theory. Production technology and cost concepts. Pricing/output decisions under different market structures. Investment behavior. Government regulation.

ECON 3501. Labor Economics. (3 cr. §ECON 4531. Prereq–1101, 1102 or equiv; not open to ECON majors)
Role of labor in economy; labor as factor of production, population, and labor force; economics of labor markets; labor market institutions; theories of wages and employment; unions and collective bargaining; public policy.

ECON 3601. Industrial Organization and Antitrust Policy. (3 cr. §ECON 4631, ECON 4631H. Prereq–1101, 1102 or equiv; not open to ECON majors)
Industrial organization and market structures. Relations between market structure, economic efficiency, and welfare. Purposes and effects of antitrust and related legislation. Industrial policy.

ECON 3611. Environmental Economics. (3 cr. Prereq–1101, 1102, or equiv; not open to ECON majors)
Dependence of the economy on the environment; alternative visions of the future and issues on which actual outcome will depend, particular attention to global warming; future generations and sustainability; economic incentives for environmental protection and degradation; economic aspects of environmental policies.

ECON 3701. Money and Banking. (3 cr. §ECON 4721, ECON 4721H. Prereq–1101, 1102 or equiv; not open to ECON majors)
Historical development, present characteristics, and economic role of financial institutions. Commercial banking, the Federal Reserve System, and monetary policy.

ECON 3801. Elements of Public Economics. (3 cr. §ECON 4821. Prereq–[1102 or equiv]; not open to ECON majors)
Competing views on proper role of government in economy. Effects of tax/spending policies. Private agents' response to government actions. Optimal policies. Applications primarily to U.S. federal government.

ECON 3951. Major Project Seminar. (2 cr. Prereq–3101, 3102 or equiv, ENGC 3027)
Students produce a significant piece of written work in economics. Project should demonstrate critical thinking, collection and analysis of data, problem solving, effective interpretation of findings. Students should attain understanding and proficiency in modes of inquiry in economics.

ECON 3960. Topics in Economics. (3 cr [max 6 cr]. Prereq–1101, 1102 or equiv)
Topics specified in *Class Schedule*.

ECON 3991. Independent Study. (1-3 cr [max 3 cr]; A-F only. Prereq–1101, 1102, #)
Students confirm topic of study with faculty supervisor or with director of undergraduate studies before beginning (otherwise no credit).

ECON 3993. Directed Studies. (1-3 cr [max 3 cr]. Prereq–1101, 1102 or equiv, #)
Guided individual reading or study in areas not available in regular course offerings.

ECON 4021. Economics, Ethics, and Economic Philosophy. (3 cr. Prereq–[1101, 1102] or equiv)
Types of economics. Ethics and its economic applications. Bases of different economic philosophies. Topics vary by semester. Examples: relationships between freedoms/reponsibilities, economics/ethics of stakeholder concept, different concepts of property rights or justice.

ECON 4022. Survey of Economic Ideas. (3 cr. §ECON 3021. Prereq–3101, 3102 or equiv)
Historical and analytical view of how important economic ideas developed and their relationship to prevailing economic conditions and politics. Economic ideas from Adam Smith to the present.

ECON 4031. American Economic Problems. (3 cr. §BP 4001, ECON 3031. Prereq–3101, 3102 or equiv)
Discussion of American economic problems and relationships. Relevance of simple economic principles to economic problems in the United States.

ECON 4033. Current Economic Issues. (3 cr [max 6 cr]. §ECON 3033. Prereq–3101, 3102 or equiv)
Current controversies over economic policies used deal with some economic problems. Students focus in part on a specific issue. Different economic issues are discussed every time the course is offered (every three years).

ECON 4041. The Prospective World Economy. (3 cr. §ECON 3041. Prereq–3102 or equiv)
Considers what the economic future holds, what can be done now to deal with global issues, and how to improve economic prospects of countries.

ECON 4100W. Undergraduate Writing in Economics. (1 cr [max 2 cr]; A-F only. Prereq–3101, [¶4831 or ¶economics honors course], #)
Research essay.

ECON 4109H. Honors Course: Game Theory and Applications. (4 cr. Prereq–3101, 3102 or equiv, MATH 1271-1272 or equiv)
Games; normal form and extensive form; wars of attrition; games of timing; bargaining applications in industrial organization, macroeconomics, and international economics.

ECON 4113. Introduction to Mathematical Economics. (4 cr. Prereq–3101, 3102 or equiv, MATH 1271-1272-2243 or equiv)
Development of selected models of economic behavior in mathematical terms. Topics selected to illustrate the advantages of a mathematical formulation.

ECON 4161. Microeconomic Analysis. (2 cr. Prereq–[3101 or 5151 or equiv], Math 2243, Math 2263, #)
Theories of consumer demand, producer supply, and market equilibrium. General equilibrium and welfare. May include topics such as externalities, economics of information/uncertainty. Seven-week course. Meets with 8001.

ECON 4162. Microeconomic Analysis. (4 cr; A-F only. Prereq–4161, #)
Theories of consumer demand, producer supply, and market equilibrium. General equilibrium and welfare. May include topics such as externalities, economics of information/uncertainty, and game theory. Seven-week course. Meets with 8002.

ECON 4163. Microeconomic Analysis. (2 cr. Prereq–4162, #)
Theories of consumer demand, producer supply, and market equilibrium. General equilibrium and welfare. May include topics such as externalities, economics of information/uncertainty, and game theory. Seven-week course. Meets with 8003.

ECON 4164. Microeconomic Analysis. (2 cr. Prereq–4163, #)
Theories of consumer demand, producer supply, and market equilibrium. General equilibrium and welfare. May include topics such as externalities, economics of information/uncertainty, and game theory. Seven-week course. Meets with 8004.

ECON 4165. Macroeconomic Theory. (2 cr. Prereq–[3102, [[Math 2243, Math 2263] or equiv]], #)
Dynamic general equilibrium models: solving for paths of interest rates, consumption, investment, and prices. Seven-week course. Meets with 8105.

ECON 4166. Macroeconomic Theory. (2 cr. Prereq–4165, #)
Dynamic general equilibrium models: solving for paths of interest rates, consumption, investment, and prices. Seven-week course. Meets with 8106.

ECON 4167. Macroeconomic Theory. (2 cr. Prereq–4166, #)
General equilibrium models with uncertainty, search, matching, indivisibilities, private information. Implications of theory for measurement and data reporting. Overlapping generations, dynasty models with money/government. Variational/recursive methods. Seven-week course. Meets with 8107.

ECON 4168. Macroeconomic Theory. (2 cr. Prereq–4167, #)
General equilibrium models with uncertainty, search, matching, indivisibilities, private information. Implications of theory for measurement and data reporting. Overlapping generations, dynasty models with money/government. Variational/recursive methods. Seven-week course. Meets with 8108.

ECON 4171. History of Economic Thought. (3 cr. Prereq–3101, 3102 or equiv)
Primarily a critical reading course. Topics include Smith, Ricardo, Malthus, and Marx; neoclassicists, Keynes, the mercantilist and physiocratic doctrines; and modern theory.

ECON 4211. Principles of Econometrics. (4 cr. Prereq–[[1101, 1102] or equiv], Math 2243 [or equiv], [[STAT 3021, STAT 3022] or equiv], familiarity with computers)
Data analysis/quantitative methods in economics. Violation of classical regression model assumptions, modified estimation procedures that retain desirable properties. Multi-equation models. Computer applications/interpretation of empirical results.

ECON 4261. Introduction to Econometrics. (4 cr; A-F only. Prereq–[3101 or equiv], [[MATH 1271, MATH 1272] or equiv], Math 2243, Math 2263, [[STAT 4101, STAT 4102] or [STAT 5101, STAT 5102]]; MATH 4242 strongly recommended)
Review of basic linear regression model, its variants. Time series/simultaneous equation models. Material may include panel data, censored/truncated regressions, discrete choice models.

ECON 4262. Econometric Analysis. (2 cr. Prereq–4261)
Review of basic linear regression model, its variants. Time series/simultaneous equation models. Material may include panel data, censored/truncated regressions, discrete choice models.

ECON 4301. Economic Development. (3 cr. §ECON 4331W. Prereq–[[1101, 1102] or equiv], non-ECON major)
Economic growth in low income countries. Theory of aggregate and per capita income growth. Population growth, productivity increases, capital formation. Allocation of resources between consumption and investment and among sectors. International assistance and trade.

ECON 4307. Comparative Economic Systems. (3 cr. §ECON 4337. Prereq–1101, 1102 or equiv; not open to ECON majors)
Functions of economic systems; market economy vs. centrally planned economy. Post socialist transitions in Eastern Europe, Russia, and China and reforms undertaken. Initial conditions and strategies for reforms; results of reforms in terms of key economic indicators.

ECON 4311. Economy of Latin America. (3 cr. Prereq–[1101, 1102] or equiv)
Economic evolution in Latin America since 1950. Trade liberalization, poverty, inflation, development strategies in selected Latin American countries. Theory/applications of important issues.

ECON 4313. The Russian Economy. (3 cr. Prereq–1101, 1102 or equiv)
Main features of the Soviet economic system and its economic development from 1971 to 1980s. Collapse of the Soviet Union in 1991. Recent economic reforms adopted by Russia and the Commonwealth of Independent States. Russia and its relations with the world.

ECON 4315. The Japanese Economy. (3 cr. Prereq–1101, 1102 or equiv)
Economic development following contact with western civilization. Issues covered include trade, development and growth, population growth, capital formation, international economic relations, agricultural and industrial policies; role of the government in the economy, and current issues of interest.

ECON 4331W. Economic Development. (3 cr. §ECON 4301. Prereq–3101, 3102 or equiv)
Economic growth in low income countries. Theory of aggregate and per capita income growth. Population growth, productivity increases, and capital formation. Allocation of resources between consumption and investment and among sectors. International assistance and trade.

ECON 4337. Comparative Economic Systems. (3 cr. §ECON 4307. Prereq–3101, 3102 or equiv)
Functions of economic systems; market economy versus centrally planned economy. Comparison of different economic systems. Post socialist transitions in Eastern Europe, Russia, and China. Initial conditions and strategies for reforms; results of reforms in terms of key economic indicators.

ECON 4401. International Economics. (3 cr. Prereq–[[1101, 1102] or equiv], not open to ECON majors)
International trade flows. Commercial policy and welfare implications, protection. Global trade organizations. International factor mobility. Balance of payments analysis and open-economy macroeconomics. Foreign exchange markets and exchange rate determination. International monetary system. Regional integration.

ECON 4421W. Economic Integration of the Americas. (3 cr. Prereq–3101, 3102 or equiv or #)
Analysis of economic relationships among countries in the Western Hemisphere. Modeling the impact of NAFTA and similar regional trade accords. Prospects for further integration. Comparison with European integration.

ECON 4431V. Honors Course: International Trade. (4 cr. Prereq–[[3101, 3102] or equiv], MATH 1271)
Theories of trade and explanations of trade patterns. Trade restrictions and commercial policy. International factor movements. Economic growth, economic development, and trade. Multinational corporations. Regional integration. Transition economies and trade.

ECON 4431W. International Trade. (3 cr. Prereq–3101, 3102 or equiv)
Theories of trade and explanations of trade patterns. Trade restrictions and commercial policy. International factor movements. Economic growth, economic development, and trade. Multinational corporations. Regional Integration. Transition economies and trade.

ECON 4432W. International Finance. (3 cr. Prereq–3101, 3102 or equiv; 4431 or 4439 or equiv recommended)
Balance of payments; international financial markets; exchange rate determination; international monetary system; international investment and capital flows; financial management of the multinational firm; open economy macroeconomic policy.

ECON 4531. Labor Economics. (3 cr. §ECON 3501. Prereq–3101, 3102 or equiv)
Economic analysis of labor markets and their operations; population and labor force; labor market institutions; wage and employment theories; unions and collective bargaining; public policy.

ECON 4560. Economics of Discrimination. (3 cr. Prereq–[3101, 3102] or equiv; [STAT 3011, STAT 3022] recommended)
Theory and empirical evidence of labor/consumer markets discrimination. Race/gender differentials. Effects of anti-discrimination policies such as affirmative action. Use of economic models, formal statistical analysis.

ECON 4611H. Honors Course: Environmental Valuation. (4 cr. §ECON 4831. Prereq–[3101 or equiv], [MATH 1271 or equiv])
Principles of cost-benefit analysis used for valuing the environment, costs of pollution. Defining, measuring, valuating benefits/costs. Economic growth, sustainable growth. Economic, ecological, ethical issues in using renewable/non-renewable resources. Optimal rate of use. Optimal pollution control.

ECON 4621H. Honors Course: Urban Economics. (4 cr. Prereq–3101 or equiv)
Economics of urbanization. Location of economic activity and cities. Central place theory. Site rents and form of city. Urban economic base and economic policy. Urban problems and economic policies: transportation, poverty/segregation, housing, public finance.

ECON 4623. Housing Markets and Public Policy. (3 cr. Prereq–1101, 1102 or equiv)
Analysis of housing markets. Market failures, externalities and the case for government intervention. Relative efficiency of particular forms of intervention.

ECON 4631. Industrial Organization and Antitrust Policy. (3 cr. §ECON 3601, ECON 4631H. Prereq–3101 or equiv)
Relations between market structure, economic efficiency and welfare. Economic origins of monopoly and other restraints on competition. Purposes and effects of antitrust and related legislation. Industrial policy.

ECON 4631H. Honors Course: Industrial Organization and Antitrust Policy. (4 cr. §ECON 3601, ECON 4631. Prereq–3101 or equiv)
Economic aspects of antitrust and related policies. Relations between market structure, economic efficiency, and welfare. Economic origins of monopoly and other restraints on competition. Purposes/effects of antitrust/related legislation.

ECON 4721. Money and Banking. (3 cr. §ECON 3701, ECON 4721H. Prereq–3101 or equiv)
Theories of money demand and money supply. Financial intermediation and banking, banking practices and regulation, role of the Federal Reserve system. Monetary policy.

ECON 4721H. Honors Course: Money and Banking. (4 cr. §ECON 3701, ECON 4721. Prereq–[3101 or equiv]; MATH 1271)
Theories of money demand and money supply. Financial intermediation, banking, nonbank financial institutions, banking practices, bank regulation, international banking, role of Federal Reserve system. Monetary policy.

ECON 4731. Macroeconomic Policy. (3 cr. Prereq–3101, 3102 or equiv)
Monetary vs. fiscal policy debate in the context of the underlying macroeconomic theory controversy. Comparison of Keynesian, Monetarist, and Classical theories; rational expectations; policy ineffectiveness; time inconsistency; rules vs. discretion; budget deficits; unemployment and inflation.

ECON 4731H. Honors Course: Macroeconomic Policy. (4 cr. Prereq–[[3101, 3102] or equiv], MATH 1271, honors)
Monetary vs. fiscal policy debate in context of underlying macroeconomic theory controversy. Comparison of Keynesian, Monetarist, and Classical theories. Rational expectations, policy ineffectiveness, time inconsistency, rules versus discretion, budget deficits. Unemployment and inflation.

ECON 4741. Quantitative Analysis of the Macroeconomy. (3 cr. Prereq–[[3101, 3102] or equiv], [STAT 3011 or equiv])
Development/calibration of growth model. Effects of policies on output, employment, other aggregate variables. Documentation of business cycle facts. Estimation of business cycles' cost. Real business theory, prediction of business cycle facts. Money in augmented model.

ECON 4741H. Honors: Quantitative Analysis of the Macroeconomy. (4 cr. Prereq–[[3101, 3102] or equiv], [STAT 3011 or equiv])
Development/calibration of growth model. Effects of policies on output, employment, and other aggregate variables. Documentation of business cycle facts. Estimation of business cycles' cost. Real business theory. Prediction of business cycle facts. Money in augmented model.

ECON 4751. Financial Economics. (3 cr. §ECON 4751H. Prereq–3101 or equiv, MATH 1271 or equiv, 1 sem statistics)
Financial decisions of firms and investors. Determination of interest rates and asset prices. Role of risk and uncertainty. Emphasis on economic models rather than the details of financial institutions.

ECON 4751H. Honors Course: Financial Economics. (4 cr. §ECON 4751. Prereq–3101, [3102 or equiv], [MATH 1271 or equiv], [STAT 3011 or equiv])
Efficiency of financial markets. Theoretical concepts, empirical evidence.

ECON 4821. Public Economics. (3 cr. §ECON 3801. Prereq–§ECON 3801; prereq 3101, 3102 or equiv)
Competing views on the proper role of government in the economy. Effects of tax and spending policies, taking into account private agents' response to government actions and the ways government officials may use their powers; optimal policies. Applications primarily to U.S. government.

ECON 4831. Cost-Benefit Analysis. (3 cr. §ECON 4611H. Prereq–3101 or equiv)
Principles for evaluation of benefits/costs of public projects or programs. Issues connected with definition/measurement of benefits/costs. Rate of return, rate of discount. Market imperfections, risk, and uncertainty. Case studies of applications of theory.

ECON 4960. Topics in Economics. (3 cr [max 6 cr]. Prereq–3101, 3102 or equiv; MATH 1271 [may change based on topic])
Topics specified in *Class Schedule*.

ECON 4991. Independent Study. (1-4 cr [max 4 cr]. Prereq–Honors student, topic approved by [faculty supervisor or dir of undergrad studies])
Honors thesis.

ECON 4993. Directed Study. (1-4 cr [max 4 cr]. Prereq–For honors thesis, #)
Guided individual reading or study in areas not available in regular course offerings.

ECON 5109H. Game Theory for Engineers. (4 cr; A-F only. Prereq–[[[Math 2283, Math 2373, Math 2374, MATH 3283] or MATH 4606], M.S./Ph.D. student in [engineerg or comp sci or info tech or operations mgmt]] or #; not for ECON [undergrads or PhD students])
Introduction to game theory and its applications. Utility theory, noncooperative/cooperative games, bargaining theory. Games in normal/extensive form, Nash equilibria/refinements.

ECON 5151. Elements of Economic Analysis: Firm and Household. (2 cr. Prereq–3101, 3102, or equiv, MATH 1271 or equiv, Math 2243 or equiv, grad or #)
Decision-making by households and firms under conditions of perfect competition, monopoly, and monopolistic competition.

ECON 5152. Elements of Economic Analysis: Income and Employment. (2 cr. Prereq–3101, 3102 or equiv, MATH 1271 or equiv, Math 2243 or equiv, grad or #)
Determinants of national income, employment, and price level; aggregate consumption, investment, and asset holding.

ECON 5312. Growth, Technology, and Development. (3 cr. Prereq–3101, 3102 or equiv or #)
Economics of research and development; technical change and productivity growth; impact of technology on institutions; science and technology policy.

ECON 5890. Economics of the Health-Care System. (3 cr; A-F only. §PUBH 6832. Prereq–[3101, 3102] or #)
Economic analysis of U.S. health-care sector. Emphasizes problems of pricing, production, distribution. Health-care services as one factor contributing to nation's health.

Education and Human Development (EDHD)

College of Education and Human Development

EDHD 1901. Freshman Seminar, Environment. (1-3 cr [max 6 cr]. Prereq–Freshman)
Interdisciplinary seminar. Topics specified in *Class Schedule*.

EDHD 1902. Freshman Seminar: Cultural Diversity. (1-3 cr [max 6 cr]. Prereq–Fr)
Interdisciplinary seminar. Topics specified in *Class Schedule*.

EDHD 1903. Freshman Seminar, Citizenship/Public Ethics. (1-3 cr [max 6 cr]. Prereq–Freshman)
Interdisciplinary seminar. Topics specified in *Class Schedule*.

EDHD 1904. Freshman Seminar, International Perspectives. (1-3 cr [max 6 cr]. Prereq–Freshman)
Interdisciplinary seminar. Topics specified in *Class Schedule*.

EDHD 1905. Freshman Seminar. (1-3 cr [max 6 cr]. Prereq–Freshman)
Interdisciplinary seminar. Topics specified in *Class Schedule*.

EDHD 1906W. Freshman Seminar, Environment and Writing Intensive. (1-3 cr [max 6 cr]. Prereq–Freshman)
Interdisciplinary seminar. Topics specified in *Class Schedule*.

EDHD 1907W. Freshman Seminar, Cultural Diversity and Writing Intensive. (1-3 cr [max 6 cr]. Prereq–Freshman)
Interdisciplinary seminar. Topics specified in *Class Schedule*.

EDHD 1908W. Freshman Seminar, Citizenship/Public Ethics and Writing Intensive. (1-3 cr [max 6 cr]. Prereq–Freshman)
Interdisciplinary seminar. Topics specified in *Class Schedule*.

EDHD 1909W. Freshman Seminar, International Perspectives and Writing Intensive. (1-3 cr [max 6 cr]. Prereq–Freshman)
Interdisciplinary seminar. Topics specified in *Class Schedule*.

EDHD 1910W. Freshman Seminar, Writing Intensive. (1-3 cr [max 6 cr]. Prereq–Freshman)
Interdisciplinary seminar. Topics specified in *Class Schedule*.

EDHD 3001. Exploring the Teaching Profession. (1 cr [max 4 cr]; S-N only. Prereq–Early admit for init lic/MEd program, ❑)
Self as teacher, the culture of teaching, students as learners, learning contexts, societal influences on teaching/schools.

EDHD 5001. Learning, Cognition, and Assessment. (3 cr. §EPSY 3119. Prereq–MEd/initial licensure student or CLA music ed or preteaching major or #; psych course recommended)
Principles of learning, cognition, cognitive development, classroom management, motivation, instruction, assessment. Approaches include behaviorism, cognitive and social constructivism, human information processing theory. Topics include intelligence, knowledge acquisition, reasoning skills, scholastic achievement, standardized testing, reliability, validity, student evaluation, performance assessment, portfolios, demonstrations. Applications to instruction and organization of curricular materials.

EDHD 5003. Developmental and Individual Differences in Educational Contexts. (3 cr; A-F only. Prereq–Jr or sr or post-bac or MEd/initial licensure or CLA music ed or preteaching major or FOE or agriculture or kinesiology or #)
Emphasizes dynamic systems perspective. Developmental transitions in childhood/adolescence. Interactions between student, environment, and task. Accommodations/adaptations for students in special education.

EDHD 5005. School and Society. (2 cr; A-F only. Prereq–Jr or sr or MEd/initial licensure student or CLA music ed major or preteaching major or #)
Readings in history, philosophy, social sciences, and law revealing diverse educational values in a pluralistic society. Multiple expectations of schools. Civil liberties, rights, community. Varying cultural backgrounds of students, family circumstances, exceptional needs.

EDHD 5007. Technology for Teaching and Learning. (1.5 cr; A-F only. Prereq–[MEd/initial licensure or CLA music ed major or preteaching major or #], basic computer skills)
Diverse educational technology in K-12 classrooms. Effective use of technology. Computer technologies used to stimulate personal productivity/communication and to enhance teaching/learning processes.

EDHD 5009. Human Relations: Applied Skills for School and Society. (1 cr; A-F only. Prereq–MEd/init lic or CLA music ed or preteaching or #)
Issues of prejudice/discrimination in terms of history, power, social perception. Knowledge/skills acquisition in cooperative learning, multicultural education, group dynamics, social influence, leadership, judgment/decision making, prejudice reduction, conflict resolution, teaching in diverse educational settings.

Educational Policy and Administration (EDPA)

Department of Educational Policy and Administration

College of Education and Human Development

EDPA 1080. Special Topics in Leadership. (1-3 cr [max 6 cr]; A-F only)
For topic, see *Class Schedule*.

EDPA 1301W. Personal Leadership in the University. (3 cr. §PA 1961W)
Introduces leadership using a personal leadership framework. Students examine their own views on leadership. Differences between personal/positional leadership, characteristics of leaders within the University, importance of personal development.

EDPA 1909W. Freshman Seminar: International Perspectives and Writing Intensive (IP, WI). (1-3 cr [max 6 cr]. Prereq–Fr)
Interdisciplinary seminar. Topics specified in *Class Schedule*.

EDPA 2124. Intercultural Communication and Service Learning: Interdisciplinary Approaches to Public Engagement. (3 cr. Prereq–#)
Cross-cultural competence. Social/economic issues in U.S. and abroad. Major theories, concepts, and models in intercultural/multicultural education. Classroom, research, and service learning activities.

EDPA 3010. Special Topics for Undergraduates. (1-3 cr [max 9 cr])
Inquiry into educational policy and administration problems and issues.

EDPA 3021. Introduction to Historical Foundations of Modern Education. (3 cr. §EDPA 5021, HUM 3021, HUM 4021)
Analysis/interpretation of important elements in modern education derived from pre-classical sources: Greeks, Romans, Middle Ages, Renaissance, Reformation, Enlightenment, Industrial Revolution.

EDPA 3023. Introduction to History of Western Educational Thought. (3 cr. §EDPA 5023, HUM 3023, HUM 4023)
Great educational classics of Western civilization: Plato, Aristotle, Quintilian, Montaigne, Milton, Locke, Rousseau, others.

EDPA 3101. Understanding SoutheAST Asia: an Intercultural/Interdisciplinary Policy Perspective. (3 cr [max 30 cr])
Contemporary southeast Asia. Complexities/diversity of region. Interdisciplinary orientation. Humanities and social science material. Case studies, critical incidents.

EDPA 3102. Maximizing Study Abroad Through Culture and Language Strategies: Pre-Departure Preparation. (1 cr. Prereq–#)
Preparation for overseas sojourn: understanding culture, ways cultures differ in values, seeing oneself as a member of a culture or cultures.

EDPA 3103. Maximizing Study Abroad Through Culture and Language Strategies: In-Country Experience. (1 cr. Prereq–3102 or #)
Reflect on activities/readings of study abroad experiences overseas. E-journaling, written activities, group interaction using various formats.

EDPA 3104. Maximizing Study Abroad Through Culture and Language Strategies: Re-Entry. (1 cr. Prereq–3103 or #)
Reflect upon personal study abroad experience through readings/activities to ease transition back into the United States and to maximize learning from study abroad experience.

EDPA 3302W. Leadership, You, and Your Community. (3 cr. §PA 3961W. Prereq–[1301W, PA 1961W] with grade of at least C, [soph or at least 60 cr])
Leadership and leadership capacities from multicultural/multidimensional perspectives. Students examine their own views on leadership. Leadership theory/practice, group dynamics/behavior, applying knowledge.

EDPA 3303. Introduction to Women in Leadership. (3 cr)
Sex discrimination, female career patterns, women leaders, inclusive conceptualizations of managerial/administrative theory.

EDPA 3304. Strategic Leadership for Future Societies. (3 cr)
Emerging leadership implications of selected short-/long-range trends. Construction of context-relevant effective leadership scenarios for selected institutions in real/hypothetical societies.

EDPA 3305. Learning About Leadership Through Film and Literature. (3 cr)
Readings from leadership studies, literature, and film. Ethical dilemmas. Different styles of leadership and their consequences. Intersection of public/private in exercising leadership. Competing loyalties/pressures felt by leaders/followers. Fundamental questions about nature/desirability of leadership.

EDPA 3402. Leadership Minor: Field Experience. (2 cr; A-F only. §PA 3971. Prereq–[3302W or PA 3961W] with grade of at least C)
Students integrate lessons learned from core leadership courses, choose from a variety of settings (e.g., community organizations, corporations, University student organizations, education).

EDPA 4303W. Leadership in the World. (3 cr; A-F only. §PA 4961W. Prereq–[3402 or PA 3971])
Leadership theory, community building, social change, interdisciplinary approaches to complex global issues. Students finalize portfolios, submit scholarly products to demonstrate understanding of personal/positional leadership in changing global context. Capstone course.

EDPA 5001. Formal Organizations in Education. (3 cr)
Classical/current theories of organizations. Applications to education and related fields.

EDPA 5021. Historical Foundations of Modern Education. (3 cr. §EDPA 3021, HUM 3021, HUM 4021)
Analysis and interpretation of important elements in modern education derived from pre-classical sources: Greeks, Romans, Middle Ages, Renaissance, Reformation, Enlightenment, and Industrial Revolution.

EDPA 5023. History of Western Educational Thought. (3 cr. §EDPA 3023, HUM 3023, HUM 4023)
Great educational classics of Western civilization: Plato, Aristotle, Quintilian, Montaigne, Milton, Locke, Rousseau, and others.

EDPA 5024. History of Ideas in American Education. (3 cr)
Readings in American cultural development related to education, including: Franklin, Jefferson, Mann, B.T. Washington, W.E.B. DuBois, Dewey. Special reference to the emerging system of public education in changing contexts, agrarian to urban-industrial, moderate pluralism to intense diversity.

EDPA 5028. Education Imagery in Europe and America. (3 cr)
Images and ideas of education expressed in the visual arts of Western civilization (antiquity to 20th century) in relation to concurrent educational thought and practice; symbolism, myth, propaganda, didacticism, genre, caricature.

EDPA 5032. Comparative Philosophies of Education. (3 cr)
Exploration of the principal philosophies in educational thought today, e.g., realism, idealism, pragmatism, and postmodernism. Practice in philosophical critique.

EDPA 5036. Ethics, Morality, and Values in Education. (3 cr)
Application to key issues of professional practice. Moral education, virtues, principles.

EDPA 5041. Sociology of Education. (3 cr. §SOC 5455)
Structures and processes within educational institutions; linkages between educational organizations and their social contexts, particularly related to educational change.

EDPA 5044. Introduction to the Economics of Education. (3 cr)
Costs and economic benefits of education, with a focus on K-12; educational markets, prices, and production relationships; investment and cost-benefit analysis.

EDPA 5048. Cross-Cultural Perspectives on Leadership. (2-3 cr [max 3 cr])
Introduction to cultural variables of leadership that influence functioning of cross-cultural groups. Lectures, case studies, discussion, problem-solving, simulations. Intensive workshop.

EDPA 5052. Ethnic Groups and Communities: Families, Children, and Youth. (3 cr)
Roles of young people in widely varied North American communities. Comparative aspects of youth commitment to society, economic value of youth, youth-adult conflict, youth roles in family. Well-defined analyses of contextual roles. Complexity of policy for appropriate educational/community development.

EDPA 5056. Case Studies for Policy Research. (3 cr; A-F only)
Qualitative case study research methods and their applications to educational policy and practice. Emphasis on designing studies that employ open-ended interviewing as primary data collection technique.

EDPA 5057. Research in International Education. (3 cr)
Key skills/proficiencies for rigorous graduate research. Quantitative/qualitative/mixed methods. How to be a critical consumer of policy-related, comparative/intercultural research. Conducting cross-cultural/comparative research. Related ethical issues.

EDPA 5061. Ethnographic Research Methods. (3 cr)
Practice in aspects of field methodology below the level of full field study; detailed reading; analysis of studies in anthropology and education for methodological content.

EDPA 5064. Divergent Perspectives in Educational Policy and Practice. (3 cr)
Examines fundamental and current issues in the field of education. Participants learn how to approach an issue from multiple perspectives, develop skills to identify and analyze its component parts, and examine personal belief systems to place a given issue within a personal context.

EDPA 5070. Special Topics: School Leadership. (1-5 cr [max 15 cr]. Prereq–BA or BS or other baccalaureate degree)
Skills/knowledge necessary to respond to multiple challenges of reduced budgets, increased accountability requirements, and growing concerns about impact of technology investments in education.

EDPA 5080. Special Topics: Educational Policy and Administration. (1-3 cr [max 24 cr])
Topical issues in educational policy/administration.

EDPA 5087. Seminar: Educational Policy and Administration. (1-3 cr [max 24 cr])
Shared responsibility of students/instructor in presentation of topics.

EDPA 5095. Problems: Educational Policy and Administration. (1-3 cr [max 24 cr])
Course or independent study on specific topic within department program emphasis.

EDPA 5096. Internship: Educational Policy and Administration. (1-9 cr [max 24 cr])
Internship in elementary, secondary, general, or postsecondary administration, or other approved field related setting.

EDPA 5101. International Education and Development. (3 cr)
Introduction to comparative and international development education, contemporary theories regarding the role of education in the economic, political, and sociocultural development of nations; examination of central topics and critical issues in the field.

EDPA 5102. Knowledge Formats and Applications: International Development Education Contexts. (3 cr)
Analyzes the interrelationships of "knowledge capital" (noetic symbolic resources) and culture through intrinsic, cross-, and multicultural perspectives. Distinguishes knowledge from information and data, focusing on national and international developments occurring along basic and applied knowledge paths.

EDPA 5103. Comparative Education. (3 cr)
Examination of systems and philosophies of education globally with emphasis upon African, Asian, European, and North American nations. Foundations of comparative study with selected case studies.

EDPA 5104. Strategies for International Development of Education Systems. (3 cr; A-F only. Prereq–Grad student)
Strategies for improving quality/efficiency of schooling in developing countries. Introduction to current research on what policy/programmatic interventions have proven most successful in increasing access, raising quality, and improving efficiency of education in developing countries.

EDPA 5121. Educational Reform in International Context. (3 cr)
Critical policy analysis of educational innovation and reform in selected countries. Use theoretical perspectives and a variety of policy analysis approaches to examine actual educational reforms and their implementation.

EDPA 5124. Critical Issues in International Education and Educational Exchange. (3 cr)
Analysis of comprehensive policy-oriented frameworks for internationaleducation; practices of U.S. and other universities; conceptual development of international education and its practical application to programs, to employment choices, and to pedagogy.

EDPA 5128. Anthropology of Learning. (3 cr. §ANTH 5128)
Cross-cultural perspectives in examining educational patterns; the implicit and explicit cultural assumptions underlying them. Methods and approaches to cross-cultural studies in education.

EDPA 5132. Intercultural Education and Training: Theory and Application. (3 cr)
Examination of intercultural education; formal and nonformal education programs intended to teach about cultural diversity, promote intercultural communication and interaction skills, and teach students from diverse background more effectively.

EDPA 5134. Futures Research for Educational Leaders. (3 cr. Prereq–Grad student)
Perspectives/methods of futures research. Historical/antecedent and contemporary influences on futures research. Futures sesearch as social technology vs social (inexact) science. Primary toolbox of futures Research. Emerging potentials of futures research.

EDPA 5136. Scenario and Story Planning for Educational Innovators. (3 cr. Prereq–Grad student)
How to create/use strategic scenarios/stories to anticipate/shape forces/events that could impact future educational design, policy, practice, and administration. Designing, analyzing, comparing multiple scenarios/stories under different initial conditions, including assumptions, information content, and contexts.

EDPA 5141. Global Youth Policy and Leadership: Comparative Youth Policy and Leadership. (3 cr. Prereq–CIDE student or #)
Comparative approach to public responses at global level to youth development and leadership issues. Social systems such as education, health, employment and recreation. Role of individuals, communities, governments, and international organizations directed to provide programs/services to young persons.

EDPA 5142. Global Youth Policy and Leadership: Strategic Projections, Visions, and Alternative Futures. (3 cr. Prereq–CIDE student or #)
Address strategic trends in global youth development, including positive/negative implications. Attention to reconciling positive/negative trends with normative scenarios with respect to presence, absence, and projected likelihood of suitable policies, workable collaborations, and funding.

EDPA 5301. Contexts of Learning: Historical, Contemporary, and Projected. (3 cr; A-F only)
Contextual understanding of education as a social institution. Education is studied as one institution among the several that constitute its dynamic context.

EDPA 5302. Educational Policy: Context, Inquiry, and Issues. (3 cr)
Review of social science concepts/research in considering educational policies/issues, process of inquiry that affect policy development, implementation, evaluation. Focus on pre-K-12. Role of educational leaders, administrators.

EDPA 5303. Managing the Learning Organization. (3 cr; A-F only)
Examines schools, colleges, and other human service organizations centered on learning. Focuses on perspectives and skills needed to manage organizations effectively.

EDPA 5304. Educational Leadership for Equity, Opportunity, and Outcome. (3 cr)
Implications of multiple contexts in which leadership occurs. Role of followers. Complexities of collaborative structures and of shared governance.

EDPA 5305. Leadership and Vision in School Technology. (1 cr. Prereq–Broadband Internet access, a newer computer)
How to create a shared vision for comprehensive integration of technology into educational environments. Ways to foster environment/culture conducive to realizing that vision.

EDPA 5306. Staff Technology Development and Support. (1 cr. Prereq–Broadband Internet access, a newer computer)
How to lead an organization in designing, implementing, evaluating, improving, and sharing approaches to staff development. Technology-related development. Facilitating staff development through use of technology.

EDPA 5307. School Management and Technology. (1 cr. Prereq–Broadband Internet access, a newer computer)
Various organizational/management issues impacted by information technology. Focuses on hardware, software, and database technologies designed to facilitate management/operations of school organizations.

EDPA 5308. Emerging Issues and School Technology. (1 cr. Prereq–Broadband Internet access, a newer computer)
Needs of schools/administrators to remain on forefront of information technologies. Focuses on anticipated technological trends years/decades ahead.

EDPA 5309. Electronic Communication Tools and Environments for Schools. (1 cr. Prereq–Broadband Internet access, a newer computer)
Various electronic communication channels, information environments to facilitate educational organizations' operations/communication. Focuses on networked environments, integration with handheld computers, and outreach to internal/external stakeholders.

EDPA 5310. Data-Driven Decision Making I. (1 cr. Prereq–Broadband Internet access, a newer computer)
Data-driven decision making for schools/administrators. Focuses on data collection/analysis needs of educational organizations and on use of appropriate software/databases to collect, manage, analyze, and report school information.

EDPA 5311. Data-Driven Decision Making II. (1 cr. Prereq–Broadband Internet access, a newer computer)
Continuation of 5310. Data-driven decision making for schools/administrators. Hands-on training in students' own organizations in using technology to analyze data to make educational decisions.

EDPA 5312. School Technology Policy Issues. (1 cr. Prereq–Broadband Internet access, a newer computer)
Various state/national policy issues related to educational technology. Focuses on "digital divide" in schools/communities, federal educational technology policy initiatives, and state/federal educational technology legislation.

EDPA 5313. Legal and Ethical Issues in School Technology. (1 cr. Prereq–Broadband Internet access, a newer computer)
Social, legal, and ethical issues related to school technology. How to model responsible decision-making related to these issues.

EDPA 5314. School Technology Safety and Security. (1 cr. Prereq–Broadband Internet access, a newer computer)
School safety/security issues impacted by information technology. Network/data security. Physical safety of students, employees, and facilities. Computer recycling/disposal. Appropriate ergonomic environments for students/employees.

EDPA 5315. School Technology Leadership Multimedia Project. (1 cr. Prereq–[[Mac or PC] with 256 MB RAM, [Windows NT 2000 or XP or Mac OS 9 or 10], Pentium [2 or faster], internet connection, [Netscape or Internet Explorer], virus protection software, School Technology Leadership] or #)
Students focus on individualized school technology leadership topic of choice, deliver a multimedia presentation of project results. Regular consultation with faculty, peer mentors, and outside mentors.

EDPA 5321. The Principalship. (3 cr)
Role of the principal: qualifications, duties, and problems.

EDPA 5322. School Superintendency. (3 cr)
Role/responsibility of superintendent in school district. Emphasizes real life experiences, leadership potential as CEO. Purposes, power, politics, practices of position. Interplay of internal school forces, external community forces analyzed in multiple contexts. Manifestations of leadership in public, high-profile appointment.

EDPA 5323. Women in Leadership. (3 cr. Prereq–technology access)
Women in leadership, in context of larger systems and their own lives. Supporting equity/equality across areas of difference.

EDPA 5324. Financial Management for Elementary-Secondary Education. (3 cr)
Provides an overview of state-local school finance systems, budgeting, governmental fund accounting, and interpretation of financial information. For graduate students pursuing licensure as elementary-secondary principals and superintendents.

EDPA 5325. Analytical Tools for Educational Leadership. (1 cr. Prereq–#)
Technological/analytical tools associated with data-driven decision-making processes in K-12 school environments.

EDPA 5326. Data Analysis for Educational Leadership. (2 cr. Prereq–[5325 or equiv], #)
Advanced technological/analytical tools associated with data-driven decision-making processes in K-12 school environments.

EDPA 5328. Introduction to Educational Planning. (3 cr)
Principles, tools, comparative practices, and emerging issues in K-12 and higher education settings; decision making models; strategic and project planning; barriers to effectiveness; and change management processes.

EDPA 5332. Leadership Development Seminar. (3 cr)
Assessment and development of skills required of the educator in planning, decision making, and human relations. Introduction to contemporary issues in educational administration.

EDPA 5336. Laboratory in Decision Making. (3 cr)
Contributions of recent research and theory to effective administration. Analysis of administrative behavior in realistic settings; relations of administration to human behavior.

EDPA 5341. The American Middle School. (3 cr)
Focus on the uniqueness of the early adolescent and appropriate learning situations. For educators working with middle-level students.

EDPA 5344. Legal Aspects of Elementary and Secondary Education. (3 cr)
Overview of legal foundations of elementary/secondary education. Statutory themes, relevant case law, emergent policy issues. Implications for educational organizations and for administrative practice.

EDPA 5346. Politics of Education. (3 cr; A-F only. Prereq–postbac, MEd, or grad student)
Political dimensions of policy formulation/implementation in education. Use of power/influence in shaping educational policies and in resolving conflicts over educational issues. Analysis of consequences/cross-impacts.

EDPA 5348. Administration of Human Resources in Education. (2 cr. Prereq–Designed for students working on licensure for dir of community educ or superintenDENT or K-12 principal or dir of special educ)
Effective personnel practices. Skills required for effective administrator/leader. Emphasizes human resources administration, including employee recruitment, selection, orientation/support, supervision, and performance appraisal of school district personnel.

EDPA 5352. Projective Leadership for Strategic Learning Communities. (3 cr)
Explores many trends and changes facing society, culture, and education from a strategic learning community perspective; helps students "futurize the present."

EDPA 5356. Disability Policy and Services. (3 cr)
Policy, research, and current practices related to education, health, and social services that support children, youth, and adults with special needs, and that support their families. Federal, state, and local perspectives.

EDPA 5361. Project in Teacher Leadership. (3 cr [max 6 cr]; S-N only. §CI 5178. Prereq–MEd student in Teacher Leadership Program)
Create, implement, evaluate, and present a leadership project designed toinitiate positive change in educational environments. Review of related literature, proposal development, project development, implementation and evaluation, critical reflection, sharing learning outcomes.

EDPA 5364. Context and Practice of Educational Leadership. (3 cr; A-F only)
Current research/practice on educational leadership. Focuses on creating school cultures conducive to continuous improvement/change. Strategies for personal/organizational leadership in PK-12 settings.

EDPA 5368. Special Services Policy and Administration. (3 cr)
Legislative, procedural, executive, and judicial actions that affect services, families, and children with special needs at all levels of government: federal, state, and local. For administrators, supervisors, and other professionals responsible for managing general, special, and alternative education programs.

EDPA 5372. Youth in Modern Society. (3 cr)
Youth in advanced societies and as a social entity; functions and roles in industrial society, family, education, politics and government, economy and work, welfare and religion; organizations, social movements, and subcultures; empirical research and cross-cultural perspectives.

EDPA 5374. Leadership for Professional Development. (4 cr. Prereq–Postbaccaleaureate, at least 3 yrs teaching experience)
Designing, implementing, evaluating staff development in preK-12 settings. Research-based standards for effective staff development. Need for embedded time for collaborative learning, evaluating staff/student outcomes.

EDPA 5376. Organizational Approaches to Youth Development. (3 cr)
Defining youth development within framework of formal and informal organizations; organizational systems responsible for youth development in the community; policy issues surrounding these systems.

EDPA 5378. Experiential Learning: Theory and Practice. (3 cr)
Theory/practice of learning by doing. Educator's personal engagement in process. Technical, motivational, and evaluative aspects.

EDPA 5381. The SeARCH for Children and Youth Policy in the U.S. (3 cr)
Review of contemporary policy issues affecting children and youth in the U.S. and South Africa; identify national standards, norms and principles of youth development; conflicting expectations facing policy-makers; and search for the critical content of youth policy.

EDPA 5384. Collaboration in Heterogeneous Classrooms and Schools. (3 cr; A-F only)
Policy, research, practice base for addressing range of student abilities/backgrounds in diverse schools. Collaborative approaches to curricular, instructional, social support.

EDPA 5385. Licensure Seminar. (1 cr [max 4 cr]; S-N only)
Prepararation for licensure program. Program overview, preassessment, reflective practice, APA writing, exit panel review, administrative employment interview.

EDPA 5386. Portfolio Seminar. (1 cr [max 4 cr]; S-N only)
Development of electronic administrative licensure portfolio as part of process to earn endorsement for license as a school superintendent, K-12 principal, director of special education, or director of community education.

EDPA 5387. Administration of Teaching and Learning. (1 cr)
Administration of teaching/learning as a system in an inclusive school system. Multiple experts present components of system. Focuses on questions an administrator must address when functioning as leader of learning.

EDPA 5388. Master(ful) Schedule Building. (2 cr. Prereq–5387)
Scheduling models. Strategies for personalizing schools. Hands-on "infinite campus student system." Master schedule is built online.

EDPA 5389. Administration of Community and Alternative Education Programs. (3 cr)
Competencies of leadership, community relations, communication, community assessment, program development, program evaluation. Philosphy/administration of community/alternative education programs.

EDPA 5391. Special Education Law. (1 cr. Prereq–Designed for students working on licensure in PK-12 administration)
Competencies of leadership, policy, and political influence. Legal/regulatory applications focusing on special education law.

EDPA 5396. Field Experience in PK-12 Educational Administration. (3 cr [max 6 cr]; S-N only. Prereq–#)
Field experience or internship arranged for students seeking licensure as PK-12 principal/superintendent. Content/credit depend on licensure requirements specified in individual field experience agreement.

EDPA 5501. Principles and Methods of Evaluation. (3 cr. §EPSY 5243)
Introduction to program evaluation. Planning an evaluation study, collecting and analyzing information, reporting results; evaluation strategies; overview of the field of program evaluation.

EDPA 5521. Cost and Economic Analysis in Educational Evaluation. (3 cr)
Use and application of cost-effectiveness, cost-benefit, cost-utility, and cost-feasibility in evaluation of educational problems and programs.

EDPA 5524. Evaluation Colloquium. (1 cr [max 24 cr]; S-N only. §EPSY 5246. Prereq–5501 or EPSY 5243)
Informal seminar of faculty and advanced students. Issues/problems of program evaluation.

EDPA 5701. U.S. Higher Education. (3 cr)
U.S. higher/postsecondary education in historical/contemporary perspective. Emphasizes structure, history, and purposes of system as a whole.

EDPA 5704. College Students Today. (3 cr. §EPSY 5451)
Issues involving population of students in colleges/universities. College student development theory, students' expectations/interests. How college affects student outcomes. Role of curricular/extracurricular activities. Student-faculty interaction.

EDPA 5721. Racial and Ethnic Diversity in Higher Education. (2-3 cr [max 3 cr])
Review of research. Theoretical frameworks, methodological perspectives, and research strategies used to study students, staff, and faculty; historical perspectives.

EDPA 5724. Leadership and Administration of Student AffAIRs. (2-3 cr [max 3 cr]. §EPSY 5421)
Scope, administration, coordination, and evaluation of programs in college and university student affairs.

EDPA 5727. Developmental Education Programs and Postsecondary Students. (2-3 cr [max 3 cr]. Prereq–Bachelor's degree)
Focuses on populations served by developmental education programs in the United States and abroad. Defines developmental education. Historical perspective for need for developmental education, student development theories that guide practice in developmental education. Identifying student needs. Model programs, best practices for student retention. Current issues/trends in field.

EDPA 5728. Two-Year Postsecondary Institutions. (2-3 cr [max 3 cr])
Present status, development, functions, organization, curriculum, and trends in postsecondary, but nonbaccalaureate, institutions.

EDPA 5732. The Law and Postsecondary Institutions. (3 cr)
Analysis of court opinions and federal regulations affecting postsecondary educational institutions.

EDPA 5734. Institutional Research in Postsecondary Education. (2-3 cr [max 3 cr]; A-F only. Prereq–[5701, (EPSY 5231 or EPSY 8261), grad student] or #)
Scope, role, administration, research strategies, and evaluation of institutional research in postsecondary institutions. Overview of research methodologies, disciplinary foundations of institutional research. Use of institutional, state, and national databases in addressing full range of institutional missions/functions.

EDPA 5795. Plan B Research Design. (3 cr [max 6 cr]; A-F only. Prereq–Grad student)
Foundation to design Plan B research project relevant to student's professional interests. Literature review strategies to establish conceptual framework for project. Relates research question to design alternatives and to associated qualitative/quantitative analysis techniques. Issues such as human subjects and APA guidelines for preparing research papers.

Educational Psychology (EPSY)

Department of Educational Psychology

College of Education and Human Development

EPSY 1600. Special Topics: Developing Special Educational and Human Service Programs. (1-4 cr [max 15 cr]. Prereq–#)
Explores the concepts, issues, and practices in developing special education and human services for persons with disabilities. Appropriate for persons in paraprofessional positions.

EPSY 1905. Freshman Seminar. (1-3 cr [max 6 cr]. Prereq–Fr)
Interdisciplinary seminar. Topics specified in *Class Schedule*.

EPSY 3101. Creativity and Intelligence: an Introduction. (3 cr)
Classic/contemporary theories of creativity/intelligence, their development, implications for behavioral/social sciences and psychological/educational practices.

EPSY 3111W. Introduction to Critical Thinking. (3 cr)
Prominent issues and research findings related to critical thinking. How to critically evaluate controversies/arguments in editorials and published essays. Applications of critical thinking to various fields.

EPSY 3119. Learning, Cognition, and Assessment. (3 cr; A-F only. §EDHD 5001)
Principles of learning, cognition, cognitive development, classroom management, motivation, instruction, and assessment. Topics: behaviorism, cognitive and social constructivism, human information processing theory, intelligence, knowledge acquisition, reasoning skills, scholastic achievement, standardized testing, reliability, validity, student evaluation, performance assessment, and portfolios.

EPSY 3132. Psychology of Multiculturalism in Education. (3 cr; A-F only)
Course critically examines social and cultural diversity in the United States, confronting social issues of poverty, handicappism, homophobia, racism, sexism, victim-blaming, violence, and so on, and presenting models for change. Students examine how and why prejudices develop.

EPSY 3133. Practicum: Service Learning, Psychology of Multiculturalism in Education. (1 cr [max 3 cr]. Prereq–[3132 or ¶3132], #)
Thirty hours of service learning in multicultural communities. Students work with children, youth, or adults in ESL tutoring or after-school youth programs. Sensitivities/competencies related to multicultural issues in U.S. society.

EPSY 3134W. Social Diversity and Deculturalization in Education. (3 cr)
How educational practices affect cultures of minority-status peoples in the United States. Emphasizes historical/contemporary educational issues of deculturalization related to assimilation, segregation, integration, and educational labeling, achievement, and interaction of students.

EPSY 3264. Basic and Applied Statistics. (3 cr. §EPSY 5231, EPSY 5261)
Introductory statistics. Emphasizes understanding/applying statistical concepts/procedures. Visual/quantitative methods for presenting/analyzing data, common descriptive indices for univariate/bivariate data. Inferential techniques.

EPSY 3300. Special Topics in Educational Psychology. (1-4 cr [max 9 cr])
Current issues in educational psychology or related coursework in areas not normally available through regular curriculum offerings.

EPSY 4300. Special Topics in Educational Psychology. (1-3 cr [max 3 cr])
Current issues in educational psychology or related coursework in areas not normally available through regular curriculum offerings.

EPSY 5101. Intelligence and Creativity. (3 cr; A-F only)
Contemporary theories of intelligence and intellectual development and contemporary theories of creativity and their implications for educational practices and psychological research.

EPSY 5112. Knowing, Learning, and Thinking. (4 cr; A-F only)
Principles of human information processing, memory, and thought; mental operations in comprehension and problem solving; developing expertise and automaticity; emphasis on applied settings.

EPSY 5113. Psychology of Instruction and Technology. (3 cr)
Introduction to adult learning and instructional design. Application of core foundational knowledge to development of effective learning environments for adults. Topics include philosophy, learning theories, instructional models, development and experience, individual differences, evaluation, assessment, and technology.

EPSY 5114. Psychology of Student Learning. (3 cr; A-F only)
Principles of educational psychology: how learning occurs, why it fails, and implications for instruction. Topics include models of learning, development, creativity, problem-solving, intelligence, character education, motivation, diversity, special populations.

EPSY 5115. Psychology of Adult Learning and Instruction. (3 cr)
Survey of adult learning/instruction. Emphasizes instructional design, learning theories, experience, individual differences, evaluation, tests/measurement, technology. Implications for curricular/instructional design in higher education, continuing education, professional/business related training.

EPSY 5117. Problem Solving and Decision Making. (3 cr; A-F only)
Strategies, rules, methods, and other cognitive components involved in problem solving and decision making, implications for educational practices, and applied domains.

EPSY 5118. Language: Psycholinguistic Research and Educational Application. (3 cr; A-F only)
Psychological study of language. Psychological processes involved in language use, mechanisms that guide these processes. Failures of these mechanisms. How language operates.

EPSY 5135. Human Relations Workshop. (4 cr)
Experiential course addressing issues of prejudice and discrimination in terms of history, power, and social perception. Includes knowledge and skills acquisition in cooperative learning, multicultural education, group dynamics, social influence, effective leadership, judgment and decision-making, prejudice reduction, conflict resolution.

EPSY 5141. Aggression in Schools. (3 cr; A-F only. Prereq–5xxx course in [developmental or educational] psychology)
Development of aggression in schools. Aggression defined, compared to cooperative/prosocial behavior. Theories, methods, gender/individual differences.

EPSY 5151. Cooperative Learning. (3 cr)
Participants learn how to use cooperative learning in their setting. Topics include theory and research, teacher's role, essential components that make cooperation work, teaching social skills, assessment procedures, and collegial teaching teams.

EPSY 5152. Psychology of Conflict Resolution. (3 cr)
Overview of the field of conflict resolution. Major theories, research, major figures in the field, factors influencing quality of conflict resolution are covered. The nature of conflict, the history of field, and intrapersonal, interpersonal, intergroup conflict, negotiation, mediation are discussed.

For definitions of course numbers, symbols, and abbreviations, see page 300.

EPSY 5154. Organization Development and Change. (3 cr)
Overview of organizational development and change. Normative models of effective organizations, entry and contracting skills, diagnosis procedures and intervention procedures (data feedback, skills training, continuous improvement, mediation).

EPSY 5155. Group Dynamics and Social Influence. (3 cr)
Overview of the field of group dynamics with emphasis on social influence. Major theories, research, and figures in the field are covered. Group goals, communication, leadership, decision making, problem solving, conflicts, power, uniqueness theory, deindividuation, and minority influence will be covered.

EPSY 5157. Social Psychology of Education. (3 cr; A-F only)
Overview of social psychology and its application to education. Participants study the major theories, research, and major figures in field. Class sessions include lectures, discussions, simulations, role-plays, and experiential exercises.

EPSY 5158. Using Power and Influence to Effect Change. (3 cr. Prereq–3xxx course in social sciences or #)
How people can influence others and avoid manipulation. Factors that shape extent to which influence is successful. Indirect/direct influence processes, minority influence, motivation, behavior management, conformity, followership, group dynamics.

EPSY 5191. Education of the Gifted and Talented. (3 cr; A-F only)
Theories of giftedness, talent development, instructional strategies, diversity and technological issues, implications for educational practices and psychological inquiry, and international considerations.

EPSY 5200. Special Topics: Psychological Foundations. (1-4 cr [max 30 cr])
Focus on special topics in psychological and methodological concepts relevant to advanced educational theory, research, and practice not covered in other courses.

EPSY 5216. Introduction to Research in Educational Psychology and Human Development. (3 cr; A-F only. Prereq–5261 or intro statistics course)
Designing/conducting a research study. Reviewing literature, formulating research problem, using different approaches to gather data, managing/analyzing data, reporting results.

EPSY 5221. Principles of Educational and Psychological Measurement. (4 cr. Prereq–5261 or equiv)
Concepts, principles, and methods in educational/psychological measurement. Reliability, validity, item analysis, scores, score reports (e.g., grades). Modern measurement theories, including item response theory and generalizability theory. Emphasizes construction, interpretation, use, and evaluation of assessments regarding achievement, aptitude, interests, attitudes, personality, and exceptionality.

EPSY 5222. Measurement and Analysis: K-12 Education Accountability. (4 cr. Prereq–5231 or [5221, 5261] or [PSY 3305, PSY 5862] or #)
Methods of educational accountability. Meaning of student/school accountability. Measurement of educational inputs, processes, and results. Data analysis, data use for school improvement.

EPSY 5231. Introductory Statistics and Measurement in Education. (4 cr. §EPSY 3264, EPSY 5261)
Students develop an understanding of basic statistics and measurement concepts and tools and apply them to the collection, analysis, and interpretation of data.

EPSY 5243. Principles and Methods of Evaluation. (3 cr. §EDPA 5501)
Introductory course in program evaluation; planning an evaluation study, collecting and analyzing information, reporting results; overview of the field of program evaluation.

EPSY 5244. Survey Design, Sampling, and Implementation. (3 cr. Prereq–[5221 or 5231 or 5261 or equiv], [CEHD grad student or MEd student])
Survey methods, including mail, phone, and Web-based/e-mail surveys. Principles of measurement, constructing questions/forms, pilot testing, sampling, data analysis, reporting. Students develop a survey proposal and a draft survey, pilot the survey, and develop sampling/data analysis plans.

EPSY 5246. Evaluation Colloquium: Psychological Foundations. (1 cr [max 8 cr]; S-N only. §EDPA 5524. Prereq–5243 or EDPA 5501)
Informal seminar of faculty and advanced students interested in the issues and problems of program evaluation.

EPSY 5247. Qualitative Methods in Educational Psychology. (3 cr. Prereq–Grad student)
Introduction to qualitative methods of inquiry. Contrasting different research traditions (e.g., case study, phenomenology, ethnography, social interactionism, critical theory). Practice with field notes, observations, and interviewing. Use of NVIVO to track/code data.

EPSY 5261. Introductory Statistical Methods. (3 cr. §EPSY 3264, EPSY 5231)
Application of statistical concepts/procedures. Graphs, numerical summaries. Normal distribution, correlation/regression analyses, probability, statistical inferences for one or two samples. Hypothesis tests, Chi-square tests. Conceptual understanding/application of statistics.

EPSY 5262. Intermediate Statistical Methods. (3 cr. Prereq–3264 or 5261 or equiv)
Application of statistical concepts/procedures. Analysis of variance, covariance, multiple regression. Experimental design: completely randomized, block, split plot/repeated measures.

EPSY 5271. Becoming a Teacher of Statistics. (3 cr. Prereq–5261 or equiv)
Current methods of teaching first courses in statistics. Innovative teaching methods, materials, and technological tools. Types of first courses, reform recommendations, goals for student learning, recommended content, teaching methods, technology, student assessment.

EPSY 5272. Statistics Teaching Internship. (3 cr; S-N only. Prereq–Grad student, #)
Supervised teaching experience.

EPSY 5273. Methodology Teaching Internship. (1 cr [max 2 cr]; S-N only. Prereq–Grad student, #)
Supervised teaching experience as part of a course in statistics, measurement, or evaluation.

EPSY 5281. Introduction to Computer Operations and Data Analysis in Education and Related Fields. (3 cr; S-N only)
Introductory computer literacy course to familiarize students with personal computers and computing resources at the University. Applications include electronic communications, spreadsheets, graphical presentation, and data analysis.

EPSY 5300. Special Topics in Educational Psychology. (1-9 cr [max 9 cr])
Current issues in educational psychology or related areas not normally available through regular curriculum offerings.

EPSY 5400. Special Topics in Counseling Psychology. (1-4 cr [max 8 cr])
Theory, research, and practice in counseling and student personnel psychology. Topics vary.

EPSY 5401. Counseling Procedures. (3 cr. Prereq–Upper div student)
Emphasis on the counseling relationship and principles of interviewing. Case studies, role playing, and demonstration. For individuals whose professional work includes counseling and interviewing.

EPSY 5412. Introduction to Developmental Counseling and Guidance. (3 cr. Prereq–#)
Contemporary models of counselors as advocates for all students. Emphasizes prevention and systems intervention with counselors involved in the developmental guidance curriculum, school change, staff and community collaboration, individual student planning, and learning success with diverse populations.

EPSY 5415. Child and Adolescent Development and Counseling. (4 cr; A-F only. Prereq–Grad student or MEd student or K-12 [counseling endorsement or licensure] student)
Development, issues, and needs of children, kindergarten through high school ages. Counseling/developmental theory/strategies, family/social environment. Cultural diversity, legal/ethical issues in counseling children/adolescents.

EPSY 5421. Leadership and Administration of Student AffAIRs. (3 cr. §EDPA 5724)
Theoretical approaches, administrative structure, and evaluation methods used in college/university student affairs.

EPSY 5422. Principles of Group Work: Theory and Procedures. (3 cr. Prereq–Advanced undergrad or grad student in the helping professions)
Principles and practices of group work for educators and the helping professions. Discussion of various types of groups (e.g., counseling support, task, psychoeducational). Applications to various settings and populations (e.g., schools and community agencies).

EPSY 5432. Foundations of Individual/Organizational Career Development. (3 cr)
Introduction to individual and organizational career development theory and practice. Examines critical issues in work patterns, work values, and workplaces in a changing global society, with implications for career planning, development, and transitions, emphasizing personal and organizational change. For nonmajors: serves students in adult ed, HRD, IR, college student advising, and other related fields.

EPSY 5433. Counseling Women Over the Life Span. (3 cr. Prereq–Counseling or career development course)
Counseling skills and interventions to facilitate career development of girls and women of different life stages and backgrounds (school girls to older women); developmental issues from a systematic integrative life planning framework; facts, myths, and trends regarding women's changing roles.

EPSY 5434. Counseling Adults in Transition. (3 cr. Prereq–Advanced undergrad or grad student in the helping professions)
Psychological, physical, and social dimensions of adult transitions (e.g., family and personal relationships, career). Adult development theories, stress and coping, and helping skills and strategies as they relate to adult transition.

EPSY 5451. College Students Today. (3 cr. §EDPA 5704)
Issues involving diverse populations of students in colleges/universities. Student development theory, students' expectations/interests, how college affects student outcomes. Role of curricular/extracurricular activities and of student-faculty interactions.

EPSY 5461. Cross-Cultural Counseling. (3 cr; A-F only)
Effect of cross-cultural/cross-national psychological differences in human traits/characteristics. Framework for development/implementation of counseling interventions.

EPSY 5601. Survey of Special Education. (2 cr)
Introduction to programs and services provided to people with disabilities in school and community settings. Emphasis on the needs of families, to the roles and responsibilities of teachers, and to related service providers.

EPSY 5604. Transition from School to Work and Community Living for Persons with Special Needs. (2 cr)
Design of training programs to promote independent living. Vocational and community adjustment for persons with disabilities and who are at-risk. Curriculum materials, methods, and organizational strategies for adolescents and adults, families, and community service providers.

EPSY 5609. Family-Centered Services. (2 cr; A-F only)
Methods for collaborating with families in the education of children with disabilities. Focus on family-centered approach to design of educational plans and procedures. Specific emphasis on multicultural perspectives of family life and expectations for children.

EPSY 5612. Understanding of Academic Disabilities. (3 cr; A-F only)
Introduction to issues related to the education of students with academic disabilities (learning disabilities, mild mental intellectual disabilities, and emotional/behavioral disabilities) including history, definition, assessment, classification, legislation, and intervention approaches.

EPSY 5613. Foundations of Special Education I. (3 cr; A-F only. Prereq–Child development course, 5601 or equiv)
Emphasis on the organization of educational programs and services for people with disabilities and their families. First course for students seeking to become licensed teachers in special education.

EPSY 5614. Foundations of Special Education II. (3 cr; A-F only. Prereq–5613)
Emphasis on assessment, planning, and implementing educational programs for people with disabilities. Second course for students seeking to become licensed teachers in special education.

EPSY 5615. Advanced Academic Interventions. (3 cr; A-F only. Prereq–5612)
Develop knowledge and skills in designing, implementing, and evaluating Individual Educational Plans (IEPs) for students eligible for special education service in learning disabilities, emotional/behavioral disorders, and mild mental intellectual disabilities.

EPSY 5616. Behavior Analysis and Classroom Management. (3 cr)
Introduction to assumptions, principles, and procedures of behavioral approach to analyzing behavior and programs for classroom management. Emphasis on specifying problems, conducting observations, intervening, and evaluating behavioral change.

EPSY 5621. Functional/Basic Academic Interventions in Mental Retardation. (3 cr; A-F only. Prereq–5613, 5614)
Methods and materials course emphasizing functional approaches to promoting academic learning in students with mild to moderate mental retardation and moderate to severe mental retardation.

EPSY 5622. Programs and Curricula for Learners with Severe Disabilities. (3 cr. Prereq–5616)
Emphasis on developing programs and curricula for students with moderate, severe, and profound developmental delays, as well as severe multihandicapping conditions. Special consideration given to preparing children and youth for integrated community environments.

EPSY 5624. Biomedical and Physical Aspects of Developmental Disabilities. (2 cr [max 3 cr]; A-F only)
Anatomy, physiology, and kinesthiology. Central/peripheral nervous system. Prenatal, perinatal, and postnatal development. Physically disabling conditions. Management/education procedures.

EPSY 5625. Education of Infants, Toddlers, and Preschool Children with Disabilities: Introduction. (2 cr; A-F only)
Overview of the issues, problems, and practical applications in designing early intervention services for young children with disabilities and their families.

EPSY 5626. Seminar: Developmental Disabilities and Instructional Management. (3 cr. Prereq–[5621, 5622] or #)
Data-based strategies for school and nonschool instruction of learners with developmental disabilities including assessment, design, implementation, and evaluation of curriculum and instruction: curriculum content, concept and task analysis, classroom arrangements, natural and instructional cues, corrections, and consequences.

EPSY 5635. Education of Students with Physical and Health Disabilities. (3 cr; A-F only. Prereq–5601 or #)
Introduction to students with physical and health disabilities and their characteristics; the educational implications of physical disabilities; assessment procedures and appropriate educational interventions for learners with physical and health disabilities.

EPSY 5636. Education of Multihandicapped Learners with Sensory ImpAIRments. (2 cr [max 3 cr]. Prereq–5613, 5614)
Characteristics of learners with visual and auditory impairments; design of instructional programs to remediate or circumvent disabilities, including use of prosthetic devices; related areas of performance affected by sensory impairments.

EPSY 5641. Foundations of Education for Individuals Who Are Deaf/Hard of Hearing. (3 cr)
Historical and current issues related to education of individuals who are deaf or hard of hearing. Implications of causes of hearing loss, social and cultural relationships, philosophies of education, characteristics and legislative guidelines and their applicability to education of individuals who are deaf or hard of hearing.

EPSY 5642. Early Childhood Intervention for Infants, Toddlers, and Preschoolers Who Are Deaf/Hard of Hearing. (3 cr. Prereq–Preservice teacher in deaf education licensing program or #)
Early identification/assessment. Family-centered, interdisciplinary servicing. Program development for infants, toddlers, preschoolers who are deaf/hard of hearing. Presentations, discussions, activities.

EPSY 5644. Language Development and Programming for Deaf/Hard of Hearing Children. (3 cr)
Comparative study of the development of functional language in communicatively disabled and nondisabled individuals. Philosophies, programs, and practices focusing on the development of language with deaf and hard of hearing individuals. Models of assessment and instruction for use in educational settings.

EPSY 5646. Reading and Writing Practices with Deaf/Hard of Hearing Children. (3 cr. Prereq–5644 or general educ methods in tchg reading and writing skills, or #)
Gain knowledge and skills to assess, plan, and implement instruction for children and youth with hearing loss. Emphasis is placed on research, theoretical, and programmatic issues in developing reading and writing skills, curricular adaptations, and effective instructional approaches.

EPSY 5647. Aural and Speech Programming for Persons Who Are Deaf/Hard of Hearing. (3 cr)
Study of the speech and hearing mechanisms, causes of hearing loss, and rehabilitation. Emphasis on instructional practices, aural rehabilitation in the educational setting, adaptive technology, and adaptations to optimize functional skills with individuals who are deaf or hard of hearing.

EPSY 5648. Communication Systems for Children with Disabilities. (2 cr)
Applied study of assessment, selection, and application of alternative communication strategies for infants, children, and youth with disabilities. Emphasis on children with hearing loss and additional disabilities.

EPSY 5649. Models of Instructional Programming With Deaf and Hard of Hearing Students. (3 cr. Prereq–[5641, 5644] or #)
Design/development of portfolios for various models of educational service delivery systems for individuals with hearing loss. Emphasizes consultation skills, curriculum management/modifications, material/technology applications, and support service adaptations.

EPSY 5656. Social and Interpersonal Characteristics of Students with Disabilities. (3 cr; A-F only)
Emphasis on children and youth of school age and on the ways in which their emotional, social, and behavioral disorders affect their functioning in school and on ways in which their behaviors disturb others.

EPSY 5657. Interventions for Social and Emotional Disabilities. (3 cr; A-F only. Prereq–5616, 5656)
Developing comprehensive behavioral programs for students with social and emotional disabilities. Instructing students with social and emotional disabilities.

EPSY 5661. Introduction to Autism Spectrum Disorder. (3 cr. Prereq–5616, Autism Spectrum Disorder certificate student)
Knowledge/skills needed to promote learning/success for school age children with Autism Spectrum Disorder. Definition, etiology, and characteristics of ASD. Current research/issues. Emphasizes collaborative problem solving approach that facilitates effective family-professional partnerships and educational programming for this population.

EPSY 5671. Literary Braille. (3 cr; A-F only)
Mastery of literary braille code including all contractions and short-form words used in Grade 2 English Braille: American Usage. Use of specialized braille writing equipment including, braille writer, slate and stylus, and computer programs with six-key input.

EPSY 5672. Advanced Braille Codes. (2 cr; A-F only. Prereq–5671 or #)
Mastery of the Nemeth code for braille mathematics transcription including elementary math computation, algebra, geometry, trigonometry, and symbolic logic notation. Introduction to foreign languages, computer notation, music, and raised line drawing techniques.

EPSY 5674. Techniques of Orientation, Mobility, and Independence for Students with Visual Disabilities. (3 cr; A-F only. Prereq–5675 or #)
Introduction to basic techniques to gain skills in pre-cane techniques, orientation to learning environments, and adaptations for activities of daily living and independence. Introduction to mobility maps, consideration of cane, guide dog, and telescopic aids to mobility.

EPSY 5676. Case Management for Children with Visual Disabilities. (3 cr; A-F only. Prereq–5671, 5673, 5675)
Advanced course evaluating and managing cognitive, psychosocial, physical, and academic needs of students. Consideration of parent, teacher, and student in counseling and educational program management.

EPSY 5681. Education of Infants, Toddlers, and Preschool Children with Disabilities: Methods and Materials. (3 cr; A-F only. Prereq–5625)
Overview of the methods and materials available to maximize the developmental and educational outcomes for young children, birth to age 5, with disabilities and their families in home, community, and school based-settings.

EPSY 5701. Practicum: Field Experience in Special Education. (1-6 cr [max 12 cr]; A-F only. Prereq–[5614, [FOE or SpEd grad or licensure student]] or #)
Observations and supervised support of teaching practice in schools or agencies serving children with disabilities in integrated programs.

EPSY 5702. Practicum in Autism Spectrum Disorder. (3 cr. Prereq–5616, 5661, 5609, one of [5622 or 5644 or SLHS 5606], enrolled in Autism Spectrum Disorder certificate program, #)
Four hundred hours of supervised work in settings where individuals with Autism Spectrum Disorder are served. On-site supervision is provided by qualified professionals. A University supervisor conducts on-site observations. Bi-weekly seminars.

EPSY 5703. Practicum in Applied Behavior Analysis. (3 cr. Prereq–5616, 5657, PSY 4011, Applied Behavior Analysis Certificate student, #)
Four hundred hours of supervised experience in applied behavior analytic intervention with individuals with significant challenging behavior and learning difficulties. On-site supervision is provided by qualified professionals. A University supervisor conducts on-site observations. Bi-weekly seminars.

EPSY 5720. Special Topics: Special Education. (1-4 cr [max 12 cr]. Prereq–#)
Lab and fieldwork approach, often assuming a product orientation, e.g., generation of action plan, creating set of observation field notes, collecting data in some form. Provides opportunities for educational personnel to study specific problems and possibilities related to special education.

EPSY 5740. Special Topics: Interventions and Practices in Educational and Human Service Programs. (1-4 cr [max 8 cr]. Prereq–#)
Concepts, issues, and practices related to the community inclusion of children, youth, and adults with developmental disabilities through weekly seminar and extensive supervised experience working with individuals within the community.

EPSY 5751. Student Teaching: Deaf/Hard of Hearing. (1-6 cr [max 10 cr]. Prereq–#)
Students participate in educational programming for infants, children, and youth who are deaf or hard of hearing, as well as in onsite, directed experiences under the supervision of master teachers of deaf and hard of hearing students.

EPSY 5752. Student Teaching: Learning Disabilities. (1-6 cr [max 10 cr]; S-N only. Prereq–#)
Supervised experience in teaching or related work in schools or other agencies serving children and adolescents with learning disabilities.

EPSY 5753. Student Teaching: Early Childhood Special Education. (1-6 cr [max 8 cr]; S-N only. Prereq–#, completion of all course requirements for license in ECSE)
Supervised experience in teaching or related work in schools, agencies, or home settings with infants, toddlers, and preschoolers with disabilities and their families.

EPSY 5754. Student Teaching: Social and Emotional Disabilities. (1-6 cr [max 8 cr]; A-F only. Prereq–Completion of licensure courses for social and emotional disorders, #)
Teach students with social and emotional disorders at public schools and other appropriate sites. Attend a weekly seminar on student teaching competencies.

EPSY 5755. Student Teaching: Developmental Disabilities, Mild/Moderate. (1-6 cr [max 6 cr]; A-F only. Prereq–Completion of all licensure coursework, #)
Supervised student teaching, or special practicum project, in schools or other agencies serving students at elementary/secondary levels who have mild to moderate developmental disabilities.

EPSY 5756. Student Teaching: Developmental Disabilities, Moderate/Severe. (1-6 cr [max 6 cr]; A-F only. Prereq–Completion of all licensure coursework, #)
Supervised student teaching, or special practicum projects, in schools or other agencies serving students at elementary/secondary levels who have moderate to severe developmental disabilities.

EPSY 5757. Student Teaching: Physical and Health Related Disabilities. (1-6 cr [max 8 cr]; A-F only. Prereq–#)
Supervised student teaching and related work (direct instruction and consultation) in schools or other agencies serving children and adolescents who have physical disabilities.

EPSY 5758. Student Teaching: Visual ImpAIRments. (1-6 cr [max 8 cr]; A-F only. Prereq–#)
Supervised student teaching, or special practicum project, in schools or other agencies serving children and adolescents who have visual impairments.

EPSY 5800. Special Topics in School Psychology. (1-9 cr [max 9 cr])
Current issues in school psychology or areas not normally available through regular curriculum offerings.

EPSY 5801. Assessment and Decision Making in School and Community Settings. (3 cr; A-F only)
Introduction to psychological and educational assessment for individuals who work with children, especially those experiencing academic and behavior problems. Study of standardized group and individual tests of intelligence, achievement, socio-emotional functioning, perception, reading, mathematics, adaptive behavior, and language.

EPSY 5849. Observation and Assessment of the Preschool Child. (3 cr [max 4 cr])
Introduction to assessment principles and practices, including observational assessment methods, for children (birth to 5). Intended primarily for teachers in training and others interested in basic information regarding assessment and its relationship to intervention services for young children.

EPSY 5851. Collaborative Family-School Relationships. (2-3 cr [max 3 cr]. Prereq–Honors senior or grad student)
Theoretical and empirical bases for creating collaborative family-school relationships for students' development and educational success in school. Emphasis on model programs for K-12 and practical strategies for educational personnel to address National Educational goal 8.

EPSY 5852. Prevention and Early Intervention. (3 cr)
Theory/research base for school-based primary/secondary programs to promote academic/social competence of children/youth (birth to grade 12).

EPSY 5871. Interdisciplinary Practice and Interagency Coordination in Education and Human Services. (3 cr)
Principles and procedures of interdisciplinary practice and interagency coordination. Examine the relative strengths of interdisciplinary approaches, develop skills for collaborating with others, and examine different approaches to interagency coordination.

EPSY 5991. Independent Study in Educational Psychology. (1-8 cr [max 20 cr]; A-F only. Prereq–#)
Self-directed study in areas not covered by regular courses. Specific program of study is jointly determined by student and advising faculty member.

Electrical and Computer Engineering (EE)

Department of Electrical and Computer Engineering

Institute of Technology

EE 1. Refresher Course for Electrical Engineers. (0 cr; A-F only. Prereq–[BSEE or BEE], pass EIT exam, four yrs elec eng experience)
Review of electrical engineering fundamentals required to pass the Minnesota Professional Engineering Examination in electrical engineering. Organized review of material ordinarily contained in electrical engineering college curriculum. Emphasizes problem solving with orientation as close possible to type of questions in exam.

EE 301. Introduction to Digital System Design: Discussion. (0 cr; S-N only. Prereq–Concurrent registration in 2301)
Discussion section to go with 2301.

EE 361. Introduction to Microcontrollers: Discussion. (0 cr; S-N only. Prereq–Concurrent registration in 2361)
Discussion section to go with 2361.

EE 1001. Introduction to Electrical and Computer Engineering. (1 cr; S-N only. Prereq–Lower div IT or Δ)
Introduction to engineering in general and to computer engineering in particular. Exploration of techniques and technologies developed by electrical and computer engineers.

EE 1301. Introduction to Computing Systems. (4 cr. Prereq–MATH 1271 or MATH 1371)
Fundamental concepts of computing systems, from machine level to high-level programming. Transistors, logic circuits. Instruction set architecture. Memory, pointer addressing. Binary arithmetic, data representation. Data types/structures. Assembly language, C programming. Control flow, iteration, recursion. Integral lab.

EE 1701W. Energy, Environment, and Society. (3 cr)
Energy supply and demand; generation of electricity; environmental impact of energy usage; energy conservation methods; utility deregulation; role of communication and computers. Demos, computer simulation, teamwork, and projects.

EE 2001. Introduction to Electronic and Electrical Circuits. (3 cr. Prereq–PHYS 1302, ¶is required in Math 2243, 2373, 2573)
Physical principles underlying modeling of circuit elements. Two- and three-terminal resistive elements, Kirchhoff's laws. Independent and dependent sources, opamps. Small signal models for BJT and FET, elementary amplifiers. Simple resistive circuits. Linearity in circuits. First- and second-order circuits. Circuits in sinusoidal steady state.

EE 2002. Introductory Circuits and Electronics Laboratory. (1 cr. Prereq–2001 or ¶2001)
Introductory lab in electronics to accompany 2001. Experiments with simple circuits. Familiarization with basic measurement tools and equipment.

EE 2006. Introductory Circuits Laboratory. (.5 cr)
Meets concurrently with an arranged 2002 section.

EE 2011. Linear Systems and Circuits. (3 cr. Prereq–2001)
Elements of signals and of linear system analysis. Time-domain modeling of linear systems by differential equations. Laplace and Fourier domain modeling/analysis. High frequency models of diodes/transistors. Frequency response of amplifiers. Design of electronic filters. Multistage amplifiers.

EE 2101. Introduction to Electronics I. (1.5 cr. Prereq–Linear circuits)
Diodes, field effect transistors and bipolar junction transistors, small signal transistor models. Amplifier circuits. Covers electronics content of 2001 in half a semester.

EE 2103. Introduction to Electronics II. (1 cr. Prereq–2001 or 2101)
Active and passive analog filters, high frequency diode and transistor models, amplifier frequency response, multistage amplifiers. Covers electronics content of 2011 in half a semester.

EE 2301. Introduction to Digital System Design. (4 cr. Prereq–Math [1272 or 1372 or 1572], concurrent registration in 0301)
Boolean algebra, logic gates, combinational logic, logic simplification, sequential logic, design of synchronous sequential logic, VHDL modeling, design of logic circuits. Integral lab.

EE 2361. Introduction to Microcontrollers. (4 cr. Prereq–[1301 or CSCI 1113 or [2301, CSCI 1901]], ¶0361)
Computer organization, assembly language programming, arithmetic/logical operations, parallel/serial input/output. Exception handling, interrupts, using special-purpose features such as A/D converters, fuzzy logic, DSP operations. Integral lab.

EE 3005. Fundamentals of Electrical Engineering. (4 cr. Prereq–Math 2243, PHYS 1302; not for EE majors)
Fundamentals of analog electronics, digital electronics, and power systems. Circuit analysis, electronic devices and applications, digital circuits, microprocessor systems, operational amplifiers, transistor amplifiers, frequency response, magnetically coupled circuits, transformers, steady state power analysis.

EE 3006. Fundamentals of Electrical Engineering Laboratory. (1 cr. Prereq–Concurrent enrollment in 3005 is allowed but not required)
Lab to accompany 3005.

EE 3015. Signals and Systems. (3 cr. Prereq–[2011, IT] or Δ)
Basic techniques for analysis/design of signal processing, communications, and control systems. Time/frequency models, Fourier-domain representations, modulation. Discrete-time/digital signal/system analysis. Z transform. State models, stability, feedback.

EE 3025. Statistical Methods in Electrical and Computer Engineering. (3 cr. Prereq–[3015, IT] or instr approval)
Notions of probability. Elementary statistical data analysis. Random variables, densities, expectation, correlation. Random processes, linear system response to random waveforms. Spectral analysis. Computer experiments for analysis and design in random environment.

EE 3101. Circuits and Electronics Laboratory I. (2 cr. Prereq–[2002, [3115 or ¶3115], IT] or Δ)
Experiments in circuits/electronics.

EE 3102. Circuits and Electronics Laboratory II. (2 cr. Prereq–[3101 or IT or Δ], attendance first day of class)
Experiments in circuits/electronics. Team design project.

EE 3105. Circuits Electronics Transition Laboratory. (.75 cr; A-F only. Prereq–3015)
Together with 3400, completes the 3101 requirement.

EE 3115. Analog and Digital Electronics. (4 cr. Prereq–[3015 or ¶3015, IT] or Δ)
Feedback amplifiers. Stability and compensation. Oscillators. Internal structure of operational amplifiers. Switching active devices. BJT and FET logic gates. Sequential circuits. Designing complex digital circuits.

EE 3161. Semiconductor Devices. (3 cr. Prereq–Upper div IT, 2011, PHYS 1302, PHYS 2303 or CHEM 1022)
Elementary semiconductor physics; physical description of pn junction diodes, bipolar junction transistors, field-effect transistors.

EE 3601. Transmission Lines, Fields, and Waves. (3 cr. Prereq–[2011, [Math 2243 or Math 2373 or Math 2573], [PHYS 1302 or PHYS 1402], IT] or Δ)
Properties of transmission lines, electrostatics, magnetostatics, and electromagnetic waves in unbounded space. Guides, cavities, radiation theory, antennas.

EE 3940. Special Topics in Electrical and Computer Engineering. (1-4 cr [max 8 cr]. Prereq–#)
Topics that are not available in regular courses. Topics vary.

EE 3961. Industrial Assignment I. (1 cr; S-N only. Prereq–Admission to ECE co-op)
Industrial work assignment in Electrical and Computer Engineering co-op program. Grade based on student's written report of semester's assignment, but deferred until completion of 4961.

EE 3990. Curricular Practical Training. (1-3 cr [max 3 cr] Prereq–#, undergrad EE or CompE major)
Industrial work assignment involving advanced electrical engineering technology. Reviewed by faculty member. Final report covering work assignment

EE 4111. Advanced Analog Electronics Design. (4 cr. Prereq–3015, 3115)
Basic integrated circuit building blocks of differential amplifiers, high bandwidth, instrumentation amplifiers. Current/voltage references. Feedback, stability, and noise in electronic circuits. Integral lab.

EE 4231. Linear Control Systems: Designed by Input/Output Methods. (3 cr. Prereq–[3015, [upper div IT or grad student in IT major]] or #; no [EE or CompE] grad cr)
Modeling, characteristics, and performance of feedback control systems. Stability, root locus, and frequency response methods. Digital implementation, hardware considerations.

EE 4233. State Space Control System Design. (3 cr. Prereq–[3015, upper div IT] or #; no EE or CompE grad cr)
State space models, performance evaluation, numerical issues for feedback control. Stability, state estimation, quadratic performance. Implementation, computational issues.

EE 4235. Linear Control Systems Laboratory. (1 cr. Prereq–4231 or ¶4231; no EE or CompE grad cr)
Lab to accompany 4231.

EE 4237. State Space Control Laboratory. (1 cr. Prereq–4233 or ¶4233; no cr for [EE or CompE] grad students)
Lab to accompany 4233.

EE 4301. Digital Design With Programmable Logic. (4 cr. Prereq–2301, CSCI 1113 or CSCI 1901)
Introduction to system design and simulation. Design using VHDL code and synthesis. Emulation using VHDL code.

EE 4341. Microprocessor and Microcontroller System Design. (4 cr. Prereq–2301, 2361, upper div IT; no EE or CompE grad cr)
Microprocessor interfacing. Memory design. Exception handling/interrupts. Parallel/serial input/output. Bus arbitration control. Multiprocessor systems. Direct memory access (DMA). Designing dynamic RAM memory systems. Special DRAM modes. Interleaved memory. Advanced bus structures. Integral lab.

EE 4363. Computer Architecture and Machine Organization. (4 cr. §CSCI 4203, EE 5361. Prereq–2361)
Introduction to computer architecture. Aspects of computer systems, such as pipelining, memory hierarchy, and input/output systems. Performance metrics. Examines each component of a complicated computer system.

EE 4501. Communications Systems. (3 cr. Prereq–3025; no EE or CompE grad cr)
Systems for transmission/reception of digital/analog information. Characteristics/design of wired/wireless communication systems. Baseband, digital, and carrier-based techniques. Modulation. Coding. Electronic noise and its effects on design/performance.

EE 4505. Communications Systems Laboratory. (1 cr [max 3 cr]. Prereq–4501 or ¶4501; no EE or CompE grad cr)
Experiments in analysis/design of wired/wireless communication systems. Lab to accompany 4501.

EE 4541. Digital Signal Processing. (3 cr. Prereq–[3015, 3025] or #)
Review of linear discrete time systems and sampled/digital signals. Fourier analysis, discrete/fast Fourier transforms. Interpolation/decimation. Design of analog, infinite-impulse response, and finite impulse response filters. Quantization effects.

EE 4609. Digital Signal Integrity. (3 cr. §EE 5609. Prereq–2011, PHYS 1301, 1302, [sr EE or CompE major])
Introduction to high speed interconnect design. Transmission line theory, coupled line theory, elements of microwave circuit theory, parasitic calculations/measurement, techniques for good interconnect design.

EE 4701. Electric Drives. (3 cr [max 4 cr]. Prereq–3015)
AC/DC electric-machine drives for speed/position control. Integrated discussion of electric machines, power electronics, and control systems. Computer simulations. Applications in electric transportation, robotics, process control, and energy conservation.

EE 4703. Electric Drives Laboratory. (1 cr. Prereq–4701 or ¶4701)
Laboratory to accompany 4701. Simulink-based simulations of electric machines/drives in applications such as energy conservation and motion control in robotics.

EE 4721. Introduction to Power System Analysis. (3 cr. Prereq–2011)
AC power systems. Large power system networks. Mathematics and techniques of power flow analysis, short circuit analysis, and transient stability analysis. Use of a power system simulation program for design. Integral lab.

EE 4722. Power System Analysis Laboratory. (1 cr. Prereq–4721 or ¶4721)
Lab analysis of AC power systems, power system networks, power flow, short circuit, transient stability.

EE 4724. Power System Planning and Operation. (3 cr. Prereq–4721)
Engineering considerations of economics, expansion, and reliability of power systems. Costs/scheduling of generation sources. Planning for system reliability. Operation of power systems to maintain reliability.

EE 4741. Power Electronics. (3 cr [max 4 cr]. Prereq–3015, 3115)
Switch-mode power electronics. Switch-mode DC power supplies. Switch-mode converters for DC and AC motor drives, wind/photovoltaic inverters, interfacing power electronics equipment with utility system. Power semiconductor devices, magnetic design, electro-magnetic interference (EMI).

EE 4743. Switch-Mode Power Electronics Laboratory. (2 cr. Prereq–4741 or ¶4741)
Laboratory to accompany 4741. PSpice-/Simulink-based simulations of converters, topologies, and control in switch-mode dc power supplies, motor drives for motion control, and inverters for interfacing renewable energy sources to utility grid.

EE 4940. Special Topics in Electrical and Computer Engineering. (1-4 cr [max 8 cr]. Prereq–IT or #)
Topics that are not available in regular courses. Topics vary.

EE 4951W. Senior Design Project. (2 cr. Prereq–3015, 3115, 3102, 3601, attendance first day of class)
Team participation in formulating/solving open-ended design problems. Oral/written presentations.

EE 4961. Industrial Assignment II. (2 cr; S-N only. Prereq–3961, ECE co-op; no grad cr)
Industrial work assignment in ECE co-op program. Grade based on student's formal written report covering semester's work.

EE 4962. Industrial Assignment III. (1 cr; S-N only. Prereq–4961, EE co-op, Δ; no grad cr)
Industrial work assignment in ECE co-op program. Formal written report covering semester's work.

EE 4970. Directed Study. (1-3 cr [max 3 cr]. Prereq–Cr ar [may be repeated for cr]; Δ)
Studies of approved projects, either theoretical or experimental.

EE 4981H. Senior Honors Project I. (2 cr. Prereq–ECE honors, sr, #)
Experience in research/design for electrical/computer engineering. Oral/written reports.

EE 4982V. Senior Honors Project II. (2 cr. Prereq–4981)
Experience in research/design for electrical/computer engineering. Oral/written reports.

EE 5121. Transistor Device Modeling for Circuit Simulation. (3 cr. Prereq–[3115, 3161, IT grad student] or Δ)
Basics of MOS, bipolar theory. Evolution of popular device models from early SPICE models to current industry standards.

EE 5141. Introduction to Microsystem Technology. (4 cr. Prereq–[3161, 3601, IT grad student] or Δ)
Microelectromechanical systems composed of microsensors, microactuators, and electronics integrated onto common substrate. Design, fabrication, and operation principles. Labs on micromachining, photolithography, etching, thin film deposition, metallization, packaging, and device characterization.

EE 5163. Semiconductor Properties and Devices I. (3 cr. Prereq–[3161, 3601, IT grad student] or Δ)
Principles/properties of semiconductor devices. Selected topics in semiconductor materials, statistics, and transport. Aspects of transport in p-n junctions, heterojunctions.

EE 5164. Semiconductor Properties and Devices II. (3 cr. Prereq–[5163, IT grad student] or Δ)
Principles/properties of semiconductor devices. Charge control in different FETs, transport, modeling. Bipolar transistor models (Ebers-Moll, Gummel-Poon), heterostructure bipolar transistors. Special devices.

EE 5171. Microelectronic Fabrication. (4 cr. Prereq–IT grad student or Δ)
Fabrication of microelectronic devices. Silicon integrated circuits, GaAs devices. Lithography, oxidation, diffusion. Process integration of various technologies, including CMOS, double poly bipolar, and GaAs MESFET.

EE 5173. Basic Microelectronics Laboratory. (1 cr. Prereq–[[5171 or ¶5171], IT grad student] or Δ)
Students fabricate a polysilicon gate, single-layer metal, NMOS chip, performing 80 percent of processing, including photolithography, diffusion, oxidation, and etching. In-process measurement results are compared with final electrical test results. Simple circuits are used to estimate technology performance.

EE 5231. Linear Systems and Optimal Control. (3 cr. Prereq–[3015, IT grad student] or #)
Properties and modeling of linear systems. Linear quadratic and linear-quadratic-Gaussian regulators. Maximum principle.

EE 5235. Robust Control System Design. (3 cr. Prereq–IT grad, 3015, 5231 or #)
Development of control system design ideas; frequency response techniques in design of single-input/single-output (and MI/MO) systems. Robust control concepts. CAD tools.

EE 5239. Introduction to Nonlinear Optimization. (3 cr. Prereq–[3025, Math 2373, Math 2374, IT grad student] or Δ)
Nonlinear optimization. Analytical/computational methods. Constrained optimization methods. Convex analysis, Lagrangian relaxation, non-differentiable optimization, applications in integer programming. Optimality conditions, Lagrange multiplier theory, duality theory. Control, communications, management science applications.

EE 5301. VLSI Design Automation I. (3 cr. Prereq–[2301, IT grad student] or Δ)
Basic graph/numerical algorithms. Algorithms for logic/high-level synthesis. Simulation algorithms at logic/circuit level. Physical-design algorithms.

EE 5302. VLSI Design Automation II. (3 cr. Prereq–[5301, IT grad student] or Δ)
Basic algorithms, computational complexity. High-level synthesis. Test generation. Power estimation. Timing optimization. Current topics.

EE 5323. VLSI Design I. (3 cr. Prereq–[2301, 3115, IT grad student] or Δ)
Combinational static CMOS circuits. Transmission gate networks. Clocking strategies, sequential circuits. CMOS process flows, design rules, structured layout techniques. Dynamic circuits, including Domino CMOS and DCVS. Performance analysis, design optimization, device sizing.

EE 5324. VLSI Design II. (3 cr. Prereq–[5323, IT grad student] or Δ)
CMOS arithmetic logic units, high-speed carry chains, fast CMOS multipliers. High-speed performance parallel shifters. CMOS memory cells, array structures, read/write circuits. Design for testability, including scan design and built-in self test. VLSI case studies.

EE 5327. VLSI Design Laboratory. (3 cr. Prereq–[4301, [5323 or ¶5323], IT grad student] or Δ)
Complete design of an integrated circuit. Designs evaluated by computer simulation.

EE 5329. VLSI Digital Signal Processing Systems. (3 cr. Prereq–[[5323 or ¶5323], IT grad student] or Δ)
Programmable architectures for signal/media processing. Data-flow representation. Architecture transformations. Low-power design. Architectures for two's complement/redundant representation, carry-save, and canonic signed digit. Scheduling/allocation for high-level synthesis.

EE 5333. Analog Integrated Circuit Design. (3 cr. Prereq–[3115, IT grad student] or Δ)
Fundamental circuits for analog signal processing. Design issues associated with MOS/BJT devices. Design/testing of circuits. Selected topics (e.g., modeling of basic IC components, design of operational amplifier or comparator or analog sampled-data circuit filter).

EE 5364. Advanced Computer Architecture. (3 cr. Prereq–[[4363 or CSCI 4203], IT grad student] or Δ)
Instruction set architecture, processor microarchitecture. Memory and I/O systems. Interactions between computer software and hardware. Methodologies of computer design.

EE 5371. Computer Systems Performance Measurement and Evaluation. (3 cr. §EE 5863. Prereq–[[4364 or 5361 or CSCI 4203 or 5201], IT grad student] or Δ)
Tools/techniques for analyzing computer hardware, software, and system performance. Benchmark programs, measurement tools, performance metrics. Deterministic/probabilistic simulation techniques, random number generation/testing. Bottleneck analysis.

EE 5381. Telecommunications Networks. (3 cr. Prereq–[4501, 5531, IT grad student] or Δ)
Fundamental concepts of modern telecommunications networks, mathematical tools required for their performance analysis. Layered network architecture, point-to-point protocols/links, delay models, multiaccess communication/routing.

EE 5391. Computing With Neural Networks. (3 cr. Prereq–[[3025 or STAT 3091], IT grad student] or Δ)
Neural networks as a computational model. Connections to AI, statistics and model-based computation. Associative memory and matrix computation; Hopfield networks. Supervised networks for classification and prediction. Unsupervised networks for data reduction. Associative recognition/retrieval, optimization, time series prediction, knowledge extraction.

EE 5501. Digital Communication. (3 cr. Prereq–[3025, 4501, IT grad student] or Δ)
Theory/techniques of modern digital communications. Communication limits. Modulation/detection. Data transmission over channels with intersymbol interference. Optimal/suboptimal sequence detection. Equalization. Error correction coding. Trellis-coded modulation. Multiple access.

EE 5505. Wireless Communication. (3 cr. Prereq–[4501, IT grad student] or Δ; 5501 recommended)
Introduction to wireless communication systems. Propagation modeling, digital communication over fading channels, diversity and spread spectrum techniques, radio mobile cellular systems design, performance evaluation. Current European, North American, and Japanese wireless networks.

EE 5531. Probability and Stochastic Processes. (3 cr. Prereq–[3025, IT grad student] or Δ)
Probability, random variables and random processes. System response to random inputs. Gaussian, Markov and other processes for modeling and engineering applications. Correlation and spectral analysis. Estimation principles. Examples from digital communications and computernetworks.

EE 5542. Adaptive Digital Signal Processing. (3 cr. Prereq–[4541, 5531, IT grad student] or Δ)
Design, application, and implementation of optimum/adaptive discrete-time FIR/IIR filters. Wiener, Kalman, and Least-Squares. Linear prediction. Lattice structure. LMS, RLS, and Levinson-Durbin algorithms. Channel equalization, system identification, biomedical/sensor array processing, spectrum estimation. Noise cancellation applications.

EE 5545. Digital Signal Processing Design. (3 cr. Prereq–[4541, IT grad student] or Δ)
Real-time implementation of digital signal processing (DSP) algorithms, including filtering, sample-rate conversion, and FFT-based spectral analysis. Implementation on a modern DSP Platform. Processor architecture. Arithmetic operations. Real-time processing issues. Processor limitations. Integral laboratory.

EE 5549. Digital Signal Processing Structures for VLSI. (3 cr. Prereq–[4541, IT grad student] or Δ)
Pipelining. Parallel processing. Fast convolution. FIR, rank-order, IIR, lattice, adaptive digital filters. Scaling and roundoff noise. DCT. Viterbi coders. Lossless coders, video compression.

EE 5551. Multiscale and Multirate Signal Processing. (3 cr. Prereq–[4541, 5531, IT grad student] or Δ)
Multirate discrete-time systems. Bases, frames. Continuous wavelet transform. Scaling equations. Discrete wavelet transform. Applications in signal/image processing.

EE 5561. Image Processing and Applications. (3 cr. Prereq–[4541, 5581, IT grad student] or #)
Two-dimensional digital filtering/transforms. Application to image enhancement, restoration, compression, and segmentation.

EE 5581. Information Theory and Coding. (3 cr. Prereq–[5531, IT grad student] or Δ)
Source/channel models, codes for sources/channels. Entropy, mutual information, capacity, rate-distortion functions. Coding theorems.

EE 5583. Error Control Coding. (3 cr. Prereq–[[3025, Math 2373] or equiv], [IT grad student or Δ])
Error-correcting codes. Concepts, properties, polynomial representation. BCH, Golay, Reed-Muller/Reed-Solomon codes. Convolutional codes. Iterative codes.

EE 5585. Data Compression. (3 cr. Prereq–IT grad student or Δ)
Source coding in digital communications and recording. Codes for lossless compression. Universal lossless codes. Lossless image compression. Scalar and vector quantizer design. Loss source coding theory. Differential coding, trellis codes, transform/subband coding. Analysis/synthesis schemes.

EE 5601. Introduction to RF/Microwave Engineering. (3 cr. Prereq–[3601, IT grad student] or Δ)
Fundamentals of EM theory and transmission lines concepts. Transmission lines and network analysis. CAD tool. Lumped circuit component designs. Passive circuit components. Connectivity to central communication theme.

EE 5602. RF/Microwave Circuit Design. (3 cr. Prereq–[5601 or equiv], [IT grad student or #])
Transmission lines, network analysis concepts. CAD tools for passive/active designs. Diode based circuit designs (detectors, frequency multipliers, mixers). Transistor based circuit design (amplifiers, oscillators, mixer/doubler).

EE 5607. Wireless Hardware System Design. (3 cr. Prereq–[3015, 3115, 3601, IT grad student] or Δ)
Review of random processes, noise, modulation, and error probabilities. Basis antenna operation, power transfer between antennas, rf propagation phenomena, transmitters/receivers, transmission lines, effect of antenna performance on system performance, rf/microwave device technologies, small-signal amplifiers, mixers, power amplifiers, rf oscillators.

EE 5609. Digital Signal Integrity. (3 cr. §EE 4609. Prereq–[2011, PHYS 1301, PHYS 1302, IT grad student] or Δ)
Introduction to high speed interconnect design. Transmission line theory, coupled line theory, elements of microwave circuit theory, parasitic calculations/measurement, techniques for good interconnect design. Term paper.

EE 5611. Plasma-Aided Manufacturing. (4 cr; A-F only. §ME 5361. Prereq–[[[ME 3321, ME 3322] or equiv], [upper div IT or grad student]] or Δ)
Manufacturing using plasma processes. Plasma properties as a processing medium. Plasma spraying, welding and microelectronics processing. Process control and system design; industrial speakers. Cross-disciplinary experience between heat transfer design issues and manufacturing technology.

EE 5613. RF/Microwave Circuit Design Laboratory. (2 cr. Prereq–[[5601 or ¶5601], IT grad student] or Δ)
Scattering parameters, planar lumped circuits, transmission lines, RF/microwave substrate materials, matching networks/tuning elements, resonators, filters, combiners/dividers, couplers. Integral lab.

EE 5616. Antenna Theory and Design. (3 cr. Prereq–[[5601 or ¶5601], IT grad student] or Δ)
Antenna performance parameters, vector potential/radiation integral, wire antenna structures, broadband antenna structures, microstrips/aperture theory, antenna measurements.

EE 5621. Physical Optics. (3 cr. Prereq–[3015, IT grad student] or Δ)
Physical optics principles, including Fourier analysis of optical systems/images, scalar diffraction theory, interferometry, and coherence theory. Diffractive optical elements, holography, astronomical imaging, optical information processing, microoptics.

EE 5622. Physical Optics Laboratory. (1 cr. Prereq–[[5621 or ¶5621], IT grad student] or Δ)
Fundamental optical techniques. Diffraction and optical pattern recognition. Spatial/temporal coherence. Interferometry. Speckle. Coherent/incoherent imaging. Coherent image processing. Fiber Optics.

EE 5624. Optical Electronics. (4 cr. Prereq–[[3601 or PHYS 3002], IT grad student] or Δ)
Fundamentals of lasers, including propagation of Gaussian beams, optical resonators, and theory of laser oscillation. Polarization optics, electro-optic, acousto-optic modulation, nonlinear optics, phase conjugation.

EE 5627. Optical Fiber Communication. (3 cr. Prereq–[3015, 3601, IT grad student] or Δ)
Components/systems aspects of optical fiber communication. Modes of optical fibers. Signal degradation/dispersion. Optical sources/detectors. Digital/analog transmissions systems. Direct/coherent detection. Optical amplifiers. Optical soliton propagation.

EE 5628. Fiber Optics Laboratory. (1 cr. Prereq–[[5627 or ¶5627], IT grad student] or #)
Experiments in fiber optics. Dielectric waveguides, modes in optical fibers, fiber dispersion/attenuation, properties of light sources/detectors, optical communication systems.

EE 5629. Optical System Design. (2 cr. Prereq–IT grad student or Δ)
Elementary or paraxial optics. Non-paraxial, exact ray tracing. Energy considerations in instrument design. Fourier optics and image quality. Design examples: telescopes, microscopes, diffraction-limited lenses, projectors, scientific instruments.

EE 5653. Physical Principles of Magnetic Materials. (3 cr. Prereq–IT grad student or Δ)
Physics of diamagnetism, paramagnetism, ferromagnetism, antiferromagnetism, ferrimagnetism. Ferromagnetic phenomena. Static/dynamic theory of micromagnetics, magneto-optics, and magnetization dynamics. Magnetic material applications.

EE 5655. Magnetic Recording. (3 cr. Prereq–IT grad student or Δ)
Magnetic fundamentals, recording materials, idealized models of magnetic records/reproduction, analytic models of magnetic record heads, sinusoidal magnetic recording, digital magnetic recording, magnetic recording heads/media, digital recording systems.

EE 5657W. Physical Principles of Thin Film Technology. (4 cr. Prereq–IT grad student or #)
Physical principles of deposition, characterization, and processing of thin film materials. Materials science, vacuum science, and technology. Physical vapor deposition techniques. Properties of thin films and metallurgical/protective coatings. Modification of surface films. Emerging thin film materials/applications. Lab. Demonstration experiments.

EE 5705. Advanced Electric Drives. (3 cr. Prereq–[4701, IT grad student] or Δ)
D-q axis analysis of salient-pole synchronous motor drives. Vector-controlled induction motor drives, sensor-less drives, voltage space-vector modulation techniques, current-source inverter drives, reluctance drives. Power quality issues. Integrated software lab.

EE 5721. Power Generation Operation and Control. (3 cr. Prereq–[4721, IT grad student] or Δ)
Engineering aspects of power system operation. Economic analysis of generation plants & scheduling to minimize total cost of operation. Scheduling of hydro resources and thermal plants with limited fuel supplies. Loss analysis, secure operation. State estimation, optimal power flow. Power system organizations.

EE 5725. Power Systems Engineering. (3 cr. Prereq–[4721, IT grad student] or Δ)
Reliability analysis of large power generation/transmission systems. Writing programs for state-by-state analysis and Monte Carlo analysis. Power system protection systems, circuit current calculations, short circuit detection, isolating faulted components. Characteristics of protection components.

EE 5741. Advanced Power Electronics. (3 cr. Prereq–IT grad student] or Δ)
Physics of solid-state power devices, passive components, magnetic optimization, advanced topologies. Unity power factor correction circuits, EMI issues, snubbers, soft switching in dc/ac converters. Practical considerations. Very low voltage output converters. Integrated computer simulations.

EE 5811. Biomedical Instrumentation. (3 cr. Prereq–IT grad student or life-science grad student or Δ)
Biological signal sources. Electrodes, microelectrodes, other transducers. Characteristics of amplifiers. Noise in biological signals. Filtering, recording, display. Protection of patients from electrical hazards. Experiments in neural/muscle stimulation, EKG/EMG recording, neuron simulation, filtering, and low-noise amplifiers.

EE 5821. Biological System Modeling and Analysis. (3 cr. Prereq–IT grad student or life science grad student or Δ)
Purpose of biological system modeling. Advantages, limitations, special problems. Models of nerve excitation and propagation. Biological control systems. Respiratory/cardiovascular systems. Sensory organs, theories of perception. Limbs/locomotion.

EE 5863. Computer Systems Performance Analysis. (2 cr. §EE 5371. Prereq–[[4363 or 5361], IT grad student] or Δ)
Basic performance measurement/simulation techniques necessary for experimental computer science/engineering. Hands-on performance evaluation techniques using simulations/measurements of existing systems. Using measured data to compare computer systems or to judge how much a new architectural feature improves systems performance.

EE 5940. Special Topics in Electrical Engineering I. (1-4 cr [max 12 cr])
Special topics in electrical and computer engineering. Topics vary.

EE 5950. Special Topics in Electrical Engineering II. (1-4 cr [max 12 cr])
Special topics in electrical and computer engineering. Topics vary.

EE 5960. Special Topics in Electrical Engineering III. (1-4 cr [max 12 cr])
Special topics in electrical and computer engineering. Topics vary.

EE 5990. Curricular Practical Training. (1-2 cr [max 6 cr]; S-N only. Prereq–#)
Industrial work assignment involving advanced electrical engineering technology. Review by faculty member. Final report covering work assignment.

Emergency Health Services (EHS)

College of Continuing Education

EHS 2999. Certification Credit. (1-40 cr [max 40 cr]; A-F only)
Evaluation of credits earned for certification

EHS 3112. First Responder for Coaches and Athletic Trainers. (3 cr; A-F only)
Critical thinking skills in emergency settings. Patient assessment, airway management, CPR, splinting, spinal immobilization. Certifications: AHA-BLS, First Responder.

EHS 3312. Emergency Medical Technician. (6 cr; A-F only)
Foundation for basic life support treatment of medical/trauma patients. Patient assessment, airway management, AHA BLS, mass casualty/bio-terrorism response, critical thinking, decision making. Meets USDOT standards for Emergency Medical Technician (EMT).

EHS 3999. Special Exam. (1-15 cr [max 15 cr])

EHS 4011. Concepts of Emergency Health Service. (3 cr; A-F only)
Emergency medical system (EMS). Its impact on all aspects of U.S. culture. Basic practices generalized across systems. Comprehensive review of components required for effective EMS. Historical perspective, medical-legal concerns, medical oversight, accountability, scope of practice, communications/transportation, rural vs. urban issues, disaster management.

EHS 4021. EMS Planning and Fiscal Management. (3 cr; A-F only)
Fundamentals of planning, fiscal, and process management as related to emergency medical systems (EMS). Regulatory requirements, EMS delivery models, contract negotiations, budgeting, scenario planning.

EHS 4999. Practicum. (1-3 cr [max 9 cr]; A-F only. Prereq–EHS)
Project in student's employing organization or project in organization providing internship or integration of projects from previous coursework or development of program-related project.

EHS 5031. Basic Principles of Research in Emergency Health Services. (3 cr; A-F only)
Basic principles of research in emergency health services.

English as a Second Language (ESL)

Department of Linguistics, ESL, and Slavic Languages and Literatures

College of Liberal Arts

ESL 10. TOEFL Preparation. (0 cr [max 8 cr]; S-N only. Prereq–Nonnative English speaker; see Minnesota English Center for override)
Describes the format of the TOEFL test. Focuses on strategies for improving skills for each section of the test.

ESL 20. Pronunciation Workshop. (0 cr [max 8 cr]; S-N only. Prereq–Nonnative English speaker; see Minnesota English Center for override)
Individual attention to specific areas of spoken language, including intonation, rhythm, segmentals.

ESL 40. Skills Enhancement. (0 cr [max 8 cr]; S-N only. Prereq–Nonnative English speaker; see Minnesota English Center for override)
Student will focus on specific areas of their English which need improvement.

ESL 80. English Through Literature. (0 cr [max 8 cr]; S-N only. Prereq–Nonnative English speaker; see Minnesota English Center for override)
An advanced course designed for students who want further practice in reading, listening, speaking and writing for non-academic purposes.

ESL 90. English Through Music. (0 cr [max 8 cr]; S-N only. Prereq–Nonnative English speaker; see Minnesota English Center for override)
Student will learn English vocabulary and culture through folksongs and by looking at popular music in various decades.

ESL 100. Topics in American Culture. (0 cr [max 6 cr]; S-N only. Prereq–Nonnative English speaker; see Minnesota English Center for override)
Students will learn about areas of U.S. culture such as American humor, religions, ethnic groups, lifestyles, and popular culture.

ESL 111. Beginning Grammar. (0 cr [max 8 cr]; S-N only. Prereq–Nonnative English speaker; see Minnesota English Center for override)
Introduces and reviews grammatical structures with attention to meaning, use, and form.

ESL 121. Beginning Reading/Composition. (0 cr [max 16 cr]; S-N only. Prereq–Nonnative English speaker; see Minnesota English Center for override)
Reading short passages of limited difficulty. Emphasizes main ideas, vocabulary, reading speed, skimming and scanning. Writing fundamentals, spelling, punctuation, paragraphing, and basic organization. Writing exercises and free writing.

ESL 131. Beginning Oral Skills. (0 cr [max 16 cr]; S-N only. Prereq–Nonnative English speaker; see Minnesota English Center for override)
Focuses on the ability to communicate in English in everyday situations. Listening and speaking are emphasized.

ESL 181. Beginning Integrated English. (0 cr [max 18 cr]; S-N only. Prereq–Nonnative English Speaker, Δ; see Minnesota English Center for override)
Reading, writing, speaking, listening, grammar.

ESL 191. English Skills Enhancement. (0 cr [max 16 cr]; S-N only. Prereq–Nonnative English speaker; see Minnesota English Center for override)
Improving basic English language skills through work in computer/language lab. Focused activities for individual learners.

ESL 193. Pronunciation. (0 cr [max 8 cr]; S-N only. Prereq–Nonnative English speaker; see Minnesota English Center for override)
Addresses important aspects of English pronunciation necessary to improve comprehensibility and reduce foreign-accents. Includes work on enunciation; word, phrasal, and sentence stress; intonation; linking; thought groups; and rhythm.

ESL 200. Understanding American Universities. (0 cr [max 2 cr]; S-N only. Prereq–Nonnative English speaker; see Minnesota English Center for override)
Strategies for success in academic classes including vocabulary development, lecture comprehension, and textbook reading; application of listening skills and the reading of supporting unadapted material.

ESL 211. High Beginning Grammar. (0 cr [max 8 cr]; S-N only. Prereq–Nonnative English speaker; see Minnesota English Center for override)
Reviews and adds to students' skills with basic structures. Focuses on increasingly complex structures with attention to form, meaning, and use; practice of structures in controlled speaking and writing activities.

ESL 221. High Beginning Reading/Composition. (0 cr [max 16 cr]; S-N only. Prereq–Nonnative English speaker; see Minnesota English Center for override)
Reading longer passages of limited difficulty with increased speed. Main ideas, vocabulary development, reading speed, skimming and scanning. Writing fundamentals, spelling, punctuation, paragraphing, and organization. Writing exercises and free writing.

ESL 231. High Beginning Oral Skills. (0 cr [max 16 cr]; S-N only. Prereq–Nonnative English speaker; see Minnesota English Center for override)
Ability to communicate in English in everyday situations. Emphasis on listening and speaking, and increasing vocabulary and fluency in spoken English.

ESL 300. Computer Lab: Intro to Computer Basics. (0 cr [max 8 cr]; S-N only. Prereq–Nonnative English speaker; see Minnesota English Center for override)
Students will learn basic word processing.

ESL 310. Computer Lab: Using the Internet for Language Learning. (0 cr [max 8 cr]; S-N only. Prereq–Nonnative English speaker; see Minnesota English Center for override)
Students will complete projects on email and the internet.

ESL 311. Low Intermediate Grammar. (0 cr [max 8 cr]; S-N only. Prereq–Nonnative English speaker; see Minnesota English Center for override)
Reviews and adds to students' skills with basic structures. Emphasizes increasingly complex structures with attention to form, meaning, and use; practice of structures used in controlled speaking and writing situations.

ESL 321. Low Intermediate Reading/Composition. (0 cr [max 16 cr]; S-N only. Prereq–Nonnative English speaker; see Minnesota English Center for override)
Reading for main ideas and supporting ideas with increased speed; vocabulary development, word formation, and use of dictionary; spelling, punctuation and paragraphing. Organization and writing as a process.

ESL 331. Low Intermediate Oral Skills. (0 cr [max 16 cr]; S-N only. Prereq–Nonnative English speaker; see Minnesota English Center for override)
Practice in speaking in structured and semi-structured situations with special attention to basic regularities in pronunciation.

ESL 400. Library and Research Skills. (0 cr [max 8 cr]; S-N only. Prereq–Nonnative English speaker; see Minnesota English Center for override)
Students will learn the basics of using the university library system for research purposes.

ESL 411. Intermediate Grammar. (0 cr [max 8 cr]; S-N only. Prereq–Non-native speaker of English; see Minnesota English Center for override)
Reviews and adds to students' skills with basic structures. Increasingly complex structures with attention to form, meaning and use. Verb phrases; practice of structures in controlled speaking and writing activities.

ESL 421. Intermediate Reading/Composition. (0 cr [max 16 cr]; S-N only. Prereq–Nonnative English speaker; see Minnesota English Center for override)
Reading for main ideas and supporting ideas with increased speed; vocabulary development through study of word formation and use of dictionary. Writing fundamentals; organization and writing as a process.

ESL 431. Intermediate Oral Skills. (0 cr [max 16 cr]; S-N only. Prereq–Nonnative English speaker; see Minnesota English Center for override)
Develop fluency and accuracy; language for specific functions; communication strategies; standard forms of organization for academic lectures; understanding natural conversational speech.

ESL 500. Community Service Learning. (0 cr [max 8 cr]; S-N only. Prereq–Nonnative English speaker; see Minnesota English Center for override)
Students will learn about and participate in community service projects.

ESL 511. High Intermediate Grammar. (0 cr [max 8 cr]; S-N only. Prereq–Nonnative English speaker; see Minnesota English Center for override)
Reviews and adds to repertoire of structures with attention to meaning, use and form; emphasizes verb phrase and control of grammar in writing.

ESL 521. High Intermediate Reading/Composition. (0 cr [max 16 cr]; S-N only. Prereq–Prerequisite: Nonnative English speaker. See Minnesota English Center for override)
Reading unadapted as well as adapted passages; efficiency, vocabulary, drawing inferences, identifying point of view, using knowledge of organization to aid understanding, writing process, academic-style assignments.

ESL 531. High Intermediate Oral Skills. (0 cr [max 16 cr]; S-N only. Prereq–Nonnative English speaker; see Minnesota English Center for override)
Develop fluency and accuracy in everyday situations and in academic situations; special attention to communication strategies; prepares students for academic lectures by introducing standard forms of organization and note-taking skills. Students also work on understanding natural conversational speech using a variety of authentic materials.

ESL 600. International Business Communication. (0 cr [max 4 cr]; S-N only. Prereq–Non-native speaker of English; see Minnesota English Center for override)
How to write business letters in English. E-mail, voice mail for business.

ESL 611. Advanced Grammar. (0 cr [max 4 cr]; S-N only. Prereq–Nonnative English speaker; see Minnesota English Center for override)
Focuses on difficult areas of grammar and on providing students with resources to work on them. Meaning, use and form are emphasized with increased emphasis on complex sentence patterns.

ESL 621. Advanced Reading Composition: The Written Word. (0 cr [max 16 cr]; S-N only. Prereq–Nonnative English speaker; see Minnesota English Center for override)
Focuses on improving reading efficiency, including strategy development, as well as vocabulary skill building. Some focus on using reading to support academic writing.

ESL 622. Advanced Reading/Composition: The Written Word. (0 cr [max 16 cr]; S-N only. Prereq–0621)
Continuation of ESL 0621.

ESL 631. Advanced Oral Skills. (0 cr [max 16 cr]; S-N only. Prereq–Nonnative English speaker, override from Minnesota English Center)
Listening/speaking skills, U.S. culture. Presentations, readings, film, discussion, travel. Meets for 20 hours weekly. Ten-day camping trip through sites of cultural/historical significance in Minnesota and South Dakota.

ESL 641. Advanced Listening Comprehension. (0 cr [max 8 cr]; S-N only. Prereq–Nonnative English speaker; see Minnesota English Center for override)
Lecture comprehension with attention to note taking, recognizing main ideas and support, and determining the attitude of the speaker toward the subject; comprehension of complex information presented in a nonlecture format, as in television documentaries.

ESL 651. Advanced Speaking/Pronunciation. (0 cr [max 8 cr]; S-N only. Prereq–Nonnative English speaker; see Minnesota English Center for override)
Emphasizes the use of spoken English in academic settings as well as in conversation. Pronunciation focuses on individual needs.

ESL 661. Advanced Reading. (0 cr [max 8 cr]; S-N only. Prereq–Nonnative English speaker; see Minnesota English Center for override)
Students will work on comprehending authentic texts of significant lengths. Develop strategies to apply in academic reading.

ESL 671. Advanced Composition. (0 cr [max 8 cr]; S-N only. Prereq–Nonnative English speaker; see Minnesota English Center for override)
Skills needed at every stage of the writing process: finding a topic, determining an approach to the topic, planning and drafting a composition, revising, and editing. Suiting one's writing to audience and topic, and looking at one's own writing critically.

ESL 700. Topics in the Media. (0 cr [max 8 cr]; S-N only. Prereq–Nonnative English speaker; see Minnesota English Center for override)
News media as means of English improvement and as source of information/entertainment. Major international news events via radio broadcasts, newspaper, and other news sources. Understanding American culture and developing listening/speaking skills using American movies/television.

ESL 711. Grammar Through Writing. (0 cr [max 8 cr]; S-N only. Prereq–Non-native speaker of English; see Minnesota English Center for override)
Focuses on production of grammatically sophisticated structures in writing. Students edit their assignments.

ESL 712. Grammar Through Writing. (0 cr; S-N only. Prereq–Non-native speaker of English; see Minnesota English Center for override)
Production of grammatically sophisticated structures in writing. Students edit their assignments.

ESL 713. Grammar Through Writing. (0 cr [max 8 cr]; S-N only. Prereq–Non-native speaker of English; see Minnesota English Center for override)
Production of grammatically sophisticated structures in writing. Students edit their assignments.

ESL 721. High Advanced Reading/Composition. (0 cr [max 16 cr]; S-N only. Prereq–Non-native speaker of English; see Minnesota English Center for override)
Emphasizes reading for academic purposes. Focus on comprehension of scholarly reading selections and on increasing reading efficiency. Focus on writing process, academic-style assignments.

ESL 731. High Advanced Oral Skills. (0 cr [max 16 cr]; S-N only. Prereq–Non-native speaker of English; see Minnesota English Center for override)
Emphasizes listening and speaking skills in addition to understanding of U.S. culture through interaction with American students. Attend a weekly seminar with American university students and visit local schools to make presentations about your home country. Pronunciation instruction will focus on individual needs.

ESL 732. High Advanced Oral Skills. (0 cr [max 16 cr]; S-N only. Prereq–0731)
Continuation of 0731

ESL 741. High Advanced Listening Comprehension. (0 cr [max 8 cr]; S-N only. Prereq–Non-native speaker of English; see Minnesota English Center for override)
Lecture comprehension with special attention to note taking, recognizing main ideas and support, and understanding relationship of ideas, implied information, and structure of speech; comprehension of information presented in a wide variety of authentic materials.

ESL 751. High Advanced Speaking/Pronunciation. (0 cr [max 8 cr]; S-N only. Prereq–Non-native English speaker; see Minnesota English Center for override)
Emphasizes use of spoken English in academic settings, including presentation skills and discussion skills; pronunciation focuses on individual needs of students.

ESL 761. High Advanced Reading. (0 cr [max 8 cr]; S-N only. Prereq–Non-native speaker of English; see Minnesota English Center for override)
Continued development of strategies to increase reading efficiency and comprehension; paraphrasing/summarizing text; quoting and citing sources; understanding writer.s perspective.

ESL 771. High Advanced Composition. (0 cr [max 8 cr]; S-N only. Prereq–Non-native speaker of English; see Minnesota English Center for override)
Refining of skills needed in the writing process; refinement of use of complex grammatical structures; research to support writing.

ESL 800. English for Science and Technology. (0 cr [max 2 cr]; S-N only. Prereq–Non-native speaker of English; see Minnesota English Center for override)
English for formulating hypotheses, describing experiments, and presenting results; includes reading, writing, listening, and speaking activities based on scientific and technical English.

ESL 810. SIELOP: Grammar. (0 cr; S-N only. Prereq–Non-native speaker of English; see Minnesota English Center for override)
Form, function, meaning of English grammar.

ESL 820. SIELOP: Reading. (0 cr; S-N only. Prereq–Non-native speaker of English; see Minnesota English Center for override)
English language reading skills.

ESL 830. SIELOP: Composition. (0 cr; S-N only. Prereq–Non-native speaker of English; see Minnesota English Center for override)
English writing skills.

ESL 840. SIELOP: Speaking/Pronunciation. (0 cr; S-N only. Prereq–Non-native speaker of English; see Minnesota English Center for override)
English speaking, pronunciation skills

ESL 850. SIELOP: Listening. (0 cr; S-N only. Prereq–Non-native speaker of English; see Minnesota English Center for override)
English listening skills.

ESL 900. Topics in English as a Second Language. (0 cr; S-N only. Prereq–Non-native English speaker; see Minnesota English Center for override)
Topics vary - see Schedule or ONESTOP

ESL 901. Topics in English as a Second Language. (0 cr; S-N only. Prereq–Non-native English speaker; see Minnesota English Center for override)
Topics vary. See *Class Schedule*.

ESL 902. Topics in English as a Second Language. (0 cr; S-N only. Prereq–Non-native English speaker; see Minnesota English Center for override)
Topics vary. See *Class Schedule*.

ESL 903. Topics in English as a Second Language. (0 cr; S-N only. Prereq–Non-native English speaker; see Minnesota English Center for override)
Topics vary. See *Class Schedule*.

ESL 911. Fundamentals in English as a Second Language. (0 cr [max 12 cr]; S-N only. Prereq–Δ, satisfactory score on [EPT or MNBatt or TOEFL])
Basic knowledge/skills needed for daily communication in spoken English. Grammatical structures explained with reference to their uses in social situations. Pronunciation.

ESL 912. Fundamentals in English as a Second Language. (0 cr [max 12 cr]; S-N only. Prereq–Δ, satisfactory score on [EPT or MNBatt or TOEFL])
Basic knowledge/skills needed for daily communication in spoken English. Grammatical structures explained with reference to their uses in social situations. Pronunciation.

ESL 931. Developing Fluency in English as a Second Language. (0 cr [max 12 cr]; S-N only. Prereq–Δ, satisfactory score on [EPT or MNBatt or TOEFL])
Communication skills for social, academic, and professional purposes. Emphasizes listening/speaking. Content drawn from mass media.

ESL 932. Developing Fluency in English as a Second Language. (0 cr [max 12 cr]; S-N only. Prereq–Δ, satisfactory score on [EPT or MNBatt or TOEFL])
Communication skills for social, academic, and professional purposes. Emphasizes listening/speaking. Content drawn from mass media.

ESL 933. Developing Fluency in English as a Second Language. (0 cr [max 10 cr]; S-N only. Prereq–Satisfactory score on [EPT or MNBatt or TOEFL])
Communication skills for social, academic, and professional purposes. Emphasizes listening/speaking. Content drawn from mass media.

ESL 937. International Business Communication. (0 cr [max 16 cr]; S-N only. Prereq–Non-native speaker of English; see Minnesota English Center for override)
Oral communication in a business setting. English as used in international trade, finance, and marketing. Listening/speaking skills for business materials. E-mail, voice mail. Writing business letters.

ESL 971. Advanced Academic Writing. (0 cr [max 8 cr]; S-N only. Prereq–Δ, grad student, non-native speaker of English, satisfactory score on [EPT or MNBatt or TOEFL])
Introduction to the use of library system and to types of writing required in graduate school courses. Developing/organizing ideas, drafting, revising/editing papers, writing essay exams.

ESL 993. Directed Studies in English as a Second Language. (0 cr [max 40 cr]; S-N only. Prereq–Non-native English speaker; see Minnesota English Center for override)
Directed study in English as a second language

ESL 994. Directed Studies in English as a Second Language. (0 cr [max 20 cr]; S-N only. Prereq–Non-native English speaker; see Minnesota English Center for override)

ESL 995. Directed Studies in English as a Second Language. (0 cr [max 30 cr]; S-N only. Prereq–Non-native English speaker; see Minnesota English Center for override)

ESL 996. Directed Studies in English as a Second Language. (0 cr [max 40 cr]; S-N only. Prereq–Non-native English speaker; see Minnesota English Center for override)

ESL 3101. Advanced English Grammar. (4 cr [max 8 cr]. Prereq–Δ, non-native speaker of English, [C-TOEFL score 153-180 or equiv], ESL program consent)
Form, meaning, and use of common English grammatical structures in written/oral discourse. Adverb, adjective, and noun clauses. Verb tense, aspect, and modality. Grammar beyond sentence level. Application to development of revision/editing skills.

ESL 3102. English Grammar for Academic Purposes. (4 cr [max 8 cr]. Prereq–3101, [Non-native speaker of English, [C-TOEFL score of at least 183 or equiv], Δ)
Form, meaning, and use of an expanded repertoire of complex English grammatical structures used in academic written/oral discourse. Subordination, coordination, transition. Complex referential expressions. Complementation. Lexical grammar. Independent self-editing of academic writing.

ESL 3201. Advanced English Reading and Composition. (5 cr [max 10 cr]. Prereq–Non-native speaker of English, [C-TOEFL score of 153-180 or equiv], Δ)
Comprehension of main ideas, organization, and support in longer authentic English texts. Expanded vocabulary comprehension. Fluency, focus, and persuasiveness through draft/revision. Focuses on accuracy/variety of expression.

ESL 3202. Academic Reading and Composition. (5 cr [max 10 cr]. Prereq–3201, Non-native speaker of English, [C-TOEFL score of at least 183 or equiv], Δ)
Academic writer s purpose, main ideas, and supporting evidence in English language texts. Expansion of academic vocabulary. Use of source material in English research writing in different academic genres. Focuses on revision to improve fluency/accuracy.

ESL 3302. Writing for Academic Purposes. (4 cr [max 8 cr]. Prereq–3202, non-native speaker of English, [C-TOEFL score of at least 183 or equiv], Δ)
Writing process. Idea generation/development, drafting, revision, editing. Focuses on different genres of academic writing, including critical response to scholarly argument, scholarly review, and incorporation of source material in writing. "Rush writing" under time pressure to improve fluency in writing.

ESL 3501. Advanced English Listening and Speaking. (5 cr [max 10 cr]. Prereq–Non-native speaker of English, [C-TOEFL score 153-180 or equiv], Δ)
Speaking/understanding naturally spoken English in academic activities such as lecture comprehension, note-taking, participation in class discussions, and oral presentations. Emphasizes cross-cultural interaction related to academic subject matter.

ESL 3502. Academic Listening and Speaking. (5 cr [max 10 cr]. Prereq–3501, non-native speaker of English, [C-TOEFL score of at least 183 or equiv], Δ)
Understanding lectures and academic discussions. Focuses on critical listening. Students produce academic presentations and participate in discussions on subjects of general academic interest. Cross-cultural awareness. Negotiation of disagreement/misunderstanding.

ESL 3551. English Pronunciation. (4 cr [max 8 cr]. Prereq–Non-native speaker of English, Δ)
Improving production/perception of sounds of English language. Intelligibility of individual sounds, rhythm, intonation, word/sentence stress, linking phenomena in fast speech. Rules of pronunciation in relation to rules of English spelling.

ESL 3602. Speaking for Academic Purposes. (4 cr [max 8 cr]. Prereq–3502, non-native speaker of English, [C-TOEFL score of at least 183 or equiv], Δ)
Students participate in American academic interactions of various types: lectures, presentations, seminar-style discussions, informal exchanges. Presenting oneself professionally/socially in collegial settings with accuracy, variety, and flexibility.

ESL 3993. Directed Studies. (1-5 cr [max 15 cr]. Prereq–Non-native speaker of English, #)

English: Composition (ENGC)

Department of English Language and Literature

College of Liberal Arts

ENGC 1001. Preparation for University Writing. (4 cr. Prereq–Category 4 placement; some sections may be limited to ESL students)
Guided writing practice in prewriting, drafting, and revising as well as grammar, sentence structure, and paragraphing. For students who are not fully prepared for academic writing. Weekly meetings with a tutor in the Student Writing Center required.

ENGC 1011. University Writing and Critical Reading. (4 cr. §ENGC 1011H, ENGC 1012, ENGC 1012H, ENGC 1013, ENGC 1013H, ENGC 1014, ENGC 1014H, ENGC 1015, ENGC 1016, PSTL 1422, PSTL 1423, PSTL 1424, RHET 1101. Prereq–Some sections limited to non-native speakers)
Critical reading/interpretation of selected texts. Research in various types of resources. Writing through several drafting steps. Finished writing is revised/edited to meet university-level standards of persuasiveness, precision, and correctness.

ENGC 1011H. Honors: University Writing and Critical Reading. (4 cr. §ENGC 1011, ENGC 1012, ENGC 1012H, ENGC 1013, ENGC 1013H, ENGC 1014, ENGC 1014H, ENGC 1015, ENGC 1016, PSTL 1422, PSTL 1423, PSTL 1424, RHET 1101. Prereq–Honors)
Critical reading/interpretation of texts, research in various resources, writing through several drafting steps. Finished writing is revised/edited to meet university-level standards of persuasiveness, precision, and correctness.

ENGC 1012. University Writing and Critical Reading: Perspectives on Multiculturalism. (4 cr. §ENGC 1011, ENGC 1011H, ENGC 1012H, ENGC 1013, ENGC 1013H, ENGC 1014, ENGC 1014H, ENGC 1015, ENGC 1016, PSTL 1422, PSTL 1423, PSTL 1424, RHET 1101)
Extended practice in writing on topics concerning cultural diversity. Projects involving critical reading/interpretation of selected texts, research in various types of resources, and writing that moves through several drafting steps. Finished writing is revised/edited to meet university-level standards of persuasiveness, precision, and correctness.

ENGC 1012H. University Writing and Critical Reading: Perspectives on Multiculturalism. (4 cr. §ENGC 1011, ENGC 1011H, ENGC 1012, ENGC 1013, ENGC 1013H, ENGC 1014, ENGC 1014H, ENGC 1015, ENGC 1016, PSTL 1422, PSTL 1423, PSTL 1424, RHET 1101. Prereq–Honors)
Extended practice in writing on topics concerning cultural diversity. Critical reading/interpretation of texts, research in various resources, writing through several drafting steps. Finished writing is revised/edited to meet university-level standards of persuasiveness, precision, and correctness.

ENGC 1013. University Writing and Critical Reading: Nature and the Environment. (4 cr. §ENGC 1011, ENGC 1011H, ENGC 1012, ENGC 1012H, ENGC 1013H, ENGC 1014, ENGC 1014H, ENGC 1015, ENGC 1016, PSTL 1422, PSTL 1423, PSTL 1424, RHET 1101)
Writing on topics concerning the environment. Critical reading/interpretation of selected texts. Research in various types of resources. Writing through several drafting steps. Finished writing is revised/edited to meet university-level standards.

ENGC 1013H. University Writing and Critical Reading: Nature and the Environment. (4 cr. §ENGC 1011, ENGC 1011H, ENGC 1012, ENGC 1012H, ENGC 1013, ENGC 1014, ENGC 1014H, ENGC 1015, ENGC 1016, PSTL 1422, PSTL 1423, PSTL 1424, RHET 1101. Prereq–Honors)
Writing on topics concerning the environment. Critical reading/interpretation of texts, research in various resources, writing through several drafting steps. Finished writing is revised/edited to meet university-level standards of persuasiveness, precision, and correctness.

ENGC 1014. University Writing and Critical Reading: Contemporary Public Issues. (4 cr. §ENGC 1011, ENGC 1011H, ENGC 1012, ENGC 1012H, ENGC 1013, ENGC 1013H, ENGC 1014H, ENGC 1015, ENGC 1016, PSTL 1422, PSTL 1423, PSTL 1424, RHET 1101)
Writing on topics concerning citizenship and public ethics. Projects involve critical reading/interpretation of selected texts, research in various types of resources, and writing through several drafting steps. Finished writing is revised/edited to meet university-level standards.

ENGC 1014H. University Writing and Critical Reading: Contemporary Public Issues. (4 cr. §ENGC 1011, ENGC 1011H, ENGC 1012, ENGC 1012H, ENGC 1013, ENGC 1013H, ENGC 1014, ENGC 1015, ENGC 1016, PSTL 1422, PSTL 1423, PSTL 1424, RHET 1101. Prereq–honors)
Writing on topics concerning citizenship, public ethics. Critical reading/interpretation of texts, research in various resources, writing through several drafting steps. Finished writing is revised/edited to meet university-level standards of persuasiveness, precision, and correctness.

ENGC 1015. University Writing and Critical Reading: Perspectives on Globalization. (4 cr. §ENGC 1011, ENGC 1011H, ENGC 1012, ENGC 1012H, ENGC 1013, ENGC 1013H, ENGC 1014, ENGC 1014H, ENGC 1016, PSTL 1422, PSTL 1423, PSTL 1424, RHET 1101)
Critical reading/interpretation of selected texts. Research in various types of resources, including Internet. Writing through several drafting steps. Finished writing is revised/edited to meet university-level standards of persuasiveness, precision, and correctness.

ENGC 1016. University Writing and Critical Reading: Community Learning and Civic Engagement. (4 cr. §ENGC 1011, ENGC 1011H, ENGC 1012, ENGC 1012H, ENGC 1013, ENGC 1013H, ENGC 1014, ENGC 1014H, ENGC 1015, PSTL 1422, PSTL 1423, PSTL 1424, RHET 1101. Prereq–Some sections limited to non-native speakers)
Extended practice in writing academic prose in response to community engagement. Students serve at least two hrs per week at a local school, agency, or community organization. Critical reading/interpretation of selected texts. Research in various types of resources, including Internet media resources. Writing that moves through several drafting steps. Finished writing is revised/edited to meet university-level standards of persuasiveness, precision, and correctness.

ENGC 1021V. Intermediate Expository Writing. (4 cr. Prereq–[1011 or 1012 or 1012H or 1013 or 1013H or 1014 or 1014H or 1015 or 1016 or GC 1422 or GC 1423 or GC 1424 or RHET 1101 or exemption from fr writing req], [honors placement in category 2 or 3])
Choices academic writers make based on audience, purpose, and context. Emphasizes effective use of University Libraries, including locating, evaluating, and using scholarly sources. Reading/writing assignments to extend/clarify arguments and improve control over writing. Selecting/limiting topics. Revision.

ENGC 1021W. Intermediate Expository Writing. (4 cr. Prereq–1011 or 1012 or 1013 or 1014)
Focuses on the range of choices writers make based on audience, purpose, and context. Relies on critical reading and a variety of writing assignments to improve control over writing and the effect it will have on intended audiences.

ENGC 3027W. Advanced Expository Writing. (4 cr. Prereq–Completion of freshman writing req)
Incorporating narrative, descriptive, analytical, persuasive techniques into writing on general topics. Effective argumentation through critical reading, use of library resources, awareness of context/audience.

ENGC 3029W. Professional Writing. (3 cr. Prereq–Daily access to e-mail)
How to write for various professional purposes/audiences, using differing styles, tones, and organizational elements. Potential genres include grant proposals, feasibility studies, job search portfolios, progress reports, annotated bibliographies. Broader issues of professional literacy.

ENGC 3650. Topics in Composition. (3 cr)
Topics specified in *Class Schedule*.

ENGC 5051. Graduate Research Writing Practice for Non-native Speakers of English. (3 cr. Prereq–Grad student)
Graduate-level writing techniques/formats for summaries, critiques, research, and abstracts. Persuasion, documentation, structure, grammar, vocabulary, field-specific requirements. Writing through several drafts, using mentor in specific field of study. Revising/editing to meet graduate standards. Discussions.

ENGC 5052. Graduate Research Presentations and Conference Writing for Non-Native Speakers of English. (3 cr. Prereq–[Grad student, non-native speaker of English] or #)
Practice in writing/presenting graduate-level research for conferences or professional seminars. Delivery of professional academic presentations to U.S. audiences. Conference abstract, paper, and poster presentation. Communication in research process. Students select topics from their own research/studies. Format, style, transitions, topic narrowing, non-verbal presentation skills.

English: Creative Writing (ENGW)

Department of English Language and Literature

College of Liberal Arts

ENGW 1101W. Introduction to Creative Writing. (4 cr)
Writing poetry and prose. Small group workshops and lecture presentations by visiting writers. For those who want to try creative writing, improve reading skills, and learn more about the creative process.

ENGW 1102. Introduction to Fiction Writing. (3 cr)
Beginning instruction in the art of fiction: characterization, plot, dialogue, and style. Writing exercises to help students generate ideas. Students read and discuss published fiction as well as their own writing.

ENGW 1103. Introduction to Poetry Writing. (3 cr)
Beginning instruction in the art of poetry. Discussion of student poems and contemporary poetry, ideas for generating material, and writing exercises both in and out of class.

ENGW 1104. Introduction to Literary Nonfiction Writing. (3 cr)
Beginning instruction in the art of literary nonfiction, including the memoir. Discussion of student work and contemporary creative nonfiction, ideas for generating material, and writing exercises.

ENGW 3102. Intermediate Fiction Writing. (3 cr. Prereq–1101 or 1102 or Δ)
Exercises, experiments, assigned readings, discussion of student work.

ENGW 3104. Intermediate Poetry Writing. (3 cr. Prereq–1101 or 1103 or Δ)
Exercises, experiments, assigned readings, discussion of student work.

ENGW 3105. Advanced Poetry Writing. (4 cr. Prereq–3104 or Δ)
Opportunity to explore new poetic possibilities and read widely in contemporary poetry/poetics. Advanced workshop.

ENGW 3106. Intermediate Literary Nonfiction Writing. (3 cr. Prereq–1104 or Δ)
Exercises, experiments, assigned readings, and discussion of students' work.

ENGW 3107. Advanced Literary Nonfiction. (4 cr [max 8 cr]. Prereq–3106 or Δ)
Advanced workshop. Writing memoir, literary essays.

ENGW 3110. Topics in Creative Writing. (3 cr [max 9 cr]. Prereq–1101 or 1102 or 1103 or 1104 or Δ)
Topics specified in *Class Schedule*.

ENGW 3110H. Topics in Creative Writing. (3 cr [max 9 cr]. Prereq–[1101 or 1102 or 1103 or 1104], honors)
Topics specified in *Class Schedule*.

ENGW 3960W. Writing Workshop for Majors. (4 cr. Prereq–ENGL major, 6 cr of ENGW [including 3xxx appropriate for workshop genre], [jr or sr], major adviser approval, Δ)
Topics specified in *Class Schedule*.

ENGW 5102. Advanced Fiction Writing. (4 cr [max 8 cr]. Prereq–Δ)
Advanced workshop for graduate students with considerable experience in writing fiction.

ENGW 5104. Advanced Poetry Writing. (4 cr [max 8 cr]. Prereq–Δ)
Advanced workshop for graduate students with considerable experience in writing poetry. An opportunity to explore new poetic possibilities and to read widely in contemporary poetry and poetics.

ENGW 5105. Advanced Poetry Writing. (4 cr [max 8 cr]. Prereq–Δ)
Advanced workshop for students with considerable experience in writing poetry. An opportunity to explore new poetic possibilities and to read widely in contemporary poetry and poetics.

ENGW 5106. Advanced Literary Nonfiction Writing. (4 cr [max 8 cr]. Prereq–Δ)
Advanced workshop for graduate students with considerable experience in writing literary nonfiction.

ENGW 5110. Topics in Advanced Fiction Writing. (4 cr [max 16 cr]. Prereq–Δ)
Special topics in fiction writing. Topics specified in *Class Schedule*.

ENGW 5120. Topics in Advanced Poetry. (4 cr [max 16 cr]. Prereq–Δ)
Special topics in poetry writing. Topics specified in *Class Schedule*.

ENGW 5130. Topics in Advanced Creative Writing. (4 cr [max 16 cr]. Prereq–#)
Workshop. Might include work in more than one genre.

ENGW 5201. Journal and Memoir Writing. (3 cr)
Using memory in writing, from brainstorming to drafting to revising, in several genres (poems, traditional memoir essays, fiction). How diverse cultures shape memory differently.

ENGW 5202. Journal and Memoir Writing. (3 cr)
Using memory in writing, from brainstorming to drafting to revision, in several genres (poems, traditional memoir essays, fiction). How diverse cultures shape memory differently.

ENGW 5204. Playwriting. (4 cr [max 8 cr]. Prereq–[Jr or sr], one ENGW 3xxx course, permission number [available in creative writing office])
Advanced workshop. Contact creative writing program for specific description.

ENGW 5205. Screenwriting. (4 cr. Prereq–[Jr or sr], one ENGW 3xxx course, Δ [permission number available in creative writing office])
Advanced workshop. Contact creative writing program for specific description.

ENGW 5207. Screenwriting II. (4 cr. Prereq–5205, one [Eng W or ENΓΛ or EngC] 3xxx course, [jr or sr], Δ)
Story structure, dialogue, description. Students turn story created in 5205 into a fully realized screenplay.

ENGW 5210. Topics in Advanced Literary Nonfiction. (4 cr [max 16 cr]. Prereq–Δ)
Special topics in essay writing (e.g., arts reviewing, writing about public affairs, writing in personal voice). Topics specified in *Class Schedule*.

ENGW 5310. Reading as Writers. (4 cr [max 8 cr]. Prereq–Grad student, Δ)
Special topics in reading fiction, literary nonfiction, poetry. Topics specified in *Class Schedule*.

ENGW 5501. Minnesota Writing Project Invitational Institute. (1-3 cr [max 3 cr]. Prereq–Competitive selection for 20 educators (K-college))
Emphasizes participants' teaching each other best practices in writing instruction. Participants attend a retreat before beginning.

ENGW 5502. Minnesota Writing Project Open Institute. (1-2 cr [max 2 cr]. Prereq–Teacher (K-college), [school district sponsorship or MWP approval])
Summer workshop to refine skills in writing instruction.

ENGW 5570. Minnesota Writing Project Directed Studies. (1-3 cr [max 3 cr]; A-F only. Prereq–Participants must be members of the Minnesota Writing Project)
Current theories of writing and writing pedagogy. Topics vary. Workshop.

ENGW 5606. Literary Aspects of Journalism. (3 cr; A-F only. §JOUR 5606W)
Literary aspects of journalism as exemplified in and influenced by works of English/American writers past/present. Lectures, discussions, weekly papers.

ENGW 5993. Directed Study in Writing. (1-4 cr [max 18 cr]. Prereq–#, Δ, ❑)
Projects in writing poetry, fiction, drama, and nonfiction, or study of ways to improve writing.

English: Literature (ENGL)

Department of English Language and Literature

College of Liberal Arts

ENGL 1001V. Honors: Introduction to Literature: Poetry, Drama, Narrative. (4 cr; A-F only. §ENGL 1001W. Prereq–honors)
Basic techniques for analyzing/understanding literature. Readings of novels, short stories, poems, plays.

ENGL 1001W. Introduction to Literature: Poetry, Drama, Narrative. (4 cr. §ENGL 1001V)
Basic techniques for analyzing/understanding literature. Readings of novels, short stories, poems, plays.

ENGL 1171. The Story of King Arthur. (3 cr; A-F only)
Arthurian literature, from earliest times to present. How the same story can accommodate many different systems of belief. Form and changing historical backgrounds.

ENGL 1181V. Honors: Introduction to Shakespeare. (4 cr; A-F only. §ENGL 1181W. Prereq–honors)
Survey of Shakespeare's work, treating approximately 10 plays. Lecture.

ENGL 1181W. Introduction to Shakespeare. (4 cr. §ENGL 1181V)
Survey of Shakespeare's work, treating approximately 10 plays. Lecture.

ENGL 1201V. Honors: Introduction to American Literature. (4 cr; A-F only. §ENGL 1201W. Prereq–honors)
Chronologically/thematically based readings from American literature. Approaches to literary analysis/criticism. Social/historical contexts of authorship/reading, literary artistry/conventions. Discussion, writing.

ENGL 1201W. Introduction to American Literature. (4 cr. §ENGL 1201V)
Chronologically/thematically based readings from American literature. Approaches to literary analysis/criticism. Social/historical contexts of authorship/reading, literary artistry/conventions. Discussion, writing.

ENGL 1301V. Honors: Introduction to Multicultural American Literature. (4 cr; A-F only. §ENGL 1301W. Prereq–honors)
Representative works by African American, American Indian, Asian American, and Chicano/Chicana writers, chiefly from twentieth century. Social/cultural factors in America's literary past/present.

ENGL 1301W. Introduction to Multicultural American Literature. (4 cr. §ENGL 1301V)
Representative works by African American, American Indian, Asian American, and Chicano/Chicana writers, chiefly from 20th century. Social/cultural factors informing America's literary past/present.

ENGL 1401V. Honors: Introduction to "Third World" Literatures in English. (4 cr; A-F only. §ENGL 1401W. Prereq–honors)
Diverse work produced in English outside the United States and Britain. Works represent different cultures, but treat concerns derived from a common post-colonial legacy.

ENGL 1401W. Introduction to "Third World" Literatures in English. (4 cr. §ENGL 1401V)
Diverse works produced in English outside the United States and Britain. Works represent different cultures, but treat concerns derived from common post-colonial legacy.

ENGL 1501W. Literature of Public Life. (4 cr; A-F only)
Meaning/practice of citizenship. Historical themes, contemporary issues in American public life: access of citizenship, tensions between social duties and individual freedoms, role of moral values in public life. Diverse literary materials.

ENGL 1601W. English Language and Society. (4 cr)
Nontechnical understanding of systematic, dynamic, creative nature of human language. Emphasizes English language.

ENGL 1701. Modern Fiction. (4 cr)
Basic techniques for analyzing/understanding fiction. Readings from novels and short stories written in English-speaking countries and elsewhere (in translation). Introduction to fictional techniques such as point of view, fictional conventions, and some forms of experimentation.

ENGL 1701H. Honors: Modern Fiction. (4 cr)
Basic techniques for analyzing/understanding fiction. Readings from novels and short stories written in English-speaking countries and elsewhere (in translation). Introduction to fictional techniques such as point of view, fictional conventions, and some forms of experimentation.

ENGL 1905. Topics: Freshman Seminar. (3 cr; A-F only. Prereq–Freshman)
Topics specified in *Class Schedule*.

ENGL 1910W. Topics: Freshman Seminar. (3 cr; A-F only. Prereq–Freshman)
Topics specified in *Class Schedule*.

ENGL 1930. General Topics in Literature. (3 cr; A-F only. Prereq–#)
Topics determined by instructor.

ENGL 3001V. Honors: Textual Analysis, Methods. (4 cr §ENGL 3001W. Prereq–CLA honors, [sOPH 1st term or higher])
Training/practice in analyzing various literary forms. Emphasizes poetry. Argument, evidence, and documentation in literary papers. Introduction to major developments in contemporary criticism.

ENGL 3001W. Textual Analysis: Methods. (4 cr §ENGL 3001V. Prereq–English major or minor or premajor or BIS/IDIM-English)
Close/critical reading, placing literature in history/culture. Idea of multiple approaches to literary works. Analysis of various literary forms, including poetry.

ENGL 3002. Modern Literary Criticism and Theory. (3 cr. §ENGL 3002H)
Problems of interpretation/criticism. Questions of meaning, form, authority, literary history, social significance.

ENGL 3002H. Honors: Modern Literary Criticism and Theory. (3 cr. §ENGL 3002. Prereq–CLA honors)
Problems of interpretation/criticism. Questions of meaning, form, authority, literary history, social significance.

ENGL 3003W. Historical Survey of British Literatures I. (4 cr)
An introductory historical survey of British literature and culture from the Anglo-Saxon invasions through the end of the 18th century.

ENGL 3004W. Historical Survey of British Literatures II. (4 cr)
An introductory historical survey of British literature and culture in the 19th and 20th centuries. Includes Romantic, Victorian, and Modernist authors, such as Wordsworth, Keats, Tennyson, the Brontes, Austen, Dickens, Wilde, Yeats, Woolf, and Thomas.

ENGL 3005W. Survey of American Literatures and Cultures I. (4 cr)
Readings in American literature from first European contact, through colonial times, to mid-19th century. Texts in several genres by diverse authors. Classics, less familiar works. Historical, social, and aesthetic contexts.

ENGL 3006W. Survey of American Literatures and Cultures II. (4 cr)
Readings from the mid-19th to the mid-20th century; including the realists' and regionalists' response to the growth of industrial capitalism, Modernism in the 1920s, and the issues which united and divided the country throughout the 20th century.

ENGL 3007H. Shakespeare. (3 cr; A-F only)
Plays from all of Shakespeare's periods, including at least *A Midsummer Night's Dream, Hamlet,* the history plays, *King Lear*, *Macbeth, The Tempest, Twelfth Night, Antony and Cleopatra, Othello,* and *The Winter's Tale*.

ENGL 3007. Honors: Shakespeare. (3 cr; A-F only. Prereq–CLA honors)
Plays from all of Shakespeare's periods, including at least *A Midsummer Night's Dream, Hamlet, the history plays, King Lear, Macbeth, The Tempest, Twelfth Night, Antony and Cleopatra, Othello,* and *The Winter'sTale*.

ENGL 3010. Studies In Poetry. (3 cr [max 9 cr])
Special topics related to reading poetry in various interpretive contexts.

ENGL 3010H. Studies In Poetry. (3 cr. Prereq–honors)
Special topics related to reading poetry in various interpretive contexts.

ENGL 3020. Studies in Narrative. (3 cr [max 9 cr])
Examine issues related to reading and understanding narrative in a variety of interpretive contexts. Topics may include "The 19th-century English (American, Anglophone) Novel," "Introduction to Narrative," or "Techniques of the Novel." Topics specified in the *Class Schedule*.

ENGL 3020H. Honors: Studies in Narrative. (3 cr; A-F only. Prereq–honors)
Issues related to reading/understanding narrative in various interpretive contexts. Topics may include nineteenth-century English (American, Anglophone) novel; narrative; or techniques of the novel. Topics specified in *Class Schedule*.

ENGL 3030. Studies in Drama. (3 cr [max 9 cr])
Topics may include English Renaissance tragedy, EnglishRestoration and 18th century, or American drama by writers of color;single-author courses focused on writers such as Tennessee Williams andEugene O'Neill, or issues and themes, such as gender and performance.

ENGL 3030H. Studies in Drama. (3 cr [max 9 cr] Prereq–honors)
Topics may include English Renaissance tragedy; EnglishRestoration and 18th century; American drama by writers of color;single-author courses focused on writers such as Tennessee Williams andEugene O'Neill; issues/themes such as gender and performance.

ENGL 3040. Studies in Film. (3 cr [max 9 cr])
Topics regarding film in a variety of interpretive contexts, from the range and historic development of American, English and Anglophone film. Recent examples: "American Film Genres," "Film Noir," "Chaplin and Hitchcock." Topics and viewing times announced in *Class Schedule*.

ENGL 3040H. Honors: Studies in Film. (3 cr [max 9 cr]. Prereq–CLA honors)
Topics regarding film in various interpretive contexts. Range, historic development of American, English, and Anglophone film. Recent examples: "American Film Genres," "Film Noir," "Chaplin and Hitchcock." For topics, see *Class Schedule*.

ENGL 3060. Studies in Literature and the Other Arts. (3 cr [max 9 cr])
Examines literature's role in conjunction with other arts including music, the visual arts, dance, etc. Topics specified in *Class Schedule*.

ENGL 3070. Studies in Literary and Cultural Modes. (3 cr [max 9 cr])
Modes of literary expression/representation that transcend conventional demarcations of genre and historical periods. Topics may include horror, romance, mystery, comedy, and satire.

ENGL 3090. General Topics. (1-3 cr [max 9 cr])
Topics specified in *Class Schedule*.

ENGL 3090H. Honors: General Topics. (3 cr [max 9 cr])
Topics specified in *Class Schedule*.

ENGL 3101. Survey of Medieval English Literature. (3 cr; A-F only)
Major/representative Medieval English works, including Sir Gawain the Green Knight, Chaucer's Canterbury Tales, Piers Plowman, Book of Margery Kempe, Julian of Norwich's Revelations, and Malory]s Morte D.Arthur.

ENGL 3102. Chaucer. (3 cr; A-F only)
Major/representative works written by Chaucer, including The Canterbury Tales, Troilus and Criseyde, and the dream visions. Historical, intellectual, and cultural background of the poems. Language, poetic theory, form.

ENGL 3110. Medieval Literatures and Cultures: Intro to Medieval Studies. (3 cr [max 9 cr])
Major and representative works of the Middle Ages. Topics specified in the *Class Schedule*.

ENGL 3111. Survey of English Literature I, Transition. (3 cr; A-F only)
Historical survey of major figures, movements, and trends in English literature. Chaucer to Marvell, including Spenser, Shakespeare, and Donne.

ENGL 3112. Survey of English Literature II, Transition. (3 cr; A-F only)
Historical survey of major figures, movements, and trends in English literature. Milton to Johnson, including Dryden, Swift, and Pope.

ENGL 3113. Survey of English Literature III, Transition. (3 cr; A-F only)
Historical survey of major figures, movements, and trends in English literature. Blake to Yeats, including Wordsworth, Coleridge, Keats,Tennyson, and the Brownings.

ENGL 3115. Medieval and Renaissance Drama. (3 cr; A-F only)
Medieval/Renaissance drama in terms of performance. Performance history, enactments of scenes from cycle/morality plays, informal production of a morality play.

ENGL 3121H. Tudor England: 16th-Century Literature and Culture. (3 cr. Prereq–Honors or #)
Major/representative works of Renaissance (1485-1660). Typical authors: More, Sidney, Spenser, Donne, Milton.

ENGL 3122. Shakespeare II: The Major Themes. (3 cr. Prereq–3007 or #)
Intensive study of two to four plays. Less familiar plays or other works, including the Sonnets. Performance as interpretation. Comparative analysis of multiple performances of a play or plays. Multiple-text plays.

ENGL 3132. Tudor England: 16th-Century Literature and Culture. (3 cr)
Major/representative works of the Renaissance (1485-1660). Typical authors: More, Sidney, Spenser, Donne, Milton.

ENGL 3133. Stuart England: 17th-Century Literature and Culture. (3 cr)
Major/representative works of the Restoration and 18th century (1660-1798). Typical authors: Dryden, Pope, Swift, Johnson, Boswell, Fielding.

ENGL 3134. Milton and the Century of Revolution. (3 cr; A-F only)
Milton's poetry/prose in political, social, and cultural contexts of 17th century England. His major literary achievements: Paradise Lost, Paradise Regained, Samson Agonistes. His early experiments in lyric poetry. Several representative selections of his political writing.

ENGL 3141. The Restoration and the Eighteenth Century. (3 cr; A-F only. §ENGL 5140)
Major/representative works of the Restoration and 18th century (1660-1789). Typical authors: Dryden, Behn, Swift, Pope, Fielding, Burney.

ENGL 3151. Romantic Literatures and Cultures. (3 cr)
British literature written between 1780 and 1830. Examine the concept of Romanticism, the effects of the French Revolution on literary production, and the role of the romantic artist.

ENGL 3161. Victorian Literatures and Cultures. (3 cr)
The literature of the British Victorian period (1832-1901) in relation to its cultural and historical contexts. Typical authors includeTennyson, the Brownings, Dickens, Arnold, Hopkins, and the Brontes.

ENGL 3161H. Victorian Literatures and Cultures. (3 cr)
The literature of the British Victorian period (1832-1901) in relation to its cultural and historical contexts. Typical authors include Tennyson, the Brownings, Dickens, Arnold, Hopkins, and the Brontes.

ENGL 3171. Modern British Literatures and Cultures. (3 cr)
Survey of principal writers, intellectual currents, conventions, genres and themes in Britain from 1950 to the present. Typically included are Beckett, Golding, Kingsley and Martin Amis, Murdoch, Larkin, Hughes, Heaney, Lessing, Shaffer, Stoppard, Fowles, and Drabble.

ENGL 3175. 20th-Century British Literatures and Cultures I. (3 cr)
Survey of principal writers, intellectual currents, conventions, and genres/themes in Britain/Ireland, from 1900 to 1945. Fiction/nonfiction by Conrad, Richardson, Forster, Joyce, Mansfield, Rhys, West, Woolf, Lawrence, and Huxley. Poetry by Hardy, Hopkins, Loy, H.D., Yeats, Pound and Eliot. Drama by Synge and Shaw.

ENGL 3176. 20th-Century British Literatures and Cultures II. (3 cr)
Survey of principal writers, intellectual currents, conventions, genres, and themes in Britain/Ireland, 1945-1999. Fiction/nonfiction by Greene, Bowen, Amis, Fowles, Lessing, Drabble, Murdoch, Naipaul, Carter, Rushdie, and Winterson. Poetry by Smith, Auden, Thomas, Larkin, Hughes, Heaney, Smith, Boland, and Walcott. Drama by Beckett, Pinter, Shaffer, Stoppard, Devlin, Friel, and Carr.

ENGL 3180. Contemporary Literatures and Cultures. (3 cr [max 9 cr])
Examine issues related to the reading and understanding of British, American, and Anglophone fiction and poetry in a variety of interpretive contexts.

ENGL 3180H. Contemporary Literatures and Cultures. (3 cr [max 9 cr]; A-F only. Prereq–honors)
Examine issues related to the reading and understanding of British, American, and Anglophone fiction and poetry in a variety of interpretive contexts.

ENGL 3211. American Poetry to 1900. (3 cr)
Poets from the Puritans to the end of the 19th century. The course attends to the intellectual and cultural background of the poets, poetic theory, and form.

ENGL 3212. American Poetry from 1900. (3 cr)
Famous and lesser-known poems from the Modernist era, the time of Frost, HD, Pound, Eliot and the Harlem Renaissance. The course attends to the intellectual and cultural background of the poets, poetic theory and form.

ENGL 3221. American Novel to 1900. (3 cr)
Novels, from early Republic, through Hawthorne, Melville, and Stowe, to writers at end of 19th century (e.g., Howells, Twain, James, Chopin, Crane). Development of a national literature. Tension between realism and romance. Changing role of women as writers and as fictional characters.

ENGL 3222. American Novel From 1900. (3 cr)
Novels from early 1900's realism through the Modernists (e.g., Faulkner, Hemingway, Fitzgerald) to more recent writers (e.g., Ellison, Bellow, Erdrich, Pynchon). Stylistic experiments, emergence of voices from formerly under-represented groups, and novelists' responses to a technologically changing society.

ENGL 3231. American Drama. (3 cr. §ENGL 3231H)
Representative dramas from the 18th through 20th centuries. Topics include the staging of national identities, the aesthetics of modern and contemporary drama, and the production concerns of mainstream, regional, and community theaters.

ENGL 3231H. Honors: American Drama. (3 cr. §ENGL 3231)
Representative dramas, from 18th through 20th centuries. Staging of national identities, aesthetics of modern/contemporary drama. Production concerns of mainstream, regional, and community theaters.

ENGL 3300. Multicultural American Literatures and Cultures. (3 cr [max 9 cr])
Writings of specific ethnic groups. Emphasizes historical or cultural context. Topics may include American minority drama, Harlem Renaissance, Asian-American literature/film, African-American women writers. Topics specified in *Class Schedule*.

ENGL 3330. Gay, Lesbian, Bisexual, and Transgendered Literature. (3 cr [max 9 cr])
Literature/culture produced by/about gay, lesbian, bisexual, and transgendered people. Emphasizes importance of materials falsified/ignored in earlier literary/cultural studies. How traditional accounts need to be revised in light of significant contributions of GLBT people.

ENGL 3350. Women Writers. (3 cr [max 9 cr])
Groups of writers in the 19th and/or 20th centuries. Will focus either on writers from a single country or be comparative in nature. The course will be organized thematically or according to topics of contemporary and theoretical interest.

ENGL 3350H. Honors: Women Writers. (3 cr. Prereq–CLA honors or Δ)
Groups of writers in 19th or 20th century. Either focuses on writers from a single country or is comparative. Organized thematically or according to topics of contemporary/theoretical interest.

ENGL 3351W. Voices from the Gaps: Writing and Art by Women of Color. (4 cr)
Collaborative/individual student research, writing, and Web site production for VG (Voices from the Gaps). Focuses on visual arts, film, music, and literature by North American women writers of colour. Texts/discussions in English.

ENGL 3400. Post-Colonial Literatures. (3 cr [max 9 cr])
Varied topics in post-Colonial literatures. Typical novelists include Chinua Achebe, Tsitsi Dangaremba, Fadia Faqir, Salman Rushdie; filmmaker Kidlat Tahimik; and "dub" poets Mutabaruka and Jean Binta Breeze.

ENGL 3501. Public Discourse: Reading Between and Beyond the Lines. (3 cr)
Public discourse in various geographic regions and historical periods. See *Course Guide* for specific course description.

ENGL 3505. Community Learning Internships I. (3 cr; A-F only)
Connections between literature/literacy, theory/practice, community work and academic study. Students work as interns in local community-based education projects. Interns meet with faculty and community representatives to reflect on daily work and practical relevance. Students receive initial training from Career and Community Learning Center and Minnesota Literacy Council, and orientations at community sites. Four hours weekly work at community site, readings, journal writing, monthly short papers.

ENGL 3506. Learning Internships II. (4 cr; A-F only. Prereq–3505 in preceding semester or #)
Students work at a community site. In weekly meetings with faculty and community representatives, students explore relationship between their academic skills and community experiences. Social functions of literacy and liberal education in the United States. Eight hours weekly work at community site, readings in history/theory of literacy, written reflection exercises, design/execution of scholarly or educational project at community site.

ENGL 3591. Introduction to African American Literature. (4 cr. §AFRO 3591W)
Afro-American autobiography, fiction, essay, poetry, drama, and folklore from the late 18th century to the present.

ENGL 3592W. Introduction to Black Women Writers in the United States. (3 cr)
Literature of African American women writers explored in novels, short stories, essays, poetry, autobiographies, drama from 18th to late-20th century.

ENGL 3597W. Introduction to African American Literature and Culture I. (4 cr)
African American oral tradition, slave narrative, autobiography, poetry, essay, fiction, oratory, and drama, from colonial era through Harlem Renaissance.

ENGL 3601. Analysis of the English Language. (4 cr)
Introduction to structure of English. Phonetics, phonology, morphology, syntax, semantics. pragmatics. Language variation/usage.

ENGL 3711. Literary Magazine Production and History. (4 cr)
Literary magazine production and history

ENGL 3713. Editing for Publication. (4 cr. Prereq–Soph or jr or 1st sem sr)
Practice professional editing of various kinds of texts (e.g., scientific/technical writing). Introduction to editing levels, from substantive revision to copyediting. Computer-mediated editorial practices.

ENGL 3741. Literacy and American Cultural Diversity. (4 cr)
Nature, acquisition, institutionalization, and state of literacy in the United States. Focuses on issues of culturally diverse, disadvantaged members of society. Service-learning component requires tutoring of children/adults in community service agencies.

ENGL 3751W. Seminar: Theory and Practice of Writing Consultancy. (4 cr. Prereq–Currently working in a University writing center, instr consent)
How writers learn to write, how writing is taught in the academy, and how rhetorical conventions vary across disciplines.

ENGL 3753W. Writing Beyond the Academy. (4 cr. Prereq–Completion of fr writing requirement, 60 cr)
Internship. Analyses of writing styles, genres, and rhetorical contexts outside the academy.

ENGL 3870. Figures in English and North American Literature. (3 cr [max 9 cr])
Topics specified in the *Class Schedule*.

ENGL 3881. London Seminar. (3 cr. Prereq–Completion of 3xxx level composition requirement, Δ)
Broad topic of literary investigation crossing and integrating several areas of study. Team taught. "Literature in London" program course.

ENGL 3883V. Honors Thesis. (1-4 cr [max 4 cr]; A-F only. Prereq–Honors candidacy in English, consent of English honors advisor)
See guidelines available from English honors adviser.

ENGL 3960W. Senior Seminar. (4 cr; A-F only. Prereq–English major, [jr or sr], major adviser approval, Δ)
Rigorous/intensive seminar. Students write extended scholarly essay. Topics specified in *Class Schedule*.

ENGL 3980. Directed Instruction. (1-6 cr [max 6 cr]. Prereq–#, Δ, ❑)
Directed study arranged between student and advising faculty member.

ENGL 3993. Directed Reading/Study. (1-8 cr [max 3 cr]. Prereq–#, Δ, college approval)
Guided individual study.

ENGL 4003. History of Literary Theory. (3 cr; A-F only)
How thinkers from classical to modern times posed/answered questions about language (how words mean), audience (to whom they mean), and the literary (how literary writing differs from other forms of writing). Works by Plato, Aristotle, Augustine, Christine de Pizan, Dante, Sidney, Behn, Wordsworth, Shelley, and Woolf.

ENGL 4041. Old Age in Film and Literature. (3 cr; A-F only)
How/why subject of old age is focus of a selection of primarily modern verbal/visual texts (fiction, non-fiction). Philosophical, sociological, and psychological perspectives. Ways in which varied experiences of old age have as much to do with culture as with biology.

ENGL 4152. Nineteenth Century British Novel. (3 cr; A-F only)
British novel during the century in which it became widely recognized as a major vehicle for cultural expression. Possible topics include the relation of novel to contemporary historical concerns: rise of British empire, developments in science, and changing roles for women; formal challenges of the novel; definition of realism.

ENGL 4153. Nineteenth-Century British Poetry. (3 cr; A-F only)
Poetry written in Britain during 19th century. Possible authors include Wordsworth, Byron, Hemans, Tennyson, Robert and Elizabeth Browning, D. G. and Christina Rossetti, Swinburne, and Hopkins.

ENGL 4232. American Drama by Writers of Color. (3 cr; A-F only)
Selected works by Asian American, African American, American Indian, Latino, and Chicano playwrights. How racial/ethnic differences are integral to shaping different visions of American drama. History of minority/ethnic theaters, politics of casting, mainstreaming of the minority playwright.

ENGL 4233. Modern and Contemporary Drama. (3 cr; A-F only)
Works written for theater in 19th/20th century. Emphasizes how major aesthetic forms of modern drama (the well-made play, realism, expressionism, symbolism, epic theater, absurdism) presented not just distinctive theatrical styles, but also new ways of .seeing. for the theatrical spectator. How social differences, as informed by gender, class, and race, inform content/presentation.

ENGL 4311. Asian American Literature and Drama. (3 cr; A-F only)
Literary/dramatic works by Asian American writers. Historical past of Asian America through perspective of writers such as Sui Sin Far and Carlos Bulosan. Contemporary artists such as Frank Chin, Maxine Hong Kingston, David Henry Hwang, and Han Ong. Political/historical background of Asian American artists, their aesthetic choices.

ENGL 4602W. Gender and the English Language. (4 cr. Prereq–§: 3602W)
Connections between gender and other social factors that influence history/future of English language. Race, ethnicity, class, regional/national variation, religion, technology. Gender theories as they relate to social issues, texts, and discourse practices.

ENGL 4603W. World Englishes. (4 cr)
Historical background, psychosocial significance, and linguistic characteristics of diverging varieties of English spoken around world, especially in postcolonial contexts (Caribbean, Africa, Asia). Development of local standards/vernaculars. Sociolinguistic methods of analysis.

ENGL 4605. Social Variation in American English. (4 cr)
Description/analysis of English language variation from sociohistorical perspective in the United States and the Caribbean. Social history of migrations (voluntary, enforced) leading to development of regional/rural dialects, pidgins, creoles, and urban varieties.

ENGL 4612. Old English I. (3 cr)
Introduction to the language through 1150 A.D. Culture of Anglo-Saxons. Selected readings in prose/poetry.

ENGL 4613. Old English II. (3 cr. §ENGL 5613. Prereq–3612, 3613, 4612)
Critical reading of texts. Introduction to versification. Readings of portions of Beowulf.

ENGL 4721. Electronic Text. (3 cr. §ENGL 5632)
Status/function of text, related questions as framed by electronic text.

ENGL 4722. Alphabet to Internet: History of Writing Technologies. (4 cr)
Equivocal relation of memory and writing. Literacy, power, control. Secrecy and publicity. Alphabetization and other ways of ordering world. Material bases of writing. Typographical design/expression. Theories of technological determinism.

ENGL 4752. Seminar: Theory and Practice of Tutoring Writing. (3 cr; A-F only. Prereq–#)
Teaching writing through one-on-one tutorials. How writers learn to write. How writing is taught in the academy. How rhetorical conventions and views of literacy vary across disciplines. Students practice tutoring strategies in class activities and in a writing center.

ENGL 5001. Introduction to Methods in Literary Studies. (3 cr. Prereq–Grad or #)
Ends/methods of literary research, including professional literary criticism, analytical bibliography, and textual criticism.

ENGL 5002. Introduction to Literary and Cultural Theory. (3 cr. Prereq–Grad or #)
Approaches to practical/theoretical problems of literary history/genre.

ENGL 5030. Readings in Drama. (3 cr [max 9 cr]. Prereq–Grad student or #)
Wide reading in literature of a given period or subject. Prepares students for work in other courses/seminars. Relevant scholarship/criticism. Topics specified in *Class Schedule*.

ENGL 5090. Readings in Special Subjects. (3-4 cr [max 9 cr]. §ENGL 5100. Prereq–Grad student or #)
General background preparation for advanced study. Diverse selection of literatures written in English, usually bridging national cultures and time periods. Readings specified in *Class Schedule*.

ENGL 5110. Readings in Middle English Literature and Culture. (3 cr [max 9 cr]. Prereq–Grad student or #)
Wide reading in literature of period. Relevant scholarship/criticism. Topics vary. See *Class Schedule*.

ENGL 5121. Readings in Early Modern Literature and Culture. (3 cr [max 9 cr]. Prereq–Grad student or #)
Topical readings in early modern poetry, prose, fiction, and drama. Attention to relevant scholarship or criticism. Preparation for work in other courses or seminars.

ENGL 5140. Readings in 18th Century Literature and Culture. (3 cr. §ENGL 3141. Prereq–Grad student or #)
Literature written in English, 1660-1798. Topics may include British literature of Reformation and 18th century, 18-century American literature, a genre (e.g., 18th-century novel).

ENGL 5150. Readings in 19th-Century Literature and Culture. (3 cr [max 9 cr]. Prereq–Grad student or #)
Topics may include British Romantic or Victorian literatures, American literature, important writers from a particular literary school, a genre (e.g., the novel). Readings.

ENGL 5170. Readings in 20th-Century Literature and Culture. (3 cr [max 9 cr]. Prereq–Grad student or #)
British, Irish, or American literatures, or topics involving literatures of two nations. Focuses either on a few important writers from a particular literary school or on a genre (e.g., drama). Topics specified in *Class Schedule*.

ENGL 5175. 20th-Century British Literatures and Cultures I. (3 cr)
Survey of principal writers, intellectual currents, conventions, genres and themes in Britain/Ireland, 1900-1945. Fiction/nonfiction by Conrad, Richardson, Forster, Joyce, Mansfield, Rhys, West, Woolf, Lawrence and Huxley. Poetry by Hardy, Hopkins, Loy, H.D., Yeats, Pound and Eliot. Drama by Synge and Shaw.

ENGL 5176. 20th-Century British Literatures and Cultures II. (3 cr)
Survey of principal writers, intellectual currents, conventions, genres, and themes in Britain/Ireland, 1945-1999. Fiction/nonfiction by Greene, Bowen, Amis, Fowles, Lessing, Drabble, Murdoch, Naipaul, Carter, Rushdie, and Winterson. Poetry by Smith, Auden, Thomas, Larkin, Hughes, Heaney, Smith, Boland, and Walcott. Drama by Beckett, Pinter, Shaffer, Stoppard, Devlin, Friel, and Carr.

ENGL 5180. Readings in Contemporary Literature and Culture. (3 cr. Prereq–Grad student or #)
Multi-genre reading in contemporary American, British, Anglophone literature. Relevant scholarship/criticism. Topics vary. See *Class Schedule*.

ENGL 5200. Readings in American Literature. (3 cr [max 9 cr]. Prereq–Grad student or #)
General background/preparation for advanced graduate study. Readings cover either a wide historical range (e.g., 19th century), a genre (e.g., the novel), or a major literary movement (e.g., Modernism).

ENGL 5300. Readings in American Minority Literature. (3 cr [max 9 cr]. Prereq–Grad or #)
Contextual readings of 19th-/20th-century American minority writers. Topics specified in *Class Schedule*.

ENGL 5400. Readings in Post-Colonial Literature. (3 cr [max 9 cr]. Prereq–Grad student or #)
Selected readings in post-colonial literature. Topics specified in *Class Schedule*.

ENGL 5510. Readings in Criticism and Theory. (3 cr [max 9 cr]. Prereq–Grad or #)
Major works of classical criticism in the English critical tradition from Renaissance to 1920. Leading theories of criticism from 1920 to present. Theories of fiction, narratology. Feminist criticisms. Marxist criticisms. Psychoanalytic criticisms. Theories of postmodernism.

ENGL 5593. The AFRO-American Novel. (3 cr. §AFRO 4593)
Contextual readings of 19th-/20th-century black novelists, including Chesnut, Hurston, Wright, Baldwin, Petry, Morrison, and Reed.

ENGL 5597. Harlem Renaissance. (3 cr. §AFRO 4597)
Multidisciplinary review of Jazz Age's Harlem Renaissance: literature, popular culture, visual arts, political journalism, major black/white figures.

ENGL 5602. Gender and the English Language. (3 cr. Prereq–Grad student or #)
Introduction to features of English that are gender-marked or gender-biased. Connections between language theory and social structures, including class and ethnicity. Patterns of women's/men's speech in specific social contexts. Gender and writing. Sociolinguistics and sexual orientation.

ENGL 5603. World Englishes. (3 cr. Prereq–Grad student or #)
Historical background, psychosocial significance, and linguistic characteristics of diverging varieties of English spoken around world, especially in postcolonial contexts (Caribbean, Africa, Asia). Development of local standards/vernaculars. Sociolinguistic methods of analysis.

ENGL 5605. Social Variation in American English. (3 cr. Prereq–Grad student or #)
Description/analysis of English language variation from sociohistorical perspective in the United States and the Caribbean. Social history of voluntary/enforced migrations leading to development of regional/rural dialects, pidgins, creoles, and urban varieties.

ENGL 5612. Old English I. (3 cr. §ENGL 3612. Prereq–Grad student or #)
Introduction to the language through A.D. 1150. Anglo-Saxon culture. Selected readings in prose/poetry.

ENGL 5613. Old English II. (3 cr. §ENGL 4613. Prereq–[[3612 or 5612], grad student] or #)
Critical reading of texts, introduction to versification. Reading of Beowulf.

ENGL 5621. Modern Irish Language I. (4 cr [max 5 cr]. Prereq–jr or sr or grad or #)
Grammatical structures of modern Irish dialect of Connemara, Co. Galway. Development of oral/written language skills: vocabulary, manipulation of grammatical structures, speaking, listening, reading, writing. Modern Gaelic culture.

ENGL 5622. Modern Irish Language II. (5 cr. Prereq–5621 or #)
Grammatical structures of modern Irish dialect. Development of oral/written language skills: vocabulary, manipulation of grammatical structures, speaking, listening, reading, writing. Modern Gaelic culture.

ENGL 5630. Theories of Writing and Writing Instruction. (3 cr. Prereq–Grad student or #)
Introduction to major theories that inform teaching of writing in college and upper-level high school curriculums. Topics specified in *Class Schedule*.

ENGL 5690. Minnesota Writing Project: Directed Studies. (1-3 cr [max 30 cr]. Prereq–#)
Workshops. Theories of writing and writing pedagogy. Writing for publication. Research topics in applied literacy.

ENGL 5711. Introduction to Editing. (4 cr)
Editor-writer relationship, manuscript reading, author querying, rewriting, style. Some discussion of copy editing. Students develop editing skills by working on varied writing samples.

ENGL 5712. Advanced Editing. (4 cr. Prereq–5401 or 5711 or Δ)
Editing long text. Fiction, children's literature, translations, indexes. Workshop/seminar.

ENGL 5743. History of Rhetoric and Writing. (3 cr. Prereq–Grad student or #)
Assumptions of classical/contemporary rhetorical theory, especially as they influence interdisciplinary field of composition studies.

ENGL 5790. Topics in Rhetoric, Composition, and Language. (3 cr. Prereq–Grad student or #)
Topics specified in *Class Schedule*.

ENGL 5800. Practicum in the Teaching of English. (2 cr. Prereq–Grad student or #)
Discussion of and practice in recitation, lecture, small-groups, tutoring, individual conferences, and evaluation of writing/reading. Emphasizes theory informing effective course design/teaching for different disciplinary goals. Topics vary. See *Class Schedule*.

ENGL 5805. Writing for Publication. (3 cr. Prereq–Grad student in ENGL or #)
Conference presentations, book reviews, revision of seminar papers for journal publication, and preparation of a scholarly monograph. Style, goals, and politics of journal and university press editors/readers. Electronic publication. Professional concerns.

ENGL 5880. General Topics. (3 cr [max 9 cr])
Topics specified in the *Class Schedule*.

ENGL 5992. Directed Readings, Study, or Research. (1-3 cr [max 45 cr]. Prereq–#, ❑)

Entomology (ENT)

Department of Entomology

College of Food, Agricultural and Natural Resource Sciences

ENT 1905. Topics: Freshman Seminar. (1-3 cr [max 3 cr]. Prereq–Fr)

ENT 3005. Insect Biology. (3 cr)
Survey of diverse biology of insects. Insect behavior (including social insects), pollination, herbivory, insects as disease vectors, beneficial insects, insect population dynamics/ecology. Emphasizes insects' role in agricultural, urban, natural systems. Lecture/lab.

ENT 3925. Insects, Aquatic Habitats, and Pollution. (3 cr; A-F only. Prereq–[[3005 or BIOL 3407 or FW 2001], [jr or sr]] or #)
Effects differing classes of pollutants have on insects that are aquatic. Insect life-cycle dynamics, trophic guilds, community structure. Hypotheses to explain community structure in streams, rivers, wetlands, ponds, lakes, reservoirs. Organic pollution, eutrophication, heavy metal pollution, runoff/siltation, acidification, thermal pollution. Changes in aquatic insect community structure. Designing/maintaining biological monitoring networks.

ENT 4015. Ornamentals and Turf Entomolgy. (3 cr. Prereq–1xxx course in BIOL or hort or forest resources)
Diagnosis and management of insect pests in landscape plants. Emphasis on the principles of biological control, biorational pesticides, and integrated pest management.

ENT 4021. Honey Bees and Insect Societies. (3 cr. Prereq–BIOL 1009 or #)
Natural history, identification, and behavior of honey bees and other social insects. Evolution of social behavior, pheromones and communication, organization and division of labor, social parasitism. Lab with honey bee management and maintenance of other social bees for pollination.

ENT 4022. Honey Bee Management. (1 cr. Prereq–BIOL 1009 or #; ¶4021 recommended)
Field course for students interested in honey bee management and the conservation and maintenance of other bee pollinators. Work with live bee colonies and participate in field research problems related to honey bee behavior and management.

ENT 4096. Professional Experience Program: Internship. (1-3 cr [max 3 cr]; S-N only. Prereq–COAFES jr or sr, complete internship contract available in COAFES Career Services before enrolling, UC only, #)
Professional experience in entomology firms or government agencies through supervised practical experience; evaluative reports and consultations with faculty advisers and employers.

ENT 4231. Insect Behavior. (3 cr; A-F only. Prereq–BIOL 1009 or equiv or #; [3005 or EEB 3111] recommended)
Diversity of behavior in insects. Modes of perception, ways in which stimuli are translated into behavior. Genetic basis of behavior. Behavioral traits with Mendelian and more complex modes of inheritance. Natural history of insect behavior. Emphasizes how evolution has shaped diversity of behaviors. Movement/dispersal, feeding, defense/escape, mating/reproduction, sociality. Case studies.

ENT 4251. Forest and Shade Tree Entomology. (3 cr)
Biology, ecology, population management of forest/shade tree insects. Emphasizes predisposing factors/integrated management. Lecture/lab. Required Saturday field trip on second weekend of semester.

ENT 4281. Veterinary Entomology. (3 cr; A-F only)
Biology/management of insects, mites, ticks that affect livestock, poultry, companion animals. Emphasizes problem identification/solving. Lecture, lab.

ENT 5011. Insect Structure and Function. (4 cr; A-F only. Prereq–3005 or #)
Comparative study of insect structures/functions from evolutionary perspective. Introduction to physiology of digestion, respiration, other organ systems.

ENT 5021. Insect Taxonomy and Phylogeny. (4 cr)
Identification of families of adult insects. Evolution/classification of insects. Techniques of collecting/curating insects. Principles of phylogeny reconstruction.

ENT 5041. Insect Ecology. (3 cr. Prereq–BIOL 5041 or EBB 5122 or #)
Synthetic analysis of the causes of insect diversity and of fluctuations in insect abundance. Focus on abiotic, biotic, and evolutionary mechanisms influencing insect populations and communities.

ENT 5045. Insect Population Dynamics. (3 cr; A-F only. Prereq–3005 or #)
Analytical/experimental approaches to study of insect abundance. Path/loop diagrams, time series analyses. Life tables and demography. Single-/multiple-species models for population growth/interactions with competitors. Predators/pathogens in time/space.

ENT 5051. Scientific Illustration of Insects. (3 cr)
Traditional/computer-assisted techniques of scientific illustration. Emphasizes insects. Pencil, pen/ink, color (water color, acrylics, colored pencil). Vector/raster illustration using Adobe Illustrator and Adobe Photoshop. Digital photography, microscopy, photomontage, traditional/electronic publication.

ENT 5081. Insects, Aquatic Habitats, and Pollution. (3 cr; A-F only. Prereq–[3005, BIOL 3407, FW 2001, EEB 4601] or #)
Effects of pollutants on biology. Ecology and community structure of aquatic insects. Life-cycle, trophic guilds, community structure in lotic/lentic habitats. Organic pollution/eutrophication, heavy metal pollution, runoff/siltation, acidification, thermal pollution. Changes in aquatic insect community structure according to original literature sources for each class of pollutant. Biological monitoring networks.

ENT 5121. Applied Experimental Design. (4 cr. §AGRO 5121. Prereq–STAT 5021 or equiv or #)
Principles of sampling methodologies, experimental design, and statistical analyses. Methods/procedures in generating scientific hypotheses. Organizing, initiating, conducting, and analyzing scientific experiments using experimental designs and statistical procedures. Offered with AGRO 5121.

ENT 5211. Insect Pest Management. (3 cr. Prereq–3005 or #)
Prevention or suppression of injurious insects by integrating multiple control tactics, e.g., chemical, biological, cultural. Strategies to optimize the dynamic integration of control methodologies in context of their economic, environmental, and social consequences.

ENT 5241. Ecological Risk Assessment. (3 cr. Prereq–#)
Evaluating current/potential impact of physical, chemical, biological agents on ecosystems. Identifying ecological stressors, assessing level of exposure, measuring ecological responses, communicating/managing risks. Class participation, two reaction papers, final exam, small-group project.

ENT 5275. Medical Entomology. (3 cr. Prereq–#)
Biology of arthropod vectors of human disease. Emphasizes disease transmission and host, vector, and pathogen interactions.

ENT 5321. Ecology of Agricultural Systems. (3 cr; A-F only. §AGRO 5321. Prereq–[[3xxx or above] course in [AGRO or ANSC or Hort], [3xxx or above] course in [Ent or PLPA or Soil]] or #)
Ecological approach to problems in agricultural systems. Formal methodologies of systems inquiry are developed/applied.

ENT 5341. Biological Control of Insects and Weeds. (3-4 cr [max 4 cr]; A-F only. Prereq–3001, BIOL 1009, EEB 3001 or grad)
Biological control of arthropod pests and weeds. Analysis of relevant ecological theory and case studies; biological control agents. Lab includes natural enemy identification, short experiments, and computer exercises.

ENT 5351. Insect Pathology. (2 cr. Prereq–5011)
Major pathogenic microorganisms that cause diseases in insects. Routes of infection of insects. Lab propagation of disease agents. Factors in application of disease to pest insect control. Safety considerations.

ENT 5361. Aquatic Insects. (4 cr; A-F only. Prereq–#)
Taxonomy, natural history of aquatic insects including their importance in aquatic ecology, water resource management, recreation, and conservation. Emphasizes family-level identification of immatures/adults. Field trips scheduled to local aquatic habitats. A collection is required.

ENT 5371. Principles of Systematics. (3 cr. Prereq–#; offered alt yrs)
Theoretical/practical procedures of biological systematics. Phylogeny reconstruction, including computer assisted analyses, morphological/molecular approaches, species concepts, speciation, comparative methods, classification, historical biogeography, nomenclature. Use/value of museums.

ENT 5481. Invertebrate Neurobiology. (2-3 cr [max 3 cr]. §NSC 5481)
Fundamental principles/concepts underlying cellular bases of behavior/systems neuroscience. Particular invertebrate preparations.

ENT 5900. Basic Entomology. (1-6 cr [max 12 cr]. Prereq–#)
For graduate students who need to make up certain deficiencies in their biological science background.

Ent 5910. Special Problems in Entomology. (1-6 cr [max 10 cr]. Prereq–#)
Individual field, lab, or library studies in various aspects of entomology.

ENT 5920. Special Lectures in Entomology. (1-3 cr [max 3 cr])
Lectures or labs in special fields of entomological research. Given by visiting scholar or regular staff member.

Environmental Sciences, Policy, and Management (ESPM)

Department of Environmental Sciences, Policy, and Management

College of Food, Agricultural and Natural Resource Sciences

ESPM 1001. Orientation to Environmental Sciences, Policy, and Management. (1 cr; A-F only)
Academic planning, ESPM careers, liberal education requirements, internships. Building relationships with other students/faculty, student life, information technology, critical computer skills.

ESPM 1003H. Honors Colloquium. (1 cr [max 2 cr]; A-F only. Prereq–Lower division honors, #)
Lectures from experts, readings, discussions of current environmental topics/issues. Topics vary, see *Class Schedule*.

ESPM 1011. Issues in the Environment. (3 cr)
Introduction to environnmental sciences, management of the environment. Ethics, historical perspectives on current condition. How values influence problem definition, use of natural/social sciences in integrated problem solving. Comparative historical reflection on problem of solving overtime. Public/private factors. Ethical professionalism within integrated environmental teams.

ESPM 1425. The Atmosphere. (4 cr; A-F only. §GEOG 1425)
Basic physical, chemical, and biological processes that drive changes in Earth's weather/climate. Radiation and energy exchange, greenhouse effect, stratospheric ozone depletion, severe weather hazards, general circulation of atmosphere. Climate teleconnections, including El Nino. Impacts of human activities on climate. Weekly field/computer labs investigate how weather/climate data are measured, analyzed, and interpreted. All lecture and lab material are made available on the course Web site.

ESPM 1480. Topics in Natural Resources. (1-4 cr [max 6 cr]. Prereq–Lower div)
Lectures by visiting scholar or regular staff member. Topics specified in *Class Schedule*.

ESPM 1901. Topics: Freshman Seminar. (3 cr. Prereq–Fr)
Topics vary.

ESPM 1901H. Topics: Freshman Seminar. (3 cr. Prereq–Fr)
Topics vary.

ESPM 2041. Natural Resources Consumption and Sustainability. (3 cr)
Trends in national/global population growth, economic growth, and consumption of food, energy, minerals, wood, and other raw materials. Natural resources as raw materials for industry and for economic development. Environmental/economic trade-offs in gathering, processing, and use. Balancing consumption and environmental needs. Environmental impacts of extraction/use. Sustainability.

ESPM 3000. Seminar on Current Issues for ESPM. (1 cr [max 6 cr]; A-F only. Prereq–Jr)
Environmental issues students will have to address in their future careers. Small group discussion, in-depth/focused intellectual debate. Topics depend on faculty selection or student interest.

ESPM 3001. Treaty Rights and Natural Resources. (3 cr; A-F only. §ESPM 5001)
Readings, class discussion about nature of treaty rights reserved by indigenous Americans with respect to utilization of natural resources. Emphasizes Midwest issues. Web-assisted course.

ESPM 3002. Colloquium: Exotic Plants and Animals. (1 cr; A-F only)
Current exotic plants/animals in Great Lakes region and around the world. Gypsy moths, brown tree snakes, zebra mussels, Eurasian watermilfoil. Impact/control. Readings, discussions, and lectures from experts on topics such as invasion theory and real world management.

ESPM 3011W. Ethics and Leadership in Resource Management. (3 cr)
Normative/professional ethics, and leadership considerations, applicable to managing natural resources and the environment. Readings, discussion.

ESPM 3021. Ecological Vegetation Management: a Consulting Approach. (3 cr. §ESPM 5021. Prereq–BIOL 3407 or EEB 3001 or FR 3104 or equiv)
Application of ecological concepts such as succession/competition to ecosystems under management. Wetlands, riparian zones, urban interfaces, agriculture, agroforestry. Northern/boreal conifer, hardwood forests, grasslands (prairie). Management objectives, methods, impacts. Evaluating practices for sustainability. Social issues. Regional (Great Lakes area), national, global case studies.

ESPM 3031. Applied Global Positioning Systems for Geographic Information Systems. (3 cr; A-F only. §ESPM 5031. Prereq–Intro GIS course, [jr or sr])
GPS principles, operations, techniques to improve accuracy. Datum, projections, and coordinate systems. Differential correction, accuracy assessments discussed/applied in lab exercises. Code/carrier phase GPS used in exercises. GPS handheld units, PDA based ArcPad/GPS equipment. Transferring field data to/from desktop systems, integrating GPS data with GIS.

ESPM 3101. Conservation of Plant Biodiversity. (3 cr; A-F only. §ESPM 5101. Prereq–BIOL 1001 or BIOL 1009)
Introduction to principles underlying assessment/conservation of plant biodiversity at individual, population, and community levels. Case studies in management of biodiversity to restore/maintain ecosystem function. Issues such as genetics, timber harvesting, invasive species, plant reproduction.

ESPM 3111. Hydrology and Water Quality Field Methods. (3 cr; A-F only. §ESPM 5111. Prereq–4061 or EEB 4601 or GEO 4601 or FR 3114)
Integrates water quality, surface/groundwater hydrology. Case studies, hands-on field data collection, calculations of hydrological/water quality parameters. Meteorological data, snow hydrology, stream gauging, well monitoring, automatic water samplers. Designing water quality sampling program. Geomorphology, interception, infiltration.

ESPM 3128. Seminar: Environmental Science. (1 cr; S-N only)
Students analyze environmental topics presented by guest speakers. Job opportunities in environmental science. Resume writing, interviewing skills.

ESPM 3131. Environmental Physics. (3 cr; A-F only. Prereq–PHYS 1101)
Concepts/principles of classic/modern physics applied to environmental problems arising from interaction between humans and the natural environment. Forms of pollution (e.g., land, water, air). Transport mechanisms. Anthropogenic greenhouse gas emissions. Global climate change. Social issues related to environmental problems.

ESPM 3202W. Environmental Conflict Management, Leadership, and Planning. (3 cr; A-F only. §ESPM 5202)
Negotiation of natural resource management issues. Use of collaborative planning. Case study approach to conflict management, strategic planning, and building leadership qualities. Emphasizes analytical concepts, techniques, and skills.

ESPM 3207. Emerging Issues in Tropical Agriculture and Forestry: Costa Rica. (3 cr. §ESPM 5207. Prereq–[Jr or sr], #)
Experiential learning through field trips. From conventional to organic bird-friendly coffee production/marketing to sustainable management of high-/low-land tropical forests and biodiversity. Lectures, seminars, labs field work, written project. A travel short course offered thru CATIE/UofM.

ESPM 3211. Survey, Measurement, and Modeling for Environmental Analysis. (3 cr. §ESPM 5211. Prereq–[MATH 1031 or MATH 1051], [STAT 3011 or FW 4001], computer competency)
Introduction to survey, measurement, and modeling concepts/methods for study of natural resources and environmental issues. Emphasizes survey design for data collection, estimation, and analysis for issues encompassing land, water, air, vegetation, animal, soil, and human/social variables.

ESPM 3221. Soil Conservation and Land-Use Management. (3 cr. Prereq–1125 or 2125 or #)
Water quality impacts of soil erosion, including nutrient transport to surface waters. Causes/consequences of soil erosion. Physical processes of wind/water erosion. Soil conservation techniques for agriculture, forestry, mining, and urban land uses. Economic, political, and sociological influences on soil conservation. Strategies for reducing nutrient losses to surface waters.

ESPM 3241W. Natural Resource and Environmental Policy: History, Creation, and Implementation. (3 cr. §ESPM 5241)
Basic concepts of political/administrative processes important to natural resource policy and program development. Case study approach to policy/legislative process, participants in policy development, and public programs. Federal/state laws/regulations, international issues.

ESPM 3245. Sustainable Land Use Planning and Policy. (3 cr; A-F only. §ESPM 5245. Prereq–All lower div RRM reqs or #)
Overview of policies that affect recreation at local, state, and federal levels. Landscape-level planning. Collaborative relationships as means to implement sustainable natural/social policy. Class project involves all aspects of implementing recreation policy, from public meetings to hands-on evaluation of options.

ESPM 3251. Natural Resources in Sustainable International Development. (3 cr; A-F only. §ESPM 5251, LAS 3251)
International perspectives on resource use in developing countries. Integration of natural resource issues with social, economic, and policy considerations. Overviews of agriculture, forestry, agroforestry, non-timber forest products, water resources, certification, and development issues. Latin American case studies.

ESPM 3261W. Economics and Natural Resources Management. (4 cr; A-F only. §ESPM 5261)
Introduction to microeconomic principles, Rrelationship of economic principles to natural resource management. Tools to address market failure, project analysis. Economic/financial considerations. Benefit/cost analysis. Valuation/assessment methods for property/resources. Planning/management problems. Managing renewable natural resources.

ESPM 3480. Topics in Natural Resources. (1-4 cr [max 6 cr])
Lectures by visiting scholar or regular staff member. Topics specified in *Class Schedule*.

ESPM 3575. Wetlands Conservation. (3 cr. §ESPM 5575)
Freshwater wetland classification, wetland biota, current/historic status of wetlands, value of wetlands. National, regional, Minnesota wetlands conservation strategies, ecological principles used in wetland management.

ESPM 3601. Our Home, Our Environment. (3 cr; A-F only. §DHA 3482)
Effects of people and their homes on the environment. Energy/resource efficiency, environmental responsibility, occupant health. Affordability issues with respect to housing. Design, construction, renovation, retrofitting, landscaping. Consumer options for lighting, weatherization, water use, emissions, waste reduction, recycling, air quality, hazardous materials, and housing growth.

ESPM 3602. Regulatory and Ethical Frameworks for CEM. (3 cr. Prereq–APEC 1101 or ECON 1101 or 3261W)
Concepts/issues relating to industrial ecology and industry as they are influenced by current standards/regulations at local, state, and national levels.

ESPM 3603. Environmental Life Cycle Analysis. (3 cr. §MGMT 3603. Prereq–[MATH 1142 or [MATH 1271, MATH 1272]], [APEC 1101 or ECON 1101 or 3261W])
Concepts/issues relating to inventory, subsequent analysis of production systems. Production system from holistic point of view, using term commonly used in industrial ecology: "metabolic system."

ESPM 3604. Environmental Management Systems and Strategy. (3 cr. §ESPM 5604)
Environmental problems such as climate change, ozone depletion, and loss of biodiversity.

ESPM 3605. Recycling: Extending Raw Materials. (3 cr. §ESPM 5605)
Principles of recycling. Role of recycling in raw materials utilization, energy, and the environment. Recycling processes for commonly recycled materials/products. Properties, environmental implications of recycling.

ESPM 3606. Minimizing Industrial Emissions. (3 cr. §ESPM 5606. Prereq–CHEM 1011, or #)
Fundamental waste streams and pollution control technologies in natural resource conversion.

ESPM 3612W. Soil and Environmental Biology. (3 cr. Prereq–BIOL 1009 or equiv, CHEM 1021 or equiv; 2125 recommended)
Properties of microorganisms that impact soil fertility, structure, and quality. Nutrient requirements of microbes and plants, and mineral transformations in biogeochemical cycling. Symbiotic plant/microbe associations and their role in sustainable agricultural production. Biodegradation of pollutants and bioremediation approaches.

ESPM 3703. Agroforestry in Watershed Management. (3 cr. §ESPM 5703)
Biological, physical, and environmental attributes of agroforestry as pertains to watershed management. Coupling production with watershed protection benefits. Implications for policy, economics, and human dimensions in sustainable development. Examples, case studies from N Amer and from developing countries.

ESPM 4021W. Environmental Impact Statements. (3 cr)
Roles of governmental agencies, consultants, and private citizens in EIS process. Students read EIS/EAW, analyze their content/scope, and prepare an EAW and an EIS according to Minnesota EQB guidelines.

ESPM 4061W. Water Quality and Natural Resources. (3 cr. §ESPM 5061)
Issues, parameters, and decision making strategies for managing surface/groundwater resources in Minnesota and globally. Biophysical and human side of water management. Wetlands, exotic species, heavy metal deposition. Cultural, political, and societal dimensions. Case studies, discussions, problem-solving, debates, projects.

ESPM 4093. Directed Study. (1-7 cr [max 20 cr]. Prereq–#)
Research, readings, and instruction.

ESPM 4094. Directed Research. (1-7 cr [max 7 cr]. Prereq–#)
Research under the direction of department faculty.

ESPM 4096. Professional Experience Program: Internship. (1-3 cr [max 6 cr]. Prereq–CFANS undergrad, #, completed internship contract)
Students create oral/written report based on paid or volunteered work or field experience.

ESPM 4195W. Problem Solving and Planning in Natural Resources. (4 cr; A-F only. Prereq–ESPM sr)
Applying problem solving tools/skills in policy, planning, and managerial situations. Students work with "real world" clients, produce publishable technical report, and present their results in a professional public forum.

ESPM 4200H. Honors Seminar. (1 cr; A-F only. Prereq–ENR upper div honors, #)
Topics presented by faculty, students, guest speakers. Lecture/discussion.

ESPM 4216. ContAMINant Hydrology. (2 cr; A-F only)
Principles of contaminant transport in percolate solution and in overland flow. Hydrologic cycle, percolation/runoff processes, contaminant transport, leachate sampling methods, remediation technologies, scale effects on runoff water quality, tillage technologies, control of sediment/chemical losses. Discussions mostly descriptive, but involve some computations.

ESPM 4295W. GIS in Environmental Science and Management. (4 cr; A-F only. §ESPM 5295. Prereq–FR 3131 or #)
Application of spatial data inventory/analysis in complex environmental planning problems. Spatial data collection, database development methods including GPS, DLG, TIGER, NWI data, spatial analysis. Topics identified by non-University partners.

ESPM 4601. Soils and Pollution. (3 cr. Prereq–[2125, [CHEM 1021 or equiv], [PHYS 1042 or equiv]] or #; 3416 recommended)
Principles of microbiology, chemistry, physics applied to evaluation of pollution of soils. Mitigation of pollution in agricultural/urban settings, remediation of polluted sites.

ESPM 4607. Industrial Biotechnology and the Environment. (2 cr §ESPM 5607. Prereq–BIOC 2011)
Biotechnology pertaining to biobased products development, their environmental impact.

ESPM 4608. Bioremediation. (2 cr §ESPM 5608. Prereq–[BIOL 1001 or BIOL 1009], CHEM 1011, BIOC 2011)
Use of organisms in remediation of waste/pollution problems related to bio-based product industries. Types, characteristics, and identification of useful microorganisms. Applications of microbes to benefit industrial processes of wood and fiber.

ESPM 4801H. Honors Research. (2 cr; A-F only. Prereq–ENR upper div honors, #)
Independent research project supervised by faculty member.

ESPM 4802H. Honors Research. (2 cr; A-F only. Prereq–ENR upper div honors, #)
Completion of honors thesis. Oral report.

ESPM 4811. Environmental Interpretation. (3 cr; A-F only. §ESPM 5811. Prereq–Jr or sr or grad student)
Theories of interpretation. Nonformal teaching pedagogy. Interpretive talks, walks, and programs. Camp leadership, oral presentation. Newsletter development, Web site design. Development of self-guided trail guides, brochures, and exhibits. Planning, evaluation. Interpretive work in private, state, or federal agencies. First-hand experience.

ESPM 5001. Treaty Rights and Natural Resources. (3 cr; A-F only. §ESPM 3001. Prereq–Grad student or #)
Readings, class discussion about treaty rights reserved by indigenous Americans with respect to use of natural resources. Emphasizes Midwest issues. Web-assisted course.

ESPM 5002. Colloquium: Restoration of Stream Ecosystems. (1 cr)
Key concepts/techniques. Overview of stream habitat restoration. Relationship of restoration to natural stream systems, planning, research, watershed groups, interagency coordination, and management decision process.

ESPM 5019. Business, Natural Environment, and Global Economy. (2 cr)
Business strategies that affect natural environment. Ways business strategies/practices can produce win-win outcomes for the environment and business.

ESPM 5021. Ecological Vegetation Management: a Consulting Approach. (3 cr. §ESPM 3021. Prereq–Grad student or #)
Application of ecological concepts such as succession/competition to ecosystems under management. Wetlands, riparian zones, urban interfaces, agriculture, agroforestry. Northern/boreal conifer, hardwood forests, grasslands (prairie). Management objectives, methods, impacts. Evaluating practices for sustainability. Social issues. Regional (Great Lakes area), national, global case studies.

ESPM 5031. Applied Global Positioning Systems for Geographic Information Systems. (3 cr; A-F only. §ESPM 3031. Prereq–Grad student or #)
GPS principles, operations, techniques to improve accuracy. Datum, projections, and coordinate systems. Differential correction, accuracy assessments discussed/applied in lab exercises. Code/carrier phase GPS used in exercises. GPS handheld units, PDA based ArcPad/GPS equipment. Transferring field data to/from desktop systems, integrating GPS data with GIS.

ESPM 5061. Water Quality and Natural Resources. (3 cr. §ESPM 4061W. Prereq–Grad student or #)
Issues, parameters, and decision making for managing surface/groundwater resources in Minnesota and globally. Biophysical/human side of water management. Wetlands, exotic species, heavy metal deposition. Cultural, political, and societal dimensions. Case studies, discussions, problem-solving, debates, projects.

ESPM 5101. Conservation of Plant Biodiversity. (3 cr; A-F only. §ESPM 3101. Prereq–Grad student or #)
Introduction to principles underlying assessment/conservation of plant biodiversity at individual, population, and community levels. Case studies in management of biodiversity to restore or maintain ecosystem function. Genetics, timber harvesting, invasive species, plant reproduction.

ESPM 5111. Hydrology and Water Quality Field Methods. (3 cr; A-F only. §ESPM 3111. Prereq–Grad student or #)
Integrates water quality, surface/groundwater hydrology. Case studies, hands-on field data collection, calculations of hydrological/water quality parameters. Meteorological data, snow hydrology, stream gauging, well monitoring, automatic water samplers. Designing water quality sampling program. Geomorphology, interception, infiltration.

ESPM 5131. Environmental Biophysics and Ecology. (3 cr; A-F only. Prereq–[[BIOL 1009 or equiv], MATH 1271, PHYS 1101, [upper div or grad student]] or #)
Basic concepts of environmental variables such as temperature, humidity, wind, and radiation. Mechanics of heat/mass transfer between a living organism and its surrounding environment. Set of practical examples to integrate concepts and transport processes.

ESPM 5195. Problem Solving and Planning in Natural Resources. (4 cr; A-F only. Prereq–Grad student or #)
Applying problem solving tools/skills in policy, planning, and managerial situations. Students work with 'real world' client to produce publishable technical report, present results in professional public forum.

ESPM 5202. Environmental Conflict Management, Leadership, and Planning. (3 cr; A-F only. §ESPM 3202W. Prereq–Grad or #)
Negotiation of natural resource management issues. Use of collaborative planning. Case study approach to conflict management, strategic planning, and building leadership qualities. Emphasizes analytical concepts, techniques, and skills.

ESPM 5207. Emerging Issues in Tropical Agriculture and Forestry: Costa Rica. (3 cr. §ESPM 3207. Prereq–Grad student, #)
Experiential learning through field trips. From conventional to organic bird-friendly coffee production/marketing. Sustainable management of high-/low-land tropical forests and of biodiversity. Lectures, seminars, labs field work, written project. Offered through CATIE/UofM.

ESPM 5211. Survey, Measurement, and Modeling for Environmental Analysis. (3 cr. §ESPM 3211. Prereq–Grad student or #)
Introduction to survey, measurement, and modeling concepts/methods for study of natural resources and environmental issues. Emphasizes survey design for data collection, estimation, and analysis for issues encompassing land, water, air, vegetation, animal, soil, and human/social variables.

ESPM 5241. Natural Resource and Environmental Policy: History, Creation, and Implementation. (3 cr. §ESPM 3241W. Prereq–Grad student or #)
Basic concepts of political/administrative processes important to natural resource policy and program development. Case study approach to policy/legislative process, participants in policy development, and public programs. Federal/state laws/regulations, international issues.

ESPM 5245. Sustainable Land Use Planning and Policy. (3 cr; A-F only. §ESPM 3245. Prereq–Grad student or #)
Overview of policies that affect recreation at local, state, and federal levels. Landscape-level planning. Collaborative relationships as means to implement sustainable natural/social policy. Class project involving all aspects of implementing recreation policy, from public meetings to hands-on evaluation of options.

ESPM 5251. Natural Resources in Sustainable International Development. (3 cr; A-F only. §ESPM 3251, LAS 3251. Prereq–Grad student or #)
International perspectives on resource use in developing countries. Integration of natural resource issues with social, economic, and policy considerations. Agriculture, forestry, agroforestry, non-timber forest products, water resources, certification, development issues. Latin American case studies.

ESPM 5261. Economics and Natural Resources Management. (4 cr; A-F only. §ESPM 3261W. Prereq–Grad student or #)
Microeconomic principles in natural resource management. Tools to address market failure, project analysis, and evaluation. Economic/financial considerations. Benefit/cost analysis methods/examples. Valuation/assessment methods for property/resources. Managing renewable natural resources.

ESPM 5295. GIS in Environmental Science and Management. (4 cr; A-F only. §ESPM 4295W. Prereq–Grad student or #)
Application of spatial data inventory/analysis in complex environmental planning problems. Spatial data collection. Database development methods, including GPS, DLG, TIGER, NWI data, and spatial analysis. Topics identified by non-University partners.

ESPM 5402. Biometeorology. (3 cr. Prereq–MATH 1271, PHYS 1201, STAT 3011)
Calculus-based introduction to atmospheric boundary layer (ABL), the interface between earth's surface and the atmosphere. ABL development/turbulence, surface energy balance, ABL clouds, air quality, microclimate, observational/modeling methods.

ESPM 5480. Topics in Natural Resources. (1-4 cr [max 6 cr]. Prereq–Sr or grad student)
Lectures by visiting scholar or regular staff member. Topics specified in *Class Schedule*.

ESPM 5482. Biosafety Science and Policy. (3 cr)
Science/policy for governing environmental/health safety of genetic engineering through Minnesota, national, and international cases.

ESPM 5501. Biological Collections: Curation and Management. (1 cr. Prereq–One [gen biology or intro to natural resources] course or #)
Roles/value of biology collections in natural history museums. Conservation of biodiversity record. Students participate in various hands-on curatorial activities. Lectures, tours.

ESPM 5555. Wetland Soils. (3 cr; A-F only. §SOIL 5555. Prereq–1125 or 2125 or equiv or #; ¶4511 recommended)
Morphology, chemistry, hydrology, formation of mineral/organic soils in wet environments. Soil morphological indicators of wet conditions, field techniques of identifying hydric soils for wetland delineations. Peatlands. Wetland benefits, preservation, regulation, mitigation. Field trips, lab, field hydric soil delineation project.

ESPM 5575. Wetlands Conservation. (3 cr. §ESPM 3575. Prereq–§: 3575; sr or grad student or #)
Freshwater wetland classification, wetland biota, current/historic status of wetlands, value of wetlands. National, regional, Minnesota wetlands conservation strategies. Ecological principles used in wetland management.

ESPM 5601. Principles of Waste Management. (3 cr; A-F only. Prereq–1125 or 2125, BIOL 1002/1009 or CHEM 1021, STAT 3011, APEC 1101 or #)
Waste and waste management principles. Issues, problems, and solutions in remedying waste stream. MSW and yard waste composting, WTE incineration operation, ash disposal, recycling, land fill requirements, direct land disposal, regulatory trends, and case studies.

ESPM 5602. Regulatory and Ethical Frameworks for CEM. (3 cr. Prereq–APEC 1101 or ECON 1101)
Concepts, major issues relating to industrial ecology and industry as they are influenced by current standards/regulations at local, state, and national levels.

ESPM 5603. Environmental Life Cycle Analysis. (3 cr. Prereq–[MATH 1142 or [MATH 1271, MATH 1282]], [ECON 1101 or APEC 1101])
Concepts, major issues relating to inventory and subsequent analysis of production systems. Production system from holistic point of view, using term commonly used in industrial ecology: "the metabolic system."

ESPM 5604. Environmental Management Systems and Strategy. (3 cr. §ESPM 3604)
Environmental problems such as climate change, ozone depletion, and loss of biodiversity.

ESPM 5605. Recycling: Extending Raw Materials Supplies. (3 cr. §ESPM 3605)
Principles of recycling. Role of recycling in raw materials utilization, energy, and the environment. Recycling processes for number of commonly recycled materials/products. Properties, environmental implications of recycling.

ESPM 5606. Minimizing Industrial Emissions. (3 cr. §ESPM 3606. Prereq–CHEM 1011 or #)
Fundamental waste streams and pollution control technologies in natural resource conversion.

ESPM 5607. Industrial Biotechnology and the Environment. (2 cr. §ESPM 4607. Prereq–BIOC 2011, grad student)
Biotechnology pertaining to biobased products development and their environmental impact.

ESPM 5608. Bioremediation. (2 cr. §ESPM 4608. Prereq–[BIOL 1001 or BIOL 1009], CHEM 1011, BIOC 2011)
Use of organisms in remediation of waste/pollution problems related to bio-based product industries. Types, characteristics, and identification of useful microorganisms. Applications of microbes to benefit industrial processes of wood/fiber.

ESPM 5703. Agroforestry in Watershed Management. (3 cr. §ESPM 3703. Prereq–Grad student or #)
Biological, physical, and environmental attributes of agroforestry as pertains to watershed management. Coupling production with watershed protection benefits. Implications for policy, economics, and human dimensions in sustainable development. Examples/case studies from North America and developing countries.

ESPM 5811. Environmental Interpretation. (3 cr; A-F only. §ESPM 4811. Prereq–Grad student or #)
Theories of interpretation, nonformal teaching pedagogy. Interpretive talks, walks, and programs. Camp leadership. Oral presentation. Newsletter development. Web site design. Development of self-guided trail guides, brochures, and exhibits. Planning, evaluation. Interpretive work in private, state, or federal agencies. Hands-on experience.

Family Social Science (FSOS)

Department of Family Social Science

College of Education and Human Development

FSOS 1101. Intimate Relationships. (4 cr)
Focuses on couple dynamics and gives an overview of how to develop, maintain, and terminate an intimate relationship. Relationship skills and issues including communication, conflict resolution, power, and roles. Programs for marriage preparation, marriage enrichment, and marital therapy are described.

FSOS 1201. Human Development in Families: Lifespan. (4 cr)
Human development in a family context. Life-course and human development theories. Individual/family development, mate selection, birth, life cycle. Physical, cognitive, language, social, social, and personality development. Historical, social, and cultural factors. How theory/research are applied to everyday lives.

FSOS 1301. Cash or Credit: You Need to Know. (1 cr; A-F only. Prereq–Fr or soph or PSEO)
Money management. Responsible use of credit, specifically credit cards. Online course: 15 Web-based lessons.

FSOS 1905. Freshman Seminar. (1-3 cr [max 6 cr]. Prereq–Fr)
Interdisciplinary seminar. Topics specified in *Class Schedule*.

FSOS 2101. Preparation for Working With Families. (2 cr; A-F only)
Systematic preparation for upper division education, research/field internships, and career possibilities in Family Social Science.

FSOS 2103. Family Policy. (3 cr)
Connections between policies that governments enact, and families and their well-being. Conceptual frameworks for influences underlying policy choices. Evaluating consequences of such choices for diverse families.

FSOS 2105. Methods in Family Research. (3 cr. §FSOS 4105)
Scientific method. Major questions/objectives of family research. Data collection/analysis/reporting. Social context of family research.

FSOS 2191. Independent Study in Family Social Science. (1-4 cr [max 12 cr]. Prereq–Soph, #)
Independent reading or writing or research under faculty supervision.

FSOS 3101. Personal and Family Finances. (3 cr. Prereq–At least soph or #)
Analysis of personal/family financial management principles. Financial planning of savings, investments, credit, mortgages, and taxation. Life, disability, health, and property insurance. Public/private pensions. Estate planning.

FSOS 3102. Family Systems and Diversity. (3 cr. §FSOS 5101. Prereq–At least soph or #)
Family systems/theories applied to dynamics/processes relevant to family life. Diversity issues related to gender, ethnicity, sexual orientation, and disability. Divorce, single parenthood, remarriage. Family strengths/problems.

FSOS 3104. Global and Diverse Families. (3 cr. §FSOS 4102. Prereq–at least Soph or #)
Perspectives on family dynamics of various racial/ethnic populations in the United States/other countries in context of national/international economic, political, and social processes.

FSOS 3150. Special Topics in Family Social Science. (1-4 cr [max 4 cr]. Prereq–Varies by topic, at least soph)
Review of research/scholarly thought. Topics specified in *Class Schedule*.

FSOS 3191. Independent Study in Family Social Science. (1-5 cr [max 12 cr]. Prereq–Jr, #)
Independent reading or writing or research under faculty supervision.

FSOS 3426. Alcohol and Drugs: Families and Culture. 3 cr. §FSOS 5426)
Psychology/sociology of drug use/abuse. Life-span, epidemiological, familial, cultural data regarding use. Fundamentals of licit/illicit drug use behavior. Variables of gender, ethnicity, social class, sexuality, sexual orientation, disability.

FSOS 3429. Counseling Skills Practicum I. (3 cr. §FSOS 5429)
Basic counseling skills. Counselor needs/motivations, non-verbal communication, basic/advanced empathy, identifying strengths, maintaining focus, challenging discrepancies, use of self. Emphasizes building from client strengths, learning through role-playing.

FSOS 3431. Counseling Skills Practicum II. (3 cr. §FSOS 5431. Prereq–[3429, 5429])
Advanced therapeutic methods. Processes of change. Identifying, reinforcing, challenging core beliefs. Reframing. Paradox. Trance, guided imagery. Cognitive-behavioral, solution-focused, narrative therapies. Emphasizes non-pathologizing models of therapy.

FSOS 3432. Chemical Abuse and Families: An Overview. (3 cr)
Relationships, family systems, families in which alcohol or drug use is a problem. Family types, family of origin, models of family therapy, family systems theory, alcoholism. Review of literature.

FSOS 4101. Sexuality and Gender in Families and Close Relationships. (3 cr. Prereq–At least jr or #)
Human ecology/development as frameworks for examining sexuality in close relationships. Diversity of sexual beliefs, attitudes, behaviors within differing social contexts. Using scientific knowledge to promote sexual health among individuals, couples, families through various life stages.

FSOS 4104W. Family Psychology. (3 cr. Prereq–At least jr or #)
Processes in families of origin, families of choice, and other close relationships, within diverse social contexts. Evaluating current research on family dynamics within/across generations.

FSOS 4106. Family Resource Management. (3 cr. Prereq–at least jr or #)
Analysis of how individuals/families use interpersonal, economic, natural, and community resources to make decisions, solve problems, and achieve central life purposes.

FSOS 4150. Special Topics in Family Social Science. (1-4 cr [max 12 cr]. Prereq–[Varies by topic], at least jr)
Review of research/scholarly thought. Topics specified in *Class Schedule*.

FSOS 4152. Gay, Lesbian, and Bisexual People in Families. (3 cr. Prereq–At least jr or #)
Perspectives on gay, lesbian, and bisexuals (GLB) in families. Unique contributions of GLB to understanding diversity among families. Homophobia, mythologies, coming-out, identity, gender, social networks, intimacy, sexuality, children, parenting, aging, AIDS, ethnicity.

FSOS 4153. Family Financial Counseling. (3 cr; A-F only. Prereq–[3101, 3102, 3429] or #)
Introduction to family financial management applications through different stages in family financial life cycle. Case studies.

FSOS 4154W. Families and Aging. (3 cr. Prereq–At least jr or #)
Aging families from diverse socioeconomic/cultural groups as complex multigenerational systems interacting within ever-changing social structures.

FSOS 4155. Parent-Child Relationships. (3 cr; A-F only. Prereq–At least jr or #)
History, theories, research, and contemporary practices of parent-child relationships in diverse families/cultures across the life span. Preparation for professionals in education, social work, and other human service occupations.

FSOS 4156. Legal-Economic Controversies in Families. (3 cr. Prereq–3101 or #)
Interdisciplinary course for critical thinking about legal-economic controversies across family life span. Principles of argumentation/debate are used to analyze controversies for public decision making about controversial family issues.

FSOS 4160H. Honors Capstone Project. (2 cr [max 4 cr]. Prereq–FSOS honors)
Individualizes the honors experience by connecting aspects of major program with special academic interests.

FSOS 4191. Independent Study in Family Social Science. (1-4 cr [max 12 cr]. Prereq–Sr, #)
Independent reading or writing or research under faculty supervision.

FSOS 4294. Research Internship. (1-4 cr [max 4 cr]. Prereq–[FSOS major, at least jr] or #)
Research project with faculty. May include planning, proposal writing, literature review, data collection/coding/cleaning/analysis, and reporting.

FSOS 4296. Field Study: Working With Families. (1-12 cr [max 12 cr]; S-N only. Prereq–[2101, at least jr] or #)
Directed paraprofessional work experience related to student's area of study.

FSOS 5014. Quantitative Family Research Methods I. (3 cr. Prereq–Grad student or #)
Family research methods, issues associated with multiple levels of analysis. Conducting family-focused data analyses using basic/intermediate methods (through ANOVA and multiple regression), including power analysis. Ethical issues involved in family research such as IRB/HIPAA regulations.

FSOS 5015. Family Research Laboratory. (1 cr; S-N only. Prereq–Grad student or #)
Application of basic family research methods into experiential learning using statistical software. Analyses that correspond with problem situations in 5014 and that involve secondary data analyses. Using statistical software for basic family research. Preparation to work with quantitative family data sets.

FSOS 5032. Family Systems Theories and Interventions. (3 cr. Prereq–Grad student or #)
Systemic/cybernetic frameworks as they apply to diverse families. Thinking systemically about families across multiple ecological systems. How to identify crucial epistemological issues in theoretical/applied areas of family science. Theoretical frameworks. Experiential role-playing, guest presenters, videos, field work, research projects, reading clubs, class discussion.

FSOS 5101. Family Systems. (3 cr. §FSOS 3102. Prereq–Grad student)
Family systems and other family theories focusing on the dynamics and processes relevant to family life. Diversity issues related to gender, ethnicity, sexual orientation, and disability. Issues related to divorce, single parenthood, and remarriage are covered. Family strengths and family problems are integrated.

FSOS 5150. Special Topics in Family Social Science. (1-4 cr [max 24 cr]. Prereq–#)
Review of research/scholarly thought. Topics specified in *Class Schedule*.

FSOS 5193. Directed Study in Family Social Science. (1-6 cr [max 6 cr]. Prereq–FSOS or grad student in related field)

FSOS 5426. Alcohol and Drugs: Families and Culture. (3 cr. §FSOS 3426)
Overview of psychology/sociology of drug use/abuse. Life-span, epidemiological, familial, cultural data regarding use. Fundamentals of licit/illicit drug use behavior. Gender, ethnicity, social class, sexuality, sexual orientation, disability.

FSOS 5429. Counseling Skills Practicum I. (3 cr. §FSOS 3429)
Basic counseling skills. Counselor needs/motivations, non-verbal communication, basic/advanced empathy, identifying strengths, maintaining focus, challenging discrepancies, use of self. Emphasizes building from client strengths, learning through role-playing.

FSOS 5431. Counseling Skills Practicum II. (3 cr. §FSOS 3431. Prereq–[3429, 5429])
Advanced therapeutic methods, processes of change. Identifying, reinforcing, challenging core beliefs. Reframing, paradox, trance, guided imagery. Cognitive-behavioral, solution-focused, narrative therapies. Emphasizes non-pathologizing models of therapy.

FSOS 5432. Chemical Abuse and Families: An Overview. (3 cr)
Relationships, family systems with particular application to families in which alcohol or drug use is a problem. Family types, family of origin, models of family therapy, family systems theory, alcoholism. Review of literature.

Finance (FINA)

Department of Finance

Curtis L. Carlson School of Management

FINA 3001. Finance Fundamentals. (3 cr; A-F only. §APEC 3501, FINA 3000. Prereq–ACCT 2050, OMS 1550, 60 cr)
Comprehensive introduction to financial management principles. Money/capital markets, risk/return/valuation triad, capital budgeting basics. Capital structure, financial leverage. Cost of capital, financial performance measures, dividend policy, working capital management, international financial management/derivatives.

FINA 4121. Financial Markets and Interest Rates. (2 cr; A-F only. Prereq–4241)
Basic framework for valuing fixed income securities. Term structure on interest rates, forward rates, principles of fixed-income valuation. Surveys treasury, corporate, municipal, securitization markets.

FINA 4122. Banking Institutions. (2 cr; A-F only. Prereq–4121, 4241)
Managing banking institutions, including commercial banks and thrifts. Theory/practice of banking. Asset management, liability management, capital management. Public policy issues in banking.

FINA 4241. Corporate Financing Decisions. (4 cr; A-F only. Prereq–3001)
Theoretical/applied understanding of corporate financial decisions. Efficient markets, financial decisions, tax effects, managerial incentives, investment banking, effect of financing issues on investment decisions, basic options.

FINA 4242. Corporate Investment Decisions. (4 cr; A-F only. Prereq–4241)
Focuses on efficiently managing working capital and fixed assets. Cases illustrate some of the topics: working capital management, making capital budgeting decisions, targeting/evaluating firm performance, assessing mergers/acquisitions.

FINA 4321. Portfolio Management and Performance Evaluation. (2 cr; A-F only. Prereq–4241)
Introduces investment environment and concepts used to manage security portfolios. Portfolio/security risk/return tradeoffs, portfolio diversification, asset allocation, active portfolio management versus indexed portfolios, portfolio performance evaluation.

FINA 4322. Security Analysis. (2 cr; A-F only. Prereq–4241, 4321)
Valuation of equity securities. Basic valuation principles. Relationships between various valuation approaches. Develops/applies tools for self-designed security selection rules.

FINA 4541. Futures, Options, and Other Derivative Securities. (4 cr; A-F only. Prereq–4121, 4241, 4321)
Foundations of stochastic cash flow representations, construction portfolios of futures/options, basic methods for valuing real/financial futures, swaps, options.

FINA 4641. International Finance and Risk Managment. (4 cr; A-F only. Prereq–3001)
Introduction to international dimensions of corporate financing, investment, risk management decisions. Foreign exchange markets, international financial systems, foreign exchange rate determination, measuring/managing currency risk, multinational capital budgeting, cost of capital in emerging economies.

Finnish (FIN)

Department of German, Scandinavian, and Dutch

College of Liberal Arts

FIN 1001. Beginning Finnish. (5 cr. §FIN 4001)
Emphasis on working toward novice-intermediate low proficiency in all four language modalities (listening, reading, speaking, writing). Topics include every day subjects (shopping, directions, family, food, housing, etc.).

Fin 1002. Beginning Finnish. (5 cr. §FIN 4002. Prereq–1001)
Continues the presentation of all four language modalities (listening, reading, speaking, writing), with a proficiency emphasis. Topics include free-time activities, careers, and the Finnish culture.

Fin 1003. Intermediate Finnish. (5 cr. §FIN 4003. Prereq–1002)
Emphasis on intermediate proficiency in listening, reading, speaking, and writing. Contextualized work on grammar and vocabulary is combined with authentic readings and essay assignments.

Fin 1004. Intermediate Finnish. (5 cr. §FIN 4004. Prereq–1003)
Emphasis on developing intermediate mid-high proficiency in listening, reading, speaking, and writing. Contextualized work on grammar and vocabulary is supported by work with authentic readings and essay assignments.

Fin 3011. Advanced Finnish. (3 cr. Prereq–1004 or 4004)
Designed to help students achieve advanced proficiency in Finnish. Discussion of fiction, film, journalistic, and professional prose is complemented by grammar, vocabulary building exercises, and review of oral/written modes of communication.

Fin 3012. Advanced Finnish. (3 cr. Prereq–3011)
Discussion of novels, short stories, plays, articles. Structural, stylistic, vocabulary-building exercises.

Fin 3670. Topics in Finnish Studies. (3 cr [max 9 cr])
Interdisciplinary social science topics on Finnish people, culture, and society. In English.

Fin 4001. Beginning Finnish. (2 cr. §FIN 1001. Prereq–1004 in another language or passing score on LPE or grad student)
Meets concurrently with 1001. See 1001 for description.

Fin 4002. Beginning Finnish. (2 cr. §FIN 1002. Prereq–1004 in another language or passing score on LPE or grad student)
Meets concurrently with 1002. See 1002 for description.

Fin 4003. Intermediate Finnish. (2 cr. §FIN 1003. Prereq–1004 in another language or passing score on LPE or grad student)
Meets concurrently with 1003. See 1003 for description.

Fin 4004. Intermediate Finnish. (2 cr. §FIN 1004. Prereq–1004 in another language or passing score on LPE or grad student)
Meets with 1004. See 1004 for description.

Fin 5670. Topics in Finnish Studies. (3 cr [max 9 cr])
Interdisciplinary social science topics on Finnish people, culture, and society. Taught in English.

Fisheries and Wildlife (FW)

Department of Fisheries, Wildlife, and Conservation Biology

College of Food, Agricultural and Natural Resource Sciences

FW 1001. Orientation in Fisheries, Wildlife, and Conservation Biology. (1 cr; A-F only)
Survey of technical requirements and education needed for careers in fisheries, wildlife, and conservation biology. Introduction to fields of work, problems, career opportunities.

FW 1002. Wildlife: Ecology, Values, and Human Impact. (3 cr. Prereq–Recommended for students without natural science background)
Controversial issues involving specific wildlife management principles/techniques.

FW 1901. Freshman Seminar. (1-3 cr [max 3 cr]. Prereq–Fr with no more than 29 cr)
In-depth study of issues/topics related to natural resources and the environment. Topics vary each semester.

FW 1905. Freshman Seminar. (1-3 cr [max 6 cr]. Prereq–Fr)
Issues/topics related to natural resources and the environment. Topics vary.

FW 2001. Introduction to Fisheries, Wildlife, and Conservation Biology. (3 cr. Prereq–BIOL 1001 or BIOL 1009)
Theory/practice of fisheries and wildlife management. Single species populations, ecosystem, landscape approaches. Biota, habitat, sociopolitical aspects of human use. Case studies explore current issues in conservation.

FW 2002. Threatened and Endangered Wildlife: Causes, Consequences, and Future Conservation. (3 cr. Prereq–Intro biology course)
Introduction to extinction as a process both natural and human caused. Illustrates differences in extinction events and why we should be concerned about rate of extinction. Definitions of current jargon used to describe imperiled species due to their legal/biological connotations. Case history examples of wildlife species that are threatened or endangered.

FW 3136. Biology of Fishes. (4 cr. §FW 5136. Prereq–BIOL 1001 or BIOL 2012)
Fish biology, adaptations to different environments, modes of living, and environmental relationships. Lab emphasizes anatomy/identification of Minnesota fishes.

FW 4001. Biometry. (4 cr; A-F only. Prereq–MATH 1031)
Basic statistical concepts such as probability, sampling space, and frequency distributions. Descriptive statistics: sample tests, linear regression (simple and multiple), ANOVA, goodness of fit, nonparameteric method and other relevant selected topics (e.g., clustering and classification).

FW 4102. Principles of Conservation Biology. (3 cr. Prereq–BIOL 1009 or equiv; BIOL 3407 recommended)
Introduction to themes/concepts of diverse, dynamic, and interdisciplinary field. Biological/social underpinnings of conservation problems/solutions.

FW 4104. Hunting and Fishing Traditions: Field Sports Reflected in Arts, Literature, and Practice. (3 cr. Prereq–#)
Philosophical foundations, history, traditions, and current importance of field sports in North American society. Laboratory sessions introduce making/using modern sport fishing equipment. Optional experiential learning laboratory introduces safe handling/operation of firearms, leading to State of Minnesota Firearms Safety Certificate. Lectures, invited guests, readings.

FW 4105. Hunting and Fishing Traditions: Field Sports Reflected in Arts, Literature, and Practice. (2 cr)
Philosophical foundations, history, traditions, and current importance of field sports in North American society. Laboratory sessions introduce making/using modern sport fishing equipment. Optional experiential learning laboratory introduces safe handling/operation of firearms, leading to State of Minnesota Firearms Safety Certificate. Lectures, invited guests, readings.

FW 4106. Important Plants in Fisheries and Wildlife Habitats. (1 cr; A-F only. Prereq–BIOL 3407, [jr or sr], FW major)
Field identification of important plants in fisheries and wildlife habitats.

FW 4108. Field Methods in Research and Conservation of Vertebrate Populations. (3 cr; A-F only. Prereq–BIOL 3407, [jr or sr], FW major)
Planning/implementation of research/management projects. Collect/analyze data in groups. Group/individual oral/written reports. Each student keeps a field journal.

FW 4132. Invertebrate Diversity. (4 cr; A-F only. Prereq–BIOL 1001 or BIOL 2012)
Survey of major invertebrate phyla from standpoints of structure, function, development, and their environmental/evolutionary relationships. Focuses on major groups of multicelled invertebrates. Special unit dedicated to invertebrates of Minnesota.

FW 4191. Independent Study: Conservation Biology. (1-5 cr [max 5 cr]. Prereq–#)
Individual field, library, and lab research in conservation biology.

FW 4200H. Honors Seminar. (1 cr. Prereq–FW upper div honors, #)
Current topics presented by faculty/students. Lecture/discussion.

FW 4291. Independent Study: Fisheries. (1-5 cr [max 15 cr]. Prereq–#)
Individual field, library, and lab research in fisheries.

FW 4292. Special Lectures: Fisheries. (1-5 cr [max 15 cr]. §FW 5292. Prereq–#)
Lectures in special fields of fisheries given by visiting scholar or regular staff member.

FW 4391. Independent Study: Wildlife. (1-5 cr [max 5 cr]. Prereq–#)
Individual field, library, and lab research in wildlife.

FW 4392. Special Lectures: Wildlife. (1-5 cr [max 15 cr]. §FW 5392. Prereq–#)
Lectures on special topics of wildlife given by visiting scholar or staff member.

FW 4401. Introduction to Fish Physiology and Behavior. (4 cr. Prereq–BIOL 1001 or BIOL 1009)
How life in aquatic environment has influenced fish biology. Ionic/osmotic balance, sensory systems, gas exchange, endocrinology, growth, foraging, locomotion, reproduction, orientation/migration, toxicology.

FW 4565. Fisheries and Wildlife Ecology and Management: Field Trip. (1 cr; S-N only. Prereq–#)
Ten-day field trip to Wyoming and points en route during spring break. Emphasizes broad range of fisheries and wildlife management, including big game, waterfowl, endangered species.

FW 4701. Fisheries and Wildlife Problem Solving. (2 cr. Prereq–FW sr or grad student or #)
Management problem identification/analysis, information gathering/analysis, oral/written reporting. Selected management issues.

FW 4801H. Honors Research. (2 cr; A-F only. Prereq–FW upper div honors, #)
Independent research project supervised by faculty member.

FW 4802H. Honors Research. (2 cr; A-F only. Prereq–FW upper div honors, #)
Completion of honors thesis. Oral report.

FW 5003. Human Dimensions of Biological Conservation. (3 cr. Prereq–[BIOL 1001 or BIOL 1009], BIOL 3407)
Survey of social, psychological, economic, policy aspects of managing/conserving wildlife, fisheries, and related resources.

FW 5051. Analysis of Populations. (3 cr. §EEB 5051. Prereq–[[BIOL 1001 or BIOL 1009], [FW 4001 or STAT 3011 or STAT 5021]] or #)
Factors involved in regulation, growth, general dynamics of populations. Data needed to describe populations, population growth, population models, regulatory mechanisms.

FW 5136. Biology of Fishes. (4 cr. §FW 3136. Prereq–Grad student)
Fish biology. Adaptations to different environments and modes of living. Environmental relationships. Lab emphasizes anatomy/identification of Minnesota fishes.

FW 5292. Special Lectures: Fisheries. (1-5 cr [max 15 cr]. §FW 4292. Prereq–Grad student or #)
Lectures in special fields of fisheries given by visiting scholar or regular staff member.

FW 5392. Special Lectures: Wildlife. (1-5 cr [max 15 cr]. §FW 4392. Prereq–Grad student or #)
Lectures given by visiting scholar or staff member.

FW 5411. Aquatic Toxicology. (3 cr. Prereq–Intro chem, intro ecol, #)
Pollution assessment approaches, biological effects, fate/flow of contaminants in aquatic systems, major types of pollutants.

FW 5455. Sustainable Aquaculture. (3 cr. Prereq–[Intro biology, intro chemistry] or #)
How aquaculture affects the environment and human well-being in Minnesota and world-wide. Role of aquaculture as world s fastest growing food sector and in hatcheries to support fishing and rebuild endangered species. Organic aquaculture, other innovations.

FW 5571. Avian Conservation and Management. (3 cr. Prereq–EEB 4134 or grad or #)
Current problems in avian conservation/management. Nongame, wetland, game birds.

FW 5601. Fisheries Population Analysis. (3 cr; A-F only. Prereq–[4001 or STAT 5021], BIOL 3407, [MATH 1142 or MATH 1271])
Introduction to theory/methods for estimating vital statistics of fish populations. Using microcomputers/statistical software to describe, analyze, model attributes of fish populations. Case studies from literature of marine/freshwater fisheries management.

FW 5603W. Habitats and Regulation of Wildlife. (3 cr; A-F only. Prereq–BIOL 3407)
Environmental interactions of wildlife at population/community levels. Environmental threats from human activities. Habitat management practices. Objectives, polices, regulations in population management.

FW 5604W. Fisheries Ecology and Management. (3 cr. Prereq–EEB 4601)
Managed species/systems. Applied aquatic/fish ecology related to fisheries. Role of planning in fisheries management. Application of management tools, assessment of their efficacy.

FW 5625. Wildlife Handling and Immobilization for Research and Management.. (2 cr; S-N only. Prereq–General biology, [grad student or vet med student or FW sr], Δ)
Practical techniques to maximize human/animal safety and encourage effective operations. Preparation procedures, legal responsibilities, capture drugs/delivery systems, safety measures, ethical issues, basic veterinary procedures for handling wildlife. Field course. Uses live animals.

Food Science and Nutrition (FSCN)

Department of Food Science and Nutrition

College of Food, Agricultural and Natural Resource Sciences

FSCN 1001. Orientation to Nutrition. (1 cr. Prereq–Enrolled in nutrition undergrad prog)
Nutrition as a professional career track. Services available at the University to achieve academic success. Various paths to becoming a registered dietitian. Use of nutrition undergraduate major as a preparation for professional schools. Work environment.

FSCN 1012. Sports Nutrition. (2 cr)
Physiological function and metabolic fate of all six classes of nutritients ingested by active individuals to improve athletic performance. Impact on physiology of ergogenic aids and various dietary supplements. Overview of these components in fulfilling energy/recovery needs for continual/progressive athletic performance. Web-based course.

FSCN 1013. Dietary Supplements: scientific, regulatory, and cultural aspects. (3 cr)
Use of dietary supplements in the U.S. How to measure risk of a dietary supplement, approach used by National Institute of Medicine for dietary recommendations. Dietary Supplements Health and Education Act, FTC responsibilities. How dietary supplements are marketed. Other cultures as sources of supplements. Intellectual property rights of indigenous cultures. Use of supplements for health/performance. Course is online.

FSCN 1021. Introductory Microbiology. (4 cr)
Broad introduction to the diverse world of microbes and how they impact our world in both deadly and life-saving ways.

FSCN 1090. Topics. (3 cr; A-F only)
Non-lab microbiolgy for nursing

FSCN 1102. Food: Safety, Risks, and Technology. (3 cr)
Ethical use of public policy and food technology to reduce or control risks in our food supply. Survey of microbiological, chemical, and environmental risks, and government and industry controls used to ensure food safety.

FSCN 1112. Principles of Nutrition. (3 cr. Prereq–High school [biology, chemistry])
Fundamental concepts of nutrition, nutrient functions, human nutritional requirements, food sources. Evaluating nutrition information/food safety. Role of nutrition in chronic disease, public policy, and the environment.

FSCN 1904. Topics: Freshman Seminar. (3 cr; A-F only)
Interdisciplinary seminar. Topics vary.

FSCN 3102. Introduction to Food Science. (3 cr. Prereq–CHEM 1022)
Introduction to composition of and chemical/physical properties of foods. Evaluating interaction/reaction of foods due to formulation, processing, and preparation.

FSCN 3612. Life Cycle Nutrition. (3 cr. Prereq–1112, CHEM 1022)
Nutritional changes throughout lifecycle. Pregnancy, lactation, childhood, adulthood, aging. Topics relevant to lifecycle changes (e.g., body composition, immunity, sports nutrition).

FSCN 3614. Nutrition Education and Counseling. (3 cr. Prereq–1112)
Application of theories/principles of learning, behavior change, instructional methods to nutrition education and counseling in community settings.

FSCN 3615. Sociocultural Aspects of Food, Nutrition, and Health. (3 cr. Prereq–1112)
Sociocultural aspects of regional and cultural diversity in food preferences and food behavior, food habits, demographics, lifestyles, food consumption, and expenditures. Effect of socioeconomic status, religious beliefs, age, and cultural meaning of food on food choices.

FSCN 3662. Introduction to Dietetic Practice. (2 cr; A-F only. Prereq–1112, admitted to Coordinated Program in Dietetics, #)
Introduction to the practice of dietetics in medical centers, residential care centers, ambulatory care clinics, and community service agencies.

FSCN 3731. Food Service Operations Management Laboratory. (2 cr; A-F only. Prereq–[3102 or ¶3102], [3732 or ¶3732])
Experience in managing a food service operation. On-/off-campus commercial/institutional restaurants used as labs. Required field trips.

FSCN 3732. Food Service Operations Management. (3 cr; A-F only. Prereq–3102 or ¶3102)
Planning, preparing, delivering, serving, managing foods served away from home.

FSCN 3796. Field Experience in Food Service Management. (3 cr; A-F only. Prereq–[3732 or ¶3732], admitted to Coordinated Dietetics Program, #)
Supervised food service production/management experience in a community or health care facility.

FSCN 4096. Professional Experience Program: Internship. (1-3 cr [max 6 cr]; A-F only. Prereq–FSCN undergrads, #; UC only)
Supervised practical and professional experience in food industry firms or government agencies; evaluative reports and consultations with faculty advisors and employees. Registration information in COAFES Career Services.

FSCN 4103. World Food Problems. (3 cr. §AGRO 4103, APEC 4103, CVM 6060. Prereq–jr or sr or grad)
A multidisciplinary look at problems and possible solutions in food production, storage, and utilization in developing countries. Presentations and discussions introduce conflicting views of population, use of technology, and ethical and cultural values of people in various parts of the world.

FSCN 4111. Food Chemistry. (3 cr. Prereq–3102, BIOC 3021)
Study of chemical structures and functional properties of food components in relation to their roles as parts of complex biochemical systems and as modified by environmental and processing factors.

FSCN 4121. Food Microbiology and Fermentations. (3 cr. Prereq–1102, [VPB 2032 or MICB 3301 or MICB 2032], BIOC 3021)
Relationship of environment to occurrence, growth, and survival of microorganisms in foods, methods of evaluation, genera and species of importance, control of food-borne pathogens and spoilage organisms in foods, and use of microorganisms in food fermentations.

FSCN 4122. Laboratory Methods in Food Microbiology and Fermentations. (2 cr. Prereq–Concurrent enrollment 4121)
Microbiological methods for analysis of foods. Use of microorganisms for production of foods.

FSCN 4131. Food Quality. (3 cr. Prereq–4111, 4121)
Management systems in the processing and distribution of foods that insure food quality and compliance with food laws and regulations. Quality management, HACCP, audits, plant/equipment design for sanitation, specifications, recalls, and control systems.

FSCN 4210. Topics in Food Science and Nutrition. (1-4 cr [max 8 cr]. Prereq–#)
In-depth investigation of a specific topic in nutrition and food science not covered by other courses. Topic announced in advance.

FSCN 4291. Independent Study. (1-4 cr [max 4 cr]. Prereq–Undergrads, #)
Individual lab or library research in an area related to food science or nutrition.

FSCN 4312W. Food Analysis. (4 cr. Prereq–4111, STAT 3011)
Examination of components in foods with analytical measurement as the primary focus. Chemical, physical, and sensory techniques are used to identify and characterize major and minor components in food systems.

FSCN 4331. Food Process Engineering I. (3 cr [max 5 cr]; A-F only. §BAE 4744. Prereq–3102, MATH 1272, [PHYS 1102 or PHYS 1302])
Specific applications of engineering principles (e.g., heat/mass transfer, kinetics, thermodynamics) to unit operations in food production.

FSCN 4332. Food Processing Operations. (3 cr; A-F only. Prereq–4331 or BAE 4744)
Engineering principles applied to commonly used food processing operations. Blanching, pasteurization, sterilization, frying, baking, milling, extrusion. Meat processing, water treatment, waste management.

FSCN 4342. Properties of Water in Foods. (4 cr. Prereq–4331)
Principles involved in processing, handling, and storage of frozen, dry and intermediate moisture biological materials (foods, drugs, biologics) with emphasis on the physio-chemical properties of water in food.

FSCN 4343. Processing of DAIRy Products. (4 cr. Prereq–4111, 4122, 4331)
Demonstration/application of basic concepts of food engineering/processing, food chemistry, and food microbiology to production of fluid, fermented, concentrated, and dehydrated dairy products.

FSCN 4345. Flavor Technology. (3 cr. Prereq–4111, 4331, ¶4121)
Flavor/off-flavor development in foods. Industrial production of food flavorings, their proper application to food systems.

FSCN 4346. Functional Foods: Regulations and Technology. (3 cr; A-F only. Prereq–[4111, 4121] or [4111, 4131] or [4121, 4131])
Overview of application of regulatory principles, food science, nutritional science to development of nutraceuticals, functional foods, dietary supplements. Scientific basis, technologies, legal requirements, animal/clinical evaluation, consumer usage versus need. Review of products available in world market, with focus on the United States.

FSCN 4596. Field Experience: Community Nutrition. (3 cr; A-F only. Prereq–Admitted to first year Coordinated Program in Dietetics, #)
Application of nutrition knowledge in the solution of problems related to health promotion. Assigned readings, discussion, and experiences in community agencies.

FSCN 4612. Human Nutrition. (3 cr. Prereq–1112, CHEM 1022, PHSL 3051)
Advanced study of digestion/absorption of nutrients. Research techniques in nutrition, including human/epidemiological studies. Health promotion, disease prevention theories.

FSCN 4613. Experimental Nutrition. (2 cr. Prereq–4612, BIOC 3021, STAT 3011)
Lab in chemical/biochemical methods of analysis of nutritional status.

FSCN 4614. Community Nutrition. (3 cr. Prereq–1112)
Community-based nutrition issues are explored including nutrition risks associated with different age, sex, ethnic, and socioeconomic groups; community needs assessment; program planning and evaluation, and programs that address the needs and interests of people in different stages of the life cycle, ethnic or cultural backgrounds, and literacy levels.

FSCN 4621W. Nutrition and Metabolism. (4 cr. Prereq–4612, BIOC 3021, PHSL 3051)
Carbohydrate, lipid, and protein metabolims. Uses systems/holistic approach to emphasize how metabolic pathways interrelate.

FSCN 4665. Medical Nutrition Therapy I. (3 cr; A-F only. Prereq–4612, PHSL 3051, BIOC 3021)
Nutrition assessment and support. Pathology, management, and nutrition therapy for disorders of the gastrointestinal, immune, and respiratory systems, and cancer.

FSCN 4666. Medical Nutrition Therapy II. (3 cr; A-F only. Prereq–4665)
Pathology, management, and nutrition therapy for disorders of the cardiovascular, endocrine, urinary, and neuromuscular and skeletal systems. Nutrition intervention for inborn errors of metabolism, and eating disorders and obesity.

FSCN 4696. Field Experience: Medical Nutrition Therapy I. (6 cr; A-F only. Prereq–Second year students in Coordinated Program in Dietetics or #)
Application of nutrition knowledge in the solution of problems related to disease and injury; assigned readings, discussions, and experience in medical centers and long-term care facilities. Emphasis on nutrition support; gastrointestinal, immune and respiratory disorders, and cancer.

FSCN 4732. Food and Nutrition Management. (3 cr; A-F only. Prereq–3732, MGMT 3001)
Financial and human resource management applied to a variety of business and institutional settings. Field trips may be required.

FSCN 4796. Field Experience in Food and Nutrition Management. (3 cr; A-F only. Prereq–Second year students in Coordinated Program in Dietetics or #)
Application of principles of food service management to problems in community, commercial, or health care facilities.

FSCN 4896. Field Experience: Medical Nutrition Therapy II. (3 cr; A-F only. Prereq–[4696, admitted to Coordinated Program in Dietetics] or #)
Application of nutrition knowledge to problems related to health/disease. Readings, discussions, experience in medical centers. Emphasizes cardiovascular, endocrine, urinary tract, energy imbalance; eating disorders.

FSCN 4996. Field Experience: Medical Nutrition Therapy III. (2-4 cr [max 4 cr]; A-F only. Prereq–[4896, Admitted to Coordinated Program in Dietetics] or #)
Application of nutrition knowledge to problems related to health/disease, clinical management experience in medical centers. Emphasizes pediatrics, home health care, staff relief.

FSCN 5411. Food Biotechnology. (2 cr. Prereq–4121)
Genetic tools as applied to food biotechnology. Improvement of microbes used in food production by modern biotechnological approaches. Discuss need for stringent regulation of modern biotechnology as well as ethical and legal issues.

FSCN 5421. Introduction to Food Law. (3 cr. Prereq–1102)
Analysis of the federal legal requirements affecting the production processing, packaging, marketing, and distribution of food and food products using case law studies and regulatory history.

FSCN 5441. Introduction to New Product Development. (2 cr. Prereq–4111, 4331)
Interactive course that introduces students to the principles of new product development, from identification and testing of new product concepts, through prototype testing, to basic process design using examples from industry.

FSCN 5461. Food Packaging. (2 cr. Prereq–1102, 3102, PHYS 1102 or PHYS 1302)
Materials, principles, and procedures of packaging as they apply to food products. Emphasis is on consumer products, but the principles also apply to bulk and institutional foods and ingredients.

FSCN 5471. Advanced Food Chemistry. (3 cr. Prereq–4111)
Chemical reactions taking place in formation, stability, and degradation of important food constituents. Examples of reactions for major chemical changes occurring in food systems.

FSCN 5481. Sensory Evaluation of Food Quality. (2 cr. Prereq–3102, STAT 3011)
Fundamentals of sensory perception. Test designs and methods used in studying sensory qualities of foods. Current issues in sencory evaluation. Group research project.

FSCN 5531. Grains: Introduction to Cereal Chemistry and Technology. (2 cr. Prereq–BIOL 1009, CHEM 1022)
Origins, structure, biochemistry, and cellular properties of major cereal grains as they relate to primary processing (milling) and secondary processing (production of cereal products).

FSCN 5601. Management of Eating Disorders. (3 cr. Prereq–[Sr or grad student] in health related program or #)
Etiology, occurrence, course, treatment, and prevention of eating disorders from a multidisciplinary perspective. Roles/responsibilities of eating disorder treatment team members of varying types across various treatment milieus.

FSCN 5631. Dietary Supplements: Regulatory, Scientific, and Cultural Perspectives. (3 cr)
Concepts/principles of dietary supplements-RDA, dose-response, risk assessment. Laws/regulations, their interpretation concerning dietary supplements. Vitamins/minerals. Philosophy/use of botanicals/nutraceuticals in Western medicine in contrast to other cultures. Use of herbal supplements in Western medicine.

Forest Resources (FR)

Department of Forest Resources

College of Food, Agricultural and Natural Resource Sciences

FR 1001. Orientation and Information Systems. (1 cr; A-F only)
Forest resources, recreation resource management, urban forestry programs. Forestry and natural resource careers. Qualification requirements for government positions, competencies, internships, and experiences to compete for jobs in industry. Course planning, mentoring, alumni contacts. Leadership, organization, process. Lab equipment/software, GUIs, the Internet, spreadsheets, Lumina, periodical indexes.

FR 1101. Dendrology: Identifying Forest Trees and Shrubs. (3 cr)
Identification nomenclature, classification, and distribution of common/important forest trees/shrubs. Use of keys. Field/lab methods of identification.

FR 1901. Freshman Seminar. (1-3 cr [max 3 cr]. Prereq–Freshman)
In-depth study of issues/topics related to natural resources and the environment. Topics vary each semester.

FR 2101. Identifying Forest Plants. (1 cr; A-F only. Prereq–[BIOL 1001 or BIOL 1009]; 1101, BIOL 2022 recommended)
Field identification of common northwoods trees, shrubs, and nonwoody vascular plants. Emphasizes concept of plant communities, soil site relationships, and wildlife values. Taught at Cloquet Forestry Center.

FR 2102. Northern Forests: Field Ecology. (2 cr; A-F only. Prereq–BIOL 1001 or BIOL 1009)
Field examination of natural history of northern/boreal forests with respect to soils, ecological characteristics of trees, community-environment relationships, stand development, succession, and regeneration ecology. Taught at Cloquet Forestry Center.

FR 2104. Measuring Forest Resources. (1 cr; A-F only)
Introduction to land survey, tree/forest stand measurement (mensuration), and forest sampling techniques. Taught at Cloquet Forestry Center.

FR 3104. Forest Ecology. (4 cr; A-F only. §FR 5104. Prereq–BIOL 1001 or 1009; 1 semester college chemistry recommended)
Form/function of forests as ecological systems. Characteristics/dynamics of species, populations, communities, landscapes, and ecosystem processes. Examples applying ecology to forest management. Weekly discussions focus on research topics in forest ecology, exercises applying course concepts, and current issues in forest resource management. Required weekend field trip.

FR 3114. Hydrology and Watershed Management. (3 cr. §FR 5114. Prereq–[BIOL 1009, CHEM 1011] or #)
Introduction to hydrologic cycle and water processes in upland/riparian systems. Applications of hydrological concepts to evaluate impacts of forest management and other land use patterns/activities on water yield, stormflow, erosion, sedimentation, and water quality. Concepts, principles, and applications of riparian/watershed management. Economic/social factors. Uses national/global examples. Emphasizes forest ecosystems.

FR 3131. Geographical Information Systems (GIS) for Natural Resources. (4 cr; A-F only. §FR 5131. Prereq–jr or sr)
Introduction to GIS. Focuses natural resources. Data structures, sources, collection, and quality. Lab exercises introduce geodesy, map projections, spatial analyses, and cartographic modeling.

FR 3203. Forest Fire and Disturbance Ecology. (3 cr; A-F only. §FR 5203. Prereq–[3104 or equiv], course fee)
Ecology, history, management, and control of fire, wind, insect infestation, browsing, and other disturbances in forests. Disturbance regimes of boreal, northern hardwood, and other major forest types of North America. Influence of disturbance on wildlife habitat, urban/wildland interfaces, forest management, and stand/landscape dynamics. Guest speakers on fire organization, training, and operations. Two-day field trip.

FR 3204. Landscape Ecology and Management. (3 cr; A-F only. §FR 5204. Prereq–Ecology course)
Introduction to landscape ecology at different scales in time/space. Development/implications of broad-scale patterns of ecological phenomena, role of disturbance in ecosystems, characteristic spatial/temporal scales of ecological events. Principles of landscape ecology as framework for landscape research, analysis, conservation, and management.

FR 3205. Productivity and Ecology of Forest Soils. (3 cr. §FR 5205. Prereq–Forest ecology, silviculture)
Soil-site factors affecting plant/wildlife communities. Site quality estimation, site modification/enhancement. Effects of forest management and other human-related disturbances on forest site quality.

FR 3218. Measuring & Modeling Forests. (3 cr; A-F only. §FR 5218. Prereq–[MATH 1142 or [MATH 1271, MATH 1272]], STAT 3011)
General sampling design and survey techniques to assess current resource conditions. Application of metrics/sampling methods to forest vegetation. Calculation of tree/stand volume. Selection of modeling approaches. Case studies of modeling to project future growth. Landscape processes, characterization, modeling.

FR 3262. Remote Sensing of Natural Resources and Environment. (4 cr. §FR 5262)
Principles/techniques of remote sensing and its applications to mapping/monitoring land/water resources from local to global scales. Forest and natural resource inventory. Forest cover and soil mapping. Landuse/global change analysis. Lab provides hands-on experience working with aerial photography and digital sensing imagery.

FR 3411. Managing Forest Ecosystems: Silviculture. (3 cr. §FR 5411. Prereq–[3104, non FR [major or minor]] or [3104, ¶5413, FR [major or minor]] or #)
Management of forest ecosystems for sustaining ecological integrity, soil productivity, water quality, wildlife habitat, biological diversity, commodity production in landscape context. Silvics, forest dynamics, disturbances, regeneration, restoration, silvicultural systems. Ramifications of management choices. Weekend field trip.

FR 3431. Timber Harvesting and Road Planning. (2 cr. §FR 5431. Prereq–3411 or #)
Introduction to forest operations. Terminology, basic engineering, equipment and harvesting system options, productivity/costs. Relationship to forest management and silviculture. Road planning, forest management guidelines, approaches for mitigating potential impacts to soil/water resources. Environmental implications of method/equipment choices. Selling timber. Sale design, layout, and administration. Two all-day field trips.

FR 3471. Forest Planning and Management. (3 cr; A-F only. §FR 5471. Prereq–Intro silviculture or concurrent registration in silviculture or #)
Processes/techniques for scheduling forest management activities. Goals of landowners, industry, government, and society. Predicting forest outcomes, financial analysis, forest regulation, mathematical models, linear programming, economic analysis. Landscape-level management, desired conditions, historical range of variability, wildlife management, carbon sequestration, resource monitoring, certification, adaptive management.

FR 3480. Topics in Natural Resources. (1-3 cr [max 12 cr]. §FR 5480. Prereq–#)
Lectures in pecial fields of natural resources given by visiting scholar or regular staff member. Topics specified in *Class Schedule*.

FR 3501. Arboriculture: Selection and Maintenance of Trees. (3 cr. Prereq–[1101 or HORT 1012], BIOL 2022)
Selection, growth, propagation, and maintenance of trees for urban spaces. Tree selection, site preparation, plant health care management. Prevention, diagnosis, and remediation of urban tree risks such as insects, pathogens, pollution, development, and climate change.

FR 3612. Silviculture and Timber Harvesting Practices in Minnesota. (1 cr. §FR 5612. Prereq–Forest ecology, managing forest ecosystems: silviculture)
Silviculture practices as driven by landowner objectives. Compares/contrasts silvicultural practices employed by county, state, federal, and industrial foresters in Minnesota.

FR 4118. Trees: Structure and Function. (3 cr; A-F only. §FR 5118. Prereq–One chemistry course, one biology course, one ecology course)
Plant-water relations. Relations of biology to ecology/management. How physiological factors affect ecological processes and management decisions.

FR 4200H. Honors Seminar. (1 cr; A-F only. Prereq–FR upper division honors, #)
Current topics presented by faculty/students. Lectures. Discussions.

FR 4293. Directed Study. (1-5 cr [max 15 cr]. Prereq–#)
Study/project on topic of personal interest in consultation with faculty member. Initial proposal, reports of accomplishments.

FR 4501. Urban Forest Management: Managing Greenspaces for People. (3 cr. §FR 5501. Prereq–[1101, 3501, Ent 4251, PLPA 3003, [UF major or minor]] or #)
Management concepts for green infrastructure of cities, towns, and communities. Urban forest as a social/biological resource. Emphasizes management of urban forest ecosystem to maximize benefits to people. Tree selection, risk assessment, cost-benefit analysis, landscape planning, values, perceptions. How urban forestry can be a tool to improve community infrastructure.

FR 4801H. Honors Research. (2 cr; A-F only. Prereq–FR upper division honors, #)
First semester of independent research project supervised by faculty member.

FR 4802H. Honors Research. (2 cr; A-F only. Prereq–FR upper division honors, #)
Honors thesis. Oral report.

FR 5104. Forest Ecology. (4 cr; A-F only. §FR 3104. Prereq–[[BIOL 1001 or 1009], grad student] or #; 1 semester college chemistry recommended)
Form/function of forests as ecological systems. Characteristics/dynamics of species, populations, communities, landscapes, and ecosystem processes. Examples applying ecology to forest management. Weekly discussions on research topics, exercises, current issues in forest resource management. Required weekend field trip.

FR 5114. Hydrology and Watershed Management. (3 cr. §FR 3114. Prereq–Grad student or #)
Introduction to hydrologic cycle and water processes in upland/riparian systems. Applications of hydrological concepts to evaluate impacts of forest management and other land use patterns/activities on water yield, stormflow, erosion, sedimentation, and water quality. Concepts, principles, and applications of riparian/watershed management. Economic/social factors. National/global examples. Emphasizes forest ecosystems.

FR 5118. Trees: Structure and Function. (3 cr; A-F only. §FR 4118. Prereq–Grad student or #)
Plant-water relations. Relations of biology to ecology and management. How physiological factors affect ecological processes and management decisions.

FR 5131. Geographical Information Systems (GIS) for Natural Resources. (4 cr; A-F only. §FR 3131. Prereq–Grad student or #)
Introduction to GIS. Focuses on natural resources. Data structures, sources, collection, and quality. Lab exercises introduce geodesy, map projections, spatial analyses, and cartographic modeling.

FR 5142. Tropical Forest Ecology. (3 cr. Prereq–3xxx ecology course)
Ecological principles related to form, function, and development of wet/dry tropical forests at organismal, community, and ecosystem scales. Ecophysiology, succession, productivity, biodiversity, sustainability, agroforestry, social forestry, and management alternatives. Natural distribution of forest types. Causes, consequences, and extent of deforestation.

FR 5146. Science and Policy of Global Environmental Change. (3 cr [max 4 cr]. §EEB 5146. Prereq–3104 or BIOL 3407 or equiv)
Intro to critical issues underpinning global change and its biological implications. Current scientific literature on evidence for global change and potential effects on a wide range of biological processes. Economic/political impact on global change.

This is FR to LAT of the Course Description section of the 2006-2008 Undergraduate Catalog for the University of Minnesota, Twin Cities campus.

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FR 5153. Forest and Wetland Hydrology. (3 cr. Prereq–[Basic hydrology course, [upper div or grad student]] or #)
Current topics, methods/models in forest/wetland hydrology. Hydrologic role of forests, wetlands, riparian systems in snowfall/rainfall regimes. How activities such as deforestation, wetland drainage, and stream channel alterations, affect hydrologic response of watersheds. Runoff/streamflow response from undisturbed/altered forest/wetland watersheds. Problem-solving exercises.

FR 5161. Northern Forest Field Course. (2 cr; A-F only. Prereq–#)
Field identification of common trees, shrubs, and nonwoody vascular plants. Plant communities, soil site relationships, wildlife values. Natural history of northern/boreal forests in terms of soils, ecological characteristics of trees, community-environment relationships, stand development, succession, and regeneration ecology. Land survey, tree/forest stand measurement, forest sampling techniques. Taught at Cloquet Forestry Center.

FR 5203. Forest Fire and Disturbance Ecology. (3 cr; A-F only. §FR 3203. Prereq–[Grad student or #], course fee)
Ecology, history, management, and control of fire, wind, insect infestation, browsing, and other disturbances in forests. Disturbance regimes of boreal, northern hardwood, and other major forest types of North America. Influence of disturbance on wildlife habitat, urban/wildland interfaces, forest management, and stand/landscape dynamics. Guest speakers on fire organization, training, and operations. Two-day field trip.

FR 5204. Landscape Ecology and Management. (3 cr; A-F only. §FR 3204. Prereq–Grad student or #)
Introduction to landscape ecology at different scales in time/space. Development/implications of broad-scale patterns of ecological phenomena, role of disturbance in ecosystems. Characteristic spatial/temporal scales of ecological events. Principles of landscape ecology as framework for landscape research, analysis, conservation, and management.

FR 5205. Productivity and Ecology of Forest Soils. (3 cr. §FR 3205. Prereq–Forest ecology, silviculture)
Soil-site factors affecting plant /wildlife communities. Site quality estimation, site modification/enhancement. Effects of forest management and other human-related disturbances on forest site quality.

FR 5218. Measuring and Modeling Forests. (3 cr; A-F only. §FR 3218. Prereq–Grad student or #)
General sampling design and survey techniques to assess current resource conditions. Application of metrics/sampling methods to forest vegetation. Calculation of tree/stand volume, selection of modeling approaches. Case studies of modeling to project future growth. Landscape processes, characterization, and modeling.

FR 5228. Advanced Assessment and Modeling. (3 cr; A-F only. Prereq–3218, MATH 1272, STAT 5021)
Application of recently developed mathematics, computer science, and statistics methodologies to natural resource functioning, management, and use problems. Specific topics, software, and methodologies vary.

FR 5262. Remote Sensing of Natural Resources and Environment. (4 cr. §FR 3262. Prereq–Grad student or #)
Principles/techniques of remote sensing. Mapping/monitoring land/water resources from local to global scales. Forest and natural resource inventory. Forest cover and soil mapping. Landuse/global change analysis. Lab provides hands-on experience working with aerial photography and digital sensing imagery.

FR 5264. Advanced Forest Management Planning. (3 cr. Prereq–3471 or #)
Applied models for forest planning to integrate forest resource conditions/uses. Stand-level management. Forest-wide/landscape-level planning. Regional timber supply analysis. Optimization models and heuristic techniques as tools. Integrating sustainable timber production with desirable future conditions and spatial structure for biodiversity. Problems, case studies involving recent large-scale applications.

FR 5411. Managing Forest Ecosystems: Silviculture. (3 cr. §FR 3411. Prereq–Grad student or #)
Management of forest ecosystems for sustaining ecological integrity, soil productivity, water quality, wildlife habitat, biological diversity, commodity production in landscape context. Silvics, forest dynamics, disturbances, regeneration, restoration, silvicultural systems. Ramifications of management choices. Weekend field trip.

FR 5412. Digital Remote Sensing. (3 cr. Prereq–3262 or grad student or #)
Physical basis and practical applications of digital remote sensing. Energy-matter interactions. Measurements and sensors. Digital image processing/analysis. Experience working with remote sensing data, image processing, and models.

FR 5413. Managing Forest Ecosystems: Silviculture Lab. (1 cr. Prereq–FR [major or minor] or grad student)
Development of silvicultural prescriptions to achieve various landownerobjectives. Timber cruise, growth/yield simulations, stand densitymanagement diagrams, thinning schedules, use of forest vegetationsimulator. Field trips, computer labs, lectures.

FR 5431. Timber Harvesting and Road Planning. (2 cr. §FR 3431. Prereq–Grad student or #)
Forest operations. Terminology, engineering, equipment/harvesting system options, productivity/costs. Relationship to forest management and silviculture. Road planning, forest management guidelines. Mitigating potential impacts to soil/water resources. Environmental implications of method/equipment choices. Selling timber. Sale design, layout, and administration. Two all-day field trips.

FR 5471. Forest Planning and Management. (3 cr; A-F only. §FR 3471. Prereq–Grad student or #)
Processes/techniques for scheduling forest management. Goals of landowners, industry, government, and society. Issues/policies/regulations that influence management. Predicting outcomes, financial analysis, regulation, mathematical models, linear programming, economic analysis. Landscape-level management, historical range of variability, wildlife management, carbon sequestration, resource monitoring, certification, adaptive management.

FR 5480. Topics in Natural Resources. (1-3 cr [max 3 cr]. §FR 3480. Prereq–#)
Lectures in special fields of natural resources given by visiting scholar or regular staff member. Topics specified in *Class Schedule*.

FR 5501. Urban Forest Management: Managing Greenspaces for People. (3 cr. §FR 4501. Prereq–Grad student or #)
Management concepts for green infrastructure of cities, towns, and communities. Urban forest as social/biological resource. Emphasizes management of urban forest ecosystem to maximize benefits. Tree selection, risk assessment, cost-benefit analysis, landscape planning, values, perceptions. How urban forestry can be a tool to improve community infrastructure.

FR 5611. Field Silviculture. (2 cr. Prereq–3104, 3411, 3612)
Collection of field data to prepare/write silvicultural prescriptions for regeneration, thinning, and harvesting in context of landscape, watershed, and wildlife habitat issues. Field exercises in forest entomology, pathology, tree improvement, and non-timber forest products. Tree planting. Marking stands for harvest. Taught at Cloquet Forestry Center. Field trips to forests managed by state/industry.

FR 5612. Silviculture and Timber Harvesting Practices in Minnesota. (1 cr. §FR 3612. Prereq–Forest ecology, managing forest ecosystems: silviculture)
Silviculture practices as driven by landowner objectives. Compares/contrasts silvicultural practices employed by county, state, federal, and industrial foresters in Minnesota.

FR 5615. Field Remote Sensing and Resource Survey. (2 cr; A-F only. Prereq–3218, 3262)
Field applications of remote sensing, sampling/measurement methods to inventory/mapping of forest and other natural resources. Offered at Cloquet Forestry Center.

FR 5621. Field Timber Harvesting and Road Planning. (2 cr. Prereq–[3411, 3431, 3612] or #)
Design, layout, and administration of timber sales. Forest road planning and design. Protecting residual trees during harvesting operations. Dealing with protesters. Field trips and on-site evaluations of timber harvesting systems. Timber appraisal, forest management guidelines. Road location and profiling. Planning/layout considerations. Taught at Cloquet Forestry Center.

FR 5700. Colloquium in Natural Resources. (1-3 cr [max 3 cr]. Prereq–#)
Colloquium in specialized topics in natural resources.

French (FREN)

Department of French and Italian

College of Liberal Arts

FREN 1. Reading French in the Arts and Sciences. (0 cr)
Basic reading knowledge of French language; intensive reading and translation of texts from a wide variety of disciplines. Students successfully completing the course obtain Language Certification in French which satisfies a Graduate School requirement.

FREN 100. Reading French in the Arts and Sciences. (0 cr)
Basic reading knowledge of French language. Intensive reading/translation of texts from a wide variety of disciplines. Students successfully completing the course obtain language certification in French.

FREN 1001. Beginning French. (5 cr)
Basic listening, speaking, reading, and writing skills. Emphasis on communicative competence. Some cultural readings.

FREN 1002. Beginning French. (5 cr. Prereq–1001 or equiv)
Basic listening, speaking, reading, and writing skills. Emphasis on communicative competence. Some cultural readings.

FREN 1003. Intermediate French. (5 cr. Prereq–1002 or Entrance Proficiency Test)
Development of listening, writing, and speaking skills in the context of cultural themes related to the Francophone world. Grammar review and elaboration.

FREN 1004. Intermediate French. (5 cr. Prereq–1003 or Entrance Proficiency Test)
Development of listening, reading, writing, and speaking skills in the context of cultural themes related to the Francophone world. Grammar review and elaboration.

FREN 1022. Accelerated Beginning French. (5 cr. Prereq–2 or more yrs high school French)
For students who have studied French in high school or at community colleges and who do not place high enough on placement exam to enter 1003. An accelerated review of Fren 1001 followed by the material covered in Fren 1002.

FREN 1904. The Poetry of Vision: Dante's "Purgatory" and Trecento Painting. (3 cr; A-F only. Prereq–Freshman)
Examples of art of Dante's time, including especially painting, but also architecture and manuscript illumination, from major Italian/French sources known to Dante.

FREN 1905. Freshman Seminar. (3 cr; A-F only. Prereq–Freshman)
Topics specified in *Class Schedule*.

FREN 1909W. Remembering to Forget: Holocaust and Its Afterlife. (3 cr; A-F only. §JWST 1909W. Prereq–Freshman)
The urge to study Holocaust as singular event is studied through testimonies, artistic endeavors, popular culture, and theory. Drawbacks of a hyper-memory bordering on amnesia.

FREN 1910W. Freshman Seminar. (3 cr; A-F only. Prereq–Freshman)
Topics specified in *Class Schedule*.

FREN 3010. French Expression. (3-6 cr [max 6 cr])
Intensive work in oral/written communication.

FREN 3014. French Phonetics. (2 cr. Prereq–1004)
Articulatory description of the sounds of French, phonetic transcription, and remedial practice to improve pronunciation.

FREN 3015. Advanced French Grammar and Communication. (4 cr. Prereq–1004 or equiv or #)
Advanced study of French with particular emphasis on grammar review, vocabulary building, oral communication skills, and language usage in cultural contexts.

FREN 3016. Advanced French Composition and Communication. (4 cr. Prereq–3015 or equiv or #)
Advanced study of grammar in context; emphasis on writing for varied communicative purposes, reading for style and content, translation.

FREN 3018. French Oral Communication. (3 cr. Prereq–3014, 3015)
Intensive work in oral expression, listening comprehension. Incorporates wide variety of cultural topics.

FREN 3019. French Diction and Speaking. (2 cr. Prereq–3014)
The relationship between the written and the spoken word in French. Learn to read prose and poetry aloud from a text using appropriate French pronunciation, etc. Leads to play readings and possible performance.

FREN 3022. The Language and Culture of Business in France. (3 cr. Prereq–3015; completion of 3016 recommended)
Examines French business language as well as business practices and culture in France. Includes cross-cultural analysis.

FREN 3101W. Introduction to French Literature. (4 cr. Prereq–3015 or equiv)
Close critical analysis of poetry, prose fiction, and plays. Introduction to literature and methods of literary analysis.

FREN 3111. Medieval Stories. (3 cr. Prereq–3101)
Reading/discussion of major forms of medieval tale (comic, bawdy, moralizing, fantasy, historical) in modern French translation. Explores their relationship to development of French culture, especially urbanization, class relations, marriage, role of Church.

FREN 3140. Topics in Medieval and Renaissance Literature. (3 cr [max 9 cr]. Prereq–3101)
Different aspects of French literature/culture of medieval/Renaissance periods (11th-16th century). Content varies depending on instructor. Literary, historical, or social problem. Period, author, genre, or topic of interest. Readings may be literary, critical, cultural, historical, political, etc. Specific content posted in department and in Course Guide.

FREN 3170. The Unruly Subject(s) of Classicism: Writing, History, Power in Ancien RÈgime France. (3 cr [max 9 cr]. Prereq–3101 or equiv)
The formation of subjectivity in the literature and culture of 17th- and 18th-century France. Aesthetics of classicism, consolidation of state power, and representations of the individual in theater, novel, and prose.

FREN 3172. The Court Society: Literature, Culture, Spectacle. (3 cr. Prereq–3101)
Examines the court and salon society in 17th-century France. The production of taste, sociability, and national identity is considered in literature, painting, architecture, and the plastic arts.

FREN 3181. Mapping Enlightenment in 17th- and 18th-Century French Prose. (3 cr. Prereq–3101)
The themes, values, and critical strategies of the social and intellectual movement designated by the term Enlightenment. The legacy of the Enlightenment project will also be evaluated.

FREN 3240. Topics in Ancien Regime Literature. (3 cr [max 9 cr]. Prereq–3101)
Different aspects of French literature/culture from early modern period (17th/18th centuries). Content varies depending on instructor. Literary, historical, or social problem. Period, author, genre or topic of interest. Readings may be literary, critical, cultural, historical, political,etc. Specific content posted in department and in *Course Guide*.

FREN 3250. French Poetry. (3 cr [max 9 cr]. Prereq–3101)
The historical, political, and social contexts of the evolution of French poetry from its origins to the modern era. While studying primarily lyric poetry, epic and dramatic poetry may also be considered when appropriate.

FREN 3260. Dramas of Culture: 20th-Century French and Francophone Theater. (3 cr [max 9 cr]. §TH 3261. Prereq–3101)
Key movements, dramatists, and contexts of 20th-century French and Francophone theater. Areas of study include naturalist and symbolist legacies as well as existentialist, avant-garde, and contemporary performance and drama.

FREN 3310. Literature of Revolution and Upheaval. (3 cr [max 9 cr]. Prereq–3101)
A study of revolutionary movements in France seen through novels placed in historical context. Content may vary, but course will deal with radical historical, cultural and literary changes in France primarily in the modern period.

FREN 3321. Producing the Bourgeois Subject: The Sense of Self in 18th-Century French Literature. (3 cr. Prereq–3101)
Examines the role of 18th-century literature in shaping the notion of self and social identity. Attention is given to the novel and its relation to new reading practices and publics.

FREN 3330. Literature and the Making of Modern France: 20th-Century Perspectives. (3 cr [max 9 cr]. Prereq–3101)
Developments of literary culture of 20th-century France in the context of historical events and social transformations.

FREN 3340. Topics in Modern French Literature. (3 cr [max 9 cr])
Different aspects of modern French literature/culture, defining modern period as that of post-Revolution France. Content varies depending on instructor. Literary, historical, or social problem. Period, author, genre, or topic of interest. Readings may be literary, critical, cultural, historical, political, etc. Specific content posted in department and in Course Guide.

FREN 3350. Topics in Literature. (3 cr [max 9 cr]. Prereq–3101)
Focuses on a problem, period, author, or topic of interest. Specific content posted in department and listed in Course Guide.

FREN 3360. Coming of Age. (3 cr [max 9 cr]. Prereq–3101)
A study of the literature of education and of the process of youth coming to terms with society. Readings will vary and will be drawn from a number of time periods.

FREN 3371. Writing Crisis in (Post) Modern Times. (3 cr. Prereq–3101)
Examines the meaning and purpose of the notion of crisis in French novels. How crises, be they personal, social or political, prompt writers to create new modes of (dis)connecting with other persons, institutions, and society.

FREN 3380. Modern Times: Literature of the 19th and 20th Centuries. (3 cr [max 9 cr]. Prereq–3101)
Variously emphasizing the two centuries. Sample topics include: esthetic currents (Realism and the novel); cultural considerations (gendered representations); philosophical concerns (the relation of individuals to the social body in civil society).

FREN 3410. Quebecois Literature. (3 cr [max 9 cr]. Prereq–3101)
Study writing produced in Quebec as a literature of its own, not simply as a part of Canadian literature. Literature will be studied in relation to other North American literatures and to Francophone literature produced elsewhere in the world.

FREN 3479. Francophone Writers of the African Diaspora. (3 cr. Prereq–3101)
Literature from Francophone North Africa, Africa, the Caribbean of the colonial and/or post-colonial eras, examined in its historical, cultural, or ideological contexts. Reading selections may include texts by immigrant or exiled writers in France.

FREN 3501. Structure of French: Phonology. (3 cr. §FREN 5501. Prereq–3014, 3015, LING 3001 or #)
Advanced study of the sound system of contemporary French.

FREN 3502. Structure of French: Morphology and Syntax. (3 cr. §FREN 5502. Prereq–3501, LING 3001 or #)
Linguistic study of contemporary French word forms (inflectional and derivational morphology); introduction to French syntax (linguistic study of grammar) and characteristic syntactic constructions.

FREN 3521. History of the French Language. (3 cr. Prereq–3015; LING 3001 recommended)
Origins and development of the French language from Latin to contemporary French. Selected texts. Present stage and development.

FREN 3531. Sociolinguistics of French. (3 cr. §FREN 5531. Prereq–3015, LING 3001 or #)
Explores variation in the use of French associated with factors such as medium (oral/written), style (formal/informal), region, social and economic groups.

FREN 3541. Oral Discourse of French. (3 cr. Prereq–3015; LING 3001 recommended)
Nature of contemporary spoken French discourse. Focuses on spontaneous, multi-speaker discourse. Readings include examples of various linguistic approaches to such discourse. Emphasizes syntactic analysis. Phonological/lexical particularities. 'Macro' level analyses such as discourse analysis and conversation analysis.

FREN 3601. French Civilization and Culture I. (3 cr. Prereq–3015)
Roman occupation of Gaul to 1715.

FREN 3602. French Civilization and Culture II. (3 cr. Prereq–3015)
1705 to present.

FREN 3650. Topics in French/Francophone Cultures. (3 cr [max 9 cr]. Prereq–3015)
Focus on aspects of French and/or francophone cultures in various historical, social, political, and geographical contexts.

FREN 3705. Atlantic Crossings: The French View Americans (and Vice Versa). (3 cr. Prereq–Not for majors)
French perspectives on the United States and American perspectives on France in "travel" literature and film examined in their historical, political, and cultural contexts. Taught in English. Knowledge of French helpful but not necessary.

FREN 3706. Quebec: Literature and Film in Translation. (3 cr. Prereq–Not for majors)
A survey of Quebec literature and film in English or with subtitles. Particular attention paid to cultural tensions as well as to the impact of women writers and filmmakers on each genre.

FREN 3710W. Reading Libertinage: Dangerous Lessons in Translation. (3 cr [max 9 cr]. Prereq–Non [major or minor] in French or [[French [major or minor], #]; students [majoring or minoring] in French arrange work in French [reading, writing] with instructor)
Libertinage and the libertine in French literature of 17th/18th centuries. Literary forms as ways to produce/question desire. Taught in English. All readings in English.

FREN 3733. The Idea of Paris. (3 cr)
Ranges across literature, painting, photography, film, and architecture. Meanings that the idea of Paris acquired in modern French cultural imagination. Paris read critically as protean metaphor, myth, or allegory of urban modernity. Views of Paris as defining American cultural imagination. Taught in English.

FREN 3750. Topics in French or Francophone Literature and Culture. (3 cr [max 9 cr]. Prereq–Non-French major; knowledge of French helpful)
Theme, problem, period, or topic of interest in French or Francophone literature or culture. See *Class Schedule*. Taught in English.

FREN 3995. Directed Teaching. (1-5 cr [max 25 cr]; S-N only. Prereq–Δ)
Directed teaching.

FREN 4001. Beginning French. (2 cr. Prereq–Grad student)
Meets concurrently with 1001. See 1001 for course description.

FREN 4002. Beginning French. (2 cr. Prereq–Grad student)
Meets concurrently with 1002. See Fren for course description.

FREN 4003. Intermediate French. (2 cr. Prereq–Grad student)
Meets concurrently with 1003. See 1003 for course description.

FREN 4004. Intermediate French. (2 cr. Prereq–Grad student)
Meets concurrently with 1004. See 1004 for course description.

FREN 4101V. Honors: Seminar in French Studies. (3 cr. Prereq–Completion of all pre-elective requirements for major or permission of DUS)
Reading/discussion of contemporary issues in French studies, workshop on senior projects.

FREN 4101W. Seminar in French Studies. (3 cr. Prereq–Completion of all pre-elective requirements for major or permission of DUS)
Reading and discussion of contemporary issues in French studies and workshop on senior projects.

FREN 4510. Topics in French Linguistics. (3 cr [max 9 cr]. Prereq–#)
Topics selected from French syntax, pragmatics, discourse analysis, or sociolinguistics.

FREN 4970. Directed Readings. (1-4 cr [max 9 cr]. Prereq–#)
Designed to meet unique requirements agreed upon by a faculty member and a student. Individual contracts are drawn up listing contact hours, number of credits, written and other work required. Each contract will vary.

FREN 5250. Promenades Poetiques: The Subject in Motion. (3 cr [max 9 cr]. Prereq–3111 or above)
The search for the subject in poetry and poetic prose as revealed through the motif of the "promenade" and experimentation with literary forms.

FREN 5260. The Returns of Tragedy. (3 cr [max 9 cr]. Prereq–3111 or above)
Tragedy as dramatic form in relation to social order, myth and history, and theatre.

FREN 5270. "To Change or not to Change?": Speculations on (Post) Modern French Texts. (3 cr [max 9 cr]. Prereq–3111)
The meaning and purpose of the notion of "change" in French novels. Explore how a multiplicity of causes produces major changes in an individual's personal and public life. The notion of change as it relates to financial and intellectual speculation.

FREN 5301. Critical Issues in French Studies. (3 cr. Prereq–Grad or #)
Introduces the methods of interpretation and critical debates that have shaped and continue to define the discipline of French studies. Provides a practical introduction to graduate-level literary research.

FREN 5350. Topics in Literature and Culture. (3 cr [max 12 cr]. Prereq–3101 or equiv)
Problem, period, author, or topic of interest. See *Class Schedule*.

FREN 5470. Post/Colonial Francophone Literatures. (3 cr [max 9 cr]. Prereq–3111 or above)
Francophone literature from North Africa, Africa, and the Caribbean of the colonial and/or post-colonial eras in the light of relevant literary and cultural theories.

FREN 5501. Structure of French: Phonology. (3 cr. §FREN 3501. Prereq–[LING 3001 or LING 5001], grad student)
Advanced study of sound system of contemporary French.

FREN 5502. Structure of French: Morphology and Syntax. (3 cr. §FREN 3502. Prereq–5501 or #)
Linguistic study of contemporary French word forms (inflectional and derivational morphology); introduction to French syntax (linguistic study of grammar) and characteristic syntactic constructions.

FREN 5531. Sociolinguistics of French. (3 cr. §FREN 3531. Prereq–§: 3531; LING 3001 or 5001, grad)
Explores variation in the use of French associated with factors such as medium (oral/written), style (formal/informal), region, social and economic groups.

FREN 5541. Oral Discourse of French. (3 cr. Prereq–3015, grad student; LING 5001 recommended)
Nature of contemporary spoken French discourse. Focuses on spontaneous, multi-speaker discourse. Readings include examples of various linguistic approaches to such discourse. Emphasizes syntactic analysis. Phonological/lexical particularities. 'Macro' level analyses such as discourse analysis and conversation analysis.

FREN 5995. Directed Teaching. (1-6 cr [max 24 cr]; S-N only. Prereq–#)
Directed teaching.

French and Italian (FRIT)

Department of French and Italian

College of Liberal Arts

FRIT 3802. Cinema and Realism. (3 cr)
Examines French poetic realism, relating it to two other periods of realist film, Italian Neorealism and American film noir. Taught in English. Knowledge of French helpful but not necessary.

FRIT 3803. New Wave Cinemas: Love, Alienation and Landscape in Post-War Italian and French Film. (3 cr)
Modernist Italian and New Wave French cinema after WWII, focusing on film syntax, constructions of gender, and the individual's relationship to the modern urban and rural landscape. Taught in English. Knowledge of Italian and French helpful but not necessary.

FRIT 3804. Cinema and Culture: The City of Paris. (3 cr)
How French cinema, from the silent era to the present, reflects and constructs the pleasures and anxieties of urbanization, new modes of entertainment, and new cultural roles for men and women. Taught in English. Knowledge of Italian and French helpful but not necessary.

FRIT 3850. Topics in French and Italian Cinema. (3 cr [max 9 cr]. Prereq–Knowledge of [French or Italian] helpful but not required)
Theme, problem, period, filmmaker, or topic of interest in French/Italian cinema. See *Class Schedule*. Taught in English.

FRIT 5257. Passionate Beings: Literary and Medical Problematics in Italy and France from 1800 to the Present. (4 cr)
Literary and medical representations of the passions in France and in Italy from 1800 to the present. Texts range from theatrical works to medical treatises on the passions as ways for exploring notions of subjectivity, responsibility, order. Taught in English.

FRIT 5850. Topics in French and Italian Cinema. (3 cr. Prereq–Knowledge of [French or Italian] helpful but not required)
Focuses on a theme, problem, period, filmmaker, or other topic of interest in French or Italian cinema. See *Class Schedule*. Taught in English.

FRIT 5999. Teaching of French and Italian: Theory and Practice. (3 cr)
Theoretical and practical aspects of language learning and teaching applied to French and Italian. Includes history of foreign language teaching in 20th-century United States. Taught in English.

Gay, Lesbian, Bisexual, and Transgender Studies (GLBT)

College of Liberal Arts-Adm

GLBT 1001. Introduction to GLBT Studies. (3 cr)
History of contemporary GLBT-identified communities. Terms of theoretical debates regarding sexual orientation, identity, and experience. Analyzes problems produced and insights gained by incorporating GLBT issues into specific academic, social, cultural, and political discourses.

GLBT 3301. Gay, Lesbian, Bisexual, and Transgender Social Movements in the United States. (3 cr. §SW 3301. Prereq–[1001 or SOC 1xxx or WoSt 1001 or WoSt 1002 or SW 2001 or SW 2501] or #)
Interdisciplinary course. Development of GLBT social movements using social movement theory and service learning.

GLBT 3610. Topics in GLBT Studies. (3 cr)
Topics specified in *Class Schedule*.

GLBT 3993. Directed Studies. (1-6 cr [max 6 cr]; A-F only. Prereq–GLBT studies minor, #)
Guided individual study. GLBT topic not available through regular course offerings. Students work with faculty who share their research interests. Number of credits based on scope of project, student needs, and advising instructor's approval.

Genetics, Cell Biology and Development (GCD)

Department of Genetics, Cell Biology, and Development

College of Biological Sciences

GCD 3022. Genetics. (3 cr. §BIOL 4003. Prereq–BIOL 1002 or 1009; not for biology majors)
Mechanisms of heredity, their implications for biological populations, and applications to practical problems.

GCD 4015. Genetics Laboratory. (2 cr. Prereq–3022 or BIOL 4003 or BIOC 4332)
Introduction to experimental techniques used in genetic analyses. Although experiments may vary from semester to semester, genetic experiments with model systems ranging from viruses to plants and animals are performed.

GCD 4025. Cell Biology Laboratory. (2 cr. Prereq–BIOL 4004 or #)
Experimental approaches to cell structure, function, and replication. Microscopy, autoradiography, cell fractionation, molecular/chemical analyses.

GCD 4034. Molecular Genetics. (3 cr. Prereq–BIOL 4003, BIOL 4004; advanced bioscience undergrad recommended)
Molecular genetics of prokaryotes/eukaryotes. Gene regulation, genome analysis. Modern techniques such as recombinant DNA, targeted mutations, genome manipulation, and gene chip technology.

GCD 4111. Histology: Cell and Tissue Organization. (4 cr. Prereq–BIOL 4004 or #)
Structure and function of vertebrate tissues and organs. Lectures combine electron microscopy, light microscopy, physiology, and cell biology of higher animals. Labs concentrate on light microscopy of mammalian tissues.

GCD 4134. Endocrinology. (3 cr. Prereq–BIOL 3211 or Biol/BIOC 3021 or BIOC 4331 or #)
Survey of structure and function of invertebrate and vertebrate endocrine systems.

GCD 4143. Human Genetics. (3 cr. Prereq–3022 or BIOL 4003 or #)
Principles of human genetics at the molecular, cellular, individual, and populations levels. Chromosomal and biochemical disorders; gene mapping; mutation and natural selection; variation in intelligence and behavior; genetic screening, counseling and therapy.

GCD 4151. Molecular Biology of Cancer. (3 cr. Prereq–BIOL 4003)
Regulatory pathways involved in directing normal development of complex eukaryotic organisms, how disruptions of these pathways can lead to abnormal cell growth/cancer. Causes, detection, treatment, prevention of cancer.

GCD 4161. Developmental Biology. (3 cr [max 4 cr]. Prereq–BIOL 4003, BIOL 4004)
Mechanisms that govern development from gametogenesis through fertilization. Embryogenesis/postembryonic development. Mechanisms of morphogenesis/differentiation. Classical/molecular approaches in various model organisms. Genetic models such as bacteriophage, yeast, Drosophila, C. elegans, Arabidopsis, zebrafish, and the mouse.

GCD 4793W. Directed Studies: Writing Intensive. (1-7 cr [max 7 cr]; S-N only. Prereq–#, Δ)
Individual study on selected topics or problems. Emphasizes selected readings, use of scientific literature. Written report.

GCD 4794W. Directed Research: Writing Intensive. (1-6 cr [max 42 cr]; S-N only. Prereq–#, Δ)
Laboratory or field investigation of selected areas of research including written report.

GCD 4993. Directed Studies. (1-7 cr [max 7 cr]; S-N only. Prereq–#, Δ)
Individual study on selected topics or problems. Emphasizes selected readings and use of scientific literature.

GCD 4994. Directed Research. (1-6 cr [max 42 cr]; S-N only. Prereq–#, Δ)
Laboratory or field investigation of selected areas of research.

GCD 5036. Molecular Cell Biology. (3 cr. Prereq–BIOL 4004 or #; [sr or grad student] recommended)
Modern, integrative approaches combining cell/molecular biology, biochemistry, and genetics to investigate cell organization/function. Membranes, signaling, extracellular matrix, secretion, endocytosis, cytoskeleton, nucleus. Analysis of scientific papers to illustrate new concepts in and experimental approaches to cell organization/function.

Geographic Information Science (GIS)

Department of Geography

College of Liberal Arts

GIS 5555. Basic Spatial Analysis. (3 cr. Prereq–[STAT 3001 or equiv, MGIS student] or #)
Analyses of data with spatial (locational) information. Exploratory data analysis. Descriptive statistics of point data. Descriptive statistics for line data. Descriptive statistics for polygon data. Spatial autocorrelation. Inferential statistical analysis of point data/polygons. Descriptive analysis of patches/landscapes. Spatial pattern recognition using empirical orthogonal functions and cluster analysis. Regression methods for spatially autocorrelated variables.

GIS 5571. Introduction to Arc/Info. (3 cr. Prereq–GEOG 5561 or equiv, status in MGIS program, familiarity with computer operating systems or #)
Introductory overview of the Arc/Info system. Topics include data capture, geometric transformations and map projections, topology, editing systems, database management and map production.

GIS 5572. Advanced Arc/Info. (3 cr. Prereq–5571, GEOG 5561 or equiv, status in MGIS program or #)
Advanced course in Arc/Info providing in-depth exploration of the topics emphasized in GIS 5571 as well as advanced topics including dynamic segmentation, address matching, and macro language programming.

GIS 5573. Desktop Mapping. (1.5 cr. Prereq–GEOG 5561 or equiv, GEOG 3 511 or equiv, status in MGIS program or #)
Introduction to desktop mapping systems such as ArcView, MapInfo and Maptitude. Emphasizes the application of these systems to the display and analysis of geographical data.

GIS 5574. GIS and the Internet. (1.5 cr. Prereq–GEOG 5561 or equiv, status in MGIS program or #)
The role of the Internet in GIS applications. Topics include GIS data sources on the Internet, the role of the Internet in information dissemination, Internet capabilities for interactive mapping and issues surrounding the development of GIS-related Web sites.

GIS 5575. Surveying and the Global Positioning System (GPS). (2 cr. Prereq–GEOG 5561 or equiv, status in MGIS program or #)
Introduction to GPS (Global Positioning System) and other surveying techniques of use to GIS professionals. Topics include geodesy, data adjustment, datums, ellipsoids, coordinate systems, and transformations.

GIS 5577. Spatial Data Administration. (3 cr. Prereq–#)
Theory/pplication for administration of geographic databases. Quality assurance, development planning/management, maintenance, access/distribution, documentation.

GIS 5578. GIS Programming. (2 cr. Prereq–MGIS student or #)
Opportunities/flexibility that computer programming offers to application of GIS technologies. Object-oriented programming techniques using Microsoft. s Visual Basic programming language. Students apply GIS principles/concepts within Visual Basic programs using ESRI.s MapObjects.

GIS 5590. Special Topics in GIS. (1-3 cr [max 6 cr]; A-F only. Prereq–#)
Special topics in geographic information science (GIS). Topics vary according to student needs, technological developments in field.

Geography (GEOG)

Department of Geography

College of Liberal Arts

GEOG 1301V. Honors: Introduction to Human Geography. (4 cr. Prereq–Honors)
Geography of population, principal ways of life. Capacity of earth for future population.

GEOG 1301W. Introduction to Human Geography. (4 cr)
Geography of population and principal ways of life; capacity of earth for future population.

GEOG 1372. Geography of Global Cities. (3 cr. §GLOS 1672)
Urban forms/processes. Uses key global cities as examples. Political, historical, and economic contexts of cities. Planning ideologies. Globalization. Race/segregation. Population growth. Environmental problems. Current issues in global urbanization.

GEOG 1403. Biogeography of the Global Garden. (4 cr)
The geography of biodiversity and productivity, from conspicuous species to those that cause human disease and economic hardship. The roles played by evolution and extinction, fluxes of energy, water, biochemicals, and dispersal. Experiments demonstrating interactions of managed and unmanaged biotic with the hydrologic cycle, energy budgets, nutrient cycles, the carbon budget, and soil processes.

GEOG 1403H. Honors: Biogeography of the Global Garden. (4 cr. Prereq–Honors)
The geography of biodiversity and productivity, from conspicuous species to those that cause human disease and economic hardship. The roles played by evolution and extinction, fluxes of energy, water, biochemicals, and dispersal. Experiments demonstrating interactions of managed and unmanaged biotic with the hydrologic cycle, energy budgets, nutrient cycles, the carbon budget, and soil processes.

GEOG 1425. Introduction to Meteorology. (4 cr. §ESPM 1425)
Nature of atmosphere, its behavior. Atmospheric composition, structure, stability, motion. Precipitation processes, air masses, fronts, cyclones, anticyclones. General weather patterns. Meteorological instruments/observation. Weather map analysis. Weather forecasting.

GEOG 1502. Maps, Visualization and Geographical Reasoning. (4 cr)
Fundamental issues related to the acquisition, storage, manipulation, analysis, display and interpretation of spatially-referenced data. Emphasis on mathematical analysis of these data and interpretation of cultural and physical patterns critical to the development of geographical reasoning.

GEOG 1904. Freshman Seminar. (3 cr. Prereq–Freshman)
Topics specified in *Course Guide*.

GEOG 1905. Freshman Seminar. (3 cr. Prereq–Freshman)
Topic specified in *Course Guide*.

GEOG 1906W. Freshman Seminar. (3 cr; A-F only. Prereq–Freshman)
Topics specified in *Class Schedule*.

GEOG 1910W. Freshman Seminar. (3 cr; A-F only. Prereq–Fr)
Topics specified in *Class Schedule*.

GEOG 1973. Geography of the Twin Cities. (3 cr. §GEOG 3973)
Social and physical characteristics of the Twin Cities. Their place in the urban network of the United States.

GEOG 3101. Geography of the United States and Canada. (4 cr. §GEOG 3 102)
Analysis of the ways in which the aspirations and abilities of diverse groups of people interact with the complexities of the natural environment to produce the contemporary pluralistic cultures and regional differentiation of the United States and Canada.

GEOG 3111. Geography of Minnesota. (3 cr)
The evolution of Minnesota and its current geographical characteristics. The state is a unique political entity that possesses similarities with other states because of the homogenizing influence of the federal government.

GEOG 3141. Africa. (3 cr. §AFRO 3141)
Regional differentiation of human groups and environments; culture contact and problems of underdeveloped countries south of the Sahara.

GEOG 3145. The Islamic World. (3 cr. §GLOS 3645)
Foundation of Islam in Arabian Peninsula, its spread to Asia and Africa. Islamic civilization, influence on Europe before rise of capitalism. Rise of Capitalist Europe, colonization of Islamic World Islamic resurgence and post-colonial world. State-society and development. Culture/conflict in Moslem societies. Gender and Islam. Islamic World and the West. Moslems in North America and Europe. Case studies.

GEOG 3158. Southern Africa: Apartheid and Beyond. (3 cr; A-F only. Prereq–Soph or jr or sr)
Historical geography. Clash of economic/cultural systems. Colonization, destruction of traditional political economy, settlement, dispossession. Capitalist agriculture, racist economy. Mining, consolidation of racist political economy. Migration/labor. Resistance to colonialism/apartheid. Independence/development north of Limpopo river. Regional implications of struggle against apartheid. Development in post-apartheid Southern Africa.

GEOG 3161. Europe: A Geographic Perspective. (3 cr. §GLOS 3921)
Comparative analysis and explanation of Europe. s physical, demographic, ethnic/cultural, economic, political, and urban landscapes; European integration - the European Union; transformation of Eastern Europe. German language discussion group in conjunction with the course for 1 extra credit.

GEOG 3181. Russia and Environs. (3 cr. §GEOG 5181)
Physical and human geography of Russia and former Soviet republics. Legacy of central planning on regional economies, city systems and city structure. Economic and cultural links among regions and republics. Conflicts rooted in religion, ethnicity and tradition. Relations with nearby states and regions. Physical environmental problems.

GEOG 3211. East Asia. (3 cr. §EAS 3211, GEOG 3215, GEOG 5211, GEOG 5215)
Physical and human geography of Japan, mainland China and Taiwan, North and South Korea; population pressure, economic and urban development, and international relations.

GEOG 3212. South Asia and Global Processes. (3 cr)
Bio-physical geography, colonial rule, historical geography. Anti-/post-colonial nationalisms. State, modernization, urban/agrarian change. Population, resources, sustainability. Social diversity, geographies of difference. Media, migrations, post-colonial politics. From .development. to .globalization.. Domestic/international ocial movements/conflicts. Democracy, citizenship, and governance in globalized South Asia.

GEOG 3331. Geography of the World Economy. (3 cr)
Geographical distribution of resources affecting development; location of agriculture, industry, services; geography of communications; agglomeration of economic activities, urbanization, regional growth; international trade; changing global development inequalities; impact of globalizing production and finance on the welfare of nations, regions, cities.

GEOG 3355. Environmental Quality. (3 cr)
The quality of the human environment depends on 1) how humans make decisions about how to act, 2) how they act, and 3) how they evaluate both. In the United States, this process is best described as .disjointed incrementalism. in which governments, organizations, and individuals play distinct and important roles.

GEOG 3361W. Land Use, Landscapes, and the Law. (3 cr)
Landscapes are political statements. They reflect how individuals, organizations, and governments have exercised the legal rights that they possess to produce goods and provide services.

GEOG 3371V. Honors: Introduction to Urban Geography. (4 cr. Prereq–Honors)
Character, distribution, development of cities in present-day world. Internal/external locational relationships.

GEOG 3371W. Cities, Citizens, and Communities. (4 cr)
Character, distribution, and development of cities in present-day world. Internal/external locational relationships.

GEOG 3373. Changing Form of the City. (3 cr)
Urban origins, ancient cultures/cities, the medieval city, rediscovery of planning, colonial cities. Industrialization and urban expansion. Speculative cities, utopian cities, planning triumphs/disasters. Cities as reflections of society, culture, the past.

GEOG 3374V. Honors: The City in Film. (4 cr. §GEOG 3374W, GEOG 5374W. Prereq–honors)
Cinematic portrayal of changes in 20th-century cities worldwide. Social/cultural conflict, political/economic processes, changing gender relationships, rural versus urban areas, population/development issues (especially as they affect women/children). Additional weekly meeting discusses films, readings. Project on a topic selected in consultation with instructor.

GEOG 3374W. The City in Film. (4 cr. §GEOG 3374V, GEOG 5374W)
Cinematic portrayal of changes in 20th-century cities worldwide including social and cultural conflict, political and economic processes, changing gender relationships, rural versus urban areas, and population and development issues (especially as they affect women and children).

GEOG 3375. Minority Settlement in America. (3 cr)
Comparative analysis of minorities in American cities, including migration patterns, residential patterns, socioeconomic characteristics, public and private community enterprises, and class in urban structure.

GEOG 3376. Political Ecology of North America. (3 cr)
Social production of nature in North America related to questions of social/environmental justice. Economic, political, cultural, ecological relations that shape specific urban/rural environments, social movements that have arisen in response to environmental change. Importance of culture/identity in struggles over resources/environments.

GEOG 3377. Music in the City: Sounds and Bodies in Different Places. (3 cr; A-F only)
Geographical conceptions of place, space, embodiment, and identity. Case studies of music.

GEOG 3378. Third World Underdevelopment and Modernization. (3 cr)
Processes underlying socioeconomic change in the Third World. Evolving global economy and internal spatial and socioeconomic conditions. Theories of modernization, development, and underdevelopment.

GEOG 3379. Environment and Development in the Third World. (3 cr; A-F only. §GLOS 3303. Prereq–Soph or jr or sr)
Basic concepts for analyzing relations between capitalist development and environment in Third World. Analytical concepts about historical geography of capitalist development, geographically/historically specific case studies, likelihood of social/environmental sustainability.

GEOG 3381W. Population in an Interacting World. (4 cr)
Comparative analysis and explanation of trends in fertility, mortality, internal and international migration in different parts of the world; world population problems; population policies; theories of population growth; impact of population growth on food supply and the environment.

GEOG 3401. Geography of Environmental Systems and Global Change. (4 cr; A-F only. §GEOG 5401)
Geographic patterns, dynamics, and interactions of atmospheric, hydrospheric, geomorphic, pedologic, and biologic systems as context for human population, development, and resource use patterns.

GEOG 3401H. Honors: Geography of Environmental Systems and Global Change. (4 cr; A-F only. Prereq–Honors)
Geographic patterns, dynamics. Interactions of atmospheric, hydrospheric, geomorphic, pedologic, biologic systems as context for human population, development, resource use patterns.

GEOG 3411W. Geography of Health and Health Care. (4 cr. §GEOG 5411)
Application of human ecology, spatial analysis, political economy, and other geographical approaches to analyze problems of health and health care. Topics include distribution and diffusion of disease; impact of environmental, demographic, and social change on health; distribution, accessibility, and utilization of health practitioners and facilities.

GEOG 3431. Plant and Animal Geography. (3 cr. §GEOG 5431)
Introduction to biogeography. Focuses on patterns of plant/animal distributions at different scales over time/space. Evolutionary, ecological, and applied biogeography. Paleobiogeography, vegetation-environment relationships, vegetation dynamics/disturbance ecology, human impact on plants/animals, nature conservation. Discussions, group/individual projects, local field trips.

GEOG 3441. Quaternary Landscape Evolution. (3 cr; A-F only. Prereq–1403 or 3401 or #)
Roles of climate change, geomorphic history, vegetation change, and soil development in evolution of landscape patterns during Quaternary Period. Emphasizes North America.

GEOG 3511. Principles of Cartography. (4 cr. Prereq–3 cr in geog or #)
History and development of U.S. academic cartography, coordinate systems and map projections, data classification and map generalization, methods of thematic symbolization, and cartographic design. A series of computer-based lab exercises will apply conceptual lecture material to the creation of thematic maps.

GEOG 3531. Numerical Spatial Analysis. (4 cr. §GEOG 5531)
Introduction to theoretical and applied aspects of geographical quantitative methods with a focus on spatial analysis. Emphasis placed on the analysis of geographical data for spatial problem solving in both the human and physical areas of the discipline.

GEOG 3561. Principles of Geographic Information Science. (4 cr. Prereq–Jr or sr)
Introduction to study of geographic information systems (GIS) for geography and non-geography students. Topics include GIS application domains, data models and sources, analysis methods and output techniques. Lectures, readings and hands-on experience with GIS software.

GEOG 3561H. Honors: Principles of Geographic Information Science. (4 cr. Prereq–Honors, [jr or sr])
Introduction to study of geographic information systems (GIS). GIS application domains, data models/sources, analysis methods, output techniques. Lectures, readings, hands-on experience with GIS software.

GEOG 3605V. Honors: Geographical Perspectives on Planning. (4 cr. §GEOG 3605W, GEOG 5605V, GEOG 5605W, PA 5203W)
Role of planning in reshaping 19th-/20th-century cities in Europe, North America, selected Third World countries. History of planning. Societal change, interest groups, power relations in planning process. Citizen participation/practice in planning. Meets with 3605W. Includes additional weekly seminar-style meeting, bibliography project on a topic selected in consultation with instructor.

GEOG 3605W. Geographical Perspectives on Planning. (4 cr. §GEOG 3605V, GEOG 5605V, GEOG 5605W, PA 5203W)
Role of planning in reshaping 19th- and 20th-century cities in Europe, North America, and selected Third World countries. History of planning. Societal change, interest groups and power relations in the planning process. Citizen participation and practice in planning.

GEOG 3900. Topics in Geography. (3 cr [max 9 cr])
Special topics/regions covered by visiting professors in their research fields.

GEOG 3973. Geography of the Twin Cities. (3 cr. §GEOG 1973)
Social/physical characteristics of Twin Cities. Their place in U.S. urban network.

GEOG 3985V. Honors Senior Project Seminar. (4 cr. Prereq–Honors, #)
Completion of research/writing of senior project.

GEOG 3985W. Senior Project Seminar. (4 cr. Prereq–[jr or sr], #)
Complete the research/writing of senior project.

GEOG 3992. Directed Reading. (1-8 cr [max 12 cr]. Prereq–#, Δ, ❑)
Guided individual reading.

GEOG 3992H. Honors: Directed Reading. (1-8 cr [max 12 cr]. Prereq–Honors, #, ❑, Δ)
Guided individual reading.

GEOG 3993. Directed Studies. (1-8 cr [max 12 cr]. Prereq–#, Δ, ❑)
Guided individual study.

GEOG 3993H. Honors: Directed Studies. (1-8 cr [max 12 cr]. Prereq–Honors, #, Δ, ❑)
Guided individual study.

GEOG 3994. Directed Research. (1-8 cr [max 12 cr]. Prereq–#, Δ, ❑)
Individual guided research.

GEOG 3994H. Honors: Directed Research. (1-8 cr [max 12 cr]. Prereq–Honors, #, Δ, ❑)
Individual guided research.

GEOG 4001. Modes of Geographic Inquiry. (4 cr)
Examination of competing approaches to the study of geography. Environmental determinism; regional tradition; scientific revolution; behavioral geography; modeling and quantitative geography; radical geography; interpretive and qualitative approaches; feminist and postmodern geography; ecological thinking and complexity; geographic ethics.

GEOG 4002W. Social Theory and the Environment. (3 cr. Prereq–Jr or sr)
How human-nature relations are understood from perspective of social theory. Contemporary debates within human sciences. Interdisciplinary, reading-intensive.

GEOG 4121W. Latin America. (4 cr. §LAS 4121W)
Interplay of natural environment and history in shaping contemporary Latin America. Political ecology of natural resources, food supply and distribution, urbanization and the informal economy, migration, ethnicity, and the role of the state and international agencies in domestic economies.

GEOG 4382. Contemporary Immigrant America. (3-5 cr [max 5 cr])
Analysis and explanation of contemporary immigration trends; immigration policies; immigrant rights; immigrant integration and adaptation; ethnic group formation; ethnic identities; ethnic neighborhoods and communities; second generation; immigrant women; ethnic conflict; xenophobic reactions. Community Service Learning component for 2 extra credits.

GEOG 4393. The Rural Landscape. (4 cr)
Analysis of the three principal components of the rural landscape (the form of the land surface, the plant life that cloaks it, and the structures that people have placed upon it). Emphasis on structures associated with agriculture including some discussion on mining, forestry, resort areas, and small towns.

GEOG 4700. Community Service Learning. (1-3 cr [max 6 cr]. Prereq–Concurrent enrollment in a Geog course that has community service learning as a component)
Community service, readings, written assignments, classactivities that promote reflection/synthesis. Students interrogate what they learn in more traditional geographycourses and confirm/question their understanding of geographic themes and their own role as social actors.

GEOG 5181. Russia and Environs. (3 cr. §GEOG 3181)
Physical and human geography of Russia and former Soviet republics. Legacy of central planning on regional economies, city systems and city structure. Economic and cultural links among regions and republics. Conflicts rooted in religion, ethnicity and tradition. Relations with nearby states and regions. Physical environmental problems.

GEOG 5361. Geography and Real Estate. (4 cr)
Origins and evolution of land ownership in the United States.

GEOG 5371W. American Cities I: Population and Housing. (4 cr. §PA 5201W. Prereq–Grad or #)
Emergence of North American cities; residential building cycles, density patterns; metropolitan housing stocks, supply of housing services; population and household types; neighborhood-level patterns of housing use; housing prices; intraurban migration; housing submarkets inside metro areas; emphasis on linking theory, method, case studies.

GEOG 5372W. American Cities II: Land Use, Transportation, and the Urban Economy. (4 cr. §PA 5202W)
Urban economy, its locational requirements. Central place theory. Transportation, urban land use: patterns/conflicts. Industrial/commercial land blight. Real estate redevelopment. Historic preservation. Emphasizes links between land use, transportation policy, economic development, local fiscal issues. U.S.-Canadian contrasts.

GEOG 5374W. The City in Film. (4 cr. §GEOG 3374V, GEOG 3374W. Prereq–Grad student or #)
Cinematic portrayal of changes in 20th-century cities worldwide. Social/cultural conflict, political/economic processes, changing gender relationships, rural versus urban areas, population/development issues (especially as they affect women/children). Meets concurrently with 3374. Additional weekly meeting discusses films, readings. Project on a topic selected in consultation with instructor.

GEOG 5377. Music in the City: Sounds and Bodies in Different Places. (3 cr)
Geographical conceptions of place, space, embodiment, and identity. Case studies of music.

GEOG 5385. Globalization and Development: Political Economy. (4 cr. Prereq–Sr or grad or #)
Nature/scope of modern world system (capitalism), its impact on regional development processes. Roles of state and of international financial institutions.

GEOG 5401. Geography of Environmental Systems and Global Change. (4 cr. §GEOG 3 401. Prereq–Grad student or #)
Processes that create/change the spatial patterns of climate, vegetation, and soils. Potential of humans to alter climate, vegetation, and soil processes. Possible impacts of human-altered environmental conditions.

GEOG 5411. Geography of Health and Health Care. (4 cr. §GEOG 3411W)
Application of human ecology, spatial analysis, political economy, and other geographical approaches to analyze problems of health and health care. Topics include distribution and diffusion of disease; impact of environmental, demographic, and social change on health; distribution, accessibility, and utilization of health practitioners and facilities.

GEOG 5421. Introduction to Atmospheric Science. (3 cr. §ES 5421. Prereq–Familiarity with fundamentals of physics, calculus, and statistics, including differential and integral calculus and basic differential equations and basic thermodynamics, mechanics, and the electromagnetic spectrum)
Calculus-based introduction to atmospheric dynamics, radiation, thermodynamics, chemical composition, and cloud processes. Applications to climate, meteorology, the hydrologic cycle, air quality, and biogeochemical cycles.

GEOG 5423. Climate Models and Modeling. (3 cr. Prereq–3401 or #)
Survey of development and research with simple and complex (three-dimensional) climate models. Environmental processes and their numerical representation in climate models; evaluation of model sensitivity and accuracy; coupling between atmosphere, biosphere, hydrosphere, and cryosphere; assessment of model predictions for climate change.

GEOG 5426. Climatic Variations. (3 cr. Prereq–1425 or 3401 or #)
Theories of climatic fluctuations and change at decadal to centuries time scales; analysis of temporal and spatial fluctuations especially during the period of instrumental record.

GEOG 5431. Plant and Animal Geography. (3 cr. §GEOG 3431)
Introduction to biogeography. Focuses on patterns of plant/animal distributions at different scales over time/space. Evolutionary, ecological, and applied biogeography. Paleobiogeography, vegetation-environment relationships, vegetation dynamics/disturbance ecology, human impact on plants/animals, nature conservation. Discussions, group/individual projects, local field trips.

GEOG 5441. Quaternary Landscape Evolution. (3 cr. Prereq–3401 or grad student or #)
Roles of climate change, geomorphic history, vegetation change, and soil development in the evolution of landscape patterns during the Quaternary Period, with emphasis on North America.

GEOG 5511. Advanced Cartography. (3 cr)
Topics on data sources for mapping. History of thematic cartography (focused on 19th-century European activity). Multivariate classification/symbolization. Models for cartographic generalization, spatial interpolation, and surface representation. Principles of animated/multimedia cartography.

GEOG 5512. Cartography: Topics. (3 cr. Prereq–3511 or 3531 or #)
Selected topics include the system of cartographic communication, map design, map reading, map analysis, history of cartography.

GEOG 5530. Cartography Internship. (2-7 cr [max 10 cr]; S-N only. Prereq–#)
Provides intensive hands-on experience in contemporary map production and design, ranging from GIS applications to digital prepress. Strong computer skills essential.

GEOG 5531. Numerical Spatial Analysis. (4 cr. §GEOG 3531)
Applied/theoretical aspects of geographical quantitative methods for spatial analysis. Emphasizes analysis of geographical data for spatial problem solving in human/physical areas.

GEOG 5561. Principles of Geographic Information Science. (4 cr. Prereq–Grad)
Introduction to the study of geographic information systems (GIS) for geography and non-geography students. Topics include GIS application domains, data models and sources, analysis methods and output techniques. Lectures, reading, and hands-on experience with GIS software.

For definitions of course numbers, symbols, and abbreviations, see page 300.

GEOG 5562. Geographic Information Science and Analytical Cartography. (3 cr. Prereq–3561 or 5561 and 3511, or #)
Topics include algorithms and data structures for digital cartographic data, topological relationships, surface modeling and interpolation, map projections and geometric transformations, numerical generalization, and raster and vector processing. Hands-on experience using a variety of software packages.

GEOG 5563. Advanced Geographic Information Science. (3 cr. Prereq–B or better in 3561 or 5561 or #)
Advanced study of geographic information systems (GIS). Topics include spatial data models, topology, data encoding, data quality, database management, spatial analysis tools and visualization techniques. Hands-on experience using an advanced vector GIS package.

GEOG 5564. Urban Geographic Information Science and Analysis. (3 cr. Prereq–3561 or 5561)
Core concepts in urban geographic information science including sources for urban geographical and attribute data (including census data), urban data structures (focusing on the TIGER data structure), urban spatial analyses (including location-allocation models), geodemographic analysis, network analysis, and the display of urban data.

GEOG 5565. Geographical Analysis of Human-Environment Systems. (3 cr. Prereq–3561 or 5561 or FR 4131 or LA 5573 or one intro GIS course or grad student or #)
Applications of geographic information systems and other spatial analysis tools to analysis of environmental systems patterns, dynamics, and interactions. Focuses on global to landscape databases developed to analyze atmospheric, hydrospheric, geomorphic, pedologic, biologic, and human landuse systems.

GEOG 5588. Multimedia Cartography. (3 cr. Prereq–Minimum of three geog courses including one cartography course or advanced standing in an allied field such as landscape architecture or #)
Conceptualizing geographic topics in animatable form, selecting appropriate animation metaphors for specific ideas, using standard graphic software to prepare images for computer display and animation.

GEOG 5605V. Honors: Geographical Perspectives on Planning. (4 cr. §GEOG 3605V, GEOG 3605W, GEOG 5605W, PA 5203W)
Role of planning in reshaping 19th-/20th-century cities in Europe, North America, selected Third World countries. History of planning. Societal change, interest groups, power relations in planning process. Citizen participation/practice in planning. Meets with 3605. Includes additional weekly seminar-style meeting, bibliography project on topic selected in consultation with instructor.

GEOG 5605W. Geographical Perspectives on Planning. (4 cr. §GEOG 3605V, GEOG 3605W, GEOG 5605V, PA 5203W. Prereq–Grad student or #)
Open to graduate students and undergraduates wishing Honors credits. Includes one additional weekly seminar-style meeting and a bibliography project on a topic selected in consultation with the instructor. Meets with 3605.

GEOG 5701. Field Research. (3 cr. Prereq–9 cr in geog, #)
Field investigation in physical, cultural, and economic geography; techniques of analysis and presentation; reconstruction of environments.

GEOG 5775. Geographic Education. (3 cr. Prereq–Three courses in geography or history or social sciences or education or #)
Teaching geography from middle school up; pedagogical use of geographical themes; methods for effective teaching of multiple cognitive domains—facts, theories, analytical skills, and evaluations; designing audio-visual aids, independent projects, simulations, etc. to meet National Standards in geography.

GEOG 5900. Topics in Geography. (3 cr [max 9 cr]. Prereq–Sr or grad, #)
Special topics and regions. Course offered by visiting professors in their research fields.

Geological Engineering (GEOE)

Department of Civil Engineering

Institute of Technology

GEOE 3111. How to Model It: Building Models to Solve Engineering Problems. (3 cr)
Problem formulation design and construction of models, and drawing conclusions from modeling results. Students learn how to use computer-based modeling tools working in small groups on a number of problems from various engineering contexts.

GEOE 3301. Soil Mechanics I. (3 cr; A-F only. §CE 3301. Prereq–IT student, AEM 3031)
Index properties and soil classification. Effective stress. Permeability and seepage. Stresses from elasticity theory. One-dimensional compression and consolidation; settlements. Compaction; cut and fill problems.

GEOE 3311. Rock Mechanics I. (3 cr; A-F only. Prereq–IT student, AEM 3031)
Classifications and index properties. Behavior of intact rock and rock masses. Failure criteria. Stereographic projections; kinematic analysis of rock slopes. Reinforcement. Foundations on rock.

GEOE 4011. Special Topics. (1-4 cr [max 12 cr] Prereq–Upper div IT)
Topics, credits vary.

GEOE 4102W. Capstone Design. (3 cr; A-F only. Prereq–CE, GeoE, or Geo upper division or graduate student or #)
Team participation in formulation and solution of open-ended civil engineering problems from conceptual stage through preliminary planning, public hearings, design, and environmental impact statements to preparation of final plans and specifications, and award of contracts.

GEOE 4111. Engineering Systems Analysis. (3-4 cr. §CE 4111. Prereq–Upper division IT)
Systems Analysis focuses on a broader "systems" approach of viewing problems. The techniques of operations research—decision engineering, network analysis, simulation, linear programming, and expert systems—are used to represent systems, and especially to assess trade-offs.

GEOE 4121. Computer Applications in Civil Engineering II. (3 cr; A-F only. §CE 4121. Prereq–CE or GEOE upper div, 3101, Math 2243, Math 2263)
Advanced application of computer tools and methods in solving partial differential equations resulting from the analysis of civil engineering problems. The major tools used will be Spreadsheet and Visual Basic programming. Methods covered could include: finite differences, boundary element, finite element and control volume finite element.

GEOE 4301. Soil Mechanics II. (3 cr; A-F only. §CE 4301. Prereq–Upper division student in IT; 3301, CE 3301, or #)
Traction and stress. Mohr-Coulomb failure criterion. Experiments on strength and angle of internal friction. Earth pressure theories; rigid and flexible retaining walls. Bearing capacity of shallow foundations. Stability of slopes.

GEOE 4311. Rock Mechanics II. (3 cr; A-F only. Prereq–Upper division or grad student in IT, 3311, CE 3311, or #)
Failure mechanisms in rock masses. Elasto-plastic solutions applied to underground excavations. Design of linings and support systems; rock-support interaction. In situ stresses and excavation shape. Instrumentation and monitoring.

GEOE 4341. Engineering Geostatistics. (3 cr; A-F only. §CE 4341. Prereq–GeoE, CE, or Geo upper division or grad student, STAT 3021 or #)
Problem solving and decision making in civil and geological engineering using applied statistics. Emphasis on spatially correlated data, e.g. geologic site characterization, and spatial sampling design.

GEOE 4351. Groundwater Mechanics. (3 cr; A-F only. §CE 4351. Prereq–IT upper division or grad student, CE 3502 or #)
Basic equations. Shallow confined and unconfined flows, two-dimensional flow in the vertical plane, and transient flow. Flow from rivers and lakes toward wells. Determination of streamlines and pathlines in two and three dimensions. Introduction to contaminant transport. Elementary computer modeling.

GEOE 4352. Groundwater Modeling. (3 cr; A-F only. §CE 4352. Prereq–Upper division or grad student in IT, 4351, CE 4351, or #)
Principle of analytic element method. Mathematical and computer modeling of single and multiple aquifer systems. Application to actual field problems. Theory and application of contaminant transport models, including capture zone analysis.

GEOE 5311. Experimental Geomechanics. (3 cr; A-F only. §CE 5311. Prereq–IT upper division or grad student, 4301, CE 4301, or #)
Machine stiffness; closed-loop testing. Small-strain theory. Measurement of deformation; strain gages, LVDTs, accelerometers, and associated circuits. Direct and indirect testing. Material behavior: experiments on anisotropic, damaged, and fluid-filled solids.

GEOE 5321. Geomechanics. (3 cr; A-F only. §CE 5321. Prereq–IT upper division or grad student, 4301, CE 4301 or #)
Review of elasticity theory and solution of some elastic boundary value problems relevant to geomechanics. Wave propagation in unbounded elastic media. Elements of fracture mechanics and applications. Elements of poroelasticity and applications.

GEOE 5331. Geomechanics Modeling. (3 cr; A-F only. §CE 5331. Prereq–IT upper division or grad student, 4301 or CE 4301)
Soil and rock response in triaxial testing; drained and undrained behavior; elastic and plastic properties. Modeling stresses, strains, and failure in geomechanics problems.

GEOE 5341. Wave Methods for Nondestructive Testing. (4 cr; A-F only. Prereq–[AEM 2021, AEM 3031] or #)
Introduction to contemporary methods for nondestructive characterization of objects of civil infrastructure (e.g., highways, bridges, geotechnical sites). Imaging technologies based on propagation of elastic waves: ultrasonic and resonant frequency methods, seismic surveys, acoustic emission monitoring. Lecture, lab.

Geology and Geophysics (GEO)

Department of Geology and Geophysics

Institute of Technology

GEO 1001. Earth and Its Environments. (4 cr)
Physical processes that shape the Earth: volcanoes, earthquakes, plate tectonics, glaciers, rivers. Current environmental issues/global change. Lecture/lab. Optional field experience.

GEO 1002. Earth History. (4 cr. §GEO 1102, GEO 5002)
Evolution of life on Earth. Interrelationships of plate tectonism, climate change and organic evolution that led to the present ecosystem. Impacts of hominid evolution on Earth systems and of geological processes on human society.

GEO 1003. Dinosaur Evolution, Ecology, and Extinction: Introduction to the Mesozoic World. (3 cr. §GEO 5003)
Dinosaurs and the Mesozoic Earth are used to introduce evolution, plate tectonics, climate change, and Earth systems. Overview of the history of dinosaur interpretations illustrates the principles and social aspects of scientific investigation.

GEO 1005. Geology and Cinema. (4 cr. §GEO 1009, GEO 1101, GEO 2111H, GEO 5001)
Physical processes shaping the Earth, materials it comprises, its nearly five billion year history as told spectacularly, but often wrongly, by Hollywood movies.

GEO 1006. Oceanography. (4 cr. §GEO 1106, GEO 5006)
How various processes in the ocean interact. Marine biology, waves, tides, chemical oceanography, marine geology, and human interaction with the sea. Labs include study of live marine invertebrates, manipulation of oceanographic data, and discussion using videos showing unique aspects of ocean research.

GEO 1007. Geobiology: Origin and Evolution of Life on Earth. (4 cr)
Scientific evidence from biology, paleontology, and geology for origin/evolution of life over 4.5 billion years of Earth's history. Biochemical basis of life, biogeochemical cycles, natural selection, origin of species, genetics, phylogeny reconstruction, timescales for evolution.

GEO 1011. Volcanoes of the Earth. (4 cr)
Nonmathematical introduction to volcanoes, their origin and distribution on Earth and through time; theory of plate tectonics, origin of magmas and the Earth's interior; products of volcanoes, types of eruptions and hazards, and impact on climate, vegetation, and society.

GEO 1081. Conspiracies, Fraud, and Deception in Earth History. (1 cr)
Famous cases of geological deception from three centuries are presented in the intellectual context of their time and demonstrate the prevailing power of scientific reasoning.

GEO 1101. Introduction to Geology. (3 cr. §GEO 1005, GEO 1009, GEO 2111H, GEO 5001)
Physical processes that shape the Earth: volcanoes, earthquakes, plate tectonics, glaciers, rivers. Current environmental issues and global change. Lecture.

GEO 1102. Introduction to Earth History. (3 cr. §GEO 1002, GEO 5002)
Evolution of life on Earth. Interrelationships of plate tectonism, climate change, and organic evolution that led to the present ecosystem. Impacts of hominid evolution on Earth systems and of geological processes on human society.

GEO 1106. Oceanography. (3 cr. §GEO 1006, GEO 5006)
How various processes in the ocean interact. Marine biology, waves, tides, chemical oceanography, marine geology, human interaction with sea.

GEO 1901. Freshman Seminar: Environment. (1-3 cr [max 6 cr]; A-F only. Prereq–Freshman)
Topics vary. See *Class Schedule*.

GEO 1905. Freshman Seminar. (1-3 cr [max 6 cr]; A-F only. Prereq–Freshman)
Topics vary. See *Class Schedule*.

GEO 1906W. Freshman Seminar: Writing Intensive and Environmental Theme. (1-3 cr [max 6 cr]; A-F only. Prereq–Freshman)
Topics vary: see freshman seminar topics.

Geo 2201. Geodynamics I: The Solid Earth. (3 cr. Prereq–¶PHYS 1301 or #)
Dynamics of solid Earth, particularly tectonic system. Seismology, internal structure of Earth. Earth's gravity, magnetic fields. Paleomagnetism, global plate tectonics, tectonic systems. Field trip.

Geo 2301. Mineralogy. (3 cr. Prereq–¶CHEM 1021 and MATH 1271 or #)
Crystallography, crystal chemistry, physics. Physical/chemical properties, crystal structures, chemical equilibria of major mineral groups. Lab includes crystallographic, polarizing microscope, X-ray powder diffraction exercises, hand-specimen mineral identification.

Geo 2302. Petrology. (3 cr. Prereq–2301 or #)
Magmatic and metamorphic processes, with an emphasis on plate tectonic interpretation of rock sequences.

Geo 2303W. Geochemical Principles. (3 cr. Prereq–¶CHEM 1021 or #)
Origin of elements (nucleosynthesis, elemental abundances). Geochemical classifications. Isotopes (radioactive, stable). Phase equilibria. Models of Earth's geochemical evolution. Basic geochemical processes that produced Earth's lithosphere, hydrosphere, atmosphere.

GEO 3001. Earth Materials. (3 cr)
Common rocks/minerals and their geologic settings. Properties of these materials as basis for identification/use in industry/society.

GEO 3002. Climate Change and Human History. (3 cr)
Causes of long-/short-term climate change. Frequency/magnitude of past climate changes; their geologic records. Relationship of past climate changes to development of agrarian societies and to shifts in power among kingdoms/city-states. Emphasizes last 10,000 years.

GEO 3003. Geohazards. (3 cr)
Geologic hazards associated with earthquakes/volcanoes. How society confronts dangers posed by these phenomena. Geological/geophysical nature/causes of earthquakes/volcanoes. Prediction/risk assessment. Public policy issues.

GEO 3004. Water and Society. (3 cr)
Processes that influence formation, circulation, composition, and use of water. Human influence on water quality through agricultural, industrial, and other land-use practices. International case studies examine human interaction with surface environment, influence of local land-use practices.

GEO 3005. Earth Resources. (3 cr)
Geologic aspects of energy/material resources. Resource size/life-times. Environmental consequences of resource use. Issues of international/public ethics associated with resource production, distribution, and use.

GEO 3006. Planets of the Solar System. (3 cr)
Recent accomplishments of space missions. Diverse/common characteristics of planetary formation. Surface processes/interior dynamics. Meteoritic impacts. Comets. Other solar systems/possibility of life.

GEO 3093. Problems in Geology and Geophysics: Junior. (1-4 cr [max 6 cr]. Prereq–#)
Geological or geophysical problems studied independently under the direction of a faculty member.

GEO 3096. Geology of Iceland. (4 cr; A-F only. Prereq–[[1001 or 1011], 2301, 2302] or Δ)
Geologic processes that form Iceland. Tectonics, volcanology, geomorphology, glaciology. Interplay between physical environment of Iceland and its social structure and culture. Lectures, field trips.

GEO 3202. Geodynamics II: The Fluid Earth. (3 cr. Prereq–¶2201)
Dynamics of fluid Earth, mainly surface processes and convection.

GEO 3401. Geochronology and Earth History. (3 cr. Prereq–2303)
Modern high precision techniques for quantifying geologic time. Litho-, bio-, and chrono-stratigraphic correlation techniques for reconstructing geologic history.

GEO 3870. Modeling Workshop. (1 cr [max 2 cr]. Prereq–Geo or Geophys or GeoEng major or #)
Modeling of geologic or geophysical systems.

GEO 3880. Laboratory Workshop. (1 cr [max 2 cr]. Prereq–Geo or Geophys or GeoEng major or #)
Geologic or geophysical lab study.

GEO 3890. Field Workshop. (1 cr [max 2 cr]. Prereq–Geo or Geophys or GeoEng major or #)
Geologic or geophysical field study.

GEO 3911. Introductory Field Geology. (4 cr; A-F only. Prereq–2201, 3890, #)
Geologic mapping on topographic maps and aerial photos. Field identification of igneous, sedimentary, and metamorphic rocks. Measurement of stratigraphic sections. Structural/geomorphic features.

GEO 4010. Undergraduate Seminar: Current Topics in Geology and Geophysics. (1-4 cr [max 12 cr]. Prereq–#)
Topics in geology and geophysics investigated in a seminar format.

GEO 4093. Problems in Geology and Geophysics: Senior. (1-4 cr [max 6 cr]. Prereq–#)
Nonstructured research course enabling seniors to engage in independent research under faculty supervision.

GEO 4094. Senior Thesis. (2 cr [max 4 cr]. Prereq–Sr, Geo or GeoPhys major, #)
Nonstructured research course enabling senior-level majors to engage in independent research under faculty supervision. Select problems according to individual interests and in consultation with faculty committee. Thesis and oral defense.

GEO 4096. Geologic Field Studies in Iceland. (4 cr; A-F only. Prereq–[[1001 or 1011], [2301, Geo 2302]] or #)
Lectures, field research in various parts of Iceland. Focuses on individual projects in southwest Iceland. Write-up, oral presentation of field studies.

GEO 4102W. Vertebrate Paleontology: Evolutionary History and Fossil Records of Vertebrates. (4 cr; A-F only. Prereq–1001 or 1002 or BIOL 1001 or BIOL 1002 or BIOL 1009 or #)
Vertebrate evolution (exclusive of mammals) in phylogenetic, temporal, functional, and paleoecological contexts. Vertebrate anatomy. Methods in reconstructing phylogenetic relationships and origin/history of major vertebrate groups, from Cambrian Explosion to modern diversity of vertebrate animals.

GEO 4103W. Fossil Record of Mammals. (4 cr; A-F only)
Evolutionary history of mammals and their extinct relatives. Methods in reconstructing phylogeny. Place of mammals in evolutionary history of vertebrate animals. Major morphological/ecological transitions. Origins of modern groups of mammals. Continuing controversies in studying fossil mammals.

GEO 4203. Principles of Geophysical Exploration. (3 cr. Prereq–PHYS 1302)
Seismic exploration (reflection and refraction); potential techniques (gravity and magnetics) and electrical techniques of geophysical exploration.

GEO 4204. Geomagnetism and Paleomagnetism. (3 cr. Prereq–2201, PHYS 1302, MATH 1272 or #)
Present geomagnetic field at the Earth's surface, secular variation, geomagnetic field reversals. Physical and chemical basis of paleomagnetism: origin of natural remanent magnetization, mineralogy of magnetic minerals, magnetic polarity stratigraphy, apparent polar wander, and environmental magnetism.

GEO 4211. Solid Earth Geophysics I. (3 cr; A-F only. Prereq–2201, PHYS 1302)
Basic elasticity, basic seismology, and physical structure of the Earth's crust and deep interior.

GEO 4212. Solid Earth Geophysics II. (3 cr; A-F only. Prereq–2201, PHYS 1302)
Dynamics of the solid Earth, mostly mantle and core; seismic tomography, geothermal measurements, gravity, time-dependent deformation of the Earth, computer modeling.

GEO 4301. Igneous and Metamorphic Petrology. (3 cr [max 4 cr]. Prereq–[2302, MATH 1272] or #)
Theoretical development of basic thermodynamic tools, chemographic analysis for interpreting chemical processes in igneous/metamorphic rocks. Problem sets.

GEO 4401. Aqueous Environmental Geochemistry. (3 cr. Prereq–CHEM 3501 or #)
General principles of solution chemistry applied to geology. Solution-mineral equilibria. Redox processes in natural waters. Geochemistry of hydrothermal fluids. Environmental geochemistry.

GEO 4402. Biogeochemical Cycles in the Ocean. (3 cr. Prereq–[CHEM 3501, 1 yr of calculus] or #)
Introduction to marine biogeochemistry and chemical oceanography. Processes controlling chemical composition of oceans past/present. Cycles of major/minor constituents, including carbon, nitrogen, phosphorus, silicon, and oxygen and their isotopes. Role of these cycles in climate system.

GEO 4501. Structural Geology. (3 cr. Prereq–2201, 2302)
Fundamental concepts related to deformation of Earth's crust. Processes associated with deformation, faulting, folding, fabric development. Lab/recitation include solving problems, conducting physical/numerical experiments. Field trips.

GEO 4502. Tectonic Styles. (3 cr. Prereq–4501 or #)
Origin and nature of major types of tectonic disturbances affecting the crust and lithosphere, including analysis of the form and development of individual structural components and relationship to plate tectonics. Changes over geologic time in the nature of orogenic processes.

GEO 4503. Neotectonics. (3 cr. Prereq–4501 or #)
Integration of diverse elements of geology, geodesy, and geophysics to examine recent and active tectonics of the Earth's lithosphere; extensional, compressional and wrench tectonic regimes with case studies around the world; modern global plate motions, geodetic techniques, seismic anisotropy, climatically driven tectonics.

GEO 4602. Sedimentology and Stratigraphy. (3 cr. Prereq–[3402, [IT upper div major in [geology or geophysics or geo-engineering or mining engineering] or CLA [jr or sr] major in geology]] or #)
Interpretation of origin of sedimentary rocks through application of basic physical/chemical principles. Modern depositional environments, petrographic microscopy, basin dynamics, stratigraphy.

GEO 4631W. Earth Systems: Geosphere/Biosphere Interactions. (3 cr. Prereq–3401)
Interdisciplinary study of global-change forcing mechanisms, feedbacks, dynamics on various time scales, using paleorecord to illustrate processes.

GEO 4701. Geomorphology. (3-4 cr [max 4 cr]. Prereq–1001, MATH 1031 or #)
Origin, development, and continuing evolution of landforms in various environments. Environmental implications. Weathering, slope and shore processes, fluvial erosion and deposition, arid region processes, glacial processes.

GEO 4703. Glacial Geology. (4 cr. Prereq–1001 or 1004 or #)
Formation and characteristics of modern glaciers; erosional and depositional features of Pleistocene glaciers; history of quaternary environmental changes in glaciated and nonglaciated areas. Field trips and labs.

GEO 4911. Advanced Field Geology. (4 cr; A-F only. Prereq–3911, #)
Geologic mapping; study of igneous, metamorphic, and sedimentary rocks; structures and surficial features; problem solving. Paper required.

GEO 4971. Field Hydrogeology. (4 cr. Prereq–5701, #)
Aquifer, vadoze zone, and surface water hydrology field techniques. Shallow soil boring and sampling. Well installation. Single and multiple well aquifer testing. Ground water sampling for chemical analysis. Weather data collection, hydrogeologic mapping, water balance calculation.

GEO 5001. Earth Systems Science for Teachers. (3 cr. §GEO 1005, GEO 1009, GEO 1101, GEO 2111H. Prereq–Educ degree)
Solid Earth, hydrosphere, atmosphere, biosphere, their interconnections in natural cycles of material/energy. Consequences of natural cycles for land-water-atmosphere-life environments/Earth's habitability. Human impact on natural cycles. Evidence for global environmental changes. Required project.

GEO 5108. Principles of Environmental Geology. (3 cr. Prereq–Geology majors: core curriculum through 4501 or #; nonmajors: 1001 or #)
Human impact on geological environment and effect of geology/geologic processes on human life from an ecosystems and biogeochemical cycles perspective. Geologic limits to resources and carrying capacity of Earth. Land use planning, environmental impact assessment, ecogeologic world models. Field project and trip.

GEO 5201. Time-Series Analysis of Geological Phenomena. (3 cr; A-F only. Prereq–Math 2263 or #)
Time-series analysis of linear and nonlinear geological and geophysical phenomena. Examples drawn from ice age cycles, earthquakes, climatic fluctuations, volcanic eruptions, atmospheric phenomena, thermal convection and other time-dependent natural phenomena. Modern concepts of nonlinear dynamics and complexity theory applied to geological phenomena.

GEO 5203. Mineral and Rock Physics. (3 cr. Prereq–2201, PHYS 1302)
Physical properties of minerals and rocks as related to the composition and dynamics of the Earth's crust, mantle, and core.

GEO 5204. Geostatistics and Inverse Theory. (3 cr. Prereq–STAT 3011 or #)
Statistical treatment of geological and geophysical data. Statistical estimation. Stochastic processes/fields. Non-linear/non-assumptive error analysis. Cluster analysis. Eigenvalue-eigenvector methods. Regional variables. Correlograms and kriging. Theoretical framework of linear geostatistics and geophysical inverse theory.

GEO 5302. Isotope Geology. (3 cr; A-F only. Prereq–2303 or #)
Theory and uses of radioactive, radiogenic, and stable isotopes in geology. Radioactive dating, geothermometry, and tracer techniques in geologic processes.

GEO 5353. Electron Microprobe Theory and Practice. (2-3 cr [max 3 cr]. Prereq–[One yr chem, one yr physics] or #)
Characterizing solid materials with electron beam instrumentation, including reduction of X-ray data to chemical compositions.

GEO 5502. Advanced Structural Geology. (3 cr. Prereq–4501 or #)
Analysis of structures and fabric of deformed rocks. Determination of states of stress and strain in rocks and of evolution of these with time. Deformation mechanisms. Extensive reading in journal literature. Field trips.

GEO 5601. Advanced Sedimentology. (4 cr. Prereq–4602 or #)
Modern techniques of sedimentary basin analysis focusing on interactions among the lithosphere, atmosphere, and hydrosphere. Sedimentary facies of modern and ancient systems, petrology of clastic and carbonate deposits, tectonic and paleoclimatic interpretations, paleocurrent analysis, diagenetic effects on subsurface fluid flow, and volcanic sedimentation.

GEO 5602. Depositional Mechanics. (3 cr. Prereq–4602, Math 2243 or #)
Elementary mechanics of sediment transport applied to quantitative interpretation of sedimentary rocks.

GEO 5701. General Hydrogeology. (3 cr [max 4 cr]. Prereq–CHEM 1022, MATH 1271, PHYS 1201, Geo majors-core curriculum through 2402 or #)
Theory of groundwater geology, hydrologic cycle, watershed hydrology, Darcy's law, governing equations of groundwater motion, flow net analysis, analog models, and groundwater resource evaluation and development. Applied analysis of steady and transient equations of groundwater motion and chemical transport. Chemistry of natural waters.

GEO 5702. Regional Aquifer Systems of North America. (3 cr. Prereq–5701 or #)
Geologic controls on flow patterns within aquifer systems. Case histories and specific examples from glaciated terrains and Paleozoic basins in Minnesota. Analysis of basin-scale regional aquifer systems of North America. Survey of famous aquifer systems of the world.

GEO 5705. Limnogeology and Paleoenvironment. (3 cr. Prereq–#)
Within-lake, hydrogeologic, and landscape (geological/biological) processes that lead to formation of various proxy records of paleoenvironment. Systems approach to physical, geochemical, biogeochemical, and biotic proxies. Basic principles, case studies. Emphasizes how proxy records relate to paleoclimate.

GEO 5713. Tracers and Karst Hydrogeology. (3 cr. Prereq–5701, #)
Karst hydrogeology and application of tracers to determine source, age, and mixing parameters of water in various natural reservoirs. Physical and chemical principles and processes operating in karst hydrogeology; use of natural and synthetic chemical and isotopic labels or tracers to follow movement and mixing of water through hydrologic cycle.

GEO 5802. Scientific Visualization. (3 cr. Prereq–CSCI 1107 or CSCI 1113 or #)
Visualization hardware and software, three-dimensional graphics, representation of scientific data, modeling, user interface techniques, output, commonly used algorithms, animation, case studies and examples.

German (GER)

Department of German, Scandinavian, and Dutch

College of Liberal Arts

GER 222. Reading German. (0 cr; A-F only)
Teaches only a reading knowledge of German. Enables graduate students to satisfy departmental requirements for an advanced degree. Intensive reading of German scholarly texts. Emphasizes reading, grammar, some listening, discipline-specific vocabulary.

GER 1001. Beginning German. (5 cr)
Emphasis on working toward novice-intermediate low proficiency in all four language modalities (listening, reading, speaking, writing). Topics include everyday subjects (shopping, directions, family, food, housing, etc.).

GER 1002. Beginning German. (5 cr. Prereq–1001)
Listening, reading, speaking, writing. Emphasizes proficiency. Topics include free-time activities, careers, and culture of German-speaking areas.

GER 1003. Intermediate German. (5 cr. Prereq–1002 or Entrance Proficiency Test)
Listening, reading, speaking, writing. Contextualized grammar/vocabulary. Authentic readings. Essay assignments.

GER 1004. Intermediate German. (5 cr. Prereq–1003 or completion of Entrance Proficiency Test at 1004 level)
Listening, reading, speaking, writing. Contextualized grammar/vocabulary. Authentic readings. Essay assignments.

GER 1020. Beginning German Conversation. (2 cr [max 8 cr]. Prereq–1001 or equiv)
Maintaining language skills through conversational practice. Emphasizes speaking skills, but also includes listening, reading, writing. Reviews essential grammatical structures.

GER 1022. Beginning German Review. (5 cr. Prereq–Placement above 1001)
Intended for students with previous experience in German, primarily those who have studied German in high school or at community colleges, or who are transfer students. Intensive review of all four language modalities (listening, reading, speaking, writing), with a proficiency emphasis to prepare for German 1003.

GER 1024. Advanced Intermediate German. (5 cr. Prereq–1003 or satisfactory completion of Entrance Proficiency Test with competency at the 1004 level)
Intended for students who have not taken the Graduation Proficiency Test and need a review before taking it. Emphasis on developing intermediate mid-high proficiency in listening, reading, speaking, and writing. Contextualized work on grammar and vocabulary is supported by authentic readings and essay assignments.

GER 1030. Intermediate German: Reading and Writing. (2 cr [max 8 cr]. Prereq–1003 or equiv)
Consolidating/developing reading/writing skills.

GER 1601. Fleeing Hitler: German and Austrian Filmmakers Between Europe and Hollywood. (3 cr)
German/American films by famous directors who left Europe in Nazi period. Analysis of films by Fritz Lang, Max Ophuls, Robert Siodmak, Otto Preminger, Billy Wilder, Douglas Sirk, and others. Films as art works and as cultural products of particular social, political, and historical moments.

GER 1905. Freshman Seminar. (3 cr [max 6 cr]; A-F only. Prereq–Fr)
Topics specified in *Class Schedule*.

GER 1909W. Freshman Seminar. (3 cr; A-F only. Prereq–Freshman)
Topics specified in *Class Schedule*.

GER 1910W. Freshman Seminar. (3 cr [max 6 cr]; A-F only. Prereq–Freshman)
Topics specified in *Class Schedule*.

GER 3011W. Conversation and Composition. (4 cr. Prereq–1004)
Achieving proficiency in professional or academic German. Refinement of oral/written expression. Review of important communicative modes of language. Wide range of topics to develop advanced level of proficiency.

GER 3012W. Conversation and Composition. (4 cr. Prereq–3011)
Prepares students for upper-level language and content courses in German. Continues the same focus and approach as 3011 with the addition of a larger reading component.

GER 3014. German Media. (3 cr. Prereq–3011)
Introduction to German language media. German language newspaper/magazine articles. The Internet. Radio/TV broadcasts. Structure/style of journalistic prose.

GER 3016. Techniques of Translation. (3 cr. Prereq–3011)
Theory/practice of translation from/to German in various genres. Idiomatics, stylistics, and cross-cultural aspects of translation.

GER 3021. Business German. (3 cr. Prereq–3011 or equiv)
German economy, business culture. Practice of language used in business. Reading/discussion of German business documents. Preparation of formal letters and reports.

GER 3022. Advanced Business German. (3 cr. Prereq–GER 3021 or equiv)
Provides more intensive training in vocabulary and practices of German business in such areas as banking, trade, import/export, business management, marketing. Prepares students for the "International Test of Business German."

GER 3104W. Reading and Analysis of German Literature. (4 cr. Prereq–3011)
Introduction to literary analysis. Readings from drama, prose, and lyric poetry, from 18th century to present.

GER 3410. German Literature Before 1750. (3 cr [max 9 cr]. Prereq–3011)
Representative literary texts of German High Middle Ages, Renaissance, Reformation, and the Baroque, in cultural-historical context. Readings in modern German translation or English.

GER 3421. 18th-Century German Literature. (3 cr. Prereq–3011)
German literature, 1720-1810, Enlightenment/Weimar classicism in historical/cultural context. Reading/discussion of literary/philosophical works, aesthetic criticism.

GER 3431. 19th-Century Literature. (3 cr. Prereq–3011)
Literary/cultural exploration of 19th-century German literature through an investigation of romanticism, realism, and naturalism. Reading/discussion of literary/critical texts.

GER 3441. 20th-Century Literature. (3 cr. Prereq–3011)
German literature, from 1890 to present, in historical, political, social, and cultural context.

GER 3460. Women Writers in German Literature. (3 cr [max 9 cr]. Prereq–3011)
Literary/historical investigation of selected German women writers, from perspectives of feminist theory, gender studies, and cultural studies/theory. Approaches may be thematic, generic, or chronological.

GER 3490. Topics in German Literature. (3 cr [max 9 cr]. Prereq–3011)
Intensive exploration of specific authors, literary genres, or literary topics not covered in period courses.

GER 3501. Contemporary Germany. (3 cr. Prereq–3011)
Social, political, and cultural developments in Germany, from 1945 to present.

GER 3510. Topics in German Studies. (3 cr [max 9 cr]. Prereq–3011)
One topic in depth dealing with culture or civilization of German-speaking countries.

GER 3511W. German Civilization and Culture: Middle Ages to 1700. (4 cr)
Survey of representative cultural-historical events in Germany from early Germanic times to 1700.

GER 3512W. German Civilization and Culture: 1700 to the Present. (4 cr)
Survey of representative cultural-historical events in Germany from 1700 to the present.

GER 3520. Topics in Austrian and Central European Culture. (3 cr [max 9 cr]. Prereq–3011)
Culture, politics, and economy in Austria and Central Europe. Comparative analysis of cultural/political developments. Topics vary.

GER 3531. Selected Writings in German Intellectual History. (3 cr. Prereq–3011)
Philosophical writings on culture, history, and art. Authors include Lessing, Schiller, Kant, Hegel, Marx, Nietzsche, and Freud.

GER 3593. Directed Studies: German-Speaking Countries. (4 cr [max 12 cr]. Prereq–3011, Δ)
Preparation for research abroad during semester before departure. Written/oral reports upon return.

GER 3601. German Medieval Literature. (3 cr. Prereq–No knowledge of German required)
Literary investigation of the greatest works of medieval German poetry. Readings in English. Majors will be required to write a paper with use of secondary sources in English and German.

GER 3604W. Introduction to German Cinema. (3 cr)
An introduction to the study of German cinema, with a focus on the relation between German film and German history, literature, culture, and politics.

GER 3610. German Literature in Translation. (3 cr [max 9 cr]. Prereq–No knowledge of German required; cr toward major or minor requires reading in German)
In-depth study of authors or topics from various periods in German literature.

GER 3631. Jewish Writers and Rebels in German, Austrian, and American Culture. (3 cr. §CSCL 3631, JWST 3631. Prereq–No knowledge of German required; cr toward major or minor requires reading in German)
Literary/cultural modes of writing used by Jewish writers in Germany, Austria, and America to deal with problems of identity, anti-Semitism, and assimilation. Focus on 20th century. All readings (novels, poetry, stories) in English.

GER 3634. German Women and Cultural History: Constructing Selves in Narrative Texts. (3 cr. Prereq–No knowledge of German required; cr toward major or minor requires reading in German)
Examination of narrative texts by German women writers against a background of the cultural history of Germany during the 20th century. Focus on personal narrative texts, both written and pictorial, and readings in literary and cultural theory and history. All readings in English.

GER 3641. German Folklore. (3 cr. Prereq–No knowledge of German required; cr for major or minor by arrangement with instructor)
Literary and cultural investigation of the main folklore genres: charms, legends, folktales, and ballads; their composition, origin, and role in society with a strong emphasis on their international character. Readings in English. Majors required to write a paper with use of secondary sources in English and German.

GER 3642. The Grimms' FAIRy Tales, Feminism, and Folklore. (3 cr. Prereq–No knowledge of German required; cr toward major or minor requires reading in German)
Exploration of the Grimms. fairy tales and investigation of how various folktale types and gender stereotypes developed and became classical models for children and adults. The genre of the literary fairy tale in Germany, Europe, and North America. Comparisons of original literary versions with contemporary tales. All readings in English.

GER 3701. History of the German Language. (3 cr. Prereq–1004)
Change in grammar and lexicon, 750 A.D. to present.

GER 3702. Beginning Middle High German. (3 cr. Prereq–1004)
Middle High German grammar. Selected literary texts.

GER 3704. German Dialects. (3 cr. Prereq–1004)
Contemporary regional dialects recorded on tape and written in texts. Synchronic and diachronic analysis.

GER 3993. Directed Studies. (1-4 cr [max 12 cr]. Prereq–#, Δ, o)
Guided individual reading or study.

GER 4001. Beginning German. (2 cr. Prereq–Grad student)
Meets concurrently with 1001. See 1001 for course description.

GER 4002. Beginning German. (2 cr. Prereq–Grad student)
Meets concurrently with 1002; see Ger 1002 for course description.

GER 4003. Intermediate German. (2 cr. Prereq–Grad student)
Meets concurrently with 1003. See 1003 for course description.

GER 4004. Intermediate German. (2 cr. Prereq–Grad student)
Meets concurrently with 1004. See 1004 for course description.

GER 4040. German Play: Oral Interpretation and Performance of German. (1-3 cr [max 9 cr])
Dramatic reading of German play for pronunciation; preparation and rehearsal for production and performance of German play.

GER 4621. German Cinema to 1945. (3 cr. Prereq–3xxx film course or #)
Beginnings of German cinema late 19th/early 20th century. "Golden age" during Weimar Republic (1918-1933). Expressionism and "New Objectivity." Its subordination to ideological/entertainment needs of Nazis' "Third Reich" (1933-45).

GER 4622. German Cinema Since 1945. (3 cr. Prereq–3xxx film course or #)
German cinema during the first years of postwar occupation and then in each of the two postwar German states, East and West Germany, from 1949-1990, and finally in the unified Germany from 1990 on. Includes films of DEFA, "New German Cinema," feminist cinema, German comedies of the 1980s and 1990s, etc.

GER 5011. Advanced Conversation and Composition. (3 cr. Prereq–3011, [grad student or adv undergrad])
Achieving high proficiency in writing/speaking professional/academic German.

GER 5016. Advanced Translation: Theory and Practice. (3 cr. Prereq–3016 or #)
Translation theory, related issues in stylistics, philosophy of language; sample translations; student production of translations with methodological commentary.

GER 5101. Analysis of German. (3 cr. Prereq–1004, LING 3001 or LING 5001 or #)
Phonology, morphology, and syntax of standard German.

GER 5410. Topics in German Literature. (3 cr [max 9 cr]. Prereq–3011)
Topic may focus on a specific author, group of authors, genre, period, or subject matter. Topics specified in *Class Schedule*.

GER 5510. Topics in Contemporary German Culture. (3 cr [max 9 cr]. Prereq–3011)
A topic of contemporary German culture explored in depth.

GER 5610. German Literature in Translation. (3 cr [max 9 cr]. Prereq–No knowledge of German required; cr toward major or minor requires reading in German)
Study in depth of authors or topics from various periods in German literature. Requires no knowledge of German.

GER 5630. Topics in German Cinema. (3 cr [max 9 cr]. Prereq–3xxx film course or #)
Topics chosen may focus on specific directors, genres, film production or reception, and/or other formal, theoretical, historical, or political issues.

GER 5711. History of the German Language I. (3 cr. Prereq–3011)
Historical development of German, from beginnings to 1450.

GER 5712. History of the German Language II. (3 cr. Prereq–5711)
Historical development of German from 1450 to 2000.

GER 5721. Introduction to Middle High German. (3 cr)
Introduction to Middle High German language and literature. Study of grammar through formal description of Middle High German phonology, morphology, and syntax. Normalized MHG texts read.

GER 5722. Middle High German: Advanced Readings. (3 cr. Prereq–5721)
Acquisition of fluency in reading Middle High German normalized as well as non-normalized texts, both poetry and prose.

GER 5731. Old High German I. (3 cr)
Study of the monuments of Old High German. Detailed investigation of Old High German in comparison with the other Germanic languages.

GER 5732. Old High German II. (3 cr. Prereq–5731)
Study of the monuments of Old High German. Detailed investigation of Old High German in comparison with the other Germanic languages.

GER 5734. Old Saxon. (3 cr)
Study of the poetry of Old Saxon. Detailed investigation of Old Saxon in comparison with the other Old Germanic languages.

GER 5740. Readings in Philology. (3 cr [max 9 cr])
Philological analysis of a chosen text in any medieval Germanic language.

GER 5993. Directed Studies. (1-4 cr [max 12 cr]. Prereq–#, Δ, ❑)
Guided individual reading or study.

German,Scandinavian, and Dutch (GSD)

Department of German, Scandinavian, and Dutch

College of Liberal Arts

GSD 3451V. Honors Major Project Seminar. (4 cr; A-F only. §GSD 3451W. Prereq–Honors student)
Major project under supervision of faculty member. Oral exam based on project.

GSD 3451W. Major Project Seminar. (4 cr; A-F only. §GSD 3451V)
Students prepare major project under supervision of faculty member.

GSD 5103. Teaching of Germanic Languages. (3 cr)
Second language acquisition theory, methods, testing, and technology applicable to teaching of modern Germanic languages.

Gerontology (GERO)

School of Public Health-Admin

GERO 5105. Multidisciplinary Perspectives on Aging. (3 cr)
Sociological, psychological aspects of aging. Theories of aging. Death/bereavement. Issues/problems of older adults in America. Human services, their delivery systems (health, nutrition, long-term care, education). Public policy, legislation. Environment/housing. Retirement.

GERO 5110. Biology of Aging. (3 cr)
Biological changes that occur with aging. Methods for studying aging, descriptions of population aging, theories on how/why we age. Process of aging in each body system, variation between individuals/populations. Clinical implications of biological changes with age. Guest lecturers from different disciplines.

GERO 5111. Studying Aging and Chronic Illness. (2 cr. Prereq–Introductory course in epidemiology or #)
Methodological issues unique to studies of older populations. Focuses on measurement of epidemiological characteristics. Health conditions/disorders of older Americans.

Global Studies (GLOS)

Institute of International Studies

College of Liberal Arts

GLOS 1015V. Honors: Introduction to Global History Since 1950. (4 cr. §GLOS 1015W, HIST 1015V, HIST 1019. Prereq–honors)
Global history in information age. East-West divisions during Cold War: North-South relations in global economy. Emerging consciousness of global systems. Issues of human rights, labor migration, environmental degradation, and indigenous peoples. Emphasizes comparison of cases from Asia, Africa, Latin America.

GLOS 1015W. Introduction to Global History Since 1950. (4 cr. §GLOS 1015V, HIST 1015V, HIST 1019. Prereq–Fr or soph)
Global history in information age. East-West divisions during Cold War: North-South relations in global economy. Emerging consciousness of global systems. Issues of human rights, labor migration, environmental degradation, and indigenous peoples. Emphasizes comparison of cases from Asia, Africa, Latin America.

GLOS 1112. Globalization and Social Justice. (3 cr)
How and why did the term "gloalization" become commonplace, what it describes. Uses questions of social justice to explore portrayals of globalization in popular media and culture.

GLOS 1200. Global Studies Practicum. (3 cr [max 6 cr]; A-F only)
Exploratory experience in one part of the world as an integral feature of an undergraduate education and as preparation for learning the language of the area visited.

GLOS 1672. Geography of Global Cities. (3 cr. §GEOG 1372)
Urban forms/processes. Key global cities as examples. Political, historical, and economic contexts of cities. Planning ideologies. Globalization. Race/segregation. Population growth. Environmental problems.

GLOS 1902. Freshman Seminar. (3 cr; A-F only. Prereq–Freshman)
Topics specified in *Class Schedule*.

GLOS 1904. Freshman Seminar. (3 cr; A-F only. Prereq–Freshman)
Topics specified in *Class Schedule*.

GLOS 1905. Freshman Seminar. (3 cr; A-F only. Prereq–Freshman)
Topics specified in *Class Schedule*.

GLOS 1909W. Topics: Freshman Seminar. (3 cr; A-F only. Prereq–Fr)
Topics specified in *Class Schedule*.

GLOS 3003. Cultural Anthropology. (3 cr. §ANTH 3003. Prereq–ANTH 1003 or #)
Marxist/feminist theories of culture. Culture and language/discourse. Psychological anthropology. Culture and transnational processes. May include field research, politics of ethnographic knowledge.

GLOS 3103. Empire and Modernity. (3 cr. Prereq–[3101, 3144] or #)
How modern world has been constituted by colonial encounter. Role of colonialism in construction of west. Images of non-western societies. Modernity in colonial/postcolonial societies. Problems/potential of universal categories such as democracy, gender, history, human rights. Globalization at the margins.

GLOS 3144. Knowledge, Power, and the Politics of Representation in Global Studies. (4 cr. §GLOS 3144H. Prereq–6 cr in social sciences including [GEOG 1301 or HIST 1015 or HIST 1019 or HIST 1012 or HIST 1018 or POL 1025])
Introduction to theoretical issues. Power/production of knowledge about world regions. Knowledge, power, and politics in contemporary world. Colonialism, nationalism, and modernity in shaping academic disciplines.

GLOS 3144H. Honors: Knowledge, Power, and the Politics of Representation in Global Studies. (4 cr. §GLOS 3144. Prereq–honors, 6 cr in social sciences [including GEOG 1301 or HIST 1015 or HIST 1019 or HIST 1012 or HIST 1018 or POL 1025])
Introduction to theoretical issues. Power, production of knowledge about world regions. Knowledge, power, and politics in contemporary world. Colonialism, nationalism, and modernity in shaping academic disciplines.

GLOS 3145. Theoretical Approaches to Global Studies. (4 cr; A-F only. §GLOS 3145H. Prereq–6 credits in the social sciences including at least one of the following: GEOG 1 301; HIST 1012/1018; GLOS 1015W; or PolSci 1025 or #)
Theoretically informed introduction to the social, political, economic, cultural, and historical processes shaping contemporary global phenomena. Topics may include nationalism, colonialism, cultural production, environmental sustainability, globalization of the economy, migration and diasporas, global conflict and cooperation.

GLOS 3145H. Theoretical Approaches to Global Studies. (4 cr; A-F only. §GLOS 3145. Prereq–6 credits in the social sciences including at least one of the following: GEOG 1 301; HIST 1012/1018; GLOS 1015W; or PolSci 1025; or #)
Theoretically informed introduction to the social, political, economic, cultural, and historical processes shaping contemporary global phenomena. Topics may include nationalism, colonialism, cultural production, environmental sustainability, globalization of the economy, migration and diasporas, global conflict and cooperation.

GLOS 3212. Globalization, Markets, and Inequality. (3 cr; A-F only. §ANTH 3212)
Globalization of American business/culture, uneven relationships between developed/underdeveloped national economies, social/economic consequences of market economies and free trade. Focuses on growing inequalities in global economy. Wall Street and transnational corporations, sweatshops, consumer culture, brand-name global marketing, mass downsizings.

GLOS 3301. Environment & Empire. (3 cr; A-F only. Prereq–[3101, 3144] or #)
Key issues in environmental history. Global/colonial processes that have made the modern environment. Global spread of diseases, modern remaking of world?s flora/fauna, idea of nature. New technologies and the environment. Conservationist ideology.

GLOS 3302. Debating "Development": Contested Visions. (3 cr; A-F only. Prereq–[3101, 3144] or #)
Radical critiques of idea/practice of "development." Debates over development. Vocabularies (Marxist, feminist, post-structuralist, ecological) that drive the debates.

GLOS 3303. Environment and Development in the Third World. (3 cr; A-F only. §GEOG 3 379. Prereq–Soph or jr or sr)
Basic concepts for analyzing relations between capitalist development and environment in Third World. Analytical concepts about historical geography of capitalist development, geographically/historically specific case studies, likelihood of social/environmental sustainability.

GLOS 3401. International Human Rights Law. (3 cr; A-F only. Prereq–[3101, 3144] or #)
Issues, procedures, advocacy strategies regarding promotion/protection of international human rights. Students analyze recent case studies of human rights violations in light of evolving laws, enforcement mechanisms.

GLOS 3402. Human Rights Internship. (3 cr; A-F only. Prereq–3401, #)
Hands-on experience in one of many Twin Cities area organizations engaged in promoting/protecting international human rights. Students work 100 hours in non-governmental organization. Substantive background on human rights laws/procedures, organizational theory/management information about human rights organizations.

GLOS 3410. Interactive Global and Local Studies. (3 cr; A-F only. Prereq–#)
Global studies topics studied through their local manifestations in the Twin Cities or Minnesota, and internationally through linked communication with classes at cooperating universities in other countries. Students communicate with counterparts abroad through e-mail to develop comparative/interactive elements in their studies. Sample topics: role of the river in local history, grain storage and processing, manufacturing and trade, growth of the metropolitan area.

GLOS 3415. Global Institutions of Power: World Bank, International Monetary Fund, and World Trade Organization. (3 cr)
Introduction to World Bank, International Monetary Fund, and World Trade Organization. Emphasizes their daily practices and political, economic, and cultural effects around the world. Politics/business of development. Free market and trade. New transnational professional class. Social activism.

GLOS 3550V. Honors Course: Supervised Research Paper. (4 cr)
Supervised research paper.

GLOS 3552H. Honors Seminar: Making of the Modern World. (3 cr; A-F only. Prereq–MacArthur Program or [IntR, honors], #)
Interaction across ecological frontiers, changing power relations, restructuring of systems of production, creation of new cultures/identities.

GLOS 3553H. Honors: Change in the Contemporary Global Order. (3 cr; A-F only. Prereq–#)
Important issues of global change: population growth, human migration; human relations with physical environment; struggles for popular power, sustainable democratic institutions; relations/conditions of work; cultural representations of social identities. Attention to U.S.-Mexican arena.

GLOS 3558V. Honors: Research Seminar. (3 cr; A-F only. Prereq–Honors, global studies major)
Theoretical perspectives/methods available for research in global studies. Focus varies with instructor.

GLOS 3602. Other Worlds: Globalization and Culture. (3 cr; A-F only. Prereq–[3101, 3144] or #)
Globalization produces complex, sometimes volatile, local responses. Course explores interconnectedness of the world, considering not one world, but many. Topics include colonialism, consumption, diasporic conditions, global media, nationalism, supra-national governance. Examines how globality is experienced and contested locally and specifically.

GLOS 3605. From Printing Press to Internet: Media, Communications, and History. (3 cr; A-F only. §HIST 3705)
Print public sphere in 17th, early 18th century. Political conflicts over freedom of press in 18th, 19th century. Emergence of advertising, public relations industries in 20th century. Significance of broadcast, computer network technologies for democratic political systems.

GLOS 3607. Gender and the Global Politics of Health. (3 cr; A-F only. §WOST 3207)
Politics, global processes, and social relations that shape health/disease patterns world wide. Case studies, including HIV/AIDS in Africa, diabetes and health care in the U.S., new reproductive technologies, and access to food. How gender, poverty, geographic/social location, citizenship, sexuality, and other factors help determine degree of vulnerability to disease or right to health.

GLOS 3613W. Food, Culture, and Society. (3 cr)
Tools to understand food issues from a sociological perspective. Cross-cultural differences in the way groups/societies think about and relate to food.

GLOS 3620. Foreign Language News Coverage of International Events. (1 cr. Prereq–Completion of college language requirement in language used for course)
Compares coverage of current news in selected foreign language newspapers with coverage in a U.S. paper such as The New York Times.

GLOS 3641. Central Asian Culture and Literature. (3 cr. §CAS 3531, MELC 3531)
Dynamics of life in contemporary Afghanistan, Iran, and Central Asia. Emphasizes role of ethnicity/ideology. Central Asian fiction illustrates impact of sovietization on Islamic traditions of region.

GLOS 3643. Islam and the West. (3 cr. §CAS 3533, MELC 3533)
Cultural/intellectual trends that have defined fundamental differences between Islam and the West. Development of historical, philosophical, and intellectual mindset of both spheres. Factors that have contributed and continue to contribute to tension, anxiety, and hatred between the Muslim world and Europe and the United States.

GLOS 3645. Islamic World. (3 cr; A-F only. §GEOG 3145)
Foundation of Islam in Arabian Peninsula, its spread to Asia and Africa. Islamic civilization, influence on Europe before rise of capitalism. Rise of Capitalist Europe, colonization of Islamic World Islamic resurgence and post-colonial World. State-society and development. Culture/conflict in Moslem societies. Gender and Islam. Islamic World and the West. Moslems in North America and Europe. Case studies.

GLOS 3701W. Population in an Interacting World. (4 cr)
Comparative analysis/explanation of trends in fertility, mortality, and internal/international migration in different parts of the world. World population problems, population policies, theories of population growth. Impact of population growth on food supply and the environment.

GLOS 3900. Topics in Global Studies. (1-5 cr [max 15 cr])
Topics vary every semester. See *Class Schedule*.

GLOS 3906. Foreign Language Immersion Program Completion. (1 cr [max 2 cr]; S-N only. Prereq–Enrolled in full course load in target language, permission of Foreign Language Immersion Program)
Credit attached to Foreign Language Immersion Program.

GLOS 3910. Topics in East Asian Studies. (1-3 cr [max 6 cr])
Selected topics in East Asian Studies not covered in regular courses. Topics reflect instructor interests.

GLOS 3920. Topics in European Studies. (3 cr [max 9 cr])
Topics vary. See *Class Schedule*.

GLOS 3921. Europe: A Geographic Perspective. (3 cr. §GEOG 3 161)
Comparative analysis/explanation of Europe.s physical, demographic, ethnic/cultural, economic, political, and urban landscapes. European integration: European Union, transformation of Eastern Europe.

GLOS 3930. Topics in Latin American Studies. (3 cr [max 9 cr])
Topics vary. See *Class Schedule*.

GLOS 3940. Topics in Middle Eastern Studies. (4 cr [max 12 cr])
Description varies with topic title.

GLOS 3950. Topics in Russian Area Studies. (3 cr)
Description varies with topic title.

GLOS 3960. Topics in South Asian Studies. (3 cr)
Topics vary. See *Class Schedule*.

GLOS 3961. Culture and Society of India. (3 cr. §ALL 3676, ANTH 3023)
Contemporary society/culture in South Asia from an anthropological perspective. Nationalism, postcolonial identities. Media, public culture. Gender, kinship/politics. Religion, ethnicity, Indian diaspora.

GLOS 3981W. Major Project Seminar. (3 cr; A-F only)
Supports senior project requirement by allowing students to formulate their own research questions, select a topic, develop and produce a 25-30 page undergraduate research paper.

GLOS 3993. Directed Study. (1-5 cr [max 12 cr]. Prereq–#, Δ, ❑)
Guided individual reading or study.

GLOS 4221. Sociology of Globalization: Culture, Norms, and Organization. (3 cr; A-F only. §SOC 4321. Prereq–SOC 1001 or #)
Sociological literature on globalization of organizations, political relations, and culture. Dependency, world systems theories. Growth of international nongovernmental organizations, their impact on state policies and civil society. Expansion of international norms governing nation-state behavior. Globalization of popular culture (movies, computer games, etc.). Contemporary trend toward globalization, its manifold impacts on societies/individuals.

GLOS 4311. Race, Class, and the Politics of Nature. (3 cr)
Global debates over how nature is produced, consumed, degraded, sustained, and defended. Analytics of race/class. Politics of North-South relations.

GLOS 4504W. Senior Project. (3 cr. Prereq–Sr or #)
Research methods, writing skills, and bibliography related to field of study.

GLOS 4609. MSID Directed Research. (2-8 cr [max 8 cr]. Prereq–Admission to MSID program, Δ)
Research project based on field work in Ecuador, India, Kenya, or Senegal through Minnesota Studies in International Development program.

GLOS 4801. International Development: Critical Perspectives on Theory and Practice. (4 cr; A-F only. Prereq–Δ)
Interdisciplinary approaches to development. Assumptions, competing paradigms, analysis of policies, projects, problems. Globalization, societal crisis, indigenous alternatives to dominant paradigm. Partially taught in separate sections to deepen understanding of particular topic (e.g., environment, health, education).

GLOS 4802. Cross-Cultural Perspectives on Work. (4 cr; A-F only. Prereq–❑)
Intercultural communication concepts/skills. US cultural/value system. Stages of adjustment. Coping strategies for crossing cultural boundaries. Host-country cultural characteristics. Emphasizes work, family, community, views of development.

GLOS 4803. MSID Country Analysis. (4 cr; A-F only. Prereq–Δ)
Multidisciplinary study of host country. Emphasizes social sciences and history, especially concepts/information regarding development issues.

GLOS 4805. Community Internships in the Global South. (4 cr. Prereq–Admission to MSID program, Δ)
Grassroots internship with a host-country development agency or project through Minnesota Studies in International Development. Community characteristics, development strategies/problems, organizational structure/culture, cross-cultural communication issues.

GLOS 4806. Topics: Case Studies in International Development. (4 cr; A-F only. Prereq–Admission to MSID program)
Development issues illustrated in students. local-level projects through MSID. Focuses on a particular sector as it relates to development of country. Sample topics: environment and development; health and development; education, literacy, and development; women and development.

GLOS 4807. Applied Field Methods. (4 cr; A-F only)
Application of selected field research methods in rural/urbansettings in Asia, Africa, and Latin America. Analysis of practical,ethical, and theoretical issues raised through small field assignmentsand individual research projects.

GLOS 4808. MSID Directed Research. (4 cr [max 8 cr]; A-F only. Prereq–Admission to MSID program, #)
Research project based on field work in Ecuador, India, Kenya, or Senegal through Minnesota Studies in International Development (MSID).

GLOS 4809. Advanced International Development Internship. (4 cr)
Study abroad course for Minnesota Studies in International Development.

GLOS 4900. Senior Seminar in Global Studies. (3 cr; A-F only. §GLOS 4900H. Prereq–[3101, 3144, global studies major] or #)
Globalization, nationalism, colonialism, cultural production, environmental sustainability, globalization of economy, migration, diasporas, global conflict/cooperation, human rights. Students examine theoretical debates and cutting edge scholarship and may develop their own research projects. Capstone course.

GLOS 4900H. Honors: Senior Seminar in Global Studies. (3 cr; A-F only. §GLOS 4900. Prereq–[3101, 3144, honors student, Global Studies major] or #)
Globalization, nationalism, colonialism, cultural production, environmental sustainability, globalization of economy, migration, diasporas, global conflict/cooperation, human rights. Students examine theoretical debates and cutting edge scholarship and develop their own research projects. Capstone course.

GLOS 4910. Topics in Global Studies. (3 cr [max 9 cr])
Topics vary every semester. See *Class Schedule*.

GLOS 4940. Topics in Asian History. (1-4 cr [max 16 cr])
Selected topics in Asian history not covered in regular courses.

GLOS 4960. Advanced Topics in South Asian Studies. (3 cr. Prereq–Jr or sr or grad or #)
Topics vary. See *Class Schedule*.

GLOS 5103. Empire and Modernity. (3 cr; A-F only. Prereq–[3101, 3144] or #)
How modern world has been constituted by colonial encounter. Role of colonialism in construction of west. Images of non-western societies. Modernity in colonial/postcolonial societies. Problems/potential of universal categories such as democracy, gender, history, human rights. Globalization at the margins.

GLOS 5114. International Perspectives: U.S.-Mexico Border Cultures. (3 cr. Prereq–Grad student)
The relations of Mexico and the United States from an international perspective with a central focus on the cultural interchange in the border lands between the two countries. Uses both literary and historical materials.

GLOS 5301. Environment & Empire. (3 cr; A-F only. Prereq–[3101, 3144] or #)
Key issues in environmental history. Emphasizes global/colonial processes that have made modern environment. Global spread of diseases, modern remaking of world?s flora/fauna, idea of nature. New technologies and the environment. Conservationist ideology.

GLOS 5410. Interactive Global and Local Studies. (3 cr; A-F only. Prereq–#)
Global studies topics, locally in the Twin Cities and Minnesota, and internationally through linked communication with classes at cooperating universities in other countries. Students communicate with counterparts abroad through e-mail to develop comparative/interactive elements. Possible topics: role of river in local history, grain storage/processing, manufacturing/trade, growth of metropolitan area.

GLOS 5602. Other Worlds: Globality and Culture. (3 cr; A-F only. Prereq–[3101, 3144, grad student] or #)
Interconnectedness of world. Considering not one world, but many. Colonialism, consumption, diasporic conditions, global media, nationalism, supra-national governance. How globality is experienced/contested locally/specifically.

GLOS 5603. Socialist/Post-socialist Transformations. (3 cr; A-F only. §HIST 5251)
Transformations underway in post-socialist societies of Eastern Europe, former Soviet Union. Ramifications of abandonment of state socialism, introduction of market relations. Effect of former system, new market system on cultural institutions/identities.

GLOS 5643. Colonialism and Culture. (3 cr; A-F only. §ANTH 5043)
Making of culture as colonial/anthropological object of knowledge. Relationship between colonial knowledge/formation of academic disciplines (especially anthropology). Colonial/postcolonial transformations of colony, nation, and metropole.

GLOS 5801. International Development: Critical Perspectives on Theory and Practice. (3 cr; A-F only. Prereq–Admission to MSID prog, grad student)
Interdisciplinary approaches to development. Assumptions, competing paradigms, analysis of policies, projects, problems. Globalization, societal crisis, indigenous alternatives to dominant paradigm. Partially taught in separate sections to deepen understanding of particular topic (e.g., environment, health, education).

GLOS 5802. Cross-Cultural Perspectives on Work. (3 cr; A-F only. Prereq–Admission to MSID prog, grad student)
Intercultural communication concepts/skills. U.S. cultural/value system. Stages of adjustment. Coping strategies for crossing cultural boundaries. Host-country cultural characteristics. Emphasizes work, family, community, views of development.

GLOS 5803. MSID Country Analysis. (3 cr; A-F only. Prereq–Admission to MSID prog, grad student)
Multidisciplinary study of host country. Emphasizes social sciences and history, especially concepts/information regarding development issues.

GLOS 5805. Community Internships in the Global South. (3 cr. Prereq–Admission to MSID prog, grad student)
Grassroots internship with a host-country development agency or project through Minnesota Studies in International Development. Community characteristics, development strategies/problems, organizational structure/culture, cross-cultural communication issues.

GLOS 5806. Topics: Case Studies in International Development. (3 cr; A-F only. Prereq–Admission to MSID prog, grad student)
Development issues illustrated in students. local-level projects through MSID. Focuses on a particular sector as it relates to development of country. Sample topics: environment and development; health and development; education, literacy, and development; women and development.

GLOS 5807. Applied Field Methods. (3 cr; A-F only. Prereq–Admission to MSID program)
Application of selected field research methods in rural/urban settings in Asia, Africa, and Latin America. Analysis of practical, ethical, and theoretical issues raised through small field assignments and individual research projects.

GLOS 5808. MSID Directed Research. (3 cr; A-F only. Prereq–Admission to MSID prog, grad student)
Research project based on field work in Ecuador, India, Kenya, or Senegal through Minnesota Studies in International Development (MSID).

GLOS 5809. Advanced International Development Internship. (3 cr)
Study abroad course for Minnesota Studied in International Development.

GLOS 5900. Topics in Global Studies. (1-4 cr [max 4 cr])
Proseminar. Selected issues in global studies. Topics specified in *Class Schedule*.

GLOS 5910. Topics in East Asian Studies. (1-3 cr [max 3 cr])
Description varies with topic title.

GLOS 5920. Topics in European Studies. (3 cr)
Description varies with topic title.

GLOS 5930. Topics in Latin American Studies. (3 cr)
Description varies with topic title.

GLOS 5940. Topics in Middle Eastern Studies. (3 cr)
Description varies with topic title.

GLOS 5950. Topics in Russian Area Studies. (3 cr)
Description varies with topic title.

GLOS 5960. Topics in South Asian Studies. (3 cr [max 4 cr])
Description varies with topic title.

GLOS 5993. Directed Studies. (1-4 cr [max 12 cr]. Prereq–#, Δ, ❑)
Guided individual reading or study. Open to qualified students for one or more semesters.

GLOS 5994. Directed Research. (1-4 cr [max 12 cr]. Prereq–#, Δ, ❑)
Qualified students work on a tutorial basis.

Greek (GRK)

Department of Classical and Near Eastern Studies

College of Liberal Arts

GRK 1001. Beginning Classical Greek I. (5 cr)
Introduction to classical Greek.

GRK 1002. Beginning Classical Greek II. (5 cr. Prereq–Grade of at least [C- or S] in 1001 or #)
Greek grammar/syntax. Readings from classical Greek authors, including Herodotus and Aristophanes.

GRK 1111H. Honors Course: Beginning Classical Greek. (3 cr. Prereq–Concurrent registration in 1112H, [honors or high ability as indicated by high school trANSCript])
Intensive Classical Greek covering material normally taught over two semesters.

GRK 1112H. Honors Course: Classical Greek, Recitation. (3 cr. Prereq–¶1111H, [honors or high ability as indicated by high school transcript])
Drills, composition exercises.

GRK 3111. Intensive Classical Greek. (3 cr. Prereq–Enrollment 3112; previous exper in another foreign language desirable)
Intensive introduction to classical Greek covering two semesters of material in one semester. Undergraduates in this course must also register for 3112 when taking this class.

GRK 3112. Intensive Classical Greek, Recitation. (3 cr. Prereq–¶3111; previous exper in another foreign language desirable)
Drills and composition exercises to help students learn classical Greek. Students must also register for 3111 when taking this course.

GRK 3113. Intermediate Greek Prose. (4 cr; A-F only. Prereq–Grade of at least [C- or S] in 1002 or #)
Readings in Classical Greek prose texts by one or more authors (e.g., Plato, Lysias, Xenophon, Herodotus). Review of grammar/morphology.

GRK 3114. Ionic Authors. (4 cr. Prereq–3113 or Δ)
Students progress from intermediate to advanced Greek reading while exploring the world of Herodotus and Homer.

GRK 3120. Greek New Testament. (3 cr [max 6 cr]. Prereq–Grade of at least [C- or S] in 3113 or #)
Readings from Gospels, epistles of Paul, and related literature. Emphasizes proficiency in reading Greek New Testament. Selections vary.

GRK 3300. Intermediate Greek Poetry. (4 cr [max 8 cr]; A-F only. Prereq–Grade of at least [C- or S] in in 3113 or #)
Readings in ancient Greek poetry. Introduction to Greek meter. Homer and tragedy offered in alternate years.

GRK 3310. Advanced Undergraduate Greek: Oratory. (3 cr [max 9 cr]. Prereq–3114 or 3 years HS Greek or Δ)
One or more appropriate authors studied during each course offering.

GRK 3320. Advanced Undergraduate Greek: Tragedy. (3 cr [max 9 cr]. Prereq–3114 or 3 years HS Greek or Δ)
Advanced reading in Greek tragedy.

GRK 3330. Advanced Undergraduate Greek: Comedy. (3 cr [max 9 cr]. Prereq–3114 or 3 years HS Greek or Δ)
Advanced readings in Greek comedy.

GRK 3340. Advanced Undergraduate Greek: History. (3 cr [max 9 cr]. Prereq–3114 or 3 years HS Greek or Δ)
Advanced readings from the Greek historians; traditions of Greek historiography.

GRK 3350. Advanced Undergraduate Greek: Philosophy. (3 cr [max 9 cr]. Prereq–3114 or 3 years HS Greek or Δ)
Read one or more works of Plato or Aristotle in the original Greek and find out what they really mean. Texts vary with each offering.

GRK 3360. Advanced Undergraduate Greek: Religious Texts. (3 cr [max 9 cr]. Prereq–3114 or 3 years HS Greek or Δ)
Reading and discussion of religious texts from Greek antiquity. Selections vary with each course offering.

GRK 3370. Advanced Undergraduate Greek: Epic. (3 cr [max 9 cr]. Prereq–3114 or 3 years HS Greek or Δ)
Reading of classical Greek epic on an advanced level.

GRK 3380. Advanced Undergraduate Greek: Lyric. (3 cr [max 9 cr]. Prereq–3114 or 3 years HS Greek or Δ)
Selections from Greek lyric poets.

GRK 3390. Advanced Undergraduate Greek: Romance. (3 cr [max 9 cr]. Prereq–3114 or 3 years HS Greek or Δ)
Selections from the Hellenistic Romances.

GRK 3440. Advanced Undergraduate Greek: Later Greek Authors. (3 cr [max 9 cr]. Prereq–3114 or 3 years HS Greek or Δ)
Selected topics in later Greek literature, especially Byzantine prose.

GRK 3450. Advanced Undergraduate Greek: Classical Authors. (3 cr [max 9 cr]. Prereq–3114 or 3 years HS Greek or Δ)
Selected topics in classical Greek literature; topics specified in *Class Schedule*.

GRK 3951W. Major Project. (4 cr. Prereq–[[Greek-Latin or Greek major], three 3xxx Greek courses], #, Δ)
Research project using documents and other sources from the ancient world. Students select project in consultation with a faculty member, who directs the research/writing.

GRK 3960H. Honors Course: Advanced Undergraduate Greek Reading. (3 cr [max 12 cr]. Prereq–Enroll in honors program or high ability as indicated by transcript)
Student attends Greek 33xx, 3440, 3450 and does additional work for honors credit.

GRK 3993. Directed Studies. (1-4 cr [max 4 cr])

GRK 5012. Prose Composition. (3 cr. Prereq–Grad student or #)
Moving step by step through Ancient Greek grammar, starting with simple sentences and progressing to complex ones. Course ends with students translating short passages of modern English prose into Greek.

GRK 5013. Advanced Composition. (3 cr. Prereq–Grad student or #)
English-to-Greek verse composition or writing styles of individual Greek authors.

GRK 5032. Text Criticism. (3 cr. Prereq–Grad student or #)
Theory/practice. Elements of paleography and manuscript study. Tools for analyzing textual apparatus; constructing a critical edition of a literary text.

GRK 5121. Biblical and Patristic Greek. (3 cr. Prereq–Grad student or #)
Septuagint, Philo, Josephus, New Testament, Apostolic Fathers, and other patristic literature to 5th century CE. Reading/discussion of selected texts in major genres.

GRK 5310. Greek Literature: Oratory. (3 cr [max 9 cr]. Prereq–Grad student or #)
One or more authors.

GRK 5320. Greek Literature: Tragedy. (3 cr [max 9 cr]. Prereq–Grad student or #)
Reading of Greek tragedy.

GRK 5330. Greek Literature: Comedy. (3 cr [max 9 cr]. Prereq–Graduate student status or instructor consent)
Readings in Greek comedy.

GRK 5340. Greek Literature: History. (3 cr [max 9 cr]. Prereq–Grad student or #)
Readings from Greek historians. Traditions of Greek historiography.

GRK 5350. Greek Literature: Philosophy. (3 cr. Prereq–Grad student or #)
Readings from one or more works of Plato or Aristotle in original Greek. Selections vary.

GRK 5360. Literature: Religious Texts. (3 cr [max 9 cr]. Prereq–Grad student or #)
Reading/discussion of religious texts from Greek antiquity, such as Homeric Hymns, cultic verse, aretalogy, sacred tales, oracle texts.

GRK 5370. Greek Literature: Epic. (3 cr [max 9 cr]. Prereq–Grad student or #)
Reading classical Greek epic.

GRK 5380. Greek Literature: Lyric. (3 cr [max 9 cr]. Prereq–Grad student or #)
Selections from Greek lyric poets.

GRK 5390. Greek Literature: Romance. (3 cr [max 9 cr]. Prereq–Grad student or #)
Selections from Hellenistic Romances of, e.g., Chariton, Longus.

GRK 5440. Greek Literature: Later Authors. (3 cr [max 9 cr]. Prereq–Grad student or #)
Selected topics in later Greek literature, especially Byzantine prose.

GRK 5450. Greek Literature: Classical Authors. (3 cr [max 9 cr]. Prereq–Grad student or #)
Selected topics in classical Greek literature. Topics specified in *Class Schedule*.

GRK 5621. GRK Paleography. (3 cr. Prereq–Grad student or #)
Analysis of various hands used in Greek manuscripts with attention to date/provenance. History of transmission of Greek literature.

GRK 5715. Introduction to the Historical-Comparative Grammar of Greek and Latin. (3 cr. §LAT 5715. Prereq–Grad student or #)
Historical/comparative grammar of Greek/Latin, from their Proto-Indo-European origins to classical norms.

GRK 5716. History of Greek. (3 cr. Prereq–Grad student or #)
Reading and formal analysis of documents illustrating evolution of Greek language from Mycenaean to modern times.

GRK 5993. Directed Studies. (1-4 cr [max 18 cr]. Prereq–Grad student or #)
Guided individual reading or study.

GRK 5994. Directed Research. (1-12 cr [max 18 cr]. Prereq–Grad student or #)
Supervised original research on topic chosen by student.

GRK 5996. Directed Instruction. (1-12 cr [max 20 cr]. Prereq–Grad student or #)
Supervised teaching internship.

Health Informatics (HINF)

Department of Laboratory Medicine and Pathology

Medical School

HINF 5430. Health Informatics I. (4 cr; A-F only)
History/challenges of health informatics. Structure of healthcare delivery system. Electronic medical records. Clinical information systems. Basics of information, computation, communication. Data management in health settings. Added value of information systems in health care, Ethical and legal considerations.

HINF 5431. Health Informatics II. (4 cr; A-F only)
Topics related to health care information systems. System integration and communications. System selection/deployment. Current technologies/architectures. Security. Special topics such as telemedicine.

HINF 5436. Seminar. (1 cr; S-N only)
Presentation and discussion of research problems, current literature and topics of interest in Health Informatics.

HINF 5494. Topics in Health Informatics. (1-6 cr [max 6 cr]. Prereq–#)
Individual or group studies in health informatics.

HINF 5496. Internship in Health Informatics. (1 cr [max 3 cr]; S-N only. Prereq–5430, 5431, #)
Practical industrial experience not directly related to student's normal academic experience.

HINF 5499. Capstone Project for the Masters of Health Informatics. (3 cr; A-F only. Prereq–[[5430, 5431] or #], MHI student)
Students apply related knowledge/skills to a practical problem in health informatics. Proper design of projects, past exemplar projects. Students work with adviser to design/complete a project in a practical setting. Students submit a written project report in lieu of a final examination.

Health Systems Management (HSM)

College of Continuing Education

HSM 3501. Clinical Research Concepts and Practice. (3 cr; A-F only. Prereq–College algebra)
Research processes. Focuses on health science applications. Statistics (descriptive, inferential). Research study design, problem statement and protocol development, hypothesis development, feasibility, sampling methods/nstruments, data management, data analysis/interpretation, dissemination of research.

HSM 3521. Health Care Delivery Systems. (3 cr; A-F only)
Health care (HC) delivery systems, health economics, third-party/public reimbursement, current trends in HC organizations/management/ administration. Regulations, standards, quality assurance, accreditation, current ethical issues. Implications for HC providers/professionals, patients/families, communities, international health.

HSM 4501. Writing for the Health Professions. (3 cr; A-F only)
How to critically review medical literature and present research data. Scientific method, logic, systematic approach, objective analysis. Students support a hypothesis using research of previously conducted work and present data in graphic/narrative form according to professional standards.

HSM 4541. Health Care Finance. (3 cr; A-F only)
General principles of financial management for health care industry. Operational knowledge of financial management theory, esp., how hospitals and their departments develop/balance operating/ capital budget for business growth/development. Governmental policies, procedures, and ethical issues controlling the health care industry.

HSM 4561. Health Care Administration and Management. (3 cr; A-F only)
Background/skills in business/administrative aspects of health care. Applications of business theory to medical settings, including organization models, reimbursement methodologies, information systems, staff-scheduling, employee evaluation, accreditation agencies, productivity management, budget planning, and group leadership.

HSM 4581. Teaching in the Health Care Setting. (3 cr; A-F only)
Basic components of contemporary learning theory. How to design teaching strategies, evaluate educational outcomes. Evaluation of educational needs, development of curriculum, application of various instructional methods, assessment of learning. Working with allied health practitioners, patients, and families.

HSM 4611. Allied Health Grand Rounds. (2 cr; A-F only. Prereq–Respiratory care major)
Capstone course. Allied health clinical/professional issues. Caregiver roles. Global views of national health policy, economics, ethical/legal problems. Challenging clinical cases. Multidisciplinary review. Cases relating individual patient and family experiences. Service project.

Hebrew (HEBR)

Department of Classical and Near Eastern Studies

College of Liberal Arts

HEBR 1001. Beginning Hebrew I. (5 cr. §HEBR 4001)
For beginners whose goal is biblical or post-biblical Jewish studies, or modern Israeli Hebrew. Leads to speaking, listening comprehension, and reading/writing Hebrew. Emphasizes communication proficiency. Cultural materials are incorporated.

HEBR 1002. Beginning Hebrew II. (5 cr. §HEBR 4002. Prereq–Grade of at least [C- or S] in [1001 or 4001] or #)
Continuation of 1001. Leads to speaking, listening comprehension, reading, and writing Hebrew. Emphasizes communication proficiency. Cultural materials.

HEBR 1101. Beginning Biblical Hebrew I. (5 cr. §HEBR 4104)
Basic grammar/syntax preparatory to reading simple narrative texts in Bible. Multiple approaches to problems/issues in biblical scholarship.

HEBR 1102. Beginning Biblical Hebrew II. (5 cr. §HEBR 4105. Prereq–Grade of at least [C- or S] in [1101 or 4104] or #)
Progression to more sophisticated reading of narrative, prophetic, and legal texts. Presentation/ discussion of multiple approaches to problems/issues in biblical scholarship.

HEBR 3011. Intermediate Hebrew I. (5 cr. Prereq–Grade of at least [C- or S] in [1002 or 4002] or #)
Prepares students for CLA language requirement. Speaking, reading, writing, and comprehension of modern Hebrew. Students read/discuss prose, poetry, news, and film. Important features of biblical/ classical Hebrew. Taught primarily in Hebrew.

HEBR 3012. Intermediate Hebrew II. (5 cr. Prereq–Grade of at least [C- or S] in in 3011 or #)
Extensive reading of simplified modern Hebrew prose selections. Students discuss poetry, newspaper, film, and TV in Hebrew. Israeli cultural experiences. Hone composition, listening comprehension, speaking skills to prepare for proficiency exams. Biblical prose, simple poetic texts. Taught in Hebrew.

HEBR 3090. Advanced Modern Hebrew. (3 cr [max 18 cr]. Prereq–3012 or #)
Preparation to read various kinds of authentic Hebrew texts and to develop higher levels of comprehension/speaking. Conducted entirely in Hebrew. Emphasizes Modern Israeli Hebrew. Introduction to earlier genres. Grammar, widening vocabulary. Contemporary short fiction, essays, articles on cultural topics, films, Hebrew Internet sites, TV.

HEBR 3101. Intermediate Biblical Hebrew I. (4 cr. Prereq–Grade of at least [C- or S] in [1102 or 4105] or #)
Text of Hebrew Bible. Basic research tools/ commentaries. Close reading of narrative biblical texts. Reading fluency, methods of research in biblical studies.

HEBR 3102. Intermediate Biblical Hebrew II. (4 cr. Prereq–Grade of at least [C- or S] in 3101 or #)
Text of Hebrew Bible, basic research tools/ commentaries. Close reading of narrative biblical texts. Reading fluency, methods of research in biblical studies.

HEBR 3200. Advanced Classical Hebrew. (3 cr [max 18 cr]. §HEBR 5200. Prereq–3012 or 3102 or #)
In-depth reading, analysis, and discussion of classical Hebrew texts. Grammar, syntax. Introduction to text-criticism, history of scholarship, and scholarly tools. Format varies between survey of themes (e.g., law, wisdom, poetry) and extended concentration upon specific classical texts.

HEBR 3300. Post-Biblical Hebrew: Second Temple Period. (3 cr [max 18 cr]. Prereq–3102 or #)
Readings in late-/post-biblical Hebrew literature of Persian, Hellenistic, and early Roman periods (e.g., Chronicles, Ezra-Nehemiah,Ecclesiastes, Daniel, Dead Sea Scrolls, apocrypha, pseudepigrapha). Focuses on historical development of Hebrew language/literature in relation to earlier biblical sources.

HEBR 3400. Rabbinic Texts. (3 cr [max 18 cr]. Prereq–3012 or 3102 or #)
Language, idiom, and literary forms of classical Rabbinic sources in Hebrew. Selections drawn from legal, homiletical, and narrative texts (Mishnah, Tosefta, Talmud, Midrash). Original socio-historical/ cultural background of Rabbinic literature, its enduring religious significance.

HEBR 3951W. Major Project. (4 cr. Prereq–[Hebr major, three 3xxx Hebrew courses], #, Δ)
Research project using primary and secondary sources. Students select project in consultation with a faculty member, who directs the research/writing.

HEBR 3980. Directed Instruction. (1-4 cr [max 4 cr]. Prereq–#)
For students interested in careers in Hebrew education. Observe and discuss classes. Gradually increased participation in preparing and presenting instructional materials to a beginning Hebrew class. Evaluation of materials, teaching techniques. Seminars with instructor and staff on language teaching issues.

HEBR 3990. Topics in Hebrew Studies. (1-4 cr [max 12 cr]. Prereq–#, Δ)
Historical, linguistic, literary, religious, or humanistic study of Hebrew society and culture. Approach and method of study varies with topic.

HEBR 3993. Directed Studies. (1-4 cr)
Guided individual reading or study.

HEBR 4001. Beginning Hebrew I. (3 cr. §HEBR 1001. Prereq–Grad student)
Leads to speaking, listening comprehension, reading/writing Hebrew. Emphasizes communication proficiency. Cultural materials are incorporated. Meets concurrently with 1001.

HEBR 4002. Beginning Hebrew II. (3 cr. §HEBR 1002. Prereq–Grade of at least [C- or S] in [1001 or 4001] or #)
Speaking, listening comprehension, reading/writing Hebrew. Emphasizes communication proficiency. Cultural materials. Meets with 1002.

HEBR 4011. Intermediate Hebrew I. (3 cr. Prereq–Grade of at least [C- or S] in [1002 or 4002] or #)
Prepares students for CLA language requirement. Speaking, reading, writing, and comprehension of modern Hebrew. Students read/discuss prose, poetry, news, and film. Taught primarily in Hebrew. Meets with 3011.

HEBR 4012. Intermediate Hebrew II. (3 cr)
Extensive reading of simplified modern Hebrew prose selections. Students discuss poetry, newspaper, film, and TV in Hebrew. Israeli cultural experiences. Composition, listening comprehension, speaking. Taught in Hebrew. Meets with 3012.

HEBR 4104. Basics of Biblical Hebrew I. (3 cr. §HEBR 1101. Prereq–Grad student)
Basic grammar/syntax preparatory to reading simple narrative texts in Bible. Multiple approaches to problems/issues in biblical scholarship. Meets with 1104.

HEBR 4105. Basics of Biblical Hebrew II. (3 cr. §HEBR 1102. Prereq–Grade of at least [C- or S] in [1101 or 4104] or #)
Progression to more sophisticated reading of narrative, prophetic, and legal texts. Presentation/discussion of multiple approaches to problems/issues in biblical scholarship. Meets with 1105.

HEBR 4106. Intermediate Biblical Hebrew I. (3 cr. Prereq–Grade of at least [C- or S] in [1102 or 4105] or #)
Text of Hebrew Bible. Basic research tools/commentaries. Close reading of narrative biblical texts. Reading fluency, methods of research in biblical studies. Meets with 3101.

HEBR 4107. Intermediate Biblical Hebrew II. (3 cr. Prereq–Grade of at least [C- or S] in 3101 or #)
Text of Hebrew Bible, basic research tools/commentaries. Close reading of narrative biblical texts. Reading fluency, methods of research in biblical studies. Meets with 3102.

HEBR 5090. Advanced Modern Hebrew. (3 cr [max 18 cr]. Prereq–3012 or #)
Preparation to read various kinds of authentic Hebrew texts and to develop higher levels of comprehension/speaking. Conducted entirely in Hebrew. Emphasizes Modern Israeli Hebrew. Introduction to earlier genres. Grammar, widening vocabulary. Contemporary short fiction, essays, articles on cultural topics, films, Hebrew Internet sites, TV.

HEBR 5200. Advanced Classical Hebrew. (3 cr [max 18 cr]. §HEBR 3200. Prereq–[3 sem of biblical Hebrew, 5 sem of modern Hebrew] or #)
In-depth reading, analysis, and discussion of classical Hebrew texts. Grammar, syntax. Introduction to text-criticism, history of scholarship, and scholarly tools. Format varies between survey of themes (e.g., law, wisdom, poetry) and extended concentration upon specific classical texts.

HEBR 5300. Post-Biblical Hebrew: Second Temple Period. (3 cr [max 18 cr]. Prereq–Grad student or #)
Readings in late-/post-biblical Hebrew literature of Persian, Hellenistic, and early Roman periods (e.g., Chronicles, Ezra-Nehemiah, Ecclesiastes, Daniel, Dead Sea Scrolls, apocrypha, pseudepigrapha). Focuses on historical development of Hebrew language and literature in relation to earlier biblical sources.

HEBR 5400. Rabbinic Texts. (3 cr [max 18 cr]. Prereq–Grad student or #)
Language, idiom, and literary forms of classical Rabbinic sources in Hebrew. Selections drawn from legal, homiletical, and narrative texts (Mishnah, Tosefta, Talmud, Midrash). Original socio-historical/cultural background of Rabbinic literature, its enduring religious significance.

HEBR 5990. Topics in Hebrew Studies. (1-4 cr [max 12 cr]. Prereq–Grad student or #)
Historical, linguistic, literary, religious, or humanistic study of Hebrew society/culture. Approach/method of study varies with topic.

HEBR 5992. Directed Readings. (1-4 cr [max 12 cr]. Prereq–3012 or #)
Guided individual reading or study.

Hindi (HNDI)

Department of Asian Languages and Literatures

College of Liberal Arts

HNDI 1001. Introduction to Conversational Hindi. (3 cr; A-F only)
Advanced grammatical structures, oral forms, new vocabulary reinforced from lessons around everyday life situations. Oral/written drills, reading for comprehension, audio-visual work.

HNDI 1015. Accelerated Beginning Hindi. (5 cr)
Aspects of linguistic performance: speaking, reading, writing, listening. Cultural/linguistic literacy about South Asia and, in paricular, India. Emphasizes individual learning styles/preferences for students to understand/retain information.

HNDI 1016. Accelerated Intermediate Hindi. (5 cr. Prereq–1015 or 1102 or 4002 or #)
Conversational aspect of Hindi. Interactive group activities, video/lab sessions. Engaging in reasonably fluent discourse. Formal grammar. Advanced reading, writing, and comprehension. Different genres/styles of spoken/written Hindi. Taught mainly in Hindi.

HNDI 1017. Accelerated Hindi. (5 cr. Prereq–Ability in basic spoken Hindi)
Intensive course. Reading, writing, listening, and speaking in various functions and cultural contexts. Focuses on reading/writing.

HNDI 1101. Beginning Hindi. (5 cr. §HNDI 4001)
Basic listening, speaking, reading, and writing skills. Emphasis on the development of communicative competence.

HNDI 1102. Beginning Hindi. (5 cr. §HNDI 4002. Prereq–1101)
Basic listening, speaking, reading, and writing skills. Emphasizes communicative competence.

HNDI 3101. Beginning Hindi. (5 cr)
Basic listening, speaking, reading, and writing skills. Emphasis on the development of communicative competence.

HNDI 3102. Beginning Hindi. (5 cr)
Basic listening, speaking, reading, and writing skills. Emphasis on the development of communicative competence.

HNDI 3131. Intermediate Hindi. (5 cr. §HNDI 4003. Prereq–1102 or #)
Development of reading, writing, speaking, and listening skills. Grammar review, some basic compositions and oral presentations.

HNDI 3132. Intermediate Hindi. (5 cr. §HNDI 4004. Prereq–3131 or #)
Development of reading, writing speaking, and listening skills. Grammar review, some basic compositions and oral presentations.

HNDI 3290. Hindi Language Teaching Tutorial. (1 cr [max 2 cr]. Prereq–Grade of A in 4162)
Students tutor beginning students of Hindi and are part of department's Hindi language team.

HNDI 4001. Beginning Hindi. (3 cr. §HNDI 1101. Prereq–passing score on GPT in another language or grad student)
Listening, speaking, reading, and writing skills. Emphasizes development of communicative competence. Meets with 1101.

HNDI 4002. Beginning Hindi. (3 cr. §HNDI 1102. Prereq–[4001, passing score on GPT in another language] or grad student)
Listening, speaking, reading, and writing skills. Emphasizes development of communicative competence. Meets with 1102.

HNDI 4003. Intermediate Hindi. (3 cr. §HNDI 3131. Prereq–4002, [passing score on GPT in another language or grad student])
Reading, writing, speaking, and listening skills. Grammar review, basic compositions, oral presentations. Meets concurrently with 3131.

HNDI 4004. Intermediate Hindi. (3 cr. §HNDI 3132. Prereq–4003, [passing score on GPT in another language or grad student])
Reading, writing, speaking, and listening skills. Grammar review, basic compositions, oral presentations. Meets concurrently with 3132.

HNDI 4161. Advanced Hindi. (4 cr. Prereq–3132 or #)
Continued emphasis on the development of communication skills, i.e., the ability to comprehend both written and spoken texts, and to speak, read, and write in Hindi beyond the intermediate level.

HNDI 4162. Advanced Hindi. (4 cr. Prereq–4161 or #)
Continued emphasis on the development of communication skills, i.e., the ability to comprehend both written and spoken texts, and to speak, read, and write in Hindi, beyond the intermediate level.

HNDI 5040. Readings in Hindi Texts. (2-4 cr [max 12 cr]; A-F only. Prereq–4162 or equiv or #)
Students read authentic materials of various types to improve reading/speaking ability. Topics specified in *Class Schedule*.

HNDI 5710. Topics in Hindi Language, Literature, and Culture. (4-5 cr [max 5 cr])
Topics in Hindi literature or the linguistic structure of Hindi.

HNDI 5990. Directed Research. (3-5 cr [max 5 cr]. Prereq–#, Δ, ❑)
HNDI 5993. Directed Readings. (1-4 cr [max 12 cr]. Prereq–#, Δ, ❑)
Guided individual reading or study of modern Hindi texts.

History (HIST)

Department of History

College of Liberal Arts

HIST 1011V. Honors:World History. (4 cr. §HIST 1011W, HIST 1017. Prereq–Fr or soph, honors student)
World civilizations in 1550. Compares religion, politics, economy, society, culture. Examples from Africa, Europe, Asia, the Americas.

HIST 1011W. World History. (4 cr. §HIST 1011V, HIST 1017. Prereq–[Fr or soph (any)] or [jr or sr, non-Hist mjr only])
World civilizations, from prehistory to 1550. Compares religion, politics, economy, society, and culture. Examples drawn from Africa, Europe, Asia, and the Americas.

HIST 1012V. Honors: World History. (4 cr. §HIST 1018. Prereq–Fr or soph, honors student)
World history, from 1450 to 1920s. Comparisons of and connections among various cultures. Emphasizes analyzing primary documents to show how historical knowledge is produced. Case studies. Web-enhanced.

HIST 1012W. World History: The Age of Global Contact. (4 cr. Prereq–[Fr or soph (any)] or [jr or sr, non-Hist mjr only])
Case study approach to world history from 1450 to 1920s. Comparisons of and connections among various cultures. Emphasizes analyzing primary documents to show how historical knowledge is produced. Web-enhanced course.

HIST 1015V. Introduction to Global History Since 1950. (4 cr; A-F only. §GLOS 1015V, GLOS 1015W, HIST 1019. Prereq–Fr or soph honors)
Global History in Information Age. East-West divisions during Cold War: North-South relations in global economy. Emerging consciousness of global systems. Issues of human rights, labor migration, environmental degradation, indigenous peoples. Emphasizes comparison of cases from Asia, Africa, Latin America.

HIST 1015W. Introduction to Global History Since 1950. (4 cr; A-F only. Prereq–[Fr or soph (any)] or [jr or sr, non-Hist mjr only])
Global History in Information Age. East-West divisions during Cold War: North-South relations in global economy. Emerging consciousness of global systems. Issues of human rights, labor migration, environmental degradation, indigenous peoples. Emphasizes comparison of cases from Asia, Africa, Latin America.

HIST 1017. World History. (3 cr. §HIST 1011V, HIST 1011W)
World civilizations from prehistory to 1550, comparing religion, politics, economy, society, and culture. Examples drawn from Africa, Europe, Asia, and the Americas.

HIST 1018. World History: The Age of Global Contact. (3 cr. §HIST 1012V)
Case study approach to world history from 1450 to 1920s. Comparisons of and connections among various cultures. Emphasizes analyzing primary documents to show how historical knowledge is produced. Course is Web-enhanced.

HIST 1019. Introduction to Global History Since 1950. (3 cr. §GLOS 1015V, GLOS 1015W, HIST 1015V)
Global History in Information Age. East-West divisions during Cold War: North-South relations in global economy. Emerging consciousness of global systems. Issues of human rights, labor migration, environmental degradation, indigenous peoples. Emphasizes comparison of cases from Asia, Africa, Latin America.

HIST 1026. Western Civilization from its Origins to ca 1500. (3 cr. §HIST 1031V)
Western civilization from its origins in ancient Middle East to Europe in 1500. Law, religion, governments, history of ideas, social organization.

HIST 1027. Western Civ From 1500 to Present. (3 cr. §HIST 1032V)
Role of European civilization in world history from early 16th century to present. Broad chronological periods/themes.

HIST 1031V. Honors: Survey of Western Civilization From its Origins to ca 1500. (4 cr. §HIST 1026. Prereq–Fr or soph, honors student)
Development of western civilization, from its origins in ancient Middle East to Europe in 1500. Law, religion, government, history of ideas, social organization.

HIST 1031W. Western Civilization, From Its Origins to ca 1500. (4 cr. Prereq–[Fr or soph (any)] or [jr or sr, non-Hist mjr only])
Western civilization, from its origins in ancient Middle East to Europe in 1500. Law, religions, governments, history of ideas, social organization.

HIST 1032V. Honors: Western Civilization, From 1500 to Present. (4 cr. §HIST 1027. Prereq–Fr or soph, honors student)
Role of European civilization in world history, from early 16th century to present. Broad chronological periods/themes.

HIST 1032W. Western Civilization, From 1500 to Present. (4 cr. Prereq–[Fr or soph (any)] or [jr or sr, non-Hist mjr only])
Role of European civilization in world history, from early 16th century to present. Broad chronological periods/themes.

HIST 1301V. Honors: U.S. History to 1877. (4 cr. §HIST 1301W, HIST 1307. Prereq–[Fr or soph], honors)
Issues, events, and ideas in the social, political, and intellectual history of the United States, from colonial era through the Civil War and reconstruction. Colonization, revolution, national expansion, religion, reform movements, slavery, immigration, industrialization, gender roles, and labor relations.

HIST 1301W. U.S. History to 1877. (4 cr. §HIST 1301V, HIST 1307. Prereq–[Fr or soph (any)] or [jr or sr, non-Hist mjr only])
Issues, events, and ideas in the social, political, and intellectual history of the United States, from colonial era through the Civil War and reconstruction. Colonization, revolution, national expansion, religion, reform movements, slavery, immigration, industrialization, gender roles, and labor relations.

HIST 1302V. Honors: U.S. History, From 1865 to Present. (4 cr. §HIST 1302W, HIST 1308. Prereq–[Fr or soph], honors)
Forces that shaped emergence of modern America, from end of Civil War to present. Shaping of the industrial/post-industrial economy. Work and everyday life. Race relations and immigration. Popular culture. Politics and reform movements. Impact of war on American society. Role of the United States as a global power, before, during, and after Cold War.

HIST 1302W. U.S. History, From 1865 to Present. (4 cr. §HIST 1302V, HIST 1308. Prereq–[Fr or soph (any)] or [jr or sr, non-Hist mjr only])
Forces that shaped emergence of modern America, from end of Civil War to present. Shaping of the industrial/post-industrial economy. Work and everyday life. Race relations and immigration. Popular culture. Politics and reform movements. Impact of war on American society. Role of the United States as a global power, before, during, and after Cold War.

HIST 1307. American History to 1877. (3 cr. §HIST 1301V, HIST 1301W)
Issues, events, and ideas in the social, political, and intellectual history of the United States, from colonial era through Civil War and reconstruction. Colonization, revolution, national expansion, religion, reform movements, slavery, immigration, industrialization, gender roles, and labor relations.

HIST 1308. U.S. History: From 1865 to Present. (3 cr. §HIST 1302V, HIST 1302W)
Forces that shaped emergence of modern America, from end of Civil War to present. Shaping of industrial/post-industrial economy. Work and everyday life. Race relations and immigration. Popular culture. Politics and reform movements. Impact of war on American society. Role of the United States as a global power, before, during, and after Cold War.

HIST 1902. Freshman Seminar. (3 cr; A-F only. Prereq–Freshman)
Topics specified in *Class Schedule*.

HIST 1904. Freshman Seminar. (3 cr [max 6 cr]; A-F only. Prereq–Freshman)
Topics specified in *Class Schedule*.

HIST 1905. Freshman Seminar. (2-3 cr [max 3 cr]; A-F only. Prereq–Freshman)
Topics specified in *Class Schedule*.

HIST 1907W. Freshman Seminar. (3 cr; A-F only. Prereq–Freshman)
Topics specified in *Class Schedule*.

HIST 1908W. Freshman Seminar. (3 cr; A-F only. Prereq–Freshman)
Topics specified in *Class Schedule*.

HIST 1909W. Freshman Seminar. (3 cr [max 6 cr]; S-N only. Prereq–Freshman)
Topics specified in *Class Schedule*.

HIST 1910W. Freshman Seminar. (3 cr; A-F only. Prereq–Freshman)
Topics specified in Course Guide.

HIST 3001. Public History. (3 cr; A-F only. Prereq–[Jr or sr], #)
Interpretations of a collective past as produced in various public venues, including museum exhibitions, films, theme parks, and Web sites. Intellectual/political issues associated with history produced for public audiences. Introduction to career opportunities in the field.

HIST 3051. Ancient Civilization: Near EAST and Egypt. (3 cr)
A broad survey of ancient Near Eastern and Egyptian history and culture from the prehistoric to the rise of Persia around 550 B.C.

HIST 3052. Ancient Civilization: Greece. (3 cr)
A broad survey of ancient Greek culture and history from the third millennium B.C. to the death of Alexander the Great in 323 B.C.

HIST 3053. Ancient Civilization: Rome. (3 cr)
A broad survey of the culture and history of Rome from its origins to the decline and fall of the Roman Empire in the third and fourth centuries A.D.

HIST 3061. "Bread and Circuses": Spectacles and Mass Culture in Antiquity. (3 cr)
Development of large-scale public entertainments in ancient Mediterranean world, from athletic contests of Olympia and dramatic festivals of Athens to chariot races and gladiatorial games of Roman Empire. Wider significance of these spectacles in their impact on political, social, and economic life of the societies that supported them.

HIST 3101. Introduction to Medieval History. (3 cr)
Europe from decline of Rome to early Renaissance. Politics, institutions, society, economy, and culture of Middle Ages.

HIST 3151W. British History to the 17th Century. (4 cr)
The making of the English nation: Anglo-Saxons and Normans; development of English law and Parliament; Reformation and constitutional crisis; early Wales, Scotland, and Ireland.

HIST 3152. British History From the Seventeenth Century. (4 cr)
Civil War, Revolution, and constitutional settlement. Industrialization and growth of democracy. Rise/decline of British Empire.

HIST 3211. History of Sexuality in Europe. (3 cr; A-F only)
History of sexuality in Europe, from ancient Greece to present. Plato's philosophy of love, St. Augustine's conception of sin, prostitution in 15th century, sexual science of Enlightenment. Industrial revolution and homosexual subcultures. Rape scares and imperialism. Eugenics and Nazi Germany.

HIST 3212. Dissident Sexualities in U.S. History. (3 cr; A-F only. Prereq–Jr or sr or #)
History of sexuality in the United States. Emphasizes sexualities that have challenged dominant social/cultural norms. Development of transgender, bisexual, lesbian, and gay identities/communities. Politics of sex across lines of race/ethnicity. Historical debates over controversial practices, including sex work.

HIST 3244. History of Eastern Europe. (3 cr)
History of the peoples of the region from their origins to modern times, culture and society in the Middle Ages; Golden Age of Eastern Europe; loss of independence; nationalism and formation of national states; fascism and World War II, Jews in Eastern Europe; communist and post-communist periods.

HIST 3271. The Viking World: Story, History, and Archaeology. (3 cr. §HIST 5271)
Viking society and expansion of Viking influence abroad. Viking impact on Western Europe; interactions with Slavic lands; settlement of North Atlantic islands; and Western Europe's impact on Scandinavian lands. Analyzes archaeological, historical, linguistic, and numismatic evidence.

HIST 3281. European Intellectual History: The Early Modern Period, 1400-1750. (3 cr. §HUM 3281)
First of a two-semester course. European thought in its historical/cultural context. Emphasizes development of philosophical/scientific thought, its relation to thinking about the individual and the community. Readings are from original sources.

HIST 3282. European Intellectual History: The Modern Period, 1750-Present. (3 cr. §HUM 3282)
Second of a two-semester course. European thought in its historical/cultural context. Emphasizes development of philosophical/scientific thought, its relation to thinking about the individual and the community. Readings are from original sources.

HIST 3347. Women in Early and Victorian America: 1600-1890. (3 cr. §WOST 3407)
The varied experiences of American women 1600-1900. Topics include women's involvement in the dispossession of native peoples, westward expansion, slavery, industrialization, reform, revolution, and transformations in family life and sexuality.

HIST 3348. Women in Modern America. (3-4 cr. §WOST 3408)
History of women in the United States from 1890 to the present. Explores women's changing roles in politics, the labor force, the family, and popular culture.

HIST 3349. U.S. Women's Legal History. (3 cr; A-F only. Prereq–[Jr or sr], basic grasp of U.S. history)
Women's legal status, from colonial era through 20th century. Women's citizenship, civil rights. Marriage, divorce, and child custody. Reproductive/physical autonomy/integrity. Economic/educational equality.

HIST 3401W. Early Latin America to 1825. (4 cr; A-F only. §LAS 3401W)
American/Iberian societies before contact. Social, cultural, and economic interactions among Native Americans, African slaves, Europeans, and people of mixed race during colonial period (c. 1492-1825).

HIST 3402W. Modern Latin America 1825 to Present. (4 cr. §LAS 3402W)
National and contemporary period 1825 to present, with emphasis on social, cultural, political, and economic change.

HIST 3415. Migrations in Modern Global History. (3 cr)
Today s debates about immigration in historical/comparative perspective. Major migrations into, within, and out of Americas over 500 years. Lives/identities of U.S. immigrants compared with foreigners living/working in Latin America, Europe, and Asia. Words/voices of migrants.

HIST 3419. The World's Economy Since 1500 in Comparison. (3 cr)
Causes of economic inequities in contemporary world. Long-term economic developments in cases taken from Africa, Asia, Europe, and North/South America. Various theoretical approaches to study of economic development. Introduction to key concepts.

HIST 3421. The World and the West 1400-1900. (3 cr; A-F only. Prereq–one sem of world history or Western civilization recommended)
Survey of the political, economic, religious, and cultural interaction between the peoples of Europe and the peoples of Africa, the Americas, and Asia, with reference to perceptions of alien cultures by both sides.

HIST 3423. Central American Revolutions. (3 cr. §CHIC 3423)
Social, political and economic issues that have shaped Central American history for nearly two centuries. Focuses on influences of colonial histories, capitalist development, ethnic/racial conflict, foreign intervention, Catholic Church, civil war throughout region. Readings cover events in Guatemala, Honduras, El Salvador, Nicaragua, Costa Rica, Panama.

HIST 3424. Women and Gender in Latin American History. (3 cr. §WOST 3413)
Changing gender norms in Latin America over time as compared with lives of women and men of diverse classes and ethnic groups. How women responded to their position in society, on a continuum from accommodation to resistance.

HIST 3425. History of Modern Mexico. (3 cr. §CHIC 3425)
Mexico from independence to the present: struggles for land, liberty, and equality; ethnicity, gender, and class; economic growth, nationalism, and globalization; urbanization, immigration, demographic transition.

HIST 3427. History of Cuba and Puerto Rico. (3 cr. §CHIC 3427, LAS 3427)
Historical development of Cuba and Puerto Rico from pre-Columbian times through Spanish conquest to the present. Conquest and colonization, slavery, Hispanic Caribbean society and culture, Operation Bootstrap, CubanRevolution.

HIST 3429. Latin American History in Film and Text. (3 cr)
Cinematic representations of Latin America in context of other historical/literary narratives. Experiences of Latinos in Hollywood. U.S. films compared with those produced in Latin America. Themes vary (e.g., women, revolution, colonialism).

HIST 3431. Early Africa and Its Global Connections. (4 cr. §AFRO 3431)
Survey of African history from earliest times to 1800. Focuses on socioeconomic, political, and cultural development in pre-colonial Africa from ancient Egypt through the era of the trans-Atlantic slave trade.

HIST 3432. Modern Africa in a Changing World. (4 cr. §AFRO 3432)
Survey of modern African history from early 19th century to present. Focuses on socioeconomic, political, and cultural development in Africa, from abolition of trans-Atlantic slave trade through postcolonial era.

HIST 3433. Images of Africa. (3 cr)
Major themes in African history, from early human development to present. History of western "knowledge" about Africa. Assumptions that have influenced production of African history. Extent to which African history is "packaged" for public consumption inside/outside Africa. How history is used to support modern political agendas.

HIST 3434. History of South Africa to 1910. (3 cr. §AFRO 3204)
Introduction to history of South Africa from early humans to arrival of first Dutch settlers at Cape of Good Hope in 1652 to formation of Union of South Africa in 1910.

HIST 3435. History of South Africa from 1910. (3 cr. §AFRO 3205)
History of South Africa from union to present. Focuses on issues such as African/Afrikaner nationalism, structures of apartheid, forced population removals, divestment/sanctions, and post-apartheid era.

HIST 3436. Historical Background to Contemporary African Conflicts: Case Studies. (3 cr)
Using case studies. Historical contexts in which specific contemporary political conflicts developed. Slave trade, colonial conquest, indirect rule, forced labor, discretionary justice, and other historical issues. Patterns of human rights violations and of socio-political conflict. Cases studies might include Somalia, Democratic Republic of Congo, and Rwanda.

HIST 3437. History of East Africa. (3 cr. §AFRO 3437, AFRO 5437, HIST 5437)
Major themes in history of East Africa, from era of early human cultural development to present. Methods that historians use to reconstruct history. Varying interpretations/constructions of history over time.

HIST 3438. History of Women in South Africa. (3 cr. §AFRO 4001)
Changing role/status of women in South Africa from pre-colonial era to present. Relationships to political, social, economic development.

HIST 3439. Popular Narratives of the African Past. (3 cr)
Diverse ways that ordinary Africans have interpreted/portrayed particular events in African history. Different popular depictions of African past, their relationships with academic histories.

HIST 3441. Chicana/o History to 1900. (3 cr. §CHIC 3444, HIST 3444, LAS 3441)
History of the Mexican people from the 16th through the 19th centuries. Historical theories of colonialism, expansion, economy, assimilation, migration, and settlement; race, class and gender, political, social, and cultural interaction and conflict.

HIST 3442. Chicana/o History: 1900 to Present. (3 cr. §CHIC 3442, LAS 3442)
Migration, repatriation, the Bracero program, contemporary Chicana/o politics, the Chicana/o movement, work, society, and culture. Lecture format with 2-3 videos/movies on selected topics. A wide range of reading from texts and articles.

HIST 3444. Chicana and Chicano History: 1821-1945. (3 cr. §CHIC 3444, HIST 3441, LAS 3441)
Experiences of people of Mexican descent in the United States. Important eras in histories of Mexico, the United States, and Mexican Americans. Central role of Chicana/os in U.S. history, culture, and politics.

HIST 3452. African Conservation Histories. (3 cr)
Historical roots of conservation in Africa in 19th/20th centuries. Historical context of contemporary laments about Africa's environmental degradation, older efforts to exploit/control African people/resources. Focuses on how Africans have interacted with and managed their lands/resources.

HIST 3453. African Rural Social History Since 1800. (3 cr)
Change in lives of African rural people. Focuses on changing livelihood strategies, labor, households, and families. Competition for resources among African farmers/herders in 19th/20th centuries.

HIST 3461. Introduction to EAST Asia I: The Imperial Age. (3-4 cr [max 4 cr]. §EAS 3461)
Comparative survey of early history of China, Japan, Korea, and Vietnam. Early Chinese thought. Diffusion of Confucianism, Buddhism, and other values throughout East Asia. Political and social history of region to 1600.

HIST 3462. Introduction to EAST Asia II: 1600-2000. (3-4 cr [max 4 cr]. §EAS 3462)
Formation/decline of early modern Asian empires. Western imperialism/Asian nationalism. Social revolution, economic modernization, and cultural change in China, Japan, Korea, and Vietnam, 1600-2000.

HIST 3464. China in the Song, Yuan, and Ming Dynasties. (3 cr. §EAS 3464, HIST 5464)
China during the Song (976-1279), Yuan (1279-1368), and Ming (1368-1644) dynasties; political institutions and social structures. Attention to primary sources and how historians ask and answer questions about the past.

HIST 3465W. China in the Ming and Qing Dynasties. (3 cr. §EAS 3465W, HIST 5465)
The political and social history of China from about 1600 until the end of the Qing dynasty in 1911. Topics include ethnicity, daily life, legal structures, city life, and peasantry.

HIST 3467W. State and Revolution in Modern China. (3 cr. §EAS 3467W, HIST 5467)
Modern China's political evolution, including the Taiping Rebellion, Republican Revolution, Rise of Nationalist and Communist Parties, Maoist era; reform under Deng Xiaping and the emergence of democracy in Taiwan.

HIST 3468. Social Change in Modern China. (3 cr. §EAS 3468, HIST 5468)
Opium War and opening of Treaty Ports in 19th century. Missionary activity and cultural influence. Changes in education system. Women.s movement. Early industrialization. Socialism/collectivization after 1949. Industrialization of Taiwan. PRC.s entry into world trading system.

HIST 3471. Modern Japan, Meiji to the Present (1868-2000). (3 cr. §EAS 3471)
Japan's early development as industrial/imperial power after Meiji Restoration of 1868. Political developments in Taisho years: social, cultural, economic trends that supported them. Militarization/mobilization for war in 1930s. Japan's war with China, Pacific War with the United States. American Occupation. Postwar economic recovery, high growth. Changing political/popular culture of 1980s, '90s.

HIST 3472. Early Modern Japan. (3 cr. §EAS 3472)
Tradition/change in society/culture under Tokugawa shoguns (1600-1867). Growth of cities. Decline of samurai class. Response to Western intrusion.

HIST 3474. The Rise of Modern Japan: 1850s to 1900s. (3 cr; A-F only. §EAS 3474)
The Meiji Revolution from Commodore Perry to the eve of World War I; origins of constitutional monarchy, industrial economy, Western influences, and modern cultural change.

For definitions of course numbers, symbols, and abbreviations, see page 300.

HIST 3476. War and Peace in Japan Through Popular Culture. (4 cr; A-F only. Prereq–Some knowledge of modern Japanese history or #)
War-related issues in Japan. Animation films, comics from 1940s to 1990s. Mobilization of culture for WWII. Conflict between constitutional pacifism and national security. Japan?s role in cold war and post-cold war worlds.

HIST 3479. History of Chinese Cities and Urban Life. (3-4 cr [max 4 cr]; A-F only. §HIST 5479)
Introduction to traditional Chinese cities, their modern transformation. Ideal city plan in Confucian classics compared with physical layout of some major cities. Models about Chinese cities, influence of the models on our understanding of Chinese history/society.

HIST 3485. History of SoutheAST Asia. (3 cr; A-F only)
Origins of civilization, rise of empires such as Angkor, diffusion of Hinduism, Buddhism, Islam, and Christianity, West European intrusion through the imperialist era, rise of nationalism, and the establishment of nation-states.

HIST 3489. 20th Century India. (3 cr; A-F only)
India under British hegemony in 1914 through Mahatma Gandhi and his nationalist movement; World War II; the British departure; creation of India and Pakistan; Nehru; Indira and Rajiv Gandhi.

HIST 3491. Classical Islamic Civilization. (3 cr. §ARAB 3491, ARAB 5491, MELC 3491)
Islamic legacy in the classical age (800-1400) in the sciences - natural and medical - mathematics, philosophy, and literature, and their transmission to Europe.

HIST 3493. Islam: Religion and Culture. (3 cr. §ARAB 3036, HUM 3036, RELA 3036. Prereq–Soph or jr or sr)
Religion of Islam, faith, practices, sectarian splintering. Expansion outside original home to status of world religion. Institutions. Status in Asia, Europe, and Americas.

HIST 3502. Ancient Israel: From Conquest to Exile. (3 cr. §CNES 3502, CNES 5502, RELA 3502)
Israelite history in context of what is known from Egyptian, Canaanite, and Mesopotamian sources. Focuses on issues raised by archaeological data related to Israelite conquest of Canaan.

HIST 3505. Survey of the Middle East. (3 cr. §ARAB 3505, ARAB 5505, MELC 3505)
Peoples, lands, and cultures of the Middle East. Historical survey from earliest civilizations to the present.

HIST 3541. Islam in the Catholic Age: ARAB Phase 600 A.D. to 900 A.D.. (3 cr. §ARAB 3541, ARAB 5541, MELC 3541)
The Rise of Islam in its Arabian setting. Roles of the prophet, the orthodox and Umayyad caliphs. Development of Islamic state and empire, organizations, institutions, and status of Muslims and non-Muslims.

HIST 3542. Medieval Islam. (3 cr. §ARAB 3542, ARAB 5542, HIST 3542, MELC 3542)
Islamic dynasties, Umayyads of Spain, Shiites, assassins, Abbasid Caliphate's disintegration and rise of Selguk Turks. Sunnism re-emerges. IlKhanids.

HIST 3543. Arabs Under Mamluks and Ottomans: 1300-1920. (3 cr. §ARAB 3543, ARAB 5543, MELC 3543)
Arabs under Mamluk rule. Ottomans conquer Mamluk territory. Ottoman rule. Disintegration and re-emergence under Muhammad Ali of Egypt, dynastic struggles in Syria, rise of Young Turks and Arab revolt.

HIST 3544. ARAB World 1920 to the Present. (3 cr. §ARAB 3544, ARAB 5544, MELC 3544)
Arab world since independence; the struggle for liberation, political stability, development and unification; political structure and conflicts; impact of Arab-Israeli conflict.

HIST 3547. The Ottoman Empire. (3 cr. §ARAB 3547)
Founding of Ottoman society/state to empire, 1300 to end of empire in 1920. Lands, institutions, peoples, legacy. Impact on Europe.

HIST 3608W. History of the Catholic Church in the Middle Ages. (3 cr. Prereq–Intro course in European history before 1500 recommended)
Religious beliefs of Latin Christianity as officially taught and as received by ordinary folk; organization of the church and its implantation in lay society; relations between Latin Christendom and its neighbors, Orthodoxy and Islamdom.

HIST 3609. Military History of Medieval Western Europe. (3 cr)
Concept and conduct of war in Western Europe in the Middle Ages and the relation between the military and society.

HIST 3611. Medieval Cities of Europe: 500-1500. (3 cr)
Evolution of Western European cities from the late Roman town to the early Renaissance city-state.

HIST 3613. History of the Crusades. (3 cr)
Crusading spirit in Europe. Results of classic medieval crusades ca 1095-1285. States established by crusaders in Near East. Internal European crusades. Chronological prolongation of crusading phenomenon.

HIST 3614. Women in Medieval Europe. (3 cr)
Women's role in family, politics, religion, work, and social movements. Representations of women in religious texts, art, literature, scientific studies, and law. Methods/approaches to study of women's history.

HIST 3615W. Women in European History: 1500 to the Present. (3 cr)
Women's history and gender relations in modern European history. Methods and primary sources for women's history and the implications of inclusion of women in historical study.

HIST 3616. France in the Middle Ages. (3 cr)
Politics, society and culture in medieval France from the end of the Carolingians to the end of the Hundred Years War.

HIST 3618. The Dark Ages Illumined: Medieval Europe to 1050. (3 cr)
Origins of medieval Europe, Germanic and Viking invasions, feudalism, manorialism, Islam, the papacy, monarchies, intellectual developments.

HIST 3619. Chivalry, Crisis, and Revival: Medieval History 1050-1500. (3-4 cr [max 4 cr])
Chivalry and courtly love, crusades, revival of towns and trade, monarchies, religious developments, Black Death, famine, and wars

HIST 3621. Renaissance Italy: 1200-1550. (3 cr. Prereq–Intro course in European history before 1500 recommended)
Political/cultural history of city-states of northern/central Italy, 1200-1550. Emphasizes Florence and Venice. Readings include Dante and Machiavelli.

HIST 3623W. Germany in the Age of Reformation. (3 cr. Prereq–General course in European history before 1500 recommended)
History of religious reform movements - Lutheran, Calvinist, and Catholic - in the context of German politics, society, and culture; emphasis on primary source readings (written during the period).

HIST 3626. France From the Late 16th Century Through Napoleon: 1594-1815. (3 cr)
The evolution of French government, economy, and society in a broad context: monarchical power and its disintegration; Louis XIV at the apex of the Old Regime; the Enlightenment; the French Revolution; and the rise and fall of Napoleon Bonaparte.

HIST 3632. History of Germany; Reformation to Unification: 1500-1871. (3 cr)
The Reformation era; warfare and demographic catastrophe of the early 1600s; life in town and country; absolutism; Baroque culture; family life and its transformation; economic crisis; Revolution of 1848; the military path to unification.

HIST 3633. Modern Germany, 1870-Present. (3 cr [max 4 cr])
Unifying the nation. Industrial development and political instability. Bourgeois culture, growth of socialism. World War I and revolution. Weimar Era, depression, Nazi seizure of power, Hitler's state. World War II and the Holocaust. Cold War and two Germanies. Reunification.

HIST 3637. Modern Russia: From Peter the Great to the Present. (3 cr)
Political, social, and cultural forces which have shaped modern Russia. Emphasis will be on modernization, attempts at reforms in the imperial and Soviet period, and the dissolution of empires.

HIST 3642. Knights, Peasants, and Bandits in Medieval England. (3-4 cr [max 4 cr])
Social history of medieval England from 1066 to 1500. Peasants, nobility, and bourgeoisie, including their economic institutions, living conditions, and entertainments. Legal and illegal ways of coping with economic and social change resulting from plague and wars.

HIST 3651. England Under the Tudors: 1485-1603. (3-4 cr [max 4 cr])
Henry VIII and the English Reformation. The early Tudor period, 1485-1547; the reign of Henry VIII and his break with the papacy.

HIST 3652. England Under the Stuarts: 1603-1689. (3 cr)
History of England from the accession of James I (1603) to the Glorious Revolution (1689), including political, social, religious, military, and intellectual history.

HIST 3671. Modern Britain: 1783-1867. (3 cr)
Britain from the end of the American Revolution to the mid-Victorian age; industrialization and reform.

HIST 3672. Modern Britain Since 1867. (3 cr)
Britain from the mid-Victorian age to the near-present; the growth of democracy, the height and depth of world power.

HIST 3681. Irish History. (3 cr)
History of Ireland, primarily modern, with emphasis on politics and Anglo-Irish relations.

HIST 3691W. The British Empire. (3 cr; A-F only)
Gain/loss of colonies in Ireland, America, India, Africa. Development of racism, multicultural composition of British society, debates about economic motives for empire, resistance of colonized peoples to conquest/domination.

HIST 3703W. European Cities: 1300-1800. (3 cr. Prereq–Background in European civilization of late Middle Ages)
The historical experience of selected cities in early modern Europe set within the context of ideas about urban formation and development. Key cities are Venice, Florence, Antwerp, Madrid, Seville, Amsterdam, Paris, and London.

HIST 3704W. Daily Life in Europe: 1300-1800. (3 cr)
Living conditions and daily life in Europe before the Industrial Revolution. Topics include marriage and family, life at court, nobles, peasants, disease, farming, livestock-raising, urban life, the middle classes, manufacturing, trade, piracy, witchcraft, war, crime, and social deviance.

HIST 3705. From Printing Press to Internet: Media, Communications, and History. (3 cr; A-F only. §GLOS 3605)
Print public sphere in 17th, early 18th century. Political conflicts over freedom of press in 18th, 19th century. Emergence of advertising, public relations industries in 20th century. Significance of broadcast, computer network technologies for democratic political systems.

HIST 3707. Social History of Modern Europe. (3 cr)
Transformation from traditional agrarian to modern society, 18th to 20th centuries. Social change; history of the family, marriage and sexuality; the roots of nationalism and racism.

HIST 3709. Science and Enlightenment. (3 cr)
History of scientific revolution and its relationship to Enlightenment, 1650-1800. Copernicus, Galileo, Newton, Voltaire. Science and politics, culture, and religion. Civil society, expertise, objectivity, publicity.

HIST 3712. Economic History of Modern Europe. (3 cr)
Long-term rise/transformation of European economy. Emergence of capitalism and spread of economic growth up to WWI. Political economy of growth, instability, and structural change in 20th century.

HIST 3714. Medieval Spain. (3 cr)
Development of the medieval kingdoms of Spain from Roman times to ca. 1500. Major social, economic, and cultural developments. Christians, Jewish, and Muslim interaction. Role of Spain in the beginning of European expansion.

HIST 3715. Modern Spain: 1500 to the Present. (3 cr)
Ferdinand and Isabella, the Habsburg and Bourbon dynasties, the 20th-century Civil War and Franco regime, and into the present. Readings, lectures, films, slides, and music will provide a comprehensive view of a vibrant people and their modern history.

HIST 3721. 20th-Century Europe From the Turn of the Century to the End of World War II: 1900-1945. (3 cr. §HIST 5721)
The social, political, and cultural changes and conflicts in Europe from the late 19th century to the end of World War II. The background to WWI, its impact, revolution, the failure of interwar stability, fascism, WWII and its consequences.

HIST 3722. 20th-Century Europe From the End of World War II to the End of the Cold War: 1945-1991. (3 cr)
The social, economic, political, and cultural impacts of WWII upon Europe; the division of Europe, communist regimes in Eastern Europe, cooperation in Western Europe, impacts of modernization and the end of the Cold War in 1991.

HIST 3727W. History of the Holocaust. (3 cr. §JWST 3521W, RELS 3521W)
Study of 1933-1945 extermination of six million Jews and others by Nazi Germany on basis of race. European anti-Semitism. Implications of social Darwinism and race theory. Perpetrators, victims, onlookers, resistance. Theological responses of Jews and Christians.

HIST 3728. Race, Nation, and Genocides in the Modern World. (3 cr; A-F only)
Meaning of the term "genocide." Particular cases, such as Armenians in the late Ottoman Empire, Jews in the Third Reich, and Muslims in the former Yugoslavia.

HIST 3729. Nazi Germany and Hitler's Europe. (3 cr; A-F only)
Comprehensive exploration of Third Reich. Students will examine How the Nazis came to power, transformations of 1930s, imposition of racial politics against Jews/others, nature of total war. Students read historical accounts, memoirs, state documents, view films.

HIST 3731. Citizens and the State in Modern France From the Revolution of 1789 to Post-de Gaulle: 1789-1991. (3 cr)
A history of the citizen and the state in France from the French Revolution to the present.

HIST 3735. Politics of Ideas: European Thought in 20th Century Contexts. (3 cr; A-F only)
Development of political ideas/ideologies in 20th century. How to understand ideas in various contexts of their production, dissemination, and appropriation. Students read primarily original political/social philosophical texts that have shaped social, cultural, and political landscape.

HIST 3747. Habsburg Central Europe: 1740-1918. (3 cr)
Evolution of Habsburg rule in Central Europe, from reforms of Maria Theresa to imperial collapse in 1918. Economic/social transformation. Revolutions of 1848. Political modernization. Rise of nationalism/anti-Semitism. Fin-de-siecle culture. WWI.

HIST 3748. Austria in the 20th Century. (3 cr)
Austria from Paris Peace Treaties to present. Political instability, social conflict, and economic stagnation between the World Wars. Nazi rule and WWII. Economic miracle, consensus politics, and neutrality after 1945. Austria after Cold War.

HIST 3767. Eastern Orthodoxy: History and Culture. (3 cr)
Development of the orthodox church in Byzantium, the Islamic Near East, the Slavic world and in the diaspora; impact of orthodoxy on political and cultural institutions, interaction with other Christian and non-Christian communities; orthodox spirituality and aesthetics.

HIST 3775. History of the European Jews from the Middle Ages to the Present. (3 cr)
Social, economic, and cultural history of the Jewish people in Europe and their interaction with other peoples; history and causes of anti-Semitism; Zionism and assimilation; Chasidism and socialism.

HIST 3797. History of Population. (3 cr)
History of births, deaths, migration, population size, and population characteristics. Evidence from Europe, the United States, and Latin America with comparative material from Africa and Asia. Methods of historical population analysis and research of historical population data.

HIST 3800. Topics in Early American History. (3 cr [max 15 cr])
For advanced undergraduate majors and non-majors. Focus on intensive exploration of particular topics in early American history such as economic history, demographic regimes, social history, intellectual history, regions, slavery, religion, and witchcraft in colonial America.

HIST 3801. The People of Early America: 16th to 18th Centuries. (3 cr)
Multicultural approach to early American history focusing on the interactions of Africans, Europeans, and American Indians who came together to create a new world in North America during the 16th, 17th, and 18th centuries.

HIST 3809. The Peoples of Revolutionary America. (3 cr)
Culture/structure of late colonial politics. Regionalism. Connections between society and politics. Imperial crisis and independence. Military history of the Revolution. Origins of national politics and the constitution.

HIST 3812. The Civil War and Reconstruction. (3 cr)
United States from 1848 to 1877. Causes of sectional crisis; Southern secession; Lincoln and emancipation; military history; impact of war North and South; Reconstruction efforts to change the Southern life and transform the status of African Americans.

HIST 3821. United States in the 20th Century to 1945. (3 cr)
American politics and society in the progressive era, the 1920's, the Great Depression and World War II. Economic reform at home, the challenges of world war abroad, and social change affecting the status of women and racial minorities.

HIST 3822. United States in the 20th Century Since 1945. (3 cr)
American politics and society in the postwar era, the diplomacy of the Cold War, the civil rights movement, the Vietnam War, cultural clashes in the 1960's, Watergate, the conservative resurgence, and the end of the Cold War.

HIST 3834. Law in American Life, Colonial Era to Civil War. (3 cr; A-F only)
Understandings of law/property held by colonists, Indians. Conceptions of relationships among family, community, state held in colonial America; conceptions held today. Law of slavery in colonial era. American Revolution/Constitution. Law, industrialization. Legal legitimacy, federalism, Civil War as constitutional crisis.

HIST 3835. Law in American Life: 1865 to Present. (3 cr)
Centralization of state power, rise of individual rights. Constitutionalization of American law. Passage, promise, abrogation, rediscovery of 13th, 14th, 15th Amendments. Expansion of federal administrative state. Origins of civil liberties. Law and the welfare state. Civil Rights Revolution of 1950s, '60s, '70s. Product liability law.Second half of two-semester survey. May be taken independently.

HIST 3837. Minnesota History. (3 cr)
Topics in political/social history of Minnesota and its region in nineteenth/twentieth centuries.

HIST 3841. American Business History. (3 cr)
Development of the modern corporation and its managerial structure.Contributions of Eli Whitney, Edison, Ford, Carnegie, Rockefeller, J.P. Morgan, Alfred Sloan, others. History of relation of business to economicdevelopment, social change, and government policies.

HIST 3842. History of Silicon Valley. (3 cr; A-F only)
Critical, historical examination of birth/development of "Silicon Valley," the high-tech region around San Jose, California. Myths/ideologies that define Silicon Valley in popular imagination. Deeper history of region. Comparisons with Twin Cities as framework for analysis.

HIST 3844. American Economic History to 1870. (3 cr)
Economic development, regional specialization and early industrialization.Slavery and southern development. The role of railroads and government policies. Economic impact of the Civil War.

HIST 3845. American Economic History: 1870 to the Present. (3 cr)
Farm problems in the 19th century. Rise of big business and finance capitalism. The 1920s economy and the Great Depression. Corporate capitalism, government policies and the modern economy.

HIST 3851. Labor in the 19th-Century United States. (3 cr)
The development of U.S. labor in and after the Age of Industry. Industrial unionism and radicalism's challenge to the AFL; organized labor's uneasy integration into American society. Management theories and workers actions. Race, gender, and the changing working class.

HIST 3852. U.S. Labor in the 20th Century. (3 cr)
The development of a working class from the preindustrial to an industrial age. Responses of American workers through labor organization, slave resistance, and political reform. The Knights of Labor, the formation of the AFL, and the challenges of Marxism.

HIST 3861. European American; From Immigrants to Ethnics: 1790-1890. (3 cr; A-F only)
Conditions which contributed to the mass exodus from northern/western Europe during this century as well as the attraction of the United States. Major theme will be how immigrants shaped and in turn were shaped by America.

HIST 3862. European Americans: 1890-1990. (3 cr; A-F only)
From the 1890s, immigrants came predominantly from southern/eastern Europe. A central theme is the role of immigrants in the transformation of America from a rural agricultural to an urban industrial society.

HIST 3864. African American History, 1619-1865. (4 cr; A-F only. §AFRO 3864)
Importance of dynamics of class, gender, region, and political ideology. Changing nature of race/racism.

HIST 3865. African American History, 1865 to Present. (4 cr; A-F only. §AFRO 3865)
Integral migrations, industrialization, unionization, Great Depression, world wars, large-scale movements for social/political change.

For definitions of course numbers, symbols, and abbreviations, see page 300.

HIST 3866. African American Gender History: 1865-Present. (3 cr)
Relationship between race, gender, and the struggle for equality. Focuses on African-Americans. Changing definitions of manhood/womanhood over the past 130 years. Critical role race and racial thought have played in these changes. How ethnicity, class, and sexuality have transformed black gender experiences.

HIST 3867. Black Women s History: From Slavery to the Present. (3 cr)
Introduction to black women s histories in America and Atlantic World. How black women on two continents defined themselves in context of migration, slavery, colonialism, post-colonialism, and social movements. Meanings, problems, and possibilities of black womanhood in global era.

HIST 3868. Race, War, and Race Wars in American History. (3 cr)
Role that race has played in American war history. Impact that wars have had on race and race relations in the U.S. and the world. Literature, film.

HIST 3869. Urban American History: Race, Class, Gender, and Sexuality in Urban America. (3 cr)
History/formation of American metropolis. Roots of "urban problem." Framework for understanding life in contemporary urban spaces. How ideas about race, class, gender, and sexuality created/permeated urban infrastructures and stratified urban populations/economies.

HIST 3870. Topics in American Indian History. (3 cr. §AMIN 3870)
Designed for advanced undergraduates. Topics may include social history, oral history, history of particular regions, political systems, education, and policy.

HIST 3871. American Indian History: Pre-Contact to 1830. (4 cr. §AMIN 3871)
Introduction to American Indian history from ancient native America to the removal era. Focuses on the social, cultural, political, and economic diversity of Native American peoples and Native American experiences with European colonialism.

HIST 3872. American Indian History: 1830 to the Present. (4 cr. §AMIN 3872)
Focus on the impact of federal Indian policy on American Indian cultures and societies, and on American Indian culture change.

HIST 3875W. Comparative Race and Ethnicity in US History. (3-4 cr; A-F only)
America through its cultural diversity. Changing notions of "American" national identity/citizenship from nineteenth century to present. Historical experiences of Native Americans, African Americans, Hispanic Americans, European immigrants, and Asian Americans: How these groups were defined in relation to each other and in relation to the nation.

HIST 3877. Asian American History, 1850-Present. (3 cr)
Asian American history and contemporary issues, from 1850 to the present. Immigration, labor, anti-Asian movements, women/families, impact of World War Two, new immigrant/refugee communities, civil rights, Asian American identity/culture.

HIST 3878. American West. (3 cr)
American West from Mexican-American War to present. U.S. expansion, Native-Anglo conflict, migration/immigration. Race, ethnicity, labor, class, and gender in the West. Business/politics of "settling" the region.

HIST 3881. History of American Foreign Relations to 1914. (3 cr)
American involvement in world affairs from 1760-1914 including political, economic, social, and cultural relations by individuals, groups, governmental, and non-governmental agencies focusing on nation building, creation of continental and commercial empires, hemispheric hegemony, cultural expansion, and wartime diplomacy.

HIST 3882. History of American Foreign Relations: 1914 to Present. (3 cr)
American involvement in world affairs 1914 to present. Political, economic, social, and cultural activities by individuals, groups, and governmental and non-governmental agencies, participation in international organizations, commercial and cultural imperialism, and war and Cold War diplomacy.

HIST 3891. American Military History. (4 cr)
Interaction of geography, politics, society, and technology in military growth. Influence of military on American national development 17th-20th centuries. Expansion/effect of land, sea, and air forces in 20th century.

HIST 3900. Topics in Medieval and Modern European History. (1-4 cr [max 16 cr]. Prereq–Jr or sr or #)
Selected topics in medieval and modern European history not covered in regular courses. To be taught as staffing and demand exist.

HIST 3910. Topics in U.S. History. (1-4 cr [max 15 cr]. Prereq–Jr or sr or #)
Selected topics in U.S. history not covered in regular courses. To be taught as staffing and demand exist.

HIST 3920. Topics in African History. (1-4 cr [max 16 cr]. Prereq–Jr or sr or #)
Selected topics in African History not covered in regular courses. To be taught as staffing and demand exist.

HIST 3930. Topics in Ancient History. (3 cr [max 15 cr])
Selected topics in Near Eastern, Egyptian, Greek, and Roman History.

HIST 3940. Topics in Asian History. (1-4 cr [max 16 cr]. Prereq–Jr or sr or #)
Selected topics in Asian history not covered in regular courses. To be taught as staffing and demand exist.

HIST 3950. Topics in Latin American History. (1-4 cr [max 16 cr]. Prereq–Jr or sr or #)
Selected topics in Latin American history not covered in regular courses. To be taught as staffing and demand exist.

HIST 3951H. Junior Honors Seminar. (4 cr. Prereq–History honors candidate)
Intended for History honors majors in their junior year, the course is run as a seminar, with emphasis on readings and discussion. Weekly sessions focus on selected topics relating to historical method and historiography.

HIST 3960. Topics in History. (1-4 cr [max 16 cr]. Prereq–Jr or sr or #)
Selected topics in history not covered in regular courses and covering more than one geographic area/time period. To be taught as staffing and demand exist.

HIST 3970. Supplemental Discussion in History. (1 cr [max 3 cr]. Prereq–Concurrent registration)
Extra discussion section with T.A. Attached to concurrent 3xxx course.

HIST 3980W. Supplemental Writing in History. (1 cr [max 4 cr]; A-F only. Prereq–#; must take a 3-cr 3xxx or 5xxx course taken concurrently)
May be attached, by agreement of instructor and students, to any 3xxx or 5xxx course to make a writing-intensive experience.

HIST 3990. Historical Internship. (1-4 cr [max 4 cr]. Prereq–#)
Internship with a historical society, government, or community historical organization. Arranged through and supervised by department.

HIST 3993. Directed Study. (1-16 cr [max 16 cr]; A-F only. Prereq–#, Δ, ❑)
Guided individual reading or study. Open to qualified students for one or more semesters.

HIST 3994. Directed Research. (1-16 cr [max 16 cr]; A-F only. Prereq–#, Δ, ❑)
Qualified students work on a tutorial basis.

HIST 4051. Ancient Near East and Egypt: Neolithic to 1500 BCE. (3 cr; A-F only. §CNES 4051. Prereq–Previous coursework in ancient history recommended)
Lands of Western Asia and Northeast Africa from Neolithic through Middle Bronze Age. Interdependent technological/political developments, such as agriculture, state formation, and writing. Use of literature/art as vehicles for articulating concepts. Changing relationships among culture/polities of ancient Near East and regions beyond.

HIST 4052. Ancient Near EAST and Egypt: 1500 to 323 BCE. (3 cr; A-F only. §CNES 4052. Prereq–4051 or prev coursework in ancient history recommended)
Lands of Western Asia and Northeast Africa from Late Bronze Age to death of Alexander in 323 BCE. Growth/decline of empires. Diplomatic relations and sociopolitic transformations among Late Bronze and Iron Age states. New military technologies. Developments in religion/theology.

HIST 4061. History of the Greek World from Earliest Times to 400 B.C.. (3 cr)
Trace the history of the Greeks from their initial appearance in Greece in the Bronze Age to the close of the 5th century B.C. Special attention will be devoted to the polis, military development, and intellectual change.

HIST 4062. History of the Greek World: 400 to 30 B.C.. (3 cr)
Trace the history of the Greeks from the end of the Peloponnesian War through the decline of the polis, the rise of Macedon and Alexander the Great, the fragmentation of Alexander's empire in the Hellenistic World and the eventual Roman take over of that world.

HIST 4071. History of Rome to 78 B.C.. (3 cr. Prereq–An appropriate introductory course is recommended)
Intensively examine the political, institutional, and socioeconomic history of Rome from its origins to the death of Sulla in 78 B.C. The institutional strengths and weaknesses that led to the rise and fall of the Republic are the primary theme.

HIST 4072. History of Rome: 78 B.C. to A.D. 117. (3 cr. Prereq–An appropriate introductory course is recommended)
Intensively examine the political, institutional, and socioeconomic history of Rome from the death of Sulla in 78 B.C. to the death of Trajan in A.D. 117.

HIST 4073. History of Rome: A.D. 117 to 641. (3 cr. Prereq–An appropriate introductory course is recommended)
Intensively examine the political, institutional, and socioeconomic history of Rome from the death of Trajan in A.D. 117 to the death of Theodosius in A.D. 395. Explores one historical question—the decline and fall of the Roman Empire.

HIST 4135. Vikings, EAST Slavs, Turks, and Finns: European Russia in the Early Middle Ages. (4 cr; A-F only)
An analysis of the Turkic nomads, East Slavic agriculturalists, and Finnic foragers who inhabited early medieval European Russia and the Khazar, Bulghar, and Rus'/Viking states which came to rule them.

HIST 4337. Bill of Rights and the Supreme Court Since 1865. (4 cr. Prereq–Jr or sr or grad student)
Constitutional, political, philosophical, social context of leading U.S. Supreme Court cases on Bill of Rights. Emphasizes property rights, free speech, freedom of religion, right to bear arms, criminal defendants' rights, death penalty.

HIST 4910. Topics in U.S. History. (1-4 cr [max 15 cr]. Prereq–Jr or sr or grad or #)
Selected topics in U.S. history not covered in regular courses. Taught as staffing permits.

HIST 4930. Topics in Ancient History. (1-4 cr [max 16 cr]; A-F only. Prereq–Advanced undergrad or grad)
Selected topics in Ancient history not covered in regular courses. Taught as staffing permits.

HIST 4959. How to Do History. (3 cr; A-F only)
Skills/research experience to complete senior paper. How to answer questions such as, "What is history?" How to locate/use historical sources, develop a thesis, and turn a rough idea into a full research proposal.

HIST 4959H. Honors: How to Do History. (3 cr)
Skills/research experience to complete senior paper. How to answer questions such as, "What is history?" How to locate/use historical sources, develop a thesis, and turn a rough idea into a full research proposal.

HIST 4960. Topics in History. (1-4 cr [max 16 cr]. Prereq–Jr or sr or grad or #)
Selected topics in history not covered in regular courses. Taught as staffing permits.

HIST 4961V. Honors: Major Paper. (4 cr. Prereq–Δ, #; sign up in Undergraduate Studies Office two sem in advance)
Research paper on topic of student's choice. Work largely with primary sources. Faculty guidance.

HIST 4961W. Major Paper. (4 cr; A-F only. Prereq–Δ, #; sign up in Undergraduate Studies Office two sem in advance)
Research paper on topic of student's choice. Work largely with primary sources. Faculty guidance.

HIST 4962. History Undergraduate Proseminar. (3 cr. Prereq–[Honors, [jr or sr]] or [history major, Δ])
Themes vary by instructor. Reading/discussion of historiography/methodology. Research component.

HIST 4962H. Undergraduate Honors Proseminar. (3 cr. Prereq–[Jr or sr], honors)
Themes vary depending on the instructor. Reading/discussion of historiography/methodology, research.

HIST 4970. Historical Internship. (1-12 cr [max 12 cr]; S-N only)
Internship with a historical society, government or community historical organization. Arranged through and supervised by the department.

HIST 5011. Quantitative Methods for Historical Research. (4 cr. Prereq–#)
Basics of quantitative historical data collection, measurement, and analysis.

HIST 5051. Before Herodotus: History and Historiography of Mesopotamia and the Ancient Near East. (3 cr; A-F only. §CNES 5051. Prereq–Prev coursework in ancient Near Eastern history recommended)
Historical method/sources for ancient Near Eastern history. Historical traditions. Historiographic texts of Mesopotamia and neighboring regions of the ancient Near East, secondary emphasis on their relationship to works of classical historians such as Herodotus. Use of these sources in modern historiography of ancient Near East.

HIST 5053. Doing Roman History: Sources, Methods, and Trends. (3 cr. Prereq–Grad student or #)
Survey of major scholarship in field of Roman history since Mommsen. Political, cultural, social, military, and economic history. Focuses on methodological problems posed by evidence. Ways in which these issues shape research.

HIST 5111. Proseminar in the History of Medieval Europe. (3 cr; A-F only. Prereq–Advanced undergrads of exceptional ability or grads, #)
Examination of basic scholarly bibliography for medieval Western European history. Aim is to help students to prepare for M.A. and Ph.D. examinations.

HIST 5115. Medieval Latin Historians. (3 cr. Prereq–Reading knowledge of Latin)
Writing of history in Western Europe during the Middle Ages. Focus on idea of history, philosophy of various historians, techniques of research by medieval historians and chroniclers, history as literature, and value of medieval histories to modern research scholars. Latin texts only.

HIST 5251. Socialist/Post-socialist Transformations. (3 cr; A-F only. §GLOS 5603)
Transformations underway in post-socialist societies of Eastern Europe, former Soviet Union. Ramifications of abandonment of state socialism, introduction of market relations. Effect of former system, new market system on cultural institutions/identities.

HIST 5264. Imperial Russia: Formation and Expansion of the Russian Empire in the 18th and 19th Centuries. (3 cr [max 4 cr])
Interaction with Europe and Asia; attempts at modernization and reform; emancipation of the serfs and rise of revolutionary movements.

HIST 5265. 20th-Century Russia: The Collapse of Imperial Russia, the Revolutions, and the Soviet Regime. (3 cr)
Analysis of the factors that led to the collapse of the tsarist regime; discussion of the 1917 revolution, the evolution of the Soviet regime and the collapse of Soviet communism. Emphasis on the role of nationalities and the rise of the Commonwealth of independent states.

HIST 5271. The Viking World: Story, History, and Archaeology. (3 cr; A-F only. §HIST 3271)
Viking society and expansion of Viking influence abroad. Viking impact on Western Europe, interactions with Slavic lands, settlement of North Atlantic islands, Western Europe's impact on Scandinavian lands. Analyzes archaeological, historical, linguistic, and numismatic evidence.

HIST 5285. Problems in Historiography and Representation of the Holocaust. (3 cr. §JWST 5111. Prereq–JWST 3521 or RelS 3521 or #)
Issues connected with the Holocaust. Inclusiveness of other groups, Holocaust vs. "Shoah," historiographical conflicts about perpetrators, problems of representation in literature/art, problems of narrative theology after Auschwitz.

HIST 5294. Social History of Russia and Eastern Europe Through the 19th Century. (3 cr)
Lives of peasants and workers, nobles and merchants. Topics include family, marriage, sexuality; culture and tradition; transformation from an agricultural to a modern society.

HIST 5295. Social History of Russia and Eastern Europe From the Late 19th Century to the Present. (3 cr)
Social movements (revolutionary, nationalist, women's); communist and post-communist societies.

HIST 5301. U.S. Women's Legal History. (3 cr)
Women's legal status in U.S. history, 1648 to present. Changes in women's legal status in marriage, divorce, and child custody; reproductive/sexual autonomy; and economic/educational equality. Differences among women based on race, class, and ethnicity.

HIST 5379. Problems in Early American History. (3 cr)
Intensive consideration of topics in early American history. Topics may include readings in race, class, and gender; comparative colonialism; slavery; demography; economic history; religion; and regions in the colonial world.

HIST 5381. Minnesota History Workshop. (3-4 cr [max 4 cr]. Prereq–1301, 1302)
A case study and seminar approach to historical research and interpretation. It offers teachers and other scholars a chance to survey a particular topic in Minnesota history and to write their own historical narrative based on primary source research.

HIST 5421. Gender in Latin American History. (3 cr)
Women's history/masculinity. Gender/colonialism, marriage, sexuality, nationalism, labor, political movements, feminism.

HIST 5436. Social History of African Women: 1850 to the Present. (3 cr. Prereq–Grad or #)
Explore the historical forces which have shaped African women's everyday lives and the ways in which these women have been active agents in the making of their own histories.

HIST 5437. History of East Africa. (3 cr. §AFRO 3437, AFRO 5437, HIST 3437)
Major themes in history of East Africa, from era of early human cultural development to present. Methods that historians use to reconstruct history. Varying interpretations/constructions of history over time.

HIST 5439. Environment and Society in Africa. (3 cr. Prereq–#)
Major historiographical, theoretical, and methodological debates concerning people-environment relations in Africa, from rise of human societies to present. Environment and the rise of civilizations. Demography, colonial environmental policies, conservation, disease, indigenous knowledge, water management, food.

HIST 5441. Transformations in Pre-Colonial African History. (3 cr; A-F only. Prereq–#)
African internal/external processes before 1600. Framework by which early African history is understood, tools for reconstructing it, themes/debates that have shaped it, new directions in which it is moving.

HIST 5446. Problems in West African History. (3 cr. Prereq–Grad or #)
This problem-centered course explores several of the major historiographical, methodological, and theoretical debates in West African history. Core topics include state formation, trade, slavery, Islam, gender, and colonialism.

HIST 5464. China in the Song, Yuan, and Ming Dynasties. (3 cr. §EAS 3464, HIST 3464)
China during the Song (976-1279), Yuan (1279-1368) and Ming (1368-1644) dynasties, political institutions, and social structures. Attention to primary sources and how historians ask and answer questions about the past.

HIST 5465. China in the Ming and Qing Dynasties. (3 cr. §EAS 3465W, HIST 3465W)
Political/social history of China from 1600 until end of Qing dynasty in 1911. Ethnicity, daily life, legal structures, city life, peasantry.

HIST 5467. State and Revolution in Modern China. (3 cr. §EAS 3467W, HIST 3467W)
Modern China's political evolution including the Taiping Rebellion, Republican Revolution, rise of Nationalist and Communist parties, Maoist era; reform under Deng Xiaoping, and the emergence of democracy in Taiwan.

HIST 5468. Social Change in Modern China. (3 cr. §EAS 3468, HIST 3468)
Opium War and opening of Treaty Ports in 19th century; missionary activity and cultural influence; changes in education system; women's movement; early industrialization; socialism and collectivization after 1949; industrialization of Taiwan; PRC's entry into the world trading system.

HIST 5469. Historiographies of China, 1000-1700. (3 cr; A-F only. Prereq–Grad student or #)
Important recent English-language work on Chinese culture during the Song, Yuan, and Ming dynasties. Topics include religion, gender, family structures, ethnic identity, commerce/economics, and political structures/events.

HIST 5473. Japan's Modernities: Historiographies. (3 cr; A-F only. Prereq–[Advanced undergrad, #] or grad student)
Historiography on modern Japan in English language scholarship. Major trends since 1950s, latest scholarship. Issues concerning Japan's modernity. Definitions of modernity, modernization, and modernism. Relationship between knowledge-making and nation building. Japan's place in world.

HIST 5474. Sex and the Politics of Desire: Japan and Beyond. (3 cr; A-F only. Prereq–Grad student or #)
History of gender/sexuality in modern Japan and Korea. Geography of Japan. Theoretical/methodological literature not specific to Japan. Sexology, eugenics, feminism, nationalism, colonialism, cyber sexuality.

HIST 5479. History of Chinese Cities and Urban Life. (3 cr; A-F only. §HIST 3479)
Introduction to traditional Chinese cities, their modern transformation. Ideal city plan in Confucian classics compared with physical layout of some major cities. Models about Chinese cities, influence of the models on our understanding of Chinese history/society.

HIST 5501. Medieval Europe and the World. (3 cr; A-F only. Prereq–#)
Place of medieval Europe in the world. Relations of Europe with Asia, Africa, and the Americas. European knowledge of the world's other great cultures. European travelers/explorers. Assessment of other cultures' knowledge of Europe in the period.

HIST 5505. Survey of the Middle East. (3 cr. Prereq–Grad or #)
Peoples, lands, cultures of the Middle East, from earliest civilizations to present.

HIST 5520. Topics in Chinese History. (3 cr [max 12 cr])
Selected topics not covered in regular courses. Taught as staffing permits.

HIST 5541. Islam in the Catholic Age. (3 cr. Prereq–Grad or #)
Rise of Islam in its Arabian setting. Roles of prophet, orthodox/Umayyad caliphs. Development of Islamic state/empire, organizations, institutions, status of Muslims/non-Muslims.

HIST 5547. The Ottoman Empire. (3 cr. Prereq–Grad student or #)
Founding of Ottoman society/state to empire, 1300 to end of empire in 1920. Lands, institutions, peoples, legacy. Impact on Europe.

HIST 5611. Proseminar in Medieval History. (3 cr; A-F only. Prereq–Grad student or #)
Basic scholarly bibliography for medieval Western European history during early Middle Ages. Foundation for teaching courses in medieval history, preparing for general doctoral exam.

HIST 5612. Proseminar in Medieval History. (3 cr; A-F only. Prereq–[5611, grad student] or #)
Basic scholarly bibliography for medieval Western European history during central/later Middle Ages. Foundation for teaching courses in medieval history, preparing for general doctoral exam.

HIST 5614. The Medieval Church. (3 cr. Prereq–Grad student or #)
Introduction to history of western church in Middle Ages. Emphasizes church teachings and institutional structures, beliefs/practices of lay people, medieval Christian encounter with non-Christian world.

HIST 5616. Proseminar in Medieval Spain. (3 cr; A-F only. Prereq–#)
Graduate research on the development of the medieval kingdoms of Spain from Roman times to ca. 1500. Emphasis on major social, economic, and cultural developments. Christian, Jewish, and Muslim interaction. Spain and the beginnings of European expansion.

HIST 5617. Spain in the Early Modern Period: 1492-1814. (3 cr)
Historiography, documents, and archives of early modern Spain analyzed. Includes reading in modern English and Spanish and practical experience with Spanish manuscript documents from the period.

HIST 5621. Proseminar: The French Revolution. (3 cr; A-F only. Prereq–Grad student or [advanced undergrad, #])
Historical literature about French Revolution of 1789. Old Regime political culture, Enlightenment, origins of the revolution, revolutionary transformations in society, politics/culture both in France and abroad, the Terror, Napoleon, revolutionary legacy.

HIST 5631. Proseminar: Comparative Early Modern History. (3 cr; A-F only. Prereq–Hist grad or #)
Critical reading of historical literature dealing with integration of the globe during the early modern period, ca. 1350-1750; book reports, class discussion.

HIST 5632. World History Proseminar. (3 cr; A-F only. Prereq–#)
Theoretical approaches to world/global history. Review of major theories, controversies, chronologies, pedagogical approaches.

HIST 5633. Socio-Economic History of China. (3 cr; A-F only. Prereq–Grad student or [adv undergrad, #])
Nature of Chinese socio-political formations and economic development in Qing and Republican eras, 1644-1937. Establishment/methods of state rule, merchants, agrarian social structure, domestic industry, demographic regimes, capitalism, and imperialism. Comparisons using theoretical and case studies of economic development.

HIST 5649. Ideas in Context: Making Early Modern Knowledge, 1500-1800. (3 cr; A-F only. Prereq–Grad student or #)
Role of institutions/locale in development of early-modern European thought/culture. University, academy, learned society, princely court, museum, printing house, workshop, trading company, armies/navies, state bureaucracies, salons, other independent associations of nascent civil society.

HIST 5650. Proseminar: Early Modern Europe. (3 cr; A-F only. Prereq–Hist grad or #)
Critical reading of historical literature for early modern Europe, ca. 1450-1700., dealing with France, Germany, Italy, the Low Countries, and Spain. Each student chooses a country to focus on; book reports, class discussion.

HIST 5651. Proseminar in Tudor England: 1485-1603. (3 cr; A-F only. Prereq–#)
A critical study of principal writings about English history during the Tudor and Stuart periods.

HIST 5652. Proseminar in Stuart England: 1603-1689. (3 cr; A-F only. Prereq–#)
Critical study of principal writings about English history.

HIST 5671. Proseminar: Modern Britain. (3 cr; A-F only. Prereq–#)
Critical study of major writings in British history, 1760-1945, and preparation for research in field.

HIST 5715. Readings in European Women's History: 1450-1750. (3 cr; A-F only)
Introduction to current historical research on European women's history, 1450-1750. Topics include gender roles and form of family structure, women's participation in religious movements, legal status of women.

HIST 5720. Society/Politics:Modern Europe. (3 cr [max 6 cr]; A-F only. Prereq–Grad or #)
Introduction to literature in English on problems of modern European social, cultural, political history. Thematic/geographic focus varies year to year. Topics include historical approaches to class/gender relations, state formation as social/political process, family history, evolution of public life, popular culture.

HIST 5721. Contemporary Europe From the Late 19th Century to the Beginning of the Cold War: 1890-1950. (3 cr. §HIST 3721. Prereq–previous coursework in 19th- and/or 20th-century Europe, #)
The historical literature and debates surrounding major issues in the social, political, cultural, and economic development of Europe from the turn of the century through the impact of WWII. Topics include the development of imperialism, national rivalries, social and political conflict, the rise of fascism and communism, and the origins of war.

HIST 5735. European Women's History; 1750 to the Present. (3-4 cr [max 4 cr]. Prereq–#)
Selected themes in modern European women's history. Forms of patriarchy. Women in the Enlightenment. Women and revolution. Gender, class, and family life. Women in the labor force. Sexuality and reproduction. Female education. Women's political movements. Women and imperialism. Gender and fascism.

HIST 5740. Topics in Modern German History. (3-4 cr [max 12 cr]; A-F only. Prereq–#)
Readings and discussions on some central questions concerning the history of Germany during the modern period with a particular emphasis on the relationship between social change and political development. Offerings vary in thematic and chronological focus.

HIST 5761. Proseminar - Imperial Russia.. (3 cr. Prereq–Knowledge of Russian or German or French)
Western and Russian historiography on crucial issues of imperial Russia. Political institutions; culture and society; modernization and reforms; new interpretations.

HIST 5762. Proseminar in 20th Century Russia. (3 cr. Prereq–5761, knowledge of Russian or German or French)
Western and Russian historiography on crucial issues of 20th-century Russia. The nature of revolutions, debate over the evolution of the Soviet regime, the collapse of empires, new interpretations.

HIST 5777. Proseminar in Habsburg Central Europe. (3 cr. Prereq–#)
Central Europe under Habsburg rule from the reforms of Maria Theresa to imperial collapse. Continuity and change in society; economic and political modernization; the rise of national consciousness and anti-Semitism; politics and culture in the Fin de Siecle; the Empire and World War I.

HIST 5794. Proseminar in European Economic History. (3 cr. Prereq–#)
Europe's rise in the world economy; England's industrial revolution and uneven development in Europe; imperialism and World War I; the Great Depression; the post-1945 economic miracle; continuity and change in Eastern Europe.

HIST 5797. Methods of Population History. (3 cr)
Standard methods of population analysis. Focuses on methods widely used for historical population research.

HIST 5801. Seminar in Early American History. (3 cr; A-F only)
Introduction to the literature of early American history. Readings selected from some of the best scholarship in the field, the questions that now hold the attention of colonial historians, and the theories, methods, and sources they use in pursuit of those questions.

HIST 5811. Nineteenth-Century U.S. History. (3 cr; A-F only. Prereq–[Grad or honors] history major, #])
Proseminar. Central themes/debates in historiography of 19th-century United States. Market revolution, antebellum party politics. Slavery, the Civil War, Reconstruction. Immigration and nationalism. Transformations in ideologies/experiences of race/gender. Industrialization, labor, and urbanization. Western expansion. Emergence of populism/progressivism.

HIST 5821. American History in the Twentieth Century. (3 cr [max 4 cr]; A-F only. Prereq–Grad student, #)
Intensive readings seminar.

HIST 5841. Proseminar in American Economic History. (3 cr; A-F only. Prereq–#)
Historical literature on American economic and business history from American Revolution to the modern economy.

HIST 5844. U.S. Labor History. (3 cr)
Readings in classic and recent approaches to the history of the working class in the United States. Central topics include slavery and free labor, women's paid and unpaid labor, management strategy, labor protest, and trade union organization.

HIST 5845. History of American Capitalism. (3 cr; A-F only. Prereq–Grad student or #)
Historiography/history of American capitalism. Crucial events (e.g., market "revolution," development of industrial cities) focus weekly discussions of new literature. Students analyze theoretical models of capitalism and new work in social, political, and economic history.

HIST 5857. Proseminar: Readings in the History of American Women. (3 cr. Prereq–#)
An intensive graduate-level readings course. Survey selected significant topics in historical literature, conceptual frameworks, and methodological problems in the history of American women from 1600 to the present.

HIST 5861. History of American Immigration. (3 cr; A-F only. Prereq–#)
Readings in historical literature on immigration to the United States. Emphasis on recent works distinguished by new research methodologies and interpretations.

HIST 5862. History of American Immigration. (3 cr; A-F only. Prereq–#)
Readings in historical literature on immigration to the United States. Emphasis on recent works distinguished by new research methodologies and interpretations. Each student undertakes an independent reading and/or research project.

HIST 5863. Proseminar: U.S.-Mexico Border. (3 cr)
Part of a two-semester sequence. Historiographical approaches to region. Vision of a unified border.

HIST 5871. Readings in U.S. Intellectual History: 19th-20th Centuries. (3 cr. Prereq–#)
Definitions of American national identity from 1789 to the present asexpressed in politics, religion, literature, painting, music, architecture, and history.

HIST 5877. Asian American History. (3 cr; A-F only)
Introduction to key issues, theoretical frameworks, research, and methodologies of Asian American history. Seminal texts that defined the field. Recent scholarship in history and in related disciplines. Emphasis field's comparative/transnational linkages to ethnic studies, Asian studies, and the Americas.

HIST 5881. American Foreign Relations to 1895. (3 cr. Prereq–#)
Intensive readings in the historiography of American foreign relations with emphasis on American imperialism, domestic courses of foreign policy, and international political, economic, and cultural relations.

HIST 5882. American Foreign Relations Since 1895. (4 cr. Prereq–#)
Intensive readings in the historiography of American foreign relations with emphasis on American imperialism, domestic courses of foreign policy, and international political, economic, and cultural relations.

HIST 5890. Problems in American Indian History. (3 cr. §AMIN 5890. Prereq–#)
Intensive consideration of topics in American Indian history. Topics may include social history, history of particular regions, political systems, education, and American Indian policy.

HIST 5900. Topics in European/Medieval History. (1-4 cr [max 16 cr] Prereq–Grad or [advanced undergrad with #])
Selected topics in European or medieval history not covered in regular courses; taught as staffing permits.

HIST 5901. Latin America Proseminar: Colonial. (3 cr. Prereq–#)
Introduces beginning graduate and advanced undergraduate students to major historical writings on various Latin American themes.

HIST 5902. Latin America Proseminar: Modern. (3 cr. Prereq–#)
Introduces beginning graduate and advanced undergraduate students to major historical writings on various Latin American themes.

HIST 5910. Topics in U.S. History. (1-4 cr [max 16 cr]. Prereq–Grad or advanced undergrad student with #)
Selected topics in U.S. history not covered in regular courses. Taught as staffing permits.

HIST 5920. Topics in African Social History. (3 cr [max 15 cr]. Prereq–Grad or #)
Focuses on the experiences of Africans in their workplaces, households, and communities. Detailed treatment of selected historical themes. Topics vary by semester.

HIST 5930. Topics in Ancient History. (1-4 cr [max 16 cr]; A-F only. Prereq–Grad or #)
Selected topics in ancient history not covered in regular courses. To be taught as staffing permits and as enrollment warrants.

HIST 5931. Topics in Comparative Third World History. (3 cr [max 16 cr]; A-F only. Prereq–Grad student or #)
Topics specified in *Class Schedule*.

HIST 5932. African Historiography and the Production of Knowledge. (3 cr; A-F only. Prereq–Major in African history or [grad student, #])
Recent scholarship on social history of Africa. Focuses on new literature on daily lives of ordinary people in their workplaces, communities, households.

HIST 5933. Seminar in Ancient History. (3 cr; A-F only. Prereq–Previous coursework in Greek or Roman history, #)
Seminar on a selected topic in ancient history.

HIST 5934. Comparative History and Social Theory. (3 cr; A-F only. Prereq–Grad student or [upper-div undergrad, #])
Works of history/sociology that are broadly comparative/theoretical. Issues of state formation, social movements, social structure, and economic development.

HIST 5935. Methods and Pedagogy in African History. (3 cr; A-F only. Prereq–Grad student or #)
Current historical methods/sources of African history. Pedagogical issues. Students design their own courses.

HIST 5940. Topics in Modern Chinese History. (1-4 cr [max 16 cr]. Prereq–Grad student or [advanced undergrad, #])
Possible topics include cultural, economic, intellectual, political, and social history.

HIST 5941. Readings in Chinese Documents. (3 cr. Prereq–Reading knowledge of Chinese)
Readings in Chinese on a topic to be selected by the instructor. Depending on the topic and the time period, readings may involve a mixture of modern and classical Chinese or may be entirely in modern Chinese. Consult instructor for more information.

HIST 5942. Topics: History of Medicine. (3-4 cr [max 16 cr]. Prereq–Prior history of medicine or history of science course recommended for undergrads)
An exploration of topics central to the history of medicine. Emphasis on mid-18th century to the present. Topics vary yearly.

HIST 5950. Topics in Latin American History. (1-4 cr [max 15 cr]. Prereq–Grad or advanced undergrad with #)
Selected topics in Latin American history not covered in regular courses. Taught as staffing permits.

HIST 5960. Topics in History. (1-4 cr [max 16 cr]. Prereq–Grad or [advanced undergrad with #])
Selected topics in history not covered in regular courses. Taught as staffing permits.

HIST 5962. Expansion of Europe. (3 cr; A-F only. Prereq–Grad student, #)
Research proseminar on actions of Europeans in wider world, 1350-1790. Based on documents in James Ford Bell Library.

HIST 5964. Comparative Economic History. (3 cr. Prereq–#)
Theoretical approaches guide cross-cultural examinations of major issues in the economic history of East Asia, Europe, and the New World. Agrarian structures in economic development, markets, the state and economic development, and the industrial revolution.

HIST 5970. Advanced Research in Quantitative History. (4 cr [max 16 cr])
Students will carry out publishable-quality research on a quantitative historical topic.

HIST 5971. Proseminar: Editing and Publishing. (3 cr; A-F only)
Evolution of modern scholarly publication as system of knowledge. Survey of history of printing/manufacture of books. Recent changes in information technology. Contemporary academic publishing. Basics of editing/editorial policy. Journals/presses.

HIST 5980. Topics in Comparative Women's History. (3 cr [max 15 cr]. Prereq–Grad student or [advanced undergrad, #])
Cross-cultural/thematic explorations in history of women. Topics vary. May include gender and colonialism; women and class formation; women and religion; sexuality; medical construction of gender; women's narratives as historical sources; gender and politics.

HIST 5990. Readings in Comparative History. (3 cr [max 9 cr]. Prereq–#)
Students read/discuss historical works that focus on common theme or employ similar methods in different geographic areas. Issues of cross-area comparison. Topics vary (e.g., peasant societies, race/ethnicity, states/nationalism).

HIST 5993. Directed Study. (1-16 cr [max 16 cr]. Prereq–[Grad student or sr], #, Δ, ❑)
Guided individual reading or study.

HIST 5994. Directed Research. (1-16 cr [max 16 cr]. Prereq–[Grad student or sr], #, Δ, ❑)
Work on a tutorial basis.

History of Medicine (HMED)

Medical School-Adm

HMED 3001V. Health Care in History I. (3 cr. §HMED 3001W. Prereq–Honors)
Introduction to intellectual/social history of European/American medicine, health care from classical antiquity through 18th century. Meets with 3001W.

HMED 3001W. Health Care in History I. (3 cr. §HMED 3001V)
Introduction to intellectual/social history of European/American medicine, health care from classical antiquity through 18th century.

HMED 3002W. Health Care in History II. (3 cr)
Introduction to intellectual/social history of European/American medicine, health care in 19th/20th centuries.

HMED 3040. Human Health, Disease, and the Environment in History. (3 cr)
Introduction to changing relationship of human health and the environment. Ways in which human-induced environmental changes have altered our experiences with disease and our prospects for health.

HMED 3055. Women, Health, and History. (3 cr)
Women's historical roles as healers, patients, research subjects, health activists. Biological determinism, reproduction, mental health, nursing, women physicians, public health reformers, alternative practitioners. Gender disparities in diagnosis, treatment, research, careers. Assignments allow students to explore individual interests.

HMED 3065. Body, Soul, and Spirit in Medieval and Renaissance European Medicine. (3 cr; A-F only)
Body/soul in medieval theology/cosmology. Religious conceptions of body/soul. Medical conceptions in medieval world. Medieval/renaissance psychology. Medical astrology and its consequences. Medical normal/abnormal body. Medicine of reproduction and sexual identity. Death, burial, dissection, and resurrection in medical/religious perspective. Macrocosmic/microcosmic body. Limits to human power/authority over body. Anatomical/chemical body/spirit.

HMED 5002. Public Health Issues in Historical Perspective. (3 cr)
Introduction to the evolution of major recurring problems and issues in public health including environment and health, food customs and nutrition, control of alcohol and drugs, venereal diseases and public policy, human resources regulation, and relationship of science to promotion of health.

HMED 5035. The Germ Theory and Modern Medicine. (3 cr)
Analysis of the formulation of the germ theory of disease and of its consequences for medical procedures (therapeutics, surgery, management of hospitals), public health programs, and the structure and prestige of the medical profession.

HMED 5045. Modern Medical Profession. (3 cr)
Historical analysis of American medical profession in 19th/20th centuries. Role of institutions, influence of social/moral values. Consequences of specialization, scientific innovation.

HMED 5055. Women, Health, and History. (3 cr. Prereq–Grad student or [jr or sr] with prev coursework in hist or #)
Women's historical roles as healers, patients, research subjects, health activists. Biological determinism, reproduction, mental health, nursing, women physicians, public health reformers, alternative practitioners. Gender disparities in diagnosis, treatment, research, careers. Assignments allow students to explore individual interests.

HMED 5200. Early History of Medicine to 1700. (3 cr; A-F only)
An introductory survey of the history of medicine in Europe and America.

HMED 5201. History of Medicine from 1700 to 1900. (3 cr. Prereq–5200)
An introductory survey of the history of medicine in Europe and America.

HMED 5210. Seminar: Theories and Methods in Medical History. (3 cr; A-F only)
Historiography of the history of medicine.

HMED 5211. Seminar: Theories and Methods in Medical History. (3 cr; A-F only. Prereq–5210)
Use of archives, primary sources. Supervised research project.

HMED 5940. Topics in the History of Medicine. (3-4 cr [max 16 cr])
Seminar on the historical relations between medicine and the State from the 18th to 20th centuries.

History of Science and Technology (HSCI)

Department of History of Science and Technology

Institute of Technology

HSCI 1212. Life on Earth: Perspectives on Biology. (4 cr. §HSCI 1214W)
How humans have developed theories/observations over 400 years about life on earth. Applying a historical perspective to issues today. Scientific ideas, environmental debates across national boundaries. Origins of life on earth. Evolution and natural theology. Ecosystems. Agricultural/industrial environmental degradation and species regeneration. "Guns, germs, and steel" hypothesis. Disease threats such as tuberculosis, influenza.

HSCI 1214W. Life on Earth: Perspectives on Biology. (4 cr. §HSCI 1212)
How humans have developed theories/observations over 400 years about life on earth. Applying a historical perspective to issues today. Scientific ideas, environmental debates across national boundaries. Origins of life on earth. Evolution and natural theology. Ecosystems. Agricultural/industrial environmental degradation and species regeneration. "Guns, germs, and steel" hypothesis. Disease threats such as tuberculosis, influenza.

HSCI 1714. Technology and Civilization: Stone Tools to Steam Engines. (4 cr. §HSCI 3714)
History of technology in its cultural context from earliest times to the Industrial Revolution. Neolithic Revolution, Bronze and Iron Ages, ancient civilizations, Greece, Rome, Middle Ages, and Renaissance.

HSCI 1715. Technology and Civilization: Waterwheels to the Web. (4 cr)
Relations of technology to culture since Industrial Revolution. Diffusion of Industrial Revolution, modes of adaptation by different cultures, social impact.

HSCI 1814. Revolutions in Science: The Babylonians to Newton. (4 cr. §HSCI 3814)
Development and changing nature of sciences in their cultural context. Babylonian/Greek science. Decline/transmission of Greek science. Scientific Revolution (1500-1700) from Copernicus to Newton.

HSCI 1815. Revolutions in Science: Lavoisier, Darwin, and Einstein. (4 cr. §HSCI 3815)
Development and changing nature of sciences in their cultural context. Newton and new mechanics. New chemistry. Light. Darwin and species. New experimental biology. Atomic/nuclear physics. Relationships among science, technology, society, and politics.

HSCI 1905. Freshman Seminar. (2 cr; A-F only. Prereq–Fr with no more than 30 cr or FRFY)
Topics vary. See *Class Schedule*.

HSCI 3211. Biology and Culture in the 19th and 20th Centuries. (3 cr. §HSCI 5211)
Changing conceptions of life and aims and methods of biology; changing relationships between biology and the physical and social sciences; broader intellectual and cultural dimensions of developments in biology.

HSCI 3242. The Darwinian Revolution. (3 cr. §HSCI 5242)
Development of evolutionary thought in 19th/20th centuries. Emphasizes Darwin's theory of evolution by natural selection. Scientific, economic, political, religious, philosophical dimensions of Darwinism. Comparative reception of Darwinism in different countries/cultures.

HSCI 3244. History of Ecology and Environmentalism. (3 cr. §HSCI 5244)
Development of ecological thought from 18th century natural theology to contemporary ecology and conservation biology; changing views of the "balance" and the "economy" of nature; conceptual and methodological developments in ecosystems ecology; connections between ecology and conservation, and between population and environmental politics.

HSCI 3331. Technology and American Culture. (3 cr. §HSCI 5331)
American technology in its cultural and intellectual context from 1790 to present. Transfer of technology to America; infrastructure promoting economic growth; social response to technological developments.

HSCI 3332. Science and American Culture. (3 cr. §HSCI 5332)
American science since 1600, including transfer of science to America; development of indigenous traditions for pursuit of science; infrastructure for education and research; public response to scientific development.

HSCI 3333H. Honors Course: Issues in Twentieth Century American Science and Technology. (3 cr)
Historical approach to understanding science and technology. Emphasizes intellectual, political, and social contexts. Decision-making by practitioners on issues of importance to the profession and the community. Topics relating to popular science, science, and warfare.

HSCI 3401. Ethics in Science and Technology. (3 cr. §HSCI 5401)
Historical issues involve research ethics including utilitarian, social Darwinian, and other ethical systems developed in science. Ethical problems posed by modern science and technology, including nuclear energy, chemical industry, and information technologies.

HSCI 3714. Technology and Civilization: Stone Tools to Steam Engines. (4 cr. §HSCI 1714)
History of technology in its cultural context from earliest times to the Industrial Revolution. Neolithic Revolution, Bronze/Iron Ages, ancient civilizations, Greece, Rome, Middle Ages, Renaissance.

HSCI 3715. Technology and Civilization: Waterwheels to the Web. (4 cr)
Relations of technology to culture since Industrial Revolution. Diffusion of Industrial Revolution, modes of adaptation by different cultures, social impact.

HSCI 3814. Revolutions in Science: The Babylonians to Newton. (4 cr. §HSCI 1814)
Development and changing nature of sciences in their cultural context. Babylonian/Greek science. Decline/transmission of Greek science. Scientific Revolution (1500-1700) from Copernicus to Newton.

HSCI 3815. Revolutions in Science: Lavoisier, Darwin, and Einstein. (4 cr. §HSCI 1815)
Development and changing nature of sciences in their cultural context. Newton and new mechanics. New chemistry. Light. Darwin and species. New experimental biology. Atomic/nuclear physics. Relationships among science, technology, society, and politics.

HSCI 4050. Special Topics in History of Science. (3 cr)
Topics specified in *Class Schedule*.

HSCI 4060. Special Topics in History of Technology. (3 cr)
Topics specified in Class Schedule

HSCI 4111. History of 19th-Century Physics. (3 cr. §PHYS 4111. Prereq–General physics or #)
Legacy of 17th-century experimental and theoretical physics. Experimental and theoretical discoveries in 19th-century physics (light, atomic theory, heat, thermodynamics and statistical mechanics, electromagnetism) within the context of educational, institutional, and political developments in Europe and the United States.

HSCI 4121. History of 20th-Century Physics. (3 cr. §PHYS 4121. Prereq–General physics or #)
Experimental and theoretical discoveries in 20th-century physics (modern physics, theory of relativity, quantum theories, nuclear physics to World War II) within the context of educational, institutional, and political developments in Europe and the United States.

HSCI 4125. The Nuclear Age. (3 cr)
Discoveries of X-rays, radiation, the atom and its nucleus, and subatomic particles. Development of nuclear weapons/power. Nuclear legacies of Hiroshima, Eniwetak, Chernobyl, and the cold war.

HSCI 4302. History of High-Technology Weapons. (3 cr)
Ancient missile launchers, gunpowder, cannons, and their role in expansion of West. Influence of arms-making on American system of manufacture. Naval warfare, air power, nuclear weapons, ICBMs, chemical/biological warfare, stealth/smart weapons.

HSCI 4321. History of Computing. (3 cr. §CSCI 4921)
Developments in the last 150 years; evolution of hardware and software; growth of computer and semiconductor industries and their relation to other business areas; changing relationships resulting from new data-gathering and analysis techniques; automation; social and ethical issues.

HSCI 4455. Women, Gender, and Science. (3 cr. §WOST 4102)
Three intersecting themes analyzed from 1700s to the present: women in science, sexual and gendered concepts in modern sciences, and impact of science on conceptions of sexuality and gender in society.

HSCI 5211. Biology and Culture in the 19th and 20th Centuries. (3 cr. §HSCI 3211)
Changing conceptions of life and aims and methods of biology; changing relationships between biology and the physical and social sciences; broader intellectual and cultural dimensions of developments in biology.

HSCI 5242. The Darwinian Revolution. (3 cr. §HSCI 3242)
Development of evolutionary thought in 19th/20th centuries. Emphasizes Darwin's theory of evolution by natural selection. Scientific, economic, political, religious, philosophical dimensions of Darwinism. Comparative reception of Darwinism in different countries/cultures.

HSCI 5244. History of Ecology and Environmentalism. (3 cr. §HSCI 3244)
Development of ecological thought from 18th century natural theology to contemporary ecology and conservation biology; changing views of "balance" and the "economy" of nature; conceptual and methodological developments in ecosystems ecology; connections between ecology and conservation, population and environmental politics.

HSCI 5331. Technology and American Culture. (3 cr. §HSCI 3331)
Development of American technology in its cultural/intellectual context from 1790 to present. Transfer of technology to America. Establishment of an infrastructure promoting economic growth. Social response to technological developments.

HSCI 5332. Science and American Culture. (3 cr. §HSCI 3332)
Development of American science since 1600, including transfer of science to America. Development of indigenous traditions for pursuit of science. Establishment of infrastructure for education/research. Response of public to scientific development.

HSCI 5401. Ethics in Science and Technology. (3 cr. §HSCI 3401)
Historical issues involving ethics in science. Ethical problems posed by modern science/technology, including nuclear energy, chemical industry, and information technologies.

HSCI 5411. Art and Science in Early Modern Europe. (3 cr)
Interaction of art and science, from Renaissance to 19th century. Development of linear perspective, color theory, artistic practice, and scientific illustration/representation.

HSCI 5993. Directed Studies. (1-15 cr [max 15 cr]. Prereq–#)
Guided individual reading or study.

HSCI 5994. Directed Research. (1-15 cr [max 15 cr]. Prereq–#)

Hmong (HMNG)

Department of Asian Languages and Literatures

College of Liberal Arts

HMNG 1011. Beginning Hmong. (5 cr. §HMNG 3022, HMNG 4001)
Listening, speaking, reading, and writing skills. Emphasizes development of communicative competence.

HMNG 1012. Beginning Hmong. (5 cr. §HMNG 4002. Prereq–1011)
Continuation of 1011. Listening, speaking, reading, and writing skills. Emphasizes development of communicative competence.

HMNG 1015. Accelerated Beginning Hmong. (5 cr. Prereq–Ability in basic spoken Hmong)
Review of grammar/usage, practice in reading/writing. Introduction to Hmong literature and formal writing. Topics in Hmong culture.

HMNG 1016. Accelerated Intermediate Hmong. (5 cr. §HMNG 4006. Prereq–1015, ability in basic spoken Hmong)
Review of grammar/usage, continued practice in reading/writing. Expanded introduction to Hmong literature and formal writing. Selected topics in Hmong culture.

HMNG 3021. Intermediate Hmong. (5 cr. §HMNG 4003. Prereq–1012)
Listening, speaking, reading, and writing. Grammar review/elaboration. Authentic texts, cultural readings, basic compositions, oral presentations.

HMNG 3022. Intermediate Hmong. (5 cr. §HMNG 1011, HMNG 4001. Prereq–3021)
Continuation of 3021. Listening, speaking, reading, writing. Grammar review/elaboration. Authentic texts, cultural readings, basic compositions, oral presentations.

HMNG 3290. Hmong Language Teaching Tutorial. (1 cr [max 2 cr]. Prereq–Grade of A in 3022)
Students tutor beginning students of Hmong and are part of department's Hmong language team.

HMNG 4001. Beginning Hmong. (3 cr. §HMNG 1011, HMNG 3022. Prereq–passing score on GPT in another language or grad student)
Listening, speaking, reading, and writing skills. Emphasizes development of communicative competence. Meets with 1011.

HMNG 4002. Beginning Hmong. (3 cr. §HMNG 1012. Prereq–[4001, passing score on GPT in another language] or grad student)
Continuation of 1011. Listening, speaking, reading, and writing skills. Emphasizes development of communicative competence. Meets with 1012.

HMNG 4003. Intermediate Hmong. (3 cr. §HMNG 3021. Prereq–[4002, passing score on GPT in another language] or grad student)
Listening, speaking, reading, writing. Grammar review/elaboration. Authentic texts, cultural readings, basic compositions, oral presentations. Meets with 3021.

HMNG 4004. Intermediate Hmong. (3 cr. Prereq–[4003, passing score on GPT in another language] or grad student)
Continuation of 4003. Listening, speaking, reading, writing. Grammar review/elaboration. Authentic texts, cultural readings, basic compositions, oral presentations. Meets with 3022.

HMNG 4005. Accelerated Beginning Hmong. (3 cr. Prereq–ability in basic spoken Hmong)
Review of proper grammar/usage, practice in reading/writing. Introduction to Hmong literature and other formal writing. Topics on Hmong culture.

HMNG 4006. Accelerated Intermediate Hmong. (3 cr. §HMNG 1016. Prereq–[1015 or 4005], ability in basic spoken Hmong)
Review of proper grammar/usage, practice in reading/writing. Expanded introduction to Hmong literature and other formal writing. Topics on Hmong culture.

HMNG 5040. Readings in Hmong Texts. (2-4 cr [max 12 cr]. Prereq–1016 or 3022 with grade of at least B or #)
Comprehensive, multidimensional overview of Hmong oral forms/traditions. Hmong legends, mythology, folksongs, birth, marriage/funeral rites. History, social/cultural anthropology. Values, life ways of traditional village society. Societal changes resulting from emigration to U.S.

Honors Seminar (HSEM)

HSEM 1001H. Introduction to Arts and Sciences. (1 cr. Prereq–1st sem fr, honors)
Small-class discussion with outstanding faculty members. Meets for 10 weeks.

HSEM 1210H. Honors Book Discussion. (1 cr [max 2 cr]; S-N only)
Honors Book Discussion.

HSEM 2010H, 2020H, 2030H, 2040H, 2050H, 2060H, 2070H, 2080H, 2090H. Honors Seminar. (3 cr [max 9 cr]; A-F only. Prereq–[Fr or soph with less than 60 cr], honors)
Topic specified in *Course Guide*.

HSEM 2110V, 2120V, 2130V. Writing Intensive Honors Seminar. (3 cr [max 9 cr] Prereq–[Fr or soph], honors)
Topics course, often interdisciplinary, writing intensive.

HSEM 3010H, 3020H, 3030H, 3040H, 3050H, 3060H, 3070H, 3080H, 3090H. Honors Seminar. (3 cr [max 12 cr]; A-F only. Prereq–[Jr or sr], honors)
Special topics. Discussions, active learning. Often interdisciplinary.

HSEM 3093H. Directed Studies. (1-4 cr [max 16 cr]. Prereq–[Jr or sr], honors, #, Δ, ❑)
Additional research related to seminar topic.

HSEM 3110V, 3120V, 3130V, 3140V. Writing Intensive Honors Seminar. (3 cr [max 12 cr]. Prereq–[Jr or sr], honors)
Special topics course. Discussions, active learning. Often interdisciplinary in perspective.

HSEM 3210H. Honors Book Discussion. (1 cr [max 2 cr]. Prereq–[Jr or sr], honors)
Students read a text, meet to discuss. Lectures on text by faculty, other experts.

Horticultural Science (HORT)

Department of Horticultural Science

College of Food, Agricultural and Natural Resource Sciences

HORT 1001. Plant Propagation. (4 cr)
Principles and techniques of propagating plants by seeds, cuttings, grafts, buds, layers, and division. Lectures on principles; labs on practice of various propagating techniques.

HORT 1003. Master Gardener Core Course: Horticulture for Home & Garden. (3 cr)
Foundation in soils; botany; entomology; plant pathology; indoor, herbaceous, and wood plants; lawn fruits/vegetables; pesticides; wildlife. Emphasizes extension publications/resources useful in answering consumer horticulture questions.

HORT 1004. Building Your Horticulture Learning Community. (1 cr; A-F only. Prereq–[New NHS admit or new NAS admit], environmental horticulture major)
How to use personal, departmental, college, and University resources to increase learning. Building collegial relationships with other incoming students to form a "student learning community" that will support personal/professional growth.

HORT 1013. Floral Design. (2 cr [max 3 cr])
Design for use in commercial flower shops and at home. Principles/elements of design. Wedding arrangements. Corsages. Decorative use of dried materials.

HORT 1015. Woody and Herbaceous Plants. (4 cr)
How to identify plants around the world. A few hundred of the most important cultivated plants for northern climates, their distinguishing features, common uses, cultural specificities, and notable cultivars.

HORT 1031. Vines and Wines: Introduction to Viticulture and Enology. (3 cr. Prereq–21 yrs of age by date of 1st class meeting)
History of wine, principles of biology, culture of grapevine, fermentation, sensory evaluation of wine.

HORT 3002W. Greenhouse Management. (3 cr; A-F only. Prereq–1001)
Worldwide floricultural production; selection of greenhouse site, construction, heating, and cooling. Greenhouse cost accounting and analysis. Root media, sanitation, water, fertilization, chemical growth regulation, temperature, light, and marketing. Lab in greenhouse operations plus field trips.

HORT 3005. Environmental Effects on Horticultural Crops. (2 cr; A-F only. Prereq–[[1001, CHEM 1011] or #], ¶BIOL 3002)
Effects of environment on plant growth/physiology. How horticulturalists manipulate environment to produce high quality plants.

HORT 3090. Horticultural Practicum. (2-4 cr [max 12 cr]. Prereq–Jr or sr Hort major, #)
Approved field, laboratory, or greenhouse experiences in application of horticultural information and practices.

HORT 4000. International Experiences in Horticultural Science. (3 cr [max 6 cr]. Prereq–1001 or #)
Perspectives in horticultural science and cultural diversity through various international settings. Focuses on different aspects, depending on interests/expertise of lead faculty. First part of course is preparation for an international study tour of one to three weeks, usually during May Session.

HORT 4000H. International Experiences in Horticultural Science: Honors. (3 cr [max 6 cr]. Prereq–[1001 or #], honors)
Perspectives in horticultural science and cultural diversity through various international settings. Focuses on different aspects, depending on interests/expertise of lead faculty. First part of course is preparation for an international study tour of one to three weeks, usually during May Session.

HORT 4015. Advanced Woody and Herbaceous Plant Topics. (1 cr [max 7 cr] Prereq–1015)
Species, cultivars, identification, and use for each genus of one group of plants.

HORT 4021. Landscape Design and Implementation I. (4 cr. Prereq–1001, 1015)
Based on philosophy of sustainable landscape theory/practice. Emphasizes sustainability to all phases of landscape development. Lab includes design, implementation, and management of actual landscape.

HORT 4022. Applications in Computer-Aided Design for Landsapes. (3 cr. Prereq–5021)
Training in computer-aided design and related software programs for use in developing landscape design solutions. Focuses on practical, real life applications. Students develop base plans, concept, draft designs, and completed landscape design.

HORT 4061W. Turfgrass Management. (3 cr. Prereq–1001, SOIL 2125)
Biology of turfgrasses, ecology of landscape systems. Turfgrass installation, management, and culture of turfgrass communities and landscape plant systems. Sod production, industrial grounds, general lawn care, park/recreation areas, athletic field management. Business management, decision making programs. Problem solving, case studies.

HORT 4062. Turfgrass Weed and Disease Science. (3 cr. Prereq–4061, PLPA 2001)
Turfgrass weed/disease problems. How to deal with these problems using an integrated approach. Biology, identifying features, and management strategies for several turfgrass diseases/weeds. How to apply IPM principles to turfgrass weed/disease problems.

HORT 4071W. Applications of Biotechnology to Plant Improvement. (4 cr. Prereq–[BIOL 1009 or equiv or grad student], #)
Fundamentals of plant genetics, molecular biology, and plant biotechnology. Emphasizes their applications to plant propagation and crop improvement. Hands-on experience with crossing plants, analysis of phenotypes and segregation data, plant tissue culture/transformation, gel electrophoresis, molecular cloning, use of genetically modified crops. Principles of ethics/citizenship to decision making in plant genetics and biotechnology. Debate, discussion, writing exercises.

HORT 4072. Growing Plants Organically: What It Means To Be Green. (3 cr. Prereq–1001 or BIOL 2022 or PBIO 3XXX or equiv, jr or sr or #)
Science and ethics of organic cultivation. What is meant by "green" from a legal, scientific, and ethical perspective? Explore original literature on an organic practice, prepare a written report, and lead a class discussion.

HORT 4096. Professional Experience Program: Internship. (1-3 cr [max 6 cr] Prereq–COAFES undergrad, #, completed internship contract)
Professional experience in horticulture firms or government agencies attained through supervised practical experience. Students evaluate reports, consult with faculty advisers and employers.

HORT 4401. Plant Genetics and Breeding. (4 cr. §AGRO 4401. Prereq–BIOL 1009 or equiv or grad, #)
Principles of plant genetics and environmental variation. Applications of genetics to crop evolution and breeding of self-pollinated, cross-pollinated, and asexually propagated crops. Lab experiments investigate hybridization, variation, and selection.

HORT 5009. Pesticides in Horticulture: Their Use and Abuse. (3 cr; A-F only. Prereq–[ENT 4015 or ENT 4251], PLPA 2001)
History of and practical information about pesticides used by horticulture industry. Pesticide modes of action. Use, application methods, environmental effects. Final three weeks devoted to labs on practical mixing/delivery systems.

HORT 5018. Landscape Operations and Management. (3 cr. Prereq–1001 or #)
Business, managerial, and technical aspects of landscape management relative to environmental horticulture and green industry. Tasks associated with maintaining turf and woody/herbaceous plants in landscape. Relationship of those tasks to preparation/justification of labor, equipment, and supply budgets. Labs, demonstrations, hands-on experiences asociated with science and technically-based landscape maintenance/operations.

HORT 5021. Landscape Design and Implementation II. (4 cr. Prereq–4021)
Residential, commercial, and recreational sites. Architectural/graphic techniques, plan drawings, sections elevations, perspectives, working drawings. Grading and site manipulation, including surveying, irrigation, and drainage. Development of business/grounds management plans. Landscape estimating/bidding.

HORT 5023. Public Garden Management. (2 cr)
Overview of knowledge/skills necessary to manage a public garden. History of public gardens. Development of mission and vision. Planning and design. Operations. Education and research. Fund raising, business management, personnel, marketing, conservation.

HORT 5031. Sustainable Fruit Production Systems. (2 cr; A-F only. Prereq–1001, 3005)
Principles of fruit production. Emphasizes temperature fruit crops. Integrated management of fruit cropping systems, including site selection, cultural management practices, taxonomic classification, physiological/environmental control of plant development. Integration of writing into understanding various fruit cropping systems.

HORT 5032. Sustainable Commercial Vegetable Production Systems. (3 cr; A-F only. Prereq–[3005, Ent 3005, PLPA 2001, SOIL 2125] or #)
Principles of commercial vegetable production. Integrated management of vegetable cropping systems. Site selection/environment, seed/stand establishment, cultural management practices, commodity use, handling from harvest to market. Perspectives on types of vegetable cultivars. Origin, historical significance/improvement through breeding, nutrition/medicinal aspects, physiological/environmental control of development.

HORT 5041W. Nursery Management. (4 cr; A-F only. Prereq–[1001, 1015] or #)
Production, maintenance, and marketing of woody ornamental plants. Establishment/management of nursery or garden centers. Lab, field trips.

HORT 5051. Floriculture Crop Production. (4 cr; A-F only. Prereq–1001, 1015, 3002)
Propagation, production, and use of floral crops. Emphasizes bedding plants, perennials, and cut flowers. Growing, marketing, and using herbaceous plants. Cultural practices. Manipulation of environment for growth/quality. Lab, field trips.

HORT 5052. Specialty Greenhouse Crop Production. (3 cr; A-F only. Prereq–1001, 1015, 3002)
Media management, insect/disease control, management of annual versus perennial plant production systems. Soil modification, seed germination, transplanting, scheduling, weed control, fertilization/irrigation. Environment management, hydroponic solution management, pest management in closed environment. Post-harvest management/care, drying/dying procedures. Consumer surveys at Minneapolis and St. Paul farmers' markets.

HORT 5061. Turfgrass Science. (3 cr. Prereq–4061)
For advanced students in turf with career objectives in professional turf management. Emphasis on ecology, physiology, and theory of turf population dynamics and specialized management situations such as golf course, commercial sod production, and fine turf athletic settings.

HORT 5071. Restoration and Reclamation Ecology. (3 cr. Prereq–BIOL 2022 or BIOL 3002, BIOL 1001 or BIOL 3407 or equiv or #)
Ecological and physiological concepts as a basis for revegetation of grasslands, wetlands, forests, and other landscapes. Plant selection, stand establishment, evaluating revegetation success. State and federal programs that administer restoration and reclamation programs. Field trips within Minnesota.

HORT 5090. Directed Studies. (1-6 cr [max 18 cr]. Prereq–8 cr upper div Hort courses, #)
In-depth exploration of concepts, technology, materials, or programs in specific area to expand professional competency/self-confidence. Planning, organizing, implementing, and evaluating knowledge obtained from formal education and from experience.

Human Resource Development (HRD)

Department of Work and Human Resource Education

College of Education and Human Development

HRD 3001. Introduction to Human Resource Development. (3 cr)
Human resource development theories, principles, concepts, and practices.

HRD 3196. Profession and Practice of Human Resource Development. (2 cr. Prereq–HRD undergrad)
Skills/strategies necessary for HRD internships/careers.

HRD 3201. Introduction to Training and Development. (3 cr; A-F only)
Processes to carry out theoretically sound training/development practices. Systemic relationship with host organization or system.

HRD 3301. Introduction to Organization Development. (3 cr. Prereq–Undgergrad)
Organization development theories, principles, concepts, and practices. How development is used to direct change in an organization.

HRD 5101. Foundations of Human Resource Development. (1 cr)
Introduction to human resource development as a field of study and practice.

HRD 5102. Economic Foundation of Human Resource Development. (1 cr. Prereq–5101)
Introduction to economics as a core discipline supporting the theory and practice of human resource development.

HRD 5103. Psychological Foundation of Human Resource Development. (1 cr. Prereq–5101)
Introduction to psychology as a core discipline supporting the theory and practice of human resource development.

HRD 5104. Systems Foundation of Human Resource Development. (1 cr. Prereq–5101)
Introduction to system theory as a core discipline supporting the theory and practice of human resource development.

HRD 5105. Strategic Planning through Human Resources. (3 cr; A-F only. Prereq–5001 or 5101, 5102, 5103, 5104)
The theory and practice of strategically developing, utilizing, and aligning human resources as a major contributor to organizational and quality improvement success.

HRD 5106. Evaluation in Human Resource Development. (3 cr; A-F only)
Evaluation of human resource development efforts from the perspective of impact on organizations, work processes, and individuals, plus follow-up decisions.

HRD 5111. Facilitation and Meeting Skills. (1 cr)
Introduction to the disciplines of planning and running effective meetings. Tools and methods for meeting management and evaluation are presented within the context of organization development.

HRD 5196. Internship: Human Resource Development. (1-10 cr [max 10 cr]; S-N only. Prereq–5001, 5201 or 5301)
Students apply and contract for human resource development positions. Contracts describe specific HRD responsibilities to be fulfilled during internship and theory-to-practice learning outcomes.

HRD 5201. Training and Development of Human Resources. (3 cr; A-F only)
Training/development of human resources in organizations. Process phases of analysis, design, development, implementation, and evaluation.

HRD 5202. Training on the Internet. (3 cr)
Major concepts, skills, and techniques for giving and receiving training on the Internet.

HRD 5301. Organization Development. (3 cr; A-F only)
Introduction to major concepts, skills, and techniques for organization development/change.

HRD 5302. Managing Work Teams in Business and Industry. (3 cr; A-F only. Prereq–2 core courses in HRD)
Frameworks and strategies for developing effective work teams. Skill development in facilitating resolution of conflicts in organizations. Provides foundational information as well as practical applications for participants (upper-level and graduate students) to become small team leaders.

HRD 5405. Quality Improvement Through Human Resources. (3 cr; A-F only. Prereq–[5201, 5301] or #)
Quality management, productivity improvement theory/practice from a human resource perspective. Organization development/training as integral components of quality improvement. HR role within quality standards. History of quality improvement, contributions of major leaders.

HRD 5408. International Human Resource Development. (3 cr)
Problems, practices, programs, theories, and methodologies in human resource development as practiced internationally.

HRD 5409. Planning and Decision-Making Skills. (1 cr)
Introduction to the disciplines of planning and decision making typically used in process improvement interventions. Tools and methods for facilitating group decisions and problem solving.

HRD 5410. Survey of Research Methods and Emerging Research in Human Resource Development. (3 cr; A-F only. Prereq–[Registered, in attendance] at conference of Academy of HRD)
Role of research in HRD. Standards/criteria for evaluating research, critique of conference research papers, identification of emerging research themes. Offered in conjunction with the annual conference of Academy of HRD.

HRD 5496. International Field Study in Human Resource Development. (3 cr. Prereq–5001)
Field study of the organization development, personnel training and development, career development, and quality improvement theories and practices in a selected nation.

HRD 5624. Sales Training. (3 cr; A-F only)
Strategies and techniques for developing effective sales people.

HRD 5625. Technical Skills Training. (3 cr)
Analyzing technical skills training practices in business and industry. Systems and process analysis and trouble-shooting of work behavior; design methods and developing training materials.

HRD 5626. Customer Service Training. (3 cr; A-F only)
Overview of customer service strategies used by successful organizations and training practices used to develop customer-oriented personnel.

HRD 5627. Management and Supervisory Development. (3 cr)
Problems, practices, programs, and methodologies relating to the training and development of managers and supervisors, including needed competencies, needs assessment, delivery modes, and evaluation.

HRD 5770. Special Topics in Human Resource Development. (1-4 cr [max 12 cr])
Issues, methods, and knowledge in HRD areas. Topics vary.

HRD 5802. Educatiion and Human Resource Development Through Tourism. (3 cr; A-F only)
Policies/practices of education and human resource development in tourism industry.

HRD 5821. Diversity Issues and Practices in Work, Community, and Family Settings. (3 cr)
Nature of diverse populations and their unique learning and training needs, exemplary programs, and collaborative efforts among persons representing work, community, and family settings.

Human Resources and Industrial Relations (HRIR)

Industrial Relations Center

Curtis L. Carlson School of Management

HRIR 1907W. Freshman Seminar. (3 cr [max 6 cr]. Prereq–Fr)
Topics vary.

HRIR 3021. Human Resource Management and Industrial Relations. (3 cr. §HRIR 8021. Prereq–1102, ECON 1101, PSY 1001, 60 cr)
Role of human resource management in organizations. Labor markets, recruitment, selection, training, compensation, labor relations, and performance management. Evolution of work. Discrimination in employment. Work performance and its reward. Effects of changing technology.

HRIR 3031. Staffing and Selection: Strategic and Operational Concerns. (2 cr. Prereq–CSOM upper div undergrad major grad)
Introduction to theory/practice of staffing decisions: recruitment, selection, promotion, demotion, transfer, dismissal, layoff, retirement. Staffing analyzed from strategic/operational perspectives. Legal issues.

HRIR 3032. Training and Development. (2 cr. Prereq–CSOM upper div undergrad major grad)
Introduction to theory/research/practice of design/implementation/evaluation of employee training/development programs. Training as process for influencing individual/organizational outcomes (e.g., performance, job satisfaction, work climate).

HRIR 3041. The Individual in the Organization. (2 cr)
Focus on factors influencing individual work performance. Includes motivation, perceptual differences, career choice, psychological contracts, assumptions about workers/work, leadership/management, learning/skill development, openness to change. Examines evidence on current trends.

HRIR 3042. The Individual and Organizational Performance. (2 cr)
Factors influencing group, team, and organizational performance. Examines systems that drive organizational success. Topics include job design and organization structure, organization effectiveness measures, culture, group dynamics, teamwork; power and influence.

HRIR 3051. Compensation: Theory and Practice. (2 cr. Prereq–[[At least 60 sem cr or 75 qtr cr], 2.00 GPA] or Δ)
Introduction to compensation/reward programs in employing organizations. Theories of organizational/employee behavior used in design/implementation of pay programs. Design, implementation, and evaluation of job evaluation, salary surveys, skill-based pay, merit-based pay, and other compensation programs.

HRIR 3071. Union Organizing and Labor Relations. (2 cr. Prereq–CSOM upper div undergrad major grad)
Analysis of labor unions, employee associations, and collective bargaining within the framework of contemporary American legislation and policy. Covers forming/organizing labor unions; union, employee, and management strategies and responsibilities, historical influences on policy and practice in the private and public sectors.

HRIR 3072. Collective Bargaining and Dispute Resolution. (2 cr. Prereq–CSOM upper div undergrad major grad)
Collective bargaining, contract administration, grievance processing, interest/rights arbitration, strikes and related policies and practices of employers, workers, and labor unions in dealing with worker representation in the private and public sectors. Impact and transfer of practices to the non-union sector are considered.

HRIR 5000. Topics in Human Resources and Industrial Relations. (2 cr [max 8 cr])

HRIR 5021. Systems of Conflict and Dispute Resolution. (4 cr. Prereq–CSOM upper div undergrad major grad)
Introduction to theoretical and practical treatment of conflict settlement in interpersonal, work-related, community, business, and international settings. Lectures, discussions, observations of actual dispute resolution sessions, and lab exercises with students participating in dispute resolution simulations applied to real world conflicts.

HRIR 5022. Managing Diversity. (2 cr. Prereq–CSOM upper div undergrad major grad)
Ways to effectively manage increasingly diverse workforce. Human resource practices examined with respect to diversity. How to incorporate diversity into decision making to enhance organizational performance.

HRIR 5023. Employment and Labor Law for the HRIR Professional. (2 cr. Prereq–[[At least 60 sem cr or 75 qtr cr], 2.00 GPA] or grad student or #)
Application of statutes and case law to work settings. Civil rights and equal opportunity. Discrimination and harassment. Compensation and benefits. Employee protection and privacy, labor relations. Emphasizes application and ability to recognize legal aspects of HRIR issues.

HRIR 5024. Employee Performance: Appraisal and Management. (2 cr. Prereq–CSOM upper div undergrad major grad)
How employee performance is organized, appraised, and managed to achieve organizational/individual performance goals. Job design standards, employee appraisal systems, worker satisfaction.

HRIR 5025. Comparative and International Human Resources and Industrial Relations. (2 cr. Prereq–Grad majors must register A-F)
Emergence, evolution, structures, functions, current challenges of labor movements in industrialized societies. Critical differences in key human resource management practices. Industrial relations systems, collective bargaining in comparative perspective. International Labor Organization.

HRIR 5026. Innovative HR Leadership in the Context of Change and Uncertainty. (2 cr. Prereq–[[At least 60 cr], 2.00 GPA] or grad student or Δ; grad majors must register A-F)
Overview of leadership in managing human resources. Historical evolution. Major theories/models. Principles of effective HR leadership in practice. Effects of uncertainty/change on leadership style/practice. HR leadership as powerful management tool.

HRIR 5054. Public Policies on Employee Benefits: Social Safety Nets. (2 cr. Prereq–Undergrad in micro economics; HRIR grad majors must register A-F)
Analysis of social safety nets through government-mandated employee benefits: workers' compensation, unemployment insurance, social security, health insurance. Rationale for social safety nets. Administration/evaluation of existing programs. Effects on worker well-being and on behavior of employers/workers. Need for reform.

HRIR 5061. Public Policies on Work and Pay. (3 cr)
Analysis of public policies regarding employment, unions, and labor markets. Public programs affecting wages, unemployment, training, worker mobility, security, and quality of work life. Policy implications of the changing nature of work.

HRIR 5062. Personnel Economics. (2 cr. Prereq–[ECON 1101, at least 60 sem cr, 2.00 GPA] or HRIR grad major)
Application of economic tools to problems in human resources and industrial relations. Human capital/training. Incentives, information. Hiring, turnover.

HRIR 5991. Independent Study in Human Resources and Industrial Relations. (1-8 cr [max 8 cr]. Prereq–Δ or #)
Individual readings or research topics.

Humanities (HUM)

Department of Humanities

College of Liberal Arts

HUM 1001. Humanities in the West I. (4 cr. §HUM 3001)
Greek and Roman civilization, rise of Christianity. Epic and lyric poetry, drama, architecture, sculpture, philosophy religion. Integrative study of works by creative figures such as Homer, Hesiod. Aeschylus, Sophocles, Euripides, Aristophanes, Plato, Aristotle. Caesar, Lucretius Virgil, Ovid, Petronius, Augustine, Boethius.

HUM 1002. Humanities in the West II. (4 cr. §HUM 3002)
Sixth to Fourteenth centuries: Growth of Christendom; monasticism; feudalism and courtly love, rise of towns and universities. Art and architecture: Byzantine, Romanesque and Gothic. Music: Gregorian chant, minstrelsy, liturgical drama. Literature: epic, romance, Dante. Islam. Scholastic philosophy: Abelard, Aquinas.

HUM 1003. Humanities in the West III. (4 cr. §HUM 3003)
European civilization from 15th/16th centuries. Religious/cultural reaction in northern Europe, humanism, counter-reformation, religious wars, philosophy, literature, art, music. Works by creative figures such as Petrarch, Machiavelli, Erasmus, Luther, Michelangelo, Josquin.

HUM 1004. Humanities in the West IV. (4 cr. §HUM 3004)
European civilization from 17th/18th centuries. Old Regime through French Revolution/Napoleon, new science, Enlightenment, cult of sensibility, art, music. Integrative study of works by creative figures such as Cervantes, Descartes, Rembrandt, Bach, Pope, Voltaire, Rousseau, Goethe, Watteau, David, Goya, Mozart.

HUM 1005. Humanities in the West V. (4 cr. §HUM 3005)
Industrial Revolution, liberalism, socialism, romanticism. Impact of science, especially evolution theory, on religious/humanistic thought. Roots of existentialism: art, music. Wordsworth, Adam Smith, Marx, Dostoevsky, Delacroix, Courbet, Beethoven, Darwin, Nietzsche, Joyce, Monet, Wagner.

HUM 1006. Humanities in the West VI. (4 cr. §HUM 3006)
The Western world, 1914-1970. Ideas and forms of society and culture: Leninist, fascist-Nazi, Freudian. Existentialism, "the absurd"; influence of oriental spiritual traditions; art, music. Integrative study of works by creative figures such as Lenin, Freud, Kafka, Picasso, Stravinsky, Bartok, Gropius, Sartre, Ionesco, Jung, Watts, Pollock, Cage, Fellini.

HUM 1905. Topics: Freshman Seminar. (3 cr. Prereq–Fr)
Topics specified in *Class Schedule*.

HUM 1909W. Freshman Seminar. (3 cr [max 6 cr]; A-F only. Prereq–Freshman)
Topics specified in *Class Schedule*.

HUM 3001. Humanities in the West I. (4 cr. §HUM 1001)
Greek and Roman civilization, rise of Christianity. Epic/lyric poetry, drama, architecture, sculpture, philosophy of religion. Integrative study of works by creative figures such as Homer, Hesiod, Aeschylus, Sophocles, Euripides, Aristophanes, Plato, Aristotle. Caesar, Lucretius Virgil, Ovid, Petronius, Augustine, Boethius.

HUM 3002. Humanities in the West II. (4 cr. §HUM 1002)
Sixth to Fourteenth centuries: Growth of Christendom; monasticism; feudalism and courtly love, rise of towns and universities. Art and architecture: Byzantine, Romanesque and Gothic. Music: Gregorian chant, minstrelsy, liturgical drama. Literature: epic, romance, Dante. Islam. Scholastic philosophy: Abelard, Aquinas.

HUM 3003. Humanities in the West III. (4 cr. §HUM 1003)
European civilization from 15th/16th centuries. Religious/cultural reaction in northern Europe, humanism, counter-reformation, religious wars, philosophy, literature, art, music. Works by creative figures such as Petrarch, Machiavelli, Erasmus, Luther, Michelangelo, Josquin.

HUM 3004. Humanities in the West IV. (4 cr. §HUM 1004)
European civilization from 17th/18th centuries. Old Regime through French Revolution/Napoleon, new science, Enlightenment, cult of sensibility, art, music. Integrative study of works by creative figures such as Cervantes, Descartes, Rembrandt, Bach, Pope, Voltaire, Rousseau, Goethe, Watteau, David, Goya, Mozart.

HUM 3005. Humanities in the West V. (4 cr. §HUM 1005)
Industrial Revolution, liberalism, socialism, romanticism. Impact of science, especially evolution theory, on religious/humanistic thought. Roots of existentialism: art, music. Wordsworth, Adam Smith, Marx, Dostoevsky, Delacroix, Courbet, Beethoven, Darwin, Nietzsche, Joyce, Monet, Wagner.

HUM 3006. Humanities in the West VI. (4 cr. §HUM 1006)
The Western world, 1914-1970. Ideas and forms of society and culture: Leninist, fascist-Nazi, Freudian. Existentialism, "the absurd"; influence of oriental spiritual traditions; art, music. Integrative study of works by creative figures such as Lenin, Freud, Kafka, Picasso, Stravinsky, Bartok, Gropius, Sartre, Ionesco, Jung, Watts, Pollock, Cage, Fellini.

HUM 3021. Introduction to Historical Foundations of Modern Education. (3 cr. §EDPA 3021, EDPA 5021, HUM 4021)
Analysis and interpretation of important elements in modern education derived from pre-classical sources, the Greeks, Romans, Middle Ages, Renaissance, Reformation, Enlightenment, and Industrial Revolution. Basic background course.

HUM 3023. Introduction to History of Western Educational Thought. (3 cr. §EDPA 3023, EDPA 5023, HUM 4023)
Great educational classics of Western civilization, by: Plato, Aristotle, Quintilian, Montaigne, Milton, Locke, Rousseau, and others.

HUM 3027. Lyric Song in Medieval Culture. (3 cr)
Courtly, paraliturgical, and popular song traditions, 1100-1500, in specific contexts: castle, palace, monastery, nunnery, cathedral, theater, tavern, street and countryside. Social roles of men and women as patrons, performers, poets, composers. Writing historical narratives and recreating medieval performance traditions.

HUM 3029. Music in the 20th Century. (3 cr. §MUS 3029)
Surveys music in European and American culture from 1890s to present. Emphasizes interactions between high art, popular and ethnic musics, contributions of men and women as composers and performers, concurrent developments in the arts, dance, and literature, music as social commentary.

HUM 3036. Islam: Religion and Culture. (3 cr. §ARAB 3036, HIST 3493, RELA 3036)
Religion of Islam, faith, practices, sectarian splintering, expansion outside original home to status of world religion. Institutions. Status in world societies: Asia, Europe, Americas.

HUM 3256. Aesthetics, Arts, and Society: France, 1848-1900. (2 cr)
Major movements in painting, literature, and poetry in France during second half of 19th century. Aesthetic concepts of artists and their critics, in context of historical events and social and political changes.

HUM 3281. European Intellectual History: the 18th and 19th Centuries. (3 cr. §HIST 3281)
First of a two-semester course dealing with logical, philosophical and methodological issues in the historical, social and natural sciences. The period covered is from the late seventeenth century to the mid-nineteenth.

HUM 3282. European Intellectual History: The Late 19th and 20th Centuries. (3 cr. §HIST 3282)
Second and concluding semester of readings in fundamental texts dealing with issues in logic, philosophy and the methodologies of the historical, social and natural sciences, from the late nineteenth century to the present. There is no text. Readings are from original sources.

HUM 3531. The Mysterious William Shakespeare: Authorship and World View. (4 cr; A-F only)
Focuses on Shakespeare authorship controversy through intensive study of Shakespeare of Stratford and Edward de Vere. Brilliance of court of Queen Elizabeth, ideas of renaissance England.

HUM 3635. Hinduism: From Guptas to 13th Century. (2 cr)
Development of classical Hinduism in its multiple cultural and social manifestations, from the 4th to 13th century C.E. Art, religion, mythology, literature, philosophy, caste system.

HUM 3677. Self-Realization in 20th-Century Western Literature. (2 cr)
Quest for meaning and process of individuation. Works by Conrad, Kate Chopin, Joyce, Sartre, Hesse.

HUM 3837. Nietzsche. (3 cr. §HUM 4837. Prereq–Jr or sr)
Nietzsche's contributions to philosophy, psychology, and criticism of religion, culture, and society.

HUM 3910. Topics in the Humanities. (2-4 cr [max 4 cr]. Prereq–Jr or sr or #)
Topics vary by offering.

HUM 3920. Honors Course: Topics in the Humanities. (2-4 cr [max 4 cr]. Prereq–Jr or sr or #)
Topics will vary from offering to offering, and will be specified in *Class Schedule*.

HUM 3970. Directed Studies. (1-4 cr [max 4 cr]. Prereq–#)
Guided individual reading or study.

HUM 3971. Directed Studies. (1-4 cr [max 4 cr]. Prereq–#)
Guided individual reading or study.

HUM 4021. Historical Foundations of Modern Education. (3 cr. §EDPA 3021, EDPA 5021, HUM 3021. Prereq–§: 3021, EDPA 3021, EDPA 5021)
Analysis and interpretation of important elements in modern education derived from pre-classical sources, the Greeks, Romans, Middle Ages, Renaissance, Reformation, Enlightenment, and Industrial Revolution. Basic background course.

HUM 4023. History of Western Educational Thought. (3 cr. §EDPA 3023, EDPA 5023, HUM 3023)
Great educational classics of Western civilization by: Plato, Aristotle, Quintilian, Montaigne, Milton, Locke, Rousseau, and others.

HUM 4837. Nietzsche. (3 cr. §HUM 3837. Prereq–Sr or grad student)
Nietzsche's contributions to philosophy, psychology, and criticism of religion, culture, and society.

HUM 4910. Topics in the Humanities. (2-4 cr [max 4 cr]. Prereq–Sr or grad)
Topics vary by offering.

HUM 4920. Honors Course: Topics in the Humanities. (2-4 cr [max 4 cr]. Prereq–Jr or sr or grad)
Topics will vary from offering to offering and will be specified in *Class Schedule*.

HUM 4970. Directed Studies. (1-4 cr [max 4 cr]. Prereq–Jr or sr or grad, #)
Guided individual reading or study.

HUM 4971. Honors Course: Directed Studies. (1-4 cr [max 4 cr]. Prereq–Jr or sr or grad, #)
Guided individual reading or study.

Icelandic (ICEL)

ICEL 1101. Intensive Modern Icelandic. (6 cr. §ICEL 4101. Prereq–Δ)
Basic listening, speaking, reading, writing. Everyday subjects (shopping, directions, family, food, housing). Culture/society. First half is at University of Minnesota-Twin Cities; second half is at University of Iceland-Reykjavik. Six-week course.

ICEL 4101. Intensive Modern Icelandic. (3 cr. §ICEL 1101. Prereq–Grad student, Δ)
Basic listening, speaking, reading, writing. Everyday subjects (shopping, directions, family, food, housing). Culture/society. First half is at University of Minnesota-Twin Cities; second half is at University of Iceland-Reykjavik. Six-week course. Meets with 1101.

Industrial Engineering (IE)

Department of Mechanical Engineering

Institute of Technology

IE 3041. Industrial Assignment I. (2 cr; A-F only. Prereq–ME upper division, registration in ME co-op program)
Industrial work assignment in engineering intern program. Evaluation based on student's formal written report covering semester's work assignment.

IE 4042. Industrial Assignment II. (2 cr; A-F only. Prereq–ME upper div, registration in ME co-op program)
Industrial work assignment in engineering intern program. Evaluation based on student's formal written report.

IE 4043. Industrial Assignment III. (4 cr; A-F only. Prereq–4042)
Solution of system design problems that require developing criteria, evaluating alternatives, and generating a preliminary design. Final report emphasizes design communication and describes design decision process, analysis, and final recommendations.

IE 4521. Statistics, Quality, and Reliability. (4 cr. Prereq–Upper div or grad student or CNR)
Random variables/probability distributions, statistical sampling/measurement, statistical inferencing, confidence intervals, hypothesis testing, single/multivariate regression, design of experiments, statistical quality control, quality management, reliability, maintainability, availability.

IE 5080. Topics in Industrial Engineering. (1-4 cr [max 4 cr]. Prereq–Upper div or grad student)
Topics vary each semester.

IE 5111. Systems Engineering I. (2 cr; A-F only. Prereq–IT upper div or grad student)
Overview of systems-level thinking/techniques in context of an integrated, design-oriented framework. Elements of systems engineering process, including lifecycle, concurrent, and global engineering. Framework for engineering large-scale, complex systems. How specific techniques fit into framework.

IE 5112. Introduction to Operations Research. (3 cr; A-F only. Prereq–[Math 2243 or Math 2373 or equiv], [one semester of probability or statistics], [IT upper div or grad student])
Survey of Operations Research models/methods in deterministic/stochastic settings. Linear programming, integer programming, networks, forecasting, Markov chains, and queuing systems. Examples from various application areas, such as systems engineering, logistics, design, and project management.

IE 5113. Systems Engineering II. (4 cr; A-F only. Prereq–5111, a course on basic probability, [IT upper div or grad student])
Systems engineering thinking/techniques presented in 5111. Hands-on techniques applied to specific problems. Topics pertinent to effectiveness of design process. Practices and organizational/reward structure to support collaborative, globally distributed design team.

IE 5441. Engineering Cost Accounting and Cost Control. (4 cr; A-F only)
Financial accounting, managerial accounting, engineering economics. Preparing financial statements, handling accounts payable/receivable, inventories, depreciation. Financing sources, capital cost/structure. Time value of money and of risk in managerial decision making. Design of cost accounting system and activity-based accounting.

IE 5511. Human Factors and Work Analysis. (4 cr; A-F only. Prereq–Upper div IT or grad student)
Human factors engineering (ergonomics), methods engineering, and work measurement. Human-machine interface: displays, controls, instrument layout, and supervisory control. Anthropometry, work physiology and biomechanics. Work environmental factors: noise, illumination, toxicology. Methods engineering, including operations analysis, motion study, and time standards.

IE 5512. Applied Ergonomics. (4 cr; A-F only. Prereq–Upper div IT or grad student, 5511)
Small groups of students work on practical ergonomic problems in local industrial firms. Projects cover a variety of ergonomic issues: workstation design, equipment and tool design, back injuries and material handling, cumulative trauma disorders, illumination and noise, and safety.

IE 5513. Engineering Safety. (4 cr; A-F only. Prereq–Upper div IT or grad student)
Occupational, health, and product safety. Standards, laws, and regulations. Hazards and their engineering control, including general principles, tools and machines, mechanics and structures, electrical safety, materials handling, fire safety, and chemicals. Human behavior and safety, procedures and training, warnings and instructions.

IE 5522. Quality Engineering and Reliability. (4 cr. Prereq–[4521 or equiv], [upper div or grad student or CNR])
Quality engineering/management, economics of quality, statistical process control design of experiments, reliability, maintainability, availability.

IE 5531. Engineering Optimization I. (4 cr. Prereq–Upper div or grad student or CNR)
Linear programming, simplex method, duality theory, sensitivity analysis, interior point methods, integer programming, branch/bound/dynamic programming. Emphasizes applications in production/logistics, including resource allocation, transportation, facility location, networks/flows, scheduling, production planning.

IE 5541. Project Management. (4 cr. Prereq–Upper div or grad student)
Project screening/selection, multiple-criteria methods for project evaluation, project structuring/work breakdown, project teams, project scheduling, resource management, life-cycle costing, project control, project termination, research/development projects, computer support for project management.

IE 5545. Decision Analysis. (4 cr. Prereq–4521 or equiv)
Normative theories of decision making. Emphasizes structuring of hard decision problems arising in business and public policy contexts. Decision trees, expected utility theory, screening prospects by dominance, assessment of subjective probability, multiple attribute utility, analytic hierarchy process, benchmarking with data envelopment analysis, basics of game theory.

IE 5551. Production Planning and Inventory Control. (4 cr. Prereq–CNR or upper div or grad student)
Inventory control, supply chain management, demand forecasting, capacity planning, aggregate production and material requirement planning, operations scheduling, and shop floor control. Quantitative models used to support decisions. Implications of emerging information technologies and of electronic commerce for supply chain management and factory operation.

IE 5552. Design and Analysis of Manufacturing Systems. (4 cr. Prereq–Upper div or grad student)
Flow lines, assembly systems, cellular manufacturing systems, and flexible manufacturing systems. Emphasis is on methodologies for modeling, analysis and optimization. Lead time analysis, capacity and workload allocation, scheduling and shop floor control, work-in-process management, facilities planning and layout, and information management.

IE 5553. Simulation. (4 cr. Prereq–CNR or upper div or grad student)
Discrete event simulation. Using integrated simulation/animation environment to create, analyze, and evaluate realistic models for various manufacturing, assembly, and material handling systems. Experimental design for simulation. Random number generation. Selecting input distributions. Evaluating simulation output.

Information and Decision Sciences (IDSC)

Department of Information and Decision Sciences

Curtis L. Carlson School of Management

IDSC 3001. Information Systems for Business Processes and Management. (3 cr; A-F only. Prereq–[BA 1001 or experience using Windows/Internet], 30 cr)
Developing/using IS to support business processes, managerial decision making, and organizational strategy. Technology components of IS. Impact on organizations. Creation/change processes. Managerial issues. Techniques for designing, developing, and implementing IS. Databases and user interfaces. Computer/communications network platforms. Internet, e-business, and e-commerce applications.

IDSC 3201. Introduction to Programming for Systems Development. (4 cr; A-F only. Prereq–3001, MIS major)
Programming language syntax and control logic. User interface design. File/database access. Structured, event, and object-oriented design. Coding, testing, and debugging. Hands-on use of application-development environment and contemporary-development tools.

IDSC 3202. Analysis and Modeling for Business Systems Development. (4 cr; A-F only. Prereq–3001)
Data modeling, database querying using SQL, use of database management systems. Process modeling of work flow, data flow, and organization flow. Decomposition. Traditional/object-oriented analysis with use cases and user interface design.

IDSC 4131. Advanced Database Design and Administration. (3 cr; A-F only. Prereq–4103)
Role, organization, functions, and tools of data administration. Data planning and information architectures. Object-oriented DBMS and support for graphics and CAD/CAM applications. Data security, maintaining database integrity, and managing data shared, networked or distributed environment. Strategies for using advanced DBMS tools and CASE tools.

IDSC 4153. Telecommunications: Domestic and International Policy and Regulation. (3 cr; A-F only. Prereq–3001)
Regulation and policy making in telecommunications. Evolution of the industry. Industry structure. Models for policy. Roles and relationships of U.S. standards organizations, the telecommunications industry, and governmental units. Evolution of international telecommunications organizations and regulatory systems. Analysis of current issues.

IDSC 4203. Information Technology Infrastructure. (4 cr; A-F only. Prereq–3201, 3202)
Technology/infrastructure for developing large-scale information systems. Processes to identify, evaluate, and select appropriate infrastructure components. Application of systems analysis and design techniques in a class project.

IDSC 4204. Managing Information Services. (4 cr; A-F only. Prereq–3202)
Information services as a service function. Techniques, activities, and issues for management/control of systems development at project level. Relationship of function, roles, and organizational structures. IS planning/business strategy, skill development, career pathing. Management of acquisition, subcontracting, outsourcing, operations, and user support.

IDSC 4401. Information Security. (2 cr)
Concepts/issues of security and data integrity threats that undermine utility, robustness, and confidence in electronic technologies in facilitating business transactions.

IDSC 4421. Financial Information Systems and Technologies. (2 cr; A-F only. Prereq–3001)
IS in financial services, corporate financial operations, and investment management. Traditional vs. electronic financial markets, computerized trading, digital sources of financial data, electronic money, and decision technologies in financial services. Software development skills for personal investments.

IDSC 4431. Advanced Database Design. (2 cr; A-F only. Prereq–3202)
Comparative review of data modeling methodologies. Advanced constructs in database design. Modeling subtypes and supertypes, ternary and higher-order relationships, integrity constraints. CASE tools; representation of facts; verbalization of a data model for human understanding and validation.

IDSC 4432. Advanced Database Management and Administration. (2 cr; A-F only. Prereq–4431 or ¶4431)
Managing information resources. Data planning, global information architectures. Advanced data manipulation languages, comprehensive DBMS facilities, and O-O DBMS. Analysis and data mining tools. Deploying/managing databases in a distributed environment. Data integrity, security, and privacy.

IDSC 4441. Electronic Commerce. (2 cr; A-F only. Prereq–3001)
Service relationships as a conceptual basis. Evolutionary execution strategy based on application of business principles of key functions using proven product development practices. Measurement/evaluation principles/practice. Case studies from advertising, marketing, and fulfillment functions.

IDSC 4461. Data Warehousing. (2 cr; A-F only. Prereq–3202)
Designing, developing, using, and managing data warehouses. Data warehousing vs traditional databases. ETL processes. Dimensional analysis and multidimensional modeling. Supporting business intelligence. Marketplace for vendors/tools. Operational performance/management of data warehouses. Deploying data warehouse on the Internet. Hands-on use of data warehousing tools.

IDSC 4490. Information Systems Special Topics. (2 cr [max 10 cr]; A-F only)
Discussion and analysis of current topics and developments in information systems.

IDSC 4491. Independent Study in Information Systems. (1-4 cr [max 4 cr]; A-F only. Prereq–#)

IDSC 4496. Information Systems Industry Internship. (2 cr; A-F only. Prereq–¶3202, Δ)
Learning by working in IS activities and receiving appropriate training from a sponsoring organization. Custom designed to meet pre-established learning objectives. "Work practice" plan required and must be approved by the organization and the director of IDSc undergraduate studies.

Information Networking (INET)

College of Continuing Education

INET 1001. Survey of Information Technology. (1 cr; A-F only)
Facets of information technology. Differentiating degree programs within information technology. Trends, career opportunities, governing standards.

INET 3350. Special Topics in IT Infrastructure. (1-3 cr [max 6 cr]; A-F only)
Topics in information technology infrastructure.

INET 4011. Network Administration. (4 cr; A-F only. Prereq–CSCI 4211 or #)
Network architecture, switching, routing, algorithms, protocols, infrastructure hardware, cable plant, security, network management. Lecture, expert guest speakers, labs.

INET 4021. Network Programming. (4 cr; A-F only. Prereq–[CSCI 4061 or #], 45 cr)
Network/distributed programming concepts. Design using C, Java, and other higher level programming languages. Sockets, TCP/IP, RPC, streaming, CORBA, .NET, SOAP. Labs use UNIX/Linux and MS Windows operating systems.

INET 4031. Systems Administration. (4 cr; A-F only. Prereq–[CSCI 4061 or #], 45 cr)
Integration of hardware, software and operational practice. Recap of machine architecture/organization. Complex technology issues, e.g. designing for scalability, configuring systems, architecting storage systems, monitoring/testing performance, executing recovery processes, managing software licenses. Lab based, Microsoft Server, and Linux OS.

INET 4041. Emerging Network Technologies and Applications. (3 cr; A-F only. Prereq–CSCI 4211 or #)
Underlying theory. Driving needs (technological, business). Developing technology. Competing technologies. Lectures by guest expert speakers, case studies, labs.

INET 4051. IT Infrastructure Operations (Capstone). (3 cr; A-F only. Prereq–CSCI 42II, one INET concentration course, sr)
Network, server, and database operations. Infrastructure architecture, organizational structure, security, metrics, vendor relations, outsourcing, capacity planning, strategic planning, budgeting. Online case study.

INET 4061. Introduction to Data Warehousing. (3 cr; A-F only. Prereq–4707 or CSCI 4707 or #)
Data warehouse architecture. Star schema and dimensional modeling. Extract-Load-Transform processes. Query design. Administration/operation. Lecture, lab.

INET 4081. Introduction to Software Engineering. (4 cr; A-F only. Prereq–[CSCI 4061 or equiv or #], 45 cr)
Theory/practice of software engineering. Software development, requirements/specifications, design, verification, validation.

INET 4131. Advanced Database Design. (3 cr; A-F only. Prereq–[4707 or CSCI 4707 or [hands-on experience using DBMS to define/populate/query a database using SQL]], basic understanding of [ER diagrams, relational databases], 45 cr)
High-level, conceptual data modeling to capture robust data semantics before implementing in a Relational DBMS. ER/relational DB design concepts and normalization. Subtypes/supertypes, ternary relationships, integrity constraints, business rules. Document/present designs. Design problem-solving with Object Role Modeling (ORM) and MS VisioEA.

INET 4153. Telecommunications: Domestic and International Policy and Regulation. (3 cr; A-F only. Prereq–45 sem cr, experience with Windows/Internet)
Regulation and policy making in telecommunications. Evolution of the industry. Industry structure. Models for policy. Roles/relationships of U.S. standards organizations, telecommunications industry, and governmental units. Evolution of international telecommunications organizations and regulatory systems. Current issues.

INET 4193. Directed Study. (1-4 cr [max 12 cr]; A-F only. Prereq–ITI student, Δ)
Independent project. Topic arranged with and supervised by ITI faculty.

INET 4707. Practice of Database Systems. (3 cr; A-F only. §CSCI 4707, CSCI 5707. Prereq–CSCI 4061, at least 45 cr completed; CSCI majors contact CSCI dept before registering)
Concepts, data models. Case studies, data manipulation languages, logical data models, database design, facilities for database security/integrity, applications.

Innovation Studies (IS)

College of Continuing Education

IS 5001. Introduction to Innovation Studies. (1-4 cr [max 4 cr]; A-F only. Prereq–Δ)
Key concepts/models from sociology, futures study, and business. Innovative, team leadership stratgies. Definition/application of just-in-time concept. Life-long self-improvement skills.

IS 5002. Final Project for Innovation Studies. (4 cr; A-F only. Prereq–Completion of IS requirements, Δ)
Either an internship in an organization or a hands-on study project on a contemporary issue or problem. Students apply expertise/ideas to a real-world situation.

IS 5100. Innovation Studies Seminar. (1-4 cr [max 24 cr]; A-F only. Prereq–Δ)
Innovation studies topics.

IS 5950. Special Topics. (1-4 cr [max 12 cr]; A-F only. Prereq–Δ)
Special interdisciplinary topics.

Institute of Technology (IOFT)

Institute of Technology

IOFT 1. Fundamentals of Engineering Review (E.I.T. Refresher). (0 cr; S-N only. Prereq–Bachelor's degree in engineering)
For engineering graduates who are preparing for the Engineer-in-Training examination, the first of two written exams required for registration as a professional engineer. Review of mathematics, chemistry, materials, statics, dynamics, strength of materials, thermodynamics, electric circuits, fluid mechanics, and engineering economics.

IOFT 1101. Environmental Issues and Solutions. (4 cr. Prereq–High school chemistry or equiv, one yr high school algebra)
Importance of science in understanding/solving various environmental problems. Case studies. Laboratory exercises.

IOFT 1311. Engineering Basics. (2 cr. Prereq–IT lower div or #)
Elements of engineering. Philosophy, tools, practice. Role of engineering in society. Engineering's relationship to science. Modeling, mathematical analysis, software tools, hands-on design-and-build project. Students work in teams.

IOFT 1312. Exploring Careers in Science and Engineering. (2 cr)
Career development self assessment, career decision making, writing resumes and cover letters, identifying/contacting employers, interviewing. Using Career Services to find internships, co-ops, and permanent positions. Topics presented by employers and by Career Services staff.

IOFT 1901. Freshman Seminar, Environment. (1-3 cr [max 4 cr]; A-F only. Prereq–Freshman)
Topics vary. See *Class Schedule*.

IOFT 1904. Freshman Seminar: International Perspective. (1-3 cr [max 4 cr]; A-F only. Prereq–Freshman)
Topics vary. See *Class Schedule*.

IOFT 1905. Freshman Seminar. (1-3 cr [max 4 cr]. Prereq–Freshman)
Topics vary. See *Class Schedule*.

IOFT 1906. Freshman Seminar: Environment/Writing Intensive. (1-3 cr [max 4 cr]; A-F only. Prereq–Freshman)
Topics vary. See *Class Schedule*.

IOFT 1909W. Freshman Seminar, International Perspective/Writing Intensive. (1-3 cr [max 4 cr]; A-F only. Prereq–Freshman)
Topics vary. See *Class Schedule*.

IOFT 1910W. Freshman Seminar, Writing Intensive. (1-3 cr [max 4 cr]; A-F only. Prereq–FYFR)
Topics vary. See *Class Schedule*.

IOFT 4101W. Communication Skills and Professional Practice. (3 cr; A-F only. Prereq–Upper div IT or #)
Non-technical skills/topics important in engineering/scientific work environment. Group/team dynamics, intellectual property, running meetings, professional ethics, effective communication, negotiation. Emphasizes realistic work scenarios requiring public speaking, teamwork, and writing.

Insurance and Risk Management (INS)

Industrial Relations Center

Curtis L. Carlson School of Management

INS 4100. Corporate Risk Management. (2 cr)
Theory applied to corporate risk management and insurance practices. Identification, measurement, and treatment of an organization.s financial risks integrated with its property, liability, workers compensation, and human resource risks. Selection and application of risk control and risk financing tools: risk retention, reduction and transfer, including insurance.

INS 4101. Employee Benefits. (2 cr. Prereq–4100 or 5100 or HRIR 3021 or #)
Design/administration of employee benefit plans and pension programs. Health insurance, disability plans. Salary reduction/deferred compensation programs, from social insurance to executive benefits. Multiple employer trusts. Alternative funding methods, including self-insurance. Ethical issues, legal liability, compliance with regulations.

INS 4200. Insurance Theory and Practice. (2 cr)
Risk theory is applied to practices in health, liability, life, property, and workers compensation insurance. Insurance marketing, pricing, underwriting, and claims administration, with adverse selection and moral hazard effects. Policy issues of tort versus no-fault compensation systems. Self-insurance and integrated risk financing methods.

INS 4201. Personal Financial Management. (2 cr)
Personal financial planning. Financial statements, cash flow/debt analysis, time value of money. Management of liability, disability, life, medical, and property risks. Investments, portfolio management. Tax reduction, employee benefits, retirement/estate planning. Ethical issues, regulation of financial planners.

INS 4202. Personal Financial Planning 2: Tax and Estate Planning Techniques. (2 cr. Prereq–4201 or 5201)
Estate planning, tax management techniques. Charitiable giving, probate process, use of health care directives, durable powers of attorney, revocable/irrevocable trusts, wills, asset distribution.

INS 5000. Personal Financial Planning 2: Tax and Estate Planning Techniques. (2 cr. Prereq–5201)
In-depth treatment of estate planning and tax management techniques introduced in 5201. Charitiable giving, probate process, use of health care directives, durable powers of attorney, revocable/irrevocable trusts, wills, asset distribution.

Inter-College Program (ICP)

College of Continuing Education

ICP 3000. Career Skills in the Professional Environment. (2 cr. Prereq–60 cr)
Career planning and job search processes appropriate to business/professional careers in corporate culture.

ICP 3001. Introduction to Multidisciplinary Studies. (3 cr. Prereq–Admitted to ICP Multidisciplinary Studies)
University study at a major research institution, its history/theory and expectations/outcomes. Students design their degree and select areas/courses. Institutional/student perspectives.

ICP 3075. Directed Study. (1-15 cr [max 15 cr]. Prereq–#)
Independent, directed study.

Interdepartmental Study (ID)

College of Liberal Arts-Adm

ID 1201. Career Exploration. (2 cr. Prereq–Fr or soph)
Students learn about their unique interests, skills, personality, values. Using this information in choosing major/career. Importance of internships, community service, other practical experiences.

ID 3201. Career Planning. (2 cr)
For juniors and seniors. A practical introduction to integrating individual talents, values, interests, and experience with critical career search strategies. Emphasis on understanding the marketplace, internet research, strategic resume writing, networking, and interviewing.

ID 3205. Law School Exploration. (2 cr)
Assessment of fit between individual, law school, and career field of law. Off-campus informational interviews, site visits.

ID 3211. Internship: Perspectives on Work. (4 cr. Prereq–Δ, internship through Career and Community Learning Center)
Combines practical experience in an internship with reflection upon work in our society. Organizational structure, work as a cultural phenomenon, history of concepts of work, relationship of work to broader demands of citizenship.

ID 3301. Introduction to Marxism. (3 cr)
Marxist philosophy as a worldview and methodology for study of processes in nature, society, and thought; linkage between technological development and evolution of class-divided societies; economic theory of capitalism and socialism; transition to socialism theory and practice; racism, sexism, homophobia, and national conflicts; aesthetics.

ID 3311. Museum Exhibits: From Initial Vision to Practical Implementation. (2 cr. Prereq–# (for more information, call Kevin Williams at (612) 624-3898))
Introduces students to museum exhibit development culminating in the students designing a science exhibit. Study content research, educational strategies of informal science education, design, production stages, marketing, and evaluation. Multidisciplinary involving teachers in graphic art, biology, communication, marketing, science education, and others.

ID 3321. AIDS/HIV: Ethical Issues. (3 cr)
Multidisciplinary examination of AIDS/HIV in cultural context. Ethical issues in educational, medical, and political responses to AIDS. Community resources available to people with HIV. Local debates about who gets what services. Required group service project in the community.

ID 3395. OMSSA: Pre-Law Program. (4 cr. Prereq–#)
Non published course. OMSAA program for selected students to participate in a summer exchange program with William Mitchell Law School.

ID 3551. Metro Internship Seminar: Corporate and Non-Profit Social Responsibility and Ethical Leadership. (6 cr. Prereq–#)
Cross disciplinary course. Combines theoretical work with a 10-week internship in a local corporation. Focuses on ethics, leadership, organizational change, and strategies for bringing about social change.

ID 3571. HECUA Off-Campus Study Program: Metro Urban Studies Term Reading Seminar. (4 cr. Prereq–¶3572, 3573, Δ; contact CCLC, 345 FraserH, 626-2044)
Roots/strategies for addressing urban inequality/poverty. Interdisciplinary field study, seminar work, internship.

ID 3572. HECUA Off-Campus Study Program: Metro Urban Studies Term Field Seminar. (4 cr. Prereq–¶3571, 3573, Δ; contact CCLC, 345 FraserH, 626-2044)
Roots/strategies for addressing urban inequality/poverty. Interdisciplinary field study, seminar work, internship.

ID 3573. HECUA Off-Campus Study Program: Metro Urban Studies Term Internship Seminar. (8 cr. Prereq–¶3571, 3572, Δ; contact CCLC, 345 FraserH, 626-2044)
Roots/strategies for addressing urban inequality/ poverty. Interdisciplinary field study, seminar work, internship.

ID 3581. HECUA Off-Campus Study Program: City Arts Reading Seminar. (4 cr. Prereq–¶3582, 3583, Δ; contact CCLC, 345 FraserH, 626-2044)
Arts, popular culture, social change. Interdisciplinary field study, seminar work, internship. Offered each spring semester.

ID 3582. HECUA Off-Campus Program: City Arts Field Seminar. (4 cr. Prereq–¶3581, 3583, Δ; contact CCLC, 345 FraserH, 626-2044)
Arts, popular culture, social change. Interdisciplinary field study, seminar work, internship. Offered each spring semester.

ID 3583. HECUA Off-Campus Program: City Arts Internship Seminar. (8 cr. Prereq–¶3581, 3582, Δ; contact CCLC, 345 FraserH, 626-2044)
Arts, popular culture, social change. Interdisciplinary field study, seminar work, internship. Offered each spring semester.

ID 3591. HECUA Off-Campus Study Program: Environmental Sustainability: Adaptive Ecosystem Management. (4 cr. Prereq–¶3592, ¶3593, ¶3594, Δ)
Examine ecological and physical processes that underlieenvironmental degradation and learn to set up ecological monitoring through in-depth case studies of adaptive management projects.

ID 3592. HECUA Off-Campus Study Program: Environmental Sustainability: Dimensions of Environmental Change. (4 cr. Prereq–¶3591, ¶3593, ¶3594, Δ)
How power dynamics and a global free market impact efforts to promote sustainability. The state's role in regulating resources and distributing environmental benefits. How social movements develop a collective future and mobilize actors to realize it.

ID 3593. HECUA Off-Campus Study Program: Environmental Sustainability: Field Methods. (2 cr. Prereq–¶3591, ¶3592, 3594, Δ)
Semester-long field research project that focuses on environmental issues. Students work with scientists and community members and conduct publishable research.

ID 3594. HECUA Off-Campus Study Program: EnvironmentalSustainability, Internship. (6 cr. Prereq–¶3591, ¶3592, ¶3593, Δ)
Students work with an organization addressing issues such as how to manage infrastructure for a booming economy and population in the metropolitan area, how rural communities can maintain viable livelihoods, and how to avert environmental decline in threatened ecosystems.

ID 3993. Directed Study. (1-4 cr [max 8 cr]. Prereq–#, Δ, ❑)
Guided individual reading or study.

Interdisciplinary Archaeological Studies (INAR)

College of Liberal Arts

INAR 5100. Topics in Interdisciplinary Archaeological Studies. (3 cr; A-F only. Prereq–InAr grad major or #)
Topics specified in the *Class Schedule*.

International Business (IBUS)

Curtis L. Carlson School of Management

IBUS 3001. International Business Topics. (3 cr. Prereq–Consent of Carlson International Programs)
Terms, concepts, and skills for analyzing fundamental business practices in the global economy.

IBUS 5100. International Business: Undergraduate Exchange. (4-16 cr [max 48 cr]; S-N only. Prereq–60 cr completed by time of study abroad, Carlson International Programs consent)
Semester of study at one of Carlson School's international exchange partner universities. Students select courses based on their academic needs/ interests. For current offerings, contact Carlson International Programs.

Italian (ITAL)

Department of French and Italian

College of Liberal Arts

ITAL 100. Reading Italian in the ARTS and Sciences. (0 cr)
Designed to teach a basic reading knowledge of the Italian language; full time is devoted to intensive reading and translation of texts from a wide variety of disciplines and to the teaching of translation techniques.

ITAL 1001. Beginning Italian. (5 cr. §ITAL 4001)
Emphasis on the four language skills (listening, speaking, writing, and reading) and on Italian culture.

ITAL 1002. Beginning Italian. (5 cr. §ITAL 4002)
Emphasis on the four language skills (listening, speaking, writing and reading) and on Italian culture.

ITAL 1003. Intermediate Italian. (5 cr. §ITAL 4003. Prereq–1001-1002)
Grammar review and development of intermediate level of proficiency in listening, reading, writing and speaking. Emphasis on some cultural aspects of contemporary Italy.

ITAL 1004. Intermediate Italian. (5 cr. §ITAL 4004. Prereq–1001, 1002, 1003)
Grammar review and development of intermediate level of proficiency in listening, reading, writing and speaking. Emphasis on some cultural aspects of contemporary Italy.

ITAL 1022. Accelerated Beginning Italian. (5 cr. Prereq–Italian [in high school or community college], score on placement exam too low to enter 1003)
Accelerated review of 1001 followed by material covered in 1002.

ITAL 1737. Friends and Countrymen. (3 cr)
Study of the problematic relation between friendship and citizenship as formulated by Dante in the "Inferno" and as we may interpret it in analyzing today's civic issues. Attention to Dante's reliance on and implicit critique of Aristotle's "Nicomachean Ethics". Taught in English.

ITAL 1837. Imagining Italy: Italian and Italian-American Culture, History, and Society Through Film. (4 cr. §ITAL 3837)
Italian/Italian-American history, culture, and society through films. Name of the Rose, Cinema Paradiso, Big Night, Life is Beautiful. Lectures expand upon issues raised by films from different disciplinary perspectives. Urban life, nationalism, opera, terrorism, violence, food, family, emigration, ethnicity, desire.

ITAL 3015. Reading, Conversation, and Composition. (4 cr. Prereq–1004)
Intensive reading, writing, speaking practice. Study of cultural materials in authentic formats.

ITAL 3201. Reading Italian Texts: Poetics, Rhetoric, Theory. (3 cr [max 9 cr]. §ITAL 5201. Prereq–3015)
A basic course in understanding the rhetorical and poetic aspects of language and literature; interpretive methods and theoretical concepts.

ITAL 3203. Italian Travelers: From the Enlightenment to the Present. (3 cr [max 12 cr]. §ITAL 5203. Prereq–3015)
Examines literary representations of travel, migration, immigration, exile, and tourism in Italy from the Enlightenment to the present.

ITAL 3209. Literature of Medieval City-States. (4 cr [max 16 cr]. Prereq–3015)
The beginnings of Italian vernacular literature in the context of the city-states of the 11th to 14th centuries.

ITAL 3219. Literature of the Despotisms. (4 cr [max 16 cr]. Prereq–3015)
Prose, verse, and drama of Italy under the Signorie and foreign invaders, 1400-1650.

ITAL 3301. Italian Dialects and Their Literature. (4 cr [max 16 cr]. Prereq–3015)
Study of selected Italian dialects and dialect texts in their cultural and historical settings.

ITAL 3305. Staging the Self: Theater and Drama in Modern Italy. (4 cr [max 16 cr]. §ITAL 5305. Prereq–3015)
Theatrical representations of the self in modern Italy. Particular attention given to issues of identity, gender, and class in theatrical works ranging from Alfieri's Mirra, Pirandello's Enrico IV to Dacia Maraini's Clyteminestra.

ITAL 3501. The World in the City: Italy 1100-1660. (3 cr [max 12 cr]. Prereq–3015)
The culture and civilization of Italian cities in medieval and early modern periods.

ITAL 3502. Making of Modern Italy: From the Enlightenment to the Present.. (3 cr [max 12 cr]. §ITAL 5502. Prereq–3015)
Italian literary, cultural, and symbolic practices from the Enlightenment to the present.

ITAL 3550. Topics in 19th Century Italy. (3 cr [max 12 cr]. Prereq–3015 or #)
Literature/culture of Italy in19th century. Content varies depending on instructor. Literary, critical, cultural, historical, or social issues. Specific author, genre, or topic of interest. Readings. Specific content posted in department and listed in Course Guide.

ITAL 3640. Topics in Italian Studies. (3 cr [max 12 cr])
Topics of interest in studies of Italian or Italian American culture of 20th century. Literary, critical, cultural, historical, or social issues, a specific author, a genre, or other topic. Readings could be literary, critical, historical, or political. Content varies by instructor, see Course Guide.

ITAL 3806. Negotiating the Terms: Italian Film and Literature. (3 cr [max 12 cr]. §ITAL 5806)
Examines cinematic representations of Italian literary texts; introduces the basic tools of literary and film analysis; discusses how both media impact Italian culture. Taught in English.

ITAL 3837. Imagining Italy: Italian and Italian-American Culture, History, and Society Through Film. (4 cr. §ITAL 1837)
Italian/Italian-American history, culture, and society through films: "Name of the rose," "Cinema Paradiso," "Big Night," "Life is Beautiful." Issues raised by films: urban life, nationalism, opera, terrorism, violence, food, family, emigration, ethnicity, desire.

ITAL 4001. Beginning Italian. (2 cr. §ITAL 1001. Prereq–Grad student)
Meets concurrently with 1001. See 1001 for course description.

ITAL 4002. Beginning Italian. (2 cr. §ITAL 1002. Prereq–Grad student)
Meets concurrently with 1002. See 1002 for course description.

ITAL 4003. Intermediate Italian. (2 cr. §ITAL 1003. Prereq–Grad student)
Meets concurrently with 1003. See 1003 for course description.

ITAL 4004. Intermediate Italian. (2 cr. §ITAL 1004. Prereq–Grad student)
Meets concurrently with 1004. See 1004 for course description.

ITAL 4303. Drama and Spectacle in Italy, 1200-1770. (4 cr [max 16 cr]. Prereq–3015)
Italian drama, festival and spectacle from the medieval sacred plays to the reform of the theater by Goldoni.

ITAL 4307. Novellistica. (3 cr [max 16 cr]. Prereq–3201, or permission of director of undergrad studies)
Study of birth and development of the novella genre. Reading and discussion of stories form the Novellino, Boccaccio, Sacchetti, Bandello, Bigolini, Basile, Verga, Deledda, Calvino, Introduction to formal study of novella structure.

ITAL 4970. Directed Readings. (1-4 cr [max 16 cr]. Prereq–#)
Meets unique requirements decided on by faculty member and student. Individual contracts list contact hours, number of credits, written and other work required.

ITAL 5201. Reading Italian Texts: Poetics, Rhetoric, Theory. (3 cr [max 12 cr]. §ITAL 3201. Prereq–Grad student or #)
Rhetorical/poetic aspects of language and literature. Interpretive methods, theoretical concepts.

ITAL 5203. Italian Travelers: From the Enlightenment to the Present. (3 cr [max 12 cr]. §ITAL 3203. Prereq–Grad student or #)
Literary representations of travel, migration, immigration, exile, and tourism in Italy, from Enlightenment to present.

ITAL 5209. Trecento Literature: Ruling the Canon. (4 cr [max 16 cr]. Prereq–3015, 3201 or #)
Works of Boccaccio and Petrarch and their role in establishing the canon of Italian vernacular literature. Taught in English also as MeSt 5610.

ITAL 5289. The Narrow Door: Women Writers and Feminist Practices in Italian Literature and Culture. (4 cr [max 16 cr]. Prereq–3015)
Focuses on issues of gender, sexual difference, equality, and emancipation raised by Italian women writers and thinkers from the 19th century to the present.

ITAL 5305. Staging the Self: Theater and Drama in Modern Italy. (4 cr [max 16 cr]. §ITAL 3305. Prereq–Grad student or #)
Theatrical representations of the self in modern Italy. Focuses on issues of identity, gender, and class in theatrical works ranging from Alfieri's Mirra, Pirandello's Enrico IV to Dacia Maraini's Clyteminestra.

ITAL 5321. Italian Renaissance Epic. (4 cr [max 16 cr]. Prereq–3015, 3201 or #)
Study of the narrative poems of Boiardo, Ariosto, and Tasso in the context of the fashioning of early modern Europe.

ITAL 5337. Nation and Narration: Writings in the 19th Century. (4 cr [max 16 cr]. Prereq–3015)
Introduces the construction of modern Italian national identity by examining the role that literature plays in this process. Works by Manzoni, Foscolo, Leopardi, Gioia, Verga, Serao, and Deledda studied in the context of a range of sociopolitical and cultural issues.

ITAL 5401. Mondo di Dante. (4 cr [max 16 cr]. Prereq–3015, 3201 or #)
Intensive reading of Dante's Inferno, Purgatorio, and Vita Nuova with emphasis on Dante's linguistic and cultural contributions.

ITAL 5502. Making of Modern Italy: From the Enlightenment to the Present. (3 cr [max 12 cr]. §ITAL 3502. Prereq–Grad student or #)
Italian literary, cultural, and symbolic practices, from Enlightenment to present.

ITAL 5550. Topics in 19th Century Italy. (3 cr [max 12 cr]. Prereq–ITAL 3015 or #)
Explores the literature and culture of Italy in the 19th century. Content will vary depending on the instructor. Topics and readings may include literary, critical, cultural, historical, and/or social issues, a specific author, a genre, or other topics of interest for the period. Specific content will be posted in the department and listed in the Course Guide.

ITAL 5609. World of Dante. (4 cr [max 8 cr])
Taught in English. Intensive reading of Dante's Inferno, Purgatorio, and Vita Nuova with emphasis on the personal, poetic, and political stakes of the journey of Dante's pilgrim through hell to the earthly paradise.

ITAL 5640. Topics in Italian Studies. (3 cr [max 12 cr]. Prereq–ITAL 3015)
Topics of interest in studies of Italian and/or Italian American culture of the 20th century. Topics and readings may include literary, critical, cultural, historical, and/or social issues, a specific author, a genre, or other topics . Content varies by instructor. Specific content posted in the department and in the Course Guide.

ITAL 5806. Negotiating the Terms: Italian Film and Literature. (3 cr [max 12 cr]. §ITAL 3806. Prereq–Grad student or #)
Cinematic representations of Italian literary texts. Basic tools of literary/film analysis. How both media impact Italian culture. Taught in English.

ITAL 5970. Directed Readings. (1-4 cr [max 16 cr]. Prereq–#)
Meets unique requirements decided on by faculty member and student. Individual contracts list contact hours, number of credits, written and other work required.

Japanese (JPN)

Department of Asian Languages and Literatures

College of Liberal Arts

JPN 1011. Beginning Japanese . (6 cr. §JPN 4001)
An introduction to speaking, reading, and writing Japanese.

JPN 1012. Beginning Japanese . (6 cr. §JPN 4002. Prereq–1011)
Introduction to speaking, reading, and writing Japanese.

JPN 3001. Japanese Calligraphy and Appreciation I. (2 cr. Prereq–1001)
Basic tools (e.g., brush, sumi ink stick, rice paper). Practice in basic brush strokes. Different characters or hiragana in expressions that are appropriate for the season or that have cultural significance. Taught entirely in Japanese.

JPN 3002. Japanese Calligraphy and Appreciation II. (2 cr. Prereq–3001 or #)
Tools used in Japanese calligraphy (e.g., brush, sumi ink stick, rice paper). Basic brush strokes. Talk about/appreciation of calligraphy. Different characters or hiragana in expressions that are appropriate for the season or that have cultural significance. One-to-one feedback on practice calligraphy. Taught entirely in Japanese.

JPN 3021. Intermediate Japanese. (5 cr. §JPN 4003. Prereq–1012 or #)
Intermediate speaking, reading, and writing in Japanese.

JPN 3022. Intermediate Japanese. (5 cr. §JPN 4004. Prereq–3021 or #)
Intermediate-level instruction in speaking, reading, and writing in Japanese.

JPN 3031. Third-Year Japanese. (4 cr. Prereq–3022 or #)
Advanced intermediate-level instruction in speaking, reading, and writing Japanese. Development of reading proficiency in modern Japanese prose.

JPN 3032. Third-Year Japanese. (4 cr. Prereq–3031 or #)
Advanced intermediate-level instruction in speaking, reading, and writing Japanese. Development of reading proficiency in modern Japanese prose.

JPN 3090H. Honors Course: Tutorial. (1-4 cr [max 4 cr])
Tutorial.

JPN 3167. Re-examining "Geisha Girls." (3 cr. §AMST 3114)
Critically investigates conceptions/representations of Japanese women entertainers, commonly termed "geisha." Literary texts, visual/performing arts, film. Premodern/modern Japanese examples, examples from the United States.

JPN 3290. Japanese Language Teaching Tutorial. (1 cr [max 2 cr]. Prereq–Grade of A in 4042)
Students tutor beginning students of Japanese and are part of department's Japanese language team.

JPN 3451. Introduction to Japanese Linguistics. (3 cr. Prereq–3022 or #)
Analysis of structure and meaning of Japanese sentence patterns.

JPN 3993. Directed Studies. (1-15 cr [max 15 cr]. Prereq–#, Δ, ❑)
Directed study in topics of Japanese literature or linguistics.

JPN 4001. Beginning Japanese. (3 cr. §JPN 1011. Prereq–passing score on GPT in another language or grad student)
Speaking, reading, and writing Japanese. Meets with 1011.

JPN 4002. Beginning Japanese. (3 cr. §JPN 1012. Prereq–4001, passing score on GPT in another language or grad student)
Speaking, reading, and writing Japanese. Meets with 1012.

JPN 4003. Intermediate Japanese. (3 cr. §JPN 3021. Prereq–4002, [passing score on GPT in another language or grad student])
Speaking, reading, and writing in Japanese. Meets with 3021.

JPN 4004. Intermediate Japanese. (3 cr. §JPN 3022. Prereq–4003, [passing score on GPT in another language or grad student])
Speaking, reading, and writing in Japanese. Meets with 3022.

JPN 4005. Third Year Japanese. (3 cr. §JPN 4006. Prereq–3022 or 4004 or #)
Speaking, reading, and writing Japanese. Development of reading proficiency in modern Japanese prose. Meets with 3031.

JPN 4006. Third Year Japanese. (3 cr. §JPN 4005. Prereq–3031 or 4005 or #)
Speaking, reading, and writing Japanese. Development of reading proficiency in modern Japanese prose.

JPN 4041. Advanced Japanese Conversation and Composition. (4 cr. Prereq–3032 or #)
Practice in advanced spoken and written Japanese. Typical assignments include essays, summaries, and formal interviews in Japanese.

JPN 4042. Advanced Japanese Conversation and Composition. (4 cr. Prereq–4041 or #)
Practice in advanced spoken and written Japanese. Typical assignments include essays, summaries, and formal interviews in Japanese.

JPN 4061. Classical Japanese. (4 cr. Prereq–3021, 3022)
Study of the structures and arguments of classical Japanese poetry, narrative, and drama.

JPN 4062. Classical Japanese. (4 cr. Prereq–4061 or #)
Analysis of the structures and arguments of classical Japanese poetry, narrative, and drama.

JPN 5040. Readings in Japanese Texts. (2-4 cr [max 12 cr]; A-F only. Prereq–4041 or equiv or #)
Students read authentic materials of various types to increase reading/speaking ability. Topics specified in *Class Schedule*.

JPN 5071. Communicative Competence for Japan-Oriented Careers. (4 cr. Prereq–4041 or 4042 or #)
Effective communication using spoken and written Japanese in contexts likely to be encountered by a career-oriented professional in Japan.

JPN 5072. Communicative Competence for Japan-Oriented Careers. (4 cr. Prereq–5071 or #)
Effective communication using spoken and written Japanese in contexts likely to be encountered by a career-oriented professional in Japan.

JPN 5160. Topics in Japanese Literature. (4 cr [max 16 cr])
Literary, historical, or cultural study of selected Japanese literature.

JPN 5161. Women's Writing in Premodern Japan. (4 cr; A-F only. Prereq–3162, 4061 or # when readings are in Japanese; 3162 or # when in translation)
Works by women in premodern Japan including Genji monogatari, a lengthy narrative, Makura no soshi, a collection of vignettes, and poetry. Concerns include gendered writing system/authorship, narrative techniques, sexuality and the figure of the author, and strategies of fictionality.

JPN 5162. Tale Literature in Premodern Japan. (4 cr; A-F only. Prereq–3162, course from classical Japanese language sequence or #)
Tale literature, both Buddhist and secular, presents the world of the middle- to lower-class people. Rhetoric and religion, fiction and history, gender and sexuality, the role of the supernatural/fantastic, and re-tellings of earlier texts.

JPN 5163. Premodern Historical Narratives. (4 cr; A-F only. Prereq–3162, course from classical Japanese language sequence or #)
Narratives rooted in history. Issues include the problematization of reality, the formation of national identity, the idea of divine Imperial power, oral storytelling and its relationship to written texts, and the popularization of historical writings.

JPN 5164. Readings in Early Modern Japanese Literature. (4 cr; A-F only. Prereq–3032 when readings are in Japanese or #)
An examination of the stylistic and ideological aspects of the prose fiction, poetry, and non-fiction of the period 1863 to 1945. Offered in a rotating format alternating between readings in the original language and readings in English translation.

JPN 5165. Readings in Postwar and Contemporary Japanese Literature. (4 cr; A-F only. Prereq–3032 when offered in Japanese or #)
Literary and historical exploration of selected works published between 1945 and the present. Focus may be on a writer, a period, or a theme. Offered in a rotating format alternating between readings in the original language and readings in English translation.

JPN 5166. Literature by 20th-Century Japanese Women. (4 cr. Prereq–3032 or #)
Literary and historical exploration of selected works by Japanese women writers in a variety of genres. All literary texts read in Japanese; critical readings may be in English.

JPN 5251. History of the Japanese Language. (4 cr. Prereq–3032, 5451 or #)
Development of Japanese grammar from classical to the modern language.

JPN 5451. Structure of Japanese : Syntax/Semantics. (4 cr. Prereq–3032, LING 3001 or #)
Analysis of structure and meaning of Japanese sentence patterns.

JPN 5452. Structure of Japanese : Phonology/Morphology. (4 cr. Prereq–3032, LING 3001 or #)
Generative and nongenerative approaches to Japanese sound and word structure.

JPN 5453. Structure of Japanese : Discourse/Conversation Analysis. (4 cr. Prereq–3032, LING 3001 or #)
Analysis of Japanese written texts and conversations. Emergence of grammar in discourse, discourse/conversational structural units, patterns genre, strategies, style, and sociolinguistics variables.

JPN 5650. Proseminar: Japanese Linguistics. (4 cr [max 12 cr]. Prereq–5451 or 5452 or 5453 or #)
Selected topics in Japanese linguistics and/or contrastive analysis of Japanese and English with attention to contributions from Eastern and Western linguistic traditions.

JPN 5993. Directed Studies in Japanese. (1-15 cr [max 15 cr]. Prereq–#, Δ, ❑)
Individual study with guidance of a faculty member.

Jewish Studies (JWST)

Department of Classical and Near Eastern Studies

College of Liberal Arts

JWST 1034. Introduction to Jewish History and Civilization. (3 cr. §JWST 3034, RELA 1034, RELA 3034)
Jewish history, society, and culture from Second Temple period (5th century BCE) to modern era as illuminated by literature, philosophy, art, film, music, religious law/custom, and artifacts of daily life. Emphasizes political, social, and cultural contexts that shapeddevelopment of Jewish ideas, practices, and institutions.

JWST 1083. Jesus the Jew. (3 cr. §CLAS 1083, JWST 3083, RELA 1083, RELA 3083)
Historic figure of Jesus within context of first century Palestinian Judaism. Main groups/institutions of Judaism at time of Jesus. Rabbinic literature/traditions. Works describing Jesus' life/sayings (synoptic gospels). Jesus and the Law, Messianic ideals/expectations, problem of religious authority. Positions regarding Rome, its authority. James and the Jerusalem Church.

JWST 1201. The Bible: Context and Interpretation. (3 cr. §CNES 1201, CNES 3201, JWST 3201, RELA 3201)
Survey of literary and historical narrative texts from Pentateuch, Joshua, Judges, Samuel, Kings, and Ruth. Art of biblical narrative, major themes of biblical stories. Comparison with other Ancient Near Eastern literatures. Literary conventions of biblical writers.

JWST 1905. Freshman Seminar. (3 cr)
Topics specified in *Class Schedule*.

JWST 1909W. Remembering to Forget: The Holocaust and Its Afterlife. (3 cr; A-F only. §FREN 1909W. Prereq–Fr or less than 30 cr)
Holocaust as incomparable event and as ultimate measure of all traumatic events in history. Testimonies, artistic endeavors, popular culture, and theory. Emphasizes both urge to study Holocaust as singular event and drawbacks of hyper-memory bordering on amnesia.

JWST 3013W. Biblical Law and Jewish Ethics. (3 cr. §JWST 5013, RELA 3013W, RELA 5013)
Significance of religious law in Judaism. Babylonian background of biblical law. Biblical creation of the person as a legal category. Rabbinic transformations of biblical norms. Covenant in Christianity/Islam. Contemporary Jewish literature/philosophy.

JWST 3034. Introduction to Jewish History and Civilization. (3 cr. §JWST 1034, RELA 1034, RELA 3034)
Jewish history, society, and culture from Second Temple period (5th century BCE) to modern era as illuminated by literature, philosophy, art, film, music, religious law/custom, and artifacts of daily life. Emphasizes political, social, and cultural contexts that shapeddevelopment of Jewish ideas, practices, and institutions.

JWST 3083. Jesus the Jew. (3 cr. §CLAS 1083, JWST 1083, RELA 1083, RELA 3083)
Historic figure of Jesus within context of first century Palestinian Judaism. Main groups/institutions of Judaism at time of Jesus. Rabbinic literature/traditions. Works describing Jesus' life/sayings (synoptic gospels). Jesus and the Law, Messianic ideals/expectations, problem of religious authority. Positions regarding Rome, its authority. James and the Jerusalem Church.

JWST 3111. Too Jewish? The Complex Construction of the Jewish American Psyche in Literature, Art, and Film. (3 cr; A-F only)
Questions about image/location of Jews in American arts and pop culture. Examples from literature, music, film.

JWST 3112. Jewish Mysticism, Magic, and Kabbalah. (3 cr; A-F only. §JWST 5112, RELA 3112, RELA 5112)
Mystical traditions from early rabbinic traditions to Zohar (Book of Splendor) in 13th century. Literature of heavenly ascent (Hekhalot, Merkavah), Book of Creation (Sefer Yetzirah), precursors of Zohar. the Bahir. Schools of Provence, Gerona, and Zohar. Tension between legal/mystical aspects, magical theurgic techniques, evolution of doctrine of Sefirot, mystical interpretation of Scripture, erotic dimension.

JWST 3113. African American and Jewish American Relations in the United States. (3 cr)
Historical and social scientific study of relations between African Americans and Jewish Americans in the U. S. during the 20th century. Includes immigration, work, cultures, gender, and alliance, and conflict.

JWST 3115. Mishnah and Midrash in Translation. (3 cr. §JWST 5115, RELA 3115, RELA 5115)
Jewish law studied as a mirror of society and as a way to actualize its value. Consideration of original socioreligious contexts and current applications. Selections include biblical interpretations addressing moral, theological, legal, and literary problems.

JWST 3116. Jews and Popular Culture in 20th Century United States. (3 cr. §AMST 3116)
Many types of 20th century American popular culture shaped, in part, by European Jewish immigrants and their native born descendants. How theater, film, music, humor, and television were affected by the Jews' innovations, social marginality, their wish to assimilate and to resist assimilation to the culture. How the nation was and was not reshaped in the process.

JWST 3201. The Bible: Context and Interpretation. (3 cr. §CNES 1201, CNES 3201, JWST 1201, RELA 3201)
Survey of literary and historical narrative texts from Pentateuch, Joshua, Judges, Samuel, Kings, and Ruth. Art of biblical narrative, major themes of biblical stories. Comparison with other Ancient Near Eastern literatures. Literary conventions of biblical writers.

JWST 3315. Contemporary Israeli Literature in English. (3 cr. Prereq–Knowledge of Hebrew not required)
Modern short stories and poetry. Works of Agnon, Yizhar, Hazaz, Yhehoshua, Greenberg, Amihai, Pagis, and others. Alienation, the crisis of faith, war, holocaust, Jews and Arabs.

JWST 3401. The Art and Architecture of the Jewish People. (3 cr)
Jewish art and architecture from antiquity to 7th-century C.E. Issues include Jewish art and the Second Commandment, non-Jewish artistic traditions, the nature of Jewish art.

JWST 3521W. History of the Holocaust. (3 cr. §HIST 3727W, JWST 3521W, RELS 3521W)
Study of the 1933-1945 extermination of six million Jews and others by Nazi Germany on the basis of race. European anti-Semitism, implications of social Darwinism and race theory, perpetrators, victims, onlookers, resistance, and theological responses of Jews and Christians.

JWST 3522. History of the Arab-Israeli Conflict. (3 cr)
The events leading to the re-establishment of the State of Israel in 1948 and subsequent conflicts and negotiations up to present. Zionism and Arab resistance, Great Powers' involvement, War of Independence/First Palestine War, subsequent conflicts and their aftermath.

JWST 3631. Jewish Writers and Rebels in German, Austrian, and American Culture. (3 cr. §CSCL 3631, GER 3631)
Investigate literary and cultural modes of writing used by Jewish writers in Germany, Austria, and America to deal with problems of identity, anti-Semitism, and assimilation. Focus on 20th century. All readings (novels, poetry, stories) in English.

JWST 3632W. Jewish Women in the United States. (3 cr. §AMST 3632W, WOST 3403W)
Analyze of the cultural, social, economic, and religious conditions of European Jewry and American society in the 19th- and 20th-centuries that structured the lives of American Jewish women.

JWST 3900. Topics: Jewish Studies. (3 cr [max 15 cr]; A-F only)
Historical, religious, sociological, anthropological, and humanistic study of Judaism and the Jewish people. Approach, method of study vary with topic.

JWST 3970. Supplemental Discussion in Jewish Studies. (1 cr [max 3 cr]. Prereq–Concurrent registration)
Extra discussion section with T.A. Attached to concurrent 3xxx course.

JWST 4000W. Final Project, Writing Intensive. (4 cr; A-F only. Prereq–JWST major, permission of dir of undergrad studies)
Independent research/writing under supervision of a faculty sponsor. A student may approach any JwSt faculty member to develop a program of independent research/writing in an area of student's choosing.

JWST 4001W. Final Project, Writing Intensive. (1 cr; A-F only. Prereq–¶5xxx, JWST major, permission of dir of undergrad studies)
Independent research and writing, under supervision of a faculty sponsor. Student makes a contract with instructor to write an in-depth research paper, or comparable project, to be completed in conjunction with a JwSt 5xxx course.

JWST 5013. Biblical Law and Jewish Ethics. (3 cr. §JWST 3013W, RELA 3013W, RELA 5013)
Significance of religious law in Judaism. Babylonian background of biblical law. Biblical creation of the person as a legal category. Rabbinic transformations of biblical norms. Covenant in Christianity/Islam. Contemporary Jewish literature/philosophy.

JWST 5111. Problems in Historiography and Representation of the Holocaust. (3 cr. §HIST 5285. Prereq–JWST 3521 or RelS 3521 or #)
Focuses on issues connected with the Holocaust. Inclusiveness of other groups, Holocaust vs. .Shoah,. historiographical conflicts about perpetrators, an examination of the problems of representation in literature and art, problems of narrative theology after Auschwitz.

JWST 5112. Jewish Mysticism, Magic, and Kabbalah. (3 cr; A-F only. §JWST 3112, RELA 3112, RELA 5112)
Mystical traditions from early rabbinic traditions to Zohar (Book of Splendor) in 13th century. Literature of heavenly ascent (Hekhalot, Merkavah), Book of Creation (Sefer Yetzirah), precursors of Zohar. the Bahir. Schools of Provence, Gerona, and Zohar. Tension between legal/mystical aspects, magical theurgic techniques, evolution of doctrine of Sefirot, mystical interpretation of Scripture, erotic dimension.

JWST 5115. Mishnah and Midrash in Translation. (3 cr. §JWST 3115, RELA 3115, RELA 5115)
Jewish law studies as mirror of society and as way to actualize its value. Original socioreligious contexts, current applications. Biblical interpretations addressing moral, theological, legal, and literary problems.

JWST 5513. Scripture and Interpretation. (3 cr; A-F only. §RELA 5513)
Idea of divine revelation, its impact upon religion/literature. How history of Bible's creation, transmission, and interpretation help us think critically about role of idea of revelation in religious traditions. What is revelation? How does belief that a text is revealed affect the way it is read within the community for which it constitutes revelation?

JWST 5900. Topics in Jewish Studies. (3-4 cr [max 8 cr])
Topics specified in *Class Schedule*.

JWST 5992. Directed Readings. (1-12 cr [max 12 cr]. Prereq–#)
Guided individual reading or study.

Journalism and Mass Communication (JOUR)

School of Journalism and Mass Communications

College of Liberal Arts

JOUR 1001. Introduction to Mass Communication. (3 cr; A-F only. Prereq–Pre-jour or non-jour major)
Historical, economic, political, legal, ethical, and social aspects of mass communication. Changing media environment of books, magazines, newspapers, records, movies, radio, television, and the Internet in global context.

JOUR 1905. Freshman Seminar. (3 cr; A-F only. Prereq–Freshman)
Topics specified in *Class Schedule*.

JOUR 1910W. Freshman Seminar. (3 cr [max 6 cr]; A-F only. Prereq–Freshman)
Topics specified in *Class Schedule*.

JOUR 3004V. Honors: Information for Mass Communication. (3 cr. Prereq–Honors, [jour major or jour minor or approved IDIM major or ICP major or BIS major])
Information resources for professional/academic work in mass communication. Techniques for locating, retrieving, appraising, and verifying information acquired from public records, libraries, research institutions, databases, the Internet, observation, and interviews.

JOUR 3004W. Information for Mass Communication. (3 cr; A-F only. Prereq–Jour major or jour minor or approved IDIM major or ICP major or BIS major)
Information resources for professional/academic work in mass communication. Techniques for locating, retrieving, appraising, and verifying information acquired from public records, libraries, research institutions, databases, the Internet, observation, and interviews.

JOUR 3006. Visual Communication. (3 cr; A-F only. Prereq–Jour major or jour minor or design COMM premajor or design COMM major or graphic design premajor or graphic design major or approved IDIM major or ICP major or BIS major or #)
Visual media, role of images in mass communication. Social, cultural, historical, psychological approaches to visual communication.

JOUR 3007. The Media in American History and Law: Case Studies. (3 cr; A-F only. Prereq–Non-jour major or [jour major, course appr on prog plan] or [pre-jour, adviser approval])
Media in socioeconomic-political-technological context of a specific historical period. Focuses on legal context and ethics questions.

JOUR 3008. Mass Communication Processes and Structure. (3 cr; A-F only. Prereq–Non-jour major or [jour major, course appr on prog plan] or [pre-jour, adviser approval])
Communication theories as they relate to mass communication processes. Major structural aspects of mass communication systems.

JOUR 3101. News Reporting and Writing. (3 cr; A-F only. §JOUR 3101H. Prereq–[3004W or ¶3004W or 3004V], [jour major or jour minor or approved IDIM major or ICP major or BIS major], typing skill)
Basic news gathering, journalistic writing. Developing story ideas. Problems associated with handling of news/features. Professional standards/responsibilities.

JOUR 3101H. Honors: News Reporting and Writing. (3 cr; A-F only. §JOUR 3101. Prereq–[3004W or ¶3004W], [jour major or jour minor or approved IDIM major or ICP major or BIS major], honors, typing skill)
News gathering, journalistic writing. Developing story ideas. Problems associated with handling of news/features. Professional standards/responsibilities.

JOUR 3102. Visual Journalism. (3 cr; A-F only. Prereq–[3004V or 3004W or ¶3004W], [Jour major or approved IDIM major or ICP major or BIS major])
Introduction to nonfiction storytelling in multiple visual media. Photojournalism, news videography, print/Web graphics. Conceptualizing stories, information gathering, camera work, editing, presentation strategies for print/electronic media.

JOUR 3121. Intermediate News Reporting. (3 cr; A-F only. Prereq–[3004W or 3004V], 3101, [jour major or approved IDIM major or ICP major or BIS major])
Reporting news that is fundamental to basic beats in most news organizations. Crime, government, politics, environment, health, in-depth profiles, issues relating to civic life.

JOUR 3155. Publications Editing. (3 cr; A-F only. Prereq–3004W, 3101, [jour major or approved IDIM major or ICP major or BIS major])
Improving news/information copy through stylistically correct copyediting/rewriting. Selection/editing of news-editorial content for newspapers, magazines, and online services. Hands-on experience using news judgment to present information in print and on the Web.

JOUR 3173W. Magazine Writing. (3 cr; A-F only. Prereq–3004W, 3101, [jour major or approved IDIM major or ICP major or BIS major]; IDL sctions are open to non-majors; prereqs do not apply to IDL sections)
Writing feature articles for consumer/trade publications. Market free-lance methods.

JOUR 3201. Principles of Strategic Communication: Advertising. (3 cr; A-F only. Prereq–[3004V or 3004W or ¶3004W],[jour major or jour minor or design COMM premajor or design COMM major or graphics design premajor or graphics design major or approved IDIM major or ICP major or BIS major])
Market analysis, positioning, creative/media strategies, evaluation. Structure of advertising industry. Economic, social, and regulatory contexts influencing advertising.

JOUR 3202. Principles of Strategic Communication: Public Relations. (3 cr; A-F only. Prereq–[3004W or ¶3004W], [jour major or jour minor or approved IDIM major or ICP major or BIS major])
History/development of public relations practice/principles. Professional writing assignments in various institutional settings. Analysis/critique of public relations in contemporary society.

JOUR 3241. Creative Strategy and Copywriting. (3 cr; A-F only. Prereq–3004W, 3201, [jour major or approved IDIM major or ICP major or BIS major])
Advertising appeals/strategy. Advertising for print/broadcast. Individual/group projects.

JOUR 3251. Strategic Communication Research. (3 cr; A-F only. Prereq–3004W, [3159 or 3201 or 3202], [jour major or approved IDIM major or ICP major or BIS major])
Introduction to applied quantitative/qualitative research methods in advertising/public relations campaign development, management, and evaluation.

JOUR 3279W. Public Relations Writing and Campaign Tactics. (3 cr; A-F only. Prereq–[3004W, [3159 or 3201 or 3202], [jour major or approved IDIM major or ICP major or BIS major]] or # for professional jour track students)
Public relations tactics. Emphasizes professional skills in writing for various audiences/purposes.

JOUR 3321. Basic Media Graphics. (3 cr; A-F only. Prereq–[3004V or 3004W or ¶3004W], [jour major or approved IDIM major or ICP major or BIS major])
Relationships between text, type, and image in communicating information. Typical individual or group projects include creating a Web site, experimenting with images/text, creating a basic layout, and new media image-making/storytelling.

JOUR 3451. Electronic News Writing and Reporting. (3 cr; A-F only. Prereq–3004W, 3101, [jour major or approved IDIM major or ICP major or BIS major])
News writing, reporting, video photography/editing, on-air delivery.

JOUR 3551. Economics of New Media. (3 cr; A-F only. Prereq–Non-jour major or [jour major, course appr on prog plan] or [pre-jour, adviser approval])
Economic issues related to traditional/new media companies and emerging communications technologies.

JOUR 3552. Internet and Global Society. (3 cr; A-F only. Prereq–Non-jour major or [jour major, course appr on prog plan] or [pre-jour, adviser approval])
Structure/processes of the Internet and global society in a comparative context. The Internet, via the World Wide Web, as an ideal site to explore how/why societies come to see/know the world and its issues the way they do.

JOUR 3614. History of Media Communication. (3 cr; A-F only. Prereq–Non-jour major or [jour major, course appr on prog plan] or [pre-jour, adviser approval])
Historical perspective on tools of communication, from earliest times to present. Impact of new technologies on society.

JOUR 3741. People of Color and the Mass Media. (3 cr; A-F only. Prereq–Non-jour major or [jour major, course appr on prog plan] or [pre-jour, adviser approval])
Past/present depictions of people of color in movies, literature, radio/TV, etc, against anthropological, psychological, and sociological knowledge/experience. Emphasizes personal/political effects of media depictions.

JOUR 3745. Mass Media and Popular Culture. (3 cr; A-F only. Prereq–Non-jour major or [jour major, course appr on prog plan] or [pre-jour, adviser approval])
Mass media's role in formation of popular culture and cultural discourse. Prevalent media metaphors, caricatures, and stereotypes. Social/commercial pressures influencing media representation.

JOUR 3771. Mass Media Ethics: Moral Reasoning and Case Studies. (3 cr; A-F only. Prereq–Non-jour major or [jour major, course appr on prog plan] or [pre-jour, adviser approval])
Overview of ethical dilemmas faced by journalists, advertisers, and public relations and communications specialists. Case studies, ethical principles/theories, professional codes of ethics, standards that have been used by mass media.

JOUR 3776. Mass Communication Law. (3 cr; A-F only. Prereq–Jour major or jour minor or approved IDIM major or ICP major or BIS major or #)
Brief historical background, First Amendment rights, basic law of defamation, free press and fair trial, access to news, access to the press, privacy, contempt, obscenity, regulation of broadcasting/advertising.

JOUR 3796. Mass Media and Politics. (3 cr; A-F only. Prereq–Non-jour major or jour major with course appr on prog plan or pre-jour with adviser approval)
Analysis of role of mass media in politics. Emphasizes television and electoral campaigns. News coverage vs newsmaking. Free press in democracy.

JOUR 3990. Special Topics in Mass Communication: Professional. (3 cr [max 6 cr]; A-F only. Prereq–Jour major or approved IDIM major or ICP major or BIS major)
Professional-skills-learning opportunity not regularly offered. Topics specified in *Class Schedule*.

JOUR 3991. Special Topics in Mass Communication: Context. (3 cr [max 6 cr]; A-F only. Prereq–Jour major or jour minor or approved IDIM major or ICP major or BIS major)
Context course not regularly offered. Topicsspecified in *Class Schedule*.

JOUR 3993. Directed Study. (1-3 cr [max 6 cr]; A-F only. Prereq–[jour major or jour minor or approved IDIM major or ICP major or BIS major], #, Δ, ❑)
Directed study, projects.

JOUR 3996. Directed Internship. (1 cr [max 3 cr]; S-N only. Prereq–Jour major, Δ)
Internship supervised by communications organization at which student is working and by student's academic sponsor.

JOUR 4171. Capstone: Covering the Arts. (3 cr; A-F only. Prereq–[3004W, 3101, [jour major or approved IDIM major or ICP major or BIS major]] or #)
Assignments may follow flow of Twin Cities arts/entertainment scene, including its controversies, or may trace the journey of a particular arts organization (e.g., Jungle Theater) through its season. Weekly writing assignments, readings, field trips, guest lectures from artists/arts journalists.

JOUR 4193. Walter H Brovald and John Cameron Sim Community Newspaper Practicum. (3 cr; A-F only. Prereq–3004W, [3101 or 3201], [jour major or approved IDIM or BIS or ICP])
Field-based practicum at community newspaper in metropolitan area. Students work directly with editors, reporters, or advertising staff to produce news, features, or advertising material. Weekly meetings with instructor about newspaper assignments, readings, projects, or guest lectures.

JOUR 4259. Cases in Strategic Planning and Thinking. (3 cr; A-F only. Prereq–3004W, [3159 or 3201 or 3202], 3251, [jour major or approved IDIM major or ICP major or BIS major])
Strategic communication cases related to campaigns or issues in business, government, education, or community.

JOUR 4261. Advertising: Media Strategy. (3 cr; A-F only. Prereq–3004W, [3159 or 3201 or 3202], 3251, [jour major or approved IDIM major or ICP major or BIS major])
Strategic elements of media planning, media consumption patterns/trends. Context/role of media plan within marketing/advertising. Information resources, terminology, and tools used in media planning and negotiations.

JOUR 4263. Strategic Communication Campaigns. (4 cr; A-F only. Prereq–[3004W or 3004V], [3201 or 3202], 3251, [3179 or 3241 or 3279 or 4159 or 4259 or 4261], MKTG 3001, [jour major or approved IDIM major or ICP major or BIS major])
Developing campaign strategy/tactics. Emphasizes planning/decision-making skills. Students work in groups with varying specializations.

JOUR 4272. Interactive Advertising. (3 cr; A-F only. Prereq–Non-jour major or [jour major, course appr on prog plan] or [pre-jour, adviser approval])
Interactive advertising models, how they differ from traditional ad models. Issues related to creating, measuring, pricing, and targeting interactive ads. Interactive ads in global, legal, and ethical contexts.

JOUR 4274W. Advertising in Society. (3 cr; A-F only. Prereq–Jour major or jour minor or approved IDIM major or ICP major or BIS major)
Forms of regulation: self-regulation and governmental. Critique of advertising's role in society. Current issues (e.g., stereotyping, political advertising, advertising to children). Ethics in advertising.

JOUR 4302. Electronic Photojournalism. (3 cr; A-F only. Prereq–3004W, 3102, [jour major or approved IDIM major or ICP major or BIS major])
Practice of photojournalism in contemporary digital environment. Visual storytelling, digital processing, professional/ethical issues.

JOUR 4321. Publication Graphics. (3 cr; A-F only. Prereq–3004, 3321, [jour major or IDIM major or ICP major or BIS major])
Design process applied to production of magazines, brochures, newsletters. Computer as tool to prepare electronic documents for printing.

JOUR 4451. Capstone: Advanced Electronic News Writing and Reporting. (3 cr; A-F only. Prereq–[3004W or 3004V], 3101, 3121, 3451, [jour major or approved IDIM major or ICP major or BIS major])
Researching, reporting, shooting, writing, and editing TV news packages. Lecture, lab.

JOUR 4452. Capstone: Electronic Newscast Producing. (3 cr; A-F only. Prereq–[3004W or 3004V], 3101, 3121, 3451, [jour major or approved IDIM major or ICP major or BIS major])
Planning, writing, and producing live TV newscasts. Lecture, lab.

JOUR 4551. New Media Culture. (3 cr; A-F only. Prereq–Non-jour major or jour major with course appr on prog plan or pre-jour with adviser approval)
Impact of "new media" (all forms of internet communication, wireless media, and combinations of "old" and "new" media) on current/future cultures. How new media may change ways we communicate, distribute, and process information. Social impact.

JOUR 4721. Mass Media and U.S. Society. (3 cr; A-F only. Prereq–Non-jour major or jour major with course appr on prog plan or pre-jour with adviser approval)
Economic, political, social determinants of character/content of mass communications in America. Effect, structure, functioning of mass media. Problems, prospects, criticism. Professionalism, technology, reform.

JOUR 4731H. Honors: Communications Problems and Issues. (1 cr; A-F only. Prereq–[¶4171 or ¶4193 or ¶4263 or ¶4451 or ¶4452 or ¶4992 or ¶5131 or ¶5155 or ¶5174], jour major, honors)
Honors discussion section in conjunction with capstone course.

JOUR 4801. Global Communication. (3 cr; A-F only. Prereq–Non-jour major or [jour major, course appr on prog plan] or [pre-jour, adviser approval])
Structures, processes, and consequences of global mass communication. Problems in free flow of information. Roles of international organizations. Mass communication in social, political, and economic development. Implications for conflict resolution.

JOUR 4990. Special Topics in Mass Communication: Professional. (3 cr [max 6 cr]; A-F only. Prereq–Jour major or approved IDIM major or ICP major or BIS major)
Professional-skills-learning opportunity not regularly offered. Topics specified in *Class Schedule*.

JOUR 4990H. Honors: Special Topics in Mass Communication. (3 cr [max 6 cr]; A-F only. Prereq–Honors, [jour major or approved IDIM major or ICP major or BIS major])
Topics specified in *Class Schedule*.

JOUR 4991. Special Topics in Mass Communication: Context. (3 cr [max 6 cr]; A-F only. Prereq–Jour major or jour minor or approved IDIM major or ICP major or BIS major)
Special context topics not regularly offered. Topics specified in *Class Schedule*.

JOUR 4992. Capstone: Field Based Practicum. (3 cr [max 6 cr]; A-F only. Prereq–Jour major)
Professional-skill-learning experience on-site at a media organization. Topics specified in *Class Schedule*.

JOUR 4993H. Honors: Thesis. (1-3 cr [max 3 cr]; A-F only. Prereq–Jour major, honors div regis, ❑, Δ, #)

JOUR 5004. Advanced Information for Mass Communication. (3 cr; A-F only. Prereq–Enrollment in M.A. in health journalism)
Messages, information, audiences, and storytelling. Search strategy and question analysis. Informal information sources. Libraries, electronic information, and data tools. Institutional sources. Interviews, polls, surveys, and evaluating information. Ethics and information for messages.

JOUR 5101. Advanced News Writing and Reporting. (3 cr; A-F only. Prereq–Enrollment in MA in Health Journalism or #)
Techniques of newspaper reporting and writing. Hands-on approach. What makes news. Basics of AP style. Thinking critically. Generating story ideas. Interviewing sources. Writing news stories and features. Exercises, discussion.

JOUR 5131. Capstone: In-Depth Reporting. (3 cr; A-F only. Prereq–[[3004W or 3004V], 3101, 3121, [jour major or approved IDIM major or ICP major or BIS major]] or grad student)
Techniques/issues of special project stories. Explanatory, investigative, civic, and literary or ethnographic journalism. Topics (e.g., civil rights, governmental malfeasance, health care problems) typically involved in these stories.

JOUR 5155. Capstone: Advanced Reporting Methods. (3 cr; A-F only. Prereq–[[3004W or 3004V], 3101, 3121, [jour major or approved IDIM major or ICP major or BIS major]] or grad student)
Investigative techniques for mass media, computer-assisted reporting, use of records/documents, advanced interviewing, methods for adverse conditions, or field-based practicum.

JOUR 5174. Capstone: Magazine Editing and Production. (4 cr; A-F only. Prereq–[3004W, 3101, [3155 or 3173W or 3321 or 4302], [jour major or approved IDIM major or ICP major or BIS major]] or grad student)
Writing, editing, illustration, design, layout, and photocomposition of print or Web magazine. Emphasizes reporting, telling substantive stories. Students work in groups with varying specializations.

JOUR 5251. Psychology of Advertising. (3 cr; A-F only. Prereq–jour maj or min or design COMM or graphic pre-design or design COMM or graph design or IDIM/ICP/BIS or #)
Psychological principles, research techniques, and applications in advertising/selling. Consumer attitudes/behavior. Psychological mechanisms upon which effectiveness of advertisements/commercials depends.

JOUR 5316. Theories of Visual Communication. (3 cr; A-F only. Prereq–[3006, [jour major or jour minor or approved IDIM major or approved ICP major or approved BIS major]] or grad student or #)
Perspectives on study/analysis of visual communication. Message structure, systems of production, use of visual media. Contributions from sociology, anthropology, psychology, and history.

JOUR 5501. Communication and Public Opinion. (3 cr; A-F only. Prereq–Non-jour major or jour major with course appr on prog plan or prejour with adviser approval)
Theories of communication, persuasion, attitude change. Functions of interpersonal/mediated communication in diffusion of information and in opinion formation.

JOUR 5541. Mass Communication and Public Health. (3 cr. Prereq–Jour major or jour minor or grad major or IDIM major or ICP major or BIS major)
Intersection of mass media, public health, and behavior. Role of theory in understanding intended/unintended campaign effect. Role of health journalism. Decisions that inform media-based interventions.

JOUR 5552. Law of Internet Communications. (3 cr; A-F only. Prereq–Non-jour major or jour major with course appr on prog plan or [pre-jour with adviser approval])
Whether/how/which traditional media laws/regulations apply to the Internet. Developing law of communication on Internet, global/ethical issues.

JOUR 5601W. History of Journalism. (3 cr; A-F only. Prereq–Jour major or jour minor or approved IDIM major or ICP major or BIS major; IDL sections are open to non-majors; prereqs do not apply to IDL sections)
Development of American media, from beginnings in Europe to present day. Rise of film/radio/television/Internet. Relation of communications development to political, economic, social trends.

JOUR 5606W. Literary Aspects of Journalism. (3 cr; A-F only. §ENGW 5606. Prereq–Jour major or jour minor or approved IDIM major or ICP major or BIS major; IDL sections are open to non-majors; prereqs do not apply to IDL sections)
Literary aspects of journalism as exemplified in, and influenced by, works of American/British writers, past/present. Lectures, discussions, weekly papers, critiques.

JOUR 5615. History of the Documentary. (3 cr; A-F only. Prereq–Non-jour major or jour major with course appr on prog plan or pre-jour with adviser approval)
Social history of photography, film, video. Informational, documentary, propaganda, and entertainment functions of visual communication. Rise/influence of visual media industries and of public-image making.

JOUR 5725. Management of Media Organizations. (3 cr; A-F only. Prereq–Non-jour major or jour major with course appr on prog plan or prejour with adviser approval)
Introduction to concepts/principles of media management. Strategic planning, leadership, organizational strategies, ethical/legal issues. Working in teams. Balance sheets, income statements. Motivating/promoting people.

JOUR 5771. Media Ethics: Principles and Practice. (3 cr; A-F only. Prereq–Non-jour major or [jour major, course appr on prog plan] or [pre-jour, adviser approval])
Connecting theoretical approaches to media ethics with real-life case studies. History of ethical standards in print, broadcast, photojournalism, public relations, and advertising. Making ethical judgments in complex situations.

JOUR 5777. Contemporary Problems in Freedom of Speech and Press. (3 cr; A-F only. §LAW 6030. Prereq–Jour major or jour minor or approved IDIM major or ICP major or BIS major)
Legal/constitutional derivation of freedom of press/speech. Emphasizes case law, statutes, judicial theories. Leading cases in privacy torts, prior restraints, news gathering/dissemination. Access to courts/government, including via the Internet. Legal-research techniques.

JOUR 5825. World Communication Systems. (3 cr; A-F only. Prereq–Non-jour major or jour major with course appr on prog plan or prejour with adviser approval)
Mass media systems of world, described/analyzed regionally/nationally. Historical roots. Social, economic, cultural context. Contemporary conditions/prospects. Relevance of journalism/mass communication to international affairs.

JOUR 5990. Special Topics in Mass Communication: Professional. (3 cr [max 6 cr]; A-F only. Prereq–Jour major or approved IDIM major or ICP major or BIS major)
Professional-skills-learning opportunity not regularly offered. Topics specified in *Class Schedule*.

JOUR 5991. Special Topics in Mass Communication: Context. (3 cr [max 6 cr]; A-F only. Prereq–Jour major or jour minor or approved IDIM major or ICP major or BIS major)
Special context topics not regularly offered. Topics specified in *Class Schedule*.

JOUR 5993. Directed Study. (1-3 cr [max 6 cr]; A-F only. Prereq–[Jour major or jour minor or approved IDIM major or ICP major or BIS major], GPA of at least 3.00, o, Δ, #)
Directed study/projects.

Kinesiology (KIN)

School of Kinesiology

College of Education and Human Development

KIN 1050. Beginning Military Physical Fitness Training. (1 cr [max 4 cr]; A-F only)
The Army's model of physical fitness training is used to address five aspects of fitness in the context of running, weight training, strength exercise, circuit training, and team sport activities. Students are organized into groups of similar fitness levels.

KIN 1375. Play Behavior. (3 cr)
Overview of play behavior across species, cultures, social settings. Relationship of play between physical/psychological development, role of sports/games in play, design of toys/playgrounds.

KIN 1871. Introduction to Kinesiology. (2 cr; A-F only)
Examination of the professional and disciplinary dimensions of physical activity. Representative experiences include lecture, discussion, small group activities, and laboratory tours.

KIN 1989. Health and Society. (3 cr; A-F only)
Major factors influencing human health, including behavior, the physical and social environments, policy, and economics. Opportunities for citizen participation in addressing each factor are explored, focusing on health topics such as nutrition and violence.

KIN 1993. Directed Study in Kinesiology. (1-6 cr [max 6 cr]; A-F only. Prereq–#)
For lower division students planning to major in kinesiology who wish to study a topic or problem under tutorial guidance.

KIN 3001. Lifetime Fitness and Health. (3 cr; A-F only)
Overview of health and wellness, including physical, emotional, intellectual, spiritual, social, environmental, and financial health. Societal changes and the influences of these changes on the general health and wellness of diverse populations.

KIN 3027. Human Anatomy for Kinesiology Students. (3 cr; A-F only)
Introduction to human anatomy. Emphasizes musculoskeletal anatomy germane to athletic training, biomechanics, exercise physiology, motor learning/development.

KIN 3050. Advanced Military Physical Fitness Training. (1 cr [max 4 cr]; A-F only. Prereq–4 cr of 1050 or #)
Students take on leadership roles in implementing Army's model of physical fitness training. Model addresses five aspects of fitness in the context of running, weight training, strength exercise, circuit training, and team sport activities.

KIN 3111. Human Anatomy. (2 cr; A-F only)
Beginning anatomy course for nonkinesiology students pursuing coaching licensure or for nonprofessional students interested in an exercise science approach to anatomy. Focus on a regional approach to muscle, nerve, and circulatory anatomy of the limbs and trunk and a systematic anatomy approach for circulatory, respiratory, digestive, urinary, and nervous systems. Students are encouraged to voluntarily attend arranged demonstrations of human cadaver dissections.

KIN 3112. Introduction to Biomechanics. (3 cr; A-F only. Prereq–[[3027 or 3111 or CBN 1027], PHYS 1101W, CEHD student] or #)
Mechanical principles applied to human movement. Analytical methods of examining human motion. Quantitative/qualitative approaches.

KIN 3113. First Responder for Coaches and Athletic Trainers. (3 cr; A-F only)
Emergency medicine for coaches/athletic trainers. Patient assessment, airway management, CPR, splinting, spinal immobilization. Emphasizes critical thinking skills in emergency settings. Certifications: AHA-BLS, First Responder. Taught by a multidisciplinary faculty of health care professionals.

KIN 3114. Prevention and Care of Athletic Injuries. (3 cr; A-F only. Prereq–[[3027 or 3111 or CBN 1027], CEHD student] or #)
Principles in athletic training for prevention/care of injury. Taping/bracing techniques. Lab.

KIN 3126W. Psychology and Sociology of Sport. (3 cr; A-F only. Prereq–Kin major)
Introduction to sport psychology and sport sociology. Topics include factors related to individual and institutional behavior in the following physical activity settings: competitive and recreational athletics, exercise, physical education, and rehabilitative.

KIN 3131W. History and Philosophy of Sport. (3 cr; A-F only. Prereq–Kin major or #)
Introductory description and interpretation of the historical and philosophical development of physical education and sport from primitive societies to 20th century civilization.

KIN 3133. Motor Control, Learning, and Development. (3 cr; A-F only. Prereq–Kin maj or #)
Concepts and principles of the coordination and control of movement, the learning of movement skills, and the changes in movement performance and physical growth across the life span.

KIN 3143. Organization and Management of Sport. (3 cr; A-F only. §SPST 3143. Prereq–Kin major or #)
Principles, policies, and procedures involved in the administration and management of sports programs at the interscholastic and intercollegiate levels.

For definitions of course numbers, symbols, and abbreviations, see page 300.

KIN 3151. Measurement, Evaluation, and Research in Kinesiology. (3 cr; A-F only. Prereq–Kin major or #)
Introduction to the philosophy of evaluation and measurement in physical education and exercise science. Test selection, construction, evaluation, and administration. Basic research methods, statistical analysis, and interpretation of test scores.

KIN 3168. Soccer Coaching. (1 cr)
Fundamental approaches used in coaching soccer. Teaching/coaching technique, team organization/management, development of training schedules, rules/strategies related to the game.

KIN 3169. Volleyball Coaching. (1 cr. Prereq–Good understanding of volleyball)
Motivation, team building, communication, game strategies, philosophy. Lecture, discussion, practical application.

KIN 3171. Baseball Coaching. (1 cr. Prereq–Good understanding of baseball)
Safety, rules, team building, game strategies, and philosophy. Lecture, discussion, practical application.

KIN 3172. Basketball Coaching. (1 cr)
Teaching/coaching individual/team skills of basketball. Rules, strategies.

KIN 3173. Football Coaching. (1 cr)
Responsibilities/philosophies of coaching. Team management, skill development/analysis, rules, systems of play, psychology, scouting.

KIN 3174. Golf Coaching. (1 cr)
Safety, rules, etiquette, skill development and analysis, and philosophy. Students should have a good understanding of the sport before enrolling. Lecture, discussion, and practical application.

KIN 3175. Gymnastics Coaching. (1 cr)
Coaching gymnastics for males/females. Skill progression, skill analysis, spotting, routine construction, safety, training for competition, scoring, rules, psychology, off-season conditioning, responsibilities of coach.

KIN 3176. Ice Hockey Coaching. (1 cr)
Coaching hockey for males/females. Terminology, breakouts, penalty killing, power-plays, neutral ice play, offensive forechecking, defensive strategies, comparisons of men.s/women.s techniques.

KIN 3177. Swimming and Diving Coaching. (1 cr)
Coaching swimming for males and females. Stroke mechanics, starts/turns, safety, training for competition, psychology, off-season conditioning, roles/responsibilities of coach.

KIN 3178. Tennis Coaching. (1 cr)
Coaching strategies, safety/rules, training for competition, off-season training/conditioning, roles/responsibilities of coach.

KIN 3179. Track and Field Coaching. (1 cr)
Basic training/conditioning programs, event characteristics, coaching strategies, knowledge of track/field, meet administration.

KIN 3181. Wrestling Coaching. (1 cr)
Teaching/coaching of technique, team organization/management, rules interpretation, development of training schedules.

KIN 3327. Teaching Physical Education in the Elementary School. (2 cr; A-F only. Prereq–Elem ed major)
Overview of the elementary physical education process with focus on a classroom teacher's perspective and needs. Representative experiences include participation, lecture, micro-teaching, final test.

KIN 3385. Human Physiology for Kinesiology Students. (3 cr; A-F only. Prereq–[[3027 or CBN 1027 or equiv], kin major] or #)
Tissue/organ function, cell structure, cellular enzymes, energy production, chemical composition of the body. Nervous, muscular, endocrine, circulatory, renal, respiratory, and gastrointestinal physiological control systems studied in detail. Clinical, exercise, sport, work examples.

KIN 3696. Supervised Practical Experience. (1-10 cr [max 10 cr]; S-N only. Prereq–#)
On-the-job supervised practical experience in the fields of sport and exercise under a specialist in a particular area of study or emphasis.

KIN 3993. Directed Study in Kinesiology. (1-10 cr [max 10 cr]; A-F only. Prereq–#)
Student-selected clinical or research experience.

KIN 3993H. Directed Study in Kinesiology. (1-10 cr [max 10 cr]; A-F only. Prereq–Kin Honors, #)
Student selected clinical or research experience.

KIN 4001H. Honors Seminar in Kinesiology. (3 cr; A-F only. Prereq–Kinesiology honors)
Contemporary issues in kinesiological research. Laboratory rotations, development of UROP project proposal, development of senior thesis topic, advanced study, career opportunities in Kinesiology, special learning opportunities.

KIN 4132. Motor Development. (3 cr; A-F only)
Developmental aspects of human movement behavior/learning. Life span change of motor skills.

KIN 4135. Motor Control and Learning. (3 cr)
Main theoretical ideas/research that have advanced motor control/learning over last three decades.

KIN 4385. Exercise Physiology. (4 cr; A-F only. Prereq–[[3385 or equiv], Kin major] or #)
Effects of exercise on physiological systems of human body. Energy/nutritional requirements of exercise, exercise prescription, athletic conditioning, ergogenic aids, exercise in environmental extremes, gender/heritability factors related to adaptation to training.

KIN 4520. Current Topics in Kinesiology. (1-4 cr [max 8 cr]. Prereq–Upper div in [Kin or Rec or SPST or coaching] or #)
Issues in kinesiology or in areas not normally available through regular curriculum offerings.

KIN 5001. Foundations of Human Factors/Ergonomics. (3 cr; A-F only. §HUMF 5001)
Variability in human performance as influenced by interaction with designs of machines and tools, computers and software, complex technological systems, jobs and working conditions, organizations, and sociotechnical institutions. Emphasizes conceptual, empirical, practical aspects of human factors/ergonomic science.

KIN 5103. Developmental/Adapted Physical Education. (3 cr; A-F only)
Introduction to physical education for students with disabilities, emphasizing conceptual, organizational, and administrative issues. Topics include historical and legal foundations, service components, individualized education plans, professional roles, and assessment of movement skills.

KIN 5104. Physical Activities for Persons with Disabilities. (3 cr; A-F only)
Different approaches to providing physical education service and related movement interventions for persons with disabilities. Topics: movement behavior foundations, movement skill progressions, unique considerations for specific impairments, and sport for persons with disabilities

KIN 5111. Sports Facilities. (3 cr; A-F only. §REC 5111. Prereq–Kin or Rec grad student or MEd student)
Steps in planning/building facilities for athletics, physical education, and sport for college, professional, and public use.

KIN 5115. Event Management in Sport. (3 cr; A-F only. Prereq–Grad student, #)
Techniques/principles of planning, funding, and managing sport events. Collegiate championships, non-profit events, benefits, professional events.

KIN 5121. Application of Basic Sciences to Kinesiology. (3 cr; A-F only)
Examination of how knowledge from the basics of science can lead to differing perspectives from which to approach questions directed to kinesiological inquiry.

KIN 5122. Applied Exercise Physiology. (3 cr; A-F only. Prereq–4385 or equiv or #)
Mechanisms of cardiorespiratory and muscular responses to exercise; application of exercise physiology to assessment of work capacity, athletic conditioning, and requirements of human powered vehicles; low to moderate exercise as an intervention in lowering risk for common health problems.

KIN 5126. Sport Psychology. (3 cr. Prereq–3126 or equiv or #)
Theory and research in sport psychology. Focus on the psychological study of human behavior in sport and physical activity settings.

KIN 5136. Psychology of Coaching. (3 cr)
Psychological dimensions of coaching across age levels, including coaching philosophy, leadership, communication skills, motivation, and mental skills training for performance enhancement.

KIN 5141. Nutrition for Health and Physical Performance. (3 cr; A-F only. Prereq–FSCN 1112 or equiv)
Requirements and physiologic roles of nutrients and physical activity in promotion of health/performance. Assessment of energy requirements. RDAs, food composition/safety, weight management. Prevention of chronic diseases; emphasizes coronary heart disease.

KIN 5142. Applied Sport Nutrition for Athletic Performance. (3 cr. Prereq–Grad student or #)
Latest research related to nutrition and human performance. Tools to differentiate between trends and scientific research related to optimizing human performance.

KIN 5152. Curriculum Development in Physical Education. (2 cr; A-F only. Prereq–Initial licensure/MEd phys ed student)
Trends, issues, and challenges in early childhood/K-12 physical education. Potential effect on curriculum.

KIN 5171. Foundations of Kinesiology. (3 cr; A-F only. Prereq–Kin major or #)
Introduction to the emerging field of kinesiology, broadly conceived as the study of human movement. Development and emergence of the term kinesiology and the scholarly, political, and educational ramifications of its development.

KIN 5196. Practicum: Developmental/Adapted Physical Education. (1-4 cr [max 4 cr]; S-N only. Prereq–5103 or ¶5103 or 5104 or ¶5104 or #; KIN undergraduate pre-teaching with sr status are limited to 2 practicum hrs)
Observation of, participation in physical education instruction for students with disabilities. Current issues in developmental/adapted physical education. Exchange of ideas/problems.

KIN 5235. Advanced Biomechanics II: Kinetics. (3 cr; A-F only. Prereq–[3112 or equiv], PMED 5135, undergrad college physics, intro calculus)
Kinetic aspects of human movement (single/multi-joint torques, simple inverted pendulum models, mass-spring systems). Analysis of experimental data and of computer simulations. Lectures, seminars, lab.

KIN 5371. Sport and Society. (3 cr; A-F only. §REC 5371. Prereq–[3126, grad student] or #)
Sport, sporting processes, social influences, systems. Structures that have effected and exist within/among societies, nations, and cultures. Contemporary issues such as social differentiation, violence, and honesty.

KIN 5375. Competitive Sport for Children and Youth. (3 cr)
Cognitive, behavioral, and biological factors having important implications for competitive sport participants from early childhood through high school age. Emphasis on translating sport science research into practical implications for youth sport coaches, teachers, and administrators.

KIN 5385. Exercise for Disease Prevention and Management. (3 cr; A-F only. Prereq–Undergrad [physiology or biology])
Exercise testing/prescription with modifications required because of special considerations associated with aging, gender differences, environmental conditions, or presence of medical conditions.

KIN 5421. Sport Finance. (3 cr; A-F only. §REC 5421. Prereq–Grad student or #)
Introduction to financial analysis in sport. Cash flow statements, budgeting issues, traditional/innovative revenue producing strategies available to sport organizations. Discussion, practical analysis of current market.

KIN 5435. Advanced Theory and Techniques of Exercise Science. (3 cr; A-F only. Prereq–[3385, 4385, Kin major] or #)
Theoretical constructs, in-depth description of procedures used in exercise science research and clinical settings. Laboratory exercises, lectures.

KIN 5461. Foundations of Sport Management. (3 cr; A-F only. Prereq–[Kin or Rec] student or #)
Theories/techniques in administration/management of sport enterprises. Organizational theory/policy, practical examples of sport management skills/strategies.

KIN 5485. Advanced Electrocardiogram, Graded Exercise Testing, and Prescription. (3 cr; A-F only. Prereq–[3385, 4385] or #)
Introduction to electrocardiogram. Placement/interpretation, use in clinical exercise testing and exercise prescription. Hands-on experience in electrocardiogram for exercise testing.

KIN 5511. Women in Sport and Leisure. (3 cr; A-F only. §REC 5511)
Critically examines women's involvement in/contributions to sport, physical activity, and leisure.

KIN 5601. Sport Management Ethics and Policy. (3 cr; A-F only. §REC 5601. Prereq–MEd or grad student or #)
How to critically analyze ethical concepts that underpin or inform sport policies and evaluate sport policies from a normative point of view. Selected sport policy issues are used to illustrate relevance of ethical considerations in policy development and to explore the ethical implications of sport policy.

KIN 5631. Programming and Promotion in Sport. (3 cr; A-F only. §REC 5631. Prereq–Kin or Rec grad student or #)
Introduction to marketing concepts as they apply to sport industry. Consumer behavior, market research, marketing mix, corporate sponsorship, licensing. Discussion, practical application.

KIN 5696. Practicum in Kinesiology. (1-6 cr [max 6 cr]; S-N only. Prereq–Grad student in KIN, #)
Practical experience in kinesiology under supervision of a University adviser and an agency supervisor.

KIN 5697. Student Teaching: Coaching. (1-10 cr [max 10 cr]; S-N only. Prereq–admission to coaching program, #)
Student coaching experience under supervision of a mentor coach.

KIN 5720. Special Topics in Kinesiology. (1-8 cr [max 8 cr]. Prereq–Kin upper div undergrad or grad student or #)
Current issues in the broad field and subfields in kinesiology, or related coursework in areas not normally available through regular offerings.

KIN 5723. Psychology of Sport Injury. (3 cr. Prereq–Intro psych course)
Psychosocial bases of risk factors preceding sport injury, responses to the occurrence of sport injury, and the rehabilitation process. Lecture, discussion, guest lecture, interviews, and presentation experience.

KIN 5725. Organization and Management of Physical Education and Sport. (3 cr; A-F only. Prereq–Grad/initial licensure or #)
Comprehensive analysis of organization and management of physical education and sport in educational settings. Focus on management and planning processes, management skills, functions, roles, decision making, leadership, shared systems, and organizational motivation. For physical education teachers, coaches, community sport administrators.

KIN 5726. Physical Education—Teaming and Trekking. (2 cr; A-F only. Prereq–Kin major, MEd student, or #)
Development of cooperative and team-building activities, group planning, and leadership skills in preparation for a two-day trip in a state park using practiced outdoor skills of camping, canoeing, and backpacking. Must be comfortable in water.

KIN 5727. Physical Education—An Adventure Experience. (1 cr; A-F only. Prereq–Kin major, MEd student, or #)
Group and individual initiatives in an experientially based program emphasizing participation in leadership, group cooperation, problem solving, low ropes, climbing walls, sensible risk taking, and trust-oriented activities.

KIN 5740. Topics: Coaching of Individual, Dual, or Team Sports. (1-9 cr [max 9 cr]; A-F only)
Instruction at the advanced level, including analyses of skills, game strategies, specific techniques of coaching, and methods of training and conditioning.

KIN 5801. Legal Aspects of Sport and Recreation. (4 cr; A-F only. Prereq–Kin or rec major)
Legal issues related to recreation, park, and sport programs/facilities in public/private sectors.

KIN 5941. Neural Basis of Movement. (3 cr; A-F only. Prereq–[(3111, CBN 1027) or equiv], [PHSL 3051 or equiv])
Overview of various neural subsystems involved in controlling human/primate sensorimotor behavior. Effects of brain lesions on overt behavior, possibilities for rehabilitation. Systems theory approach. Lectures, seminars, class presentations.

KIN 5981. Research Methodology in Kinesiology, Recreation, and Sport. (3 cr; A-F only. §REC 5981. Prereq–3151 or equiv)
Defines/reviews various types of research in exercise/sport science, physical education, and recreation studies. Qualitative research, field studies, and methods of introspection as alternative research strategies to traditional scientific paradigm.

KIN 5987. Professional Skills and Grant Writing for Health Sciences. (2 cr. Prereq–Grad student)
Introduction to structure/function of different organizations (e.g., NIH, AHA). Writing/reviewing grants/manuscripts. Preparing for a job in academia.

KIN 5992. Readings in Kinesiology. (1-9 cr [max 9 cr]; A-F only. Prereq–CEHD student, grad, #)
Independent study under tutorial guidance.

KIN 5995. Research Problems in Applied Kinesiology. (1-6 cr [max 6 cr]; A-F only. Prereq–[Grad or MEd student in Kin], #)
Selected topics in physical activity/human performance.

Korean (KOR)

Asian Languages and Literatures

College of Liberal Arts

KOR 1011. Beginning Korean. (5 cr. §KOR 4001)
Basic grammatical structure, vocabulary, and expressions of modern colloquial Korean. Introduces Korean writing system.

KOR 1012. Beginning Korean. (5 cr. §KOR 4002. Prereq–1011)
Basic grammatical structure, vocabulary, and expressions of modern colloquial Korean.

KOR 1017. Accelerated Korean. (5 cr. Prereq–Ability in basic spoken Korean)
Intensive course. Emphasizes reading/writing. Listening/speaking in various contexts.

KOR 3021. Intermediate Korean. (5 cr. §KOR 4003. Prereq–1012)
Speaking, reading, and writing at intermediate level in modern colloquial Korean. Simple narration/written reports. Some basic Chinese characters may be introduced.

KOR 3022. Intermediate Korean. (5 cr. §KOR 4004. Prereq–3021)
Speaking, reading, and writing at intermediate level in modern colloquial Korean. Narration/written reports. Introduction of additional basic Chinese characters.

KOR 3031. Third Year Korean. (4 cr. Prereq–3022)
Speaking, reading, and writing at advanced level in modern colloquial Korean. Narration, written reports. Further Chinese characters introduced.

KOR 3032. Third Year Korean. (4 cr. Prereq–3031)
Speaking, reading, writing at advanced level in modern colloquial Korean. Narration, written reports. Further Chinese characters introduced.

KOR 3290. Korean Language Teaching Tutorial. (1 cr [max 2 cr] Prereq–Grade of A in 3032)
Students tutor beginning students of Korean and are part of department's Korean language team.

KOR 3650. 20th Century Korean Literature in Translation. (3 cr)
Various works of Korean literature from colonial age through 1990s. Literary responses to historical changes. Relationship of literary works with historical issues such as colonial experience, Korean civil war and its results, and modern industrial society.

KOR 4001. Beginning Korean. (3 cr. §KOR 1011. Prereq–passing score on GPT in another language or grad student)
Grammatical structure, vocabulary, expressions of modern colloquial Korean. Korean writing system. Meets with 1011.

KOR 4002. Beginning Korean. (3 cr. §KOR 1012. Prereq–[4001, passing score on GPT in another language] or grad student)
Basic grammatical structure, vocabulary, and expressions of modern colloquial Korean. Meets with 1012.

KOR 4003. Intermediate Korean. (3 cr. §KOR 3021. Prereq–[4002, passing score on GPT in another language] or grad student)
Speaking, reading, and writing in modern colloquial Korean. Simple narration/written reports. Basic Chinese characters may be introduced. Meets with Hmng 3021.

KOR 4004. Intermediate Korean. (3 cr. §KOR 3022. Prereq–[4003, passing score on GPT in another language] or grad student)
Speaking, reading, and writing at intermediate level in modern colloquial Korean. Narration/written reports. Introduction of additional basic Chinese characters. Meets with KOR 3022.

KOR 4005. Third Year Korean. (3 cr. Prereq–3022 or #)
Speaking, reading, and writing in modern colloquial Korean. Narration, written reports. Further Chinese characters. Meets with 3031.

KOR 4006. Third Year Korean. (3 cr. Prereq–3031 or 4005 or #)
Speaking, reading, and writing in modern colloquial Korean. Narration, written reports. Further Chinese characters.

Laboratory Medicine and Pathology (LAMP)

Department of Laboratory Medicine and Pathology

Medical School

LAMP 4172. Pathology for Allied Health Students. (3 cr. Prereq–Regis allied health program, anatomy course, physiology course or #)
General and organ system pathology.

LAMP 4177. Pathology for Allied Health Students. (3 cr. Prereq–Regis allied health program, anatomy course and physiology course or #)
General and organ system pathology.

LAMP 5100. General and Systemic Pathology for Dental Students. (4 cr; A-F only. Prereq–Regis dental student)
Causes, courses, mechanisms and outcomes of disease. Required as preparation for clinical dental practice and oral pathology.

LAMP 5125. Chronobiology. (2-6 cr [max 6 cr])
How to interpret biologic time series and how to use them in practice as well as in designing chronobiology experiments. Chronobiologic procedures of data collection and analysis, interpretation of the output in clinical practice.

Landscape Architecture (LA)

Department of Landscape Architecture

College of Design

LA 1101W. Introduction to Design Thinking. (4 cr; A-F only. §DHA 1101W)
Introduction to theories and processes that underpin design thinking. Survey of the design professions; the power of design; and interactions between humans and their natural, social, and designed environments.

LA 1201. Learning from the Landscape. (3 cr; A-F only)
Physical elements shaping the world. Shapes, forms, and order of towns, cities, and countryside. How design, planning, and natural systems, taken together, shape physical surroundings. Lectures, discussions, field trips.

LA 1202. Making the Mississippi. (3 cr; A-F only)
Historical overview and case studies of actions that have "made" the Mississippi River and the communities along its banks. Relations between the river and human settlements. What role various members of the public have had in making the river.

LA 1301. Introduction to Drawing in Architecture and Landscape Architecture. (3 cr; A-F only. §LA 5301)
Development of basic skills involved in perceiving and representing the material environment. Study of sketching and drawing conventions of visual phenomena and forms.

LA 1401. The Designed Environment. (3 cr; A-F only)
Examination of relationships between place and space, and realms of the ideal and real, public and private. Survey of how the fields of architecture, landscape architecture, and urban design have explored those issues.

LA 3001. Understanding and Creating Landscape Space. (3 cr; A-F only. Prereq–B.E.D major or pre-LA student or #)
Introduction to spatial design issues at all scales.

LA 3002. Informants of Creating Landscape Space. (3 cr; A-F only. Prereq–3001, ARCH 3401, 3501)
Development of the design program, Site analysis of landscape space. Design exercises show how design program and site analysis inform creation of landscape space in developing schematic designs at varying geographic scales and in different geographic settings. Lectures, readings, discussions.

LA 3204. Landscape Ecology. (3 cr; A-F only. Prereq–EEB 3001 or equiv)
Relationships among spatial patterns, temporal patterns, and ecological processes in landscape.

LA 3413. Introduction to Landscape Architectural History. (3 cr; A-F only. Prereq–One course in history at 1xxx or higher)
Study of landscape architecture's roots by examining the creation of landscapes over time. Areas of emphasis include ecological and environmental issues; and the political, economic, and social contexts of landscape architectural works.

LA 3501. Environmental Design and Its Biological and Physical Context. (3 cr; A-F only)
Consideration of dynamic relationships between environmentally designed places and their biological and physical contexts. Case studies of successfully integrating created place and biological and physical contexts.

LA 3571. Landscape Construction: Site Systems and Engineering. (3 cr; A-F only. Prereq–BED major or BED minor or #)
Theory applications of landform systems for design. Landform typology, representation methods, manipulation techniques, use of land survey data, earthwork construction issues. Spatial accommodation of vehicles in landscape architecture, including road design.

LA 5201. Making Landscape Spaces and Types. (6 cr; A-F only. Prereq–B.E.D accelerated status or LA grad or #)
Design exploration using 3-D models and historical precedent studies to create outdoor spaces for human habitation and use. Application of the basic landscape palette of landform, plants, and structures to give physical, emotional, cognitive, and social definition to created places.

LA 5202. Landscape Analysis Workshop. (1 cr; S-N only)
Introduction to field techniques for site analysis, including vegetation, soil, and landform description. One-week session, before fall term, at lake Itasca Forestry and Biological Station.

LA 5203. Ecological Dimensions of Space Making. (6 cr; A-F only. Prereq–LA major or #; recommended for both BED and Grad students)
Design studio experience drawing on ecological, cultural, aesthetic influences to explore development of design ideas responsive to ecological issues and human experience.

LA 5204. Landscape Ecology. (3 cr. Prereq–B.E.D. accelerated status or LA grad student or #)
Relationships among spatial patterns, temporal patterns, ecological processes in landscape. Factors affecting landscape patterns, measurement of landscape pattern, material transport through landscape, effects of landscape pattern on population dynamics, landscape planning.

LA 5301. Introduction to Drawing in Architecture and Landscape Architecture. (3 cr. §LA 1301. Prereq–LA grad student, accelerated B.E.D. student)
Perceiving/representing material environment. Sketching/drawing conventions, visual phenomena/forms.

LA 5351. AutoCAD I. (3 cr. Prereq–B.E.D. major or LA grad or #; may not be taken for graduate credit)
Basic concepts, tools, and techniques of computer-aided drawing. Introduction to current AutoCAD Release software. Strategies and techniques for producing dimensioned and annotated drawings. Introduction to 3-D drawing capabilities. Use of dimension variables, attributes, blocks, symbols, and creation of customized menus.

LA 5352. AutoCAD II. (3 cr. Prereq–ARCH 5351 or LA 5351, B.E.D. major or LA grad or #; may not be taken for graduate credit)
Intermediate concepts, tools, and techniques of computer-aided drawing with current AutoCAD Release software. Strategies and techniques for producing dimensioned and annotated drawing. Use of dimension variables, attributes, blocks, symbols, and creation of customized menus.

LA 5371. Computer Methods I. (1 cr; S-N only. §ARCH 5371. Prereq–B.E.D. accelerated status or LA grad or #)
Introduction to current techniques, programs, and new editions of computer programs, and their application to landscape architecture computing.

LA 5372. Computer Methods II. (1 cr; S-N only. §ARCH 5372. Prereq–Arch/LA 5371, LA grad or #)
Current techniques and computer programs, and their application to landscape architecture computing.

LA 5373. Computer Methods III. (3 cr. §ARCH 5373. Prereq–LA grad or #)
Advanced techniques and computer programs, and their application to landscape architecture computing in design, theory, and technology.

LA 5400. Topics in Landscape Architecture. (1-3 cr [max 12 cr]; A-F only. Prereq–B.E.D. accelerated status or LA grad or #)
Current topics in landscape architecture. Taught by regular or visiting faculty in their areas of specialization.

LA 5401. Directed Studies in Emerging Areas of Landscape Architecture. (1-3 cr [max 12 cr]; A-F only. Prereq–#)

LA 5402. Directed Studies in Landscape Architecture History and Theory. (1-6 cr [max 12 cr]; A-F only. Prereq–#)
Independent studies under the direction of landscape architecture faculty.

LA 5403. Directed Studies in Landscape Architecture Technology. (1-6 cr [max 12 cr]; A-F only. Prereq–#)
Independent studies under the direction of landscape architecture faculty.

LA 5404. Directed Studies in Landscape Architecture Design. (1-6 cr [max 12 cr]; A-F only. Prereq–#)
Independent studies under the direction of landscape architecture faculty.

LA 5405. Interdisciplinary Studies in Landscape Architecture. (1-6 cr [max 12 cr]; A-F only. Prereq–#)
Research, planning, or design projects. Topics vary.

LA 5406. Urban Design Journal. (3-4 cr [max 4 cr]; A-F only. Prereq–Admitted to Denmark International Study Program co-sponsored by the University; given in Denmark)
Methods and theories in urban design and human behavior. Students develop journal as tool for experiencing, analyzing, and recording the urban landscape, its fabric, spatial elements, and individual components, and for analyzing design solutions.

LA 5407. Landscape Architecture Studio. (3-4 cr [max 4 cr]; A-F only. Prereq–Admitted to Denmark International Study Program co-sponsored by the University; given in Denmark)
Individual and small-group projects focusing on urban issues; design process in Danish conditions; solutions based on knowledge of Danish problems in landscape and urban design and an understanding of how these problems are solved within Danish and European contexts.

LA 5408. Landscape Architecture, Architecture, and Planning. (3-4 cr [max 4 cr]; A-F only. Prereq–Admitted to Denmark International Study Program co-sponsored by the University; given in Denmark)
Methods and theories in urban design and human behavior. Students develop urban design journal as tool for experiencing, analyzing, and recording the urban landscape, its fabric, spatial elements, and individual components, and for analyzing design solutions.

LA 5413. Introduction to Landscape Architectural History. (3 cr; A-F only. Prereq–One course in history at 1xxx or higher)
Introductory course examines the multiple roots of landscape architecture by examining the making of types of landscapes over time. Emphasis on ecological and environmental issues, and issues related to political, economic, and social contexts of landscape architectural works.

LA 5431. History of Landscape Architecture: Individual Influences. (3 cr; A-F only)
Assessment of influences of individuals on formation of the profession of landscape architecture from 1800 to present. Lectures, presentations, field trips, readings, papers, projects.

LA 5571. Landscape Construction: Landform Systems and Spatial Performance. (3 cr; A-F only. Prereq–Accelerated BED student or LA grad student)
Theory and professional applications of landform systems for design. Landform typology, representation methods, manipulation techniques, use of land survey data, earthwork construction issues. Spatial accommodation of vehicles in landscape architecture, including road design.

LA 5572. Plants in Design. (3 cr; A-F only. Prereq–[5201, 5203, plant identification course] or #)
Design principles for using plants in landscape. Cultural/ecological principles in design projects of various scales. Lectures, presentations, field trips, readings, projects.

LA 5573. Landscape Technology: Introduction to Geographic Information Systems. (3 cr; A-F only. Prereq–jr or sr B.E.D. major or LA grad or #)
GIS as an analytical tool to solve geographical problems of regional landscape design and resource management. Topics include application techniques, analytical procedures, data characteristics, data sources, input/output methods, and implementation.

LA 5574. Identification of Minnesota Flora. (3 cr; A-F only. Prereq–BED accelerated status or LA grad student or #)
Introduction to identification of approximately 500 plants commonly used by landscape architects and environmental designers in Minnesota. Students develop a working knowledge of over 250 plants. Focuses on plant selection techniques, plant landscape associations, and issues of plants for use in standard landscape architectural settings. Regular field sessions.

LA 5712. Infrastructure, Natural Systems and the Space of Inhabited Landscapes. (3 cr; A-F only)
Relationship between natural/infrastructural systems for human dwelling. Land-embedded systems for hybrid agricultural/post-ag landscapes. Relationships between natural systems/resources and engineered systems. Appropriateness/fit versus flexible generalizability. Resolution of economic/ecological forces. Role of landscape architects in creating morphologies of settlement.

LA 5721. Proseminar in Metropolitan Design. (3 cr; A-F only. §ARCH 5721. Prereq–[[ARCH 5711 or equiv], enrollment in CMD prog] or #)
Reading seminar. Evolution of the contemporary city. Dynamics that created contemporary urban spatial patterns. Planning/design theories that have guided public interventions in the built environment. Thematic texts, classroom discussions.

LA 5790. Special Topics in Metropolitan Design. (3 cr [max 6 cr]; A-F only. §ARCH 5790. Prereq–Enrollment in CMD prog or #)

Language, Teaching, and Technology (LGTT)

Institute of Linguistics, ESL, and Slavic Languages and Literatures

College of Liberal Arts

LGTT 5101. Applications of Technology in Language Teaching. (3 cr)
Explore uses of technology in language teaching; theoretical background, demonstrations, and applications.

LGTT 5110. Technology in the Second Language Classroom. (2 cr. §LGTT 5611)
Examine, evaluate, and use technology in language teaching. Theoretical background, demonstration, hands-on exploration.

LGTT 5710. Special Topics in Language Teaching and Technology. (1-3 cr [max 12 cr])
Examine, evaluate, apply specific area of technology to K-higher education, second/foreign language teaching/learning in classroom, independent study, distance education environments.

LGTT 5738. Web-based Second Language Instruction: Issues, Models, and Designs. (3 cr [max 6 cr])
Issues, models, and designs related to Web-based second language instruction in K-Higher Education settings. Evaluating course Web sites. Pedagogical value of Web technology. Applying technology in creating course Web sites.

Latin (LAT)

Department of Classical and Near Eastern Studies

College of Liberal Arts

LAT 1001. Beginning Latin I. (5 cr. §LAT 1111H, LAT 3111)
Gradual mastery of Latin structure in order to attain reading knowledge; practice in oral reading and composition.

LAT 1002. Beginning Latin II. (5 cr. Prereq–Grade of at least [C- or S] in 1001 or #)
Latin grammar/syntax. Graduated readings from Roman authors, including Cicero, Catullus, and Roman comedy.

LAT 1102. Beginning Latin II, Transition. (3.33 cr; A-F only)
Continuation of basic grammar/vocabulary, practice reading/writing. Latin readings, Roman legends.

LAT 1103. Selections from Latin Literature, Transition. (3.33 cr; A-F only)
Prose/poetry. Historical/literary background.

LAT 1111H. Honors Course: Beginning Latin. (3 cr. §LAT 1001, LAT 3111. Prereq–Concurrent registration required in 1112; regis in honors program or high ability as indicated by high school transcript)
Intensive Latin course covering material usually taught over two semesters. Students must also register for 1112 when taking this class.

LAT 1112H. Honors Course: Beginning Latin, Recitation. (3 cr. Prereq–Concurrent registration in 1111, regis in honors program or high ability as indicated by high school transcript)
Drills and composition exercises. Students must also register for 1111 when taking this class.

LAT 3100. Reading Latin Prose. (3 cr. Prereq–1002 or 1111 or 1112 or 3111 or 3112 or #)
Introduction to reading Latin prose. Selections from Roman authors. Review of grammar/syntax. Follow-up course to intensive Latin or review for students returning to reading Latin after time lapse.

LAT 3111. Intensive Latin. (3 cr. §LAT 1001, LAT 1111H. Prereq–Concurrent registration in 3112; previous exper in another foreign language desirable)
Intensive Latin course covering material usually taught over two semesters. Undergraduates must also register for 3112 when taking this class.

LAT 3112. Intensive Latin, Recitation. (3 cr. Prereq–Concurrent registration in 3111; previous exper in another foreign language desirable)
Drills and composition exercises. Students must also register for 3111 when taking this course.

LAT 3113. Intermediate Latin Prose. (4 cr. Prereq–Grade of at least [C- or S] in [1002 or 1112H or 3112] or #)
Reading Latin. Reviews elementary grammar, vocabulary, and morphology. Introduction to major themes/issues in Latin literature and Roman culture.

LAT 3114. Augustan Latin Authors. (4 cr. Prereq–3113 or Δ)
Students progress from intermediate to advanced Latin reading while surveying the world of Augustan Rome. Authors include Livy, Virgil, and Ovid.

LAT 3300. Intermediate Latin Poetry. (4 cr [max 8 cr]. Prereq–Grade of at least [C- or S] in 3113 or #)
Readings in Latin poetry. Introduction to Latin Meter. Vergil and Catullus/Ovid offered in alternate years.

LAT 3310. Advanced Undergraduate Latin: History. (3 cr [max 12 cr]. Prereq–3114 or equiv or #)
Roman history as the Romans wrote it; selections from Livy, Sallust, Tacitus, or Ammianus.

LAT 3320. Advanced Undergraduate Latin: Belles-Lettres. (3 cr [max 12 cr]. Prereq–3114 or equiv or #)
Selections from expository Latin literature (essays, epistles, monographs).

LAT 3330. Advanced Undergraduate Latin: Oratory. (3 cr [max 12 cr]. Prereq–3114 or equiv or #)
One or more appropriate authors studied each semester.

LAT 3340. Advanced Undergraduate Latin: Epic/Pastoral. (3 cr [max 12 cr]. Prereq–3114 or equiv or #)
One or more appropriate authors studied each semester.

LAT 3350. Advanced Undergraduate Latin: Lyric/Elegiac. (3 cr [max 12 cr]. Prereq–3114 or equiv or #)
One or more appropriate authors studied each semester.

LAT 3360. Advanced Undergraduate Latin: Drama. (3 cr [max 12 cr]. Prereq–3114 or equiv or #)
One or more appropriate authors studied each semester.

LAT 3370. Advanced Undergraduate Latin: Satire. (3 cr [max 12 cr]. Prereq–3114 or equiv or #)
One or more appropriate authors studied each semester.

LAT 3440. Advanced Undergraduate Latin: Later Latin. (3 cr [max 12 cr]. Prereq–3300 or 3114)
Reading course. Authors of Late Antiquity, Middle Ages, and Renaissance. Topics specified in *Class Schedule*.

LAT 3450. Advanced Undergraduate Latin: Classical Authors. (3 cr [max 12 cr]. Prereq–3114 or Δ)
Readings from various classical Latin authors. Topics specified in *Class Schedule*.

LAT 3951W. Major Project. (4 cr. Prereq–[Greek-Latin or Latin major], three 3xxx Latin courses, #, Δ)
Research project using documents and other sources from the ancient world. Students select project in consultation with a faculty member who directs the research and writing.

LAT 3960H. Honors Course: Advanced Undergraduate Latin Reading. (3 cr [max 12 cr]. Prereq–Regis in honors program or high ability as indicated by trANSCript)
Student attends Latin 33xx, 3440, or 3450 and does additional work for honors credit.

LAT 3993. Directed Studies. (1-4 cr [max 12 cr]. Prereq–# and Δ)
Guided individual reading or study.

LAT 5012. Latin Prose Composition. (3 cr. Prereq–Grad student or #)
Latin grammar, syntax, diction, and prose style. Graduated exercises in prose composition.

LAT 5032. Text Criticism. (3 cr. Prereq–Grad student or #)
Theory/practice. Elements of paleography and manuscript study. Tools for analyzing a textual apparatus. Constructing a critical edition of a literary text.

LAT 5033. Epigraphy. (3 cr. Prereq–Grad student or #)
Practical/theoretical introduction to Latin epigraphy (study/interpretation of inscriptions). Readings/discuss of epigraphic texts. Focuses on their value as historical documents, as evidence for development of Latin language, and as literary texts.

LAT 5310. Latin Literature: History. (3 cr [max 12 cr]. Prereq–Grad student or #)
One or more authors.

LAT 5320. Latin Literature: Epistles and Essays. (3 cr [max 12 cr]. Prereq–Grad student or #)
One or more authors.

LAT 5330. Latin Literature: Oratory. (3 cr [max 12 cr]. Prereq–Grad student or #)
One or more authors.

LAT 5340. Latin Literature: Epic and Pastoral. (3 cr [max 12 cr]. Prereq–Grad student or #)
One or more authors.

LAT 5350. Latin Literature: Lyric and Elegiac Poetry. (3 cr [max 12 cr]. Prereq–Grad student or #)
One or more authors.

LAT 5360. Latin Literature: Latin Dramatists. (3 cr [max 12 cr]. Prereq–Grad student or #)
One or more authors.

LAT 5370. Latin Literature: Satire. (3 cr [max 12 cr]. Prereq–Grad student or #)
One or more authors.

This is LGTT to PUBH of the Course Description section of the 2006-2008 Undergraduate Catalog for the University of Minnesota, Twin Cities campus.

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LA 5573. Landscape Technology: Introduction to Geographic Information Systems. (3 cr; A-F only. Prereq–jr or sr B.E.D. major or LA grad or #)
GIS as an analytical tool to solve geographical problems of regional landscape design and resource management. Topics include application techniques, analytical procedures, data characteristics, data sources, input/output methods, and implementation.

LA 5574. Identification of Minnesota Flora. (3 cr; A-F only. Prereq–BED accelerated status or LA grad student or #)
Introduction to identification of approximately 500 plants commonly used by landscape architects and environmental designers in Minnesota. Students develop a working knowledge of over 250 plants. Focuses on plant selection techniques, plant landscape associations, and issues of plants for use in standard landscape architectural settings. Regular field sessions.

LA 5712. Infrastructure, Natural Systems and the Space of Inhabited Landscapes. (3 cr; A-F only)
Relationship between natural/infrastructural systems for human dwelling. Land-embedded systems for hybrid agricultural/post-ag landscapes. Relationships between natural systems/resources and engineered systems. Appropriateness/fit versus flexible generalizability. Resolution of economic/ecological forces. Role of landscape architects in creating morphologies of settlement.

LA 5721. Proseminar in Metropolitan Design. (3 cr; A-F only. §ARCH 5721. Prereq–[[ARCH 5711 or equiv], enrollment in CMD prog] or #)
Reading seminar. Evolution of the contemporary city. Dynamics that created contemporary urban spatial patterns. Planning/design theories that have guided public interventions in the built environment. Thematic texts, classroom discussions.

LA 5790. Special Topics in Metropolitan Design. (3 cr [max 6 cr]; A-F only. §ARCH 5790. Prereq–Enrollment in CMD prog or #)

Language, Teaching, and Technology (LGTT)

Institute of Linguistics, ESL, and Slavic Languages and Literatures

College of Liberal Arts

LGTT 5101. Applications of Technology in Language Teaching. (3 cr)
Explore uses of technology in language teaching; theoretical background, demonstrations, and applications.

LGTT 5110. Technology in the Second Language Classroom. (2 cr. §LGTT 5611)
Examine, evaluate, and use technology in language teaching. Theoretical background, demonstration, hands-on exploration.

LGTT 5710. Special Topics in Language Teaching and Technology. (1-3 cr [max 12 cr])
Examine, evaluate, apply specific area of technology to K-higher education, second/foreign language teaching/learning in classroom, independent study, distance education environments.

LGTT 5738. Web-based Second Language Instruction: Issues, Models, and Designs. (3 cr [max 6 cr])
Issues, models, and designs related to Web-based second language instruction in K-Higher Education settings. Evaluating course Web sites. Pedagogical value of Web technology. Applying technology in creating course Web sites.

Latin (LAT)

Department of Classical and Near Eastern Studies

College of Liberal Arts

LAT 1001. Beginning Latin I. (5 cr. §LAT 1111H, LAT 3111)
Gradual mastery of Latin structure in order to attain reading knowledge; practice in oral reading and composition.

LAT 1002. Beginning Latin II. (5 cr. Prereq–Grade of at least [C- or S] in 1001 or #)
Latin grammar/syntax. Graduated readings from Roman authors, including Cicero, Catullus, and Roman comedy.

LAT 1102. Beginning Latin II, Transition. (3.33 cr; A-F only)
Continuation of basic grammar/vocabulary, practice reading/writing. Latin readings, Roman legends.

LAT 1103. Selections from Latin Literature, Transition. (3.33 cr; A-F only)
Prose/poetry. Historical/literary background.

LAT 1111H. Honors Course: Beginning Latin. (3 cr. §LAT 1001, LAT 3111. Prereq–Concurrent registration required in 1112; regis in honors program or high ability as indicated by high school transcript)
Intensive Latin course covering material usually taught over two semesters. Students must also register for 1112 when taking this class.

LAT 1112H. Honors Course: Beginning Latin, Recitation. (3 cr. Prereq–Concurrent registration in 1111, regis in honors program or high ability as indicated by high school transcript)
Drills and composition exercises. Students must also register for 1111 when taking this class.

LAT 3100. Reading Latin Prose. (3 cr. Prereq–1002 or 1111 or 1112 or 3111 or 3112 or #)
Introduction to reading Latin prose. Selections from Roman authors. Review of grammar/syntax. Follow-up course to intensive Latin or review for students returning to reading Latin after time lapse.

LAT 3111. Intensive Latin. (3 cr. §LAT 1001, LAT 1111H. Prereq–Concurrent registration in 3112; previous exper in another foreign language desirable)
Intensive Latin course covering material usually taught over two semesters. Undergraduates must also register for 3112 when taking this class.

LAT 3112. Intensive Latin, Recitation. (3 cr. Prereq–Concurrent registration in 3111; previous exper in another foreign language desirable)
Drills and composition exercises. Students must also register for 3111 when taking this course.

LAT 3113. Intermediate Latin Prose. (4 cr. Prereq–Grade of at least [C- or S] in [1002 or 1112H or 3112] or #)
Reading Latin. Reviews elementary grammar, vocabulary, and morphology. Introduction to major themes/issues in Latin literature and Roman culture.

LAT 3114. Augustan Latin Authors. (4 cr. Prereq–3113 or Δ)
Students progress from intermediate to advanced Latin reading while surveying the world of Augustan Rome. Authors include Livy, Virgil, and Ovid.

LAT 3300. Intermediate Latin Poetry. (4 cr [max 8 cr]. Prereq–Grade of at least [C- or S] in 3113 or #)
Readings in Latin poetry. Introduction to Latin Meter. Vergil and Catullus/Ovid offered in alternate years.

LAT 3310. Advanced Undergraduate Latin: History. (3 cr [max 12 cr]. Prereq–3114 or equiv or #)
Roman history as the Romans wrote it; selections from Livy, Sallust, Tacitus, or Ammianus.

LAT 3320. Advanced Undergraduate Latin: Belles-Lettres. (3 cr [max 12 cr]. Prereq–3114 or equiv or #)
Selections from expository Latin literature (essays, epistles, monographs).

LAT 3330. Advanced Undergraduate Latin: Oratory. (3 cr [max 12 cr]. Prereq–3114 or equiv or #)
One or more appropriate authors studied each semester.

LAT 3340. Advanced Undergraduate Latin: Epic/Pastoral. (3 cr [max 12 cr]. Prereq–3114 or equiv or #)
One or more appropriate authors studied each semester.

LAT 3350. Advanced Undergraduate Latin: Lyric/Elegiac. (3 cr [max 12 cr]. Prereq–3114 or equiv or #)
One or more appropriate authors studied each semester.

LAT 3360. Advanced Undergraduate Latin: Drama. (3 cr [max 12 cr]. Prereq–3114 or equiv or #)
One or more appropriate authors studied each semester.

LAT 3370. Advanced Undergraduate Latin: Satire. (3 cr [max 12 cr]. Prereq–3114 or equiv or #)
One or more appropriate authors studied each semester.

LAT 3440. Advanced Undergraduate Latin: Later Latin. (3 cr [max 12 cr]. Prereq–3300 or 3114)
Reading course. Authors of Late Antiquity, Middle Ages, and Renaissance. Topics specified in *Class Schedule*.

LAT 3450. Advanced Undergraduate Latin: Classical Authors. (3 cr [max 12 cr]. Prereq–3114 or Δ)
Readings from various classical Latin authors. Topics specified in *Class Schedule*.

LAT 3951W. Major Project. (4 cr. Prereq–[Greek-Latin or Latin major], three 3xxx Latin courses, #, Δ)
Research project using documents and other sources from the ancient world. Students select project in consultation with a faculty member who directs the research and writing.

LAT 3960H. Honors Course: Advanced Undergraduate Latin Reading. (3 cr [max 12 cr]. Prereq–Regis in honors program or high ability as indicated by trANSCript)
Student attends Latin 33xx, 3440, or 3450 and does additional work for honors credit.

LAT 3993. Directed Studies. (1-4 cr [max 12 cr]. Prereq–# and Δ)
Guided individual reading or study.

LAT 5012. Latin Prose Composition. (3 cr. Prereq–Grad student or #)
Latin grammar, syntax, diction, and prose style. Graduated exercises in prose composition.

LAT 5032. Text Criticism. (3 cr. Prereq–Grad student or #)
Theory/practice. Elements of paleography and manuscript study. Tools for analyzing a textual apparatus. Constructing a critical edition of a literary text.

LAT 5033. Epigraphy. (3 cr. Prereq–Grad student or #)
Practical/theoretical introduction to Latin epigraphy (study/interpretation of inscriptions). Readings/discuss of epigraphic texts. Focuses on their value as historical documents, as evidence for development of Latin language, and as literary texts.

LAT 5310. Latin Literature: History. (3 cr [max 12 cr]. Prereq–Grad student or #)
One or more authors.

LAT 5320. Latin Literature: Epistles and Essays. (3 cr [max 12 cr]. Prereq–Grad student or #)
One or more authors.

LAT 5330. Latin Literature: Oratory. (3 cr [max 12 cr]. Prereq–Grad student or #)
One or more authors.

LAT 5340. Latin Literature: Epic and Pastoral. (3 cr [max 12 cr]. Prereq–Grad student or #)
One or more authors.

LAT 5350. Latin Literature: Lyric and Elegiac Poetry. (3 cr [max 12 cr]. Prereq–Grad student or #)
One or more authors.

LAT 5360. Latin Literature: Latin Dramatists. (3 cr [max 12 cr]. Prereq–Grad student or #)
One or more authors.

LAT 5370. Latin Literature: Satire. (3 cr [max 12 cr]. Prereq–Grad student or #)
One or more authors.

LAT 5380. Latin Literature: Legal Texts. (3 cr [max 12 cr]. Prereq–Grad student or #)
One or more authors.

LAT 5390. Literature: Religious Texts. (3 cr [max 12 cr]. Prereq–Grad student or #)
Reading/discussion of religious texts from Latin antiquity, such as Varro's Antiquitates Divinae, Cicero's De natura deorum, Apuleius's Metamorphoses, or Christian writers (Tertullian, Cyprian, Lactantius, Jerome, Augustine).

LAT 5410. Latin of Late Antiquity. (3 cr [max 12 cr]. Prereq–Grad student or #)
Pagan/Christian Latin literature selected from authors of 3rd to 6th centuries AD. Topics specified in *Class Schedule*.

LAT 5420. Medieval Latin. (3 cr [max 12 cr]. Prereq–Grad student or #)
Literature from 6th to 15th centuries. Authors/genres vary. Topics specified in *Class Schedule*.

LAT 5621. Latin Paleography. (3 cr. Prereq–Grad student or #)
Analysis of various hands used in manuscripts of Latin authors, with attention to date/provenance. Transmission of ancient Latin literature.

LAT 5715. Introduction to the Historical-Comparative Grammar of Greek and Latin. (3 cr. §GRK 5715. Prereq–# or 2 yrs college Greek)
Historical and comparative grammar of Greek and Latin from their Proto-Indo-European origins to the classical norms.

LAT 5717. History of Latin. (3 cr. Prereq–Grad student or #)
Reading/analysis of documents illustrating stylistic registers/evolution of Latin language, from its earliest attestations through Middle Ages.

LAT 5993. Directed Studies. (1-4 cr [max 18 cr]. Prereq–#, Δ)
Guided individual reading or study.

LAT 5994. Directed Research. (1-12 cr [max 20 cr]. Prereq–Grad student or #)
Guided research on original topic chosen by student.

LAT 5996. Directed Instruction. (1-12 cr [max 20 cr]. Prereq–Grad student or #)
Supervised teaching internship.

Latin American Studies (LAS)

Institute of International Studies

College of Liberal Arts

LAS 3019. Hispanic Cultures of Latin America. (3 cr. §ANTH 3019. Prereq–ANTH 1003 or 1005 or #)
Overview of Hispanic cultures from Mexico to South America. Economy, underdevelopment. Family, ritual kinship. Gender, religion, values, ideology, change. Several concepts are introduced to explore continuity/change.

LAS 3114. International Perspectives: U.S.-Mexico Border Cultures. (3 cr. §CHIC 3114, CHIC 5114)
Examines the relations of Mexico and the United States from an international perspective, with an central focus on the cultural interchange in the border lands between the United States and Mexico, using both literary and historical materials.

LAS 3251. Role of Renewable Natural Resources in Developing Countries. (1 cr; A-F only. §ESPM 3251, ESPM 5251)
International perspectives on resource use in developing countries. Integration of natural resource issues with social, economic, and policy considerations. Overviews of agriculture, forestry, agroforestry, non-timber forest products, water resources, certification, and development issues. Latin American case studies.

LAS 3401W. Early Latin America to 1825. (4 cr; A-F only. §HIST 3401W)
Begins with American and Iberian societies before contact. Emphasizes social, cultural, and economic interactions among Native Americans, African slaves, Europeans, and people of mixed race during colonial period.

LAS 3402W. Modern Latin America 1825 to Present. (4 cr. §HIST 3402W)
National and contemporary period 1825 to present, with emphasis on social, cultural, political, and economic change.

LAS 3405. Latin American Women's Lives. (3 cr. §WOST 3405. Prereq–WoSt 1001, WoSt 1002 or WoSt 1003 or #)
An interdisciplinary approach to understanding women's lives in Latin America. Use of ethnography, history, poetry, fiction, and "testimonio" to understand the conditions of women's lives in Latin America.

LAS 3427. History of Cuba and Puerto Rico. (3 cr. §CHIC 3427, HIST 3427)
Historical development of Cuba and Puerto Rico from pre-Columbian times through Spanish conquest to the present. Conquest and colonization, slavery, Hispanic Caribbean society and culture, Operation Bootstrap, Cuban Revolution.

LAS 3441. Chicana/o History to 1900. (3 cr. §CHIC 3444, HIST 3441, HIST 3444)
The history of the Mexican people from the 16th through 19th centuries. Historical theories of colonialism, expansion, economy, assimilation, migration and settlement; race, class and gender, political, social and cultural interaction, and conflict.

LAS 3442. Chicana/o History: 1900 to Present. (3 cr. §CHIC 3442, HIST 3442)
The 20th-century Chicana/o experience: migration, repatriation, the Bracero program, politics, the Chicana/o movement, work, society, and culture.

LAS 3502W. Foundations of Brazilian Culture. (3 cr. §PORT 3502V, PORT 3502W. Prereq–PORT 3003 or equiv)
Emphasis on Brazilian modern society. History, culture (music, art, cinema, literature, intellectual thought, popular culture, media), and social problems (ethnicity, tropical deforestation). Discussions and readings are in Portuguese.

LAS 4121W. Latin America. (3 cr. §GEOG 4121W)
Interplay of natural environment and history in shaping contemporary Latin America. Political ecology of natural resources, food supply and distribution, urbanization and the informal economy, migration, ethnicity, and the role of the state and international agencies in domestic economies.

LAS 4465. Housing in World Perspective. (3 cr; A-F only. Prereq–DHA 2401, DHA 2463 or #)
Evaluation of theories and concepts that allow an understanding of housing policies and housing choices of individuals, families, and households in developed and developing countries.

LAS 4479. Latin American Politics. (3 cr. §LAS 4479, POL 4479, POL 5479. Prereq–POL 1054 or POL 3051 or non-pol sci grad or #)
An overview of Latin American politics and political economy focused on authoritarianism, human rights, and redemocratization; development and economic policy; social movements; ethnicity and race; religion; revolution; U.S.-Latin American relations.

Learning and Academic Skills (LASK)

Department of Educational Psychology

College of Education and Human Development

LASK 1001. Mastering Skills for College Success. (2 cr)
Practical assistance to develop efficient, effective learning/academic performance skills. Improve reading, memorization, test-taking, critical thinking; identify academic and career Learning styles, motivation, life skills, and their relation to successful academic performance.

LASK 1101. Academic Success. (1 cr; S-N only. Prereq–#)
Identifying factors interfering with academic performance, selecting strategies, and establishing a plan to promote academic success. Learning-style, educational goals, life management skills, motivation, attitude.

Liberal Studies (LS)

College of Continuing Education

LS 5100. Liberal Studies Seminar. (1-4 cr [max 24 cr]; A-F only. Prereq–Δ)
Interdisciplinary topics.

LS 5125. Field Experience. (1-8 cr [max 8 cr]; A-F only. Prereq–MLS student or #)
Off-campus observation, experience, and evaluation in interdisciplinary field of study.

LS 5950. Special Topics. (1-4 cr [max 12 cr]; A-F only. Prereq–Δ)
Interdisciplinary topics.

LS 5993. Directed Studies. (1-4 cr [max 15 cr]. Prereq–Grad student, Δ)
Guided individual reading or study.

LS 5994. Directed Research. (1-4 cr [max 15 cr]. Prereq–#)
Tutorial for qualified graduate students.

Linguistics (LING)

Institute of Linguistics, ESL, and Slavic Languages and Literatures

College of Liberal Arts

LING 1701. Language and Society. (4 cr)
Role of language in human social interaction; linguistic indicators of social status and attitudes; language and sex roles; linguistic ecology; language planning for multilingual communities; implications for education and public policy.

LING 1907W. Freshman Seminar. (3 cr [max 6 cr]. Prereq–Freshman)
Topic specified in Course Guide.

LING 1909W. Freshman Seminar. (3 cr [max 6 cr]; A-F only. Prereq–Freshman)
Topics specified in *Class Schedule*.

LING 3001. Introduction to Linguistics. (4 cr. §LING 3001H, LING 5001)
Phonetics, phonology, morphology, syntax, semantics, and historical-comparative linguistics; language learning and psychology of language; linguistic universals; language in society.

LING 3001H. Honors: Introduction to Linguistics. (4 cr. §LING 3001, LING 5001. Prereq–honors candidate or #)
Phonetics, phonology, morphology, syntax, semantics, historical-comparative linguistics, language learning, psychology of language, linguistic universals, language in society.

LING 3051H. Honors: Thesis. (3 cr. Prereq–Linguistics honors candidate, #)
Supervised planning and research for honors thesis to be completed in 3052.

LING 3052H. Honors: Thesis. (3 cr. Prereq–3051)
Supervised research, writing, and revision for honors thesis begun in 3051.

LING 3101W. Languages of the World. (3 cr. Prereq–3001 or 3001H or 3011 or 5001 or #)
Survey of language families of the world. Classifying languages genetically/typologically. Historical relationships among languages.

LING 3301. Phonetics. (4 cr. §LING 5301. Prereq–3001 or 3001H or 5001 or concurrent registration 3001 or concurrent registration 3001H or concurrent registration 5001 or #)
Phonetic analysis, transcription of speech. Articulatory/acoustic correlates of speech sounds. Practice transcribing. Emphasizes narrow transcription of human speech. One section focuses on universal phonetics, another focuses on English.

LING 3601. Historical Linguistics. (3 cr. §LING 5601. Prereq–3001 or #)
Historical change in phonology, syntax, semantics, and lexicon. Linguistic reconstruction. Genetic relationship among languages.

LING 3707. Ethnic Bilingualism in the United States. (3 cr. Prereq–Some knowledge of linguistics and a 2nd language helpful)
Social, behavioral, and cognitive aspects of bilingualism; the linguistic experience of American immigrants and ethnic minority groups, especially Asian Americans; attitudes and public policies with regard to linguistic minorities; field experience in bilingual communities.

LING 4002. Linguistic Analysis. (3 cr. Prereq–3001 or 3001H or 5001 or #)
Techniques for analyzing phonological, morphological, and syntactic data from a variety of languages. Discovering, stating, and justifying generalizations. Comparing diverse languages.

LING 4901W. Senior Project. (1 cr; S-N only. Prereq–Ling major, #)
Revision and/or expansion of a paper completed for a linguistics course.

LING 5001. Introduction to Linguistics. (4 cr. §LING 3001, LING 3001H. Prereq–Grad or #)
Phonetics, phonology, morphology, syntax, semantics, and historical-comparative linguistics; language learning andpsychology of language; linguistic universals; language in society.

LING 5005. Applications of Linguistics. (3 cr. Prereq–3001 or 3001H or 3011 or 5001 or #)
Relationships between linguistics and neighboring disciplines. Applications to practical fields such as lexicography, orthography, translation/interpreting, language planning, reading, language teaching, bilingual education, education of the deaf, and correction of language disorders. Computer applications, forensic applications. Topics vary.

LING 5101. Language Types and Linguistic Universals. (3 cr. Prereq–[[3001 or 3001H or 5001], 5201, 5302] or #)
Comparison of languages and language types. Cross-linguistic similarities/universals of language, their explanation.

LING 5105. Field Methods in Linguistics I. (4 cr. Prereq–5201, 5302 or #)
Techniques for obtaining and analyzing linguistic data from unfamiliar languages through direct interaction with a native speaker.

LING 5106. Field Methods in Linguistics II. (4 cr. Prereq–5105)
Techniques for obtaining and analyzing linguistic data from unfamiliar languages through direct interaction with a native speaker.

LING 5201. Syntax I. (3 cr. Prereq–3001 or 3001H or 5001 or #)
Syntactic phenomena/constructions in various languages. Principles of grammar construction/evaluation. Syntactic theories as instruments of grammatical analysis.

LING 5202. Syntax II. (3 cr. Prereq–5201)
Foundation in modern syntactic theory. Syntactic phenomena in various languages. Emphasizes syntactic argumentation, development of constraints on grammar formalisms.

LING 5205. Semantics. (3 cr. Prereq–5201 or #)
Analysis of sentence meaning. Semantic properties. Relations such as analyticity, entailment, quantification, and genericity. Philosophical background, formal techniques of semantic analysis, how sentence meaning depends on word meaning, syntax, and context. The role of semantics in grammatical theory.

LING 5206. Linguistic Pragmatics. (3 cr. Prereq–5201 or #)
The analysis of linguistic phenomena in relation to beliefs and intentions of language users; speech act theory, conversational implicature, presupposition, information structure, relevance theory, discourse coherence.

LING 5301. Phonetics. (4 cr. §LING 3301. Prereq–3001 or 3001H or 5001 or ¶5001 or #)
Phonetic analysis/transcription of speech. Articulatory/acoustic correlates of speech sounds. Extensive practice transcribing. Emphasizes narrow transcription of human speech. One section focuses on universal phonetics, another focuses on English.

LING 5302. Phonology I. (3 cr. Prereq–3001 or 3001H or 5001 or #)
Concepts/types of information needed for describing patterns in sounds of words, for all speakers of all human languages, including current theoretical frameworks. Extensive practice identifying/analyzing phonological patterns in words of a language.

LING 5303. Phonology II. (3 cr. Prereq–5302 or #)
Phonology of human languages. Preparartion for reading papers in the literature and for doing research in phonology.

LING 5461. Conversation Analysis. (3 cr. §COMM 5461. Prereq–3001 or 3001H or 5001 or #)
Discourse processes. Application of concepts through conversation analysis.

LING 5462. Field Research in Spoken Language. (3 cr. §COMM 5462. Prereq–5461 or Spch 5461 or #)
Transcribing and analyzing talk and movement related to talk. Applying concepts to recorded conversations.

LING 5501. Introduction to Language Acquisition. (3 cr. Prereq–3001 or 3001H or 5001 or #)
First/second language acquisition.

LING 5505. Introduction to Second Language Acquisition. (3 cr. Prereq–[3001 or 3011 or 5001], course on phonological/grammatical structure of a language)
Research on language and learning processes of second-language learners. Linguistic structure of interlanguage. Cognitive/social factors that influence acquisition of a new language.

LING 5601. Historical Linguistics. (3 cr. §LING 3601. Prereq–3001 or 3011H or 5001)
Historical change in phonology, syntax, semantics, and lexicon. Linguistic reconstruction. Genetic relationship among languages.

LING 5701. Sociolinguistics. (3 cr. Prereq–3001 or 3001H or 3011 or 5001 or #)
Social determinants of linguistic diversity, variation, and change. Topics may include social and regional dialects, language style/register, style-/code-switching, quantitative study of speech, linguistic/social inequality.

LING 5721. Bilingualism. (3 cr. Prereq–3001 or 3001H or 3011 or 5001 or #)
Sociolinguistic theory/methods in study of bilingualism. Language ecology in multilingual societies. Language and language behavior in bilingual individual. Language in ethnic conflict. Implications for public policy/planning.

LING 5801. Introduction to Computational Linguistics. (3 cr. Prereq–3001 or 3001H or 3011 or 5001 or #; programming experience helpful)
Methods/issues in computer understanding of natural language. Programming languages, their linguistic applications. Lab projects.

LING 5802. Computational Linguistics. (3 cr. Prereq–5801 or #)
Computer processing of natural language. Applications to such areas as speech recognition and information retrieval.

LING 5900. Topics in Linguistics. (1-4 cr [max 12 cr])
Topics vary. See *Class Schedule*.

LING 5931. Morphology and Syntax of Contemporary English. (3 cr. Prereq–3001 or 3001H or 5001 or #)
Linguistic analysis of word/sentence structure of contemporary English. Focuses on data from recorded/written texts.

LING 5932. Topics in the Structure of Modern English. (3 cr [max 12 cr]. Prereq–[[3001 or 3001H or 5001], [5201 or 5931]] or #)
Aspects of the morphology, syntax, or semantics/pragmatics of modern English. Emphasizes analysis of written or recorded texts. Topics vary.

LING 5993. Directed Study. (1-3 cr [max 10 cr]. Prereq–#, Δ, ❑)
Directed study for Linguistics.

Management (MGMT)

Department of Strategic Management and Organization

Curtis L. Carlson School of Management

MGMT 1350. Introduction to Business and Business Careers. (3 cr; A-F only)
Organizations as systems, profit centers, and political communities. Current business issues, trends for the future. Concepts applied to other settings. Basic business processes, needs, contexts, problems.

MGMT 3001. Fundamentals of Management. (3 cr; A-F only. Prereq–30 cr)
General aspects/characteristics of organizations and their members. Why people/groups in organizations feel/behave as they do. Processes/methods that improve behavior/attitudes/effectiveness of organizational members. Organizational member/manager skills. Guest speakers, group presentations, films.

MGMT 3010. Introduction to Entrepreneurship. (4 cr; A-F only)
Fundamentals of entrepreneurship. Career paths, including new business start-ups, franchising, acquisitions (including family business succession), corporate venturing, and entre-preneurial services. Legal structures for new business formation. Aspects of business law/ethics.

MGMT 3014. Topics in International Business, Government, and Society. (4 cr; A-F only)
Selected topics.

MGMT 3040. Understanding the International Environment of Firms: International Business. (3 cr; A-F only. Prereq–3001, CSOM upper div, at least 60 cr)
Theories, frameworks, tools, and facts for understanding the environment of firms in international competition. Main world-level economic flows (trade, investment, finance). How country-/industry-level economic, political, and socio-cultural factors influence behavior/functions of firms in international competition.

MGMT 3040H. Honors: Understanding the International Environment of Firms, International Business. (3 cr. Prereq–3001, CSOM Honors, at least 60 cr)
Theories, frameworks, tools, and facts for understanding the environment of firms in international competition. Main world-level economic flows (trade, investment, finance). How country-/industry-level economic, political, and socio-cultural factors influence behavior/functions of firms in international competition.

MGMT 3070. Topics in Management. (4 cr; A-F only. Prereq–At least 60 cr [completed or in progress])
Selected topics.

MGMT 3080. Topics in Ethics. (4 cr; A-F only. Prereq–At least 60 cr [taken or in progress])
Topics vary with each offering.

MGMT 3090. Topics in Leadership. (4 cr; A-F only. Prereq–At least 60 cr [completed or in progress])
Selected topics.

MGMT 3480. Topics: Natural Resources. (3 cr)
Individual topics related to natural resources.

MGMT 3603. Topics: Environmental Issues. (3 cr. §ESPM 3603. Prereq–[MATH 1142 or [MATH 1271, MATH 1272]], [APEC 1101 or ECON 1101 or 3261W])
Concepts/issues relating to inventory, subsequent analysis of production systems. Production system from holistic point of view, using term commonly used in industrial ecology: "metabolic system."

MGMT 3604. Topics: Environmental Issues. (3 cr)
Environmental problems such as climate change, ozone depletion, and loss of biodiversity.

MGMT 4002. Managerial Psychology. (4 cr; A-F only)
Behavioral principles, methods, and skills that underlie and compose dimensions of managerial competence and contribute to managers' effectiveness in preventing and solving problems within and between individuals and groups; development of human resource skills management needs based partially on experiential exercises.

MGMT 4004V. Honors: Business Policy: Strategy Formulation and Implementation. (3 cr. Prereq–At least 90 cr, CSOM honors, completion of business core courses)
Integrative perspective on overall direction of enterprise. Choice of products/markets, selection of organizaton structures and management styles. Case analysis: identifying key issues, evaluating options, and making recommendations, under conditions of uncertainty and incomplete information.

MGMT 4004W. Business Policy: Strategy Formulation and Implementation. (3 cr; A-F only. Prereq–90 credits, completion of business core courses)
Integrative perspective on overall direction of the enterprise involving both choice of products and markets and selection of organization structures and management styles; case analysis involving the identification of key issues, evaluation of options, and making recommendations under conditions of uncertainty and incomplete information.

MGMT 4005. Managing the Multinational Business. (4 cr; A-F only. Prereq–BGS 3040)
Structures/strategies of global business. Personnel, technology, and operations in host nations. Challenges unique to management of multinational firm. May include topics such as comparative culture, trade, and ethics.

MGMT 4008. Entrepreneurial Management. (4 cr. Prereq–3001, CSOM upper div)
Assessing opportunities, managing constraints in developing new business. Structuring the venture, perceiving critical issues, obtaining skills needed to succeed. Management, operations, marketing, financial, legal, and competitive issues. Business plan for start-ups, buyouts, franchises, and family firm.

MGMT 4050. Management of Innovation and Change. (2 cr; A-F only. Prereq–3001, CSOM upper div)
Applying theories/research on how new organizational programs, products, and technologies are developed/implemented. Diagnostic skills. How innovation unfolds.

MGMT 4101. Independent Study in Strategic Management and Organization. (1-4 cr [max 4 cr]; A-F only. Prereq–# or Δ)
Students contract with faculty on independent studies.

MGMT 4177. The Business Plan. (2 cr. Prereq–4008, CSOM upper div)
Structure of business plans. Critically analyzing business plans. Formulating an original business plan.

MGMT 5019. Business, Natural Environment, and Global Economy. (2 cr. Prereq–MBA student)
Resource deployment policies that affect the natural environment. Sustainability. Local/global environmental threats, how government policies address these issues. Business strategies/practices that produce "win-win" outcomes.

MGMT 5480. Topics in Natural Resources. (3 cr)
Specific topic for each offering.

Manufacturing Technology (MT)

College of Continuing Education

MT 2999. Manufacturing Technology Credit. (1-20 cr [max 20 cr])
Evaluation for Manufacturing Technology credit.

MT 3111. Elements of Microelectronic Manufacturing. (3 cr. Prereq–Completion of [higher of physics, chemistry, [college algebra or precalculus]] with grade of at least C-, 45 sem crs completed)
Common micro fabrication processes, how they are applied to CMOS manufacturing.

MT 3112. Elements of Micro and Nano Manufacturing Laboratory. (1 cr. Prereq–¶3111, student in Dakota County Technical College NanoTech prog)
Basic process steps to make top-down micro- and nano-scaled structures. Oxidation, photolithography, electron beam lithography, chemical vapor deposition, etching, rapid thermal annealing, wet chemical/plasma etching. Students build a test chip containing various micro-mechanical structures.

MT 3121. Thin Films Deposition. (4 cr. Prereq–Completion of [physics, chemistry, [college algebra or precalculus]] with a grade of at least C-, 45 sem crs completed)
Thin film materials such as metals/oxides. Photolithography, methods of deposition. HV/UHV range. Vacuum evaporation, sputtering, chemical vapor deposition.

MT 3131. Introduction to Materials Characterization. (3 cr. Prereq–Completion of [physics, chemistry, [college algebra or precalculus]] with a grade of at least C-, 45 sem crs completed)
Four basic types of characterization methods: electron beam microscopy, optical microscopy/FTIR, proximal probe techniques, x-ray/ion beam scattering. Principles for, and information that can be reliably obtained from, each each technique.

MT 3132. Materials Characterization Lab. (1 cr. Prereq–¶3131, 2nd yr student in Dakota County Technical College NanoTech prog)
Hands-on characterization of engineering materials by electron/optical microscopy, atomic force microscopy, x-ray diffraction. Spectroscopic methods, specimen preparation, data collection/analysis, maintaining lab notebook.

MT 3141. Principles and Applications of Bionanotechnology. (3 cr. Prereq–Completion of [physics, chemistry, [college algebra or precalculus]] with a grade of at least C-, 45 sem crs)
Intro to protein, lipid, and nucleic biochemistry. Biomolecule design, production using recombinant DNA technology. Use in nanodevices and nano-materials. Applications of biological molecules in bionanotechnology. Effects of Brownian motion. Biomolecular surfaces forces. Biomolecule structure alterations due to molecular interaction. Self-assembly.

MT 3142. Nanoparticles and Biotechnology Laboratory. (1 cr. Prereq–¶3141; 2nd yr student in Dakota County Technical College NanoTech prog)
Use of practical equipment of detecting particle formation. Performing size measurements, aerosol sampling. Optical/condensation counters. Basic biotech equipment, approaches.

MT 4001. Manufacturing Cost Accounting, Analysis, and Control. (3 cr; A-F only)
Basic accounting concepts. Financial statements. Analysis/control of current assets. Income tax planning. Cost analysis. Standard costs for product costing. Time value of money. Quantifying risk/uncertainty. Utility theory, cost of capital, capital structure. Capital budgeting under capital rationing. Management decisions and investment.

MT 4011. Design of Manufacturing Systems and Simulation. (3 cr; A-F only)
Design/analysis of manufacturing systems: flow lines, assembly systems, cellular manufacturing, flexible manufacturing, automated systems. Control issues in manufacturing systems: facility layout, scheduling, batch sizing, group technology, bottleneck management. Modeling/analysis tools, including computer simulation and operations.

MT 4012. Manufacturing Processes. (3 cr; A-F only)
Description/modeling of commonly used manufacturing processes. Process descriptions, process capabilities/performance, process models relating process parameters to part/process characteristics, process control.

MT 4015. Quality Engineering. (3 cr; A-F only. Prereq–4201)
Statistical, engineering, and management approaches to quality improvement. Economics. Teams and information systems. Problem-solving. Function deployment. Value analysis. Reliability engineering. Design for manufacturability analysis. Experiment design. Statistical control. Process validation/capability. Standards, audits, certification.

MT 4021. Properties of Materials. (3 cr; A-F only)
Classification of materials. Atomic bonding, crystal structures, diffusion, structure/properties of materials. Ceramics, polymers, wood, concrete. Corrosion of materials. Elasticity, plasticity, strengthening mechanisms, failure modes, phase diagrams. Transformations and thermal processing.

MT 4025. Computer Integrated Manufacturing. (3 cr. Prereq–4012, ABUS 4102)
Manufacturing systems as open systems. Manufacturing system design. Information flow and computer networks. Network classification/services, hardware components. Network protocols/architecture applied to product design/manufacturing. Computer software used to simulate system/environment interaction.

MT 4031. Engineering Materials Processing I. (3 cr; A-F only)
Manufacture of products. Manufacturing process. Casting, forming, cutting, sheet-metal working. Theories, practice. Lab.

MT 4032. Engineering Materials Processing II. (3 cr; A-F only)
Computer-Aided-Manufacturing (CAM), joining processes. Processing of non-traditional machining. Surface-finishing processes. Lab.

MT 4041. Fluid Mechanics. (3 cr; A-F only)
Pressure/flow measurements, hydrostatic force, continuity/momentum equations, flow in conduits, velocity distribution, drag force, pump calculations, flow through porous media.

MT 4042. Manufacturing Automation. (3 cr; A-F only)
CNC programming, computer-aided manufacturing (CAM), flexible automations, machining centers, robotics, programmable logic controllers, tooling systems, work holding devices.

MT 4102. Machine Control. (3 cr; A-F only)
Discrete control, digital control logic, sequential and feedback control, programmable logic controllers, stepper motors, other devices. Motion control methods, performance. Control languages/techniques, systems hierarchy.

MT 4105. Machine Tool Design. (3 cr; A-F only)
Precision, drives, economy. Cutting/forming tool materials, geometries, selections, sharpening, and standards. Designin Jigs, fixtures, and pressworking tools.

MT 4201. Statistical Process Control. (3 cr; A-F only)
Control charts, cost of quality, hypothesis testing, process capability, gage capability. Development/evaluation of process control chart systems. Experiment design. Six Sigma for business improvement. Computer analysis methods with Microsoft Excel.

MT 4301. Design and Analysis of Experiments. (3 cr; A-F only)
Introduction to applications of statistical methods used by industrial researchers to aid in solving industrial problems. Analysis of means, analysis of variance, factorial designs, fractional factorial (screening) designs. Industrial case studies. Experience at local industries when available.

MT 4501. Manufacturing Product/System Design I. (3 cr; A-F only)
Student teams develop a part or product from requirement definition through prototype fabrication. Definition of product requirements, development of product/tooling design, analysis, definition of fabrication process, development of quality assurance plan, fabrication of prototype, inspection/testing. Capstone project.

MT 4511. Manufacturing Product/System Design II. (3 cr; A-F only)
Continuation of Manufacturing Product/System Design I. Broader experience in manufacturing product and system design. Focuses on involving other stakeholders in design/production of a product. Products from student.s workplace, teamwork. Final report. Capstone project.

Marathi (MAR)

Department of Asian Languages and Literatures

College of Liberal Arts

MAR 1101. Beginning Marathi. (4 cr. §MAR 3101)
Basic listening, speaking, reading, and writing skills. Emphasis on the development of communicative competence.

MAR 1102. Beginning Marathi. (4 cr. §MAR 3102. Prereq–1101 or equiv or #)
Emphasis on developing proficiency in all four language modalities—listening, reading, speaking, and writing.

MAR 3101. Beginning Marathi. (4 cr. §MAR 1101)
Basic listening, speaking, reading, and writing skills. Emphasis on the development of communicative competence.

MAR 3102. Beginning Marathi. (4 cr. §MAR 1102. Prereq–3101 or equiv or #)
Emphasis on developing proficiency in all four language modalities—listening, reading, speaking, and writing.

Mar 3131. Intermediate Marathi. (4 cr. Prereq–1102 or 3102 or equiv or #)
Speaking and comprehension; development of reading and writing skills based on Marathi-language material.

MAR 3132. Intermediate Marathi. (4 cr. Prereq–3131 or equiv or #)
Speaking and comprehension; development of reading and writing skills based on Marathi-language material.

MAR 5992. Directed Readings. (3-5 cr [max 12 cr]. Prereq–#, Δ, ❑)
Individualized guided reading or study of modern Marathi texts.

MAR 5994. Directed Research. (3-5 cr [max 12 cr]. Prereq–#, Δ, ❑)
Directed research on a subject agreed upon by student and instructor.

Marketing (MKTG)

Department of Marketing and Logistics Management

Curtis L. Carlson School of Management

MKTG 3001. Principles of Marketing. (3 cr; A-F only. Prereq–ECON 1101, at least 60 cr)
Introduction to terms, concepts, and skills for analyzing marketing problems. Factors outside the organization affecting its product, pricing, promotion, and distribution decisions. Cases from actual organizations.

MKTG 3010. Marketing Research. (4 cr; A-F only. Prereq–[3001 or ¶3001], [OMS 2550 or equiv])
Methods for collecting/analyzing data to solve marketing problems. Research design, secondary/primary data collection, sample design, data analysis.

MKTG 4020. Advanced Logistics and Supply Chain Management. (2 cr; A-F only. Prereq–3001; 3010 recommended)
Flow of physical product through channels of distribution. Linkages between controlling physical flows and major functions of firm (e.g., finance, marketing, operations). Emphasizes organizing interactions between firms, developing an integrative supply chain management strategy.

MKTG 4030. Selling and Sales Management. (4 cr; A-F only. Prereq–3001; 3010 recommended)
Role of sales manager in developing/implementing sales force plan. Impact of manager's decisions on behavior of individual sales persons.

MKTG 4040. Buyer Behavior. (4 cr; A-F only. Prereq–3001; 3010 recommended)
Application of behavioral sciences to buyer behavior. Perception, memory, affect, learning, persuasion, motivation, behavioral decision theory, social/cultural influences, managerial implications.

MKTG 4050. Integrated Marketing Communications. (4 cr; A-F only. Prereq–3001; 3010 recommended)
Managing communication aspects of marketing strategy. Advertising, sales promotion, public relations, direct marketing. Setting communications objectives/budgets, media selection, creative strategy, sales promotion techniques.

MKTG 4060. Marketing and Distribution Channels. (4 cr; A-F only. Prereq–3001; 3010 recommended)
Design/management of channels of distribution in consumer/industrial settings. Interrelationships between marketing institutions in channels of distribution. Logistics, supply chain strategies.

MKTG 4070. International Marketing. (2 cr; A-F only. Prereq–3001)
Managing international marketing functions. Identifying marketing-based international business opportunities; understanding cultural factors in buyer behavior, constructing and evaluating global and culturally adjusted marketing strategies.

MKTG 4080. Marketing Strategy. (4 cr; A-F only. Prereq–3001; 3010 recommended)
Determining product markets where organizations should compete based on ability to create/maintain competitive advantage. External environment of business. Marketing strategy.

MKTG 4090. Marketing Topics. (2 cr [max 4 cr]; A-F only. Prereq–3001)
Selected topics and problems of current interest considered in depth. Class discussion and course projects.

Materials Science (MATS)

Department of Chemical Engineering and Materials Science

Institute of Technology

MATS 1001. Advances in Chemical Engineering and Materials Science. (1 cr; S-N only. §CHEN 1001. Prereq–§: CHEN 1001; Recommended for [chemical engineering, materials science/engineering] majors)
Introduction to chemical engineering, materials science/engineering. Practical examples of important advances in both fields. Design problems, career opportunities. Lectures, demonstrations, interactive exercises.

MatS 2001. Introduction to the Science of Engineering Materials. (3 cr. Prereq–CHEM 1021, MATH 1272, PHYS 1301W, 2nd yr IT)
Structure-property relationships of engineering materials. Atomic structure and bonding. Crystal structures. Imperfections in solids. Strength of materials, strengthening mechanisms. Phase transformations. Heat treatment/control of microstructures. Materials selection/design. Integrating properties of metals, ceramics, polymers, and composites.

MatS 2002. Introduction to the Science of Engineering Materials Laboratory. (1 cr. Prereq–2001 or ¶2001)
Lab experiments dealing with mechanical properties of engineering materials. Elastic modulus, tensile strength, creep, impact strength, fracture.

MatS 2601. Introduction to Materials Science (Honors). (3-4 cr. Prereq–IT lower div honors program)
Physical principles which govern materials properties at the microscopic scale. Starting from the atomic structure and interatomic bonding, it moves to more complex, physical properties: mechanical, electrical, optical, and thermodynamical properties.

MATS 3011. Introduction to Materials Science and Engineering. (3 cr. Prereq–CHEM 1021, MATH 1272 or 1372, PHYS 1302)
Builds progressively from electrons to atoms to bonding to crystal structures. Defects, X-ray diffraction, phase diagrams, microstructure as a basis for understanding mechanical/electrical properties. Metals, polymers, ceramics, semiconductors, composites.

MATS 3012. Metals and Alloys. (3 cr. Prereq–[3011, [MatS or CHEN upper div]] or #)
Structure of metals/alloys. Crystal structure/defects (point defects, dislocations, grain boundaries). Microstructure. Properties of metals, especially mechanical properties.

MATS 3041. Industrial Assignment I. (2 cr; A-F only. §CHEN 3041. Prereq–MatS upper div, completion of required courses in MatS program through fall sem of 3rd yr, GPA of at least 2.80, regis in co-op program)
Industrial work assignment in engineering co-op program. Formal written report.

MATS 3045. Materials Science and Engineering Industrial Internship. (1-2 cr [max 2 cr])
Industrial internship, three to eight months. Requirements for grade are a proposed plan approved by supervisor and Faculty Internship Co-op Coordinator (FI/CC), and report describing engineering work completed, signed by industrial supervisor prior to submission to faculty internship co-op coordinator.

MATS 3801. Structural Characterization Lab. (2 cr; A-F only. Prereq–[3011, MatS upper div] or Δ)
Characterization of structure of engineering materials by optical/electron microscopy, atomic force microscopy, x-ray diffraction, spectroscopic method, related methods. Crystallography, defects, microstructure, macromolecular structure. Specimen preparation, data collection/analysis, maintaining laboratory notebook.

For definitions of course numbers, symbols, and abbreviations, see page 300.

MATS 3851W. Materials Properties Lab. (2 cr; A-F only. Prereq–[3011, MatS upper div] or Δ)
Characterization of properties of engineering materials. Mechanical, electrical, optical, magnetic, thermal properties. Relationship between properties, materials structure. Specimen preparation. Data collection/analysis, including statistical analysis. Laboratory notebook/report writing.

MATS 4001. Thermodynamics of Materials. (4 cr. Prereq–MatS upper div)
Fundamental thermodynamic concepts, 1st, 2nd, 3rd Laws. Behavior of gases, liquids, solids. Phase diagrams. Reaction equilibria involving gases, condensed phases. Use of computer-based thermodynamic program(s). Electrochemistry.

MATS 4002. Mass Transport and Kinetics. (4 cr; A-F only. Prereq–CE 3101, upper div MatS)
Mass transport in solids: solid state diffusion, Fick's laws, defects/diffusion mechanisms. Mass transport in fluids: fluid flow, diffusion with convection, mass transfer. Kinetics of chemical reactions and phase transformations. Computer-based problems illustrating applications.

MATS 4013. Electrical and Magnetic Properties of Materials. (3 cr; A-F only. Prereq–[3011, upper div [MatS or ChEn]] or #)
Electronic/magnetic properties of solids. Simple band theory of solids. Free electron theory of conductivity/transport. Optical/dielectric response functions. Elementary theory of magnetism. Electronic devices. Superconductivity. Computer-based problems to illustrate applications.

MATS 4041. Industrial Assignment II. (2 cr; A-F only. §CHEN 4041. Prereq–3041, completion of required courses in MatS program through fall sem of 4th yr, GPA of at least 2.80, registration in co-op program)
Industrial assignment in engineering co-op program. Application of materials science principles to engineering design problems in an industrial work environment. Formal written report.

MATS 4212. Ceramics. (3 cr. Prereq–[3011, [MatS or ChEn] sr] or #)
Structure of ceramics: crystal structures, non-crystalline (glass) structures, microstructure. Ceramic phase relationships: binary/ternary diagrams. Ceramic properties: thermal, mechanical, electrical, magnetic, optical. Computer applications.

MATS 4214. Polymers. (3 cr. Prereq–[3011, [MatS or ChEn] sr] or #)
Polymer structure-property relations: structure/morphology of crystalline/amorphous state. Crystallization kinetics. Vitrification and glass transition. Mechanical properties, failure, permeability, optical/electrical properties, polymer composites, effect of processing on properties.

MATS 4221. Materials Design and Performance. (4 cr. Prereq–MATS 3012 or #)
Thermal and mechanical processing to control properties, selection of materials for electronic applications and other applications, analysis of costs/performance, analysis of failure in metallurgical structures by use of fracture mechanics methodology. Laboratory experiments involve creep, fracture, fatigue, optical and SEM metallography, surface science analysis, and statistics.

MATS 4301W. Materials Processing. (4 cr. Prereq–MATS 4212 and 4214)
Casting, solidification and plastic forming of metals; powder processing, forming operations, sintering of ceramics; and processing of thermoplastic and thermoset polymers. Computer applications of data collection and reduction. Additional laboratory projects available to graduate students.

MATS 4400. Senior Design Project. (3 cr. Prereq–Sr, [MatS major or CHEN major])
Students work in teams to apply their expertise in materials science/engineering toward a specific project. With guidance from a mentor from industry or a faculty member, each team defines a problem and follows design steps that culminate in a product design.

MATS 4401. Senior Design Thesis I. (2 cr; A-F only. Prereq–§: 4400; MatS senior, Δ, GPA of at least 3.00, project approval by faculty adviser)
First semester of a 2-semester thesis project. Research and design work directed by faculty member in Department of Chemical Engineering and Materials Science. Written reports are due at midsemester and end of semester. At least one research presentation must be given.

MATS 4402. Senior Design Thesis II. (2 cr; A-F only. Prereq–4401)
Second of 2-semester thesis project. Students continue thesis design project, write thesis, and give final presentation. Lecture portion meets concurrently with 4400.

MATS 4511W. Corrosion and Electrochemistry of Corrosion. (4 cr. Prereq–MATS 3011 or #, upper div IT or grad)
Electrochemical thermodynamics, electrochemical kinetics, theory of aqueous corrosion, theory of high temperature oxidation; specific topics include general corrosion, passivation, pitting, galvanic protection/corrosion, environmental degradation of mechanical properties, corrosion of electronic components, growth of oxide scales by diffusion, materials selection and design. Computers used to collect lab data.

MATS 4512. Corrosion and Electrochemistry of Corrosion. (4 cr. Prereq–MATS 3011 or #, upper div IT or grad)
Electrochemical thermodynamics, electrochemical kinetics, theory of aqueous corrosion, theory of high temperature oxidation; specific topics include general corrosion, passivation, pitting, galvanic protection/corrosion, environmental degradation of mechanical properties, corrosion of electronic components, growth of oxide scales by diffusion, materials selection and design. Computers used to collect lab data.

MATS 4591. Independent Study in Materials Science. (1-3 cr [max 12 cr]. Prereq–Upper div mat sci)
Library, theoretical, laboratory or design studies of scientific or engineering topics in materials science for an individual student. Course content and credits by arrangement with professor. Design credits available if arranged with professor. May be used for upper division Honors Program experience if arranged with professor.

MATS 4593. Directed Study in Materials Science. (1-4 cr [max 12 cr]. Prereq–Upper div MatS)
This course can take two forms: (a) Library, theoretical or design studies of scientific or engineering topics in materials science for an individual or a small group of students. Course content and credits by arrangement with professor. Design credits available if arranged with professor. (b) Special topics course offered only once, e.g., by a visiting professor.

MATS 4594. Directed Research in Materials Science. (1-3 cr [max 12 cr]. Prereq–Upper div mat sci)
Research studies of scientific or engineering topics in materials science for an individual or small group of students. Course content and credits by arrangement with professor. Design credits available if arranged with professor. May be used for upper division Honors Program experience if arranged with professor.

MATS 5221. Introduction to Polymer Chemistry. (3 cr [max 4 cr]; A-F only. §CHEM 4221, CHEM 8221, CHEN 5221, MATS 8221. Prereq–[3501, CHEM 2302] or #)
Condensation, radical, ionic, emulsion, ring-opening, metal-catalyzed polymerizations. Chain conformation, solution thermodynamics, molecular weight characterization, physical properties.

MATS 5223W. Polymer Laboratory. (2 cr. §CHEM 4223W. Prereq–4214 or 5221 or CHEN 4214 or CHEM 5221 or 8221 or #)
Synthesis, characterization, and physical properties of polymers. Free radical, condensation, emulsion, anionic polymerization. Infrared spectroscopy/gel permeation chromatography. Viscoelasticity, rubber elasticity, crystallization.

MATS 5517. Electron Microscopy. (3 cr; A-F only)
Transmission electron microscope, scattering and diffraction, electron sources, lenses, apertures and resolution, specimen preparation, diffraction patterns, kikuchi diffraction, planar defects, strain fields, high resolution imaging, X-ray spectrometry.

MATS 5518. Imaging and Diffraction in the Scanning Electron Microscope. (1 cr; A-F only. Prereq–#)
Theory/practice of scanning electron micrscopy. Classroom sessions cover how instrument works, best-use practices. Practical sessions allow students to hone skills.

MATS 5519. Basic Transmission Electron Microscopy. (1 cr; A-F only. Prereq–#)
Theory/practice of transmission electron microscope. Classroom sessions cover how instrument works, best-use practices. Practical sessions allow students to hone skills.

MATS 5520. Basic Analytical Electron Microscopy. (1 cr; A-F only. Prereq–5518, 5119)
Theory/practice of analytical electron microscopy. Classroom sessions cover techniques, best-use practices. Practical sessions allow students to hone skills.

MATS 5521. Thin Films and Interfaces. (3 cr. Prereq–IT upper div or grad, MATS 4013 or #)
Fundamentals of vacuum science; vapor pressures and thin film deposition processes (physical and chemical vapor deposition, sputtering, laser ablation); thermodynamics and kinetics of thin film growth; epitaxy; film stability and reactions; structure-property relationship; multilayers and diffusion barriers; characterization techniques to include photon, electron, and ion spectroscopies. Computer-based homework problems.

MATS 5531. Electrochemical Engineering. (3 cr. §CHEN 5531. Prereq–MATS 3011 or #, upper div IT or grad)
Fundamentals of electrochemical engineering. Topics include electrochemical mass transfer electrokinetics, thermodynamics of cells, modern sensors, formation of thin films and microstructured materials. Computer-based problems will be assigned.

Mathematics (MATH)

School of Mathematics

Institute of Technology

MATH 1001. Excursions in Mathematics. (3 cr. Prereq–3 yrs high school math or placement exam or grade of at least C- in GC 0731)
Breadth of mathematics, its nature/applications. Power of abstract reasoning.

MATH 1008. Trigonometry. (2.67 cr; A-F only. Prereq–Plane geometry, two yrs high school algebra [or C or better in GC 0731])
Analytic trigonometry, identities, equations, properties of trigometric functions, right/oblique triangles.

MATH 1031. College Algebra and Probability. (3 cr. Prereq–3 yrs high school math or grade of at least C- in GC 0731; Credit will not be granted if credit has been received for: 1051, 1151, 1155)
Algebra, analytic geometry explored in greater depth than is usually done in three years of high school mathematics. Additional topics from combinations, permutations, probability.

MATH 1038. College Algebra and Probability Submodule. (1 cr; A-F only. Prereq–1051 or 1151 or 1155)
For students who need probability/permutations/combinations portion of 1031. Meets with 1031, has same grade/work requirements.

MATH 1051. Precalculus I. (3 cr. Prereq–3 yrs high school math or placement exam or grade of at least C- in GC 0731; Credit will not be granted if credit has been received for: 1031, 1151)
Algebra, analytic geometry, exponentials, logarithms, beyond usual coverage found in three-year high school mathematics program.

MATH 1131. Finite Mathematics. (3 cr. Prereq–3 1/2 yrs high school math or grade of at least C- in [1031 or 1051])
Financial mathematics, probability, linear algebra, linear programming, Markov chains, some elementary computer programming.

MATH 1142. Short Calculus. (4 cr. §MATH 1271, MATH 1281, MATH 1371, MATH 1571H. Prereq–3 1/2 yrs high school math or grade of at least C- in [1031 or 1051])
Derivatives, integrals, differential equations, partial derivatives, maxima/minima of functions of several variables covered with less depth than full calculus. No trigonometry included.

MATH 1143. Introduction to Advanced Mathematics. (4 cr; A-F only. Prereq–1142 or 1272 or 1372 or #; recommended especially for students in [social/biological sciences, business])
Topics that are covered in more depth in 2243 and 2263, plus probability theory. Matrices, eigenvectors, conditional probability, independence, distributions, basic statistical tools, linear regression. Linear differential equations and systems of differential equations. Multivariable differentiability and linearization.

MATH 1151. Precalculus II. (3 cr. Prereq–3 1/2 yrs high school math or placement exam or grade of at least C- in [1031 or 1051]; Credit will not be granted if credit has been received for: 1155)
Algebra, analytic geometry, trigonometry, complex numbers, beyond usual coverage found in three-year high school mathematics program.

MATH 1155. Intensive Precalculus. (5 cr. Prereq–3 yrs high school math or placement exam or grade of at least C- in GC 0731; Credit will not be granted if credit has been received for: 1031, 1051, 1151)
Algebra, analytic geometry, exponentials, logarithms, trigonometry, complex numbers, beyond usual coverage found in three-year high school mathematics program. One semester version of 1051-1151.

MATH 1271. Calculus I. (4 cr. §MATH 1142, MATH 1281, MATH 1371, MATH 1571H. Prereq–4 yrs high school math including trig or placement test or grade of at least C- in 1151 or 1155)
Differential calculus of functions of a single variable. Introduction to integral calculus of a single variable, separable differential equations. Applications: max-min, related rates, area, volume, arc-length.

MATH 1272. Calculus II. (4 cr. §MATH 1252, MATH 1282, MATH 1372, MATH 1572H. Prereq–[1271 or equiv] with grade of at least C-)
Techniques of integration. Calculus involving transcendental functions, polar coordinates. Taylor polynomials, vectors/curves in space, cylindrical/spherical coordinates.

MATH 1281. Calculus with Biological Emphasis I. (4 cr. §MATH 1142, MATH 1271, MATH 1371, MATH 1571H. Prereq–[[four yrs high school math including trigonometry] or [grade of at least C- in [1151 or 1155]] or placement exam], [instr or o])
Differential calculus of single-variable functions, basics of integral calculus. Applications emphasizing biological sciences.

MATH 1282. Calculus With Biological Emphasis II. (4 cr. §MATH 1252, MATH 1272, MATH 1372, MATH 1572H. Prereq–[1271 or 1281 or 1371] with grade of at least C-)
Techniques/applications of integration, differential equations/systems, matrix algebra, basics of multivariable calculus. Applications emphasizing biology.

MATH 1371. IT Calculus I. (4 cr. §MATH 1142, MATH 1271, MATH 1281, MATH 1571H. Prereq–IT, background in [precalculus, geometry, visualization of functions/graphs], #; familiarity with graphing calculators recommended)
Differentiation of single-variable functions, basics of integration of single-variable functions. Applications: max-min, related rates, area, curve-sketching. Emphasizes use of calculator, cooperative learning.

MATH 1372. IT Calculus II. (4 cr. §MATH 1252, MATH 1272, MATH 1282, MATH 1572H. Prereq–IT, grade of at least C- in 1371)
Techniques of integration. Calculus involving transcendental functions, polar coordinates, Taylor polynomials, vectors/curves in space, cylindrical/spherical coordinates. Emphasizes use of calculators, cooperative learning.

MATH 1461H. Honors Calculus IA for Secondary Students. (2 cr. Prereq–High school student, #)
Accelerated honors sequence. Foundations of calculus. Single variable calculus through differentiation, applications.

MATH 1462H. Honors Calculus IB for Secondary Students. (3 cr. Prereq–1461H)
Accelerated honors sequence. Theory/techniques of integration. Applications. Introduction to parametric equations and polar coordinates.

MATH 1473H. Honors Calculus IIA for Secondary Students. (2 cr. Prereq–1462H)
Accelerated honors sequence. Differential equations, sequence/series. Linear algebra.

MATH 1474H. Honors Calculus IIB for Secondary Students. (3 cr. Prereq–1473H)
Accelerated honors sequence. Linear Algebra from geometric viewpoint. First-order systems of differential equations.

MATH 1571H. Honors Calculus I. (4 cr [max 5 cr]. §MATH 1142, MATH 1271, MATH 1281, MATH 1371. Prereq–IT Honors office approval)
Differential/integral calculus of functions of a single variable. Emphasizes hard problem-solving rather than theory.

MATH 1572H. Honors Calculus II. (4 cr [max 5 cr]. §MATH 1252, MATH 1272, MATH 1282, MATH 1372. Prereq–Grade of at least C- in 1571, IT Honors Office approval; parts of this sequence may be taken for cr by students who have taken non-honors calc classes)
Continuation of 1571. Infinite series, differential calculus of several variables, introduction to linear algebra.

Math 2001. Actuarial Science Seminar. (1 cr; S-N only. Prereq–1272 or equiv)
Actuarial science as a subject and career. Guest lectures by actuaries. Resume preparation and interviewing skills. Review and practice for actuarial exams.

Math 2066. Elementary Differential Equations. (1-4 cr [max 4 cr])
Not taught: merely provides credit for transfer students who have taken a sophomore-level differential equations class that does not contain enough linear algebra to qualify for credit for 2243.

Math 2142. Elementary Linear Algebra. (1-4 cr; A-F only)
Not taught: merely provides credit for transfer students who have taken a sophomore-level linear algebra course that does not contain enough differential equations to qualify for credit for 2243.

Math 2243. Linear Algebra and Differential Equations. (4 cr. §MATH 2373. Prereq–1272 or 1282 or 1372 or 1572)
Linear algebra: basis, dimension, matrices, eigenvalues/eigenvectors. Differential equations: first-order linear, separable; second-order linear with constant coefficients; linear systems with constant coefficients.

Math 2263. Multivariable Calculus. (4 cr. §MATH 2374, MATH 2573H, MATH 3251. Prereq–1272 or 1372 or 1572)
Derivative as a linear map. Differential/integral calculus of functions of several variables, including change of coordinates using Jacobians. Line/surface integrals. Gauss, Green, Stokes Theorems.

Math 2283. Sequences, Series, and Foundations. (3 cr. §MATH 3283W. Prereq–¶[2243 or 2263 or 2373 or 2374])
Introduction to mathematical reasoning used in advanced mathematics. Elements of logic. Mathematical induction. Real number system. General, monotone, recursively defined sequences. Convergence of infinite series/sequences. Taylor's series. Power series with applications to differential equations. Newton's method.

Math 2373. IT Linear Algebra and Differential Equations. (4 cr. §MATH 2243. Prereq–[1272 or 1282 or 1372 or 1572], IT)
Linear algebra: basis, dimension, eigenvalues/eigenvectors. Differential Equations: linear equations/systems, phase space, forcing/resonance, qualitative/numerical analysis of nonlinear systems, Laplace transforms. Emphasizes use of computer technology.

Math 2374. IT Multivariable Calculus and Vector Analysis. (4 cr. §MATH 2263, MATH 2573H, MATH 3251. Prereq–[1272 or 1282 or 1372 or 1572], IT)
Derivative as a linear map. Differential/integral calculus of functions of several variables, including change of coordinates using Jacobians. Line/surface integrals. Gauss, Green, Stokes theorems. Emphasizes use of computer technology.

Math 2472H. Honors Calculus IIIA for Secondary Students. (3 cr. Prereq–1474H)
Accelerated honors sequence for selected mathematically talented high school students. The geometry of IR^2 and IR^3. Vectors and vector functions. Multivariable calculus through differentiation using linear algebra.

Math 2473H. Honors Calculus IIIB for Secondary Students. (3 cr. Prereq–2472H)
Accelerated honors sequence. Integration in multivariable calculus using linear algebra. Vector Analysis. Topics from differential equations.

Math 2474H. Advanced Topics for Secondary Students. (3 cr. Prereq–2473H)
Topics may include linear algebra, combinatorics, advanced differential equations, probability/statistics, numerical analysis, dynamical systems, topology/geometry. Emphasizes concepts/explorations.

Math 2573H. Honors Calculus III. (4 cr [max 5 cr]. §MATH 2263, MATH 2374, MATH 3251. Prereq–1572 or IT Honors office approval)
Integral calculus of several variables. Vector analysis, including theorems of Gauss, Green, Stokes.

Math 2574H. Honors Calculus IV. (4 cr. Prereq–[2573 or equiv], IT Honors office approval)
Advanced linear algebra, differential equations. Additional topics as time permits.

Math 2582H. Honors Calculus II: Advanced Placement. (5 cr; A-F only. Prereq–Δ)
First semester of integrated three semester sequence covering infinite series, multivariable calculus (including vector analysis with Gauss, Green and Stokes theorems, linear algebra (with vector spaces), ODE, and introduction to complex analysis. Material is covered at a faster pace and at a somewhat deeper level than the regular honors sequence.

Math 2583H. Honors Calc 3 - Adv Placement. (5 cr; A-F only. Prereq–2582H or #)
Second semester of three-semester sequence. Infinite series. Multivariable calculus including vector analysis with Gauss, Green, and Stokes theorems. Linear algebra (with vector spaces), ODE, and introduction to complex analysis. Material is covered at faster pace and deeper level than in regular honors sequence.

Math 2999. Special Exam. (1 cr)
Special exam.

MATH 3113. Topics in Elementary Mathematics I. (4 cr. Prereq–[Grade of at least C- in 1031] or placement exam)
Arithmetic/geometric sequences. Counting, building on techniques from college algebra. Graph theory. Integers, rational numbers; emphasizes aspects related to prime factorization. Modular arithmetic with applications.

MATH 3116. Topics in Elementary Math II: Short Course. (2 cr; A-F only. Prereq–Grade of at least C- in 3113)
Probability/Statistics, vector geometry, real/complex numbers. Meets during first half of semester only.

MATH 3118. Topics in Elementary Mathematics II. (4 cr. Prereq–Grade of at least C- in 3113)
Probability/statistics, vector geometry, real/complex numbers, finite fields building on previously learned modular arithmetic, trees.

MATH 3283W. Sequences, Series, and Foundations: Writing Intensive. (4 cr. §MATH 2283. Prereq–¶[2243 or 2263 or 2373 or 2374])
Introduction to reasoning used in advanced mathematics courses. Logic, mathematical induction, real number system, general/monotone/recursively defined sequences, convergence of infinite series/sequences, Taylor's series, power series with applications to differential equations, Newton's method. Writing-intensive component.

MATH 3584H. Honors Calculus IV: Advanced Placement. (5 cr. Prereq–[2583 or equiv], IT Honors office approval)
Advanced linear algebra, differential equations. Introduction to complex analysis.

MATH 3592H. Honors Mathematics I. (5 cr; A-F only. Prereq–Δ; for students with mathematical talent)
First semester of three-semester sequence. Focuses on multivariable calculus at deeper level than regular calculus offerings. Rigorous introduction to sequences/series. Theoretical treatment of multivariable calculus. Strong introduction to linear algebra.

MATH 3593H. Honors Mathematics II. (5 cr; A-F only. Prereq–3592H or #)
Second semester of three-semester sequence. Focuses on multivariable calculus at deeper level than regular calculus offerings. Rigorous introduction to sequences/series. Theoretical treatment of multivariable calculus. Strong introduction to linear algebra.

MATH 4005. Calculus Refresher. (4 cr; A-F only. Prereq–Δ)
Review of first-year calculus. Functions of one variable. Limits. Differentiation/integration of functions of one variable. Some applications, including max-min, related rates. Volume and surface area of solids of revolution. Vectors/curves in the plane and in space.

MATH 4065. Theory of Interest. (3 cr. Prereq–1272 or 1372 or 1572; primarily for [mathematics, business] majors interested in actuarial science)
Time value of money. Annuities, sinking funds, bonds, similar items.

MATH 4113. Topics in Elementary Mathematics I. (4 cr. Prereq–[Grade of at least C- in 1031] or placement exam)
Arithmetic/geometric sequences. Counting, building on techniques from college algebra. Graph Theory. Integers, rational numbers; emphasizes aspects related to prime factorization. Modular arithmetic with applications. Grading standard one-third higher than 3113.

MATH 4116. Topics in Elementary Math II: Short Course. (2 cr; A-F only. Prereq–Grade of at least C- in 4113)
Probability/Statistics, vector geometry, real/complex numbers. Meets during first half of semester only. Grading standard one-third higher than 3116.

MATH 4118. Topics in Elementary Mathematics II. (4 cr. Prereq–Grade of at least C- in 4113)
Probability/statistics, vector geometry, real/complex numbers, finitefields building on previously learned modular arithmetic, trees. Grading standard one-third higher than 3118.

MATH 4151. Elementary Set Theory. (3 cr. Prereq–One soph math course or #)
Basic properties of operations on sets, cardinal numbers, simply and well-ordered sets, ordinal numbers, axiom of choice, axiomatics.

MATH 4152. Elementary Mathematical Logic. (3 cr. §MATH 5165. Prereq–one soph math course or #)
Propositional logic. Predicate logic: notion of a first order language, a deductive system for first order logic, first order structures, Godel's completeness theorem, axiom systems, models of formal theories.

MATH 4242. Applied Linear Algebra. (4 cr. §MATH 4457. Prereq–2243 or 2373 or 2573)
Systems of linear equations, vector spaces, subspaces, bases, linear transformations, matrices, determinants, eigenvalues, canonical forms, quadratic forms, applications.

MATH 4281. Introduction to Modern Algebra. (4 cr. Prereq–2283 or 3283 or #)
Equivalence relations, greatest common divisor, prime decomposition,modular arithmetic, groups, rings, fields, Chinese remainder theorem,matrices over commutative rings, polynomials over fields.

MATH 4428. Mathematical Modeling. (4 cr. Prereq–2243 or 2373 or 2573)
Modeling techniques for analysis/decision-making in industry. Optimization (sensitivity analysis, Lagrange multipliers, linear programming). Dynamical modeling (steady-states, stability analysis, eigenvalue methods, phase portraits, simulation). Probabilistic methods (probability/statistical models, Markov chains, linear regression, simulation).

MATH 4457. Methods of Applied Mathematics I. (4 cr. §MATH 4242. Prereq–[2243 or 2373 or 2573], [2263 or 2374 or 2574])
Vector spaces, minimization principles, least squares approximation, orthogonal bases, linear functions, linear systems of ordinary differential equations. Applications include statics/dynamics of electrical circuits, mechanical structures. Stability/resonance, approximation/interpolation of data. Numerical methods and geometry.

MATH 4458. Methods of Applied Mathematics II. (4 cr. Prereq–4457)
Boundary value problems, partial differential equations, complex variables, dynamical systems, calculus of variations, numerical methods. Green's functions, delta functions, Fourier series/integrals, wavelets, conformal mapping, finite elements/differences. Applications: fluid/continuum mechanics, heat flow, signal processing, quantum mechanics.

MATH 4512. Differential Equations with Applications. (3 cr. Prereq–2243 or 2373 or 2573)
Laplace transforms, series solutions, systems, numerical methods, plane autonomous systems, stability.

MATH 4567. Applied Fourier Analysis. (4 cr. Prereq–2243 or 2373 or 2573)
Fourier series, integral/transform. Convergence. Fourier series, transform in complex form. Solution of wave, heat, Laplace equations by separation of variables. Sturm-Liouville systems, finite Fourier, fast Fourier transform. Applications. Other topics as time permits.

MATH 4606. Advanced Calculus. (4 cr. Prereq–[2263 or 2374 or 2573], [2283 or 2574 or 3283 or #]; Credit will not be granted if credit has been received for:5615)
Axioms for the real numbers. Techniques of proof for limit theorems, continuity, uniform convergence. Rigorous treatment of differential/integral calculus for single-/multi-variable functions.

MATH 4653. Elementary Probability. (4 cr. Prereq–[2263 or 2374 or 2573]; [2283 or 2574 or 3283] recommended)
Probability spaces, distributions of discrete/continuous random variables, conditioning. Basic theorems, calculational methodology. Examples of random sequences. Emphasizes problem-solving.

MATH 4707. Introduction to Combinatorics and Graph Theory. (4 cr. Prereq–2243, [2283 or 3283]; Credit will not be granted if credit has been received for: 5705, 5707)
Existence, enumeration, construction, algorithms, optimization. Pigeonhole principle, bijective combinatorics, inclusion-exclusion, recursions, graph modeling, isomorphism. Degree sequences and edge counting. Connectivity, Eulerian graphs, trees, Euler.s formula, network flows, matching theory. Emphasizes mathematical induction as proof technique.

MATH 4990. Topics in Mathematics. (1-4 cr [max 12 cr])

MATH 4991. Independent Study. (1-4 cr [max 12 cr])

MATH 4992. Directed Reading. (1-4 cr [max 12 cr])

MATH 4993. Directed Study. (1-4 cr [max 12 cr])

MATH 4995. Senior Project for CLA. (1 cr; A-F only. Prereq–2 sem of upper div math, Δ)
Directed study. May consist of paper on specialized area of math or original computer program or other approved project. Covers some math that is new to student. Scope/topic vary with instructor.

MATH 4997W. Senior project (Writing Intensive). (1 cr [max 2 cr]; A-F only. Prereq–2 sem upper div math, Δ)
Directed study. A 10-15 page paper on a specialized area, including some math that is new to student. At least two drafts of paper given to instructor for feedback before final version. Student keeps journal of preliminary work on project. Scope/topic vary with instructor.

MATH 5067. Actuarial Mathematics I. (4 cr. Prereq–4065, [one sem [4xxx or 5xxx] [probability or statistics] course])
Future lifetime random variable, survival function. Insurance, life annuity, future loss random variables. Net single premium, actuarial present value, net premium, net reserves.

MATH 5068. Actuarial Mathematics II. (4 cr. Prereq–5067)
Multiple decrement insurance, pension valuation. Expense analysis, gross premium, reserves. Problem of withdrawals. Regulatory reserving systems. Minimum cash values. Additional topics at instructor's discretion.

MATH 5075. Mathematics of Options, Futures, and Derivative Securities I. (4 cr. Prereq–Two yrs calculus, basic computer skills)
Mathematical background (e.g., partial differential equations, Fourier series, computational methods, Black-Scholes theory, numerical methods—including Monte Carlo simulation). Interest-rate derivative securities, exotic options, risk theory. First course of two-course sequence.

MATH 5076. Mathematics of Options, Futures, and Derivative Securities II. (4 cr; A-F only. Prereq–5075)
Mathematical background such as partial differential equations, Fourier series, computational methods, Black-Scholes theory, numerical methods (including Monte Carlo simulation), interest-rate derivative securities, exotic options, risk theory.

MATH 5165. Mathematical Logic I. (4 cr. §MATH 4152. Prereq–2283 or 3283 or PHIL 5201 or CSCI course in theory of algorithms or #)
Theory of computability: notion of algorithm, Turing machines, primitive recursive functions, recursive functions, Kleene normal form, recursion theorem. Propositional logic.

MATH 5166. Mathematical Logic II. (4 cr. Prereq–5165)
First-order logic: provability/truth in formal systems, models of axiom systems, Godel's completeness theorem. Godel's incompleteness theorem: decidable theories, representability of recursive functions in formal theories, undecidable theories, models of arithmetic.

MATH 5248. Cryptology and Number Theory. (4 cr. Prereq–2 sems soph math)
Classical cryptosystems. One-time pads, perfect secrecy. Public key ciphers: RSA, discrete log. Euclidean algorithm, finite fields, quadratic reciprocity. Message digest, hash functions. Protocols: key exchange, secret sharing, zero-knowledge proofs. Probablistic algorithms: pseudoprimes, prime factorization. Pseudo-random numbers. Elliptic curves.

MATH 5251. Error-Correcting Codes, Finite Fields, Algebraic Curves. (4 cr. Prereq–2 sems soph math)
Information theory: channel models, transmission errors. Hamming weight/distance. Linear codes/fields, check bits. Error processing: linear codes, Hamming codes, binary Golay codes. Euclidean algorithm. Finite fields, Bose-Chaudhuri-Hocquenghem codes, polynomial codes, Goppa codes, codes from algebraic curves.

MATH 5285H. Honors: Fundamental Structures of Algebra I. (4 cr. Prereq–[2243 or 2373 or 2573], [2283 or 2574 or 3283])
Review of matrix theory, linear algebra. Vector spaces, linear transformations over abstract fields. Group theory, includingnormal subgroups, quotient groups, homomorphisms, class equation, Sylow's theorems. Specific examples: permutation groups, symmetry groups of geometric figures, matrix groups.

MATH 5286H. Honors: Fundamental Structures of Algebra II. (4 cr. Prereq–5285)
Ring/module theory, including ideals, quotients, homomorphisms,domains (unique factorization, euclidean, principal ideal), fundamental theorem for finitely generated modules over euclidean domains, Jordan canonical form. Introduction to field theory, including finite fields,algebraic/transcendental extensions, Galois theory.

MATH 5335. Geometry I. (4 cr. Prereq–[2243 or 2373 or 2573], [¶2263 or ¶2374 or ¶2574])
Advanced two-dimensional Euclidean geometry from a vector viewpoint. Theorems/problems about triangles/circles, isometries, connections with Euclid's axioms. Hyperbolic geometry, how it compares with Euclidean geometry.

MATH 5336. Geometry II. (4 cr. Prereq–5335)
Projective geometry, including: relation to Euclidean geometry, finitegeometries, fundamental theorem of projective geometry. N-dimensionalEuclidean geometry from a vector viewpoint. Emphasizes N§3, including: polyhedra, spheres, isometries.

MATH 5345. Introduction to Topology. (4 cr. Prereq–[2263 or 2374 or 2573], [¶2283 or ¶2574 or ¶3283])
Set theory. Euclidean/metric spaces. Basics of general topology, including compactness/connectedness.

MATH 5378. Differential Geometry. (4 cr. Prereq–[2263 or 2374 or 2573], [2243 or 2373 or 2574]; [2283 or 3283] recommended])
Basic geometry of curves in plane and in space, including Frenet formula, theory of surfaces, differential forms, Riemannian geometry.

MATH 5385. Introduction to Computational Algebraic Geometry. (4 cr. Prereq–[2263 or 2374 or 2573], [2243 or 2373 or 2574])
Geometry of curves/surfaces defined by polynomial equations. Emphasizes concrete computations with polynomials using computer packages, interplay between algebra and geometry. Abstract algebra presented as needed.

MATH 5445. Mathematical Analysis of Biological Networks. (4 cr. Prereq–Linear algebra, differential equations)
Development/analysis of models for complex biological networks. Examples taken from signal transduction networks, metabolic networks, gene control networks, and ecological networks.

MATH 5467. Introduction to the Mathematics of Image and Data Analysis. (4 cr. Prereq–[2243 or 2373 or 2573], [2283 or 2574 or 3283 or #]; [[2263 or 2374], 4567] recommended)
Background theory/experience in wavelets. Inner product spaces, operator theory, Fourier transforms applied to Gabor transforms, multi-scale analysis, discrete wavelets, self-similarity. Computing techniques.

MATH 5481. Mathematics of Industrial Problems I. (4 cr. Prereq–[2243 or 2373 or 2573], [2263 or 2374 or 2574], familiarity with some programming language)
Topics in industrial math, including crystal precipitation, air quality modeling, electron beam lithography. Problems treated both theoretically and numerically.

MATH 5482. Mathematics of Industrial Problems II. (4 cr. Prereq–[2243 or 2373 or 2573], [2263 or 2374 or 2574], familiarity with some programming language)
Topics in industrial math, including color photography, catalytic converters, photocopying.

MATH 5485. Introduction to Numerical Methods I. (4 cr. Prereq–[2243 or 2373 or 2573], familiarity with some programming language)
Solution of nonlinear equations in one variable. Interpolation, polynomial approximation, numerical integration/differentiation, numerical solution of initial-value problems.

MATH 5486. Introduction To Numerical Methods II. (4 cr. Prereq–5485)
Direct/iterative methods for solving linear systems, approximation theory, methods for eigenvalue problems, methods for systems of nonlinear equations, numerical solution of boundary value problems for ordinary differential equations.

MATH 5487. Computational Methods for Differential and Integral Equations in Engineering and Science I. (4 cr. Prereq–4242)
Numerical methods for elliptic partial differential equations, integral equations of engineering and science. Methods include finite element, finite difference, spectral, boundary integral.

MATH 5488. Computational Methods for Differential and Integral Equations in Engineering and Science II. (4 cr. Prereq–5487)
Numerical methods for time-dependent partial differential equations of engineering/science. Methods include finite element, finite difference, spectral, boundary integral. Applications to fluid flow, elasticity, electromagnetism.

MATH 5525. Introduction to Ordinary Differential Equations. (4 cr. Prereq–[2243 or 2373 or 2573], [2283 or 2574 or 3283])
Ordinary differential equations, solution of linear systems, qualitative/numerical methods for nonlinear systems. Linear algebra background, fundamental matrix solutions, variation of parameters, existence/uniqueness theorems, phase space. Rest points, their stability. Periodic orbits, Poincare-Bendixson theory, strange attractors.

MATH 5535. Dynamical Systems and Chaos. (4 cr. Prereq–[2243 or 2373 or 2573], [2263 or 2374 or 2574])
Dynamical systems theory. Emphasizes iteration of one-dimensional mappings. Fixed points, periodic points, stability, bifurcations, symbolic dynamics, chaos, fractals, Julia/Mandelbrot sets.

MATH 5583. Complex Analysis. (4 cr. Prereq–2 sems soph math [including [2263 or 2374 or 2573], [2283 or 3283]] recommended)
Algebra, geometry of complex numbers. Linear fractional transformations. Conformal mappings. Holomorphic functions. Theorems of Abel/Cauchy, power series. Schwarz' lemma. Complex exponential, trig functions. Entire functions, theorems of Liouville/Morera. Reflection principle. Singularities, Laurent series. Residues.

MATH 5587. Elementary Partial Differential Equations I. (4 cr. Prereq–[2243 or 2373 or 2573], [2263 or 2374 or 2574])
Emphasizes partial differential equations w/physical applications, including heat, wave, Laplace's equations. Interpretations of boundary conditions. Characteristics, Fourier series, transforms, Green's functions, images, computational methods. Applications include wave propagation, diffusions, electrostatics, shocks.

MATH 5588. Elementary Partial Differential Equations II. (4 cr [max 400 cr]; A-F only. Prereq–[[2243 or 2373 or 2573], [2263 or 2374 or 2574], 5587] or #)
Heat, wave, Laplace's equations in higher dimensions. Green's functions, Fourier series, transforms. Asymptotic methods, boundary layer theory, bifurcation theory for linear/nonlinear PDEs. Variational methods. Free boundary problems. Additional topics as time permits.

MATH 5594H. Honors Mathematics - Topics. (4 cr [max 12 cr]; A-F only. Prereq–[3593H with grade of at least B, experience in writing proofs] or Δ; intended for mathematically-talented students with proven achievement in theoretical mathematics courses)
Topics vary depending on interests of instructor. Theoretical treatment of chosen topic.

MATH 5615H. Honors: Introduction to Analysis I. (4 cr. Prereq–[[2243 or 2373], [2263 or 2374], [2283 or 3283]] or 2574)
Axiomatic treatment of real/complex number systems. Introduction to metric spaces: convergence, connectedness, compactness. Convergence of sequences/series of real/complex numbers, Cauchy criterion, root/ratio tests. Continuity in metric spaces. Rigorous treatment of differentiation of single-variable functions, Taylor's Theorem.

MATH 5616H. Honors: Introduction to Analysis II. (4 cr. Prereq–5615)
Rigorous treatment of Riemann-Stieltjes integration. Sequences/series of functions, uniform convergence, equicontinuous families, Stone-Weierstrass Theorem, power series. Rigorous treatment of differentiation/integration of multivariable functions, Implicit Function Theorem, Stokes' Theorem. Additional topics as time permits.

MATH 5651. Basic Theory of Probability and Statistics. (4 cr. Prereq–[2263 or 2374 or 2573], [2243 or 2373]; [2283 or 2574 or 3283] recommended; Credit will not be granted if credit has been received for: STAT 4101, STAT 5101)
Logical development of probability, basic issues in statistics. Probability spaces, random variables, their distributions/expected values. Law of large numbers, central limit theorem, generating functions, sampling, sufficiency, estimation.

MATH 5652. Introduction to Stochastic Processes. (4 cr. Prereq–5651 or STAT 5101)
Random walks, Markov chains, branching processes, martingales, queuing theory, Brownian motion.

MATH 5654. Prediction and Filtering. (4 cr. Prereq–5651 or STAT 5101)
Markov chains, Wiener process, stationary sequences, Ornstein-Uhlenbeck process. Partially observable Markov processes (hidden Markov models), stationary processes. Equations for general filters, Kalman filter. Prediction of future values of partially observable processes.

MATH 5705. Enumerative Combinatorics. (4 cr. Prereq–[2243 or 2373 or 2573], [2263 or 2283 or 2374 or 2574 or 3283]; Credit will not be granted if credit has been received for: 4707)
Basic enumeration, bijections, inclusion-exclusion, recurrence relations, ordinary/exponential generating functions, partitions, Polya theory. Optional topics include trees, asymptotics, listing algorithms, rook theory, involutions, tableaux, permutation statistics.

MATH 5707. Graph Theory and Non-enumerative Combinatorics. (4 cr. Prereq–[2243 or 2373 or 2573], [2263 or 2374 or 2574]; [2283 or 3283 or experience in writing proofs] highly recommended; Credit will not be granted if credit has been received for: 4707)
Basic topics in graph theory: connectedness, Eulerian/Hamiltonian properties, trees, colorings, planar graphs, matchings, flows in networks. Optional topics include graph algorithms, Latin squares, block designs, Ramsey theory.

MATH 5711. Linear Programming and Combinatorial Optimization. (4 cr. Prereq–2 sems soph math [including 2243 or 2373 or 2573])
Simplex method, connections to geometry, duality theory,sensitivity analysis. Applications to cutting stock, allocation of resources, scheduling problems. Flows, matching/transportationproblems, spanning trees, distance in graphs, integer programs, branch/bound, cutting planes, heuristics. Applications to traveling salesman, knapsack problems.

MATH 5900. Tutorial in Advanced Mathematics. (1-6 cr [max 120 cr]; A-F only)
Individually directed study.

Mathematics Education (MTHE)

Department of Curriculum and Instruction

College of Education and Human Development

MTHE 3101. Mathematics and Pedagogy for Elementary Teachers I. (4 cr. Prereq–[College algebra, elementary FOE student] or #)
Math content knowledge of K-6 in an environment modeling pedagogy for future implementation. Integrated content/methods. Problem solving, connections, communication, reasoning, representation. Functions, proportionality, number, numeration.

MTHE 3102. Mathematics and Pedagogy for Elementary Teachers II. (4 cr. Prereq–3101, college algebra)
Math content knowledge of K-6 in an environment modeling pedagogy for future implementation. Integrated content/methods. Problem solving, connections, communication, reasoning, representation. Geometry, measurement, probability, statistics.

Mechanical Engineering (ME)

Department of Mechanical Engineering

Institute of Technology

ME 1. Refresher Course for Mechanical Engineers. (0 cr; S-N only)
Organized review of topics in mechanical engineering program in preparation for Minnesota Professional Engineering Exam. Emphasizes problem solving, organization of information/notes, trial exams.

ME 2011. Introduction to Engineering. (4 cr; A-F only. Prereq–IT lower div)
Develop skills critical for practicing engineers. Core disciplinary areas of mechanical engineering and engineering design. Extensive exposure to visual, written and oral communication forms, and to computer-based design tools. Substantial design projects, including prototype construction.

ME 3041. Industrial Assignment I. (2 cr; A-F only. Prereq–ME upper div, enrolled in ME co-op program)
Industrial work assignment in engineering intern program. Evaluation based on student's formal written report covering the quarter's work assignment.

ME 3080. Topics in Mechanical Engineering. (1-4 cr [max 8 cr]. Prereq–Δ)
Specialized topics within various areas of mechanical engineering. Topics vary each semester.

ME 3221. Design and Manufacturing I: Engineering Materials and Manufacturing Processes. (4 cr; A-F only. Prereq–2011, AEM 3031, MatS 2001, ME upper div)
Material behavior/failure in design/manufacturing. Models for material removal, bulk deformation, sheet metal forming, and consolidation processes. Characterization of process capabilities/parts.

ME 3222. Design and Manufacturing II. (4 cr; A-F only. Prereq–[3221 or ¶3221], [CSCI 1113 or equiv], ME upper div)
Selection of standard mechanical components such as bearings, gears, and fasteners. Analysis/synthesis of motion in machines. Displacement, velocity, and acceleration of mechanisms. Machine design project: Apply lecture topics to develop new machines that fulfill customer specifications.

ME 3281. System Dynamics and Control. (4 cr; A-F only. Prereq–AEM 2021, [Math 2243 or Math 2373], ME upper div)
Dynamics of mechanical, electrical, thermal, fluid, and hybrid systems. System response using Laplace transform and numerical integration. Fourier transform and convolution. Transfer functions and frequency response. Introduction to classical control.

ME 3321. Thermodynamics. (4 cr; A-F only. Prereq–CHEM 1021, Math 2243, PHYS 1301, IT student, [wood and paper science or paper science engineering] major)
Properties, equations of state, processes, cycles for reversible/irreversible thermodynamic systems. Modes of work/heat transfer. Equations for conservation of mass, linear momentum, energy, entropy. Mixture properties, thermochemistry, chemical equilibrium for ideal gases.

ME 3322. Heat Transfer and Fluid Flow. (4 cr; A-F only. Prereq–ME upper div, wood/paper sci, 3321)
Mechanisms of heat transfer: conduction, radiation, convection, phasechange. Fluid flow: mass/momentum conservation laws, statics, inviscid model, Bernoulli's equation. Convection: external/internal flows, heat transfer coefficient, forced/natural convection, heat exchangers. Phase change: boiling/condensation.

ME 3324. Introduction to Thermal Science. (3 cr; A-F only. Prereq–CHEM 1021, Math 2243, PHYS 1301, [IT student or COAFES pre-BAE major])
Thermodynamics, heat transfer. Thermal properties of substances. First/second laws of thermodynamics. Steady/unsteady heat conduction. Thermal resistance concept. Convection heat transfer. Radiative heat transfer between solid surfaces. Boiling/condensation heat transfer.

ME 3331. Thermal Sciences I. (3 cr. Prereq–CHEM 1021, PHYS 1301, IT student)
Properties, equations of state, processes, cycles for reversible/irreversible thermodynamic systems. Modes of work/heat transfer. Equations for conservation of mass, linear momentum, energy, entropy.

ME 3332. Thermal Sciences II. (3 cr. Prereq–Math 2243, 3331, ME upper div)
Mass, momentum conservation principles. Fluid statics, Bernoulli equation. Control volume analysis, dimensional analysis, internal/external viscous flow. Momentum and energy considerations. Introduction to hydrodynamic and thermal boundary layers.

ME 3333. Thermal Sciences III. (3 cr. Prereq–3332, [4031W or ¶4031W], ME upper div)
Mechanisms of heat transfer: conduction, convection, radiation. Differential analysis of momentum/energy equations. Forced/natural convection, heat exchangers.

ME 4031W. Basic Mechanical Measurements Laboratory. (4 cr; A-F only. Prereq–[3333 or ¶3333], IE 4521, upper div ME)
Experimental methods, instrumentation for engineering measurements, statistical estimates of experimental uncertainty, calibration, signal conditioning, selected transducers for mechanical measurements, data acquisition/processing, presentation of results. Measurement of temperature, pressure, humidity, stress-strain, force, velocity, and flow/radiative properties.

ME 4042. Industrial Assignment II. (2 cr; A-F only. Prereq–ME upper div, enrolled in ME co-op program)
Industrial work assignment in engineering intern program. Evaluation based on student's formal written report covering the quarter's work assignment.

ME 4043W. Industrial Assignment II. (4 cr. Prereq–3041)
Solution of system design problems that require developing criteria, evaluating alternatives, and generating a preliminary design. Final report emphasizes design communication and describes design decision process, analysis, and final recommendations.

ME 4044. Industrial Assignment III. (2 cr. Prereq–ME upper div, registration in ME co-op program)
Industrial work assignment in engineering co-op program. Evaluation based on student's formal written report covering semester work assignment.

ME 4054W. Design Projects. (4 cr; A-F only. Prereq–2011, 3221, 3222, 3281, 3321, 3322, 4031W, AEM 2021, AEM 3031, EE 3005)
Students work in teams and undertake single, substantial design project. Design problems are open-ended. Product design process. Teams give formal presentation of progress at mid-semester design review, show completed work at design show.

ME 4081H. Mechanical Engineering Honors Thesis I. (2 cr; A-F only. Prereq–ME upper div honors student, #)
Unstructured research course enabling honors students to do independent research supervised by faculty. Selection of suitable topics according to individual interests and faculty approval. Thesis and oral defense.

ME 4082H. Mechanical Engineering Honors Thesis II. (2 cr; A-F only. Prereq–ME upper div honors student, #)
Unstructured research course enabling honors students to do independent research supervised by faculty. Selection of suitable topics according to individual interests and faculty approval. Thesis and oral defense.

ME 4131W. Thermal Environmental Engineering Laboratory. (4 cr; A-F only. Prereq–3322, 4031W, [ME upper div or grad student])
Experiments in psychrometrics, refrigeration, air conditioning, solar energy, indoor air quality, and other topics related to refrigeration, building heating/cooling, and indoor air quality.

ME 4231. Motion Control Laboratory. (4 cr; A-F only. Prereq–3281, 4031W, ME upper div)
Microprocessor programming, digital filters, frequency response testing, modeling of eletromechanical systems, closed loop velocity and position control, programmable logic controllers, factory automation, open loop position control of a vibratory system using input shaping, closed loop position control using pole placement.

ME 4232. Fluid Power Control Lab. (4 cr; A-F only. Prereq–3281, 4031W, ME upper div)
Fluid power fundamentals. Description/operation of components. Fluid power symbols/circuits. Component sizing. Modeling/simulation, system identification, controller design/implementation. Connecting/making measurements on hydraulic circuits. Lab.

ME 4331. Thermal Engineering Laboratory. (4 cr; A-F only. Prereq–[3321, 3322, 4031W], [IT upper div or grad student])
Measurement and analysis of heat transfer in single phase, multiphase, and reacting environments. Emphasis on experimental measurements relevant to thermal/fluid systems as well as the statistical design of experiments and uncertainty analysis. Heat exchange.

ME 4431W. Energy Conversion Systems Laboratory. (4 cr; A-F only. Prereq–3333, 4031W, [IT upper div or grad student])
Material from courses is applied to analyze operation/control of engines, power plants, and heating/ventilation systems. Emphasizes principles underlying performance characteristics of devices, measurement techniques, interpretation of experimental data, and presentation of results.

ME 5080. Topics in Mechanical Engineering. (1-4 cr [max 4 cr]. Prereq–IT upper div or grad student, submission of permission form, #)
Topics vary each semester.

ME 5090. Advanced Engineering Problems. (1-4 cr [max 4 cr]. Prereq–ME upper div, #)
Special investigations in various fields of mechanical engineering and related areas including an independent study project.

ME 5101. Vapor Cycle Systems. (4 cr; A-F only. Prereq–IT upper div or grad student)
Vapor compression and absorption refrigeration systems; heat pumps; vapor power cycle analysis, regeneration, reheat, compound cycle modifications, combines gas turbine—vapor cycle systems.

ME 5103. Thermal Environmental Engineering. (4 cr; A-F only. Prereq–IT upper div or grad, 3322 or 3323)
Thermodynamic properties of moist air; psychrometric charts; HVAC systems; solar energy; human thermal comfort; indoor air quality; heating and cooling loads in buildings.

ME 5105. HVAC System Design. (4 cr; A-F only. Prereq–5103, [IT upper div or grad student])
Design procedures used for heat exchangers, cooling towers, hydronic systems, and air handling systems. HVAC system design for a commercial building.

ME 5113. Aerosol/Particle Engineering. (4 cr; A-F only. Prereq–IT upper div or grad student)
Kinetic theory, definition, theory and measurement of particle properties, elementary particle mechanics, particle statistics; Brownian motion and diffusion, coagulation, evaporation and condensation, sampling and transport.

ME 5115. AIR Quality and AIR Pollution Control. (4 cr; A-F only. Prereq–IT upper div or grad student)
Air pollution sources, atmospheric transport, transformations, fate, and emissions control. Air pollution meteorology, dispersion, chemistry of secondary pollutant formation, standards and regulation. Control devices and techniques for gaseous and particulate emissions. Cyclones, electrostatic precipitators, wet and dry scrubbers, combustion modification.

ME 5116. Cleanroom Technology and Particle Monitoring. (4 cr; A-F only. Prereq–IT upper div or grad student)
Fundamentals of cleanroom technology for microelectronics manufacturing; airborne and liquid-borne particulate contaminants; particle monitors: optical and condensation particle counters, wafer surface scanner, microscopy; filter performance and testing; cleanroom design and operation; high purity systems; particle detection in processing equipment.

ME 5133. Aerosol Measurement Laboratory. (4 cr; A-F only. Prereq–IT upper div or graduate student)
Principles of aerosol measurement. Single particle analysis by optical and electron microscopy. Aerosol samplers and inertial collectors. Integral mass concentration and number concentration detectors. Size distribution by laser particle counter and differential mobility particle sizer. Aerosol generation and instrument calibration.

ME 5221. Computer-Assisted Product Realization. (4 cr; A-F only. Prereq–3221, AEM 3031, CSCI 1113, MatS 2001)
Injection molding with emphasis on design of manufacturing processes. Tooling design and specification of processing conditions using computer-based tools; process simulation software and computer-controlled machine tools. Simultaneous process and part design. Production of tooling and parts. Part evaluation.

ME 5223. Materials in Design. (4 cr. Prereq–3221)
Fundamental properties of engineering materials. Fabrication, treatment. Physical and corrosive properties. Failure mechanism, cost and value analysis as related to material selection and specification.

ME 5228. Introduction to Finite Element Modeling, Analysis, and Design. (4 cr; A-F only. Prereq–IT upper div or grad, 3221, AEM 3031, CSCI 1113, MatS 2001)
Finite elements as principal analysis tool in computer-aided design (CAD); theoretical issues and implementation aspects for modeling and analyzing engineering problems encompassing stress analysis, heat transfer, and flow problems for linear situations. One-, two-, and three-dimensional practical engineering applications.

ME 5231. Digital and Analog Control Laboratory. (4 cr; A-F only. Prereq–ME or AEM upper div or grad student, 5281 or equiv)
Lab experiments illustrate and apply control theory to mechanical engineering systems. Emphasis on real-life control design and implementation, including dynamic modeling, controller design, analysis and simulation, hardware implementation, measurement techniques, sensor calibration, data acquisition, and processing.

ME 5241. Computer-Aided Engineering. (4 cr; A-F only. Prereq–IT upper div or grad, 3222, CSCI 1113 or equiv)
Apply computer-aided engineering to mechanical design. Engineering design projects and case studies using computer-aided design and finite element analysis software; design optimization and computer graphical presentation of results.

ME 5243. Advanced Mechanism Design. (4 cr; A-F only. Prereq–IT upper div or grad, 3222 or equiv, basic kinematics and dynamics of machines; knowledge of CAD packages such as Pro-E recommended)
Analytical methods of kinematic, dynamic, and kinetoelastodynamic analysis and synthesis of mechanisms. Computerized design for function, path, and motion generation based on Burmeister theory.

ME 5247. Stress Analysis, Sensing, and Transducers. (4 cr; A-F only. Prereq–AEM 3031, MatS 2001)
Electrical resistance strain gage theory and technology. Gage characteristics, selection, and use. Bridge circuits and temperature and stray strain compensation. Signal conditioning. Data analysis. Photoelasticity techniques. Interpretation of fringe patterns. Sensor principles and performance. Transducer design and characterization.

ME 5248. Vibration Engineering. (4 cr. Prereq–IT upper div or grad, 3281)
Apply vibration theory to design; optimize isolators, detuning mechanisms, viscoelastic suspensions and structures. Use modal analysis methods to describe free vibration of complex systems, relating to both theoretical and test procedures.

ME 5281. Analog and Digital Control. (4 cr. Prereq–3281)
Continuous and discrete time feedback control systems. Frequency response, stability, poles and zeros; transient responses; Nyquist and Bode diagrams; root locus; lead-lag and PID compensators, Nicols-Ziegler design method. Digital implementation aliasing; computer-aided design and analysis of control system.

ME 5286. Robotics. (4 cr; A-F only. Prereq–[3281 or equiv], [upper div ME or AEM or CSCI or grad student])
Manipulator forward/inverse kinematics, homogeneous transformations, coordinate frames, Jacobian/velocity control, task primitives/programming, computational issues. Determining path trajectories. Reaction forces, manipulator dynamics/control. Vehicle kinematics, dynamics, and guidance. Lab project demonstrates concepts.

ME 5312. Solar Thermal Technologies. (4 cr; A-F only. Prereq–[3333, IT upper Div] or grad student)
Solar radiation fundamentals. Measurement/processing needed to predict solar irradiance dependence on time, location, and orientation. Characteristics of components in solar thermal systems: collectors, heat exchangers, thermal storage. System performance, low-temperature applications. Concentrating solar energy, including solar thermo-chemical processes, to produce hydrogen/solar power systems and photovoltaics. Solar design project.

ME 5341. Case Studies in Thermal Engineering and Design. (4 cr; A-F only. Prereq–IT upper div or grad student, 3321, 3322)
Characteristics of applied heat transfer problems: nature of problem specification, incompleteness of needed knowledge base, accuracy issues. Categories of applied heat transfer problems (e.g., materials processing, turbomachinery, cooling of electronic equipment, biomedical thermal therapeutic devices, heat exchangers, HVAC systems).

ME 5344. Thermodynamics of Fluid Flow with Applications. (4 cr; A-F only. Prereq–IT upper div or grad student, 3321, 3322)
Conservation of mass, momentum, and energy for compressible gas flows. Relevant thermodynamic properties. Nozzles, diffusers, thrust producers, shocks. Fluid-wall frictional interactions. Wall heat transfer, internal heat release. Temperature recovery. Mass addition. Chemical thermodynamics/applications.

ME 5351. Computational Heat Transfer. (4 cr; A-F only. Prereq–IT upper div or grad student, 3322)
Numerical solution of heat conduction and analogous physical processes. Develop and use a computer program to solve complex problems involving steady and unsteady heat conduction, flow and heat transfer in ducts, flow in porous media, and other special applications.

ME 5361. Plasma-Aided Manufacturing. (4 cr; A-F only. §EE 5611. Prereq–Grad or IT upper div, ME 3321, ME 3322 or equiv)
Properties of plasmas as a processing medium, process control and system design considerations using specific examples of plasma spray coating, welding, and microelectronics processing.

ME 5381. Biological Transport Processes. (4 cr; A-F only. §BMEN 5311, CHEN 5753. Prereq–IT upper div or grad student, transport class, [3322 or CHEN 5103] or #)
Fluid, mass, and heat transport in biological systems. Mass transfer across membranes, fluid flow in capillaries, interstitium, veins and arteries. Biotransport issues in single cells and tissues, artificial organs, membrane oxygenators, and drug delivery applications.

ME 5446. Introduction to Combustion. (4 cr; A-F only. Prereq–IT upper div or grad student, 3321, 3322)
Thermodynamics, kinetics, energy and mass transport, and pollutants in reacting systems. Reactors, laminar and turbulent flames. Ignition, quenching, and flame stability. Diffusion flames. Combustion in reciprocating engines, furnaces, and turbines, with emphasis on internal combustion engine performance and emissions.

ME 5461. Internal Combustion Engines. (4 cr; A-F only. Prereq–IT upper div or grad student, C or better in 3322 or 3324)
Basic spark ignition and diesel engine principles, air, fuel-air and actual engine cycles, cycle modeling, combustion and emissions, knock phenomena, air flow and volumetric efficiency, mixture requirements, ignition requirements and performance. Lectures and complementary labs.

ME 5462. Gas Turbines. (4 cr; A-F only. Prereq–IT upper div or grad student, 3321, ¶3322)
Gas turbine cycles, regeneration, recuperation, reheat, intercooling, combined cycle plants, and thermochemical regeneration. Axial and radial flow compressors and turbines; combustor designs, energy analysis, emissions, and noise. Turbojet, fanjet, turboprop engine performance. Stationary power plants, vehicular propulsion, hybrid vehicles.

Medical Technology (MEDT)

Allied-Medical Technology

Academic Health Center Shared

MEDT 1010. Orientation in Medical Technology. (1 cr; S-N only. Prereq–Δ)
Orientation to the medical technology (clinical laboratory science) profession.

MEDT 4064. Introduction to Clinical Immunohematology. (2 cr; A-F only. §CLS 5064)
Principles of blood grouping, antibody identification, compatibility testing, serology, and immunology.

MEDT 4065. Introduction to Clinical Immunohematology: Laboratory. (2 cr; A-F only. §CLS 5065)
Exercises illustrating basic techniques in blood grouping, antibody identification, compatibility testing, and detection of antibodies by serological and immunological methods.

MEDT 4082. Applied Clinical Chemistry. (3 cr; S-N only. Prereq–4310, 4311, 4320, 4321, enrolled MEDT student, #)
Application of basic methods/techniques in clinical chemistry lab.

MEDT 4085. Applied Clinical Hematology. (2 cr; S-N only. Prereq–4251, 4252, 4253, enrolled MEDT student, #)
Application of methods/techniques in clinical hematology, morphology, and hemostasis.

MEDT 4086. Applied Clinical Immunohematology. (2 cr; S-N only. Prereq–4064, 4065, enrolled MEDT student, #)
Application of basic techniques and methods in blood banking and immunology in clinical lab. Blood grouping, compatibility testing, and immunologic procedures.

MEDT 4088. Applied Diagnostic Microbiology. (2 cr; S-N only. Prereq–4100, 4102, enrolled MEDT student, #)
Isolation, identification, and antimicrobial susceptibility testing of clinically relevant microbes (bacteria, fungi, parasites) from patient specimens.

MEDT 4089. Specialty Rotation. (1 cr; S-N only. Prereq–Completion of MEDT preclinical professional courses, enrolled MEDT student, #)
One-week clinical rotation in a specialty lab such as immunophenotyping, cytogenetics, surgical pathology, molecular diagnostics, immunology, or forensics.

MEDT 4090. Special Laboratory Methods. (1-2 cr. §CLS 5090. Prereq–#)
Individual assignment to a special area of experience in the clinical lab.

MEDT 4092. Honors Program: Laboratory Methods. (3 cr. Prereq–#)
Individual assignment to special projects or research in one of the clinical areas of chemistry, hematology, immunohematology, or microbiology.

MEDT 4100. Virology, Mycology, and Parasitology for Medical Technologists. (2 cr; A-F only. §CLS 5100. Prereq–One microbiology course with lab, one bioCHEM course, enrolled MEDT student, #)
Basic aspects of lab diagnosis of viral, fungal, and parasitic infections. Lecture.

MEDT 4104. Principles of Diagnostic Microbiology: Lecture. (2 cr; A-F only. §CLS 5104. Prereq–One microbiology course with lab, one bioCHEM course, enrolled MEDT student, #)
Current techniques used in lab diagnosis of infectious disease. Isolating/identifying bacteria/yeasts. Antimicrobial susceptibility testing. Lecture.

MEDT 4105. Principles of Diagnostic Microbiology: Laboratory. (2 cr; A-F only. §CLS 5105. Prereq–One microbiology course with lab, one bioCHEM course, enrolled MEDT student, #)
Current techniques used in lab diagnosis of infectious disease. Isolating/identifying bacteria/yeasts. Antimicrobial susceptibility testing. Lab.

MEDT 4127W. Introduction to Management and Education I. (1 cr; A-F only. §CLS 5127. Prereq–#)
Basic concepts in management and education.

MEDT 4251. Hematology I: Basic Techniques. (3 cr; A-F only. §CLS 5251. Prereq–Enrolled MedT, #)
Theory and application of basic principles and techniques in clinical hematology and hemostasis. Lecture and lab.

MEDT 4252. Hematology II: Morphology and Correlation. (2 cr; A-F only. §CLS 5252. Prereq–[4251 or CLS 5251], enrolled MEDT student, #)
Fundamentals of examining blood and bone marrow. Emphasizes microscopic identification of immature/abnormal cells. Clinical correlation of lab findings in hematology/hemostasis. Lecture, lab.

MEDT 4253. Hemostasis. (1 cr; A-F only. §CLS 5253. Prereq–[4251 or CLS 5251], enrolled MEDT student, #)
Theory/application of specific concepts/techniques in hemostasis/coagulation. Lecture, lab.

MEDT 4263. Comparative Hemostasis. (1 cr; A-F only)
Theory and application of specific concepts and techniques in hemostasis and coagulation.

MEDT 4310. Clinical Chemistry I: Lecture. (2 cr; A-F only. §CLS 5310. Prereq–One organic CHEM course with lab, one biochem course, #)
Principles and theory of clinical chemistry to assess renal and metabolic disease/dysfunction, electrolyte balance, and acid-base balance. Introduction to principles and processes for quality management in the clinical lab.

MEDT 4311. Clinical Chemistry I: Laboratory Applications. (2 cr; A-F only. §CLS 5311. Prereq–One organic CHEM course with lab, one biochem course, #)
Application of clinical chemistry principles and lab techniques in the analysis of urine, plasma, and body fluids. Emphasis on lab tests to evaluate renal function, electrolytes, and acid-base balance. Principles and processes for managing test quality.

MEDT 4320. Clinical Chemistry II: Lecture. (2 cr; A-F only. §CLS 5320. Prereq–One organic CHEM course with lab, one biochem course, 4310 or CLS 5310)
Principles and theory of clinical chemistry to assess metabolic disease/dysfunction involving hormones, enzymes, lipids/lipoproteins, cardiac function, liver and digestive tracts. Emphasis on measurement methods and physiological significance.

MEDT 4321. Clinical Chemistry II: Laboratory Applications. (2 cr; A-F only. §CLS 5321. Prereq–One organic CHEM course with lab, one biochem course, 4310 or CLS 5310)
Application of clinical chemistry principles and lab techniques in the analysis of serum, plasma, and urine. Focus on tests to evaluate selected disorders. Development of lab skills and instrumentation use with emphasis on quality control and technique.

MEDT 4400. Immunological and Molecular Basis of Laboratory Testing. (1 cr [max 2 cr]; A-F only. Prereq–§: CLS 5400; BIOC 3021, #)
Basic concepts in immunology, cytogenetics, molecular biology, and basic clinical laboratory testing. Lecture.

Medicinal Chemistry (MEDC)

Department of Medicinal Chemistry

College of Pharmacy

MEDC 5185. Principles of Biomolecular Simulation. (3 cr. Prereq–CHEM 3502 or #)
Molecular simulation for students in medicinal chemistry, pharmaceutics, biochemistry, and chemical physics

MEDC 5202. Research and Development Process of Pharmaceutical Products. (2 cr; S-N only)
New drug development process in the U.S. pharmaceutical industry

MEDC 5245. Introduction to Drug Design. (3 cr; A-F only. §CHEM 5245, PHAR 6245. Prereq–Chem)
Concepts that govern design/discovery of drugs. Physical, bioorganic, medicinal chemical principles applied to explain rational design, mechanism of action drugs.

MEDC 5494. Advanced Methods in Quantitative Drug Analysis. (3 cr; A-F only. Prereq–#)
Quantitative methods (HPLC, GC, TLC, and immunoassays) for analysis of drugs and metabolites in biological fluids. Advanced techniques such as capillary electrophoresis, supercritical fluid chromatography, GC-MS, LC-MS, and tandem mass spectrometry. Chromatographic theory and statistical approaches to method validation.

MEDC 5495. Vistas in Medicinal Chemistry Research. (1 cr; S-N only)
Selected topics of contemporary interest in medicinal chemistry

MEDC 5700. General Principles of Medicinal Chemistry. (2 cr; A-F only. Prereq–MEDC grad student or #)
Fundamental principles of molecular recognition, physicohemical properties of drugs, drug metabolism and disposition, interaction of molecules with DNA/RNA.

MEDC 5710. General Principles of Medicinal Chemistry. (2 cr; A-F only. Prereq–MEDC grad student or #)
Fundamental principles of enzyme inhibitors, combinatorial chemistry and library design, drug receptor interactions and signal transduction mechanisms, and molecular modeling.

Medieval Studies (MEST)

Center for Medieval Studies

College of Liberal Arts

MEST 1001. The Middle Ages: An Introduction to Medieval StudiesMiddle Ages: Intro. (3 cr)
An introduction to the history, culture, literature, and architecture of the Middle Ages and to interdisciplinary methods of study.

MEST 3610. Topics in Medieval Studies. (3-4 cr [max 24 cr])
Fall of Rome through end of the Middle Ages (ca. 300-1500 A.D.) Current topics specified in *Class Schedule*.

MEST 3993. Directed Studies in Medieval Studies. (3 cr. Prereq–Previous work in a medieval studies discipline, #)
Directed study with one of core faculty members of Medieval Studies program.

MEST 4610. Intermediate Topics in Medieval Studies. (3-4 cr [max 32 cr])
Topics between fall of Roman Empire and end of Middle Ages (ca. 300-1500 A.D.). Topics specified in *Class Schedule*.

MEST 5610. Advanced Topics in Medieval Studies. (3-4 cr [max 15 cr]. Prereq–One yr work in some area of Middle Ages, reading knowledge of appropriate language, #)
From late antiquity through end of Middle Ages (circa 300-1500 A.D.). Current topics specified in *Class Schedule*.

MEST 5993. Directed Studies in Medieval Studies. (1-3 cr [max 6 cr]. Prereq–One yr work in some area of Middle Ages, reading knowledge of appropriate language, #)
Directed study with one of the core faculty of medieval studies program.

Microbial Engineering (MICE)

BioTechnology Institute

College of Biological Sciences

MICE 5309. Biocatalysis and Biodegradation. (3 cr. §BIOC 5309. Prereq–Chemistry through organic chemistry; knowledge of word processing, e-mail, access to World Wide Web, access to college-level science library recommended)
Assessing validity of information on biocatalysis and biodegradation; fundamentals of microbial catabolic metabolism as it pertains to biodegradation of environmental pollutants; biocatalysis for specialty chemical synthesis; display of this information on the World Wide Web.

MICE 5355. Advanced Fermentation and Biocatalysis Laboratory. (3 cr; A-F only. Prereq–[BIOL 3301 or MICB 3301], [grad student in microbial engineering or upper-div major in [microbiology or CHEM engineering or biochemistry]], #)
Methods in industrial microbiology, laboratory, and pilot scale fermentation/biocatalysis engineering. Laboratory experiments carried out in fermentation pilot plant. Operation of bench scale and pilot scale bioreactors, designing bioreactors, process optimization, process monitoring/control, scale-up experiments, experimental design, data analysis.

Microbiology (MICB)

Department of Microbiology

Medical School

MICB 3301. Biology of Microorganisms. (5 cr; A-F only. §BIOL 2032. Prereq–[BIOL 1002 or BIOL 1009], CHEM 2301, ¶CHEM 2302)
Taxonomy, anatomy, physiology, biochemistry, pathogenesis, immunology, ecology of microbes. Molecular structure in relation to bacterial function/disease. Includes lab.

MICB 4001. Microorganisms and Disease. (2 cr. Prereq–[4 cr BIOL sci or #], non-microbiology major)
Pathogenic microorganisms, host-parasite interactions, disease treatment/prevention.

MICB 4111. Microbial Physiology and Diversity. (3 cr. Prereq–[2022 or VPB 2022 or BIOL 2032 or VPB 2032 or VBS 2032 or 3301 or BIOL 3301], [BIOC 3021 or BIOL 3021 or BIOC 4331])
Structural/functional organization of bacteria/archaea. Energy metabolism utilizing light, inorganic/organic chemicals. Cell morphologies, roles/assembly of surface structures. Growth/survival mechanisms in various extreme environments. Adaptation to changing conditions by development of specialized cells/structures, altering metabolic patterns.

MICB 4121. Microbial Ecology and Applied Microbiology. (3 cr; A-F only. §ES 4121, SOIL 4121. Prereq–3301)
Evolution/structure of microbial communities. Population interaction within ecosystems. Quantitative/habitat ecology. Biogeochemical cycling. Molecular microbial ecology, gene transfer in the environment. Molecular phylogeny of microorganisms. Application of microbes in agriculture. Production of commodity chemicals, drugs, and other high-value products.

MICB 4131. Immunology. (3 cr. Prereq–[2022 or VPB 2022 or BIOL 2032 or VPB 2032 or VBS 2032 or 3301 or BIOL 3301], [BIOC 3021 or BIOL 3021 or BIOC 4331])
Molecular, genetic, and cellular bases for humoral/cell-mediated immunity. Innate immunity. Antigen recognition by B and T lymphocytes. Interactions between lymphocytes and other cells of immune system. Cytokines. Immunoregulation. Key aspects of clinical immunology.

MICB 4141W. Biology, Genetics, and Pathogenesis of Viruses: Writing Intensive. (4 cr. §MICB 4171. Prereq–[3301, BIOC 3021, BIOL 4003, BIOL 4004] or #)
Properties/analysis of viruses. Structure, attachment, entry. Genome replication/mRNA production by RNA viruses. Reverse transcription. Transcription from DNA virus templates. Replication of DNA virus genomes. Processing of viral pre-mRNA. Translational control. Assembly, host defense, tumor viruses, pathogenesis, HIV, emerging viruses, antivirals and vaccines. Lectures, in-class activities, interactive Web site.

MICB 4151. Molecular and Genetic Bases for Microbial Diseases. (3 cr. Prereq–[3301, [4131 or ¶4131], [BIOC 3021 or BIOC 4331]]; [BIOL 4003 or GCD 3022] recommended)
Genetic basis of microbial pathogenesis. Effect of gene transfer/regulation on evolution of microbial pathogens and on their capacity to colonize, induce disease. Biochemical/cellular interactions between bacteria and their human hosts.

MICB 4161. Eukaryotic Microbiology. (3 cr. Prereq–3301, GCD 3022)
Cell biology of higher eukaryotes, animal/plant pathogenesis, evolution, industrial microbiology. Tetrahymena, Chlamydomons, Paramecium, Toxoplasma, Aspergillus, Neurospora.

MICB 4171. Biology, Genetics, and Pathogenesis of Viruses. (3 cr; A-F only. §MICB 4141W. Prereq–[BIOC 3021, 3301, BIOL 4003, BIOL 4004] or #)
Properties/analysis of viruses. Structure, attachment, entry. Genome replication/mRNA production by RNA viruses. Reverse transcription. Transcription from DNA virus templates. Replication of DNA virus genomes. Processing of viral pre-mRNA. Translational control. Assembly, host defense, tumor viruses, pathogenesis, HIV, emerging viruses, antivirals and vaccines. Lectures, in-class activities, interactive Web site.

MICB 4215. Advanced Laboratory: Microbial Physiology and Diversity. (3 cr; A-F only. Prereq–3301 or BIOL 2032 or VBS 2032 or intro microbiology course with lab)
Isolation/cultivation of wide variety of bacteria. Physiological experiments illustrate characteristic features of microorganisms.

MICB 4235. Advanced Laboratory: Virology, Immunology, and Microbial Genetics. (3 cr. Prereq–BIOC 3021, 3301, two from [4131, 4141W, 4151, 4171])
Techniques, experimental methods in microbial genetics, immunology, and virology used to study microbes and their interactions with a host.

MICB 4793W. Directed Studies: Writing Intensive. (1-7 cr [max 7 cr]; S-N only. Prereq–#, Δ; no more than 7 cr of [4793, 4794, 4993, 4994] may count toward major requirements)
Individual study on selected topics or problems. Emphasizes readings, use of scientific literature.

MICB 4794W. Directed Research: Writing Intensive. (1-7 cr [max 15 cr]; S-N only. Prereq–#, Δ; no more than 7 cr of [4793, 4794, 4993, 4994] may count toward major requirements)
Laboratory or field investigation of selected areas of research.

MICB 4993. Directed Studies. (1-7 cr [max 7 cr]; S-N only. Prereq–Biol/MICB 3301 or #; 7 cr of 4993 and/or 4994 may count toward major requirements)
Individual study on selected topics or problems with emphasis on selected readings and scientific literature.

MICB 4994. Directed Research. (1-7 cr [max 7 cr]; S-N only. Prereq–Biol/MICB 3301, #; 7 cr max of 4993 and/or 4994 may count toward major requirements)
Lab or field investigation of selected areas of research.

MICB 5205. Microbiology and Immunology for Medical Students. (0-7 cr [max 7 cr])
Basic/clinical human immunology, medical microbiology. Molecular/cellular basis of immune responses, tolerance. Immunologic disease, serology, antimicrobial agents, chemotherapy. Basic/medical bacteriology, parasitology, mycology, virology. Unifying principles governing pathogenesis. Diseases are grouped with organisms important in differential diagnosis.

Middle Eastern Languages and Cultures (MELC)

Institute of Linguistics, ESL, and Slavic Languages and Literatures

College of Liberal Arts

MELC 1904. Freshman Seminar. (3 cr; A-F only. §CAS 1904)
Topics vary. See *Class Schedule*.

MELC 3491. Classical Islamic Civilization. (3 cr. §ARAB 3491, ARAB 5491, HIST 3491)
Islamic legacy in the classical age (800-1400) in medical and natural sciences, mathematics, philosophy, literature, and transmission to Europe.

MELC 3505. Survey of the Middle East. (3 cr. §ARAB 3505, ARAB 5505, HIST 3505)
Peoples, lands, and cultures of the Middle East. Historical survey from earliest civilizations to the present.

MELC 3511. Ancient Iran. (3 cr. §CAS 3511)
The development of ancient Iranian culture under the Achaemenians and the Sassanians, the impact of the Zoroastrian religion on Iranians and of Hellenism on the east, especially on such domains as Bactria, Iran's contribution to the flourishing of the cultures of the Silk Road, the thread that connected distant China and Europe.

MELC 3512. Modern Iran. (3 cr. §CAS 3512)
Development of medieval Iranian culture under the Arab, Turkish, and Mongol rules. Study two major trends: Islamization beginning after the Arab conquest until A.D. 1500; westernization from the Safavids to the Islamic Republic in 1979.

MELC 3526. Islam and Communismand Communism. (3 cr. §CAS 3526, CAS 5526, MELC 5526)
Development of medieval Islamic culture in Transoxiana; formation of Sufi orders; rise and development of Communist ideology; introduction of socialist principles into Central Asia; clash of Islamic principles with Communist dicta; Pan-Islamism; Pan-Turkism.

MELC 3531. Central Asian Culture and Literature. (3 cr. §CAS 3531, GLOS 3641)
Dynamics of life in contemporary Afghanistan, Iran, and Central Asia. Emphasizes role of ethnicity/ideology. Central Asian fictional illustrations of impact of sovietization on Islamic traditions.

MELC 3532. Russia and Central Asia. (3 cr. §CAS 3532, CAS 5532, MELC 5532)
Rise and fall of the Mongol Empire, formation of the Chaghatai Khanate and the Golden Horde. Russian expansion into Central Asia and rivalry with Britain. Russia and the Central Asian republics during and after the Soviet period.

MELC 3533. Islam and the West. (3 cr. §CAS 3533, GLOS 3643)
Cultural/intellectual trends that have defined the fundamental differences between Islam and the West. Development of historical, philosophical, and intellectual mindset of both spheres. Factors that have contributed and continue to contribute to tension, anxiety, and hatred between the Muslim world and Europe and the United States.

MELC 3541. Islam in the Catholic Age: ARAB Phase 600 A.D. to 900 A.D.. (3 cr. §ARAB 3541, ARAB 5541, HIST 3541)
The rise of Islam in its Arabian setting. Roles of the prophet, the Orthodox and Umayyad Caliphs. Development of Islamic state and empire. Status of Muslims and non-Muslims.

MELC 3542. Medieval Islam. (3 cr. §ARAB 3542, ARAB 5542, HIST 3542, MELC 3542)
Islamic dynasties, Mamluks and Mongols, Crusaders and Assassins. Abbasid Caliphate's disintegration and rise of Seljuk Turks.

MELC 3543. Arabs Under Mamluks and Ottomans: 1300-1920. (3 cr. §ARAB 3543, ARAB 5543, HIST 3543)
Arabs under Mamluk rule. Struggle against Crusaders and Mongols. Disintegration and reemergence under Muhammad Ali of Egypt, dynastic struggles in Syria, rise of Young Turks and Arab revolt.

MELC 3544. ARAB World 1920 to the Present. (3 cr. §ARAB 3544, ARAB 5544, HIST 3544)
Struggle in the Arab world for independence and its course since independence. Emphasis on development, political stability and unity, political structures, and the Arab-Israeli conflict.

MELC 3601. Persian Fiction in Translation. (3 cr. §CAS 3601, CAS 5601, MELC 5601)
Impact of westernization on Iran, from 1920s to present. Materials produced by Iranian writers, film makers, and intellectuals. Internal/external forces that bind contemporary Iranian society to world civilization. Works of Hedayat (especially Blind Owl), Chubak, Al-i Ahmad, Daneshvar, and Behrangi are analyzed/interpreted.

MELC 3602. Persian Poetry in Translation. (3 cr. §CAS 3602, CAS 5602, MELC 5602)
Major poetic works of Iran in translation dealing with life at the medieval courts, Sufic poetry, and "new" poetry. Rudaki, Khayyam, Rumi, Hafiz, Yushij, and Farrukhzad are among the poets whose works are examined.

MELC 3900. Topics in Middle Eastern Languages and Cultures. (1-4 cr [max 16 cr]; A-F only. §CAS 3900)
Topics vary. See Class Schedule or contact department for details.

MELC 3993. Directed Studies. (1-10 cr [max 10 cr]. Prereq–#, Δ, ❑)
Guided individual study.

MELC 3994. Directed Research. (1-10 cr [max 10 cr]. Prereq–#, Δ, ❑)
Directed Research

MELC 5311. Medieval Sages. (3 cr. §CAS 5311. Prereq–background in Iranian, Central Asian, or Islamic studies recommended)
Study and discussion of the intellectual life of the region from the rise of the Ghaznavids (A.D. 1000) to the fall of the Timurids (A.D. 1500). Ibn Sina (Avicenna), al-Biruni, al-Ghazali, Rumi, Sa'di, and Firdowsi are among the sages whose lives are examined.

MELC 5526. Islam and Communism. (3 cr. §CAS 3526, CAS 5526, MELC 3526)
Development of medieval Islamic culture in Transoxiana; formation of Sufi orders; rise and development of Communist ideology; introduction of socialist principles into Central Asia; clash of Islamic principles with Communist dicta; Pan-Islamism; Pan-Turkism.

MELC 5532. Russia and Central Asia. (3 cr. §CAS 3532, CAS 5532, MELC 3532)
Rise and fall of the Mongol Empire, formation of the Chaghatai Khanate and the Golden Horde. Russian expansion into Central Asia and rivalry with Britain. Russia and the Central Asian republics during and after the Soviet period.

MELC 5601. Persian Fiction in Translation. (3 cr. §CAS 3601, CAS 5601, MELC 3601)
Impact of westernization on Iran, from 1920s to present. Materials produced by Iranian writers, film makers, and intellectuals. Internal/external forces that bind contemporary Iranian society to world civilization. Works of Hedayat (especially Blind Owl), Chubak, Al-i Ahmad, Daneshvar, and Behrangi are analyzed/interpreted.

MELC 5602. Persian Poetry in Translation. (3 cr. §CAS 3602, CAS 5602, MELC 3602)
Major poetic works of Iran dealing with life at the medieval courts, Sufic poetry, and "new" poetry are studied. Rudaki, Khayyam, Rumi, Hafiz, Yushij, and Farrukhzad are among the poets whose works are examined.

MELC 5993. Directed Studies. (1-10 cr [max 10 cr]. Prereq–#, Δ, ❑)
Directed Studies

MELC 5994. Directed Research. (1-10 cr [max 10 cr]. Prereq–#, Δ, ❑)
Directed Research

Military Science (MIL)

Department of Military Science (Army ROTC)

Office of the Senior Vice President for Academic Affairs and Provost

MIL 102. Military Science I Leadership Lab. (0 cr; A-F only. Prereq–Enrollment in 1010)
Learn and practice basic skills. Gain insight into the Advanced course in order to make an informed decision whether to apply for it. Build self confidence and team-building leadership skills that can be applied throughout life.

Mil 202. Military Science II Leadership Lab. (0 cr; A-F only. Prereq–Enrollment in 1220)
Learn and practice basic military skills. Gain insight into the Advanced Course in order to make an informed decision whether to apply for it. Build self confidence and team-building leadership skills that can be applied throughout life.

MIL 302. Military Science III Leadership Lab. (0 cr. Prereq–Enrollment in 3130)
Open only to students in the associated Military Science Course series withdifferent roles for students at different levels. Involves leadership responsibilities for the planning, coordination, execution and evaluation of various training and activities with Basic course students and for the AROTC program as a whole. Students develop, practice and refine leadership skills by serving in a variety of leadership positions.

MIL 402. Military Science IV Leadership Lab. (0 cr. Prereq–Student must be enrolled in the Advanced Course and associated Military Science class)
Open only to students in the associated Military Science Course Series. Involves leadership responsibilities for the planning, execution and evaluation of various training activities within the program. Additional duties as a primary or secondary staff member is necessary for the completion of this course. Assist in the development of Basic and Advance Course cadet's leadership skills.

MIL 1001. Military Science I Leadership Lab. (1 cr. Prereq–Enrollment in 1010)
Learn and practice basic skills. Gain insight into the Advance Course in order to make an informed decision whether to apply for it. Build self confidence and team building leadership skills that can be applied throughout life.

MIL 1002. Military Science I Leadership Lab. (1 cr. Prereq–Enrollment in 1011)
Learn and practice basic skills. Gain insight into the Advance Course in order to make an informed decision whether to apply for it. Build self confidence and team building leadership skills that can be applied throughout life.

MIL 1003. Military Science II Leadership Lab. (1 cr. Prereq–Enrollment in 1220)
Learn and practice basic skills. Gain insight into the Advance Course in order to make an informed decision whether to apply for it. Build self confidence and team building leadership skills that can be applied throughout life.

MIL 1004. Military Science II Leadership Lab. (1 cr. Prereq–Enrollment in 1221)
Learn and practice basic leadership skills. Build self confidence through individual and team building concepts. Gain insight into the advance course in order to make an informed decision on whether to apply. Further develop your leadership style through practical application scenarios.

MIL 1005. Military Science III Leadership Lab. (1 cr. Prereq–Enrollment in 3130)
Involves leadership responsibilities for the planning, coordination, execution, and evaluation of various training and activities with Basic Course students and for the ROTC program. Students develop, practice, and refine leadership skills by serving and being evaluated in a variety of responsible positions.

MIL 1006. Military Science III Leadership Lab. (1 cr. Prereq–Enrollment in 3131)
Involves leadership responsibilities for the planning, coordination, execution, and evaluation of various training and activities with Basic Course students and for the ROTC program. Students develop, practice, and refine leadership skills by serving and being evaluated in a variety of responsible positions.

MIL 1007. Military Science IV Leadership Lab. (1 cr. Prereq–Enrollment in 3140)
Involves leadership responsibilities for the planning, coordination, execution, and evaluation of various training and activities with Basic Course students and for the ROTC program. Students develop, practice, and refine leadership skills by serving and being evaluated in a variety of responsible positions.

MIL 1008. Military Science IV Leadership Lab. (1 cr. Prereq–Enrollment in 3141)
Involves leadership responsibilities for the planning, coordination, execution, and evaluation of various training and activities with Basic Course students and for the ROTC program. Students develop, practice, and refine leadership skills by serving and being evaluated in a variety of responsible positions.

MIL 1010. Introduction to ROTC. (1 cr. Prereq–Enrollment in 1001)
Increase self-confidence through team study and activities in basic drill, physical fitness, rappelling, leadership reaction course, first aid, making presentations, and basic marksmanship. Learn fundamental concepts of leadership in a profession in both classroom and outdoor lab environments.

MIL 1011. Introduction to Leadership. (1 cr. Prereq–Enrollment in 1002)
Learn/apply principles of effective leading. Reinforce self-confidence through participation in physically and mentally challenging exercises. Relate organizational ethical values to the effectiveness of a leader. Participation in a weekend exercise is optional, but highly encouraged.

MIL 1220. Self/Team Development. (2 cr; A-F only. Prereq–Enrollment in Basic Course)
Learn and apply ethics-based leadership skills that develop individual abilities and contribute to the building of effective teams. Develop skills in oral presentations, writing concisely, planning of events, coordination of group efforts, advanced first aid, land navigation, and basic military tactics. Fundamentals of ROTC's Leadership Development program.

MIL 1221. Individual/Team Military Tactics. (2 cr; A-F only. Prereq–Enrollment in Basic Course)
Individual and team aspects of military tactics in small unit operations. Use of radio communications, making safety assessments, movement techniques, planning for team safety/security and methods of pre-execution checks. Practical exercises with upper division ROTC students.

MIL 3130. Leading Small Organizations I. (3 cr. Prereq–Enrollment in Advanced Course)
Series of practical opportunities to lead small groups, receive personal assessments and encouragement, and lead again in situations of increasing complexity. Uses small unit defensive tactics and opportunities to plan and conduct training.

MIL 3131. Leading Small Organizations II. (3 cr. Prereq–Enrollment in Advanced Course)
Continues methodology of 3130. Analyze tasks; prepare written or oral guidance for team members to accomplish tasks. Delegate tasks and supervise. Plan for and adapt to the unexpected in organizations under stress.

MIL 3140. Leadership Challenges and Goal Setting. (3 cr. Prereq–Enrollment in Advanced Course)
Plan, conduct, and evaluate activities of the ROTC cadet organization. Articulate goals, put plans into action to attain them. Assess organization cohesion and develop strategies to improve it. Develop confidence in skills to lead people and manage resources. Learn/apply various Army policies and programs.

MIL 3141. Transition to Lieutenant. (3 cr. Prereq–Enrollment in Advanced Course)
Continues the methodology from 3140. Identify and resolve ethical dilemmas. Refine counseling and motivating techniques. Examine aspects of tradition and law as they relate to leading as an officer in the Army. Prepare for a future as a successful Army lieutenant.

MIL 3970. Directed Studies. (3 cr. Prereq–Δ)

Modern Greek (MDGK)

Classical and Near Eastern Studies

College of Liberal Arts

MDGK 1001. Beginning Modern Greek I. (4 cr)
Speaking and reading demotic Greek. Pattern-practice drill, simple readings, some grammar.

MDGK 1002. Beginning Modern Greek II. (4 cr. Prereq–1001 or #)
Speaking and reading demotic Greek. Pattern-practice drill, simple readings, some grammar.

MDGK 1003. Intermediate Modern Greek I. (4 cr. Prereq–1002 or #)
Review the fundamentals of syntax through various readings from Modern Greek prose writers and poets. Provides additional grammatical elements which are reinforced through reading, conversation, and composition.

MDGK 1004. Intermediate Modern Greek II. (4 cr. Prereq–1003 or #)
Review the fundamentals of syntax through various readings from Modern Greek prose writers and poets. Provides additional grammatical elements which are reinforced through reading, conversation, and composition.

Mortuary Science (MORT)

Medical School

MORT 3005. History of Funeral Service. (2 cr; A-F only)
Development of funeral practices from a historical perspective with emphasis on ethnic and cultural groups that have had an impact on contemporary funeral service.

MORT 3012. Organization and Management of Funeral Business. (3 cr; A-F only. Prereq–Mortuary science major)
How to create an entrepreneurial marketing strategy and business plan for a small funeral business. Various forms of ownership. Financial requirements, risk management, human resources management. Theory supplemented with practical information, real-life experiences.

MORT 3014. Funeral Service Rules and Regulations. (2 cr; A-F only. Prereq–Mortuary science major)
Licensing/government regulations, compliance with regulations of state/federal regulatory agencies, cemetery and crematory rules and regulations, and Federal Trade Commission Funeral Practice Rule for the funeral industry.

MORT 3016. Funeral Service Marketing and Merchandising. (3 cr; A-F only. Prereq–Mortuary science major)
Introduction to key elements of funeral service merchandising/marketing. How to manage delivery process. Theory supplemented with contemporary product offerings, merchandising techniques.

MORT 3018. Funeral Practice. (3 cr. Prereq–Mortuary science major)
Practices and procedures related to funeral directing, including social, religious, ethical, and cultural issues; event planning; conducting funeral ceremonies; record keeping; computer applications.

MORT 3019. Funeral Practice II. (3 cr. Prereq–3018, mortuary science major)
Methods/procedures of final disposition. Cremation, cemetery, and interment laws. Monuments. Computer use/applications related to funeral service practice. Field trips to cemeteries and burial vault plant.

MORT 3021W. Funeral Service Psychology. (3 cr; A-F only)
Applied psychological principles helpful in dealing with clients, especially those experiencing emotional crisis.

MORT 3022W. Funeral Service Counseling. (3 cr; A-F only)
Principles, techniques, and basic helping skills of counseling as applied to funeral arrangement conference.

MORT 3025. Business Law. (3 cr; A-F only)
Basic concepts/principles of business law.

MORT 3030. Funeral Service Law. (3 cr; A-F only)
Duty of burial, right to control funeral arrangements. Torts involving final disposition of human remains. Wills, estates, probate. State/federal laws related to funeral practice.

MORT 3049. Microbiology. (2 cr; A-F only)
Basic principles of microbiology. Bacteriology, rickettsiology, virology, protozoology, mycology. Methods of transmission of infectious diseases. Control procedures for protection of public health as related to funeral service practice.

MORT 3050. Forensic Pathology. (3 cr. Prereq–Mort Sci major or Δ)
Investigating patterns of injury/disease as related to sudden, unusual, or unexpected deaths. Survey of natural disease processes, their effects on human body, from perspective of forensic investigation.

MORT 3051. Restorative Art. (2 cr; A-F only. Prereq–Mortuary science major)
Theory and procedures of restorative art.

MORT 3055W. Complicated Grief. (3 cr; A-F only. Prereq–Working understanding of grief/loss)
Issues related to loss, grief, bereavement, traumatology. Complicated bereavement/traumatology, complicated vs. non-complicated loss. Current treatment methods.

MORT 3061. Embalming Theory. (3 cr; A-F only. Prereq–Mortuary science major)
Principles/procedures of embalming theory as related to funeral service practice.

MORT 3065. Embalming Chemistry. (3 cr; A-F only. Prereq–Intro course in general chemistry, registration in mortuary science)
Fundamentals of organic chemistry and biochemistry. Chemical changes in human body during life, after death, and during chemical preservation. Disinfection, toxicology, embalming fluids.

MORT 3090. Independent Study Project. (1-15 cr [max 30 cr]. Prereq–Mortuary science major)
Independent study contracted between instructor, program director, and student.

MORT 3091W. Independent Study in Funeral Service. (1-4 cr [max 4 cr]. Prereq–Mortuary science major)
Students complete a project supervised by a faculty member. Credit(s) is negotiated with the faculty member based on the size and scope of the project. Students must demonstrate that the project has value within the major.

MORT 3151. Restorative Art Laboratory. (1 cr. Prereq–Mortuary science major)
Practical principles and techniques for restorative art. Emphasis on modeling facial features with clay or wax and the use of restorative techniques and cosmetic application on dead human bodies.

MORT 3161. Embalming Laboratory. (1 cr. Prereq–Mortuary science major)
Practices/procedures of embalming in a preparation room setting using human cadavers.

MORT 3171. Human Anatomy Laboratory. (2 cr; A-F only. Prereq–3 cr of biology, 3 cr of human anatomy; limited space for non-mortuary science majors)
Study of gross human anatomy, using cadavers. How anatomical structures relate to processes of post-mortem examination, embalming, pathology, restorative art, and forensic science.

MORT 3370. Death and Dying Across Cultures and Religions. (3 cr; A-F only. Prereq–Mort science major or Δ)
Cross-cultural competencies related to death, dying, and bereavement.

MORT 3379. Clinical Funeral Service Rotation. (3 cr [max 12 cr]; S-N only. Prereq–Mortuary science major)
Practical experience working in clinical settings related to funeral service. Rotation sites include licensed funeral homes, licensed crematories, licensed cemeteries, and affiliate institutions such as hospices, hospitals, morgues, and coroner/medical examiners offices.

MORT 3380. Funeral Service Practicum. (8 cr; S-N only. Prereq–Mortuary science major who has completed all other coursework)
Practical experience during one academic term in a funeral home as assigned by the program.

Museum Studies (MST)

Bell Museum of Natural History

MST 5011. Museum History and Philosophy. (3 cr; A-F only. Prereq–#)
Historical and philosophical roots of museum development in Europe and North America from the Renaissance to modern day museums and history centers. Emerging philosophical issues faced by museums today.

MST 5012. Museum Practices. (3 cr; A-F only. Prereq–5011 or #)
Practical aspects of museum work. Standards, practices, responsibilities, and issues, all set in greater museum context. Curatorial and educational duties, collections management, security, funding, boards, public relations, installation, and budgeting.

MST 5020. Internship. (1-4 cr [max 32 cr]; S-N only. Prereq–5011, 5012, Δ)
Students arrange to perform a professional-level task in a museum of good standing under close supervision of a member of the museum's professional staff. Instructor must approve a work plan and report.

Music (MUS)

School of Music

College of Liberal Arts

MUS 440. Chamber Ensemble Registration. (0 cr)
Registration mechanism for chamber ensembles.

MUS 501. Fundamentals of Music for Music Majors. (0 cr. Prereq–Music major or #)
Remedial theory course. Cover topics covered in 1501, but at a slower pace and with extra assistance.

Mus 901. Junior Recital. (0 cr; A-F only. Prereq–Music major, ¶applied music, #, Δ)
Preparation for junior recital. Student will be supervised by major applied instructor.

Mus 951. Senior Recital. (0 cr; A-F only. Prereq–Music major, ¶applied music, #, Δ)
Preparation for senior recital. Student will be supervised by major applied instructor.

MUS 1001. Fundamentals of Music. (3 cr. Prereq–For non-music majors)
Study of music notation and fundamental concepts underlying musical structure. Intervals, clefs, chords, scales, cadences, harmonic analysis; rhythm and meter. Emphasis on active participation: playing the piano, singing, clapping rhythms, aural perception. Weekly lab assignments in vocal and piano performance.

MUS 1001H. Music Fundamentals. (3 cr)
Music notation. Concepts underlying musical structure. Intervals, clefs, chords, scales, cadences, harmonic analysis. Rhythm, meter. Emphasizes active participation: playing the piano, singing, clapping rhythms, aural perception. Weekly lab assignments in vocal/piano performance.

MUS 1013. Rock I: The Historical Origins and Development of Rock Music to 1970. (3 cr; A-F only)
Musical, cultural, historical, social, and political evolution of rock music, from its traceable antecedents in mid-19th century America through the early 1970s. Emphazes manner in which African, European, and other ethnic traditions combined in a uniquely American manner.

MUS 1014. Rock II: Rock Music from 1970 to the Present. (3 cr)
Musical, cultural, and historical evolution of rock music and related pop forms. Progressive rock, punk, disco, new wave, MTV, heavy metal, hip-hop, grunge, turntable-based styles, women in rock.

MUS 1015. Music and Movies: The Use and Representation of Music and Musicians in Film in a Global Context. (4 cr; A-F only)
Film from perspectives of its use/representation of music/musicians. How does music underscore nuances of action, characterization, and feeling in film? Roles of music in film musicals, rock, and other vernacular films. Films about musical life. Films whose structure is musically based.

MUS 1021. Introduction to Music. (3 cr. §MUS 3021)
Survey of European/American "art," "popular" music in context of those cultures. Aural analyses of musical styles/forms.

MUS 1051. Class Piano for Nonmusic Majors I. (2 cr)
For nonmusic majors with little or no keyboard background. Functional skills such as reading, harmonizing, playing by ear and improvising, along with basic technique and study of elementary solo and ensemble repertoire.

MUS 1052. Class Piano for Non Music Majors II. (2 cr)
For nonmusic majors with little or no keyboard background. Functional skills such as reading, harmonizing, playing by ear and improvising, along with basic technique and study of elementary solo and ensemble repertoire.

MUS 1151. Piano: Class Lessons I. (2 cr; A-F only. Prereq–Music major, #)
Functional skills such as reading, transposing, harmonizing, improvising, and playing by ear. Keyboard theory, technique, and repertoire.

MUS 1152. Piano: Class Lessons II. (2 cr; A-F only. Prereq–1051, #)
Functional skills such as reading, transposing, harmonizing, improvising, and playing by ear. Keyboard theory, technique, and repertoire.

MUS 1155. Keyboard Skills I. (2 cr; A-F only. Prereq–[Keyboard major or music major], extensive keyboard background, #)
Reading, transposing, harmonizing, improvising, and playing by ear. Keyboard theory, technique, and music learning skills.

MUS 1156. Keyboard Skills II. (2 cr; A-F only. Prereq–1155, #)
Reading, transposing, harmonizing, improvising, and playing by ear. Keyboard theory, technique, and music learning skills.

MUS 1260. Voice Class. (2 cr [max 4 cr]. Prereq–Basic musicianship for learning and performing simple songs)
The fundamentals of speech and singing including information about the vocal instrument, the vocal process, vocal technique, and how to learn and perform three simple songs.

MUS 1471. Guitar: Class Lessons I. (2 cr; A-F only)
Fundamentals for the beginning guitarist; progressive development of skills. Basic strumming techniques, harmonizations in basic keys. Students must furnish acoustic guitar.

MUS 1472. Guitar: Class Lessons II. (2 cr; A-F only. Prereq–1471 or #)
Fundamentals for the beginning guitarist; progressive development of skills. Advanced strumming techniques, bass runs, finger-picking strums. Students must furnish acoustic guitar.

MUS 1501. Theory and Analysis of Tonal Music I. (2 cr; A-F only. Prereq–Music major or #)
Common-practice tonal harmony, part-writing, music analysis in various contexts.

MUS 1502. Theory and Analysis of Tonal Music II. (2 cr; A-F only. Prereq–[[1501, 1511] with grade of at least C-] or diagnostic test administered by School of Music)
Basics of common-practice tonal harmony/part-writing. Music analysis in various contexts.

MUS 1511. Ear-Training and Sight-Singing I. (1 cr; A-F only. Prereq–Music major or #)
Ear-training, sight-singing of tonal music.

MUS 1801W. Music, Society, and Cultures. (3 cr; A-F only. Prereq–[Music major or #], permission number)
Study rural, urban, tribal musics throughout world with interdisciplinary methods of humanities/social sciences. World-wide distribution of musical creativity with audio/video documentation.

MUS 1804. World Music. (3 cr)
Musical practice/meaning around the world and in our backyard. World music styles/perspectives in cultural context. Lectures, in-class music making, guest artists, videos, listening.

MUS 1902. Topics: Freshman Seminar. (3 cr; A-F only. Prereq–Freshman)
Topics specified in *Class Schedule*.

MUS 1904. Freshman Seminar. (3 cr [max 6 cr])
Topics vary.

MUS 1905. Topics: Freshman Seminar. (3 cr; A-F only. Prereq–Freshman)
Topics specified in *Class Schedule*.

MUS 1907W. Topics: Freshman Seminar. (3 cr; A-F only. Prereq–Freshman)
Topics specified in *Class Schedule*.

MUS 1910W. Topics: Freshman Seminar. (3 cr; A-F only. Prereq–Freshman)
Topics specified in *Class Schedule*.

MUS 3021. Introduction to Music. (3 cr. §MUS 1021)
Survey of European and American .art. and .popular. music in the context of those cultures; aural analyses of musical styles and forms.

MUS 3029. Music in the 20th Century. (3 cr. §HUM 3029)
Music in European and American culture from 1890s to present. Emphasizes interactions between high art, popular and ethnic musics, contributions of men and women as composers and performers, concurrent developments in the arts, dance, and literature, and music as social commentary.

MUS 3045. The Avant-Garde. (3 cr; A-F only)
Introduction to recent music. Composers of the American musical avant-garde, ca. 1950-1970, including John Cage and Pauline Oliveros, in their sonic/social contexts. Non-Western culture's recent effect on music. Reading, listening, journal writing, original composition, performance.

MUS 3150. Accompanying Skills. (1 cr [max 8 cr]; A-F only. Prereq–Jr or sr piano or organ major or #)
A practical introduction to every facet of the art of piano as an accompaniment and collaborative instrument.

MUS 3230. Chorus. (1 cr [max 8 cr]. Prereq–Choral and/or instrumental music background, audition, #)
Includes the University Women's Chorus, Men's Chorus, Concert Choir, and Choral Union. Choirs participate in a variety of programs exploring both Western and non-Western repertoire from the Middle Ages through the 20th century. Concerts include touring, and collaborative campus and community performances.

MUS 3241. Vocal Literature (German Lieder) and Pedagogy. (1 cr; A-F only. Prereq–[Vocal performance or accompanying major], 2 yrs music theory/history)
German Lied: its origins, composers, and development. Musical/textual analysis of representative works. Poetry that serves as song text. Poets in German Romantic period. Topics/issues associated with voice in speech/singing. Vocal anatomy/physiology, process/methods/techniques, care. Listening assignments.

MUS 3242. Vocal Literature (French Melodie) and Pedagogy. (1 cr; A-F only. Prereq–[Vocal music or accompanying major], 2 yrs of music theory/history)
French MÈlodie: its origins, composers, and development. Musical/textual analysis of representative works. Poetry that serves as song text. French symbolist poets. Listening assignments.

MUS 3261. Italian Diction for Singers. (1 cr; A-F only. Prereq–Voice or choral music major, ¶applied voice)
The sounds and symbols of the International Phonetic Alphabet, rules for correct Italian lyric diction, rudimentary Italian grammar, the meanings of Italian musical expressive markings, and Italian words most commonly found in song texts.

MUS 3262. English Diction for Singers. (1 cr; A-F only. Prereq–Voice or choral music major, ¶applied voice)
English lyric diction for performance of classical vocal music. Use International Phonetic Alphabet for standard transcriptions of song texts, compile a discography of British/American art songs, perform songs in class, and prepare poetry for oral presentation and improvisation.

MUS 3263. German Diction for Singers. (1 cr; A-F only. Prereq–Voice or choral music major, ¶applied voice)
Principles and practice of German lyric diction for classical vocal music. Transcriptions of German Lieder into International Phonetic Alphabet, elementary German grammar and common song vocabulary, 4 to 5 German songs performed in class for critique, and rules for pronunciation.

MUS 3264. French Diction for Singers. (1 cr; A-F only. Prereq–Voice or choral music major, concurrent enroll in applied voice)
Principles and practice of French lyric diction for classical vocal music. Transcriptions of French mÈlodie into International Phonetic Alphabet, elementary French grammar and common song vocabulary, 4 to 5 French songs performed in class for critique, and rules for pronunciation.

MUS 3340. Jazz Ensemble. (1 cr [max 8 cr]; A-F only. Prereq–Audition, #)
A 20-member performing organization covering significant jazz compositions and arrangements written specifically for this medium.

MUS 3350. Jazz Combo. (1 cr [max 8 cr]; A-F only. Prereq–Audition, #)
A performance laboratory class with emphasis on improvisation and learning the jazz vocabulary. A minimum of two public performances is required each semester.

MUS 3380. Gospel Choir. (1 cr [max 8 cr]; A-F only)
Performance ensemble. Students explore history of gospel music through experiential/participatory songs. Field songs, songs of struggle. Southern, traditional, and contemporary songs.

MUS 3400. University and Campus Bands. (1 cr [max 10 cr])
Lab course.

MUS 3401. Basic Conducting. (2 cr; A-F only. Prereq–1502, music major)
Beginning course in basic conducting techniques and role of the conductor.

MUS 3410. University Wind Bands. (1 cr [max 14 cr]; A-F only. Prereq–Audition, #)
Wind ensemble and symphony bands perform standard and contemporary literature; concerts and tour appearances. Players from all colleges may participate.

MUS 3420. Orchestra. (1 cr [max 8 cr]; A-F only. Prereq–Audition, #)
Symphony orchestra performs standard repertory and major works with chorus; concerts and tour appearances. Players from all colleges may participate.

MUS 3430. Campus Orchestra. (1 cr [max 8 cr]. Prereq–Audition, #)
An orchestra for players who are not music majors and/or are unable to register for University Orchestra. Standard chamber orchestra and string orchestra literature rehearsed and performed.

MUS 3440. Chamber Ensemble. (1 cr [max 8 cr]; A-F only. Prereq–#)
Performance of chamber music; duos, trios, quartets, quintets, and other ensemble combinations for instruments and voices.

MUS 3460. Ensemble for the Performance of Early Music, c900-1750. (1 cr [max 8 cr])
Performance of medieval, renaissance, and baroque music (sacred and secular) according to traditions established from c900 to 1750. Ensemble consists of a chamber chorus and consorts of period instruments. Repertoire includes Gregorian chant, masses, motets, chansons, madrigals, and choral/instrumental movements from cantatas, oratorios, passions, all in original languages.

MUS 3480. Marching Band. (1 cr [max 4 cr]; A-F only. Prereq–#)
A 250-member performing organization open to players from all colleges. Performs at University football games and other athletic functions.

MUS 3490. Athletics Bands. (1 cr [max 16 cr]; A-F only. Prereq–#)
Athletics bands for men's hockey, men's basketball, and women's sports.

MUS 3501. Theory and Analysis of Tonal Music III. (2 cr; A-F only. Prereq–[[1501, 1502, 1511, 1512] with grade of at least C-] or diagnostic test administered by School of Music)
Harmony and voice-leading. Diatonic and basic chromatic chords. Form. Analysis of music from 18th/19th centuries.

MUS 3502. Theory and Analysis of Tonal Music IV. (2 cr; A-F only. Prereq–[[3501, 3511] with grade of at least C-] or diagnostic test administered by School of Music)
Harmony and voice-leading. Chromatic tonal practices. Form, including sonata, rondo, variations, and other standard categories of tonal composition. Analysis of music from 18th/19th centuries.

MUS 3508. Review of Tonal Theory. (3 cr; A-F only. Prereq–Theory placement exam)
Fast-paced review of 1501, 1502, and 3501. Focuses on diatonic and basic chromatic procedures, part-writing, and analysis.

MUS 3509. Review of Tonal Theory IV. (2 cr; A-F only. Prereq–Grad music student or #)
Remedial course. Harmony, voice-leading. Chromatic tonal practices. Form, including sonata, rondo, variations, and other standard categories of tonal composition. Analysis of music from 18th/19th centuries.

MUS 3511. Ear-Training and Sight-Singing III. (1 cr; A-F only. Prereq–[[1501, 1511] with grade of at least C-] or diagnostic test administered by School of Music], [music major or #])
Melodic, harmonic, and rhythmic dictation. Sight-singing. Clef reading. Emphasizes chromatic harmony.

MUS 3518. Review of Ear-Training and Sight-Singing. (1 cr; A-F only. Prereq–Theory Placement Exam)
Fast-paced review of 1502 and 3501 focusing on diatonic and basic chromatic procedures. Emphasis on melodic and harmonic dictation. Individual sight-singing auditions.

MUS 3519. Review of Ear-Training and Sight-Singing. (1 cr; A-F only. Prereq–Grad student in music or #)
Remedial course. Fast-paced review of 3502. Focuses on diatonic/basic chromatic procedures. Emphasizes melodic/harmonic dictation. Individual sight-singing auditions.

MUS 3601W. History of Western Music I. (3 cr; A-F only. Prereq–Δ)
History of European art-music tradition, its social contexts from antiquity to 1700: composers, styles, structures, social institutions.

MUS 3602W. History of Western Music II. (3 cr; A-F only. Prereq–1502, 3601, music major, #)
History of European art-music tradition, its social contexts, from 1700 to 1850. Composers, styles, structures, social institutions.

MUS 3603W. History of Western Music III. (3 cr; A-F only. Prereq–1503, 3602, music major, #)
History of European/American art, popular music traditions, from 1850 to present. Composers, styles, structures, social institutions.

MUS 3950. Topics in Music. (1-3 cr [max 15 cr])
Each offering focuses on a single topic. Topics specified in *Class Schedule*.

MUS 3993. Directed Studies. (1-4 cr [max 10 cr]; A-F only. Prereq–#, Δ, o)
Guided individual reading or study.

MUS 3995. Major Project. (1 cr; A-F only. Prereq–Undergrad music major in B.A. program, #, Δ)
Required of music majors in senior year of the B.A. program. Research paper on topic of student's choice in consultation with faculty mentor. Sign up in Undergraduate Studies office one term in advance.

MUS 4502. 18th-Century Counterpoint. (3 cr; A-F only. Prereq–[3501, 3508] or pass basic skills exam)
Harmony and voice-leading. Advanced chromatic practices. Analysis of music from late 19th/early 20th centuries. Ear-training, sight-singing.

MUS 4503. Theory and Analysis of Tonal Music V. (3 cr)
Harmony, voice-leading. Advanced chromatic practices. Analysis of music from late 19th/early 20th centuries. Ear-training, sight-singing.

MUS 4504. Intensive Theory and Analysis of 20th-Century Music. (4 cr; A-F only. Prereq–3502 or #)
Theory/analysis of art music in various styles developed in 20th century.

MUS 4505. Jazz Theory. (3 cr; A-F only. Prereq–3502 or #)
Beginning through advanced techniques for chord construction. Extended chords. Nomenclature in jazz idiom.

MUS 5101. Piano Pedagogy I. (2 cr. Prereq–8 cr in MUSA 1301 or MUSA 1401 or #)
Demonstration and discussion of teaching techniques, methods, and materials for group and individual instruction at the elementary, early intermediate, and late intermediate levels.

MUS 5102. Piano Pedagogy II. (2 cr. Prereq–8 cr in MUSA 1301 or MUSA 1401 or #)
Demonstration and discussion of teaching techniques, methods, and materials for group and individual instruction at the elementary, early intermediate, and late intermediate levels.

MUS 5111. Advanced Piano Pedagogy I. (2 cr; A-F only. Prereq–5102 or grad piano major or #)
Demonstration and discussion of teaching techniques, methods, and materials for group and individual instruction at the intermediate and early advanced levels.

MUS 5112. Advanced Piano Pedagogy II. (2 cr; A-F only. Prereq–5101 or grad piano major or #)
Demonstration and discussion of teaching techniques, methods, and materials for group and individual instruction at the intermediate and early advanced levels.

MUS 5120. Piano Pedagogy Practicum. (1 cr [max 4 cr]; A-F only. Prereq–5101-5102 or 5111-5112 or #)
Supervised teaching of a piano pupil or group of pupils for one semester (minimum 12 weeks for one half-hour per week). Supervising instructor will assist with selection of materials, periodic consultation, and observation (live or video taped) of selected lessons.

MUS 5150. Body Awareness in Activity: The Alexander Technique for Musicians. (2 cr [max 4 cr])
Alexander technique with specific applications to music performance. Emphasis on body/mind awareness to promote technical ease and freedom.

MUS 5151. Organ Literature I. (3 cr; A-F only. Prereq–3502, 3603, sr or grad or #)
Organ literature from the 14th century to the mid-18th century. Influence of organ design of various periods and national schools on the literature and its performance.

MUS 5152. Organ Literature II. (3 cr; A-F only. Prereq–3502, 3603, sr or grad or #)
Organ literature of J. S. Bach and of other 19th- and 20th-century composers. Influence of organ design of various periods and national schools on the literature and its performance.

MUS 5160. Instrumental Accompanying Skills and Repertoire. (2 cr [max 4 cr]; A-F only. Prereq–Accomp major)
Performance class in accompanying skills particular to orchestral reductions and non-sonata instrumental accompanying. Repertoire to include, but not be limited to, classical and romantic string concerti, and "encore" pieces.

MUS 5170. Vocal Accompanying Skills and Repertoire. (2 cr [max 4 cr]; A-F only. Prereq–French, German and Italian diction, accomp or grad vocal major)
Performance class (Lieder, melodie, opera) with emphasis on coaching techniques and performance skills of pianists and singers.

MUS 5181. Advanced Piano Literature I. (2 cr; A-F only. Prereq–Grad piano major or #)
Literature for piano from late Baroque period to mid-20th century.

MUS 5182. Advanced Piano Literature II. (2 cr; A-F only. Prereq–Grad piano major or #)
Literature for piano from late Baroque period to mid-20th century.

MUS 5230. Chorus. (1 cr [max 8 cr]. Prereq–Choral and/or instrumental music background; audition, #)
University Women's Chorus, Men's Chorus, Concert Choir and Choral Union. Choirs participate in a variety of programs exploring both Western and non-Western repertoire from the Middle Ages through the 20th century. Concerts include touring, and collaborative campus and community performances.

MUS 5240. Chamber Singers. (1 cr [max 8 cr]; A-F only. Prereq–Audition, #)
Mixed chorus of about 24 voices. Performances each semester of works for small choirs.

MUS 5241. Vocal Literature I. (3 cr; A-F only. Prereq–[12 cr in MUSA 1304, grad music student] or #)
Vocal literature of major/minor composers from 17th century to present. Structure, style, performance practice.

MUS 5242. Vocal Literature II. (3 cr; A-F only. Prereq–12 cr in MUSA 1104 or MUSA 1304, grad music major or #)
Vocal literature of major and minor composers from 17th century to present; structure, style, and performance practice.

MUS 5250. Opera Workshop and Ensemble. (1 cr [max 8 cr]; A-F only. Prereq–audition, #)
Preparation and performance of operatic arias, choruses, and scenes. Participation in fully staged or workshop productions of music theatre repertoire.

MUS 5270. Voice Practicum. (1 cr [max 2 cr]. Prereq–Undergrad sr vocal major or #)
Teaching voice class or individual students with peer and faculty feedback. Assist in class voice instruction or teach two students weekly in conjunction with two one-hour observation labs. May be taken for two semesters.

MUS 5271. Diction for Singers I. (2 cr; A-F only. Prereq–12 cr MUSA 1304 or grad music major or #)
Principles and techniques of singing in English, Italian, Spanish, German, and French. International Phonetic Association alphabet used.

MUS 5272. Diction for Singers II. (2 cr; A-F only. Prereq–12 cr MUSA 1304 or grad music major or #)
Principles and techniques of singing in English, Italian, Spanish, German, and French. International Phonetic Association alphabet used.

MUS 5275. Vocal Pedagogy I. (3 cr. Prereq–Sr vocal major or #)
Advanced study of mind/body preparations for singing, anatomy, and physiology of the vocal mechanism. Voice use and care, historical and comparative pedagogy, learning theories, models and guidelines for teaching, instructional techniques, and diagnosing and solving vocal problems.

MUS 5277. Vocal Workshop. (1-2 cr [max 8 cr]; A-F only. Prereq–Music major or #)
Short term vocal workshops address specific topics including voice science, pedagogy, and performance of vocal repertoire. One workshop focuses on class voice instruction.

MUS 5279. Group Voice: Performance/Pedagogy. (2-3 cr; A-F only. Prereq–Performance only track: 2 cr per sem; performance/pedagogy track: 3 cr per sem; [upper div student or grad student], #)
Foundations/fundamentals of speech/singing. Vocal production, anatomy, physiology, terminology. Application of vocal techniques in learning/performing repertoire. Teaching methods, including voice/motion exercises.

MUS 5280. Opera Theatre. (2 cr [max 16 cr]; A-F only. Prereq–audition, #)
Preparation and performance of fully-staged operatic production. Major involvement in singing, acting, and technical aspects of opera.

MUS 5336. Jazz Arranging. (3 cr; A-F only. Prereq–3502 or #)
Beginning techniques of arranging for jazz combo and jazz ensemble; vocal and instrumental.

MUS 5340. Jazz Ensemble. (1 cr [max 6 cr]; A-F only. Prereq–audition, #)
A 20-member performing organization covering significant jazz compositions and arrangements written specifically for this medium.

MUS 5341. Jazz Pedagogy. (2 cr; A-F only. Prereq–#)
Teaching methods of vocal and instrumental jazz improvisation, basic arranging techniques, and jazz history; bibliographies and materials.

MUS 5380. Gospel Choir. (1 cr [max 4 cr]; A-F only)
Performance ensemble. Students explore history of gospel music through experiential/participatory songs. Field songs, songs of struggle. Southern, traditional, and contemporary songs.

MUS 5400. University and Campus Bands. (1 cr [max 10 cr])
Lab course.

MUS 5410. University Wind Bands. (1 cr [max 14 cr]; A-F only. Prereq–audition, #)
Wind ensemble and symphony bands perform standard and contemporary literature; concerts and tour appearances. Players from all colleges may participate.

MUS 5420. Orchestra. (1 cr [max 8 cr]; A-F only. Prereq–audition, #)
Symphony orchestra performs standard repertory and major works with chorus; concerts and tour appearances. Players from all colleges may participate.

MUS 5421. Suzuki Violin Pedagogy I. (2 cr; A-F only. Prereq–Violin major or #)
Philosophy and teaching techniques of Japanese pedagogue Shinichi Suzuki and their applications in Western culture. Discussion, playing experience, and observation of children's lessons in the MacPhail Center Suzuki Program.

MUS 5422. Suzuki Violin Pedagogy II. (2 cr; A-F only. Prereq–5421 or #)
Philosophy and teaching techniques of Japanese pedagogue Shinichi Suzuki and their applications in Western culture. Discussion, playing experience, and observation of children's lessons in the MacPhail Center Suzuki Program.

MUS 5423. Suzuki Pedagogy Practicum. (1 cr; A-F only. Prereq–[(¶5424 or ¶5425), grad music student] or #, grad consent)
Supervised teaching of both individual and group lessons. Instructor provides periodic critiques from observation of live or videotaped lessons.

MUS 5424. Advanced Suzuki Violin Pedagogy I. (2 cr; A-F only. Prereq–5422 or #)
Intensive examination of Suzuki techniques for intermediate and advanced violin students in Western society. Discussion, playing experience, observation of children's lessons in the MacPhail Center Suzuki Program, and practical teaching experience.

MUS 5425. Advanced Suzuki Violin Pedagogy II. (2 cr; A-F only. Prereq–5424 or #)
Intensive examination of Suzuki techniques for intermediate and advanced violin students in Western society. Discussion, playing experience, observation of children's lessons in the MacPhail Center Suzuki Program, and practical teaching experience.

MUS 5427. Violin Pedagogy I. (2 cr; A-F only. Prereq–Violin or viola major or #)
Private teaching of violin students at beginning, intermediate, and advanced levels. Discussion and demonstrations of pedagogical techniques.

MUS 5428. Violin Pedagogy II. (2 cr; A-F only. Prereq–Violin or viola major or #)
Private teaching of violin students at beginning, intermediate, and advanced levels. Discussion and demonstrations of pedagogical techniques.

MUS 5430. New Music Ensemble. (1 cr [max 8 cr]; A-F only. Prereq–#)
Study/performance of contemporary ensemble (including small chamber orchestra) literature. Historical/theoretical analysis of works performed.

MUS 5440. Chamber Ensemble. (1 cr [max 8 cr]; A-F only. Prereq–audition, #)
Performance of chamber music; duos, trios, quartets, quintets, and other ensemble combinations for instruments and/or voices.

MUS 5450. Orchestral Repertoire. (1 cr [max 3 cr]; A-F only. Prereq–#)
Investigation of practical and performance problems in standard orchestral repertoire with regard to style and interpretation.

MUS 5460. Ensemble for the Performance of Early Music, c900-1750. (1 cr [max 8 cr])
Performance of medieval, renaissance, and baroque music (sacred and secular) according to traditions established from c900 to 1750. Ensemble consists of a chamber chorus and consorts of period instruments. Repertoire includes Gregorian chant, masses, motets, chansons, madrigals, and choral/instrumental movements from cantatas, oratorios, passions, all in original languages.

MUS 5464. Cello Pedagogy. (2 cr; A-F only)
Concentrated study of cello teaching methods. Provides students with the strategies for teaching cello privately, develops analytical skills, and increases knowledge of cello repertoire. For practical application in conjunction with string technique course.

MUS 5466. Guitar Pedagogy. (2 cr; A-F only. Prereq–Guitar principal or major or #)
Historical survey of methods and etudes from late 18th century to present, reflecting variety of content and approach. Works by Aguado, Sor, Giuliani, Tarrega, Segovia, Carlevaro, Duncan, Iznaola, Dodgson, and Brindle.

MUS 5470. Woodwind Chamber Ensemble. (1 cr [max 8 cr]; A-F only. Prereq–audition, #)
Chamber music performance using homogeneous or mixed combinations of woodwind instruments.

MUS 5471. Woodwind Literature and Pedagogy I. (3 cr; A-F only. Prereq–Music major or #)
A study of the major teaching materials for the five woodwind instruments including methods, duets, and solos used primarily for pedagogical reasons.

MUS 5472. Woodwind Literature and Pedagogy II. (3 cr; A-F only. Prereq–Music major or #)
A study of chamber music involving one or more woodwind instruments. May include additional instruments such as piano, strings, and/or voice.

MUS 5473. History and Acoustics of Single Reed Instruments. (2 cr; A-F only. Prereq–Music major or #)
Study of clarinet and saxophone history and literature, mechanical design and development, acoustics, modern schools of performance, selected teaching and performance techniques.

MUS 5480. University Brass Choir. (1 cr [max 8 cr]. Prereq–Audition, #)
The University Brass Choir is an ensemble of 16 brass and percussion players exploring unique literature that spans 400 years. From the rich antiphonal music of Giovanni Gabrieli (1557-1612) to the works of the 20th century. The Brass Choir performs in Twin Cities churches and concert halls.

MUS 5481. Trumpet Pedagogy. (2 cr. Prereq–Sr or grad in music or #)
Principles of trumpet pedagogy. Discussion of literature, history, and current teaching aids.

MUS 5485. TrANSCription for Winds. (2 cr. Prereq–3502 or #)
Principles of music manuscript and examination of transcription examples. Transcription projects with score and parts. Smaller projects that involve arrangements and original compositions.

MUS 5490. Percussion Ensemble. (1 cr [max 10 cr]; A-F only. Prereq–#)
Practice and performance of standard and contemporary compositions for percussion instruments in various combinations.

MUS 5491. Percussion Literature I. (2 cr; A-F only. Prereq–Jr or sr or grad or #)
Repertoire derived from orchestral and band literature for snare drum, timpani, mallet instruments, and various percussion accessories. Major works of the 20th century written for solo percussion, percussion ensemble, and chamber groups of percussion and non-percussion instruments.

MUS 5492. Percussion Literature II. (2 cr; A-F only. Prereq–Jr or sr or grad or #)
Repertoire derived from orchestral and band literature for snare drum, timpani, mallet instruments, and various percussion accessories. Major works of the 20th century written for solo percussion, percussion ensemble, and chamber groups of percussion and non-percussion instruments.

MUS 5541. 16th-Century Counterpoint. (3 cr; A-F only. Prereq–[3501, 3508] or pass basic skills exam)
Polyphonic counterpoint in modal style of Renaissance. Writing exercises in species counterpoint and in two, three, and four parts. Cantus firmus techniques, mixed values, invertible counterpoint, canon. Representative works by Josquin, Lassus, Palestrina, Victoria, and others. Renaissance treatises by Artusi, Banchieri, Diruta, Morley, Zarlino, and others.

MUS 5550. Class Composition. (2 cr [max 8 cr]; A-F only. Prereq–3502 or #)
Original works in various forms. Development of individual compositional style in a post-tonal idiom. Various forms, performing forces, techniques.

MUS 5561. Orchestration I. (3 cr; A-F only. Prereq–3502)
Scoring techniques for ensembles in combination and full orchestra; year-long sequence. Score study of representative works from 18th through 20th centuries.

MUS 5562. Orchestration II. (3 cr; A-F only. Prereq–5561)
Scoring techniques for ensembles in combination and full orchestra; year-long sequence. Score study of representative works from 18th through 20th centuries.

MUS 5571. Schenkerian Analysis for Performers. (3 cr; A-F only. Prereq–3502)
Theory/analysis of tonal music using principles developed by Henrich Schenker. Basic concepts/notation, their application to excerpts/short pieces from 18th/19th centuries.

MUS 5572. Chromaticism in Tonal Music. (3 cr. Prereq–3502)
Exploration of chromatic tonal practices through analysis of selected repertoire, completion of written exercises (figured bass, harmonization of melodies, model composition), ear-training, and keyboard exercises.

MUS 5573. Analysis of Late-Romantic Orchestral Literature. (3 cr; A-F only. Prereq–3502 or Theory IV Exam or # 3504 or equiv recommended)
Introduction to advanced tonal analysis. Corpus of dramatic orchestral music by Wagner, Strauss, Tchaikovsky, Rimsky-Korsakov, Moussorgsky, and Rachmaninoff as focus for projects and classroom discussions related to chromatic harmony, form, and orchestration.

MUS 5591. Electronic Music: History, Literature, Principles. (3 cr; A-F only. Prereq–#, at least jr)
In-depth survey of electroacoustic music repertoire, from tape/analog music through computer-generated compositions. Basic principles of acoustics, electronic sound generation/manipulation, digital signal processing techniques. Programming languages for digital sound synthesis. Work with editing software, MIDI applications.

MUS 5592. Digital Music Synthesis and Processing Techniques. (3 cr; A-F only. Prereq–5591 or #)
Study of specific dsp topics such as filtering, formant synthesis, reverberation techniques, and additive synthesis. Work with interactive MIDI applications.

MUS 5597. Music and Text. (3 cr; A-F only. Prereq–3502)
Designed for music majors only, this course gives an introduction to the analysis of music with texts such as art song and opera.

MUS 5611. Resources for Music Research. (3 cr; A-F only. Prereq–3603)
Development of skills in identifying, locating, and evaluating resources for research in music. Computer-searching techniques, acquaintance with basic reference sources in the field, preparation of the music research paper.

MUS 5620. Topics in Opera History. (3 cr [max 6 cr]; A-F only. Prereq–Grad music major or #)
Study of specific operas. Development of opera in context of other artistic, social, cultural, and political events, movements, and changes. Periods/countries vary each semester.

MUS 5644. Music in 20th-Century American Culture. (3 cr; A-F only. Prereq–3603, 5501 or #)
Stylistic and cultural bases of cultivated and vernacular traditions and their intersections. Topics include folk and ethnic musics, ragtime, city blues and jazz, rock, musical theater, impact of technology, modernism, nationalism, new accessibility.

MUS 5647. 20th-Century European/American Music. (3 cr. Prereq–3603 or equiv, 5501 or equiv, 12 undergrad cr in music history)
Emphasizes major artistic movements, stylistic turning points, social roles of music. Interactions between high art, popular, ethnic musics; contributions of men and woman as composers and performers.

MUS 5658. History of the Symphony in the 20th Century. (3 cr; A-F only. Prereq–3603, 5501 or #)
History of symphony (and related genres) in Europe and America, ca. 1890 to present. Changing aesthetic concerns, structural, harmonic, and timbral innovations. Sociocultural contexts; analysis and criticism.

MUS 5666. Stravinsky. (3 cr; A-F only. Prereq–5502, 12 cr music history)
Analysis and criticism of representative works; aesthetic concerns as expressed in writings of Stravinsky and others; influence upon European and American composers; biographical issues and contributions to artistic life, particularly the ballet.

MUS 5668. Beethoven's Symphonies. (3 cr; A-F only. Prereq–3603, #)
Analytical overview of selected movements from Beethoven's 9 symphonies. Principles of sonata analysis (norm and deformation); introduction to wider contexts of interpretation and understanding (generic, expressive, social).

MUS 5804. Folk and Traditional Musics: Selected Cultures of the World. (3 cr; A-F only. Prereq–1801 or 1804 or music grad or #)
A study of selected music traditions from 5 to 7 world cultures. Genres, social institutions, concepts, styles, instruments, and usages.

MUS 5950. Topics in Music. (1-4 cr [max 15 cr])
Each offering focuses on a single topic. Topics specified in *Class Schedule*.

MUS 5993. Directed Studies. (1-4 cr [max 12 cr]. Prereq–#, Δ, ❑)
Guided individual reading or study.

Music Applied (MUSA)

School of Music

College of Liberal Arts

Note: MUSA 1101 through MUSA 1123 are private instruction and include the following: (2 cr [max 16 cr]; A-F only. Prereq–Audition, Δ)

MUSA 1101. Piano—Elective.

MUSA 1102. Harpsichord—Elective.

MUSA 1103. Organ—Elective.

MUSA 1104. Voice—Elective.

MUSA 1105. Violin—Elective.

MUSA 1106. Viola—Elective.

MUSA 1107. Cello—Elective.

MUSA 1108. Double Bass—Elective.

MUSA 1109. Flute—Elective.

MUSA 1111. Oboe—Elective.

MUSA 1112. Clarinet—Elective.

MUSA 1113. Saxophone—Elective.

MUSA 1114. Bassoon—Elective.

MUSA 1115. French Horn—Elective.

MUSA 1116. Trumpet—Elective.

MUSA 1117. Trombone—Elective.

MUSA 1118. Euphonium—Elective.

MUSA 1119. Tuba—Elective.

MUSA 1121. Percussion—Elective.

MUSA 1122. Harp—Elective.

MUSA 1123. Guitar—Elective.

Note: MUSA 1301 through MUSA 1523 are private instruction and unless otherwise noted, include the following: (2-4 cr [max 16 cr]; A-F only. Prereq–Audition, Δ)

MUSA 1301. Piano—Major.

MUSA 1302. Harpsichord—Major.

MUSA 1303. Organ—Major.

MUSA 1304. Voice—Major.

MUSA 1305. Violin—Major.

MUSA 1306. Viola—Major.

MUSA 1307. Cello—Major.

MUSA 1308. Double Bass—Major.

MUSA 1309. Flute-Major.

MUSA 1311. Oboe—Major.

MUSA 1312. Clarinet—Major.

MUSA 1313. Saxophone—Major.

MUSA 1314. Bassoon—Major.

MUSA 1315. French Horn—Major.

MUSA 1316. Trumpet—Major.

MUSA 1317. Trombone—Major.

MUSA 1318. Euphonium—Major.

MUSA 1319. Tuba—Major.

MUSA 1321. Percussion—Major.

MUSA 1322. Harp—Major.

MUSA 1323. Guitar—Major.

MUSA 1401. Piano—Secondary.

MUSA 1402. Harpsichord—Secondary.

MUSA 1403. Organ—Secondary.

MUSA 1404. Voice—Secondary.

MUSA 1405. Violin—Secondary.

MUSA 1406. Viola—Secondary.

MUSA 1407. Cello—Secondary.

MUSA 1408. Double Bass—Secondary.

MUSA 1409. Flute—Secondary.

MUSA 1411. Oboe—Secondary.

MUSA 1412. Clarinet—Secondary.

MUSA 1413. Saxophone—Secondary.

MUSA 1414. Bassoon—Secondary.

MUSA 1415. French Horn—Secondary.

MUSA 1416. Trumpet—Secondary.

MUSA 1417. Trombone—Secondary.

MUSA 1418. Euphonium—Secondary.

MUSA 1419. Tuba—Secondary.

MUSA 1421. Percussion—Secondary.

MUSA 1422. Harp—Secondary.

MUSA 1423. Guitar—Secondary.

MUSA 1501. Piano: Major Beyond Requirements.

MUSA 1502. Harpsichord: Major Beyond Requirements.

MUSA 1503. Organ-Major Beyond Requirements.

MUSA 1504. Voice-Major Beyond Requirements.

MUSA 1505. Violin-Major Beyond Requirements.

MUSA 1506. Viola-Major Beyond Requirements.

MUSA 1507. Cello-Major Beyond Requirements.

MUSA 1508. Double Bass-Major Beyond Requirements.

MUSA 1509. Flute-Major Beyond Requirements.

MUSA 1511. Oboe-Major Beyond Requirements.

MUSA 1512. Clarinet-Major Beyond Requirements.

MUSA 1513. Saxophone-Major Beyond Requirements.

MUSA 1514. Bassoon-Major Beyond Requirements.

MUSA 1515. French Horn-Major Beyond Requirements.

MUSA 1516. Trumpet-Major Beyond Requirements.

MUSA 1517. Trombone-Major Beyond Requirements

MUSA 1518. Euphonium-Major Beyond Requirements. (2-4 cr [max 32 cr]. Prereq–Audition, Δ)

MUSA 1519. Tuba-Major Beyond Requirements.

MUSA 1521. Percussion-Major Beyond Requirements.

MUSA 1522. Harp-Major Beyond Requirements.

MUSA 1523. Guitar-Major Beyond Requirements.

Note: MUSA 1901 through MUSA 1923 are private instruction for transfer students, one semester only and include the following: (2-4 cr [max 4 cr]; A-F only. Prereq–Audition, Δ).

MUSA 1901. Piano—Transfer.

MUSA 1902. Harpsichord—Transfer.

MUSA 1903. Organ—Transfer.

MUSA 1904. Voice—Transfer.

MUSA 1905. Violin—Transfer.

MUSA 1906. Viola—Transfer.

MUSA 1907. Cello—Transfer.

MUSA 1908. Double Bass—Transfer.

MUSA 1909. Flute—Transfer.

MUSA 1911. Oboe—Transfer.

MUSA 1912. Clarinet—Transfer.

MUSA 1913. Saxophone—Transfer.

MUSA 1914. Bassoon—Transfer.

MUSA 1915. French Horn—Transfer.

MUSA 1916. Trumpet—Transfer.

MUSA 1917. Trombone—Transfer.

MUSA 1918. Euphonium—Transfer.

MUSA 1919. Tuba—Transfer.

MUSA 1921. Percussion—Transfer.

MUSA 1922. Harp—Transfer.

MUSA 1923. Guitar—Transfer.

Note: MUSA2301 through MUSA 2323 are private instruction and include the following: (2-4 cr [max 16 cr]; A-F only. Prereq–Audition, Δ)

MUSA 2301. Piano-Performance Major.

MUSA 2302. Harpsichord-Performance Major.

MUSA 2303. Organ-Performance Major.

MUSA 2304. Voice-Performance Major.

MUSA 2305. Violin-Performance Major.

MUSA 2306. Viola-Performance Major.

MUSA 2307. Cello-Performance Major.

MUSA 2308. Double Bass—Performance Major.

MUSA 2309. Flute-Performance Major.

MUSA 2311. Oboe—Performance Major.

MUSA 2312. Clarinet-Performance Major.

MUSA 2313. Saxophone-Performance Major.

MUSA 2314. Bassoon-Performance Major.

MUSA 2315. French Horn-Performance Major.

MUSA 2316. Trumpet-Performance Major.

MUSA 2317. Trombone-Performance Major.

MUSA 2318. Euphonium—Performance Major.

MUSA 2319. Tuba-Performance Major.

MUSA 2321. Percussion—Performance Major.

MUSA 2322. Harp-Performance Major.

MUSA 2323. Guitar-Performance Major.

Note: MUSA3101 through MUSA 3123 are private instruction and include the following: (2 cr [max 8 cr]; A-F only. Prereq–Audition, Δ).

MUSA 3101. Piano—Elective.

MUSA 3102. Harpsichord—Elective.

MUSA 3103. Organ—Elective.

MUSA 3104. Voice—Elective.

MUSA 3105. Violin—Elective.

MUSA 3106. Viola—Elective.

MUSA 3107. Cello—Elective.

MUSA 3108. Double Bass—Elective.

MUSA 3109. Flute—Elective.

MUSA 3111. Oboe—Elective.

MUSA 3112. Clarinet—Elective.

MUSA 3113. Saxophone—Elective.

MUSA 3114. Bassoon—Elective.

MUSA 3115. French Horn—Elective.

MUSA 3116. Trumpet—Elective.

MUSA 3117. Trombone—Elective.

MUSA 3118. Euphonium—Elective.

MUSA 3119. Tuba—Elective.

MUSA 3121. Percussion—Elective.

MUSA 3122. Harp—Elective.

MUSA 3123. Guitar—Elective.

Note: MUSA 3301 through MUSA 3309 are private instruction and include the following: (2-4 cr [max 16 cr]; A-F only. Prereq–Audition, Δ).

MUSA 3301. Piano—Major.

MUSA 3302. Harpsichord—Major.

MUSA 3303. Organ—Major.

MUSA 3304. Voice—Major.

MUSA 3305. Violin—Major.

MUSA 3306. Viola—Major.

MUSA 3307. Cello—Major.

MUSA 3308. Double Bass—Major.

MUSA 3309. Flute—Major.

Note: MusA 3311 through MusA 3323 are private instruction and include the following: (2-4 cr [max 24 cr]; A-F only. Prereq–Audition, Δ)

MUSA 3311. Oboe—Major.

MUSA 3312. Clarinet—Major.

MUSA 3313. Saxophone—Major.

MUSA 3314. Bassoon—Major.

MUSA 3315. French Horn—Major.

MUSA 3316. Trumpet—Major.

MUSA 3317. Trombone—Major.

MUSA 3318. Euphonium—Major.

MUSA 3319. Tuba—Major.

MUSA 3321. Percussion—Major.

MUSA 3322. Harp—Major.

MUSA 3323. Guitar—Major.

Note: MUSA 5101 through MUSA 5123 are private instruction and include the following: (2 cr [max 8 cr]; A-F only. Prereq–Audition, Δ)

MUSA 5101. Piano—Elective.

MUSA 5102. Harpsichord—Elective.

MUSA 5103. Organ—Elective.

MUSA 5104. Voice—Elective.

MUSA 5105. Violin—Elective.

MUSA 5106. Viola—Elective.

MUSA 5107. Cello—Elective.

MUSA 5108. Double Bass—Elective.

MUSA 5109. Flute—Elective.

MUSA 5111. Oboe—Elective.

MUSA 5112. Clarinet—Elective.

MUSA 5113. Saxophone—Elective.

MUSA 5114. Bassoon—Elective.

MUSA 5115. French Horn—Elective.

MUSA 5116. Trumpet—Elective.

MUSA 5117. Trombone—Elective.

MUSA 5118. Euphonium—Elective.

MUSA 5119. Tuba—Elective.

MUSA 5121. Percussion—Elective.

MUSA 5122. Harp—Elective.

MUSA 5123. Guitar—Elective.

Note: MUSA 5401 through MUSA 5423 are private instruction and, unless otherwise noted, include the following: (2-4 cr [max 24 cr]; A-F only. Prereq–Audition, Δ).

MUSA 5401. Piano—Secondary.

MUSA 5402. Harpsichord—Secondary.

MUSA 5403. Organ—Secondary.

MUSA 5404. Voice—Secondary.

MUSA 5405. Violin—Secondary.

MUSA 5406. Viola—Secondary.

MUSA 5407. Cello—Secondary.

MUSA 5408. Double Bass—Secondary.

MUSA 5409. Flute—Secondary.

MUSA 5411. Oboe—Secondary.

MUSA 5412. Clarinet—Secondary.

MUSA 5413. Saxophone—Secondary.

MUSA 5414. Bassoon—Secondary.

MUSA 5415. French Horn—Secondary. (2-4 cr [max 4 cr]. Prereq–Audition, Δ)

MUSA 5416. Trumpet—Secondary.

MUSA 5417. Trombone—Secondary.

MUSA 5418. Baritone—Secondary.

MUSA 5419. Tuba—Secondary.

MUSA 5421. Percussion—Secondary.

MUSA 5422. Harp—Secondary.

MUSA 5423. Guitar—Secondary.

Music Education (MUED)

School of Music

College of Liberal Arts

MUED 1201. Introduction to Music Education. (1 cr; A-F only)
Orientation to the profession of music education through in-school observations, readings, presentations, and self-reflection. Introduction to technology for music educators.

MUED 1801. Introduction to Music Therapy. (2 cr; A-F only)
Methods, materials, and applications of music therapy in various clinical settings with emphasis on field observation.

MUED 3301. Teaching Elementary Vocal and General Music. (3 cr; A-F only. Prereq–Music ed major)
Methods, materials, curriculum development, principals of learning, the child voice, rhythm, music reading, history, appreciation, listening, creativity, classroom instruments, and applications of technology for elementary school classroom music.

MUED 3350. Student Teaching in Classroom Music. (4-8 cr [max 8 cr]; A-F only. Prereq–Music ed major, #)
Supervised teaching and observing of classroom and general music in elementary, junior high, and senior high schools. Weekly seminar emphasizing classroom management, curriculum development, and administration of music programs.

MUED 3415. Choral Conducting and Methods I. (4 cr; A-F only. Prereq–Music ed major or music therapy major or #)
Development of basic choral conducting skills and rehearsal techniques. Diction for singing. Repertoire/arranging for various choral ensembles. Strategies/methods for teaching secondary general music, including interdisciplinary issues, keyboard, and guitar. The adolescent voice. Applications of technology.

MUED 3416. Choral Conducting and Methods II. (4 cr; A-F only. Prereq–Music ed major or #)
Development of choral conducting skills and rehearsal techniques. Emphasizes interpretation of choral compositions. Methods, materials, and curriculum for school choral ensembles. Diction for singing. Secondary general music methodology.

MUED 3450. Student Teaching in Vocal Music. (4-8 cr [max 8 cr]; A-F only. Prereq–Music ed major, #)
Supervised teaching and observing of vocal music in elementary, junior high, and senior high schools. Weekly seminar emphasizing classroom management, curriculum development, and administration of music programs.

MUED 3502. STRINg Techniques and Teaching. (2 cr [max 3 cr]; A-F only. Prereq–Music ed or music therapy major or #)
Playing experience on orchestral string instruments. Historical/acoustical background. Scoring for strings. Principles of improvisation. Basic concepts of teaching. Methods/materials. Techniques of individual/class instruction.

MUED 3503. Woodwind Techniques and Teaching. (2 cr; A-F only. Prereq–Music ed or music therapy major or #)
Playing experience on instruments of the woodwind family. Historical/acoustical background. Scoring for brasses. Principles of improvisation. Basic concepts of teaching. Methods/materials. Techniques of individual/class instruction.

MUED 3504. Brass Techniques and Teaching. (2 cr [max 3 cr]; A-F only. Prereq–Music ed or music therapy major or #)
Playing experience on instruments of the brass family. Historical/acoustical background. Scoring for brasses. Principles of improvisation. Basic concepts of teaching. Methods/materials. Techniques of individual/class instruction.

MUED 3505. Percussion Techniques and Teaching. (2 cr [max 3 cr]; A-F only. Prereq–Music ed or music therapy major or #)
Playing experience on percussion instruments. Historical/acoustical background. Scoring for percussion. Principles of improvisation. Basic concepts of teaching. Methods/materials. Techniques of individual/class instruction.

MUED 3516. Instrumental Methods and Conducting I. (3 cr; A-F only. Prereq–Music ed major)
Techniques for administering a school instrumental music program. Emphasizes rehearsal techniques, literature, and materials for school use. School-based experiences. Orchestration and arranging.

MUED 3517. Beginning Instrumental Methods and Materials. (3 cr; A-F only. Prereq–[1201, 3502, 3503, 3504, 3505, 3516, MUS 3401] with at least C-)
Development of skills for teaching beginning instrumentalists.

MUED 3518. Instrumental Methods and Conducting II. (3 cr; A-F only. Prereq–[1201, 3502, 3503, 3504, 3505, 3516, 3517, MUS 3401] with at least C-)
Students synthesize knowledge/skills to develop/maintain curricular-oriented, comprehensive instrumental music program.

MUED 3550. Student Teaching in Instrumental Music. (4-8 cr [max 8 cr]; A-F only. Prereq–Music ed major, #)
Supervised teaching and observing of instrumental music in elementary, junior high, and senior high schools. Weekly seminar emphasizing classroom management, curriculum development, and administration of music programs.

MUED 3650. Student Teaching Seminar. (2 cr; A-F only. Prereq–At least C- in all required [music, music education, professional education] courses)
Reflective practice during student teaching. Developing materials for professional employment (e.g., resume, portfolio).

MUED 3800. Introduction to Clinical Music Therapy Practice. (4 cr; A-F only. Prereq–Music therapy major or #)
Introduction to lab and field studies of music therapy and music behavior. Pre-internship experiences in health, welfare, recreational, and educational settings.

MUED 3804. Applications of Music Therapy I: Music Therapy for Children in Rehabilitative Settings. (4 cr; A-F only. Prereq–Music therapy major, #)
Examination of specific techniques in quantification of study of music behavior; projects using behavioral observations.

MUED 3805. Applications of Music Therapy II: Music Therapy in Long Term Care and Psychiatric Care. (4 cr; A-F only. Prereq–Music therapy major or #)
Methods and materials for music therapy in school and hospital settings; designing and implementing programs for severely and moderately handicapped children and adults.

MUED 3806. Preparing for a Music Therapy Career. (4 cr; A-F only. Prereq–Music therapy major or #)
Identify and explore current controversies, issues, and values encountered in music therapy. Explore and analyze counseling processes and techniques. Students are placed in a health care facility for the term to gain pre-internship experience.

MUED 3855. Music Therapy Internship. (6 cr; S-N only. Prereq–Music therapy major, #)
Six-month resident internship in music therapy at an affiliated, approved hospital or clinic.

MUED 5011. Music in the Elementary Classroom Curriculum. (2 cr. Prereq–MUS 1001, elem ed grad student, Δ)
Fundamentals of music, methods, and materials for incorporating singing, rhythmic activities, classroom instruments, movement, listening, appreciation, and creation into context of classroom curriculum.

MUED 5112. Research in Music Education: Techniques. (3 cr; A-F only. Prereq–Grad music ed major or #)
Methods and techniques employed in investigating and reporting music education problems; proposal development; bibliographic skills involved in conducting a significant review of related research.

MUED 5115. Research in Music Education: Measurement. (3 cr; A-F only)
Assessment of music behaviors, including test design, interpretation of test results, and evaluation and reporting of student achievement; published tests in music; uses of assessment and measurement in the classroom and in research.

MUED 5118. Research in Arts Education: Qualitative. (3 cr; A-F only. Prereq–Grad student in ARTS or #)
Practical/systematic introduction to qualitative research procedures in arts education. Prepares students to develop research proposals. Students participate in a joint field exploration. Those who have established research interests may also work in another setting relevant to their long-term research goals.

MUED 5211. Foundations of Music Education. (3 cr; A-F only)
An overview of the historical, philosophical, and psychological foundations of music education.

MUED 5313. Youth Music: Preferences, Influences, and Uses. (2 cr; A-F only)
Youth music preferences and their determinants; how music influences youth behavior; students' and teachers' uses of commercial styles. Particularly appropriate for educators and parents.

MUED 5433. Techniques and Materials: Choral Ensembles. (2 cr; A-F only. Prereq–Music or music ed major or #)
Research and literature on vocal and choral music education; choral curriculum issues; repertoire selection; rehearsal techniques.

MUED 5500. Guitar Methods for Music Education/Therapy Professionals. (2 cr [max 8 cr]. Prereq–3502 recommended)
Accelerated program for developing guitar performance skills. Classroom applications, therapy applications, pedagogy.

MUED 5606. Movement-Based Methods for Music Education. (2 cr; A-F only. Prereq–Music or music ed major or #)
Participation in movement activities; study of Dalcroze philosophy and techniques; applications of movement to music education; examination of research.

MUED 5611. Teaching Music with Related Arts. (2 cr; A-F only)
Methods and materials for teaching music in cultural context including other art forms.

MUED 5647. Teaching the Percussion Instruments. (2 cr; A-F only)
Contemporary approaches for teaching percussion in the schools; development of curricular materials and practice in performance techniques.

MUED 5655. New Dimensions in Music Education. (2 cr; A-F only)
Analysis of recent curricular trends and current issues.

MUED 5664. Teaching Music on the Internet. (3 cr; A-F only)
Home page development techniques, investigation of software and materials, audio and video utilities, and research applications.

MUED 5667. Computer-Based Music Instruction. (3 cr; A-F only. Prereq–Music or music ed major or #)
Design and development of computer applications for the music classroom. Creating interactive audio and video presentations for music theory, ear training, composition, analysis, music history, and appreciation.

MUED 5668. Computerized Music Notation. (3 cr [max 6 cr])
Fundamentals of music notation and printing utilizing the computer, MIDI keyboards, and Finale software program. Preparation of instrumental and vocal scores, part extraction and page layout. Basic techniques for sequencing and transcription.

MUED 5669. Psychology of Music. (3 cr; A-F only. Prereq–PSY 1001 or PSY 3604 or #)
Basic study of the psychology and psychoacoustics of music including hearing, music perception and cognition, values and preferences, musical abilities, musical systems, media music effects, the influence of music on human behavior, and psycho-socio-physiological processes involved in musical behavior.

MUED 5750. Topics in Music Education. (1-4 cr [max 16 cr]; A-F only. Prereq–Grad student in [music education/therapy or education] or #)
Focuses on single topic, specified in *Class Schedule*.

MUED 5991. Independent Study. (1-4 cr [max 8 cr]; A-F only. Prereq–Music ed or music therapy major or grad, #, Δ)
Independent study project organized by the student in consultation with the appropriate instructor.

Naval Science (NAV)

Department of Naval Science (Navy ROTC)

Office of the Senior Vice President for Academic Affairs and Provost

NAV 1000. Professional Training in Naval Science. (1 cr; S-N only. Prereq–Enrolled in NROTC)
Instruction and training in basic military subjects and professional development, including military leadership, close order drill, marksmanship, honors and ceremonies, personnel inspections, and computer-based war game simulations. Classes and small group seminars on leadership and ethical issues with case studies.

NAV 1101. Introduction to Naval Science. (3 cr; A-F only)
Navy organization, customs and traditions, officer and enlisted rank and rating structures, uniforms and insignia, shipboard duties, seamanship, damage control, and safety. Core values of the naval services, Navy regulations, and the Uniform Code of Military Justice.

NAV 1102. Seapower and Maritime AffAIRs. (3 cr; A-F only)
Historical influences on development of U.S. Navy, from American Revolution to present. Critical, contemporary issues.

Nav 2000. Professional Training in Naval Science. (1 cr; S-N only. Prereq–Soph enrolled in NROTC)
Instruction and training in basic military subjects and professional development, including military leadership, close order drill, marksmanship, honors and ceremonies, personnel inspections, and computer-based war game simulations. Classes and small group seminars on leadership and ethical issues with case studies.

Nav 2201. Ship Systems I: Naval Engineering. (3 cr; A-F only)
Detailed study of ship characteristics/types. Design, hydrodynamic forces, stability, compartmentation, propulsion, electrical/auxiliary systems, damage control, administration. Basic concepts of theory/design for steam, gas turbine, diesel, nuclear propulsion.

Nav 2202. Ship Systems II: Science and Technology in Naval Weapons Systems. (3 cr; A-F only)
Detection, evaluation, threat analysis, weapon selection, delivery, guidance, explosives. Physical aspects of radar, underwater sound. Facets of command, control, communications as means of weapons system integration.

NAV 3000. Professional Training in Naval Science. (1 cr; S-N only. Prereq–Jr enrolled in NROTC)
Instruction and training in basic military subjects and professional development, including military leadership, close order drill, marksmanship, honors and ceremonies, personnel inspections, and computer-based war game simulations. Classes and small group seminars on leadership and ethical issues with case studies.

NAV 3301. Navigation I: Piloting and Celestial Navigation. (3 cr; A-F only)
Theory/practice piloting a ship near land. Coordinate systems, chart reading, dead reckoning, fixes, tides, currents, anchoring. Theory based on observance of celestial bodies.

NAV 3302. Navigation II: Seamanship and Ship Operations. (3 cr; A-F only. Prereq–3301)
National/international nautical rules of the road, seamanship, tactical maneuvering/signaling, relative motion, vector-analysis, formation tactics, ship employment, ship behavior/characteristics. Application of maneuvering board in solving motion problems.

NAV 3310. Evolution of Warfare. (3 cr; A-F only)
Great military leaders of history. Development of warfare, from dawn of recorded history to present. Focuses on effect of major military theorists, strategists, tacticians, technological developments.

NAV 4000. Professional Training in Naval Science. (1 cr; S-N only. Prereq–Sr enrolled in NROTC)
Instruction and training in basic military subjects and professional development, including military leadership, close order drill, marksmanship, honors and ceremonies, personnel inspections, and computer-based war game simulations. Classes and small group seminars on leadership and ethical issues with case studies.

NAV 4401W. Leadership and Management I. (3 cr; A-F only)
Advanced study of organizational behavior/management. Major behavioral theories examined in detail. Practical applications. Exercises, case studies, seminar discussions.

NAV 4402W. Leadership and Ethics. (3 cr; A-F only. Prereq–4401)
Junior officer role. Responsibilities faced as leader, manager, professional officer of Naval Services. Develops specific competencies in areas of leadership, management, professional administration, development. Emphasizes Naval Service ethics, core values.

NAV 4410. Amphibious Warfare. (3 cr; A-F only)
Development of amphibious doctrine, its expansion in Pacific Campaign of World War II. Detailed case studies of Tarawa, Iwo Jima, Okinawa illustrate amphibious planning.

Neuroscience (NSC)

Medical School

NSC 4185. Itasca Summer Neurobiology Laboratory. (3 cr; A-F only. Prereq–#, ❑)
Concepts in cellular neurosciences. Basis of membrane properties, including ionic/molecular mechanisms of resting, action, and synaptic potentials. State-of-the-art equipment and contemporary techniques used to examine experimental evidence.

NSC 5031W. Perception. (3 cr. §PSY 5031W. Prereq–PSY 3031 or PSY 3051 or #)
Cognitive, computational, and neuroscience perspectives on visual perception. Color vision, pattern vision, image formation in eye, object recognition, reading, impaired vision. Course is biennial: offered fall of odd years.

NSC 5037. Psychology of Hearing. (3 cr. §PSY 5037. Prereq–PSY 3031 or #)
Biological and physical aspects of hearing, auditory psychophysics, theories and models of hearing, perception of complex sounds including music and speech, clinical and other applications.

NSC 5201. Computational Neuroscience I: Membranes and Channels. (3 cr. §NSC 5201, PHSL 5201. Prereq–Calculus through differential equations)
Comprehensive examination of membrane and ion channels using UNIX workstations to simulate their properties. Hodgkin-Huxley model, nonlinear dynamic systems, voltage- and ligand-gated ion channels, impulse propagation.

NSC 5202. Theoretical Neuroscience: Systems and Information Processing. (3 cr. Prereq–[3101, 3102W] recommended)
Concepts of computational/theoretical neuroscience. Distributed representations and information theory. Methods for single-cell modeling, including compartmental/integrate-and-fire models. Learning rules, including supervised, unsupervised, and reinforcement learning models. Specific systems models from current theoretical neuroscience literature. Lecture/discussion. Readings from current scientific literature.

NSC 5461. Cellular and Molecular Neuroscience. (4 cr; A-F only. Prereq–NSC grad student or #)
Lectures by team of faculty, problem sets in important physiological concepts, discussion of original research papers.

NSC 5462. Neuroscience Principles of Drug Abuse. (2 cr. §PHCL 5462. Prereq–#)
Current research on drugs of abuse, their mechanisms of action, characteristics shared by various agents, and neural systems affected by them. Offered biennially, spring semester of even-numbered years.

NSC 5481. Invertebrate Neurobiology. (3 cr; A-F only. §ENT 5481)
Fundamental principles/concepts underlying cellular bases of behavior and "systems" neuroscience. Particular invertebrate preparations. Offered annually the last 10 weeks of spring semester.

NSC 5540. Advanced Survey of Biomedical Neuroscience. (2 cr. Prereq–#; intended for members of biomedical community or students with advanced scientific backgrounds)
Current topics in biomedical neuroscience, accompanied by supporting, fundamental concepts. Intensive, one week course.

NSC 5551. Itasca Cell and Molecular Neurobiology Laboratory. (4 cr; S-N only. Prereq–Neuroscience grad or #)
Intensive lab introduction to cellular and molecular aspects of research techniques in contemporary neurobiology; held at Itasca Biological Station. Electrophysiological investigations of neuronal properties, neuropharmacological assays of transmitter action, and immunohistochemical studies in experimental preparations.

NSC 5561. Systems Neuroscience. (4 cr; A-F only. Prereq–NSC grad student or #)
Principles of organization of neural systems forming the basis for sensation/movement. Sensory-motor/neural-endocrine integration. Relationships between structure and function in nervous system. Team taught. Lecture, laboratory.

NSC 5661. Behavioral Neuroscience. (3 cr; A-F only. Prereq–Grad NSC major or grad NSC minor or #)
Neural coding/representation of movement parameters. Neural mechanisms underlying higher order processes such as memorization, memory scanning, and mental rotation. Emphasizes experimental psychological studies in human subjects, single cell recording experiments in subhuman primates, and artificial neural network modeling.

NSC 5667. Neurobiology in Disease. (2 cr. Prereq–#)
Basic clinical/pathological features, pathogenic mechanisms. Weekly seminar course.

NSC 5668. Neurodegeneration and RepAIR. (2 cr. Prereq–#)
Pathogenic mechanisms of neuronal death, neurodegenerative disease, neuronal repair. Weekly seminar course.

Neuroscience Department (NSCI)

Department of Neuroscience

Medical School

NSCI 3101. Introduction to Neuroscience I: From Molecules to Madness. (3 cr; A-F only. §BIOL 3101, PHSL 3101. Prereq–BIOC 3021 or ¶BIOC 3021 or BIOC 4331 or ¶BIOC 4331 recommended)
Basic principles of cellular/molecular neurobiology and nervous systems.

NSCI 3102W. Introduction to Neuroscience II: Biological Basis of Behavior. (3 cr; A-F only. Prereq–BIOL 3101 or NSCI 3101 or PHSL 3101)
Organization of neural systems/subsystems underlying sensory/motor aspects of behavior. Writing intensive.

NSCI 4105. Neurobiology Laboratory I. (2 cr; A-F only. §BIOL 4105. Prereq–[3101 or BIOL 3101 or PHSL 3101], [3102W or BIOL 3102W], #)
Principles, methods, and laboratory exercises for investigating neural mechanisms and examining experimental evidence.

NSCI 4151. Advanced Topics in Neuroscience. (3 cr; A-F only. §ANPH 4151, BIOL 4151, PHSL 4151, PHSL 5150. Prereq–§: PHSL 4151; Biol/NSc/PHSL 3101 or #)
In-depth study of aspects of neurodevelopment, neurochemistry/molecular neuroscience, sensory systems, motor control, and behavioral neuroscience. Primarily for undergraduates majoring in neuroscience or related areas.

NSCI 4167. Neuroscience in the Community. (1-3 cr; A-F only. Prereq–#)
A service learning experience in which a student is paired with a middle school science teacher who has completed the BrainU program in neuroscience. Student observes and assists in implementing previously developed neuroscience educational activities and designs and implements a new classroom activity to teach concepts of neuroscience to middle school learners.

NSCI 4793W. Directed Studies: Writing Intensive. (1-7 cr [max 7 cr]; S-N only. Prereq–#, Δ; no more than 7 cr of [4793, 4794, 4993, 4994] may count toward major requirements)
Individual study of selected topics. Emphasis on readings, use of scientific literature. Writing intensive.

NSCI 4794W. Directed Research: Writing Intensive. (1-7 cr [max 7 cr]; S-N only. Prereq–#, Δ; no more than 7 cr of [4793, 4794, 4993, 4994] may count toward major requirements)
Lab or field investigation of selected areas of research. Writing intensive.

NSCI 4993. Directed Studies. (1-7 cr [max 7 cr]; S-N only. Prereq–#, Δ; max of 7 cr of 4993 and/or 4994 may count toward major requirements)
Individual study of selected topics with emphasis on selected readings and use of scientific literature.

NSCI 4994. Directed Research. (1-7 cr [max 7 cr]; S-N only. Prereq–#, Δ; max of 7 cr of 4993 and/or 4994 may count toward major requirements)
Lab or field investigation of selected areas of research.

NSCI 5101. Introduction to Neuroscience for Graduate Students. (3 cr; A-F only. Prereq–[BIOC 3021 or BIOC 4331], Δ; intended for grad students outside neuroscience program who require comprehensive intro)
Basic principles of cellular/molecular neurobiology and nervous system. A term paper supplements lectures. Multiple-choice exams.

NSCI 5110. Dental Neuroscience for Graduate Students. (2 cr; A-F only. Prereq–§: 6110; BIOC 3021, BIOL 4004, #; intended for grad students who require a comprehensive grad-level neuroscience course)
Structure/function of human nervous system. Lectures and reading assignments emphasize topics pertinent to dentistry.

NSCI 5111. Medical Neuroscience for Graduate Students. (5 cr; A-F only. Prereq–§: 6111; BIOC 3021, BIOL 4004, #; intended for grad students who require a comprehensive medically-oriented neuroscience course)
Survey of molecular, cellular, and systems neuroscience as related to medicine. Lecture/lab.

NSCI 5540. Advanced Survey of Biomedical Neuroscience. (2 cr. Prereq–#; intended for members of biomedical community or students with advanced scientific backgrounds)
Current topics in biomedical neuroscience. Supporting, fundamental concepts. Intensive, one week course.

NSCI 5913. BrainU 101: Neuroscience in the Classroom. (3 cr; A-F only. Prereq–[Elementary or middle school or high school or preservice] teacher, #, application)
Two-week summer workshop. Week one focuses on training teachers in neuroscience through lectures, activities, and discussion sessions. Week two focuses on designing inquiry-based classroom investigations based on neuroscience education given during week one. Follow-up activities held during the academic year include BrainU staff/faculty classroom presentations and use of training materials.

NSCI 5914. BrainU 202: Neuroscience in the Classroom. (3 cr; A-F only. Prereq–[5913 or BIOL 5190], #, application)
One-week summer workshop. Focuses on critiquing previously implemented neuroscience class activities, developing assessment tools, learning peer mentoring, and expanding neuroscience content knowledge. Follow-up activities held during academic year include BrainU staff/faculty classroom presentations, use of training materials, and peer mentoring sessions.

NSCI 5915. BrainU 303: Neuroscience in the Classroom. (2 cr; A-F only. Prereq–[5913 or BIOL 5190], 5914, #, application)
One-week summer workshop. Focuses on critiquing previously implemented neuroscience class activities and assessment tools, and expanding neuroscience content knowledge. Follow-up activities held during academic year include BrainU 303 participants. use of training materials and implementation of neuroscience investigations.

Norwegian (NOR)

German, Scandinavian, and Dutch

College of Liberal Arts

NOR 1001. Beginning Norwegian. (5 cr. §NOR 4001)
Emphasis on working toward novice-intermediate low proficiency in all four language modalities (listening, reading, speaking, writing). Topics include everyday subjects (shopping, directions, family, food, housing, etc.).

NOR 1002. Beginning Norwegian. (5 cr. §NOR 4002. Prereq–1001)
Continues the presentation of all four language modalities (listening, reading, speaking, writing) with a proficiency emphasis. Topics include free-time activities, careers, and the Norwegian culture.

NOR 1003. Intermediate Norwegian. (5 cr. §NOR 4003. Prereq–1002)
Emphasis on intermediate proficiency in listening, reading, speaking, and writing. Contextualized work on grammar and vocabulary is combined with authentic readings and essay assignments.

NOR 1004. Intermediate Norwegian. (5 cr. §NOR 4004. Prereq–1103)
Emphasis on developing intermediate mid-high proficiency in listening, reading, speaking, and writing. Contextualized work on grammar and vocabulary is supported by work with authentic readings and essay assignments.

NOR 1010. Online Basic Norwegian. (2 cr [max 8 cr])
Norwegian language/culture. Travel, weather, family, work, school, daily life. Students meet for orientation and midterm, then work at own pace using multi-media Web curriculum. Instructor-student interactions through e-mail, threaded discussions, and audio messages.

NOR 3011. Advanced Norwegian. (3 cr. Prereq–1004 or 4004)
Fiction, film, journalistic, and professional prose. Grammar, vocabulary building exercises, Systematic review of oral/written modes of communication.

NOR 3012. Advanced Norwegian. (3 cr. Prereq–1004 or 4004)
Novels, short stories, plays, articles. Structural, stylistic, and vocabulary-building exercises.

NOR 4001. Beginning Norwegian. (2 cr. §NOR 1001. Prereq–1004 in another language or passing score on LPE or grad student)
Meets concurrently with 1001. See 1001 for description.

NOR 4002. Beginning Norwegian. (2 cr. §NOR 1002. Prereq–1004 in another language or passing score on LPE or grad student)
Meets concurrently with 1002. See 1002 for description.

NOR 4003. Intermediate Norwegian. (2 cr. §NOR 1003. Prereq–1004 in another language or passing score on LPE or grad student)
Meets concurrently with 1003. See 1003 for description.

NOR 4004. Intermediate Norwegian. (2 cr. §NOR 1004. Prereq–1004 in another language or passing score on LPE or grad student)
Meets concurrently with 1004. See 1004 for description.

Nursing (NURS)

School of Nursing

NURS 1020. Challenge of Nursing. (2 cr; S-N only)
Overview of nursing profession. Contemporary nursing, its historical roots/stages. Career opportunities/challenges.

NURS 1030H. Freshman Seminar in Nursing. (1 cr; A-F only. Prereq–#)
Overview of nursing profession, including its historical roots, current roles/scope, and potential future evolution. Career opportunities/challenges.

Nurs 2001. Human Growth and Development: A Life Span Approach. (3 cr. Prereq–General psychology course)
Biosocial, cognitive, and psychosocial domains of human development across life span. Major theoretical perspectives/research. Personal and culturally determined views of various ages/stage of human development.

NURS 3690. Life Span, Growth, and Development I. (2 cr. Prereq–One general psychology and one general biology course or #)
An introductory, multimedia course that incorporates biological, sociological, and psychological perspectives of human life span development from the prenatal period through young adulthood.

NURS 3691. Life Span, Growth, and Development II. (1 cr. Prereq–3690, one general psychology and one general biology course or #)
An introductory, multimedia course that incorporates biological, sociological, and psychological perspectives of human life span development for the period of young adulthood through aging and the death experience.

NURS 3700. Human Experience of Health and Illness. (2 cr; A-F only. Prereq–Nursing student or #)
Uses literature, film, and fine arts to explore health/illness as multicultural individual, family, and community experiences. Theoretical perspectives about health/illness. Social-cultural organization of health services, social mandate for professional participation in health/illness events.

NURS 3702. Foundations of Professional Nursing. (3 cr; A-F only. Prereq–Nursing student or #)
Nature of nursing, nursing practice, nursing history, roles, foundational concepts, classification systems, documentation. Students develop nursing care plans using nursing process. Clinical application in various settings.

NURS 3704. Nursing Fundamentals I: Assessment and Intervention. (4 cr; A-F only. Prereq–Nursing student or #)
Foundational psychomotor skills/interventions used in nursing practice when caring for persons throughout lifespan in various contexts. Theory/skills of health assessment, including health history and physical exam of infants/adults.

NURS 3706. Therapeutic Communication. (3 cr; A-F only. Prereq–Nursing student or #)
Developing therapeutic use of self. Applying communication strategies to provide optimal nursing care and to communicate with individuals, families, interdisciplinary teams, and communities.

NURS 3710. Statistics for Clinical Practice and Research. (3 cr; A-F only. Prereq–High school algebra or #)
Quantitative literacy, numerical reasoning, measurement principles for clinical practice/research. Vital statistics, rates, data description. Probability and statistical inference (hypothesis testing, confidence intervals) for tests on means, proportions, correlations, and simple linear regression.

NURS 3800. Nursing Topics. (1-4 cr. Prereq–#)
Topics not included in regular courses.

NURS 3999. Clinical Internship. (1 cr; S-N only. Prereq–Completed jr yr of a baccalaureate nursing prog, accepted into an approved clinical internship prog, #)
Clinical-based learning opportunities to encourage application of theory and research based knowledge in clinical practice. Students engage in experiences to enhance the development of their professional nursing role.

NURS 4104. Ethical Sensitivity and Reasoning in Health Care. (2 cr. Prereq–[¶4100, 4101, 4102, 4103] or #)
Range/complexity of ethical issues/dilemmas in health care. Ethical concepts, principles, and theories. Addressing specific morally troubling issues in health care settings.

NURS 4201. Nursing Care of Adults. (6 cr; A-F only)
Health promotion, disease prevention, acute/chronic illness management in context of family/environment. Individual/family assessment, recognition of response patterns, formulation of client goals, selection/application of nursing interventions, evaluation of outcomes.

NURS 4203. Nursing Fundamentals II: Assessment and Intervention. (4 cr; A-F only. Prereq–Nursing student or #)
Foundational, complex, and advanced psychomotor nursing interventions and their research basis. Lab components provide opportunities to perform psychomotor skills used in nursing/complementary interventions. Skills taught within caring framework.

NURS 4205V. Honors: Nursing Theory and Research. (3 cr. Prereq–Nurs honors)
Knowledge basic to discipline/practice of nursing. Relationships among research, theory, practice. Introduction to research process, with attention to use of research in practice. Students develop honors research proposal.

NURS 4205W. Nursing Theory and Research. (3 cr; A-F only. Prereq–Undergrad in nursing)
Knowledge basic to discipline/practice of nursing. Relationships among research, theory/theoretical formulations, and practice. Research process is introduced with attention to utilization of research in practice.

NURS 4320. Psychiatric and Mental Health Nursing. (5 cr; A-F only)
Assessing biopsychosocial needs. Developing a holistic plan of care. Helping clients negotiate care, evaluating client outcomes. Students establish therapeutic relationships with clients experiencing psychiatric illnesses. Use of self as therapeutic tool in promoting mental health.

NURS 4322. Population-based Public Health Nursing. (5 cr; A-F only. Prereq–Nursing or #)
Applying nursing process with individuals, families, communities, and systems. Stuents complete a community assessment, apply evidence-based practice within the context of social justice.

NURS 4324. Transcultural Nursing and Global Health. (3 cr; A-F only. Prereq–Nursing student or #)
Influence of culture on nursing care delivery. Role of nurse in providing culturally appropriate care for increasingly diverse populations. Global health issues, factors affecting health infrastructure of populations.

NURS 4326. Nursing Care of Older Adults. (3 cr; A-F only. Prereq–Human Experience of Health and Illness, Introduction to Ethics, Introduction to Nursing, Therapeutic Communication, Nursing Fundamentals, Complex Nursing Interventions, Family Focused Care Across the Lifespan: I)
Nursing care for older adults across the health/illness continuum. Focuses on promoting healthy aging, functional health, management of symptoms/chronic conditions. Biopsychosocial changes, specialized assessment of older adults, impact/management of common chronic conditions.

NURS 4402. Taking Ethical Action in Health Care. (1 cr)
Distribution of scarce resources to meet health care needs in various health care settings. Ethics in a managed care environment. Increasing focus on how to take ethical action in health care.

NURS 4403. Nursing Care of Childbearing Families. (4 cr; A-F only. Prereq–4201, 4203)
Nurse.s role in providing care for childbearing families during antepartum period, birth experience, and immediate postpartum phase. Emphasizes health promotion, risk reduction, and active participation of clients to achieve optimum family health.

NURS 4404. Applied Nursing Research and Research Utilization. (2 cr. Prereq–4205 or #)
Design and carry out a research project of limited scope to develop fundamental skills in systematic inquiry, and interpreting and evaluating research as it applies to nursing practice. The final product is a scholarly research report.

NURS 4404H. Honors: Applied Research and Research Utilization. (2 cr. Prereq–4205V)
Fundamental skills in systematic inquiry. Interpreting/evaluating research for applicability to nursing practice. Implement study proposed in 4205V. Write report to serve as honors research project or thesis.

NURS 4406W. Leadership and Management for Shaping Professional Nursing Practice. (4 cr; A-F only. Prereq–4103, 4205, 4306)
Provides a basis for synthesis of current leadership and management theories within the professional practice of nursing. Examine the interaction among professional nursing issues, health care trends, and the leadership potential of nurses.

NURS 4408. Nursing Care of Infants, Children, and Adolescents. (4 cr; A-F only. Prereq–4201, 4203)
Family centered nursing care. Emphasizes culturally competent and developmentally appropriate nursing care during wellness/illness to promote healthy childhood/adolescence and family function.

NURS 4414. Chronic Health Conditions of Elders: a Cross-Cultural, International Perspective. (3 cr; A-F only. Prereq–4100, 4101, 4102, 4103, 4104, 4200, 4202, 4205, 4210, 4300, 4302)
Assessment/management of chronic health conditions of elders from cross-cultural, international perspective. Complex long-term health needs of elders, care delivery models that address these needs.

NURS 4420. Managing Care of Adult Clients With Complex Health Conditions Across the Continuum. (3 cr. Prereq–4100, 4101, 4102, 4103, 4104, 4200, 4202, 4205, 4210, 4300, 4302)
Coordination of comprehensive nursing care to clients with multi-system illnesses and complex socio-emotional situations, across settings and over time. Specialized strategies such as discharge planning, care paths, end-of-life interventions, and interdisciplinary collaboration. Emphasizes achieving quality health outcomes for clients and their families.

NURS 4430. Immunization Tour. (1 cr; S-N only. §PHAR 6210. Prereq–4202, level II nursing student, #)
Student teams plan/implement influenza immunization clinics for U of M faculty, staff, and students. Interdisciplinary collaboration, public health principles, public health nursing interventions, leadership.

NURS 4500W. Nursing Leadership and Health Care Systems. (4 cr; A-F only. Prereq–Nursing student or #)
Nurse as leader/manager in client care and as colleague. Status, structure, environment, and operations of healthcare systems. Social, economic, technologic, and political factors influencing nursing care and health quality, access, and cost.

NURS 4501. Critical Care Nursing Practice. (3 cr. Prereq–4400, 4401, 4402, [4404 or 4404H], 4406W, 4410)
Students participate in care of critically-ill patients with a nurse preceptor. Synthesize theoretical knowledge and practice skills. Increase competence in evaluating patient data from numerous sources. Provide safe, organized care to patients with life-threatening, multi-system problems.

NURS 4502. Clinical Immersion. (6 cr; A-F only. Prereq–3702, 3704, 3706, 4200, 4203, [4205V or 4205W], 4322, 4326, 4500, 4504)
Underlying clinical processes associated with complex, acute, or chronic health disruptions of individuals, families, and populations (communities). Students design, provide, manage, and coordinate nursing interventions to meet client physiological, psychosocial, and spiritual needs and promote health. Students evaluate influence of health care system on achieving client outcomes for optimal function/quality of life. Preceptored professional internship in a selected setting.

NURS 4503. Acute and Critical Nursing Care of Children Practicum. (3 cr. Prereq–4100, 4101, 4103, 4104, 4200, 4202, 4205, 4210, 4300, 4412)
Acute/critical care setting. Students participate with preceptors in evaluating data from numerous sources, providing holistic care to children with life-threatening conditions or multi-system disorders, and providing care to their families.

NURS 4504. Professional Issues. (2 cr; A-F only. Prereq–¶4500)
Social, economic, organization, and regulatory factors influencing profession/practice of nursing. Professional/social role of nurses in influencing policies/practices to improve health of persons/communities. Preparing for transition from student to novice nurse.

NURS 4505. Managing Chronic Health Conditions of Elders: a Study Abroad Practicum. (3 cr; A-F only. Prereq–4100, 4101, 4102, 4103, 4104, 4200, 4202, 4205, 4210, 4300, 4302, 4414)
Practicum in care of elders with complex, chronic health conditions in international setting using culturally focused, holistic framework. Students evaluate patient information from multiple sources to develop appropriate plans of care, analyze model of nursing and health care delivery.

NURS 4511. Practicum in Managing the Care of Adult Clients With Complex Health Conditions Across the Continuum. (3 cr. Prereq–4100, 4101, 4103, 4104, 4200, 4202, [4205V or 4205W], 4210, 4300, 4302, 4420)
Students participate in coordinating comprehensive nursing care to clients and their families with complex/chronic health problems across settings and over time with a nurse preceptor. Coordinating/implementing care for a group of clients. Functioning as an interdisciplinary team leader/member.

NURS 4800. Nursing Topics. (1-16 cr [max 16 cr]. Prereq–#)
Exploration of a topic to meet individual student needs.

NURS 4801. Research Topics. (1-16 cr [max 16 cr])
Exploration of research topic to meet individual student needs.

NURS 5016. Critical Reading of Scientific Literature in Adolescent Health. (1 cr. Prereq–[Grad-level Research methods course, inferential statistics course] or #)
Application of skills, from research methods and statistics courses to critical reading of empirical literature on adolescent health. Relevance of research findings to adolescent health practice.

NURS 5030. Clinical Foundations. (7 cr [max 21 cr]; A-F only. Prereq–Admission to postbaccalaureate certificate nursing program)
Foundation for culturally appropriate, ethical, evidence-based nursing practice across the life span. Emphasizes research/theory that underlie art/science of professional nursing. Concepts of person, environment, health, and nursing. Didactic, clinical, and laboratory experiences.

NURS 5031. Human Response to Health and Illness: Adults and Elders. (6 cr; A-F only. Prereq–Postbaccalaureate certificate prog)
Individual responses to health/illness, in context of families/environments. Clinical component emphasizes application of nursing process in adult/elderly populations.

NURS 5032. Human Response to Health and Illness: Children and Childbearing Families. (6 cr; A-F only. Prereq–Postbaccalaureate certificate prog)
Family responses to health/illness. Emphasizes application of nursing process in children and childbearing families. Seminar and community-based project focus on family as unit of care.

NURS 5033. Population Response to Health and Mental Illness. (5 cr; A-F only. Prereq–Nursing postbaccalaureate certificate prog)
Population-based nursing practice. Emphasizes application of nursing process in promoting mental health and public health, and in preventing illness across life span. Clinical experiences include interactions with individuals, families, communities, and systems.

NURS 5034. Clinical Seminar: Nursing Care of Clients With Complex Health Conditions. (2 cr; A-F only. Prereq–5033, 8100, Nursing Postbaccalaureate Certificate Prog)
Exemplar cases from students. clinical settings used as basis for development of clinical decision-making. Critical analysis of current/emergent nursing care issues associated with caring for complex/diverse populations.

NURS 5035. Practical Nursing Care for Complex Health Conditions. (5 cr; A-F only. Prereq–Nursing postbaccalaureate certificate prog)
Clinical decision-making, comprehensive nursing care of clients with complex health problems. In collaboration with a clinical preceptor and a faculty adviser, students develop an individualized learning contract.

NURS 5040H. Seeking Solutions to Global Health Issues. (3 cr. Prereq–Grad student or sr nursing honors student or CLA upper div honors or #)
Global health issues from interdisciplinary perspective. Emphasizes ethical/cultural sensitivity/complexities. Students propose realistic actions that could be taken to resolve these issues.

NURS 5111. Learning Theories for Nursing Education. (1 cr)
Overview of selected learning theories used in academic, patient, and staff education in nursing.

NURS 5113. Web-based Teaching/Learning Strategies. (2 cr; S-N only. Prereq–#)
Skills necessary to design, produce, implement, and evaluate effective technology enhanced learning environments. Pedagogical/technological issues surrounding teaching with technology.

NURS 5141. Ethical Issues in Health Care of Elders. (3 cr. Prereq–Grad student or nursing sr or #)
Health care related ethical issues that confront elders, their families, health care providers, and society.

NURS 5170. Research Topics. (1-16 cr [max 16 cr]. §PUBH 6170)
Exploration of research topic to meet individual student needs.

NURS 5171. SPSS Programming and Data Analysis. (2 cr. Prereq–Inferential statistics, [[grad or professional] student] or #])
Skills needed to collect/analyze data using SPSS for Windows. Review of statistical methods.

NURS 5172. Decision Making in Health Care. (2 cr. Prereq–Grad student, #)
Selected classical conceptual models of decision making, their particular perspectives/limitations/usefulness for decision making about health care issues. Models/components used to assess, evaluate, teach, or help healthy people, patients, families, health care professionals, or policy making groups in making health care decisions.

NURS 5200. Holistic Health Assessment and Therapeutics for Advanced Practice Nurses. (3 cr. Prereq–Nursing grad student or nursing postbaccalaureate xertificate student)
Health assessment knowledge/skills for advanced nursing practice with patients across age span, including pregnancy. Selected nursing interventions, complementary therapies for application to specific populations/illnesses.

NURS 5202. Introduction to Complementary Healing Practices. (3 cr)
Historical and cultural context of the allopathic and complementary healing traditions. Philosophies and paradigms of selected complementary therapies and culturally based healing traditions; descriptions of selected interventions.

NURS 5204. Population Focused Assessment and Intervention. (2 cr. Prereq–Grad nursing major, #)
Population focused assessment in health planning. Models of assessment for communities, organizations, other aggregates. Skill development in conducting/analyzing/using assessment in planning population focused interventions.

NURS 5222. Advanced Physiology. (3 cr. Prereq–Grad nursing major or #)
Systems approach to human physiology/pathophysiology. Physiologic changes across life span. Emphasizes clinical application using population-specific content related to various specialty areas in advanced practice nursing.

NURS 5223. Assessment of Psychopathology for Advanced Practice Psychiatric/Mental Health Nursing. (4 cr. Prereq–Nurs grad or #)
Advanced concepts from nursing theory and research, social sciences, neuropsychology, and neurophysiology used in the assessment of psychiatric symptoms and disorders across the age continuum. During clinical, develop proficiency in the assessment of psychopathology in clients with psychiatric symptoms.

NURS 5224. Clinical Pharmacotherapeutics. (3 cr. Prereq–Nursing grad student in advanced practice in primary care, physiology course, #)
Foundation in pharmacotherapeutics across life span. Pharmacodynamics/kinetics/epidemiology, client patterns of medication use, selection of appropriate drugs for selected client conditions, and prescriptive writing privileges for advanced practice nurses.

NURS 5225. Psychopharmacology for Advanced Practice Psychiatric/Mental Health Nursing. (3 cr. Prereq–Grad student or RN [with master's degree] or #)
Advanced concepts in neuroscience, psychopharmacology, and clinical management related to psychopharmacologic treatment of psychiatric disorders/symptoms. Application to problems in various clinical settings.

NURS 5228. Acute Care Pharmacotherapeutics. (3 cr; A-F only. Prereq–Grad student)
Analysis of pharmacodynamics, physiological bases, therapeutic effects, and non-intended effects (common errors, adverse effects, side effects) for selected pharmacologic agents within drug categories commonly used in acute care.

NURS 5300. Health Behavior Intervention: Theory and Application. (3 cr. Prereq–Grad or #)
Interdisciplinary course examines theoretical foundations and research base of intervention strategies to promote health behavior acquisition, behavioral change, and maintenance for adults (individuals and groups). Critical examination of health behavior and patterns and health risk assessment; approaches to program creation.

NURS 5340. Group as a Health-Care Intervention. (2 cr. Prereq–Grad or #)
Theoretical concepts and research findings from the areas of group therapy and dynamics are applied in the development of a model for using group as an intervention for various client populations.

NURS 5501. Professional Issues in Nurse-Midwifery. (1-2 cr [max 2 cr]; S-N only. Prereq–Nurs grad major, #)
Analysis of professional issues that confront and impact the practice of certified nurse-midwives. History and development of the professional organization including certification, legislation, ethical dimensions, public policy, and clinical practice issues.

NURS 5522. Sociopolitical Context of Women's Health. (1-2 cr [max 3 cr]; S-N only. Prereq–Grad student)
Women.s health issues from multidisciplinary perspective. Sexual/reproductive health issues across life span. Sociocultural issues affecting health, such as poverty/violence.

NURS 5601. School Nursing in the Educational System and the Community. (1-3 cr [max 3 cr]; A-F only. Prereq–3 yrs of college level courses, #)
School health problems, assessment/intervention strategies. Integration of research findings. Applications with individuals, families, communities.

NURS 5604. Advanced Health Assessment and Interventions with Adolescents. (2 cr. Prereq–CPSY 5303 or equiv or #)
Integrates knowledge from nursing, public health, health behavior, and adolescent development as framework for developing health assessment/intervention strategies for clinical practice with adolescents.

NURS 5800. Nursing Topics. (1-4 cr [max 8 cr]. Prereq–#)
Course allows students to study a topic not included in regular courses, or for faculty to offer a course to determine interest in a topic.

NURS 5801. Policymaking, Health Policy, Political Action and Nursing. (3 cr)
Analysis of sociocultural values, public policymaking, health care policy, and the relationship to the health care delivery system. The impact of health care policy on the profession and practice of nurses, and on consumers. Enhanced participation of nurses in policymaking and political action.

NURS 5802. Spirituality and Nursing Practice. (2 cr. Prereq–For undergrad cr: nurs sr or RN; for grad cr: nurs grad student or #)
Exploration of the concept of spirituality as integral to the whole person. Discussion of spiritual nursing care interventions.

NURS 5803. Transcultural Nursing: Theories and Issues. (2 cr. Prereq–Cultural ANTH course or #)
Study of cultural factors that influence theories, issues, and nursing care practices in diverse cultures and subcultures. Emphasis on nursing within international systems of health care and nursing practices related to various health-illness systems in this country and worldwide.

NURS 5804. Therapeutic Healing Touch: Research and Practice. (2 cr; S-N only. Prereq–[Upper div or grad] student in [health sciences or health care])
Therapeutic/Healing Touch as energetic based, biofield healing modality. Art/science of this modality. Research literature related to Therapeutic Touch/Healing Touch. Explanations for effects. Practice of Therapeutic Touch, intervention techniques.

NURS 5805. The 'M' Technique. (1 cr; S-N only. Prereq–Undergrad nursing student or grad student in health sciences or health professional)
Scientific/theoretical foundations/practice of 'm' technique, a touch therapy for promoting relaxation by topically administering essential oils. Appropriate applications. Demonstration/practice of technique. Interdisciplinary course.

NURS 5806. Theoretical Foundations and Experiential Learning in Complementary/Alternative Therapies. (2-3 cr. Prereq–#)
Overview of complementary therapies. Demonstration of selected therapies. Theoretical/scientific knowledge supporting use of therapies.

NURS 5807. Stories of Illness. (3 cr)
Subjective experiences of various physical/mental illnesses. Social context of illness, society's responses to illness. Ethical implications for patients/practitioners. Uses fiction, art, film, music, first-person accounts of illness, and anthropological, sociological, and historical literature.

NURS 5808. American Indian Health and Health Care. (2 cr. Prereq–Upper div or grad student or #)
Examines health of native nations in Minnesota within historical/cultural contexts. Epidemiology of major health conditions, health services, traditional Indian medicine, health beliefs. Opportunities for contact with Native American community.

NURS 5809. Seminars in Critical Care. (2 cr)
Analyzes current research/developments in treatments, care delivery, and ethical issues affecting critically ill patients and their families. Students participate with team of multidisciplinary faculty from Center for Critical Care in critiquing/presenting literature and discussing applications to clinical practice.

NURS 5810. Health Activism. (3 cr)
Interdisciplinary skill-building workshops. Sessions taught by community leaders/activists. Community project focuses on issues of health disparities, environmental justice, and access to care.

NURS 5830. Advanced Clinical Nursing. (1-6 cr [max 2 cr]. Prereq–Graduate nursing major or #)
Independent study or faculty seminar on special clinical topic.

NURS 5900. Introduction to Principles and Practice of Anesthesia. (3 cr; A-F only. Prereq–Grad student in nurse ANEStheia)
Safe/effective administration of anesthesia for nurse anesthetists. Application in operating room setting under one-to-one guidance of a certified registered nurse anesthetist (CRNA).

NURS 5901. Basic Principles and Practice of Nurse Anesthesia. (2 cr; A-F only. Prereq–5900)
Students apply principles of anesthesia to formulate nurse anesthesia care plans for care of adults undergoing anesthesia.

NURS 5910. Nurse ANESthesia Care: Patients With Cardiothoracic Problems. (2 cr. Prereq–5222, 5224, 5228, 5901, PHSL 5115)
First in series of three courses. Delivering anesthesia to complex patients. Focuses on anesthesia for patients undergoing cardiothoracic procedures.

NURS 5920. Nurse Anesthesia Care: Pediatric Patients and Patients With Trauma. (3 cr; A-F only. Prereq–5910)
Second in a series of three courses. Theory/application of principles used to deliver anesthesia by nurse anesthetists to pediatric patients and to trauma patients.

NURS 5930. Nurse Anesthesia Care: Obstetric and Gynecology Patients. (3 cr; A-F only. Prereq–5920)
Third of three courses. Theory/application of principles used to deliver anesthesia by nurse anesthetists for complex patients with obstetric or gynecologic conditions and for effective management of pain. Increasing autonomy in decision-making processes and clinical experiences.

NURS 5941. Nurse Anesthesia Practicum A. (5 cr; S-N only. Prereq–5930)
First of a series of three clinical courses that focus on developing proficiency in nurse anesthesia practice. Emphasizes incorporating current research and demonstrating increasing autonomy in decision making and case management.

NURS 5942. Nurse Anesthesia Practicum B. (5 cr; S-N only. Prereq–5941)
Second of a series of three clinical courses. Analyzing impacts of research on clinical practice. Increasing efficiency in decision-making and case management for various patient populations.

NURS 5943. Nurse Anesthesia Practicum C. (5 cr; S-N only. Prereq–5942)
Third of a series of three. Evaluating impact of research on clinical practice, on achieving a level of safe beginning practice as a nurse anesthetist, and on demonstrating leadership in operating room. Increasing autonomy in decision-making. Case management for various patient populations.

NURS 5995. Research Dissemination. (2 cr. Prereq–Doctoral student or #)
Knowledge dissemination skills for advancement of health/nursing science/practice. Emphasizes interpretation/diffusion of research findings to health professional and scientific audiences in various venues and communication modalities.

Nutrition (NUTR)

College of Food, Agricultural and Natural Resource Sciences

NUTR 5621. Nutrition and Metabolism. (4 cr. Prereq–BIOC 3021, PHSL 3051, FSCN 4612)
Carbohydrate, lipid, and protein metabolism. Uses "systems" or "holistic" approach to emphasize how metabolic pathways interrelate.

NUTR 5622. Vitamin and Mineral Biochemistry. (3 cr. Prereq–BIOC 3021, PHSL 3051, FSCN 4612)
Nutritional, biochemical, and physiological aspects of vitamins/essential minerals in human/experimental-animal models.

NUTR 5623W. Regulation of Energy Balance. (2 cr. Prereq–5621 or FSCN 4621)
Regulation of energy balance in humans, including regulation of food intake and energy expenditure.

Operations and Management Sciences (OMS)

Department of Operations and Management Science

Curtis L. Carlson School of Management

OMS 2550. Business Statistics: Data Sources, Presentation, and Analysis. (4 cr; A-F only. §OMS 2550H. Prereq–[MATH 1031 or equiv], at least 30 cr)
Data analysis, basic inferential procedures, statistical sampling/design, regression/time series analysis. How statistical thinking contributes to improved decision making.

OMS 2550H. Honors: Business Statistics: Data Sources, Presentation, and Analysis. (4 cr; A-F only. §OMS 2550. Prereq–[MATH 1031 or equiv], CSOM honors, at least 30 cr)
Data analysis, basic inferential procedures, statistical sampling/design, regression/time series analysis. How statistical thinking contributes to improved decision making.

OMS 3001. Introduction to Operations Management. (3 cr; A-F only. Prereq–At least 60 cr)
Concepts, principles, and techniques for managing manufacturing/service operations. Emphasizes decision making in operations function of organizations. Quantitative/qualitative methods for improving management of operations.

OMS 3041. Project Management. (2 cr; A-F only. Prereq–3000 or #)
Principles and methods useful for planning and controlling a project, including development of project plan, resource planning and scheduling, and project monitoring and control. Selected computerized packages are studied, including PERT and CPM, and examples of different types of projects from manufacturing and service industries are used.

OMS 3045. Purchasing and Supply Management. (2 cr)
Strategic/operational role of purchasing/supply function in the organization. Aspects of supply management: organization, steps in purchasing cycle. Supplier-selection criteria such as quantity, quality, and cost/price considerations. Buyer-supplier relationships. Purchasing function s contribution to competitiveness of the firm.

OMS 3056. Operations Planning and Control. (4 cr; A-F only. Prereq–3001 or #)
Decisions/tradeoffs managers face when directing operations of supply chain. Forecasting, capacity/production planning, just-in-time, theory of constraints, managing supply chain flows, enterprise resource planning (ERP), supply chain design.

OMS 3059. Quality Management and Six Sigma. (4 cr; A-F only. Prereq–3001 or equivalent or #)
Critical concepts of process management from Quality Management and Six Sigma perspective. Managerial/technical aspects of improvement. Strategy, improvement tools/methods, Malcolm Baldrige Award, ISO 9000, Six Sigma.

OMS 3850. Topics in Operations and Management Science. (2-4 cr [max 16 cr]. Prereq–3001)
Discussion/analysis of current topics/developments in operations/management science.

OMS 4081. Operations Strategy and Technology. (4 cr. Prereq–3001)
How to achieve/sustain a competitive advantage through a consistent pattern of decisions in manufacturing/service operations. Coordinating operations with marketing/business strategy in a global context. Vertical integration, capacity, facilities, technology/infrastructure.

OMS 5170. Simulation Modeling and Analysis. (4 cr; A-F only. Prereq–MBA 6120 or BA 1550 or #)
Techniques and application of computer simulation modeling and analysis. Includes animations of existing or proposed real-world facilities and processes. Experiments in simulation programming language and environment. Simulation models and animations demonstrating actual operation of models. Planning, analysis, and interpretation of simulation experiment results.

Otolaryngology (OTOL)

Department of Otolaryngology

Medical School

OTOL 5101. Introduction to the Basic Sciences in Otolaryngology I: Ear. (2 cr; A-F only. Prereq–Otolaryngology major or #)
Multidisciplinary introduction to the basic sciences of the ear. Acoustics and psychoacoustics, temporal bone anatomy, external and middle ear mechanisms, cochlear physiology, auditory neurophysiology, ear embryology, ear biochemistry, immunology, fine structures, vestibular mechanisms and measurement. S-N grading option for nonmajors only.

OTOL 5102. Introduction to the Basic Sciences in Otolaryngology II: Head and Neck. (2 cr; A-F only. Prereq–Otol major or #)
Multidisciplinary introduction to the basic sciences of the head and neck. Laryngeal anatomy and physiology, nasal anatomy and physiology, immune biology, embryology of head and neck. S-N grading option for nonmajors only.

OTOL 5993. Directed Studies. (1-12 cr [max 24 cr]; A-F only. Prereq–#)
Directed readings and preparation of reports on selected topics.

Periodontics (PERO)

School of Dentistry

PERO 5123. Practice Management Externship. (1 cr. Prereq–Resident in advanced education program in periodontology)
Familiarizes periodontal students with the private practice environment and prepares them to select the type of practice they want to purchase or build and successfully manage their office.

Pharmacology (PHCL)

Department of Pharmacology

Medical School

PHCL 3100. Pharmacology for Pre-Med and Life Science Students. (2 cr; A-F only. Prereq–College-level biology; biochemistry or physiology recommended)
Principles/mechanisms of drug action. Major drug categories for different organ systems.

PHCL 4001. Mechanisms of Drug Action. (2 cr; A-F only. Prereq–Upper div or #; [prev or concurrent] courses in [biology, biochemistry] recommended)
How drugs function as applied to treatment of a single medical condition. Pharmacokinetics, pharmacodynamics, pharmacogenetics, pharmacogenomics.

PHCL 5101. Pharmacology for Pharmacy Students. (3 cr; A-F only. Prereq–2nd yr pharmacy student or #)
Action/fate of drugs. Lectures, lab.

PHCL 5102. Pharmacology for Pharmacy Students. (2 cr; A-F only. Prereq–5101 or #)
Action/fate of drugs.

PHCL 5103. Pharmacology for Dental Students. (3 cr. Prereq–Enrolled dental student or #)
Pharmacological principles/actions of drugs.

PHCL 5109. Problems in Pharmacology. (1-18 cr [max 18 cr]. Prereq–Upper div or grad student or #)
Research projects and special problems by arrangement.

PHCL 5110. Introduction to Pharmacology. (3 cr; A-F only. Prereq–Grad student or #)
Basic principles of Pharmacology. Focuses on molecular mechanisms of drug action.

PHCL 5111. Pharmacogenomics. (3 cr; A-F only. Prereq–Grad student or #)
Human genetic variation, its implications. Functional genomics, pharmacogenomics, toxicogenomics, proteomics. Interactive, discussion-based course.

PHCL 5210. Pharmacology. (1 cr; A-F only. Prereq–Grad student or #)
Principles of pharmacology. Meets with 6110.

PHCL 5211. Pharmacology. (2 cr; A-F only. Prereq–5210 or #)
Continuation of 5210. Meets with 6111. Lectures on the major classes of drugs.

PHCL 5212. Pharmacology. (3 cr; A-F only. Prereq–5211 or #)
Continuation of 5211. Meets with 6112

PHCL 5462. Neuroscience Principles of Drug Abuse. (2 cr. §NSC 5462. Prereq–#)
Current research on drugs of abuse, their mechanisms of action, characteristics shared by various agents, and neural systems affected by them. Offered biennially, spring semester of even-numbered years.

Pharmacy (PHAR)

College of Pharmacy

PHAR 1001. Orientation to Pharmacy. (2 cr)
Online (Vista) course. One-credit option provides information on need for pharmacists, work settings, and educational process. Two credit-option adds material on impact of pharmacists, professional challenges, and expanding roles.

PHAR 1002. Health Sciences Terminology. (2 cr)
Self-study course. How to analyze and build words by using combining forms, suffixes, and prefixes in a systematic manner. Course information is sent to the U of M email addresses of registered students.

PHAR 1003. Non-Prescription Medications and Self-Care: Treating Minor Conditions. (2 cr)
Self-study, online course. Nonprescription medications, appropriate self care. How to become informed consumer of over-the-counter medications and testing devices. Textbook is supplemented with online coursework. Students use Web CT.

PHAR 1004. Common Prescription Drugs and Diseases. (2 cr)
Self-study, online course. Frequently prescribed medications, conditions medications are intended to treat. Diagnostic criteria, disease complications, mechanism-of-action, side effects. Direct-to-consumer advertising. Students use Vista to view powerpoint presentations, download materials, and complete study guides.

PHAR 1905. Seminar: What Your Mom Didn't Tell You About Caring for Yourself. (2 cr; A-F only. Prereq–Fr)
Making independent decisions about self-care. Tools for being an educated health consumer.

PHAR 3800. Pharmacotherapy for the Health Professions. (3 cr; A-F only. Prereq–Enrolled [nursing or radiation therapy or respiratory therapy] student)
General drug therapy.

PHAR 4200. Drugs and the U.S. Health Care System. (3 cr. §PHAR 5200)
How to be an informed/responsible user of medications within U.S. health care system.

PHAR 5200. Drugs and the U.S. Health Care System. (3 cr. §PHAR 4200)
How to be an informed/responsible user of medications within U.S. health care system.

PHAR 5201. Health Sciences Applied Terminology. (2 cr. Prereq–Basic knowledge of human anatomy/physiology)
Self-study course. Medical terms, how to apply them when documenting/reporting patient care procedures. Course information is sent to the U of M e-mail addresses of registered students.

PHAR 5210. Diminishing Health Disparities Through Cultural Competence. (2 cr)
Various dynamics of health disparities, cultural competencies. Uses sociological framework.

PHAR 5270. Therapeutics of Herbal and Other Natural Medicinals. (2 cr; A-F only. Prereq–PHSL 6051, organic chemistry, pathophysiology of disease states, [3rd or 4th yr pharmacy student])
Herbal products/supplements. Pharmacology, clinical indications, and drug interactions of most commonly used products in nontraditional complementary health care. Historical significance and evidenced-based role of these products in health care. Case studies of clinical applications.

PHAR 5280. Principles of Health Care Counseling. (1 cr. Prereq–2nd or 3rd yr pharmacy student)
Basic counseling theory/practice. Means of bringing about behavioral change from perspective of pharmacy/health care practitioner. Application of course principles through interactive small group exercises. Case presentations by experienced pharmaceutical care practitioners.

Philosophy (PHIL)

Department of Philosophy

College of Liberal Arts

PHIL 1001. Introduction to Logic. (4 cr. §PHIL 1001H, PHIL 1021)
Application of formal techniques for evaluating arguments.

PHIL 1001H. Honors Course: Introduction to Logic. (4 cr. §PHIL 1001, PHIL 1021. Prereq–§: 1021)
Application of formal techniques for evaluating arguments.

PHIL 1002V. Honors: Introduction to Philosophy. (4 cr. §PHIL 1002W, PHIL 1006W, PHIL 1026W, PHIL 1102)
Problems. Methods. Schools of philosophy (historical, contemporary).

PHIL 1002W. Introduction to Philosophy. (4 cr. §PHIL 1002V, PHIL 1006W, PHIL 1026W, PHIL 1102)
Problems, methods, historical/contemporary schools of philosophy.

PHIL 1003V. Honors: Introduction to Ethics. (4 cr. §PHIL 1003W, PHIL 1103)
Central concepts, principal theories of moral philosophy.

PHIL 1003W. Introduction to Ethics. (4 cr. §PHIL 1003V, PHIL 1103)
Central concepts/principal theories of moral philosophy.

PHIL 1004V. Honors: Introduction to Political Philosophy. (4 cr. §PHIL 1004W)
Central concepts, principal theories of political philosophy.

PHIL 1004W. Introduction to Political Philosophy. (4 cr. §PHIL 1004V)
Central concepts, principal theories of political philosophy.

PHIL 1005. Scientific Reasoning. (4 cr. Prereq–[1st or 2nd] yr student or #)
Techniques for understanding/evaluating scientific information as presented in popular media and in specialized publications. Emphasizes general reasoning skills that do not require extensive training in particular sciences.

PHIL 1006W. Philosophy and Cultural Diversity. (4 cr. §PHIL 1002V, PHIL 1002W, PHIL 1026W, PHIL 1102)
Central problems/methods of philosophy through culturally diverse texts. Focus is critical/comparative, reflecting range of U.S. philosophical traditions.

PHIL 1007. Introduction to Political Philosophy Practicum. (1 cr. Prereq–¶1004W)
Students do at least two hours a week of community service and connect their service activities in writing to issues discussed in 1004.

PHIL 1021. Accelerated Introduction to Logic. (3 cr. §PHIL 1001, PHIL 1001H)
Application of formal techniques for evaluating arguments.

PHIL 1026W. Philosophy and Cultural Diversity. (3 cr. §PHIL 1002V, PHIL 1002W, PHIL 1006W, PHIL 1102)
Central problems/methods of philosophy through culturally diverse texts. Focus is critical/comparative, reflecting a range of U.S. philosophical traditions.

PHIL 1102. Introduction to Philosophy. (4 cr. §PHIL 1002V, PHIL 1002W, PHIL 1006W, PHIL 1026W)
Problems, methods, historical/contemporary schools of philosophy.

PHIL 1103. Introduction to Ethics. (4 cr. §PHIL 1003V, PHIL 1003W)
Central concepts, principal theories of moral philosophy.

PHIL 1303. Business Ethics. (4 cr; A-F only)
Purpose of business, its obligations to various stakeholders (e.g. stockholders, customers, employees), its social function.

PHIL 1905. Topics: Freshman Seminar. (3 cr; A-F only. Prereq–Freshman)
Topics specified in *Class Schedule*.

PHIL 1910W. Topics: Freshman Seminar. (3 cr; A-F only. Prereq–Freshman)
Topics specified in *Class Schedule*.

PHIL 1999. *Dantes:* "Ethics in America," SE-474 Test*Dantes:* Ethics in America. (3 cr; S-N only)
Defense Activity for Non-Traditional Support Subject Standardized Tests Program (*Dantes*): "Ethics in America," SE-474 Test.

PHIL 3001V. Honors: General History of Western Philosophy: Ancient Period. (4 cr. §PHIL 3101)
Major developments in ancient Greek philosophic thought: pre-Socratics, Socrates, Plato, Aristotle, Hellenistic thinkers.

PHIL 3001W. General History of Western Philosophy: Ancient Period. (4 cr)
Major developments in ancient Greek philosophic thought: pre-Socrates, Socrates, Plato, Aristotle, Hellenistic thinkers.

For definitions of course numbers, symbols, and abbreviations, see page 300.

PHIL 3005V. General History of Western Philosophy: Modern Period. (4 cr. §PHIL 3005W, PHIL 3105. Prereq–honors)
Major developments in philosophic thought of the modern period: renaissance beginnings, Descartes through Hume, with some attention paid to Kant.

PHIL 3005W. General History of Western Philosophy: Modern Period. (4 cr. §PHIL 3005V, PHIL 3105)
Major developments in philosophic thought of the modern period: renaissance beginnings, Descartes through Hume. Some attention to Kant.

PHIL 3010W. Classical Ancient Text. (3 cr)
Introduction to and in-depth analysis of Plato's Republic.

PHIL 3101. General History of Western Philosophy: Ancient Period. (4 cr. §PHIL 3001V)
Major developments in ancient Greek philosophic thought: pre-Socrates, Socrates, Plato, Aristotle, Hellenistic thinkers.

PHIL 3105. General History of Western Philosophy: Modern Period. (4 cr. §PHIL 3005V, PHIL 3005W)
Major developments in philosophic thought of the modern period: renaissance beginnings, Descartes through Hume. Some attention to Kant.

PHIL 3231. Philosophy and Language. (4 cr)
Philosophical issues concerning the nature and use of human language.

PHIL 3234. Knowledge and Society. (4 cr)
Critical discussion of concepts such as knowledge, objectivity, justification, rationality, evidence, authority, expertise, and trust in relation to the norms and privileges of gender, race, class, and other social categories.

PHIL 3301. Environmental Ethics. (4 cr)
Philosophical basis for membership in moral community. Theories applied to specific problems (e.g., vegetarianism, wilderness preservation). Students defend their own reasoned views about moral relations between humans, animals, and nature.

PHIL 3302W. Moral Problems of Contemporary Society. (4 cr. §PHIL 3322W, PHIL 3402)
Selected moral problems of private/public life.

PHIL 3304. Law and Morality. (4 cr)
A study of the relationship among law, morality, and our role as critizens.

PHIL 3305. Medical Ethics. (4 cr)
Moral problems confronting physicians, patients, and others concerned with medical treatment, research, and public health policy. Topics include abortion, living wills, euthanasia, genetic engineering, informed consent, proxy decision-making, and allocation of medical resources.

PHIL 3307. Social Justice and Community Service. (4 cr)
Exploration of concepts of justice, charity, equality, freedom, community service in connection with current social issues. Perspectives from philosophy, history, literature, and student involvement in the community. Community service for at least three hours per week.

PHIL 3308. Social Justice and Community Service. (4 cr)
Special exploration of diversity in connection with concepts of justice, charity, equality, freedom, community service. Perspectives from philosophy, history, literature, and student involvement in the community. Community service for at least three hours per week. Students may enroll in this course without having taken 3307.

PHIL 3311W. Introduction to Ethical Theory. (4 cr)
Nature and justification of moral judgments and moral principles; analysis of representative moral views.

PHIL 3322W. Moral Problems of Contemporary Society. (3 cr. §PHIL 3302W, PHIL 3402)
Selected moral problems of private/public life.

PHIL 3402. Moral Problems of Contemporary Society. (4 cr. §PHIL 3302W, PHIL 3322W)
Selected moral problems of private/public life.

PHIL 3502W. Introduction to Aesthetics. (3 cr [max 4 cr])
Development of aesthetic theories with applications to specific aesthetic problems.

PHIL 3601W. Scientific Thought. (4 cr. Prereq–One course in philosophy or natural science)
Introduction to philosophical issues concerning the nature of scientific knowledge. Reading of historical and contemporary sources that describe major scientific achievements and controversies.

PHIL 3602. Science, Technology, and Society. (3 cr; A-F only)
Philosophical issues that arise out of interaction between science, technology, society (e.g., religion and science, genetics and society, science and the environment).

PHIL 3607. Philosophy of Psychology. (4 cr. Prereq–One course in philosophy or psychology)
Major theories of mind including the "invention" of the mind by Descartes, classical empiricism, the impact of Darwinism, Freud's theories, Gestalt psychology, behaviorism, Chomsky's rationalism, contemporary functionalism, the computer model.

PHIL 3900H. Honors Seminar. (3 cr. Prereq–Honors enroll, 6 crs of 3xxx-5xxx philosophy courses)
Topics of contemporary interest varying from semester to semester.

PHIL 3910W. Major Seminar. (3 cr. Prereq–Phil major or #)
Development and presentation of the major project.

PHIL 3993. Directed Studies. (1-3 cr [max 6 cr]. Prereq–#, Δ, ❑)
Guided individual reading or study.

PHIL 4003. Medieval Philosophy. (3 cr. Prereq–[Grad or upper div undergrad] student)
Survey of several major figures of the medieval Christian synthesis (e.g., Augustine, Anselm, Aquinas, Scotus, Ockham).

PHIL 4004. 19th-Century Philosophy. (3 cr. Prereq–Upper div or grad student)
Survey of several major figures from 19th century, e.g., Hegel, Schopenhauer, Mill, Kierkegaard, Marx, Nietzsche. Kant, 18th century, will also be studies, as background.

PHIL 4008. Survey of Contemporary Philosophy. (3 cr. Prereq–3005 or #)
Survey of major figures in contemporary analytic/phenomenological philosophy (e.g., Dewey, Russell, Wittgenstein, Heidegger, Carnap, de Beauvoir).

PHIL 4009. Existentialism. (3 cr. Prereq–3005 or 4004 or #)
Central themes (e.g., being-in-the-world, freedom, engagement) of several important existentialist thinkers (e.g., Kierkegaard, Jaspers, Sartre, de Beauvoir, Baldwin).

PHIL 4010. Ancient Philosophers. (3 cr [max 6 cr]. Prereq–3001 or #)
Major work of selected ancient philosophers (e.g., Plato's Parmenides, Plato's Sophist, Aristotle's Metaphysics). Works discussed may vary from offering to offering.

PHIL 4030. Medieval Philosophers. (3 cr [max 6 cr]. Prereq–3001 or 4003 or #)
Major work of selected medieval philosophers (e.g., Anselm's Proslogion, Aquinas's Summa contra Gentiles, Books I/II, Nicholas of Cusa's On Learned Ignorance). Works discussed may vary from offering to offering.

PHIL 4040. Rationalists. (3 cr [max 6 cr]. Prereq–3005 or #)
Major work of selected early modern rationalists (e.g., Descartes' Principles of Philosophy, Spinoza's Ethics, Conway's Principles of the Most Ancient and Modern Philosophy, Leibniz's Discourse on Metaphysics). Works discussed may vary from offering to offering.

PHIL 4050. Empiricists. (3 cr [max 6 cr]. Prereq–3005 or #)
Major work of selected early modern empiricists (e.g., Locke's Essay Concerning Human Understanding, Berkeley's Principles of Human Knowledge, Hume's Treatise of Human Nature). Works discussed may vary from offering to offering.

PHIL 4055. Kant. (3 cr. Prereq–3005 or 4004 or #)
Major work (e.g., Critique of Pure Reason).

PHIL 4070. Selected 19th- or Early to Middle 20th-Century Philosophy. (3 cr [max 6 cr]. Prereq–One sem history of philosophy)
Major writings of selected 19th- or early to middle 20th-century philosopher (e.g., Schopenhauer's World as Will and Idea, Thoreau's Walden, Du Bois's The Souls of Black Folk, Wittgenstein's Philosophical Investigations, de Beauvoir's The Second Sex).

PHIL 4085. Wittgenstein. (3 cr. Prereq–3005 or 4231 or #)
Major work (e.g., Philosophical Investigations).

PHIL 4101. Metaphysics. (3 cr. Prereq–One course in history of philosophy or #)
Philosophical theories concerning nature of reality.

PHIL 4105W. Epistemology. (3 cr; A-F only. Prereq–1001 or #)
Theories of nature/sources of knowledge/evidence.

PHIL 4231. Philosophy of Language. (3 cr. Prereq–1001 or 5201 or #)
Theories of reference, linguistic truth, relation of language/thought, translation/synonymy.

PHIL 4310W. History of Moral Theories. (3 cr. Prereq–1003 or #)
Issues in western moral philosophy from classical age to present.

PHIL 4320W. Intensive Study of an Historical Moral Theory. (3 cr [max 6 cr]. Prereq–1003 or #)
Intensive consideration of an author or theory in the history of moral or political philosophy.

PHIL 4321W. Theories of Justice. (3 cr. Prereq–1003 or 1004 or #)
Philosophical accounts of concept/principles of justice.

PHIL 4324. Ethics and Education. (3 cr. §PHIL 5324. Prereq–6 cr in [philosophy or education] or #)
What constitutes good education, both in terms of educational outcomes and of processes that promote learning? What connections are there between concepts of good education and of good society?

PHIL 4325. Education and Social Change. (4 cr; A-F only. §PHIL 5323. Prereq–#)
Connections between education, social change. Theories of democratic/popular education, their application through in-depth practicum in community education setting.

PHIL 4326. Lives Worth Living: Questions of Self, Vocation, and Community. (6 cr. §PHIL 5326. Prereq–#)
Immersion experience. Students live together as a residential community of learners. Works of philosophy, history, and literature form backdrop for exploring such questions as How is identity constructed? What is vocation? What experiences of community are desirable in a life? Each student creates a life-hypothesis for a life worth living.

PHIL 4330. Contemporary Moral Theories. (3 cr. Prereq–1003 or #)
Discusses view that evaluative judgments cannot be based on factual considerations alone, relation of this view to objectivity of ethics.

PHIL 4414. Political Philosophy. (3 cr. Prereq–1004 or #)
Survey of historical/contemporary works in political philosophy.

PHIL 4501. Principles of Aesthetics. (3 cr. Prereq–3502 or one philosophy course or #)
Problems arising in attempts to identify, characterize, or evaluate art.

PHIL 4510. Philosophy of the Individual Arts. (3 cr. Prereq–3502)
Aesthetic problems that arise in studying or practicing an art.

PHIL 4521. Philosophy of Religion. (3 cr. Prereq–8 cr in philosophy)
Conceptual problems that arise from attempts to provide rational justification for religious belief.

PHIL 4605. Space and Time. (3 cr. §PHIL 5605. Prereq–Courses in [philosophy or physics] or #)
Philosophical problems concerning nature/structure of space, time, and space-time.

PHIL 4607. Philosophy of the Biological Sciences. (3 cr. Prereq–Courses in [philosophy or biology] or #)
Structure/status of evolutionary theory. Nature of molecular biology, genetics. Reductionism in biology. Legitimacy of teleology. Species concept.

PHIL 4611. Philosophy of the Social Sciences. (3 cr. §PHIL 5611. Prereq–9 cr of [philosophy or social science] or #)
Criteria for describing/explaining human actions. Problems of objectivity, reduction, freedom.

PHIL 4614. Philosophy of Psychology. (3 cr. Prereq–3607 or PSY 3051 or #)
Problems/prospects in recent developments in psychology, cognitive science, and philosophy of mind.

PHIL 4615. Minds, Bodies, and Machines. (3 cr. Prereq–One course in philosophy or #)
Mind-body problem. Philosophical relevance of cybernetics, artificial intelligence, computer simulation.

PHIL 4622. Philosophy and Feminist Theory. (3 cr. §PHIL 5622, WOST 4122, WOST 5122. Prereq–8 crs in [philosophy or women's studies] or #)
Encounters between philosophy/feminism. Gender's influence in traditional philosophical problems/methods. Social role of theorist/theorizing as they relate to politics of feminism.

PHIL 4760. Selected Topics in Philosophy. (3 cr [max 9 cr]. Prereq–3 [3xxx-5xxx] cr in philosophy or #)
Philosophical problems of contemporary interest. Topics specified in *Class Schedule*.

PHIL 4993. Directed Studies. (1-3 cr [max 6 cr]. Prereq–#, Δ, ❑)
Guided individual reading or study.

PHIL 5040. Rationalists. (3 cr [max 6 cr]. Prereq–3005 or #)
Major work of selected early modern rationalists (e.g., Descartes' Principles of Philosophy, Spinoza's Ethics, Conway's Principles of the Most Ancient and Modern Philosophy, Leibniz's Discourse on Metaphysics). Works discussed may vary from offering to offering.

PHIL 5050. Empiricists. (3 cr [max 6 cr]. Prereq–3005 or #)
Major work of selected early modern empiricists (e.g., Locke's Essay Concerning Human Understanding, Berkeley's Principles of Human Knowledge, Hume's Treatise of Human Nature). Works discussed may vary from offering to offering.

PHIL 5201. Symbolic Logic I. (4 cr. Prereq–1001 or #)
Study of syntax and semantics of sentential and first-order logic. Symbolization of natural-language sentences and arguments. Development of deductive systems for first-order logic. Metatheoretic proofs and methods, including proof by mathematical induction and proof of consistency and completeness.

PHIL 5202. Symbolic Logic II. (4 cr. Prereq–5201 or #)
Elements of set theory, including the concepts of enumerability and nonenumerability. Turing machines and recursive functions; the results of Church, Godel, and Tarski and the philosophical significance of those results.

PHIL 5211. Modal Logic. (3 cr. Prereq–5201 or #)
Axiomatic and semantic treatment of propositional and predicate modal logics; problems of interpreting modal languages.

PHIL 5221. Philosophy of Logic. (3 cr. Prereq–5202 or #)
Attempts to answer, "What is logic?" Scope of logic. Disputes about alternative logics. Theories concerning logical truth (e.g., conventionalism: view that logical truths are contingent).

PHIL 5222. Philosophy of Mathematics. (3 cr. Prereq–College level logic or mathematics course or #)
Major philosophical questions arising in connection with mathematics. What is mathematics about? How do we know the mathematics we do? What is the relation between mathematics and the natural sciences? Selected readings of leading contributors such as Frege, Dedekind, Russell, Hilbert, Brouwer, Godel, Quine.

PHIL 5323. Education and Social Change. (4 cr; A-F only. §PHIL 4325)
Connections between education, social change. Theories of democratic/popular education, their application through in-depth practicum in community education setting.

PHIL 5324. Ethics and Education. (3 cr. §PHIL 4324. Prereq–6 cr in [philosophy or education] or #)
What constitutes good education in terms of educational outcomes and of processes that promote learning. Connections between concepts of good education and of good society.

PHIL 5325. Biomedical Ethics. (3 cr. Prereq–Grad or #)
A survey of major topics and issues in biomedical ethics including patients' rights and duties, informed consent, confidentiality, ethical issues in medical research, the initiation and termination of medical treatment, euthanasia, abortion, and the allocation of medical resources.

PHIL 5326. Lives Worth Living: Questions of Self, Vocation, and Community. (4 cr. §PHIL 4326. Prereq–#)
Immersion experience. Students live together as a residential community of learners. Works of philosophy, history, and literature form backdrop for exploring such questions as How is identity constructed? What is vocation? What experiences of community are desirable in a life? Each student creates a life-hypothesis for a life worth living.

PHIL 5415. Philosophy of Law. (3 cr. Prereq–1003 or 1004 or 3302 or social science major or #)
Analytical accounts of law and legal obligation.

PHIL 5601. History of the Philosophy of Science. (3 cr. Prereq–#)
History of logical empiricism, from its European origins in first half of 20th century to its emergence as nearly universal account of science in post-war Anglo-American philosophy.

PHIL 5602. Scientific Representation and Explanation. (3 cr. Prereq–#)
Contemporary issues concerning representation and explanation of scientific facts.

PHIL 5603. Scientific Inquiry. (3 cr. Prereq–#)
Philosophical theories of methods for evaluating scientific hypotheses, of role of experimentation in science, and of how hypotheses come to be accepted within a scientific community.

PHIL 5605. Space and Time. (3 cr. §PHIL 4605. Prereq–Courses in [philosophy or physics] or #)
Philosophical problems concerning nature/structure of space, time, and space-time.

PHIL 5606. Philosophy of Quantum Mechanics. (3 cr)
Problems of interpretation in ordinary (nonrelativistic) quantum mechanics. Two-slit experiment, Schrodinger cat paradox (measurement problem), Einstein-Podolsky-Rosen paradox. Leading approaches to interpretation (Copenhagen, hidden variables, universal wave function) and their connections with philosophical issues.

PHIL 5611. Philosophy of the Social Sciences. (3 cr. §PHIL 4611. Prereq–[9 cr of [philosophy or social science], grad student] or #)
Criteria for describing/explaining human actions. Problems of objectivity, reduction, freedom.

PHIL 5622. Philosophy and Feminist Theory. (3 cr. §PHIL 4622, WOST 4122, WOST 5122. Prereq–8 crs in [philosophy or women's studies] or #)
Encounters between philosophy/feminism. Gender's influence in traditional philosophical problems/methods. Social role of theorist/theorizing as they relate to politics of feminism.

PHIL 5760. Selected Topics in Philosophy. (3 cr [max 9 cr]. Prereq–3xxx-5xxx course in phil or #)
Philosophical problems of contemporary interest. Topics specified in *Class Schedule*.

PHIL 5993. Directed Studies. (1-3 cr [max 6 cr]. Prereq–#, Δ, ❑)
Guided individual reading or study.

Physical Education (PE)

School of Kinesiology

College of Education and Human Development

PE 1004. Diving: Springboard. (1 cr. Prereq–1007 or equiv or #)
Fundamentals of diving. Proper mechanics/techniques to ensure safety. Technical/numerical aspects. Lecture, participatory testing.

PE 1007. Beginning Swimming. (1 cr)
Introduction to basic aquatic safety, fundamentals of swimming and hydrodynamics. Principles of hydrodynamics and stroke mechanics; five basic strokes; basic rescue techniques with use of pool equipment; hydrotherapy for disabilities and other conditions, opportunities for competitive activities, lifetime enjoyment of aquatics.

PE 1014. Conditioning. (1 cr)
Fundamentals of personal fitness. Principles of fitness; health and motor skill components of fitness; principles of training/conditioning programs; nutrition; weight control; common fitness injuries; motivation and consistency in fitness programs; stress management.

PE 1015. Weight Training. (1 cr)
Introduction to weight training. Basic aspects of weight training including exercise selection and technique, charting workouts, program design, nutritional considerations, and safety.

PE 1016. Posture and Individual Exercise. (1 cr)
Good posture techniques, individual exercises, fitness concepts, and mental techniques. Specific overall sound body and mind techniques to include flexibility exercises, cardiovascular fitness, resistance training, nutrition management, weight control, stress management, and self-thought.

PE 1022. Whitewater Kayaking. (2 cr. Prereq–Good general health, intermediate swimming ability)
Basic/intermediate whitewater kayaking skills. Equipment parts/use, group development, river hydrology, navigation, paddle strokes, self/assisted rescues, river maneuvers/etiquette, swift-water safety. Emphasizes progression of practical skills necessary for kayaking. Includes 4-day paddling/camping trip.

PE 1029. Handball. (1 cr)
Hand and eye coordination, footwork in practice and game conditions, and skills and strategies of service and rally for the court sport handball (four-wall version). Novice to intermediate levels of play accommodated.

PE 1031. Sabre Fencing. (1 cr)
Basic sabre techniques, movement, an overview of fencing as a recreational sport and an Olympic sport, and the history of fencing.

PE 1032. Badminton. (1 cr)
Fundamentals including etiquette, terminology, game rules for singles and doubles, footwork, shot selection, and strategy.

PE 1033. Foil Fencing. (1 cr)
Fending fundamentals, including basic foil techniques, movement, a general overview of fencing as a recreational sport and an Olympic sport, and the history of fencing.

PE 1034. Judo. (1 cr)
Basic skills for throwing, falling, grappling (matwork), choking, arm and neck techniques; contest judo from Jiu-Jitsu; fundamental rules and scoring of contests. Videotapes used for technique instruction and contest appreciation.

PE 1035. Karate. (1 cr)
Japanese Traditional Shotokan Karate (JTSK) is non-contact—no protective pads or gear are worn. Structural foundation, discipline and control, posture, basic body dynamics, blocking, kicking, punching techniques, as well as basic sparring (kumate) and forms (kata).

PE 1036. Racquetball. (1 cr)
Fundamentals of racquetball, including equipment; safety and etiquette; terminology; game rules of singles, doubles, and cutthroat; grips; basic strategies; serves and shots.

PE 1037. Squash Racquets. (1 cr)
Entry-level technique, basic equipment, international dimension courts, and fitness.

PE 1038. Beginning Tennis. (1 cr)
Fundamental strokes, including forehands, backhands, volleys, lobs, overheads, and serves; introduction to doubles play; terminology, rules, and etiquette.

PE 1041. Cycling. (1 cr)
Fundamentals of cycling, including physical fitness associated with aerobic training, stretching, safety, and bike maintenance. Students should provide bicycle in good working condition.

PE 1042. Orienteering. (1 cr)
Fundamentals, including navigation of an orienteering course using map and compass; types of orienteering courses; multiple techniques and tactics of orienteering. Course is physically challenging and requires participation in three orienteering meets (Sunday afternoons).

PE 1043. Beginning Horse Riding. (1 cr)
Techniques, styles, and communication of English riding. Students will learn riding techniques at a walk, trot, canter, and jumping.

PE 1044. Self-Defense. (1 cr)
Physical, psychological, and de-escalation skills for acting in crisis situations. Distance, body language, and tone of voice are addressed. Physical skills include striking, kicking, shifting, blocking, releasing techniques, floor defenses, and applications to armed attackers and multiple attackers.

PE 1045. Rock Climbing. (1 cr. Prereq–Good general health, no [neck or back] problems)
Safety, knots, equipment, techniques, and anchor systems used in climbing. Course includes all necessary equipment. Held at St. Paul Gym climbing wall.

PE 1046. Tae Kwon Do. (1 cr)
Fundamentals of Tae Kwon Do. Principles of martial arts, body mechanics of Tae Kwon Do, practical self-defense.

PE 1047. Backpacking. (2 cr. Prereq–Good general health, no back problems)
Packing/fitting a backpack, trip planning, trail safety, gear selection, backcountry cooking, minimum impact camping/travel. Emphasizes practical skills and best practices. Four-day backpacking trip.

PE 1048. Bowling. (1 cr)
Fundamentals, including stance, approach and delivery, scoring, bowling terminology, and etiquette.

PE 1053. Ice Skating. (1 cr)
Basic turns, basic stops, balance techniques, and various other skills from both the forward and backward positions. Equipment, safety issues, ice skating terminology.

PE 1055. Golf. (1 cr)
Proper grip, stance, ball address, swing, club selection, psychological management, rules, and etiquette. Basic instruction in analyzing, assisting with, and coaching golf.

PE 1056. Nordic (Cross-Country) Skiing. (1 cr)
Introduction to the fundamental techniques of classical and freestyle cross country skiing. Students will be taught through lecture and direct experience on cross country skiing trails.

PE 1057. Beginning Skiing. (1 cr. Prereq–$100 facility fee)
Introduction to alpine skiing. Students are taught to stop, turn, and use lifts, as well as safety, etiquette, and purchase of equipment. Class held at Highland Hills ski area in Bloomington.

PE 1058. Snowboarding. (1 cr. Prereq–Good general health, injury free; $100 facility fee)
Introduction to alpine snowboarding. Using American Teaching System, classes are split into nine skill levels, beginning through advanced. Held at Hyland Ski and Snowboard School in Bloomington.

PE 1059. Track and Field. (1 cr)
Introduction to track and field: conditioning and training, events and skills, strategies, track and field knowledge, equipment, facilities, and technology.

PE 1065. Beginning Tumbling and Gymnastics. (1 cr)
Rolls, handstands, cartwheels, extensions, handsprings, tucks (flips). Spotting techniques. Skills on bars, vault, and beam.

PE 1067. Basketball. (1 cr)
Fundamental skills and rules of basketball, with emphasis on basic court movement and different offensive and defensive strategies.

PE 1071. Beginning Cricket. (1 cr)
Fundamentals of Cricket. Laws of Cricket, bowling/batting techniques, competitive/recreational Cricket opportunities.

PE 1072. Soccer. (1 cr)
Fundamentals of soccer including sporting behavior both on and off the field, game rules, soccer terminology, participation and competition drills, fundamental soccer skills, practical instruction in strategy.

PE 1073. Softball. (1 cr)
Development of basic skills for lifetime involvement.

PE 1074. Beginning Volleyball. (1 cr)
Basic skills, team play, rules, officiating, and strategy.

PE 1075. Ice Hockey. (1 cr. Prereq–1053 or equiv or #)
Offensive/defensive strategies/techniques, goal tending, scrimmage play. Students need their own equipment.

PE 1107. Intermediate Swimming. (1 cr. Prereq–1007 or equiv, proficient ability to swim 100 meters or #)
Intermediate swimming skills. Fundamentals of swimming and hydrodynamics.

PE 1133. Intermediate Foil Fencing. (1 cr. Prereq–1033 or equiv or #)
Intermediate/advanced technical/tactical actions in foil, rudimentary epee skills, intermediate/advanced footwork. Rules, officiating, bout tactics.

PE 1135. Intermediate Karate. (1 cr. Prereq–1035 or equiv or #)
Techniques of Japanese traditional Shotokan Karate taught through Ippon Kumite (one step sparring), San Kumite (three step sparring), and Heian Shodan Kata/Nidan Kata (forms). Testing for orange belt is optional.

PE 1136. Intermediate Racquetball. (1 cr. Prereq–1036 or equiv, #)
Improvement of basic skills and strategies. Format is determined by the number of players and their level of ability.

PE 1138. Intermediate Tennis. (1 cr. Prereq–1038 or equiv or #)
Review terminology, rules, etiquette. Improve basic skills. Singles/doubles strategy, competitive play.

PE 1154. Figure Skating. (1 cr. Prereq–1053 or equiv or #)
Terminology, rules. Basic moves, jumps, spins. On-/off-ice assignments.

PE 1157. Intermediate Skiing. (1 cr. Prereq–1057 or equiv or #; assessment is made to determine skill level; $100 facility fee)
Developing advanced skills in alpine skiing. Skiing safely on more difficult terrain. Class held at Highland Hills ski area in Bloomington.

PE 1165. Intermediate Tumbling and Gymnastics. (1 cr. Prereq–1065 or #)
Rolls, handstands, cartwheels, extensions, handsprings, tucks (flips), twists. Spotting techniques. Skills on bars, vault, and beam.

PE 1174. Intermediate Volleyball. (1 cr. Prereq–1074 or equiv, #)
Development of a broader understanding of volleyball systems of play, and incorporation of offensive and defensive formations into team play. Fundamental skills will be developed further and more advanced skills will be introduced. Team play, transition, coaching, and officiating.

PE 1205. Scuba and Skin Diving. (1 cr. Prereq–Ability to swim 400 yds comfortably or #)
Diving equipment, physics, physiology, decompression, emergencies, recreational dive planning, oceans, currents and aquatic life, snorkeling/SCUBA equipment usage, buoyancy control, entries, emergencies.

PE 1305. Scuba Stress Rescue and Accident Management. (1 cr. Prereq–[Open Water SCUBA Certification or higher], [CPR, First Aid] certified, [own SCUBA equipment [mask, fins, snorkel, buoyancy compensator, regulator depth pressure gauge, wet suit] or pay $55 rental fee])
Continuing education after basic SCUBA certification course. Accident prevention, personal safety, SCUBA rescue, recognizing/reducing diver stress. SCUBA Schools International (SSI) Stress and Rescue certification.

PE 1306. Lifeguard Training. (1 cr. Prereq–[Proficiently swim 500 meters, at least 17 yrs old] or #)
Upon completion, certifications are obtained in the following categories: American Red Cross Lifeguarding Today and First Aid; CPR for the Professional Rescuer; and Waterfront Lifeguarding.

PE 1411. Water Safety Instructor. (2 cr. Prereq–[Proficiency in basic strokes, completion of skill/written pre tests] or #)
Advanced lifesaving techniques, treading strategies.

PE 1415. Advanced Weight Training and Conditioning. (1 cr. Prereq–[1014, [1015 or equiv]] or #; one yr of serious weight training recommended)
Introduction to advanced forms of cardiovascular/weight training. Powerlifting, Olympic weightlifting, bodybuilding, sport-specific training. Proper technique, exercise selection, programming, nutrition, anatomy/physiology of weight training.

PE 1720. Special Activities in Physical Education. (1-3 cr [max 9 cr])
Activities or related opportunities not normally available through regular course offerings.

Physical Medicine and Rehabilitation (PMED)

Department of Physical Medicine and Rehabilitation

Medical School

PMED 1003. Orientation to Occupational Therapy. (1 cr; S-N only)
Survey of the profession through lectures, films, demonstrations, and tours. For students investigating the field of occupational therapy.

PMED 5121. Issues in Mental Health. (1 cr; S-N only. Prereq–One course gen psych, one course abnorm psych)
Psychiatric/neuropsychological assessment/treatment. Issues related to medical/community management and to roles of OT/PT with respect to clients with mental health needs. Interaction between physical/mental health and disability.

PMED 5122. Descriptive Neurology. (2 cr; A-F only. Prereq–OT student or #)
Relates neuroanatomical/neurophysiological principles to neurological conditions commonly seen in occupational/physical therapy practice.

PMED 5161. Theory of Physical Medicine and Rehabilitation Applied to Medical Sciences. (2 cr; A-F only. Prereq–OT student or #)
Diagnostic procedures. Medical, surgical, and rehabilitation management of patient problems in orthopedics, surgery, pediatrics, dermatology, medicine, cancer, and speech. Correlation to current practice. Presentation of patients.

PMED 5182. Functional Neuroanatomy and Neurophysiology. (4 cr; A-F only. Prereq–Registered occupational therapy student or #)
Neuroanatomic structures as functional systems, basic neurophysiologic concepts. Emphasizes applications for understanding/treating physical dysfunctions.

PMED 5214. Clinical Practice of Physical Therapy. (1 cr; S-N only. Prereq–Registered PT student)
Clinical visitation.

PMED 5215. Clinical Practice of Physical Therapy I. (1 cr [max 2 cr]; S-N only. Prereq–Regis PT student)
First of three-course sequence. Emphasizes sensitivity to needs of patients, families, and health-care coworkers. Patient handling techniques, communication skills, awareness of cultural differences, psychological aspect of disability, and use of community resources.

PMED 5217. Clinical Practice of Physical Therapy III. (1 cr; S-N only. Prereq–Registered 2nd-year PT student)
Third of three-course sequence. Sensitivity to needs of patients, families, and health-care coworkers. Patient handling techniques, communication skills, awareness of cultural differences, psychological aspects of disability, use of community resources. Offered summer session.

PMED 5223. Electrotherapy and Electrophysiological Testing. (2 cr; A-F only. Prereq–Enrolled PT student)
Theory and technique of movement analysis and treatment using electrophysiological testing and therapeutic devices.

PMED 5231. Clinical Biomechanics. (4 cr; A-F only. §PT 6231. Prereq–Intro calculus, intro physics, [registered RSC student or registered PT student])
Forces/structures internal/external to body responsible for normal/abnormal human movement. Analysis techniques, independent assignments. Muscle function, palpation, posture. Gait of normal individuals, analysis to detect deviation from norm.

PMED 5260. Professional Issues in Physical Therapy. (3 cr; A-F only. Prereq–Enrolled PT student)
Current professional issues, dilemmas, and trends in health care. Evaluation and treatment skills in physical therapy specialty areas.

PMED 5284. Musculoskeletal II. (4 cr; A-F only. Prereq–Enrolled PT student)
Problem-solving approach to evaluating, treating, and preventing selected musculoskeletal conditions across life span. Chart review, history taking, strength testing, functional testing, gait/posture examination, special orthopedic tests. Therapeutic exercises, orthopedic ambulation, joint mobilization, splinting, patient education. Second of two-course sequence.

PMED 5287. Neurorehabilitation I. (4 cr; A-F only. Prereq–Enrolled PT student)
Assessment and rehabilitation of patients with neurological conditions (e.g., cerebral vascular disease traumatic brain injury, multiple sclerosis, Parkinson's disease, amyotrophic lateral sclerosis). Using treatment procedures, orthotics, and equipment to improve function and prevent, stabilize, or decrease impairments.

PMED 5288. Neurorehabilitation II. (4 cr; A-F only. Prereq–Registered PT student)
Pediatric assessment/rehabilitation for neurological, orthopedic, cardiac, prematurity, transplant, and behavioral conditions. Preparation for adult assessment/treatment with neurological, general medical, and vascular disease. Students use etiologic knowledge to assess patients in clinic and establish treatment plans and goals.

PMED 5300. Concepts for Occupational Therapy Practice. (4 cr; A-F only. Prereq–Enrolled OT student or #)
Critical thinking, ethics, professional resources/organizations, patient-therapist relationship. Level I fieldwork experience.

PMED 5313. Therapeutic Occupation. (4 cr; A-F only. Prereq–Enrolled OT student or #)
Occupational therapy philosophy, history, and frames of reference. Activity analysis applied to purposeful, therapeutic activities for individuals and groups.

PMED 5341. Introduction: Evaluation and Intervention I. (4 cr; A-F only. Prereq–5393 or #)
Assessment concepts/techniques. Application to patient populations with both mental health/physical disabilities. Treatment planning/documentation.

PMED 5342. Compensatory Rehabilitation: Evaluation and Intervention II. (4 cr; A-F only. Prereq–5300, 5313 or #)
Assessment of daily living performance areas; adaptation techniques to compensate for performance deficits. Level I fieldwork experience.

PMED 5343. Specialty Topics: Evaluation and Intervention III. (4 cr; A-F only. Prereq–5342 or #)
Applies critical thinking model to assessment/intervention of selected patient populations with mental/physical problems requiring specialized approaches. Focus on habilitation/rehabilitation of populations with multiple performance component deficits. Fieldwork.

PMED 5344. Neurorehabilitation: Evaluation and Intervention IV. (5 cr; A-F only. Prereq–5343 or #)
Assessment/intervention related to perception, cognition, reflexes, sensory integration, and motor control. Application to individuals with multiple performance component deficits.

PMED 5360. Dynamics of Group Models. (2 cr; A-F only. Prereq–5313 or #)
Application of group/team dynamics in diverse professional settings.

PMED 5370. Theory of Occupation. (1 cr [max 2 cr]; A-F only. Prereq–Enrolled OT student or #)
Occupational therapy frames of reference, role of activity, and historical development of profession.

PMED 5375. Community Resources and Health-Care Issues. (2 cr; A-F only. Prereq–[5300, 5342] or #)
Analysis of community health-care systems, including cultural/family influences on individual health and decision making. Students identify current trends in health care and determine responses to them at social, political, or legislative level.

PMED 5376. Adult Education and Planning. (1 cr; A-F only. Prereq–5313 or #)
Skills needed to plan, implement, and evaluate adult educational programs/materials for patient/family education, peer/professional education, and education of others in order to carry out therapeutic interventions. Student teaching unit, community based activity.

PMED 5380. Management of Occupational Therapy Services. (3 cr; A-F only. Prereq–[5360, 5375, 5376] or #)
Administration/management of occupational therapy services within managed care environment. Issues in Medicare, HMOs, TQM, consultation, human resources, promotion of profession. Emphasizes program development in current organizational structures.

PMED 5391. Occupation across the Life Span. (3 cr; A-F only. Prereq–[5375, 5376] or #)
The well elderly, school therapy, work-related injuries/industrial rehabilitation. Fieldwork.

PMED 5392. Research in Occupational Therapy. (3 cr; A-F only. Prereq–5313 or #)
Analysis of scientific literature, development of research proposals.

PMED 5393. Functional Anatomy and Kinesiology. (4 cr; A-F only. Prereq–Enrolled OT student or #)
Gross human anatomy emphasizing skeletal, muscular, circulatory, and peripheral nervous systems of the extremities and trunk. Includes cadaver lab prosections. Analyzing functional human movement from a biomechanical perspective.

PMED 5394. Orthotics. (3 cr; A-F only. Prereq–5341 or #)
Analysis, design, and construction of orthotic devices.

PMED 5395. Independent Study in Occupational Therapy. (1-4 cr [max 16 cr]. Prereq–Enrolled OT student or #)

Physics (PHYS)

Institute of Technology

PHYS 1001W. Energy and the Environment. (4 cr. Prereq–1 yr high school algebra)
Fundamental principles governing physical world in context of energy/environment. Lab.

PHYS 1011. Physical World. (3 cr; A-F only. Prereq–1 yr high school algebra)
Fundamental laws and principles governing the physical world, discussed in the context in which encountered in modern science and technology.

PHYS 1012. Elementary Physics. (4 cr; A-F only. Prereq–1 yr high school algebra, Internet connectivity)
Topics represented in context of real world situations. Motion, forces, momentum, energy, heat, vibrations, sound, light, electricity, magnetism. Emphasizes development of logical reasoning skills. Lab.

PHYS 1101W. Introductory College Physics I. (4 cr. §PHYS 1107, PHYS 1201W, PHYS 1301W, PHYS 1401V, PHYS 1501. Prereq–High school algebra, plane geometry, trigonometry; primarily for students interested in technical areas)
Fundamental principles of physics in the context of everyday world. Use of kinematics/dynamics principles and quantitative/qualitative problem solving techniques to understand natural phenomena. Lecture, recitation, lab.

PHYS 1102W. Introductory College Physics II. (4 cr. Prereq–1101; primarily for students interested in technical areas)
Fundamental principles of physics in the context of everyday world. Use of conservation principles and quantitative/qualitative problem solving techniques to understand natural phenomena. Lecture, recitation, lab.

PHYS 1107. Introductory Physics Online. (4 cr. §PHYS 1101W, PHYS 1201W, PHYS 1301W, PHYS 1401V, PHYS 1501. Prereq–High school algebra, plane geometry, trigonometry)
Principles of physics in context of everyday world. Use of kinematics/dynamics principles together with quantitative/qualitative problem solving techniques to understand natural phenomena.

PHYS 1111. Basic Physics I. (3 cr. Prereq–High school algebra, high school geometry, high school trigonometry)
Algebra-based. Motion of a body in one dimension. Newton's laws of motion. Emphasizes developing systematic approach to problem solving and applying it to problems. Experiments. No lab component.

PHYS 1112. Basic Physics II. (3 cr [max 4 cr]. Prereq–1111 or equiv)
Algebra-based. Work, energy, momentum, collisions, circular motion, universal gravitation, heat, electricity. Systematic approach to problem solving. Experiments. No lab component.

PHYS 1201W. Introductory Physics for Biology and Pre-medicine I. (5 cr. §PHYS 1101W, PHYS 1107, PHYS 1301W, PHYS 1401V, PHYS 1501. Prereq–[High school or college] calculus, trigonometry, algebra)
Fundamental principles of physics. Description of motion, forces, conservation principles, structure of matter. Applications to mechanical systems, including fluids, waves, heat. Lab.

PHYS 1202W. Introductory Physics for Biology and Premedicine II. (5 cr. §PHYS 1302W, PHYS 1402V, PHYS 1502. Prereq–1201)
Fundamental principles of physics. Motion, forces, conservation principles, structure of matter. Applications to electromagnetic phenomena, including optics, atomic structure. Lab.

PHYS 1301W. Introductory Physics for Science and Engineering I. (4 cr. §PHYS 1101W, PHYS 1107, PHYS 1201W, PHYS 1401V, PHYS 1501. Prereq–¶MATH 1271 or ¶MATH 1371 or ¶MATH 1571)
Use of fundamental principles to solve quantitative problems. Motion, forces, conservation principles, structure of matter. Applications to mechanical systems.

PHYS 1302W. Introductory Physics for Science and Engineering II. (4 cr. §PHYS 1202W, PHYS 1402V, PHYS 1502. Prereq–1301, ¶MATH 1272 or MATH 1372 or MATH 1572)
Use of fundamental principles to solve quantitative problems. Motion, forces, conservation principles, fields, structure of matter. Applications to electromagnetic phenomena.

PHYS 1401V. Honors Physics I. (4 cr. §PHYS 1101W, PHYS 1107, PHYS 1201W, PHYS 1301W, PHYS 1501. Prereq–IT honors or consent of IT honors office)
Comprehensive, calculus-level general physics. Emphasizes use of fundamental principles to solve quantitative problems. Description of motion, forces, conservation principles. Structure of matter, with applications to mechanical systems.

PHYS 1402V. Honors Physics II. (4 cr. §PHYS 1202W, PHYS 1302W, PHYS 1502. Prereq–IT honors or consent of IT honors office)
Second semester of comprehensive, calculus-level general physics. Emphasizes use of fundamental principles to solve quantitative problems. Description of motion, forces, conservation principles, fields. Structure of matter, with applications to electromagnetic phenomena.

PHYS 1501. Enriched Physics for Science and Engineering I. (4 cr. §PHYS 1101W, PHYS 1107, PHYS 1201W, PHYS 1301W, PHYS 1401V. Prereq–High school physics, [AP calculus or equiv])
Enriched, calculus-based introductory physics. Use of fundamental principles. Structure of matter. Applications to mechanical systems.

PHYS 1502. Enriched Physics for Science and Engineering II. (4 cr. §PHYS 1202W, PHYS 1302W, PHYS 1402V. Prereq–1501W, physics experience, one yr of calculus)
Use of fundamental principles to solve quantitative problems in electromagnetic phenomena.

PHYS 1901. Freshman Seminar: Environment. (1-3 cr [max 6 cr]; A-F only. Prereq–Freshman)
Topics vary. See *Class Schedule*.

PHYS 1904. Freshman Seminar: International PerspectiveFresh Sem-Int'l Persp. (1-3 cr [max 6 cr]; A-F only. Prereq–Freshman)
Topics vary. See *Class Schedule*.

PHYS 1905. Freshman Seminar. (1-3 cr [max 6 cr]; A-F only. Prereq–Fr)
Topics vary. See *Class Schedule*.

PHYS 1910W. Freshman Seminar: Writing Intensive. (1-3 cr [max 3 cr]; A-F only. Prereq–Freshman)
Topics vary. See *Class Schedule*.

PHYS 2303. Physics III: Physics of Matter. (4 cr. §PHYS 2403H, PHYS 2503. Prereq–1302, [MATH 1272 or MATH 1372 or MATH 1572H])
Use of fundamental principles to solve quantitative problems. Structure of matter. Applications to 20th-century physics such as Bohr atom and models of the hydrogen atom, classical/quantum mechanical waves, molecules, solid state, nuclear physics.

PHYS 2311. Modern Physics. (4 cr. Prereq–[1302 or 1402], CHEM 1022, Math 2243)
Broad overview of physical concepts developed in twentieth century. Special relativity, wave-particle duality, Schrodinger equation, Bohr atom, hydrogen atom in wave mechanics, many-electron atoms, x-rays, nuclear structure, radioactivity, nuclear reactions, statistical physics.

PHYS 2403H. Honors Phys III. (4 cr. §PHYS 2303, PHYS 2503. Prereq–1402V, [IT honors or consent of IT honors office])
Third semester of comprehensive calculus-level general physics. Emphasizes use of fundamental principles to solve quantitative problems. Applications to 20th-century physics such as classical/quantum mechanical waves, optics, special relativity, and atomic structure of materials.

PHYS 2503. Physics III: Foundations of Modern Physics. (4 cr. §PHYS 2303, PHYS 2403H. Prereq–1302W, [MATH 1272 or MATH 1372 or MATH 1572H])
Use of fundamental principles to solve quantitative problems in wave mechanics. Statistical theory from probability to thermodynamics. Applications to matter and to electromagnetic waves, optics, and special relativity.

PHYS 2601. Quantum Physics. (4 cr. Prereq–[2403H or 2503], [¶Math 2243 or Math 2373 or Math 2574H])
Introduction to quantum mechanics. Applications to atomic, molecular, condensed-matter, nuclear, elementary-particle, and statistical physics. Associated lab is 2605.

PHYS 2605. Quantum Physics Laboratory. (3 cr. Prereq–¶2601)
Laboratory experiments in atomic, solid state, and nuclear physics offered in conjunction with 2601.

PHYS 3071W. Laboratory-Based Physics for Teachers. (4 cr. Prereq–No IT credit, college algebra; designed for students intending to be education majors)
Laboratory-based introductory physics. Topics selected to apply to elementary school curriculum: earth's motion, properties of matter, heat/temperature, kinematics, electric current.

PHYS 3993. Directed Studies. (1-5 cr [max 10 cr]. Prereq–#, Δ)
Directed study in Physics in areas arranged by the student and a faculty member.

PHYS 3994. Directed Research. (1-5 cr [max 10 cr]. Prereq–#, Δ)
Independent, directed study in physics in areas arranged by the student and a faculty member.

PHYS 4001. Analytical Mechanics. (4 cr. Prereq–[2303 or 2601 or CHEM 3501 or CHEM 3502], two sems soph math)
Analytic Newtonian mechanics. Mathematics beyond prerequisites developed as required.

PHYS 4002. Electricity and Magnetism. (4 cr. Prereq–[2303 or 2601 or CHEM 3501 or CHEM 3502], two sems soph math)
Classical theory of electromagnetic fields using vector algebra and vector calculus.

PHYS 4051. Methods of Experimental Physics I. (5 cr. Prereq–2605 or equiv lab experience or #)
Contemporary experimental techniques. Introduction to modern analog and digital electronics from an experimental viewpoint. Use of computers for data acquisition and experimental control. Statistics of data analysis.

PHYS 4052W. Methods of Experimental Physics II. (5 cr. Prereq–4051)
Second semester of laboratory sequence. Contemporary experimental techniques illustrated by experiments with data analysis. Students design and execute an experimental project. Lectures on specialized topics of professional concern.

PHYS 4071. Concepts in Physics. (3 cr. Prereq–2201, 2303)
Overview of physics with emphasis on 20th-century developments. Primarily for secondary teachers and science majors wishing to understand the conceptual connections within physics.

PHYS 4101. Quantum Mechanics. (4 cr. Prereq–[2303 or 2601 or CHEM 3502], two sems soph math)
Mathematical techniques of quantum mechanics. Schrodinger Equation and simple applications. General structure of wave mechanics. Operator methods, perturbation theory, radiation from atoms.

PHYS 4111. History of 19th-Century Physics. (3 cr. §HSCI 4111. Prereq–General physics or #)
Legacy of 17th-century experimental and theoretical physics especially light, electricity, magnetism, and heat. Experimental and theoretical discoveries in 19th-century physics set within the context of concurrent educational, institutional, and political developments in Europe and the United States. Heritage of 19th-century physics.

PHYS 4121. History of 20th-Century Physics. (3 cr. §HSCI 4121. Prereq–General physics or #)
Experimental and theoretical discoveries in 20th-century physics (birth of modern physics, special theory of relativity, old and new quantum theories, nuclear physics to WWII) within the context of concurrent educational, institutional, and political developments in Europe and the United States.

PHYS 4201. Statistical and Thermal Physics. (3 cr. §PHYS 5201. Prereq–2601)
Principles of thermodynamics and statistical mechanics. Selected applications such as kinetic theory, transport theory, and phase transitions.

PHYS 4211. Introduction to Solid-State Physics. (3 cr. Prereq–4101, 4201)
A modern presentation of the properties of solids. Topics include vibrational and electronic properties of solids; diffraction of waves in solids and electron band structure. Other possible topics include optical properties, magnetic phenomena, and superconductivity.

PHYS 4303. Waves, Optics, and Relativity. (3 cr. Prereq–4001, 4002)
Further topics in analytical mechanics, electricity and magnetism including mechanical and electromagnetic wave phenomena, physical and geometrical optics, and relativistic dynamics of particles and fields.

PHYS 4501. Experimental Project. (1-5 cr [max 5 cr]. Prereq–4052, #)
Research project in physics area of contemporary interest. Project must be approved by faculty coordinator before registration.

PHYS 4511. Introduction to Nuclear and Particle Physics. (3 cr. Prereq–4101)
Fundamental particles and Standard Model. Symmetries/quarks, models of nuclei, interactions between particles/nuclei, tests of conservation laws, fission/fusion.

PHYS 4611. Introduction to Space Physics. (3 cr. Prereq–2601, 4001, 4002)
Astrophysics of energetic particles in space, including cosmic rays and those of solar origin. Detection/identification. Interactions with matter/magnetic fields in space. Acceleration, modulation, and propagation.

PHYS 4621. Introduction to Plasma Physics. (3 cr. Prereq–4001, 4002)
Magnetohydrodynamics and properties of collisionless plasmas with applications to the magnetic field of the earth and sun, and to plasma confinement. Transport phenomena and effects of collisions.

PHYS 4711. Introduction to Optics. (3 cr. Prereq–4002)
Modern theoretical and experimental optics broadly defined to include, for example, radio astronomy and particle accelerators. Matrix methods in geometrical optics including charged particle optics; optical detectors and noise; phenomena in intense coherent radiation including nonlinear effects.

PHYS 4911. Introduction to Biopolymer Physics. (3 cr. §PHYS 5081. Prereq–[2303, 2403H, 2503] or CHEM 3501 or #)
Introduction to biological and soft condensed matter physics. Emphasizes physical ideas necessary to understand behavior of macromolecules and other biological materials. Elements of thermodynamics and statistical mechanics are presented as needed.

PHYS 4950H. Senior Thesis. (1-3 cr [max 6 cr]; S-N only. Prereq–#)
Independent project with adviser.

PHYS 4960H. Honors Seminar. (1 cr [max 2 cr] Prereq–Upper div honors, #)
Designed to prepare students for senior honors thesis projects and provide guidance in choice of future careers.

PHYS 4993. Directed Studies. (1-5 cr [max 10 cr]. Prereq–#)
Directed study in Physics in areas arranged by student and faculty member.

PHYS 4994. Directed Research. (1-5 cr [max 10 cr]. Prereq–#)
Independent, directed study in physics in areas arranged by student and a faculty member.

PHYS 5001. Quantum Mechanics I. (4 cr. Prereq–4101 or equiv or #)
Schrodinger equation: bound state and scattering problems in one dimension. Spherically symmetric problems in three dimensions, angular momentum, and the hydrogen atom. Approximation methods for stationary states. Time-dependent perturbation theory. Operators and state vectors: general formalism of quantum theory.

PHYS 5002. Quantum Mechanics II. (4 cr. Prereq–5001 or equiv)
Symmetry in quantum mechanics, space-time symmetries and the rotation group, Clebsch-Gordan coefficients and the Wigner-Eckart theorem. Scattering theory. Method of second quantization with elementary applications. Relativistic wave equations including Dirac equation.

PHYS 5011. Classical Physics I. (4 cr. Prereq–4001, 4002 or #)
Classical mechanics: Lagrangian/Hamiltonian mechanics, orbital dynamics, rigid body motion, special relativity.

PHYS 5012. Classical Physics II. (4 cr. Prereq–5011 or #)
Classical electromagnetism: electrostatics, magnetostatics, Maxwell's equations, electromagnetic waves, radiation, interaction of charged particles with matter.

PHYS 5022. Relativity, Cosmology, and the Universe. (4 cr. §AST 5022. Prereq–2601 or #)
Large-scale structure and history of universe. Introduction to Newtonian and relativistic world models. Physics of early universe. Cosmological tests. Formation of galaxies.

PHYS 5041. Analytical and Numerical Methods of Physics I. (4 cr. Prereq–Grad or #)
Survey of mathematical techniques, both analytic and numerical, needed for physics. Application to physical problems.

PHYS 5042. Analytical and Numerical Methods of Physics II. (4 cr. Prereq–5041 or #)
Survey of mathematical techniques, both analytic and numerical, needed for physics. Application to physical problems.

PHYS 5071. Physics for High School Teachers: Experimental Foundations and Historical Perspectives. (3 cr. Prereq–Gen physics, #; no cr for physics grad or grad physics minor)
In-depth examination of a conceptual theme in physics, its experimental foundations and historical perspectives. Kinematics and dynamics from Aristotle through Einstein; nature of charge and light; energy and thermodynamics; electricity, magnetism, and quantized fields; structure of matter.

PHYS 5081. Introduction to Biopolymer Physics. (3 cr. §PHYS 4911. Prereq–working knowledge of [thermodynamics, statistical mechanics])
Introduction to biological and soft condensed matter physics. Emphasizes physical ideas necessary to understand behavior of macromolecules and other biological materials.

PHYS 5201. Thermal and Statistical Physics. (3 cr; A-F only. §PHYS 4201. Prereq–2601 or equivalent)
Principles of thermodynamics and statistical mechanics. Selected applications such as kinetic theory, transport theory, and phase transitions.

PHYS 5401. Physiological Physics. (4 cr. Prereq–1301 or 1401)
Musculoskeletal system, circulatory system/ membrane transport, biological control systems, propagation/action potential in nervous system, biomagnetism, electromagnetism at cellular level.

PHYS 5402. Radiological Physics. (4 cr. Prereq–1302 or 1402)
Signal analysis, medical imaging, medical x-rays, tomography, radiation therapy, nuclear medicine, MRI, and similar topics.

PHYS 5701. Solid-State Physics for Engineers and Scientists. (4 cr. Prereq–Grad or advanced undergrad in physics or engineering or the sciences)
Crystal structure and binding; diffraction; phonons; thermal and dielectric properties of insulators; free electron model; band structure; semiconductors.

PHYS 5702. Solid State Physics for Engineers and Scientists. (4 cr. Prereq–5701 or #)
Diamagnetism and paramagnetism; ferromagnetism and antiferromagnetism; optical phenomena; lasers; superconductivity; surface properties; ferroelectricity.

PHYS 5950. Colloquium Seminar. (1 cr; S-N only. Prereq–[Grad student or advanced undergrad in physics], Δ)
Colloquium of School of Physics and Astronomy.

PHYS 5980. Introduction to Research Seminar. (1 cr [max 3 cr]; S-N only. Prereq–Grad or upper div phys major)
Introduction to the research activities of the School of Physics and Astronomy.

PHYS 5993. Directed Studies. (1-5 cr [max 15 cr]. Prereq–#, Δ)
Independent, directed study in physics in areas arranged by the student and a faculty member.

PHYS 5994. Directed Research. (1-5 cr [max 15 cr]. Prereq–Jr, Δ)
Problems, experimental or theoretical, of special interest to students. Written reports.

Physiology (PHSL)

Department of Physiology

Medical School

PHSL 1001. Human Physiology. (3 cr. Prereq–High school chem, high school biol)
How major organ systems function (nerve, muscle, circulation,respiration, endocrine, renal, gastrointestinal, temperature regulation and energy metabolism). Function in terms of mechanism. Ideas presented in terms of scientific concepts and methods, although a scientific background is not assumed.

PHSL 3051. Human Physiology. (4 cr. Prereq–[BIOL 1009 or 1 yr college biol], 1 yr college chem)
For pre-allied health sciences majors. How major organ systems function (nerve, muscle, circulation, respiration, endocrine, renal, gastrointestinal, temperature regulation and energy metabolism). Fall offering emphasizes independent learning using e-mail extensively for information exchange between students and faculty. One-hour lecture, two-hour lab.

PHSL 3061. Principles of Physiology. (4 cr. §BMEN 3701, PHSL 3063, PHSL 3701. Prereq–1 year college CHEM and physics and math through integral calculus)
Human physiology with emphasis on quantitative aspects. Organ systems (circulation, respiration, gastrointestinal, renal, endocrine, muscle, peripheral and central nervous systems), cellular transport processes, and scaling in biology.

PHSL 3062W. Research Paper for Physiology Majors. (1 cr; A-F only. Prereq–¶3061, physiology major, 1 yr [college chem, physics], math through integral calculus)
Students write a research paper on a topic of interest, mentored by a faculty member.

PHSL 3063. Principles of Human Physiology. (6 cr. §BMEN 3701, PHSL 3061, PHSL 3701. Prereq–1 yr [college chem, physics], math through integral calculus)
Physiology of human organ systems. Emphasizes quantitative aspects. Lab exercises integrated with lectures. All organ systems. cellular transport processes, scaling.

PHSL 3095. Problems in Physiology. (1-5 cr [max 20 cr]. Prereq–¶college physiology, #)
Individualized study in physiology. Students address a selected problem in physiology through library or lab research, supervised by physiology faculty.

PHSL 3701. Physiology Laboratory. (2 cr; A-F only. §BMEN 3701, PHSL 3061, PHSL 3063. Prereq–3062W or ¶3062W or 3071W)
Experiments in physiology. Emphasizes quantitative aspects, including analysis of organ systems.

PHSL 4095. Honors Problems in Physiology. (2-4 cr [max 4 cr]; A-F only. Prereq–¶3061, physiology honors candidate, approval of director of undergrad studies in physiology)
Students pursue a selected topic in physiology through library or lab research supervised by physiology faculty.

PHSL 5061. Principles of Physiology for Biomedical Engineering. (4 cr. Prereq–Biomedical engineering grad, one yr college CHEM and physics and math through integral calculus)
Human physiology with emphasis on quantitative aspects. Organ systems (circulation, respiration, renal, gastrointestinal, endocrine, muscle, central and peripheral nervous systems), cellular transport processes, and scaling in biology.

PHSL 5094. Research in Physiology. (1-5 cr [max 20 cr]. Prereq–#)
Independent lab research project in physiology, supervised by physiology faculty.

PHSL 5095. Problems in Physiology. (1-5 cr [max 20 cr]. Prereq–#)
Individualized study in physiology. Students address selected problem through library or lab research, supervised by physiology faculty.

PHSL 5101. Human Physiology. (5 cr. Prereq–Grad student)
Survey of human physiology. Muscle, cardiovascular, respiratory, gastrointestinal, renal physiology. Integrative, systems approach. Emphasizes normal function.

PHSL 5115. Advanced Clinical Physiology I for Nurse Anesthetists. (3 cr; A-F only. Prereq–#)
Cellular mechanisms underlying systems physiology. Cellular physiology, physiology of excitable tissues, renal physiology, cardiovascular physiology.

PHSL 5116. Advanced Clinical Physiology II for Nurse Anesthetists. (3 cr; A-F only. Prereq–5115, #)
Respiratory physiology, acid-base physiology, gastrointestinal physiology, metabolism, endocrinology, physiology of pregnancy and labor.

PHSL 5201. Computational Neuroscience I: Membranes and Channels. (3 cr. §NSC 5201. Prereq–Calculus through differential equations)
Neural excitation (ion channels, excitation models, effects of neural morphology) using UNIX workstations to simulate empirical results. Includes the Hodgkin-Huxley model, nonlinear dynamic systems analysis, voltage and ligand gated ion channels, ion transport theories, and impulse initiation and propagation.

PHSL 5444. Muscle. (3 cr. §BIOC 5444. Prereq–3061 or 3071 or 5061 or BIOC 3021 or BIOC 4331 or #)
Muscle membranes: structures, mechanisms, and physiological roles of channels/pumps. Muscle contraction: force generation by actin/myosin.

PHSL 5510. Advanced Cardiac Physiology and Anatomy. (2-3 cr. Prereq–#)
Fundamental concepts, advanced topics related to clinical/biomedical cardiac physiology. Lectures, laboratories, workshops, anatomical dissections. Intense, one week course.

PHSL 5511. Advanced Neuromuscular Junction Physiology. (2-3 cr. Prereq–#)
Fundamental concepts and advanced topics related to clinical/biomedical aspects of neuromuscular junction physiology. Lectures, laboratories, workshops, anatomical dissections. Intense, one week course.

PHSL 5520. Advanced Pulmonary Mechanics: Physiology and Pathophysiology. (2-3 cr. Prereq–#)
Fundamental concepts and advanced topics related to mechanical aspects of pulmonary function (e.g., elastic recoil, airway resistance). Lectures, laboratories, demonstrations. Intense, one week course.

PHSL 5530. Physiology of Drug Absorption, Distribution, and Elimination. (1-2 cr [max 2 cr]. Prereq–Two semesters of calculus, #)
Topics in pharmacokinetics. Non-compartmental calculations of clearance and volume of distribution. Compartmental modeling. Deconvolution approaches. Physiologically-based pharmacokinetic modeling. Course is designed around the pharmacokinetic program PKQuest.

PHSL 5540. Advanced Exercise Medicine: Physiology and Bioenergetics. (1-2 cr [max 2 cr]. Prereq–[Grad student or practicing health professional], #)
Three-day intensive course. Physiology, bioenergetics, nutrition, and sports medicine. Focuses on application of principles to treatment of diseases and functional deficits. Lectures, demonstrations, hands-on experiences in an exercise medicine facility.

PHSL 5701. Physiology Laboratory. (1-2 cr [max 2 cr]; A-F only. Prereq–#)
Experiments in physiology. Emphasizes quantitative aspects, including analysis of organ systems.

Plant Biology (PBIO)

Department of Plant Biology

College of Biological Sciences

PBIO 1212. Plants and Society. (3 cr. Prereq–Non-biology major)
Roles that plants play and have played in human biological and cultural development.

PBIO 4321. Minnesota Flora. (3 cr. Prereq–BIOL 1001 or BIOL 1009 or equiv)
Identification of common vascular plants of Minnesota and surrounding region. Distinguishing characteristics of local taxa. Descriptive terminology. Use of manuals of floras. Lab, field trips.

PBIO 4404. Developmental Plant Anatomy. (3 cr. Prereq–BIOL 2022 or BIOL 3007)
Introduction to the microscopic structure and development of plants at the cell, tissue, and organ level. Emphasis on relationships between anatomy and the ontogeny, phylogeny, and ecology of seed plants with some reference to lower vascular plants.

PBIO 4511. Flowering Plant Diversity. (3 cr. §PBIO 4811. Prereq–BIOL 2022 or BIOL 3007)
Systematics of flowering plants of the world. Ecology, geography, origins, and evolution. Family characteristics. Floral structure, function, evolution. Pollination biology. Methods of phylogenetic reconstruction. Molecular evolution. Taxonomic terms. Methods of collection/identification. Includes lab.

PBIO 4516W. Plant Cell Biology: Writing Intensive. (3 cr. §PBIO 5516. Prereq–[BIOL 2022 or BIOL 3002 or BIOL 3007], [BIOC 3021 or BIOL 3021 or BIOL 4003])
Structure, function, and dynamic properties of plant cellular components. How cellular structures function and contribute to cell growth. Cell fate/development. Developing a clear/concise writing style for incisive criticism of scientific papers.

PBIO 4793W. Directed Studies: Writing Intensive. (1-7 cr [max 7 cr]; S-N only. Prereq–#)
Individual study on selected topics or problems. Emphasizes readings, use of scientific literature. Written report.

PBIO 4794W. Directed Research: Writing Intensive. (1-6 cr [max 42 cr]; S-N only. Prereq–#, Δ)
Lab or field investigation of selected areas of research, including written report.

PBIO 4801. Plains and Boreal Flora. (4 cr; A-F only. Prereq–taxonomy course, Δ)
Survey of state summer flowering plants and ferns with particular reference to local flora. Identification of important plant families using technical keys, and field recognition of common species and habitat preferences; collecting methods, literature, and taxonomic methods.

PBIO 4811. Flowering Plant Systematics. (3 cr; A-F only. §PBIO 4511. Prereq–[BIOL 1103 or BIOL 3012 or BIOL 3812])
Systematics of flowering plants of the world. Ecology, geography, origins, and evolution. Family characteristics. Floral structure, function, evolution. Pollination biology. Methods of phylogenetic reconstruction. Molecular evolution. Taxonomic terms. Methods of collection/identification. Fieldwork.

PBIO 4993. Directed Studies. (1-7 cr [max 7 cr]; S-N only. Prereq–#)
Individual study on selected topics or problems. Emphasizes selected readings, use of scientific literature.

PBIO 4994. Directed Research. (1-6 cr [max 42 cr]; S-N only. Prereq–#)
Lab or field investigation of selected areas of research.

PBIO 5109. Current Questions in Fungal Biology. (2 cr; A-F only)
Diversity of fungi and their interactions with other organisms. Pathogenic/mutualistic interactions with animals/plants. Use of fungal systems for drug discovery and understanding pathogenicity, signal transduction, morphogenesis, and evolution.

PBIO 5301. Plant Genomics. (3 cr. §PLPA 5301. Prereq–[Intro course in genetics, intro course in biochemistry] or #)
Introduction to genomics. Emphasizes plants and relevant model organisms. DNA marker/sequencing technology, comparative genomics, whole genome sequencing, DNA chips/microarrays, EST libraries and SAGE analysis, gene-knockout systems, genome databases, sequence comparison/clustering algorithms, visualization tools.

PBIO 5412. Plant Physiology. (3 cr. Prereq–BIOL 2022 or BIOL 3002 or BIOL 3007, Biol/BIOC 3021 or BIOC 4331)
Physiological and biochemical bases of plant systems with emphasis on higher plants.

PBIO 5416. Plant Morphology, Development, and Evolution. (4 cr. Prereq–BIOL 2022 or BIOL 3002 or BIOL 3007)
Evolutionary history of land plants. Morphological changes in vegetative and reproductive structures. Morphology of green algal ancestors, nonvascular land plants, and spore bearing and seed bearing vascular plants are analyzed in an evolutionary framework.

PBIO 5514. Plant Molecular Biology. (3 cr. Prereq–BIOC 3021 or BIOL 3021 or BIOL 4003 or BIOC 4332 or equiv)
Survey topics in plant molecular biology. How advances in molecular/genomic biology are being used to better understand plant physiology and developmental biology. Uses of transgenic plants in research/biotechnology.

PBIO 5516. Plant Cell Biology. (3 cr. §PBIO 4516W. Prereq–[BIOL 2022 or BIOL 3007 or BIOL 3022], [BIOL 3021 or BIOC 3021 or BIOL 4003])
Structure, function, and dynamic properties of plant cellular components such as organelles, cytoskeleton, and cell wall. How cellular structures are assembled, how it contributes to cell growth/division. Cell fate/development. Responses to hormones and external signals.

PBIO 5960. Special Topics. (1-3 cr [max 6 cr]. Prereq–#)

Plant Pathology (PLPA)

Department of Plant Pathology

College of Food, Agricultural and Natural Resource Sciences

PLPA 1002. Plant Diseases and Your Garden. (1 cr)
Characteristics and causes of diseases that can affect the growth of plants with emphasis on flowers, small fruits, and vegetables. In-depth study of 18 different plant diseases that may appear in your garden, why they occur, and how to avoid them.

PLPA 1005. Plants Get Sick Too. (4 cr)
Classroom/online course. Plants, aspects of pathology or "the nature of disease." Elements of plant anatomy/physiology. What is actually happening when plants get sick.

PLPA 2001. Introductory Plant Pathology. (3 cr. Prereq–BIOL 1009 or equiv)
Pathogens that cause plant disease. Symptoms resulting when susceptible plants and causal agents interact. Roles environment and physio-chemical stresses have on incidence/severity of plant disease. Examples of how techniques of plant disease control can be integrated.

PLPA 3001. Plant Disease Biology and Management. (1 cr. Prereq–BIOL 1009 or equiv)
Introduction to organisms that cause plant diseases. Symptoms of plant diseases, economic losses due to plant diseases, and chemical and biological strategies for managing plant diseases will be discussed.

PLPA 3002. AIR Pollution, People, and Plants: The Science and the Ethics. (3 cr. Prereq–BIOL 1009 or equiv, CHEM 1021, ¶CHEM 1022)
History of air pollution, its sources and types; global climate change; air pollution effects on human health, crops and forests; air pollution control and international perspective; risk perception and assessment; public ethics and decision making.

PLPA 3003. Diseases of Forest and Shade Trees. (3 cr)
Diseases of trees in urban and forested areas. Biology, ecology and control of tree diseases. Labs provide experience identifying disease agents and learning appropriate integrated control procedures.

PLPA 3090. Research in Plant Pathology. (1-4 cr [max 4 cr])
Assignment of special problems to undergraduates desiring opportunity for independent research in plant pathology.

PLPA 4000. Plant Pathology Practicum. (1 cr [max 5 cr]. Prereq–2001, [3001 or introductory plant pathology])
Analysis/identification of plant disease problems facing horticultural or agricultural enterprises. Developing procedures/practices that have the potential to improve existing programs for plant disease management in those businesses.

PLPA 4096. Professional Experience Program: Internship. (1-3 cr [max 6 cr]; S-N only. Prereq–COAFES undergrad, complete internship contract available in COAFES Career Services before registering; UC only)
Supervised practicum with professional experience in plant pathology and related industries including the Plant Disease and "Dial-U" clinics. Evaluative reports and consultations with faculty advisers and employers.

PLPA 5003. Diseases of Forest and Shade Trees. (3 cr)
Diseases of trees in urban and forested areas. Biology, ecology, and control of tree diseases. Identifying disease agents, integrated control procedures. Laboratory.

PLPA 5090. Issues in Plant Pathology. (1-4 cr [max 4 cr])
See *Class Schedule* or department for current offerings.

PLPA 5102. Epidemiology and Genetics of Host-Parasite Interactions. (3 cr; A-F only. Prereq–[5201 or equiv], GCD 3022)
Concepts/methodology in study of plant disease epidemics, host plant resistance, and host-parasite genetics. Disease assessment, epidemic progress models, environmental influences, crop loss assessment, disease forecasting, ecology of host-parasite. Environmentally sound management strategies. Use of resistance for disease control.

PLPA 5103. Plant-Microbe Interactions. (3 cr)
Genetics, physiology, molecular biology of plant-microbe interactions. Communication between plant/microbes, signal transduction, control of gene expression, symbiosis/parasitism, plant host response mechanisms, plant disease physiology.

PLPA 5201. Biology of Plant Diseases. (4 cr. Prereq–BIOL 1009 or equiv)
Principles and concepts of plant disease caused by selected viruses, bacteria, fungi, nematodes, and environmental factors. Pathogen biology, interaction of pathogens and the environment; epidemiology and control measures appropriate to plant disease.

PLPA 5202. Field Plant Pathology. (2 cr)
Characteristics of a variety of plant diseases. Field trips to observe symptoms and effects of diseases, and to learn about prevention and control of diseases in field, forest, golf course, greenhouse, nursery, orchard, and urban environments.

PLPA 5203. Biology and Ecology of Fungi. (3 cr. Prereq–BIOL 1009 or equiv)
Major groups of fungi, their roles in ecosystems and human society, environmental and nutritional needs, and modes of dissemination and survival. Representative species of fungi observed and manipulated.

PLPA 5204. Plant Disease Management. (3 cr; A-F only. Prereq–3001 or 3002)
Principles of crop/pathogen biology, epidemiology, crop ecology, crop management practices that influence occurrence of plant disease. Interaction of crop management practices with plant disease. Strategies for controlling plant disease through management practices illustrated by examples from agronomic, horticultural, forest crops.

PLPA 5300. Current Topics in Molecular Plant Pathology. (1 cr [max 2 cr] Prereq–[BIOC 4125, course in [plant pathology or microbiology], course in genetics, [lab in [molecular biology, Biotechnology] or equivalent]] or #)
Interactive class. Students read, discuss, and critique publications in molecular plant pathology. Each week, students focus on one article and examine it from different dimensions (underlying principles, experimental strategies, data analysis, impact on the broader discipline).

PLPA 5301. Plant Genomics. (3 cr. §PBIO 5301. Prereq–Intro course in genetics or #)
Introduction to genomics. Emphasizes plants and relevant model organisms. DNA marker/sequencing technology, comparative genomics, whole genome sequencing, DNA chips/microarrays, EST libraries and SAGE analysis, gene-knockout systems, genome databases, sequence comparison/clustering algorithms, visualization tools.

PLPA 5302. Genomics of Plant-Associated Microbes. (3 cr; A-F only. Prereq–[BIOC 4125, course in [plant pathology or microbiology], course in genetics, [lab in [molecular biology, biotechnology] or equiv]] or #)
Genomics research for plant-associated microbes. Journal articles, discussions, case studies. Identification/characterization of genes in plant-microbe interactions. Analysis of plant pathogens, research methodologies. Linkage/gene/physical mapping, candidate genes, sequencing, gene silencing, knock-out, ESTs, microarrays, bioinformatics. Online training modules, field trips, guest lectures, individual/group projects.

PLPA 5999. Special Workshop in Plant Pathology. (1-4 cr [max 4 cr])
Workshops on a variety of topics in plant pathology offered at locations other than the Twin Cities campus. See Class Schedule or department for current offerings.

Polish (PLSH)

Institute of Linguistics, ESL, and Slavic Languages and Literatures

College of Liberal Arts

PLSH 1101. Beginning Polish. (5 cr)
Develop basic proficiency in listening, speaking, reading, and writing and become acquainted with Polish culture. First of four courses designed to satisfy CLA language graduation requirement.

PLSH 1102. Beginning Polish. (5 cr. Prereq–1101 or equiv)
Develop basic proficiency in listening, speaking, reading and writing and to acquaint students with Polish culture. Second of four courses designed to satisfy CLA language graduation requirement.

PLSH 3001. Intermediate Polish. (5 cr. Prereq–1102 or equiv)
Conversation, composition, advanced grammar, translation, and readings in appropriate literature. Third of four courses designed to satisfy CLA language graduation requirement.

PLSH 3002. Intermediate Polish. (5 cr. Prereq–3001 or equiv)
Conversation, composition, advanced grammar, translation, and readings in appropriate literature. Fourth in a sequence of courses designed to satisfy CLA language graduation requirement.

PLSH 3601. Survey of Polish Literature: Baroque through Romanticism. (3 cr)
Reading and analysis of major works of Polish literature from Baroque through Romanticism.

PLSH 3602. Survey of Polish Literature: 1863 to the Present. (3 cr)
Reading and analysis of major works of Polish literature from 1863 to the present.

PLSH 5900. Topics. (1-4 cr [max 3 cr])
Topics specified in *Class Schedule*.

PLSH 5993. Directed Readings. (1-3 cr [max 3 cr])
Guided individual reading or study in Polish language, literature, and culture.

Political Science (POL)

Department of Political Science

College of Liberal Arts

POL 1001. American Democracy in a Changing World. (4 cr)
Introduction to politics/government in the United States. Constitutional origins/development, major institutions, parties, interest groups, elections, participation, public opinion. Ways of explaining politics, nature of political science. Emphasizes recent trends.

POL 1001H. Honors Course: American Democracy in a Changing World. (4 cr)
Introduction to politics/government in the United States. Constitutional origins/development, major institutions, parties, interest groups, elections, participation, public opinion. Ways of explaining politics, nature of political science. Emphasizes recent trends.

POL 1015. Mass Politics in a Media Age. (3 cr)
In a world of sound bites, soft news, and ubiquitous information/images, do we make rational voting decisions? Are we politically engaged? Do politicians, the media, and political institutions promote or obstruct our efforts to be good citizens? What does responsible citizenship entail? What can be done to enhance citizenship?

POL 1019. Indigenous Peoples: A Global Perspective. (3 cr; A-F only. §AMIN 1002)
Colonial experiences of selected indigenous peoples in Americas, Euroasia, Pacific Rim.

POL 1025. Global Politics. (4 cr)
Study of international relations and issues in contemporary world affairs. Forms of state interaction from violent conflict to cooperation and integration; activities of international institutions; transnational relations involving non-state actors such as international businesses, human rights networks, and environmental movements.

POL 1026. We and They: U.S. Foreign Policy. (4 cr)
Contemporary foreign policy issues; how the United States makes foreign policy in a global era; historical background. How two regions (such as the Middle East and China) affect and are affected by U.S. policy.

POL 1054. Repression and Democracy Around the World. (4 cr)
Introduction to political life in all its worldwide variety. Focus on repression, democracy, rights, corruption, gender, and political change. Guest lectures by political science professors who are experts on different parts of the world. Non-majors welcome.

POL 1054H. Honors: Repression and Democracy. (4 cr)
Introduction to political life in all its worldwide variety. Focuses on repression, democracy, rights, corruption, gender, and political change. Guest lectures by political science professors who are experts on different parts of world.

POL 1065. Government and Medicine. (3 cr)
Why is the United States the only industrialized nation that lacks national health insurance? Should the government regulate health care? Who should address these issues? Introduction to American government. Health care policy, constitution, elections, congress, the presidency.

POL 1201. Political Ideas and Ideologies. (4 cr)
Analysis of key concepts and ideas (e.g., freedom, equality, democracy) as they are constructed by major theories and ideologies (liberalism, conservatism, socialism, etc.).

POL 1902. Topics: Freshman Seminar. (3 cr; A-F only. Prereq–Freshman)
Topics specified in *Class Schedule*.

POL 1903. Freshman Seminar. (3 cr. Prereq–Fr or no more than 30 cr)
Topics specified in *Class Schedule*.

POL 1904. Topics: Freshman seminar. (3 cr [max 6 cr]. Prereq–Fr or FRFY)
International perspectives.

POL 1905. Freshman Seminar. (3 cr)
Topics vary by instructor.

POL 1908W. Topics: Freshman Seminar. (3 cr; A-F only. Prereq–Freshman)
Topics specified in *Class Schedule*.

POL 1909W. Topics: Freshman Seminar. (3 cr; A-F only. Prereq–Freshman)
Topics specified in *Class Schedule*.

POL 3051. Power and Choice: Who Gets What, When, and Why. (3 cr)
Introduction to major concepts and issues in political science including political participation, policy making; justice, legitimacy, political development, and types of political systems. Explore empirical and normative problems and compare among major countries.

POL 3070. Faculty-Supervised Individual Field Work. (1-13 cr [max 13 cr]; A-F only. Prereq–#, Δ)
Faculty-supervised research related to work in political or governmental organizations.

POL 3080. Faculty-Supervised Individual Internships. (3-13 cr [max 15 cr]; A-F only. Prereq–#, Δ)
Internship with government or community organizations arranged by the department and awarded competitively each spring semester.

POL 3085. Quantitative Analysis in Political Science. (4 cr; A-F only. Prereq–9 cr social sciences or #)
Introduction to empirical research techniques, or how one tests a political hypothesis using data. Topics such as setting up a research question in political science, proper research design, and some basic techniques of data analysis.

POL 3085H. Honors Course: Quantitative Analysis in Political Science. (4 cr. Prereq–9 cr soc sci or #)
Introduction to empirical research techniques or how one tests a political hypothesis using data. Topics such as setting up a research question in political science, proper research design, and basic techniques of data analysis.

POL 3110H. Honors Thesis Credits. (1-4 cr [max 4 cr]; A-F only. Prereq–§: 3110; 3109, pol sci, honors)
Individual research/writing of departmental honors thesis.

POL 3210. Practicum. (2 cr [max 12 cr])
Offers different kinds of out-of-class opportunities to complement the readings, assignments, and objectives of a parent course in political science. Opportunities vary according to demands of the parent course.

POL 3225. American Political Thought. (3 cr)
Puritans, American Revolution, Constitution, pro- and anti-slavery arguments, civil war and reconstruction, industrialism, westward expansion, Native Americans, immigration, populism, socialism, social Darwinism, women's suffrage, red scares, Great Depression, United States as world power, free speech, pluralism and multiculturalism.

POL 3235W. Democracy and Citizenship. (3-4 cr [max 4 cr]. Prereq–1201 recommended)
Surveys models of democracy based on individual rights; pluralism; civic republicanism; community activism. Examines dilemmas of democratic government and citizenship in a race, class, and gender-stratified society; explores its possibilities in a changing world.

POL 3251. Greeks, Romans, and Christians: Ancient and Medieval Political Thought. (3-4 cr [max 4 cr]. §POL 5251. Prereq–§: 5251)
Politics and ethics in Greece, Rome, Christendom: Thucydides, Socrates, Plato, Aristotle, Cicero, Augustine, Aquinas, Marsilius.

POL 3252. Renaissance, Reformation, and Revolution: Early Modern Political Thought. (3-4 cr [max 4 cr]. Prereq–§: 5252)
Thinkers, themes, and discourses from the Renaissance to the French Revolution. Renaissance Humanists; Machiavelli; More; Reformation; Luther; Calvin; Natural Law; Grotius; Divine Right; Common Law; Bacon; English Revolutionaries; Hobbes; Locke; Astell; Enlightenment; Rousseau; French Revolutionaries; Hume; Burke; Wollstonecraft.

POL 3319. Education and the American Dream. (3 cr; A-F only)
Introduction to politics and education in the United States. Equality of educational opportunity, educating democratic citizens, school finance, role of political institutions in making educational policy. Efforts to reform/remake American education, including charter schools and private school vouchers.

POL 3321. Issues in American Public Policy. (3 cr. Prereq–1001 or equiv or #)
Analysis of the politics of the policy process including agenda formation, formulation, adoption, implementation, evaluation. Attention to selected policy areas.

POL 3323. Political Tolerance in the United States. (3-4 cr [max 4 cr])
Political importance of civil liberties in American society. Tolerance as a political phenomenon. Issues such as free speech, privacy, religion, race, gender.

POL 3441. Politics of Environmental Protection. (3 cr. §POL 5441. Prereq–§: 5441; jr or sr social science major)
How the American political system deals with environmental issues, how third world countries deal with problems of environmental protection and economic growth, and the way the international community deals with global environmental problems.

POL 3451W. Politics and Society in the New Europe. (3 cr. §SOC 3351W. Prereq–3051 or SOC 1001 or #)
Explores the changing politics and society of the new Europe. Particular focus on generational change and values, political parties, welfare state, the future of European integration, and political stability and democratization.

POL 3477. Political Development. (3-4 cr [max 4 cr]. Prereq–1054 or #)
Political processes/problems associated with economic development. Political economy of underdevelopment/development. Problems of state building, development of political institutions.

POL 3491. Film and Latin American Politics. (3 cr. Prereq–1054 recommended)
Introduction to using film to study Latin American politics. Hollywood films explore how the United States "sees" Latin America, its people, and its political problems; films from Latin America explore how Latin American popular culture reflects a country's political issues. One feature film per week. Brief readings about issues raised by each film.

POL 3701. American Indian Tribal Governments and Politics. (3 cr; A-F only. §AMIN 3501)
History, development, structure, politics of American Indian Governments. North American indigenous societies from pre-colonial times to present. Evolution of aboriginal governments confronted/affected by colonizing forces of European/Euro-American states. Bearing of dual citizenship on nature/powers of tribal governments in relation to states and federal government.

POL 3739. Politics of Race, Class, and Ethnicity. (3 cr. Prereq–6 cr in soc sci)
Introduction to how race, ethnicity, and class interact in political process. Focuses on political conflict through comparative analysis of United States, South Africa, and Brazil.

POL 3752. Chicano Politics. (3 cr. §CHIC 3852)
Foundations/contradictions of contemporary Chicano politics. Policy issues that concern Latinos, successes/failures of Latino empowerment strategies, electoral impact of Latino votes. Question of whether there is a Latino politic/community.

POL 3766. Political Psychology of Mass Behavior. (3 cr. Prereq–1001 or equiv or #)
How political behavior of citizens and political elites is shaped by psychological factors, including personality, attitudes, values, emotions, and cognitive sophistication. Political activism/apathy, leadership charisma, mass media, group identifications, political culture.

POL 3767. Political Psychology of Elite Behavior. (3 cr; A-F only)
Intersections of politics, personality, and social psychology. Focuses on political leaders and elites. Usefulness of psychological theories for conducting political analysis. Role of individual, of group processes, of political/social cognition, and of context in political decision-making.

POL 3785. Persuasion and Political Propaganda. (3 cr; A-F only)
Introduction to persuasion and political propaganda. Persuasion theories relevant to designing effective political propaganda. Applying theories to analyze WWI/WWII propaganda posters, films, and political campaign commercials. Use of fiction as propaganda tool.

POL 3835. International Relations. (3 cr)
Introduction to theoretical study of international relations. How theoretical perspective shapes one's understandings of structure/practices of global politics.

POL 3872W. Global Environmental Cooperation. (4 cr [max 5 cr]. Prereq–§5872)
Emergence of the environment as a key aspect of the global political agenda. Non-governmental and governmental international organizations. Politics of protection of the atmosphere, rain forest, seas, and other selected issues. International security and the environment.

POL 3873W. Global Citizenship and International Ethics. (3 cr)
Case studies of ethics in intervention, war, weapons, foreign aid, environmental practices, and human rights are used to examine the global ethical responsibilities of individual citizens and public officials; effectiveness of transnational social movements in influencing policy at domestic and international levels.

POL 4210. Topics in Political Theory. (3 cr [max 6 cr]; A-F only. §POL 5210)

POL 4225. Politics and Education. (3-4 cr [max 4 cr])
Politics/education: theoretically, historically, practically. Ancient/modern theories of politics (especially democratic politics) in connection with education. Course usually has a practicum in which students work with each other or coach younger students on problems of public importance to their communities.

POL 4253. Modernity and Its Discontents: Late Modern Political Thought. (3-4 cr [max 4 cr]. §POL 5253)
Theoretical responses to and rival interpretations of Western economy, society, politics, and democratic culture in modern age. Theories of history. Class struggle. End of metaphysics, death of God. Technology/bureaucracy. Psychology of culture in Hegel, Marx, Tocqueville, Mill, Nietzsche, Weber, Freud.

POL 4275. Contemporary Political Thought. (3 cr. Prereq–1201 recommended)
The 20th-century crisis of Western humanism in major works of contemporary political thought from World War II to the present. Relationships between force and freedom; ideology and truth; authority and resistance. Thinkers may include Arendt, Camus, Beauvoir, Fanon, Foucault, Habermas, Rawls, Sartre, Said. Ideas may include communitarianism, feminism, postcolonialism, postmodernism, socialism.

POL 4280. Topics in Political Theory. (3-4 cr [max 8 cr])
Topics in historical, analytical, or normative political theory. Topics vary.

POL 4303. American Democracy in Crisis. (3 cr [max 4 cr]. §POL 5303. Prereq–1001 or equiv, non-pol sci grad major or #)
Compare the performance of the American political system with the promises of democracy. Discuss a range of interpretations of democratic government and the American national governing process.

POL 4306. Presidential Leadership and American Democracy. (3-4 cr [max 4 cr]. §POL 5306. Prereq–1001 or equiv, non-pol sci grad major or #)
No single individual in the American political system is the subject of such high expectations as the president. Examine whether the president's political and constitutional powers are sufficient to satisfy the high expectations that Americans have of him. Should presidents be expected to dominate American politics?

POL 4308. Congressional Politics and Institutions. (3-4 cr [max 4 cr]. §POL 5308. Prereq–1001 or 1002, non-pol sci grad major or #)
Origin/development of U.S. congressional institutions, parties, committees, leaders, lobbying/elections, and relations between Congress/executive branch. Relationship of campaigning/governing, nature of representation, biases of institutional arrangements.

POL 4309. Justice in America. (3 cr. Prereq–1001 or 1002, non-pol sci grad major or #)
The American judiciary, the selection of judges and how and why these individuals and institutions behave the way they do. What influences judicial decisions? What impact do these decisions have? Why do people comply with them?

POL 4310. Topics in American Politics. (3 cr [max 9 cr]. Prereq–1001 or equiv or #)
See *Class Schedule* for description.

POL 4315W. State Governments: Laboratories of Democracy. (4 cr. §POL 5315. Prereq–1001 or equiv, non-pol sci grad major or #)
Political behavior, governmental institutions, and public policies in American states; comparison among states, between state and national government, with special attention given to Minnesota.

POL 4322. Rethinking the Welfare State. (3-4 cr [max 4 cr])
Discuss competing arguments about welfare states in advanced industrial countries. Are welfare states the result of sectional interests, class relations, or citizenship rights? Compare American social policy with policies in other western countries.

POL 4327. The Politics of American Cities and Suburbs. (3 cr. Prereq–1001 or 1002, non-pol sci grad major or equiv or #)
Development and role of American local government; forms and structures; relationships with states and the federal government; local politics and patterns of power and influence.

POL 4331. Thinking Strategically in Domestic Politics. (3-4 cr [max 4 cr])
A survey of applications of rational-choice and game theories to important features of domestic politics in the United States and elsewhere.

POL 4403. Comparative Constitutionalism. (3 cr)
Theory/practice of constitutionalism in different countries. Conceptual/normative inquiry between constitutionalism, rule of law, and democracy. Origins/role of constitutions. Relevance of courts with constitutional review powers: U.S., Germany, Japan, Hungary, Russia, South Africa, Nigeria.

POL 4410. Topics in Comparative Politics. (3 cr)
Topics of current analytical or policy importance to comparative politics. Topics vary.

POL 4461W. European Government and Politics. (4 cr [max 7 cr]. §POL 5461. Prereq–1054 or 3051 or non-pol sci grad or #)
European political institutions in their social settings; power and responsibility; governmental stability; political decision making, government and economic order.

POL 4465. Southeast Asian Politics. (3 cr)
Southeast Asia's increasingly important role in global political/economic affairs. U.S. involvement in region. Progress toward and resistance to democratic political systems. Economic development.

POL 4473. Chinese Politics. (3 cr [max 4 cr]. §EAS 4473)
Focuses on fundamental conflicts in Chinese society; the democracy movement, human rights, class divisions, gender struggles, environmental issues, and capitalist vs. socialist development strategies. Secondary topics include Chinese foreign relations and domestic and foreign political issues in Taiwan.

POL 4477. Struggles and Issues in the Middle East. (4 cr. Prereq–1054 or 3051 or non-pol sci grad or #)
Turkey, Iran, Israel, and selected Arab states. Domestic politics of religious/secular, ethnic, economic, environmental, and other policy/identity issues. Regional politics of water access, Israeli/Palestinian/Arab world relationships, oil and the Persian/Arabian Gulf, and human rights.

POL 4478. Contemporary Politics in Africa and the Colonial Legacy. (4 cr. §AFRO 4478, AFRO 5478, POL 5478. Prereq–1054 or 3051 or non-pol sci grad or #)
Examines how current politics in mainly, though not exclusively, sub-Saharan Africa have been shaped by the pre-colonial and colonial processes. Reality of independence; recurrent political and economic crises, global context and prospects for effective democracy.

POL 4479. Latin American Politics. (3 cr [max 4 cr]. §LAS 4479, POL 5479. Prereq–1054 or 3051 or non-pol sci grad or #)
An overview of Latin American politics and political economy focused on authoritarianism, human rights, and redemocratization; development and economic policy; socialmovements; ethnicity and race; religion; revolution; U.S. - Latin American relations.

POL 4481. Governments and Markets. (3-4 cr [max 4 cr]. Prereq–1054 or 3051 or non-pol sci grad or #)
Study the connection between democracy and markets with attention to the experiences of countries in North America and Europe.

POL 4485. Human Rights and Democracy in the World. (3 cr. §POL 5485. Prereq–At least one 1xxx or 3xxx course in pol sci, non-pol sci major or #)
Examine the question of human and democracy rights in global and comparative perspectives. Explore the history of ideas about human rights and democracy and contrast economic, political, psychological, and ideological explanations for repression.

POL 4487. The Struggle for Democratization and Citizenship. (4 cr. §POL 4501, POL 5487. Prereq–Non-pol sci grad)
Traces the origins of the democratic process with particular emphasis on how the disenfranchised fought to become included. Begins with the history of the democratic movement from its earliest moments in human history to the present and attempts to draw a balance sheet.

POL 4489W. Citizens, Consumers, and Corporations. (3 cr)
How ordinary people can act collectively to hold corporations accountable for effects their activities have on communities/nations. Mobilizing as citizens through mass protests, lobbying politicians, and pursuing claims through court system. Mobilizing as consumers through purchasing decisions.

POL 4501. The Supreme Court and Constitutional Interpretation. (3 cr. §POL 4487, POL 5487. Prereq–1001 or 1002 or equiv or [non-pol sci] grad student or #)
Historical/analytical approaches to Court's landmark decisions. Explores theory/techniques of judicial review. Relates Court's authority to wider political/social context of American government.

POL 4502. The Supreme Court, Civil Liberties, and Civil Rights. (3 cr. Prereq–1001 or 1002 or equiv or [non-pol sci] grad major or #)
Supreme Court's interpretation of Bill of Rights, 14th amendment. Focuses on freedom of speech, press, religion; crime/punishment; segregation/desegregation, affirmative action; abortion/privacy.

POL 4525W. Federal Indian Policy. (3 cr; A-F only. §AMIN 4525W)
Formulation, implementation, evolution, comparison of Indian policy from pre-colonial times to self-governance of new millennium. Theoretical approaches to federal Indian policy. Major federal Indian policies. Views/attitudes of policy-makers, reactions of indigenous nations to policies. Effect of bodies of literature on policies.

POL 4561. Comparative Legal Systems. (3 cr. §POL 5561. Prereq–Jr or sr or non-pol sci grad major)
Survey of the principal legal systems of the Western world. Examine the role of the legal system in relation to various political and economic systems and the contrast between the common law and civil law traditions.

POL 4737. American Political Parties. (3-4 cr [max 4 cr]. §POL 5737. Prereq–1001 or equiv or #)
The American two-party system; party influence in legislatures and executives; decline of parties and their future.

POL 4766. American Political Culture and Values. (3-4 cr [max 4 cr]. Prereq–1001 or equiv or non-pol sci grad major or #)
Empirical analysis of basic political values—individualism, freedom, and equality; dominant beliefs about democratic principles, materialism, capitalism, citizenship, patriotism and heroism.

POL 4767. Public Opinion and Voting Behavior. (3 cr [max 4 cr]. §POL 5767. Prereq–1001 or equiv or #)
Major factors influencing electoral decisions and political attitude formation/change. Data analysis lab required.

POL 4771. Racial Attitudes and Intergroup Conflict. (3 cr)
Basic approaches, findings, and controversies in research on racial attitudes and intergroup relations, from perspective of political psychology. Approaches developed by researchers in political science, social psychology, and sociology. Contemporary issues/debates, historical development of research/theory.

POL 4810. Topics in International Politics and Foreign Policy. (3 cr [max 6 cr])
Analysis of selected issues in contemporary international relations. Topics vary.

POL 4833. The U.S. in the Global Economy. (3-4 cr [max 4 cr]. Prereq–3835 recommended)
Domestic and international politics of United States, foreign economic policy (trade, aid, investment, monetary, and migration policies). Effects of policies and international economic relations on the U.S. economy and U.S. politics.

POL 4867. United States Foreign Policy Toward the Middle East. (4 cr. Prereq–Jr or sr)
U.S. foreign policy toward Israeli-Palestinian issue in Turkey, Iran, Iraq, etc. Mideast polities, debates, actions. Rationales for U.S. engagement with region. Readings of Middle East authors.

POL 4881. International Law. (3 cr. §POL 5881. Prereq–3835 or non-pol sci grad or #)
How international law matters for world politics. Lectures, discussions, and simulations of cases examine key concepts and theories of international law. Topics include war crimes, human rights, law of the sea, the environment, and international crime.

POL 4883. Global Governance. (3 cr [max 4 cr]. Prereq–3835 or non-pol sci grad or #)
Seminar discussions and class simulations examine the rise and role of inter-governmental organizations such as the United Nations and non-governmental organizations. Topics include peacekeeping, trade, development, human rights, security and arms control, self-determination, refugees, health, and the environment.

POL 4885. International Conflict and Security. (3-4 cr [max 4 cr]. §POL 5885)
An examination of alternative theories of the sources of militarized international conflict. Apply these theories to one or more past conflicts and discuss their relevance to the present.

POL 4887. Thinking Strategically in International Politics. (3 cr; A-F only)
Survey of applications of game theory to international politics; conflict and cooperation, global environmental commons, deterrence and reputation.

POL 4889. Governments and Global Trade and Money. (3-4 cr [max 4 cr]. §POL 5889. Prereq–3835 or non-pol sci grad or #)
Study the politics of international trade and monetary affairs including north-south and east-west relations

POL 4900V. Honors: Senior Paper. (1 cr; A-F only. Prereq–Honors, pol sr, #)
Can be attached to any 3xxx or 4xxx course. A 10-15 page paper is submitted for evaluation/advice by instructor, then revised for final submission.

POL 4900W. Senior Paper. (1 cr; A-F only. Prereq–Pol sr, #)
Can be attached to any 3xxx or 4xxx course (with the agreement of that course's instructor). A 10-15 page paper is submitted for evaluation/advice by instructor, then revised for final submission.

POL 4970. Individual Reading and Research. (1-4 cr [max 4 cr]. Prereq–#, Δ, ❑)
Guided individual reading or study.

POL 5210. Topics in Political Theory. (3 cr [max 9 cr]; A-F only. §POL 4210. Prereq–¶3210, grad student, Δ)

POL 5251. Greeks, Romans, and Christians: Ancient and Medieval Political Thought. (4 cr. §POL 3251. Prereq–Grad student)
Politics/ethics in Greece, Rome, Christendom: Thucydides, Socrates, Plato, Aristotle, Cicero, Augustine, Aquinas, Marsilius.

POL 5252. Renaissance, Reformation, and Revolution: Early Modern Political Thought. (4 cr. Prereq–§: 3252)
Thinkers, themes, and discourses from the Renaissance to the French Revolution. Renaissance Humanists; Machiavelli; More; Reformation; Luther; Calvin; Natural Law; Grotius; Divine Right; Common Law; Bacon; English Revolutionaries; Hobbes; Locke; Astell; Enlightenment; Rousseau; French Revolutionaries; Hume; Burke; Wollstonecraft.

POL 5253. Modernity and its Discontents: Late Modern Political Thought. (4 cr. §POL 4253. Prereq–§: 3253)
Theoretical responses to and rival interpretations of Western economy, society, politics, and democratic culture in the modern age; theories of history; class struggle; end of metaphysics and death of God; technology and bureaucracy; psychology of culture in Hegel, Marx, Tocqueville, Mill, Nietzsche, Weber, Freud.

POL 5275. Contemporary Political Thought. (3 cr. Prereq–§: 4275; grad student; 1201 recommended)
20th-century crisis of Western humanism in major works of contemporary political thought from World War II to present. Force and freedom. Ideology and truth. Authority and resistance. Thinkers may include Arendt, Camus, Beauvoir, Fanon, Foucault, Habermas, Rawls, Sartre, Said. Ideas may include communitarianism, feminism, postcolonialism, postmodernism, socialism.

POL 5280. Topics in Political Theory. (3-4 cr. Prereq–§: 4280; grad student)
Topics in historical, analytical, or normative political theory. Topics vary, see *Class Schedule*.

POL 5303. American Democracy in Crisis. (3-4 cr. §POL 4303. Prereq–Grad student or #)
Compares performance of American political system with promises of democracy. Interpretations of democratic government and American national governing process.

POL 5306. Presidential Leadership and American Democracy. (3 cr. §POL 4306. Prereq–Grad student or #)
Examines whether president's political and constitutional powers are sufficient to satisfy citizens' high expectations and whether president should be expected to dominate American politics.

POL 5308. Congressional Politics and Institutions. (3 cr. §POL 4308. Prereq–Grad student or #)
Origin/development of U.S. congressional institutions, parties, committees, leaders, lobbying/elections, and relations between Congress/executive branch. Relationship of campaigning/governing, nature of representation, biases of institutional arrangements.

POL 5309. Justice in America. (3 cr. Prereq–§: 4309; [1001 or 1002], [non-pol sci grad major or equiv or #])
American judiciary, selection of judges, how/why these individuals/institutions behave the way they do. What influences judicial decisions. What impact decisions have. Why people comply with them.

POL 5310. Topics in American Politics. (3 cr. Prereq–Grad student or #)
See *Class Schedule* for description.

POL 5315. State Governments: Laboratories of Democracy. (4 cr. §POL 4315W. Prereq–Grad student or #)
Political behavior, governmental institutions, and public policies in American states. Comparison among states, between state and national government. Emphasizes Minnesota.

POL 5322. Rethinking the Welfare State. (3-4 cr. Prereq–§: 4322; grad student)
Competing arguments about welfare states in advanced industrial countries. Whether welfare states result from sectional interests, class relations, or citizenship rights. Compares American social policy with policies in other western countries.

POL 5327. Politics of American Cities and Suburbs. (3 cr. Prereq–§: 4327; [[1001 or 1002], [non-pol sci grad major or equiv]] or #)
Development/role of American local government. Forms and structures. Relationships with states and federal government. Local politics and patterns of power/influence.

POL 5331. Thinking Strategically in Domestic Politics. (3-4 cr. Prereq–§: 4331; grad student)
Applications of rational-choice and game theories to important features of domestic politics in the United States and elsewhere.

POL 5403. Comparative Constitutionalism. (3 cr)
Theory/practice of constitutionalism in different countries. Conceptual/normative inquiry between constitutionalism, rule of law, and democracy. Origins and role of constitutions. Relevance of courts with constitutional review powers: U.S., Germany, Japan, Hungary, Russia, South Africa, Nigeria.

POL 5410. Topics in Comparative Politics. (3 cr. Prereq–Grad student)
Topics of current analytical or policy importance. Topics vary, see *Class Schedule*.

POL 5441. Environmental Policy. (3 cr. §POL 3441. Prereq–non-pol sci grad student or #)
How American political system deals with environmental issues. How third world countries deal with environmental protection/economic growth. How international community deals with global environmental problems.

POL 5461. European Government and Politics. (4 cr. §POL 4461W. Prereq–Grad student or #)
European political institutions in their social settings. Power and responsibility. Governmental stability. Political decision making. Government and economic order.

POL 5465. SoutheAST Asian Politics. (3 cr)
U.S. involvement in region. Progress toward and resistance to democratic political systems and economic development.

POL 5473. Chinese Politics. (3 cr. Prereq–§: 4473, EAS 4473; grad student)
Fundamental conflicts in Chinese society. Democracy movement, human rights, class divisions, gender struggles, environmental issues, capitalist vs socialist development strategies. Secondary topics include Chinese foreign relations and domestic/foreign political issues in Taiwan.

POL 5477. Struggles and Issues in the Middle East. (4 cr. Prereq–§: 4477; 1054 or 3051 or non-pol sci grad student or #)
Turkey, Iran, Israel, and selected Arab states. Domestic politics of religious/secular, ethnic, economic, environmental, and other policy/identity issues. Regional politics of water access, Israeli/Palestinian/Arab world relationships, oil and Persian/Arabian Gulf, human rights.

POL 5478. Contemporary Politics in Africa and the Colonial Legacy. (4 cr. §AFRO 4478, AFRO 5478, POL 4478. Prereq–Grad student or #)
How current politics in mainly, though not exclusively, sub-Saharan Africa have been shaped by pre-colonial/colonial processes. Reality of independence, recurrent political/economic crises. Global context and prospects for effective democracy.

POL 5479. Latin American Politics. (3-4 cr. §LAS 4479, POL 4479. Prereq–Grad student or #)
Overview of Latin American politics and political economy. Authoritarianism, human rights, redemocratization. Development and economic policy. Social movements. Ethnicity/race. Religion. Revolution. U.S.-Latin American relations.

POL 5481. Governments and Markets. (3-4 cr; S-N only. Prereq–§: 4481; 1054 or 3051 or non-pol sci grad student or #)
Connection between democracy and markets. Focuses on countries in North America, Europe.

POL 5485. Human Rights and Democracy in the World. (3 cr. §POL 4485. Prereq–Grad student or #)
History of ideas about human rights and democracy. Economic, political, psychological, and ideological explanations for repression.

POL 5487. Struggle for Democratization and Citizenship. (4 cr. §POL 4487, POL 4501. Prereq–Grad student)
History of democratic movement from its earliest moments in history to present. Attempts to draw balance sheet. Emphasizes how disenfranchised fought to become included.

POL 5501. Supreme Court and Constitutional Interpretation. (3 cr. Prereq–Grad student or #)
Historical/analytical approaches to Court's landmark decisions. Theory/techniques of judicial review. Court's authority related to wider political/social context of American government.

POL 5502. Supreme Court, Civil Liberties, and Civil Rights. (3 cr. Prereq–§: 4502; 1001 or 1002 or equiv or non-pol sci grad student or #)
Supreme Court's interpretation of Bill of Rights, 14th amendment. Freedom of speech, press, religion. Crime/punishment. Segregation/desegregation, affirmative action. Abortion/privacy.

POL 5525. Federal Indian Policy. (3 cr; A-F only. Prereq–§: 4525, AMIN 4525; grad student)
Formulation, implementation, evolution, comparison of Indian policy from pre-colonial times to self-governance of new millennium. Theoretical approaches to federal Indian policy. Major federal Indian policies. Views/attitudes of policy-makers, reactions of indigenous nations to policies. Effect of bodies of literature on policies.

POL 5561. Comparative Legal Systems. (3 cr. §POL 4561. Prereq–Grad student or #)
Survey of principal legal systems of Western world. Role of legal system in relation to various political/economic systems. Contrast between common law and civil law traditions.

POL 5737. American Political Parties. (3 cr. §POL 4737. Prereq–Grad student or #)
American two-party system. Party influence in legislatures/executives. Decline of parties, their future.

POL 5766. American Political Culture and Values. (3-4 cr. Prereq–§: 4766; 1001 or equiv or non-pol sci grad student or #)
Individualism, freedom, equality. Dominant beliefs about democratic principles, materialism, capitalism, citizenship, patriotism/heroism.

POL 5767. Public Opinion and Voting Behavior. (3 cr. §POL 4767. Prereq–Grad student or #)
Major factors influencing electoral decisions. Political attitude formation/change. Data analysis lab required.

POL 5810. Topics in International Politics and Foreign Policy. (3 cr [max 6 cr]. Prereq–§: 4810; grad student)
Selected issues in contemporary international relations. Topics vary, see *Class Schedule*.

POL 5833. The United States in the Global EconomyUS For ECON Policy. (3-4 cr. Prereq–§: 4833; grad student; 3835 recommended)
Domestic/international politics of United States. Foreign economic policy (trade, aid, investment, monetary, migration policies). Effects of policies and international economic relations on U.S. economy/politics.

POL 5872. Global Environmental Politics. (3 cr. Prereq–§: 3872; non-pol sci grads only)
Emergence of the environment as a key aspect of the global political agenda. Non-governmental and governmental international organizations. Politics of protection of the atmosphere, rain forests, seas and other selected issues. International security and the environment.

POL 5881. International Law. (3 cr. §POL 4881. Prereq–Grad student or #)
How international law matters for world politics. War crimes, human rights. Law of the sea and of the environment. International crime. Lectures, discussions, simulations of cases.

POL 5883. Global Governance. (3 cr. Prereq–§: 4883; 3835 or non-pol sci grad student or #)
Rise/role of inter-governmental organizations such as United Nations, non-governmental organizations. Peacekeeping, trade, development, human rights, security and arms control, self-determination, refugees, health, environment. Seminar discussions, class simulations.

POL 5885. International Conflict and Security. (3 cr. §POL 4885. Prereq–Grad student)
Alternative theories of sources of militarized international conflict. Theories applied to past conflicts. Theories' relevance to present.

POL 5887. Thinking Strategically in International Politics. (3 cr; A-F only. Prereq–§: 4887; grad student)
Applications of game theory to international politics. Conflict/cooperation, global environmental commons, deterrence/reputation.

POL 5889. Governments and Global Trade and Money. (3 cr. §POL 4889. Prereq–3835 or grad student or #)
Politics of international trade and monetary affairs, including north-south and east-west relations.

POL 5970. Individual Reading and Research. (1-4 cr [max 4 cr]. Prereq–#, Δ, ❑)
Guided individual reading or study.

Portuguese (PORT)

Department of Spanish and Portuguese Studies

College of Liberal Arts

PORT 1101. Beginning Portuguese. (5 cr)
Speaking and understanding Portuguese; pronunciation; introduction to writing and reading; basic grammar; cultural aspects of language and civilizations of Portuguese-speaking world.

PORT 1102. Beginning Portuguese. (5 cr. Prereq–1101 or #)
Speaking and understanding Portuguese; pronunciation; introduction to writing and reading; basic grammar; cultural aspects of language and civilizations of Portuguese-speaking world.

PORT 1103. Intermediate Portuguese. (5 cr. Prereq–1102 or #)
Speaking and comprehension. Development of reading and writing skills based on Portuguese-language materials.

PORT 1104. Intermediate Portuguese. (5 cr. Prereq–1103 or #)
Speaking and comprehension. Development of reading and writing skills based on materials from Portugal and Brazil. Grammar review; compositions and short presentations.

PORT 3001. Portuguese for Spanish Speakers. (4 cr. Prereq–[[SPAN 3015, LPE] or Port LPE or #]], speak other Romance language)
Based on student's knowledge of Spanish. Contrastive approach to Portuguese phonic/morpho-syntactic structures.

PORT 3003. Portuguese Conversation and Composition. (4 cr. Prereq–1104, 3001, Port LPE)
Speaking, writing. Cultural comparisons, current events. Grammar review. Writing workshops.

PORT 3501W. Foundations of Portuguese Culture. (3 cr. §PORT 3501V. Prereq–3003)
Foundations of Portuguese-speaking culture (Portugal, Brazil, Lusophone Africa), from origins to present. Social/cultural trends that form basis for modern Portuguese-speaking world (literature, history, cinema, music).

PORT 3502W. Foundations of Brazilian Culture. (3 cr. §LAS 3502W, PORT 3502V. Prereq–3003 or equiv)
Emphasis on modern Brazilian society. History, culture (music, art, cinema, literature, intellectual thought, popular culture, media), and social problems (ethnicity, tropical deforestation).

PORT 3503W. Literatures and Cultures of Lusophone Africa. (3 cr. §PORT 3503V. Prereq–3003, #)
Origins/development of Lusophone Africa (Angola, Cape-Verde, Guinea-Bissau, Mozambique, São Tome/Principe) using literature, cultural/literary criticism, history, anthropology, and various media (film, art, music, Internet).

PORT 3603. Portuguese-Speaking Cultures and Literatures in Translation. (3 cr)
Introduction to the Portuguese-speaking world using literature, history, anthropology, and film. Focuses on sociopolitical, cultural, and historical development of Brazil, Portugal, and Lusophone Africa (Angola, Mozambique, Cape-Verde, Guinea-Bissau, and São TomÈ and PrÌncipe).

PORT 3800. Film Studies in Portuguese. (3 cr [max 6 cr]; A-F only. §PORT 3800H. Prereq–3003 or [dept or #])
Films from Portuguese-speaking world in their historical, (geo)political, and socio-economic contexts. Films from Brazil, Portugal, or Lusophone Africa analyzed under interdisciplinary framework, noting aspects related to cinematography/rhethorics.

PORT 3910. Topics in Lusophone Literatures. (3 cr [max 9 cr]. §PORT 3910H)
Critical reading of Lusophone literary texts (Brazil, Portugal, Portuguese-speaking Africa) representing various genres (novel, short story, poetry). Terminology of criticism, literary problems, techniques.

PORT 3920. Topics in Lusophone Cultures. (3 cr [max 9 cr]. Prereq–[1101, 1102, 1103, 1104] or [3001, 3003] or equiv)
Critical studies of various aspects of Portuguese-speaking cultures (Portugal, Brazil, or Lusophone Africa). Topics may include (among others) popular music, visual/media culture, religion, diaspora, the Amazon.

PORT 3970. Directed Readings. (1-4 cr [max 9 cr]. Prereq–3501 or 3502 or 3503 or 3910)
Guided individual reading or study

PORT 5520. Portuguese Literary and Cultural Studies. (3 cr [max 9 cr])
Study of origins and development of modern Portuguese nation (late 15th to 20th century) using literature, cultural and literary criticism, history, sociology) and various media (film, art, music, Internet). Main cultural problematics pertaining to Portugal as well as fundamental literary texts.

PORT 5530. Brazilian Literary and Cultural Studies. (3 cr [max 9 cr])
Study of origins and development of modern Brazilian nation (late 16th to 20th century) using literature, cultural and literary criticism, history, sociology) and various media (film, art, music, Internet). Main cultural problematics pertaining to Brazil as well as fundamental literary texts.

PORT 5540. Literatures and Cultures of Lusophone Africa. (3 cr [max 9 cr]. Prereq–#)
Origins/development of Lusophone Africa (Angola, Mozambique, Cape-Verde, Guinea-Bissau, S,,o TomÈ, PrÌncipe) using literature, cultural/literary criticism, history, sociology, and various media (film, art, music, Internet).

PORT 5910. Topics in Lusophone Cultures. (3 cr [max 9 cr])
Cultural manifestations in Portuguese-speaking world (Portugal, Brazil, Lusophone Africa): literature, history, film, intellectual thought, critical theory, popular culture. Topics include: Portuguese colonialism; postcolonial nation in Lusophone world; Lusophone women writers; Luso-Brazilian (post)modernity.

PORT 5920. Figures in Lusophone Literatures. (3 cr [max 9 cr])
One Portuguese, Brazilian, or other major Portuguese-speaking writer or group of writers whose work has had impact on thought, literature, or social problems (e.g., Machado de Assis, Fernando Pessoa, Clarice Lispector). Figures specified in *Class Schedule*.

PORT 5930. Topics in Brazilian Literature. (3 cr [max 9 cr])
Major issues of Brazilian literature; focuses on important authors, movements, currents, genres. Problems, socioeconomic questions, literary techniques related to Brazilian themes. Topics specified in *Class Schedule*.

PORT 5970. Directed Readings. (3 cr [max 9 cr]. Prereq–MA or PhD candidate, #, Δ, ❑)
Lusophone studies (Portuguese-speaking Africa, Brazil, Portugal). Areas not covered in other courses. Students submit reading plans for particular topics, figures, periods, or issues.

PORT 5990. Directed Research. (1-4 cr [max 9 cr]. Prereq–#, Δ, ❑)
Graduate-level research in literatures and cultures of the Portuguese-speaking world. Topics vary.

Postsecondary Teaching and Learning (PSTL)

Postsecondary Teaching and Learning (PSTL)

College of Education and Human Development

PSTL 712. Introductory Algebra, Part I. (0 cr. Prereq–[4 cr equiv]; GC math placement)
Traditional lecture/discussion course with group work. Covers first half of content of a first course in algebra at level of difficulty geared for students at a research university. Arithmetic review, real number operations, expressions, equations, inequalities, rectangular (x-y) graphs.

PSTL 713. Introductory Algebra, Part II. (0 cr. Prereq–[4 cr equiv]; 0712, 0716, #)
Traditional lecture/discussion course with group work. Covers second half of content of a first course in algebra at level of difficulty geared for students at a research university. Graphing review, linear systems, word problems, exponents, polynomials, factoring.

PSTL 721. Introductory Algebra. (0 cr. Prereq–General Math Placement Test)
Real number operations, expressions, equations, inequalities, rectangular (x-y) graphs, linear systems, word problems, exponents, polynomials, factoring.

PSTL 722. Introductory Algebra (Computer). (0 cr. Prereq–General Math Placement Test)
Students learn via multimedia software. Instructor helps students individually during class. Real numbers, expressions, equations, inequalities, rectangular graphs, systems, word problems, exponents, polynomials, factoring.

PSTL 731. Intermediate Algebra. (0 cr. §PSTL 732. Prereq–Grade of at least C in [0713 or 0717 or 0721 or 0722] or General Math Placement Test)
Rational expressions, absolute value, roots, radicals, quadratic, exponential, and logarithmic functions, complex numbers.

PSTL 732. Intermediate Algebra (Computer). (0 cr. §PSTL 731. Prereq–Grade of at least C in [0713 or 0717 or 0721 or 0722] or General Math Placement Test)
Students learn via multimedia software. Instructor helps students individually during class. Rational expressions, absolute value, roots, radicals, quadratic, exponential, and logarithmic functions, complex numbers.

PSTL 1001. Introduction to Mathematical Modeling: Life Matters Through a Mathematical Lens. (3 cr. §PSTL 1002)
Algebraic modeling. Numbers in culture. Voting/election methods. Quota methods, probability. Fair division. Routes/networks. Scheduling. Data/patterns. Collecting/interpreting Data. Consumer mathematics. Growth/decay. Inferential statistics.

PSTL 1002. Mathematics and Social Action: Mathematics Matters for Democracy. (3 cr. §PSTL 1001)
Includes service learning component. Numbers in culture. Voting/election methods. Quota methods, probability. Fair division. Routes/networks. Scheduling. Data/patterns. Collecting/interpreting data. Consumer mathematics. Growth/decay. Inferential dtatistics.

PSTL 1003. Ethnomathematics. (3 cr)
Mathematical principles/ideas about space, number, time/ and design that have been developed by all human cultures. Case studies. Discrete math. Algebra/geometry, including graph theory, matrices, probability, transformational geometry, scaling, algorithmic recursion, numerical base systems, and modular arithmetic.

PSTL 1004. Statistics. (4 cr. Prereq–Grade of at least C in 0731 or equiv)
Problem solving and decision making through collection, analysis, and interpretation of data. Organization/presentation of data, summary statistics, sampling, probability, distributions, estimation, correlation, hypothesis testing, contingency tables, chi-square. Uses groups and computers.

PSTL 1005. Functions and Problems of Logic. (3 cr)
Formal (symbolic) techniques (e.g., Venn diagrams, truth tables, formal proofs) for evaluating validity of arguments. Translating English statements into symbolic system. Structure/complexity of valid reasoning.

PSTL 1041. Developing College Reading. (2 cr [max 6 cr]. Prereq–Non-native speaker of English, CE enrollment, #)
Comprehension/study strategies for reading college-level textbooks. Previewing a textbook for content/organization. Underlining and making margin notes. Outlining, anticipating test questions, and interpreting technical vocabulary. Paired with a designated content course.

PSTL 1042. Reading in the Content Area. (2 cr [max 6 cr]. Prereq–Non-native speaker of English, CE enrollment, #)
Reading skills/strategies for a content area. Previewing/predicting content/organization. Note taking, outlining, anticipating test questions, and interpreting technical/sub-technical vocabulary. Paired with designated content course.

PSTL 1051. Introduction to College Writing: Workshop. (2 cr. Prereq–Designed for non-native speaker of English)
Language editing strategies. Review of linguistic features of standard written English. Style/language in writing. Small-group activities. In-group or individual conferences.

PSTL 1076. Orientation to Self and Career. (2 cr)
How to organize what one knows about oneself to explore career paths and find a place world of work. Experiential exercises, discussion. Self-reflection/anaylsis through writing. Papers, oral presentation, final portfolio.

PSTL 1081. Academic Development Seminar: Supplemental Instruction in Social Sciences. (1 cr [max 2 cr]; A-F only. Prereq–[1081 or 1085], ¶[specific content course], adviser approval)
Methods of study in social science courses. Note taking, exam preparation, and time management. Specific writing tasks, critical thinking, research methods, essay/presentation styles associated with disciplinary content.

PSTL 1082. Academic Development Seminar: Supplemental Instruction in the Sciences. (1 cr [max 3 cr]; A-F only. Prereq–[1081 or 1085], ¶[specific content course], adviser approval)
Methods of study in science courses. Note taking, exam preparation, time management. Specific problem solving techniques, augmented problem sets, writing tasks, presentation styles associated with disciplinary content.

PSTL 1083. Academic Development Seminar: Supplemental Instruction in the Humanities. (1 cr; A-F only. Prereq–[1081 or 1085], ¶[specific content course], adviser approval)
Methods of study in humanities courses. Note taking, exam preparation, time management. Specific writing tasks, critical thinking skills, research methods, essay/presentation styles associated with disciplinary content.

PSTL 1084. Academic Development Seminar: Supplemental Instruction in Mathematics. (1 cr; A-F only. Prereq–[1081 or 1085], ¶[specific content course], adviser approval)
Methods of study in mathematics courses. Note taking, exam preparation, time management. Necessary math background, specific problem-solving techniques, application of mathematical concepts associated with disciplinary content.

PSTL 1085. Academic Development Seminar: Supplemental Instruction in Composition. (1 cr; A-F only. Prereq–[1081 or 1085], ¶[specific content course], adviser approval)
Methods of study in composition courses. Note taking, exam preparation, time management. Specific writing tasks, research methods, essay/presentation styles associated with disciplinary content.

PSTL 1086. The First-Year Experience. (2 cr; A-F only)
Awareness of roles, identity, needs, and interactions with diverse groups. Expectations, resources, and challenges associated with transition into college. Speakers, journals/portfolios, technology, reading/writing assignments, classroom exercises/experiences.

PSTL 1112. Ecological Evaluation of Environmental Problems. (4 cr)
Relating ecological concepts (energy flow, material cycling) to causes/effects of environmental problems (world hunger, toxic waste, global warming, acid rain). Methods of evaluating cultural practices' impact on the environment. Critical evaluation of potential interventions.

PSTL 1131. Principles of Biological Science. (4 cr)
Biodiversity/classification, genetics, evolution, ecology, life cycles/reproduction, cell theory, chemical bases for life from a "how-we-know" perspective, relevancy to modern life. Inquiry-based, collaborative lab.

PSTL 1133. Nature Study. (4 cr)
Natural history. Several Twin Cities habitats are surveyed/characterized. Students spend time in the field, measuring soil/climate conditions and identifying plants/animals found in each habitat. Students collect specimens and make a scientific plant collection.

PSTL 1135. Human Anatomy and Physiology. (4 cr)
In lecture section, students take notes, see multi-media presentations, and do group work. Lab section focuses on organ dissections (e.g., eye, heart) and physioloogy activities. Meets in a computer lab where students work in groups on quizzes and other assignments.

PSTL 1163. Physical Systems: Principles and Practices. (4 cr)
Fundamental physical principles governing properties of matter, electric circuits, and light/color. Applications to real-world systems. Integrated lecture/lab.

PSTL 1166. Principles of Chemistry. (3 cr. Prereq–0713 or 0721 or equiv)
Problem-solving. Classification of matter, elements, atomic/molecular structure, compounds, mole calculations, chemical bonding, empirical formulas, chemical reactions, stoichiometry, bond energy, enthalpy, gases/gas laws, solutions, solution concentrations, acids, bases, qualitative equilibrium.

PSTL 1171. Physical Geology. (4 cr)
Development of common land features (valleys, mountains, rivers, lakes) and processes responsible for their origin/change. Types of surface materials. Movements inside Earth and their effects on its surface. Lecture, lab: mineral/rock analysis, topographic map reading, landform identification, landscape interpretation.

PSTL 1172. Historical Geology. (4 cr)
Development of earth's physical/chemical features through time, with changing patterns of life as a response. Problem-solving, logical deductions from facts stressed. Lecture, lab: identification/interpretation of rocks, fossils, geologic maps, ancient environments, and geographies.

PSTL 1173. Geology of the National Parks. (4 cr)
Processes that produced scenic/geologic features of North America's national parks/monuments, using a regional approach. Role of national park system in modern society. Basic geology introduced as needed. Map analyses emphasized. Lecture, lab.

PSTL 1204. Ways of Knowing in the Social Sciences. (4 cr; A-F only)
Multidisciplinary social science exploration of an international issue. Local/global dimensions of worldwide immigration from perspective of economics, political science, history, sociology, anthropology, and geography.

PSTL 1211. People and Problems. (4 cr)
Social problems that arise in a diverse society. Sociology as source of concepts/theories used to analyze problems such as unemployment, social inequality, violence, and environmental crisis. Fifteen hours in community involvement/service.

PSTL 1231. Perspectives in American History. (4 cr)
One-semester survey of American history. Focuses on major issues from a variety of perspectives. Political, social, economic, and diplomatic developments in America, from pre-contact Indian civilizations and foundations of American society, through formation of the United States and crisis of Civil War, to maturation of American political system and exercise of world leadership in 20th century.

PSTL 1233. U.S. Government and Politics. (4 cr)
Structure and process. How government institutions address demands made on them. History/foundations of government structure. Institutions of power. Links between people and government. Government and social welfare. Economic, military, and foreign policies.

PSTL 1235W. Law in Society. (4 cr)
How social science concepts/research affect legal responses to social conflict. History/philosophy of American law. Interaction of social/legal institutions. Effect of beliefs/social conditions on laws addressing family, criminal, employment, and environmental controversies.

PSTL 1251. World History: Since 1500. (4 cr)
Political, economic, social, diplomatic, and intellectual aspects of major world cultures. Awareness of growing interdependence of peoples. International perspective on events that affect students. lives. Classroom simulations, lecture, discussion.

PSTL 1280. Psychology of Personal Development. (3 cr)
Using psychological research/theory for effective living. Establishing positive relationships, managing stress, maintaining physical/mental health, leadership, gender roles, and work roles. Development of appropriate study strategies for social science courses. Readings, writing assignments, discussion.

PSTL 1281. General Psychology. (4 cr. §PSTL 1289, PSY 1001, PSY 1001H)
Individual instruction and computer technology are used to survey major psychological theories, concepts, and methods.

PSTL 1285W. Introduction to Cultural Anthropology. (4 cr)
Ways our lives are conditioned by culture. Fundamental anthropological concepts, theories, methods. Study of anthropological materials, collaborative social research, cross-cultural comparison. Recognizing cultural realities. Ways of life of other cultures.

PSTL 1289. Psychology of the American Experience. (4 cr. §PSTL 1281, PSY 1001, PSY 1001H)
Students use traditional and cross cultural psychology to explore culture/development and its influence on individual perspectives. Purpose of stereotypes, prejudices, and other mental decision-making constructs. Relationship between culture and identity development across ethnicity.

PSTL 1311. Art: General Art. (3 cr)
Visual/performing arts produced in diverse American/international cultures. Slides, videos, galleries, performances, and music show how/why art is created. Students discuss various artworks, formulate/evaluate ideas/attitudes about art.

PSTL 1312. Identity, Community, and Culture in the Performing Arts. (4 cr)
How performing arts from around the world deal with themes of identity, community, and culture. Students practice at least one of the arts in interactive workshops. Films, music, and lectures complement the workshops. Assignments include creative writing, quizzes, performance.

PSTL 1350W. Political Power and Social Change. (3 cr)
Political power and agency as illustrated by individual/collective action. Draws upon traditional texts and strategies of social/political movements. Questions about political authority, role of state, conceptions of justice/equality, and rights/responsibilities of citizenship.

PSTL 1364. Literature of the American Immigrant Experience. (3 cr)
Literature by/about immigrants. Historical/contemporary American immigrant experiences (conditions leading to emigration, adjustments to and impact on the United States, inter-generational conflict). Readings include novels, poetry, expository prose, biographies, and oral histories.

PSTL 1365W. Literatures of the United States. (3 cr)
Stories, poetry, essays, and drama by diverse U.S. writers (mid-19th century to present) depicting conflicts/challenges of life in various stratas of American culture. Addresses multicultural aspect of the "American story."

PSTL 1366W. Images of Women in Literature. (4 cr)
Diversity of 20th-century American women writers. Focuses on feminist re-interpretations of the literary canon. Portrayals of women across various identities based on race, class, sexuality, age, and religion. Readings include novels, short stories, poetry, essays, and plays.

PSTL 1367W. Contemporary Literature: International Perspectives. (4 cr)
Comparative readings in fiction, poetry, drama, and autobiography from contemporary writing not originating in the United States. Extensive formal/informal written assignments. Lecture, discussion.

PSTL 1371. Reading Short Stories. (3 cr)
Current short story format from diverse communities within North America, Africa, the Caribbean, and Europe. Emphasizes written literature inspired by oral "storytelling," storytelling as "theatre," and storytelling as communal endeavor.

PSTL 1374W. The Movies. (3 cr)
Aesthetics of feature-length films. Work of selected contemporary directors. Fundamentals of film study: mise-en-sc[gr]ene, editing, sound, photography, movement, screenplay, acting, and directing. Students write about films viewed in class.

PSTL 1421. Writing Laboratory: Basic Writing. (3 cr)
Develop academic reading, writing, and research skills. Students write in response to a variety of assignments, receive extensive one-on-one assistance, and work on computers. Clear/effective expression emphasized through writing/revision.

PSTL 1422. Writing Laboratory: Communicating in Society. (3 cr. §ENGC 1011, ENGC 1011H, ENGC 1012, ENGC 1012H, ENGC 1013, ENGC 1013H, ENGC 1014, ENGC 1014H, ENGC 1015, ENGC 1016, PSTL 1423, PSTL 1424, RHET 1101. Prereq–Grade of at least D in [1421 or equiv])
Conventions/skills of academic writing, reading, and research. How people communicate in society, perceive events/ideas, and think/write about them. Extensive use of computers for writing/research.

PSTL 1423. Writing Laboratory: Community Service Writing. (3 cr. §ENGC 1011, ENGC 1011H, ENGC 1012, ENGC 1012H, ENGC 1013, ENGC 1013H, ENGC 1014, ENGC 1014H, ENGC 1015, ENGC 1016, PSTL 1422, PSTL 1424, RHET 1101. Prereq–Grade of at least D in [1421 or equiv], #)
Writing description, research, and analysis based on work in community setting, and on readings/analysis. Students work three hours weekly at off-campus site for approximately seven weeks. Extensive research and writing practice. Requires use of microcomputer.

PSTL 1424. Writing Laboratory: Communicating in a Diverse Society. (3 cr. §ENGC 1011, ENGC 1011H, ENGC 1012, ENGC 1012H, ENGC 1013, ENGC 1013H, ENGC 1014, ENGC 1014H, ENGC 1015, ENGC 1016, PSTL 1422, PSTL 1423, RHET 1101. Prereq–Grade of at least D in [1421 or equiv])
Proficiency in academic writing, reading, research. Multicultural, thematic content. Extensive experience with computers as tools for writing/research.

PSTL 1461. Oral Communication in the Public Sphere. (3 cr. §COMM 1101, COMM 1101H, RHET 1223)
Communication, ethics, and citizenship in interpersonal, group, and public contexts. Communication theory/experience in diverse verbal/nonverbal communication patterns/strategies. Individual/group activities, public presentations.

PSTL 1464. Group Process and Discussion in a Multicultural Society. (3 cr)
Nature of groups, how they form/function, what purpose they serve in U.S. society, and how leadership and other role behaviors emerge from their structure. Multicultural approaches to conflict management, diverse verbal/nonverbal communication patterns/strategies.

PSTL 1481. Creativity Art Laboratory: Experiences in the Media. (3 cr)
Discussing, reading, and writing about art. Creating art that reflects personal/cultural identity. Multicultural art works explored through slides/videos. How to analyze, interpret, and evaluate artwork.

PSTL 1485. Creativity: Photography. (4 cr. Prereq–Own camera [35 mm w/adjustable controls preferred], UC; $50 lab fee)
Conceptual, technical, and historical aspects of photography as art. Hands-on experience with camera control, film development, enlarging, and printing in black-and-white. Individual/group critiques of student portfolios. Lab.

PSTL 1511. Introduction to Business and Society. (4 cr)
Role of business in economic/social life of the United States. Symbiotic relationship between business activity and broader aspects of society. Environmentalism, consumerism, cultural diversity, economic systems, ethics, management, marketing, accounting/finance, legal issues.

PSTL 1513. Small Business Fundamentals With E-Business Applications. (3 cr)
Starting up, purchasing, owning, and operating a small business. Traditional research/developmental methods for growing a business, technology associated with the Internet. Moving toward one or more e-commerce applications in researching, starting, and operating a business.

PSTL 1534. Practical Law. (4 cr)
American legal process. Everyday legal matters. Courts, crimes, personal injury, contracts, consumer transactions, property ownership/insurance, debtor-creditor relations, banking, bankruptcy, international law.

PSTL 1540. Accounting Fundamentals I. (3 cr)
Hands-on course with a small-business orientation. Making accounting entries from business transactions in journals. Posting to ledger accounts. Completing accounting cycle. Preparing/interpreting financial statements.

PSTL 1571. Computer Literacy and Problem Solving. (4 cr)
Competencies in computer technologies used in social sciences and in business to solve problems. Using advanced word processing techniques to create complex written documents such as reports. Using electronic spreadsheet to analyze data and present it graphically. Using database management programa to store, organize, and query data. Using presentation software to communicate ideas/findings in multimedia format to larger groups.

PSTL 1816. African-American Literature. (3 cr)
Short stories, novels, poetry, and drama by African American writers evaluated in context of internationalization. Interconnection between literature of African Americans in the United States and other international writers of African descent.

PSTL 1836. Asian-American Literature. (3 cr)
Historical/contemporary prose, poetry, and drama analyzed to assess writers' interpretations of their identity. Issues of generational conflict/peer pressure.

PSTL 1851. Multicultural Relations. (3 cr)
Nature of historical/contemporary multicultural relationships within American society. Intercultural, interethnic, interracial, and cross-gender relationships from historical/contemporary perspectives. Tools to think about complex issues.

PSTL 1901. Freshman Seminar: Environmental Issues. (3 cr. §PSTL 1902, PSTL 1903, PSTL 1904, PSTL 1905. Prereq–Freshman)
Reading, discussion, critical analysis, and writing about environmental issues. Intensive, small-group setting.

PSTL 1902. Freshman Seminar: Cultural Diversity. (3 cr. §PSTL 1901, PSTL 1903, PSTL 1904, PSTL 1905. Prereq–Freshman)
Reading, discussion, critical analysis, and writing about cultural diversity. Intensive, small-group setting.

PSTL 1903. Freshman Seminar: Citizenship and Public Ethics. (3 cr. §PSTL 1901, PSTL 1902, PSTL 1904, PSTL 1905. Prereq–Freshman)
Reading, discussion, critical analysis, and writing about citizenship/public ethics. Intensive, small-group setting.

PSTL 1904. Freshman Seminar: International Perspectives. (3 cr. §PSTL 1901, PSTL 1902, PSTL 1903, PSTL 1905. Prereq–Freshman)
Reading, discussion, critical analysis, and writing about international perspectives. Intensive, small-group setting.

PSTL 1905. Freshman Seminar. (3 cr. §PSTL 1901, PSTL 1902, PSTL 1903, PSTL 1904. Prereq–Freshman)
Reading, discussion, writing, and critical analysis. Intensive, small-group setting.

PSTL 1906W. Freshman Seminar: Environmental Issues. (3 cr. §PSTL 1907W, PSTL 1908W, PSTL 1909W, PSTL 1910W. Prereq–Freshman)
Reading, discussion, critical analysis, and writing about environmental issues. Intensive, small-group setting.

PSTL 1907W. Freshman Seminar: Cultural Diversity. (3 cr. §PSTL 1906W, PSTL 1908W, PSTL 1909W, PSTL 1910W. Prereq–Freshman)
Reading, discussion, critical analysis, and writing about cultural diversity. Intensive, small group setting.

PSTL 1908W. Freshman Seminar: Citizenship and Public Ethics. (3 cr. §PSTL 1906W, PSTL 1907W, PSTL 1909W, PSTL 1910W. Prereq–Freshman)
Reading, discussion, critical analysis, and writing about citizenship and public ethics. Intensive, small group setting.

PSTL 1909W. Freshman Seminar: International Perspectives. (3 cr. §PSTL 1906W, PSTL 1907W, PSTL 1908W, PSTL 1910W. Prereq–Freshman)
Reading, discussion, critical analysis, and writing about international perspectives. Intensive, small group setting.

PSTL 1910W. Freshman Seminar. (3 cr. §PSTL 1906W, PSTL 1907W, PSTL 1908W, PSTL 1909W. Prereq–Freshman)
Reading, discussion, writing, critical analysis. Intensive, small-group setting.

PSTL 1990. Special Topics. (1-8 cr [max 8 cr]. Prereq–#, ❑)
Topics related to instructor's areas of expertise.

PSTL 1993. Directed Study. (1-8 cr [max 8 cr]. Prereq–#, ❑)
Student-initiated project in consultation with faculty monitor. Student determines topic, sets goals, designs a course of study, and finds an appropriate faculty member to work with collaboratively.

PSTL 1996. Internship. (1-8 cr [max 8 cr]. Prereq–#, ❑)
Skills, techniques, and research in disciplinary content associated with college teaching. Goals/functions of public/community agencies. Career goals. Internships supervised by faculty monitor and site supervisor.

PSTL 2271W. Stories and Storytellers. (3 cr. Prereq–At least 13 cr completed GPA)
Uses concepts and research methods of cultural studies to explores the "stories" we use to comprehend society (narratives, images, sounds, designed objects) and the "storytellers" that create them (family, friends, ghosts); the media (TV, movies, music); politics; religion; architecture; fashion; and schools.

PSTL 2283W. Psychology of Human Development. (4 cr. Prereq–[1281 or PSY 1001], [1422 or 1423 or 1424 or ENGC 1011 or ENGC 1012 or ENGC 1013 or ENGC 1014 or ENGC 1015 or ENGC 1011H or ENGC 1012H or ENGC 1013H or ENGC 1014H or RHET 1101])
Biosocial, cognitive, psychosocial development of individuals over life span. Writing intensive. Computer assisted instruction, video, small group discussion.

PSTL 2357. World Religious Beliefs. (4 cr. Prereq–[1421 or equiv], at least 15 cr)
Beliefs, rituals, attitudes of world's major living religions. Parallel "little traditions" in their historical, social, cultural settings. Intensive writing/reading.

PSTL 2375W. Film and Society. (4 cr)
Films as medium for social/cultural expression. Problems of individuals' values or identities in conflict with societal demands/constraints (racism, sexism, urban living, family living, aging, politics, education, sexual mores, adolescence). Social issues in contemporary documentary films.

Program for Individualized Learning (PIL)

College of Continuing Education

PIL 3200. Continuing Studies. (1-2 cr [max 2 cr]; S-N only. Prereq–PIL student, Δ)
Students complete work for another PIL course in which an incomplete was received. Registration allows students to access academic advising in PIL.

PIL 3211. Degree Planning. (5 cr; S-N only. Prereq–PIL student, Δ)
Students develop individualized curricular plans for their baccalaureate degrees.

PIL 3251. Project Registration. (5 cr [max 10 cr]; S-N only. Prereq–PIL student, Δ)
Students develop a project proposal, identify objectives/resources, conduct research, accomplish an outcome, secure a narrative evaluation from a project adviser/evaluator.

PIL 3252. Program Active. (1-5 cr [max 5 cr]; S-N only. Prereq–PIL student)
Registration maintains program activity and access to PIL advising and student service.

PIL 3281. Major Project. (5 cr; S-N only. Prereq–PIL student, Δ)
Students complete a major project as partial fulfillment of criterion for Primary Area Studies in their degree plans.

PIL 3291. Graduation Preparation. (5 cr; S-N only. Prereq–PIL student, Δ)
Students compile a graduation dossier for presentation to preliminary review committee. Dossier consists of criteria summary, introduction, transcripts, illustrative materials, project proposals, degree plan.

PIL 3293. Graduation Preparation. (4 cr [max 40 cr]; S-N only. Prereq–Admitted PIL student)
Students complete draft dossier.

PIL 4299. Graduation Review. (5 cr; S-N only. Prereq–PIL student, Δ)
Students revise graduation dossier, present it to graduation review committee for BA or BS degree recommendation.

Psychology (PSY)

Department of Psychology

College of Liberal Arts

PSY 1001. Introduction to Psychology. (4 cr. §PSTL 1281, PSTL 1289, PSY 1001H)
Scientific study of human behavior. Problems, methods, findings of modern psychology.

PSY 1001H. Honors Introduction to Psychology. (4 cr. §PSTL 1281, PSTL 1289, PSY 1001. Prereq–Honors)
Scientific study of human behavior. Problems, methods, findings of modern psychology.

PSY 1905. Freshman Seminar. (3 cr; A-F only. Prereq–Freshman)
Topics specified in *Class Schedule*.

PSY 1907W. Freshman Seminar. (3 cr [max 6 cr]; A-F only. Prereq–Freshman)
Topics specified in *Class Schedule*.

PSY 1910W. Freshman Seminar. (3 cr; A-F only. Prereq–Fr or no more than 30 cr)
Topics specified in *Class Schedule*.

PSY 2801. Introduction to Psychological Measurement and Data Analysis. (3 cr. Prereq–High school algebra, [PSY 1001 or equiv]; intended for students who plan to major in psychology)
Descriptive/basic inferential statistics used in psychology. Measures of central tendency, variability, t tests, one-way ANOVA, correlation, regression, confidence intervals, effect sizes. Psychological measurement. Graphical data presentation. Statistical software.

PSY 3005V. Honors Introduction to Research Methods and Statistics. (4 cr; A-F only. Prereq–1001, [soph or jr or sr honors student])
Concepts/procedures used to conduct/evaluate research, especially in social sciences. Benefits/limitations of traditional research methods. Using statistics to describe/interpret research outcomes. Evaluating scientific claims.

PSY 3005W. Introduction to Research Methods and Statistics. (4 cr; A-F only. Prereq–1001, [soph or jr or sr])
Concepts/procedures used to conduct/evaluate research, especially in social sciences. Benefits/limitations of traditional research methods. Using statistics to describe/interpret research outcomes. Evaluating scientific claims.

PSY 3011. Introduction to Learning and Behavior. (3 cr. Prereq–1001)
Basic methods and findings of research on learning and behavior change. Survey of 20th-century theoretical perspectives, including contemporary models. Emphasis on animal learning and behavioral psychology.

PSY 3031. Introduction to Sensation and Perception. (3 cr. Prereq–1001)
Psychological, biological, and physical bases of sensory experience in humans and animals. Emphasis on the senses of vision and hearing.

PSY 3051. Introduction to Cognitive Psychology. (3 cr. Prereq–1001)
Scientific study of the mind in terms of representation and processing of information. Research and theory on cognitive abilities such as perception, attention, memory, language, and reasoning. Aspects of computational modeling and neural systems.

PSY 3061. Introduction to Biological Psychology. (3 cr. §PSY 5061. Prereq–1001 or BIOL 1009)
Basic neurophysiology/neuroanatomy, neural mechanisms of motivation, emotion, sleep-wakefulness cycle, learning/memory in animals/humans. Neural basis of abnormal behavior, drug abuse.

PSY 3101. Introduction to Personality. (3 cr. §PSY 5101. Prereq–1001)
Major theories, issues, facts about personality and personality assessment. Review of important historical/contemporary perspectives (e.g., psychoanalysis, humanistic psychology, trait psychology, behaviorism, evolutionary psychology) on human nature/individuality.

PSY 3135. Introduction to Individual Differences. (3 cr. §PSY 5135. Prereq–1001)
Differential methods in studying human behavior. Psychological traits. Influence of age, sex, heredity, and environment in individual/group differences in ability, personality, interests, and social attitudes.

PSY 3201. Introduction to Social Psychology. (4 cr. Prereq–1001 or #)
Overview of theories/research in social psychology. Emphasizes attitudes/persuasion, social judgment, the self, social influence, aggression, prejudice, helping, and applications.

PSY 3301. Introduction to Cultural Psychology. (3 cr; A-F only. Prereq–1001)
Theories/research on how culture influences basic psychological processes (e.g., emotion, cognition, psychopathology) in domains that span different areas of psychology (e.g., social, clinical, developmental, industrial-organizational) and of other disciplines (e.g., anthropology, public health, sociology).

PSY 3511. Introduction to Counseling Psychology. (3 cr. Prereq–1001)
History, theories, and research related to counseling psychology. Development/application of counseling theories to diverse populations. Psychological research on counseling process. Psychological mechanisms that promote change in people's lives.

PSY 3604. Introduction to Abnormal Psychology. (3 cr. §PSY 5604H. Prereq–1001)
Diagnosis, classification, etiologies of behavioral disorders.

PSY 3617. Introduction to Clinical Psychology. (3 cr. Prereq–3604 or 5604H)
Historical developments, contemporary issues. Trends in psychological assessment methods, intervention strategies, and clinical psychology research. Theories behind, empirical evidence for, usefulness of psychological intervention strategies.

PSY 3666. Human Sexuality. (3 cr. Prereq–1001)
Overview of theories, research, and contemporary issues in human sexual behavior from an interdisciplinary perspective. Topics include sexual anatomy and physiology, hormones and sexual differentiation, cross-cultural perspectives on sexual development, social and health issues, and sexual dysfunction and therapy.

PSY 3711. Introduction to Industrial and Organizational Psychology. (3 cr. Prereq–[1000, 3005 or 4801 or equiv, 1001 or #)
Application of psychological theory and research to recruitment, personnel selection, training and development, job design, work group design, work motivation, leadership, performance assessment, and job satisfaction measurement.

PSY 3902W. Major Project in Psychology. (4 cr; A-F only. Prereq–3005W, psy major, sr)
Completion of undergraduate major project.

PSY 3960. Undergraduate Seminar. (1-5 cr [max 45 cr]. Prereq–1001)
Current topics in psychology. Topics listed in psychology office.

PSY 3960H. Undergraduate Honors Seminar in Psychology. (1-4 cr [max 36 cr]. Prereq–Honors)
Topics in psychology.

PSY 3993. Directed Study. (1-6 cr [max 24 cr]. Prereq–#, Δ, ❑)
Independent reading leading to paper or to oral or written exam.

PSY 3994. Directed Research. (1-6 cr [max 24 cr]. Prereq–#, Δ, ❑)
Individual empirical project leading to written report.

PSY 3996. Undergraduate Fieldwork and Internship in Psychology. (1-6 cr [max 12 cr]. Prereq–1001, #, Δ, ❑)
Supervised fieldwork/internship in community/industry pertinent to formal academic training in psychology.

PSY 4011. Applied Behavioral Psychology. (3 cr. Prereq–3011, #)
Fundamental concepts of behavioral psychology. Practical techniques of behavior modification with humans/animals. Emphasizes functional analyses of behavior deficits/excesses, development/implementation of programs to bring about meaningful behavior change.

PSY 4012. Behavior Analysis and Autism. (4 cr; A-F only. Prereq–Reliable transportation, #)
Off-campus work with autistic children, under professional supervision. Professional ethics, social responsibility, scientific methods, moral philosophy concerning children with autism. At least five hours per week, for 12 weeks, at service-learning site. One on-campus evening class meeting per week.

PSY 4036. Perceptual Issues in Visual Impairment. (3 cr. Prereq–1001 or #)
Contemporary knowledge on visual, tactile, and auditory perception informs us about the challenges and capabilities of people who are blind or have low vision. Topics include reading, space perception, mobility, and the strengths and weaknesses of pertinent adaptive technology.

PSY 4133. Psychological Testing and Assessment. (3 cr. Prereq–3005W)
Survey of psychological tests, assessment instruments. Methods for developing, administering, scoring tests. Criteria for evaluating test/assessment adequacy. Examples relevant to clinical psychology (e.g., abilities, personality, mental disorders). Hands-on opportunity to design/evaluate a psychological test. Small groups.

PSY 4501. Psychology of Women. (3 cr. Prereq–1001 or #)
Survey of current theory and research regarding psychology of women and psychological sex differences including topics related uniquely to women (e.g., pregnancy) as well as sex differences in personality, abilities, and behavior.

PSY 4801. Introduction to Statistics. (4 cr. Prereq–[3005W or 3005V], honors)
Descriptive/inferential statistics, hypothesis testing, correlation, regression.

PSY 4902V. Honors Project. (1-6 cr [max 5 cr]; A-F only. Prereq–Honors, #, Δ)
Critical literature review or empirical study.

PSY 4960. Seminar in Psychology. (1-4 cr [max 16 cr]. Prereq–[1001, psych major] or #)
Seminars in subjects of current interest in Psychology.

PSY 4993. Directed Research: Special Areas of Psychology and Related Sciences. (1-6 cr [max 48 cr]. Prereq–#, Δ)
This is a Directed Research course. Each section is a special area of Psychology or a related science.

PSY 4994V. Honors Research Practicum. (4 cr. Prereq–3005W, honors psych)
Practical experience conducting psychological research. Preparation for completion of honors thesis. Research ethics, practical aspects of conducting psychological research, writing research reports. Students assist faculty and advanced graduate students in research.

PSY 4996H. Honors Internship/Externship. (1-6 cr [max 6 cr]; A-F only. Prereq–Honors, #, Δ, ❑)
Supervised internship/externship experience in a community-service or industrial setting relevant to formal academic training/objectives.

PSY 5012. Learning and Cognition in Animals. (4 cr. Prereq–3011 or 4011 or honors or grad student or #)
Review/evaluation of key questions, methods, theories, and data about forms of learning and elementary cognitive processes. Emphasizes animal models. Implications for human learning/behavior.

PSY 5014. Psychology of Human Learning and Memory. (3 cr. Prereq–3011 or 3051 [except for honors/grad student])
Survey of basic methods and findings of research on human learning, memory, and cognition. Emphasis on major factors influencing human encoding or acquisition of information and skill, retention, and retrieval. Theoretical perspectives on underlying processes of encoding, retention, and retrieval.

PSY 5015. Cognition, Computation, and Brain. (3 cr. Prereq–3051 [except for honors/grad student])
Human cognitive abilities (perception, memory, attention) from different perspectives (e.g., cognitive psychological approach, cognitive neuroscience approach).

PSY 5018H. Mathematical Models of Human Behavior. (3 cr. Prereq–MATH 1271 or #)
Mathematical models of complex human behavior, including individual/group decision making, information processing, learning, perception, and overt action. Specific computational techniques drawn from decision theory, information theory, probability theory, machine learning, and elements of data analysis.

PSY 5031W. Perception. (3 cr. §NSC 5031W. Prereq–3031 or 3051 or #)
Cognitive, computational, and neuroscience perspectives on visual perception. Topics include color vision, pattern vision, image formation in the eye, object recognition, reading, and impaired vision.

PSY 5034. Psychobiology of Vision. (3 cr. §NSC 5034. Prereq–3031 or #)
Analysis of the properties and biological bases of visual perception in humans and animals. Emphasis on color vision, visual sensitivity and adaptation, nerve cells and circuits in the eye, structure and function of the visual brain.

PSY 5036W. Computational Vision. (3 cr. Prereq–[[3031 or 3051], [MATH 1272 or equiv]] or #)
Applications of psychology, neuroscience, computer science to design principles underlying visual perception, visual cognition, action. Compares biological/physical processing of images with respect to image formation, perceptual organization, object perception, recognition, navigation, motor control.

PSY 5037. Psychology of Hearing. (3 cr. §NSC 5037. Prereq–3031 or #)
Biological and physical aspects of hearing, auditory psychophysics, theories and models of hearing, perception of complex sounds including music and speech, clinical, and other applications.

PSY 5038W. Introduction to Neural Networks. (3 cr. Prereq–[[3061 or NSC 3102], Math 2243] or #)
Parallel distributed processing models in neural/cognitive science. Linear models, Hebbian rules, self-organization, non-linear networks, optimization, representation of information. Applications to sensory processing, perception, learning, memory.

PSY 5051W. Psychology of Human-Machine Interaction. (3 cr. Prereq–3031 or 3051 or #)
Cognitive-science approach to human-machine interaction. Analysis of human errors, human-machine system evaluation, human-computer interaction, bionic interfaces, adaptive technology for visually impaired people.

PSY 5054. Psychology of Language. (3 cr. Prereq–3005w or honors or grad student)
Theories/experimental evidence in past/present conceptions of psychology of language.

PSY 5061. Neurobiology of Behavior. (3 cr. §PSY 3061. Prereq–3005W or BIOL 1009 or #)
Physiological/neuroanatomical mechanisms underlying behavior of animals, including humans. Neural basis of learning/memory, sleep, wakefulness, and attention processes. Effects of drugs on behavior.

PSY 5062. Cognitive Neuropsychology. (3 cr. Prereq–3031 or 3051)
Consequences of different types of brain damage on human perception/cognition. Neural mechanisms of normal perceptual/cognitive functions. Vision/attention disorders, split brain, language deficits, memory disorders, central planning deficits. Emphasizes function/phenomenology. Minimal amount of brain anatomy.

PSY 5064. Brain and Emotion. (3 cr; A-F only. Prereq–3061 or 5061 or #)
Introduction to affective neuroscience. Focuses on how brain promotes emotional behavior in animals/humans. Biological theories of emotion reviewed in historical, current theoretical contexts. Research related to specific "basic" emotions, including brain substrates for fear, sadness, pleasure, attachment. Implications for understanding emotional development, vulnerability to psychiatric disorders.

PSY 5101. Personality Psychology. (3 cr. §PSY 3101. Prereq–§: 3101; 3005W, [honors or grad student])
Theories and major issues/findings on personality functioning, personality structure, and personality assessment. Historically important and currently influential perspectives.

PSY 5135. Psychology of Individual Differences. (3 cr. §PSY 3135. Prereq–3005W or 5862 or equiv or #)
Differential methods in study of human behavior. Psychological traits. Influence of age, sex, heredity, and environment in individual/group differences in ability, personality, interests, and social attitudes.

PSY 5137. Introduction to Behavioral Genetics. (3 cr. Prereq–3005W or equiv or #)
Genetic methods for studying human/animal behavior. Emphasizes nature/origin of individual differences in behavior. Twin and adoption methods. Cytogenetics, molecular genetics, linkage/association studies.

PSY 5138. Psychology of Aging. (3 cr. Prereq–3005W or equiv)
Theories/findings concerning age-related changes in mental health, personality, cognitive functioning, productivity are reviewed/interpreted within context of multiple biological, social, and psychological changes that accompany age.

PSY 5202. Attitudes and Social Behavior. (3 cr. Prereq–3201 or #)
Theory/research in social psychology, other fields in psychology of attitudes, beliefs, values. These fields' relationship to social behavior. Principles/theories of persuasion.

PSY 5204. Psychology of Interpersonal Relationships. (3 cr; A-F only. Prereq–[Honors or grad student], #)
Introduction to interpersonal relationship theory/research findings. Emphasizes conceptual/methodological issues.

PSY 5205. Applied Social Psychology. (3 cr. Prereq–3201 or grad student or #)
Applications of social psychology research/theory to domains such as physical/mental health, education, the media, desegregation, the legal system, energy conservation, public policy.

PSY 5206. Social Psychology and Health Behavior. (3 cr; A-F only. Prereq–3201 or grad student or #)
Survey of social psychological theory/research pertaining to processes by which people develop beliefs about health/illness. Relationship between these beliefs, adoption of health-relevant behavior. Effect of psychological factors on physical health.

PSY 5207. Personality and Social Behavior. (3 cr; A-F only. Prereq–3101 or 3201 or honors or grad student or #)
Conceptual/methodological strategies for scientific study of individuals and their social worlds. Applications of theory/research to issues of self, identity, and social interaction.

PSY 5501. Vocational and Occupational Health Psychology. (3 cr. Prereq–3005 or #)
Survey of history, concepts, theories, methods, and findings of vocational/occupational health psychology. Burnout, personality, violence, stressors/stress-relations, counter productive behaviors, coping in workplace. Vocational development/assessment, career decision-making/counseling, person-environment fit.

PSY 5604H. Abnormal Psychology. (3 cr. §PSY 3604. Prereq–honors or grad student or #)
Comprehensive review of psychopathological disorders. Etiology, diagnostic criteria, clinical research findings.

PSY 5606. Clinical Psychophysiology. (3 cr. Prereq–3005 or equiv, 3061 or 5061, 3604 or 5604 or #)
How psychophysiological methods such as autonomic and central nervous system recording are used in the study of major psychopathological disorders.

PSY 5707. Personnel Psychology. (4 cr. Prereq–[[3005W or equiv], 3711] or #)
Application of psychological research/theory to organizational staffing, evaluation, and training. Principles of individual differences and psychological measurement applied to decision making, staffing, and instruction in organizations. Job analysis, recruitment, screening, selection, performance appraisals, criterion measurement, organizational training, learning, aptitude treatment interactions.

PSY 5708. Organizational Psychology. (4 cr. §PSY 5702, PSY 5705. Prereq–[[3005W or equiv], 3711] or #)
Psychological causes of behavior in work organizations. Consequences for individual fulfillment and organizational effectiveness. Individual differences, social perception, motivation, stress, job design, leadership, job satisfaction, teamwork, organizational culture.

PSY 5862. Psychological Measurement: Theory and Methods. (3 cr. Prereq–4801 or equiv)
Types of measurements (tests, scales, inventories) and their construction. Theory/measurement of reliability/validity.

PSY 5865. Advanced Psychological and Educational Measurement. (4 cr. §EPSY 8222. Prereq–5862 or #)
Topics in test theory. Classical reliability/validity theory/methods, generalizability theory. Linking, scaling, equating. Item response theory, methods for dichotomous/polytomous responses. Comparisons between classical, item response theory methods in instrument construction.

PSY 5960. Topics in Psychology. (1-4 cr [max 8 cr]. Prereq–1001, [jr or sr or grad student])
Special course or seminar. Topics listed in psychology office.

Public Affairs (PA)

Humphrey Institute of Public Affairs

PA 1490. Topics in Social Policy. (1-3 cr [max 9 cr])
Topics in social policy.

PA 1907W. Freshman Seminar: Cultural Diversity. (1-3 cr [max 6 cr]. Prereq–Freshman)
Reading, discussion, critical analysis, writing. Intensive, small-group setting.

PA 1961W. Personal Leadership in the University. (3 cr. §EDPA 1301W)
Introduction to leadership theory, personal development, interpersonal relations, leadership at University of Minnesota. Personal assessment, written/verbal presentation, resume writing, electronic communication, goal setting, coping with group dynamics.

PA 1990. General Topics in Public Policy. (1-3 cr [max 9 cr])
General topics in public policy.

PA 3003. Nonprofit and Public Financial Analysis and Budgeting. (3 cr; A-F only)
Financial/budget documents from nonprofit/public organizations. Emphasizes conceptual frameworks analytical techniques applied to real-world problems.

PA 3401. The Arts of Liberty: Educating for Democracy in Information Age. (3 cr)
"Hands-on" approach to education for democracy. Core concepts and their different meanings in American history, especially ideas of freedom, work, and democracy. Students participate in community projects, either through the Jane Addams School or as "democratic coaches" for teams of young people. Two essays and a journal.

PA 3961W. Leadership, You, and Your Community. (3 cr. §EDPA 3302W. Prereq–[1961W or EDPA 1301W], [jr or sr])
Leadership, leadership capacities. Multicultural/multidimensional perspectives. Students examine their views on leadership. Leadership theory/practice. Group dynamics/behavior. Applying knowledge to practice.

PA 3971. Leadership Minor Field Experience. (2 cr; A-F only. §EDPA 3402. Prereq–3961W or EDPA 3302W)
Core leadership course information applied to leadership situations. Settings include community or educational organizations, corporations, University student organizations, and formal internships. Students identify two leadership objectives from among personal, interpersonal, and organizational development. Experiential learning, individual presentations, group discussions, critical reflection/writing.

PA 3990. General Topics in Public Policy. (1-3 cr [max 9 cr])
General topics in public policy.

PA 4101. Nonprofit Management and Governance. (3 cr)
Managing/governing nonprofit/public organizations. Theories, concepts, real-world examples. Governance systems, strategic management practices, effect of different funding environments, management of multiple constituencies.

PA 4190. Topics in Public and Nonprofit Leadership and Management. (3 cr [max 9 cr])
Topics in public/nonprofit leadership/management.

PA 4200. Urban and Regional Planning. (3 cr)
Fundamental principles of urban/regional land-use planning. Introduction to planning theory and its applications. Political-economic context of urban/regional planning.

PA 4290. Topics in Planning. (1-3 cr [max 12 cr]; A-F only)
Topics in social policy.

PA 4421. Racial Inequality and Public Policy. (3 cr)
Historical roots of racial inequality in American society. Contemporary economic consequences. Public policy responses to racial inequality. Emphasizes thinking/analysis that is critical of strategies offered for reducing racism and racial economic inequality.

PA 4490. Topics in Social Policy. (3 cr [max 9 cr])
Topics in social policy.

PA 4961W. Self-developed Leadership in the World. (3 cr; A-F only. §EDPA 4303W. Prereq–3971 or EDPA 3402)
Leadership theory, community building/social change, systems thinking. Students conduct/present research on leadership models through literature review, internships, and study groups. Student groups produce major paper describing research project. Students assemble portfolio, participate in two-day leadership retreat.

PA 5001. Intellectual Foundations of Public Action. (1.5 cr; A-F only. Prereq–Major in publ aff or publ policy or sci, tech, and environ policy or urban and regional planning or publ hlth or #)
Evolution of intellectual approaches that underlie public planning, management, and policy analysis as strategies for public action. How public decision making is shaped by knowledge and values; role of rationality. Conceptual approaches to public action along descriptive/normative lines and structure/process lines.

PA 5002. Introduction to Policy Analysis. (1.5 cr; A-F only. Prereq–Major in public policy or #)
Process of public policy analysis from problem structuring to communication of findings. Commonly used analytical methods. Alternative models of analytical problem resolution.

PA 5003. Introduction to Financial Analysis and Management. (1.5 cr; A-F only. Prereq–Major in public policy or #)
Basic finance/accounting concepts/tools used in public/nonprofit organizations. Fund accounting, balance sheet and income statement analysis, cash flow analysis, and public/nonprofit sector budgeting processes. Lectures, discussions. Cases/examples from nonprofit and public sector organizations.

PA 5004. Introduction to Planning. (3 cr; A-F only. Prereq–Major in urban/regional planning or #)
History, institutional development of urban planning as a profession. Intellectual foundations, planning theory. Roles of urban planners in U.S./international settings. Scope, legitimacy, limitations of planning and of planning process. Issues in planning ethics and in planning in settings of diverse populations/stakeholders.

PA 5011. Public Management and Leadership. (3 cr; A-F only. Prereq–Major in public policy or #)
Challenges facing higher-level managers in public/nonprofit organizations in a mixed economy and democratic republic. Distinctive features of public/nonprofit management, skills necessary for effective management, manager's role as creator of public value. Lectures, case discussions.

PA 5012. The Politics of Public AffAIRs. (3 cr; A-F only. Prereq–Major in public policy or [sci, tech, and environ policy] or #)
Stages of policy making from agenda setting to implementation. Role/behavior of political institutions (courts, legislatures, executives, bureaucracies) and citizens, social movements, and interest groups. Concepts of political philosophy. Theories of the state. Team taught, interdisciplinary course. Small discussion sections.

PA 5013. Law and Urban Land Use. (1.5 cr; A-F only. Prereq–Major in urban/regional planning or #)
Role of law in regulating/shaping urban development, land use, environmental quality, and local/regional governmental services. Interface between public/private sector.

PA 5021. Economics For Policy Analysis and Planning I. (3 cr; A-F only. Prereq–[[ECON 1101 or equiv], Major in public policy or [sci, tech, and environ policy]] or #)
Introduction to tools useful for public policy: intermediate microeconomics, macroeconomics, concepts of international trade.

PA 5022. Economics For Policy Analysis and Planning II. (1.5-3 cr [max 4.5 cr]; A-F only. Prereq–[[5021 or equiv], public policy major] or #)
Application of economic reasoning to various public policy issues. Cost-benefit analysis, nonmarket valuation, and tax analysis.

PA 5031. Empirical Analysis I. (4 cr; A-F only. Prereq–Major in publ policy or [sci, tech, and environ policy] or urban/regional planning or #)
Basic statistical tools for empirical analysis of public policy alternatives. Frequency distributions, descriptive statistics, elementary probability and probability distributions, statistical inference. Estimation and hypothesis testing. Cross-tabulation and chi-square distribution. Analysis of variance, correlation. Simple/multiple regression analysis.

PA 5032. Intermediate Regression Analysis. (1-2 cr [max 2 cr]; A-F only. Prereq–[[5031 or equiv], major in [public policy or [sci, tech, and environ policy]]] or #)
Bivariate/multivariate models of regression analysis, assumptions behind them. Problems using these models when such assumptions are not met.

PA 5033. Multivariate Techniques. (1-2 cr [max 2 cr]; A-F only. Prereq–[[5031 or equiv], major in [public policy or [sci, tech, and environ policy]]] or #; [5032 or equiv] recommended)
Public affairs topics using maximum-likelihood estimation approaches.

PA 5035. Survey Research and Data Collection. (1.5 cr; A-F only. Prereq–[[5031 or equiv], [major in publ policy or [sci, tech, and environ policy] or urban/regional planning]] or #)
Introduction to survey research methods. Emphasizes applications to policy and applied research. Research design choices (e.g., descriptive, experimental, case studies), sampling, variable specification, measurement. Conducting interviews, mailed questionnaires. Qualitative techniques.

PA 5036. Regional Economic Analysis. (1.5 cr. Prereq–Major in public policy or [science, tech, env policy] or urban/regional planning or #)
Economic data analysis techniques for practitioners in planning and economic development working at local/regional levels. Shift-share analysis, economic base model, base multipliers, location quotient analysis, minimum requirements method, economic impact analysis. Individual/group projects.

PA 5037. Regional Demographic Analysis. (1.5 cr. Prereq–Major in public policy; or science, tech, and env. policy; or urban and regional planning; or instructor consent)
Demographic data analysis, population projection techniques for practitioners in planning, social service delivery, and community development at local/regional levels. Population extrapolation using curve fitting methods, demographic indicators, cohort-component method of population projection, estimation of fertility/migration rates, life tables. Individual/group projects.

PA 5101. Management and Governance of Nonprofit Organizations. (3 cr. Prereq–Grad or #)
Draws on theories, concepts, and real world examples to explore critical managerial challenges. Governance systems, strategic management practices, effect of different funding environments, management of multiple constituencies. Different types of nonprofits using economic/behavioral approaches.

PA 5102. Organization Design and Change. (3 cr. Prereq–Grad or #)
Basic concepts related to organizational design decisions. Managerial challenges associated with organizational change in context of public sector agencies and nonprofit organizations. Major forces for change, kinds of change, management of change. Case-based analysis/discussion.

PA 5104. Strategic Human Resource Management. (3 cr)
Theory/practice of developing, utilizing, and aligning human resources to improve culture/outcomes of nonprofit/public organizations. HR strategy, individual diversity, leadership, selection, training, compensation, classification, performance appraisal, future HR practices.

PA 5111. Financial Management in Public and Nonprofit Organizations. (3 cr. Prereq–[5003, grad] or #)
Design, installation, and use of accounting/control systems in public/nonprofit organizations. Public accounting standards/practices, financial administration/reporting, debt management, budgeting, contract/procurement management systems. Lecture, discussion, case analysis.

PA 5112. Public Budgeting. (3 cr. Prereq–Grad student or #)
Budget processes in legislative/executive branches of federal, state, and local government. Program planning evaluation/administration. Techniques of budget/program analysis. Use of budget as policy/management tool. Analysis of fund flows within/among governments.

PA 5113. State and Local Public Finance. (3 cr. Prereq–Grad or #)
Theory/practice of financing. Providing public services at state/local level of government. Emphasizes integrating theory/practice, applying materials to specific policy areas, and documenting wide range of institutional arrangements across/within the 50 states.

PA 5122. Law and Public Affairs. (3 cr. Prereq–Grad or #)
Overview of evolution of American legal system. Role of courts, legislatures, and political actors in changing law. How law is used to change public policy.

PA 5123. Financing Nonprofits: Philosophies and Realities. (3 cr. Prereq–Grad student or #)
Brief history of philanthropy in the United States. Foundation/other sources of funding for nonprofit activity. Philosophies of fundraising/grantmaking. Types of foundations/agencies that fund. Practical approaches to getting/managing money.

PA 5131. Conflict Management: Readings in Theory and Practice. (3 cr. Prereq–Grad or #)
Current theory. Review of conflict resolution strategies. Aspects of interpersonal, group, organizational, and systemic conflict.

PA 5132. Mediation Training. (3 cr. Prereq–Grad or #)
Creating an arena for mediation. Skills/expectations needed to mediate disputes between individuals, among groups: balanced (peer or colleague), imbalanced (power differentials). Role playing, group debriefing, critique. Cases.

PA 5133. Conflict Management Proseminar. (1 cr. Prereq–Grad or #)
Topics in conflict management research/practice. Theoretical implications, practical applications from the perspectives of participants. National/international issues.

PA 5134. Conflict Management Proseminar. (1 cr. Prereq–Grad or #)
Topics in conflict management. Theoretical implications, practical applications from the perspectives of participants. National/international issues.

PA 5142. Public Issues Facilitation Strategies. (1 cr. Prereq–Grad student or #)
Course equips facilitators with processes that encourage civic participation and effective, timely decision-making. Students identify and examine facilitation components and link them to public issues, examine one approach or theory of facilitation and apply it to a case study, and share experiences and cases with other learners.

PA 5143. Teaching Leadership for the Common Good. (1 cr. Prereq–Grad student or #, basic ability to use the Internet and Web browsers)
Introduces learners to main concepts in "Leadership for the Common Good" framework, offers a number of tools and exercises for applying these concepts, and prepares learners to teach others about leadership for the common good.

PA 5190. Topics in Public and Nonprofit Leadership and Management. (1-3 cr [max 9 cr]. Prereq–Grad or #)
Selected topics.

PA 5201W. American Cities I: Population and Housing. (4 cr. §GEOG 5371W. Prereq–Grad or #)
Emergence of North American cities. Residential building cycles, density patterns. Metropolitan housing stocks, supply of housing services. Population/household types. Neighborhood-level patterns of housing use. Housing prices. Intraurban migration. Housing submarkets inside metro areas. Emphasizes linking theory, method, and case studies.

PA 5202W. American Cities II: Land Use, Transportation, and the Urban Economy. (4 cr. §GEOG 5372W. Prereq–Grad student or #)
Urban economy, its locational requirements. Central place theory. Transportation and urban land use, patterns/conflicts. Industrial/commercial land blight. Real estate redevelopment. Historic preservation. Emphasizes links between land use, transportation policy, economic development, and local fiscal issues. U.S.-Canadian contrasts.

PA 5203W. Geographical Perspectives on Planning. (3 cr. §GEOG 3605V, GEOG 3605W, GEOG 5605V, GEOG 5605W. Prereq–Grad student or #)
Includes additional weekly seminar-style meeting and bibliography project on topic selected in consultation with instructor.

PA 5211. Land Use Planning. (3 cr. Prereq–Grad student or #)
Physical/spatial basis for land use planning at community/regional level. Role of public sector in guiding private development. Land use regulations, comprehensive planning, growth management, innovative land use planning/policies.

PA 5212. Managing Urban Growth and Change. (3 cr. Prereq–Grad student or #)
Theory/practice of planning, promoting, and controlling economic growth/change in urban areas. Economic development tools available to state/local policymakers, historic context of their use in the United States. legal, social, and economic implementation constraints. Interactions among economic, social, and demographic trends.

PA 5221. Private Sector Development. (3 cr. Prereq–Grad or #)
Roles of various participants in land development. Investment objectives, effects of regulation. Overview of development process from private/public perspective.

PA 5231. Transit Planning and Management. (3 cr. Prereq–Grad student or #)
Principles/techniques related to implementing transit systems. Historical perspective, characteristics of travel demand, demand management. Evaluating/benchmarking system performance. Transit-oriented development. Analyzing alternative transit modes. System design/finance. Case studies, field projects.

PA 5232. Transportation Policy, Planning, and Deployment. (3 cr. Prereq–Sr or grad student or #)
Development of transportation policy, making of transportation plans, deployment of transportation technologies. Lectures, interactive case studies, role playing.

PA 5251. Strategic Planning and Management. (3 cr; A-F only. Prereq–Grad student or #)
Theory/practice of strategic planning/management for public/nonprofit organizations/networks. Strategic planning process, management systems; stakeholder analyses. Tools/techniques such as purpose expansions, SWOT analyses, oval mapping, portfolio analyses, and logic models.

PA 5252. Strategy and Tactics in Project Planning and Management. (1.5 cr. Prereq–Grad or #)
Planning, analysis, evaluation, and implementation of short-term plans/projects. Technical analyses, interactional elements of completing projects within budget/time constraints. Strategic/tactical choices in planning. Case examples.

PA 5253. Designing Planning and Participation Processes. (3 cr. Prereq–Grad student or #)
Theory/practice of design, implementation, and evaluation of planning/participation processes in an increasingly diverse society. Types of planning. Stakeholders, including typically under-represented groups. Costs/benefits of participation. Participant roles. Planning/participation tools/techniques.

PA 5254. Strategic Planning Tools and Techniques. (1.5 cr; A-F only. Prereq–Grad student or #)
Techniques may include purpose expansions, competitive/collaborative analysis methods, core/distinctive competency identification, portfolio methods, logic and business process models, scenario construction, balanced scorecards, and related strategy mapping tools.

PA 5255. Stakeholder Identification, Analysis, and Influence Techniques. (1.5 cr; A-F only. Prereq–Grad student or #)
Techniques include basic identification, power vs. interest grids, stakeholder influence diagrams, discerning the common good, support vs. opposition matrices, participation planning matrices, and ethical analysis.

PA 5261. Housing Policy. (3 cr; A-F only. §DHA 5463. Prereq–Grad or #)
Institutional/environmental setting for housing policy in the United States. Competing views of solving housing problems through public intervention in the market. Federal/local public sector responses to housing problems.

PA 5271. Geographic Information Systems: Applications in Planning and Policy Analysis. (3 cr. Prereq–Grad student or #)
Introduction to GIS. Applications in public planning and policy analysis. Operational skills in GIS software. Mapping analysis of U.S. Census material. Local/state government management/planning. Spatial statistical analysis for policy/planning.

PA 5290. Topics in Planning. (1-3 cr [max 9 cr]. Prereq–Grad student or #)
Selected topics.

PA 5301. Population Methods and Issues for the United States and Third World. (3 cr. Prereq–Grad student or #)
Basic demographic measures/methodology. Demographic transition, mortality, fertility. Diverse perspectives on nonmarital fertility, marriage, divorce, and cohabitation. Cultural differences in family structure, aging, migration, refugee movements, population policies. Discussion of readings on population growth and environment.

PA 5311. Program Evaluation. (3 cr. Prereq–Grad student or #)
Principal methods, primary applications of evaluation research as applied to policies/programs in health/human services, education, or the environment. Conducting evaluations. Becoming a critical consumer of studies.

PA 5390. Topics in Advanced Policy Analysis Methods. (1-4 cr [max 9 cr]. Prereq–Grad student or #)
Topics in advanced policy analysis methods.

PA 5401. Poverty, Inequality, and Public Policy. (3 cr. Prereq–Grad or #)
Nature/extent of poverty/inequality in the United States, causes/consequences, impact of government programs/policies. Extent/causes of poverty/inequality in other developed/developing countries.

PA 5411. Child Welfare Policy. (3 cr. §SW 5107. Prereq–Grad or publ hlth or non-degree seeking student or #)
Intersection of conceptual orientations of developmental psychology with policies that affect children/families. Demographic, historical, social trends that underlie assumptions driving policies directed at women/children. Projections of future policies.

PA 5412. Aging and Disability Policy. (3 cr. Prereq–Grad or #)
Policy debates concerning populations that are aging or disabled. Students learn/practice analyses in context of important health, social, and economic policy debates. Readings on current theory/evidence.

PA 5421. Racial Inequality and Public Policy. (3 cr. Prereq–Grad or #)
Historical roots of racial inequality in American society. Contemporary economic consequences. Public policy responses to racial inequality. Emphasizes thinking/analysis that is critical of strategies offered for reducing racism and racial economic inequality.

PA 5431. Public Policies on Work and Pay. (3 cr. Prereq–[[PA 5031 or equiv], grad student] or #)
Public policies affecting employment, hours of work, and institutions in labor markets. Public programs impacting wages, unemployment, training, collective bargaining, job security, and workplace governance. Policy implications of the changing nature of work.

PA 5441. Education Policy and the State Legislature. (3 cr. Prereq–Grad or #)
How Minnesota legislature decides K-12 issues. Implications for higher education. How to increase one's influence in process. Discussions with persons who influence statewide educational policy. Presentations. Field trip to state legislature.

PA 5442. Policy Design for Education and Human Development. (3 cr. Prereq–Grad or #)
Designing effective educational policies. Using interdisciplinary approaches to identify/understand core variables (economic, psychological, etc). Work on policy design.

PA 5451. Immigrant Health Issues. (3-4 cr [max 4 cr]. §PUBH 6281. Prereq–Grad student or #)
How to access demographic, health, background information on U.S. immigrants. Characteristics and health needs of immigrants. Designing culturally competent health programs. How to advocate for change to promote immigrant health. Community visits required. Online course.

PA 5452. Immigration and Public Policy. (3 cr. Prereq–Grad student or #)
How to employ an analytical framework to analyze a current immigration policy proposal. Topics vary (e.g., president s guest worker proposal, democratic alternative proposals).

PA 5480. Topics in Race, Ethnicity, and Public Policy. (1-3 cr [max 9 cr]. Prereq–Jr or sr or grad student or #)
Link between race/ethnicity and public policy. How to identify/measure racial/ethnic disparities and their historical/cultural origins and policy impacts and to craft politically feasible remedies. Topics may include criminal justice, housing, child welfare, and education.

PA 5490. Topics in Social Policy. (1-4 cr [max 9 cr]. Prereq–Grad student or #)
Selected topics.

PA 5501. Economic Development I. (2 cr. Prereq–Grad or #)
Economic development theories/strategies at national/regional levels in developing countries and the United States. Redistributive and basic needs strategies, institutional approaches, dependency/Neo-Marxist approaches, gender and development, sustainable development, effects of globalization on workers/communities, public policy responses.

PA 5502. Economic Development II. (2 cr. Prereq–Grad student or #)
Economic development from macroeconomic/open-economy perspective. Sources of economic growth. Agricultural development. Import-substitution industrialization. Endogenous growth models. Population, migration, and human development. Policy reform/adjustment.

PA 5511. Community Economic Development. (3 cr. Prereq–Grad or #)
Contexts/motivations behind community economic development activities. Alternative strategies for organizing/initiating economic development projects. Tools/techniques for economic development analysis/planning (market analysis, feasibility studies, development plans). Implementation at local level.

PA 5521. Development Planning and Policy Analysis. (4 cr. Prereq–[[5031 or equiv], [5501 or equiv], grad student] or #)
Techniques/assumptions of development planning and policy analysis at national, regional, and project levels. Direct/indirect effects of external shocks and government interventions on national/regional economies. Macroeconomic modeling, input-output analysis, social accounting matrices/multipliers, project appraisal/evaluation techniques.

PA 5522. Economic Development Policies in Latin America. (3 cr. Prereq–Grad student or #)
Evolution of economic development policies from import-substituting industrialization policies of 1950s/1960s through beginning of reform in 1970s, economic crisis of 1980s, and reform into 1990s. Emphasizes privatization, economic integration, exchange rate/trade, and domestic/adjustment policies.

PA 5531. Strategies for Sustainable Development: Theory and Practice. (2 cr. Prereq–[Microecon course, grad student] or #)
Economic, environmental, and social aspects of sustainable development. Strategies, methods of implementation, and applications of sustainable development in different economic systems of industrialized/developing countries. Special attention to countries in transition.

PA 5590. Topics in Economic and Community Development. (1-3 cr [max 9 cr]. Prereq–Grad student or #)
Selected topics.

PA 5601. Survey of Women, Law, and Public Policy in the United States. (3 cr. Prereq–Grad or #)
Gendered nature of public policy. Historical analysis of welfare, single motherhood, and protective legislation. How laws structure public policy. How courts are arenas for policy making. Emphasizes employment discrimination and reproductive rights. Differences among women. Intersection of oppression based on class/race/sexual orientation.

PA 5611. Feminist Economics. (2 cr. Prereq–[5021, grad student] or #)
Feminist philosophy, methodology, and economic practice. Feminist perspectives on development and the global economy, work/family. Heterodox traditions in economics.

PA 5690. Topics in Women and Public Policy. (1-3 cr [max 9 cr]. Prereq–Grad student or #)
Selected topics.

PA 5701. Science and State. (3 cr. Prereq–Grad or #)
Relationship between science and contemporary society. Nature of science: its values, processes, and ways of knowing. How science has influenced U.S. political institutions and political/judicial processes. Issues in current debate over U.S. science policy.

PA 5711. Science, Technology, and International Affairs. (3 cr. Prereq–Grad student or #)
Effect of science/technology on relations among nations in such matters as autonomy, national security, economic strength, environment, cultural identity, and international cooperation. Negotiating international agreements with S&T implications.

PA 5721. Energy and Environmental Policy. (3 cr. Prereq–Grad or #)
Impact of energy production/consumption choices on environmental quality, sustainable development, and other economic/social goals. Emphasizes public policy choices for energy/environment, linkages between them.

PA 5722. Environmental and Resource Economics Policy. (3 cr. Prereq–[Intermediate microeconomics, intermediate policy analysis, grad student] or #)
Public policy associated with natural resource use and environmental protection. Develops/applies economic concepts/methodologies/policy mechanisms. Principles of environmental/resource economics. Issues related to renewable/nonrenewable resources and environmental pollution. Focuses on scientific/political aspects of policy.

PA 5790. Topics in Science, Technology, and Environmental Policy. (1-3 cr [max 9 cr]. Prereq–Grad or #)
Selected topics.

PA 5801. Global Public Policy. (3 cr. Prereq–Grad student or #)
Creation of rules, norms, and institutions to regulate global activities. Policy making, from exclusive domain of state to including various nonstate actors. How global policy making regulates interstate, national, and transnational activities. Creation/enforcement of global rules. Applications to international security, political economy, and other topics.

PA 5812. Open Economy Models: An Assessment. (3 cr. Prereq–[Intermediate macroeconomics, trade theory, grad student] or #)
Open economics, implications for policy making/implementation. Issues at level of international/domestic economies.

PA 5890. Topics in Foreign Policy and International AffAIRs. (1-5 cr [max 9 cr]. Prereq–Grad student or #)
Selected topics.

PA 5900. Computer Applications in Public Affairs (Summer). (.5 cr [max 1 cr]; S-N only. Prereq–#)
Introduction to basic computer systems/applications in public affairs practice (e.g., MS Windows, MS Word). Offered summer.

PA 5901. Computer Applications in Public Affairs. (.5-3 cr [max 6 cr]; S-N only. Prereq–#)
Introduction to computer systems/applications in public affairs practice.

PA 5902. Computer Applications in Public Affairs. (.5-3 cr [max 6 cr]; S-N only)
Introduction to computer systems/applications in public affairs practice.

PA 5903. Introduction to Computers and Applications at the Humphrey Institute. (2 cr; S-N only. Prereq–International HHH fellow)
Computers/applications. Basic skills. Software such as MS Word, Excel, PowerPoint, Access. Using Internet, e-mail, search engines (for research), HTML (through Web page creation software).

PA 5910. Developing Your Public Service Career. (1 cr; S-N only. Prereq–Major in [public affairs or public policy or urban/regional planning or [science, technology/environmental policy]] or #)
Students investigate/analyze interests, skills, and abilities and combine them in a career plan. Students develop tools to demonstrate their abilities, document their experiences/knowledge, and explore public service career options.

PA 5912. Politics of Public Affairs and Civic Engagement. (3 cr. Prereq–Grad student or #)
Potential for public affairs professionals to be agents/architects of democracy in a radically changing, diverse, global landscape of governance.

PA 5920. Skills Workshop. (.5-3 cr [max 6 cr]. Prereq–Grad student or #)
Topics on various public policy/planning skills such as lobbying, grantwriting, and project management.

PA 5931. Role of the Media in Public AffAIRs. (3 cr. Prereq–Grad or #)
Historical/contemporary role of news media in defining/shaping public opinion/policy, primarily in the United States. Emphasizes critical research, professional skills in three forms of journalism: hard news coverage, investigative reporting, documentaries. Field experience, practice in governmental public relations.

PA 5941. Leadership for the Common Good. (4 cr. Prereq–Major in public affairs or #)
Personal, team, organizational, visionary, political, and ethical aspects of leadership. Emphasizes building/experiencing a learning community.

PA 5951. Global Commons Seminar. (3 cr [max 6 cr]; S-N only. Prereq–International Hubert H. Humphrey Fellows)
Meets specific needs of International Humphrey Fellows. Topics vary each year depending on the interests and needs of the fellows.

PA 5952. Global Commons Seminar II. (2 cr. Prereq–HHH International fellow)
Research/presentations related to professional development projects. Each week selected students assign readings, deliver a presentation on their professional development project, and distribute a summary of the talk. Presentations are developed in collaboration with at least one faculty specialist in the subject area.

PA 5990. Topics: Public Affairs—General Topics. (.5-3 cr [max 9 cr]. Prereq–Grad student or #)
General topics in public policy.

Public Health (PUBH)

School of Public Health

PUBH 1003. Alcohol and College Life. (1 cr. Prereq–Fr or soph or PSEO)
Facts about how alcohol affects college life. Personal prevention strategies. Maximizing student/campus safety. Web-based distance learning format starts before students arrive on campus.

PUBH 3000. Topics: Public Health. (.5-4 cr [max 80 cr])
New courses or topics of interest in public health.

PUBH 3001. Personal and Community Health. (2 cr)
Fundamental principles of health conservation and disease prevention.

PUBH 3003. Fundamentals of Alcohol and Drug Abuse. (2 cr. §PUBH 3004, PUBH 3005, PUBH 6003)
Scientific, sociocultural, and attitudinal aspects of alcohol and other drug abuse problems. Emphasizes incidence, high-risk populations, prevention, and intervention.

PUBH 3004. Basic Concepts in Personal and Community Health. (4 cr. §PUBH 3003, PUBH 3005, PUBH 6003)
Scientific, sociocultural, and attitudinal aspects of communicable and degenerative diseases, environmental and occupational health hazards, and alcohol and drug problems. Role of education in health conservation, disease control, and drug abuse.

PUBH 3005. Fundamentals of Alcohol and Drug Abuse for Teacher Education. (1 cr. §PUBH 3003, PUBH 3004, PUBH 6003. Prereq–Undergrad in agricultural educ or business/marketing educ or career/technical educ or foundations of educ or [kinesiology, pre-PE] or technology educ or music educ)
Scientific/socio-cultural aspects of alcohol/drug problems. Emphasizes role of education in health conservation and drug abuse prevention.

PUBH 3010. Public Health Approaches to HIV/AIDS. (2 cr. §PUBH 6010. Prereq–College level biology course)
FPrimary, secondary, and tertiary prevention. Community responses to HIV/AIDS in Minnesota. Medical, social service, and political responses.

PUBH 3040. Dying and Death in Contemporary Society: Implications for Intervention. (2 cr [max 4 cr]. §PUBH 6040. Prereq–Jr or sr or #)
Concepts, attitudes, ethics, and lifestyle management in relation to dying, death, grief, and bereavement. Emphasizes intervention/educational aspects for community health/helping professionals and educators.

PUBH 3050. Practicum in Peer Education I. (2 cr; A-F only. Prereq–[Upper div student, [demonstrated hth sci or hlth ed interests], [3001 or ¶3001 or 3004 or ¶3004]], #)
Multiple factors that influence health. Through various health promotion strategies, students build upon or gain skills such as public speaking, needs assessments, program planning, interpersonal communication, and program evaluation.

PUBH 3052. Practicum in Peer Education II. (2 cr; A-F only. Prereq–[Upper div student, [demonstrated hth sci or hlth ed interests], [3001 or ¶3001 or 3004 or ¶3004]], #)
Multiple factors that influence health. Through various health promotion strategies, students build upon or gain skills such as public speaking, needs assessments, program planning, interpersonal communication, and program evaluation.

PUBH 3093. Directed Study: Public Health. (1-4 cr [max 4 cr]. Prereq–#)
Directed study in selected public health problems or current issues.

PUBH 3102. Issues in Environmental and Occupational Health. (3 cr. §PUBH 6102)
Scope of the field of environmental health. Concepts upon which environmental interventions are based. Consulting literature to identify appropriate interventions for community environmental health problems. Online course.

PUBH 3300. Topics: Clinical Research. (1-4 cr [max 8 cr]. Prereq–Jr or sr)
Topics regarding health research in humans.

PUBH 3390. Topics: Epidemiology. (1-4 cr [max 20 cr]. Prereq–Jr or sr)
New course offerings or topics.

PUBH 3639. Prevention: Theory, Practice, and Application in Public Health Services. (3 cr. Prereq–Jr or sr)
Current issues/controversies centered on prevention and health promotion. How they relate to health services and program implementation.

This is Public Health (PUBH) to Youth Development and Research (YoSt) of the Course Description section of the 2006-2008 Undergraduate Catalog for the University of Minnesota, Twin Cities campus.

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PA 5601. Survey of Women, Law, and Public Policy in the United States. (3 cr. Prereq–Grad or #)
Gendered nature of public policy. Historical analysis of welfare, single motherhood, and protective legislation. How laws structure public policy. How courts are arenas for policy making. Emphasizes employment discrimination and reproductive rights. Differences among women. Intersection of oppression based on class/race/sexual orientation.

PA 5611. Feminist Economics. (2 cr. Prereq–[5021, grad student] or #)
Feminist philosophy, methodology, and economic practice. Feminist perspectives on development and the global economy, work/family. Heterodox traditions in economics.

PA 5690. Topics in Women and Public Policy. (1-3 cr [max 9 cr]. Prereq–Grad student or #)
Selected topics.

PA 5701. Science and State. (3 cr. Prereq–Grad or #)
Relationship between science and contemporary society. Nature of science: its values, processes, and ways of knowing. How science has influenced U.S. political institutions and political/judicial processes. Issues in current debate over U.S. science policy.

PA 5711. Science, Technology, and International Affairs. (3 cr. Prereq–Grad student or #)
Effect of science/technology on relations among nations in such matters as autonomy, national security, economic strength, environment, cultural identity, and international cooperation. Negotiating international agreements with S&T implications.

PA 5721. Energy and Environmental Policy. (3 cr. Prereq–Grad or #)
Impact of energy production/consumption choices on environmental quality, sustainable development, and other economic/social goals. Emphasizes public policy choices for energy/environment, linkages between them.

PA 5722. Environmental and Resource Economics Policy. (3 cr. Prereq–[Intermediate microeconomics, intermediate policy analysis, grad student] or #)
Public policy associated with natural resource use and environmental protection. Develops/applies economic concepts/methodologies/policy mechanisms. Principles of environmental/resource economics. Issues related to renewable/nonrenewable resources and environmental pollution. Focuses on scientific/political aspects of policy.

PA 5790. Topics in Science, Technology, and Environmental Policy. (1-3 cr [max 9 cr]. Prereq–Grad or #)
Selected topics.

PA 5801. Global Public Policy. (3 cr. Prereq–Grad student or #)
Creation of rules, norms, and institutions to regulate global activities. Policy making, from exclusive domain of state to including various nonstate actors. How global policy making regulates interstate, national, and transnational activities. Creation/enforcement of global rules. Applications to international security, political economy, and other topics.

PA 5812. Open Economy Models: An Assessment. (3 cr. Prereq–[Intermediate macroeconomics, trade theory, grad student] or #)
Open economics, implications for policy making/implementation. Issues at level of international/domestic economies.

PA 5890. Topics in Foreign Policy and International AffAIRs. (1-5 cr [max 9 cr]. Prereq–Grad student or #)
Selected topics.

PA 5900. Computer Applications in Public Affairs (Summer). (.5 cr [max 1 cr]; S-N only. Prereq–#)
Introduction to basic computer systems/applications in public affairs practice (e.g., MS Windows, MS Word). Offered summer.

PA 5901. Computer Applications in Public Affairs. (.5-3 cr [max 6 cr]; S-N only. Prereq–#)
Introduction to computer systems/applications in public affairs practice.

PA 5902. Computer Applications in Public Affairs. (.5-3 cr [max 6 cr]; S-N only)
Introduction to computer systems/applications in public affairs practice.

PA 5903. Introduction to Computers and Applications at the Humphrey Institute. (2 cr; S-N only. Prereq–International HHH fellow)
Computers/applications. Basic skills. Software such as MS Word, Excel, PowerPoint, Access. Using Internet, e-mail, search engines (for research), HTML (through Web page creation software).

PA 5910. Developing Your Public Service Career. (1 cr; S-N only. Prereq–Major in [public affairs or public policy or urban/regional planning or [science, technology/environmental policy]] or #)
Students investigate/analyze interests, skills, and abilities and combine them in a career plan. Students develop tools to demonstrate their abilities, document their experiences/knowledge, and explore public service career options.

PA 5912. Politics of Public Affairs and Civic Engagement. (3 cr. Prereq–Grad student or #)
Potential for public affairs professionals to be agents/architects of democracy in a radically changing, diverse, global landscape of governance.

PA 5920. Skills Workshop. (.5-3 cr [max 6 cr]. Prereq–Grad student or #)
Topics on various public policy/planning skills such as lobbying, grantwriting, and project management.

PA 5931. Role of the Media in Public AffAIRs. (3 cr. Prereq–Grad or #)
Historical/contemporary role of news media in defining/shaping public opinion/policy, primarily in the United States. Emphasizes critical research, professional skills in three forms of journalism: hard news coverage, investigative reporting, documentaries. Field experience, practice in governmental public relations.

PA 5941. Leadership for the Common Good. (4 cr. Prereq–Major in public affairs or #)
Personal, team, organizational, visionary, political, and ethical aspects of leadership. Emphasizes building/experiencing a learning community.

PA 5951. Global Commons Seminar. (3 cr [max 6 cr]; S-N only. Prereq–International Hubert H. Humphrey Fellows)
Meets specific needs of International Humphrey Fellows. Topics vary each year depending on the interests and needs of the fellows.

PA 5952. Global Commons Seminar II. (2 cr. Prereq–HHH International fellow)
Research/presentations related to professional development projects. Each week selected students assign readings, deliver a presentation on their professional development project, and distribute a summary of the talk. Presentations are developed in collaboration with at least one faculty specialist in the subject area.

PA 5990. Topics: Public Affairs—General Topics. (.5-3 cr [max 9 cr]. Prereq–Grad student or #)
General topics in public policy.

Public Health (PUBH)

School of Public Health

PUBH 1003. Alcohol and College Life. (1 cr. Prereq–Fr or soph or PSEO)
Facts about how alcohol affects college life. Personal prevention strategies. Maximizing student/campus safety. Web-based distance learning format starts before students arrive on campus.

PUBH 3000. Topics: Public Health. (.5-4 cr [max 80 cr])
New courses or topics of interest in public health.

PUBH 3001. Personal and Community Health. (2 cr)
Fundamental principles of health conservation and disease prevention.

PUBH 3003. Fundamentals of Alcohol and Drug Abuse. (2 cr. §PUBH 3004, PUBH 3005, PUBH 6003)
Scientific, sociocultural, and attitudinal aspects of alcohol and other drug abuse problems. Emphasizes incidence, high-risk populations, prevention, and intervention.

PUBH 3004. Basic Concepts in Personal and Community Health. (4 cr. §PUBH 3003, PUBH 3005, PUBH 6003)
Scientific, sociocultural, and attitudinal aspects of communicable and degenerative diseases, environmental and occupational health hazards, and alcohol and drug problems. Role of education in health conservation, disease control, and drug abuse.

PUBH 3005. Fundamentals of Alcohol and Drug Abuse for Teacher Education. (1 cr. §PUBH 3003, PUBH 3004, PUBH 6003. Prereq–Undergrad in agricultural educ or business/marketing educ or career/technical educ or foundations of educ or [kinesiology, pre-PE] or technology educ or music educ)
Scientific/socio-cultural aspects of alcohol/drug problems. Emphasizes role of education in health conservation and drug abuse prevention.

PUBH 3010. Public Health Approaches to HIV/AIDS. (2 cr. §PUBH 6010. Prereq–College level biology course)
FPrimary, secondary, and tertiary prevention. Community responses to HIV/AIDS in Minnesota. Medical, social service, and political responses.

PUBH 3040. Dying and Death in Contemporary Society: Implications for Intervention. (2 cr [max 4 cr]. §PUBH 6040. Prereq–Jr or sr or #)
Concepts, attitudes, ethics, and lifestyle management in relation to dying, death, grief, and bereavement. Emphasizes intervention/educational aspects for community health/helping professionals and educators.

PUBH 3050. Practicum in Peer Education I. (2 cr; A-F only. Prereq–[Upper div student, [demonstrated hth sci or hlth ed interests], [3001 or ¶3001 or 3004 or ¶3004]], #)
Multiple factors that influence health. Through various health promotion strategies, students build upon or gain skills such as public speaking, needs assessments, program planning, interpersonal communication, and program evaluation.

PUBH 3052. Practicum in Peer Education II. (2 cr; A-F only. Prereq–[Upper div student, [demonstrated hth sci or hlth ed interests], [3001 or ¶3001 or 3004 or ¶3004]], #)
Multiple factors that influence health. Through various health promotion strategies, students build upon or gain skills such as public speaking, needs assessments, program planning, interpersonal communication, and program evaluation.

PUBH 3093. Directed Study: Public Health. (1-4 cr [max 4 cr]. Prereq–#)
Directed study in selected public health problems or current issues.

PUBH 3102. Issues in Environmental and Occupational Health. (3 cr. §PUBH 6102)
Scope of the field of environmental health. Concepts upon which environmental interventions are based. Consulting literature to identify appropriate interventions for community environmental health problems. Online course.

PUBH 3300. Topics: Clinical Research. (1-4 cr [max 8 cr]. Prereq–Jr or sr)
Topics regarding health research in humans.

PUBH 3390. Topics: Epidemiology. (1-4 cr [max 20 cr]. Prereq–Jr or sr)
New course offerings or topics.

PUBH 3639. Prevention: Theory, Practice, and Application in Public Health Services. (3 cr. Prereq–Jr or sr)
Current issues/controversies centered on prevention and health promotion. How they relate to health services and program implementation.

PUBH 3801. Health Economics and Policy. (3 cr. §APEC 3801. Prereq–[Principles of microeconomics [APEC 1101 or ECON 1101], knowledge of plane geometry] or #)
Economics of health care markets. Problems faced by consumers and health care services. Builds on basic microeconomic principles of supply and demand for health, health care, health insurance, and role of government. Theoretical/empirical models/ applications.

PUBH 3810. Math Review for Health Economics. (1 cr; S-N only. Prereq–[Jr or sr or grad student], basic calculus, linear algebra)
Calculus, linear algebra. Health economic models, equilibriums, matrix algebra, general function models, exponentials/logarithms. Lecture, working mathematical problems, discussion.

PUBH 3893. Directed Study: Health Services Research and Policy. (1-4 cr [max 20 cr]. Prereq–#)

PUBH 3905. Human Nutrition and Health. (2 cr. §PUBH 6905. Prereq–Jr or sr or #)
Topics of contemporary interest. Concepts/facts about science of human nutrition discussed in relation to personal/community nutrition problems/ concerns. Applied introductory course with labs.

PUBH 5060. Smoking Intervention. (2 cr. Prereq–[Che or MCH or epi MPH] or epi grad student or #)
Impact of smoking on U.S. public health. Review of research on onset/prevention. Factors maintaining dependence, cessation/intervention strategies. Public health campaigns. Public policies, second-hand smoking controversies. International issues.

Radiation Therapy (RTT)

College of Continuing Education

RTT 2001. Radiation Therapy: Radiation Exposure, Imaging, Safety, and Basic Care. (1 cr; A-F only. Prereq–BAS student in radiation therapy program, Δ)
Introduction to technical aspects of radiologic sciences, standard patient care issues, and radiation oncology issues. Structure/function of x-ray equipment. Fundamental concepts of x-ray production, interaction, imaging, and safety. Physical/psychological aspects of patient care. Legal/ ethical values in health care environment.

RTT 2002. Radiation Therapy: Radiation Exposure, Imaging, Safety, and Basic Care Lab. (1 cr; A-F only. Prereq–2001, BAS student in radiation therapy program, Δ)
Fundamental topics of x-ray imaging and patient-care skills in a hands-on environment. Focuses on simulation of procedures and of clinical projects.

RTT 2999. Radiography Certification Credit. (1-40 cr [max 40 cr])
Evaluation of credits earned for certification.

RTT 3001. Radiation Therapy: Introduction to Radiation Therapy. (1 cr; A-F only)
Basic overview of radiation therapy and its role in medicine.

RTT 3100. Radiation Therapy: Mathematics. (2 cr; A-F only)
Basic arithmetic, algebra, geometry, and trigonometry.

RTT 3110. Radiation Therapy: Basic Physics. (2 cr; A-F only)
Basic physics.

RTT 3120. Radiation Physics I. (3 cr; A-F only. Prereq–BAS-RTT student (UMMC))
Physics principles of physics related to ionizing radiation. Production, interactions. Types of radiation, their application to patient treatment. Radiation protection. Technical aspects of RT technology. Treatment modalities, patient set-up. Application re clinical dosimetry and treatment planning. Machine calibration. Quality assurance.

RTT 3121. Radiation Physics II. (3 cr; A-F only. Prereq–BAS-RTT admitted (UMMC))
Electron beam therapy, radiation protection, quality assurance, 3D CRT, beam geometry, beam quality/ characteristics, whole body irradiation, advanced concepts, nuclear transformations.

RTT 3122. Radiation Therapy: Advanced Dosimetry. (2 cr; A-F only. Prereq–Δ)
Modern radiation oncology treatment planning. Cross-sectional anatomy.

RTT 3130. Radiation Therapy: Principles of Oncology I. (3 cr; A-F only)
General principles of radiation oncology. Imaging procedures, concept of disease, disease factors, disease management, treatment results.

RTT 3131. Radiation Therapy: Principles of Oncology II. (3 cr; A-F only)
General principles of radiation oncology. Imaging procedures, concept of disease, disease factors, disease management, treatment results.

RTT 3132. Radiation Therapy: Medical Oncology. (2 cr; A-F only. Prereq–3131, Δ)
Medical oncology principles. Basis for classification/ action of cytotoxic drugs. Chemotherapy regimens, strategies, side effects, effect on radiotherapy patient.

RTT 3140. Radiation Therapy: Radiobiology. (2 cr; A-F only)
Principles of cell response to radiation/hyperthermia.

RTT 3150. Radiation Therapy: Brachytherapy. (1 cr; A-F only)
Principles of radioactivity, its medical uses.

RTT 3160. Radiation Therapy: Methods of Patient Care. (1 cr; A-F only)
Concepts of radiotherapy patient care/management. Physical/psychological concerns.

RTT 3171. Radiation Therapy: Clinical Radiation I. (6 cr [max 7 cr]; A-F only)
Hands-on clinical experience in a working environment.

RTT 3172. Radiation Therapy: Clinical Radiation II. (5 cr; A-F only)
Hands-on clinical experience in a working environment.

RTT 3173. Radiation Therapy: Clinical Radiation III. (9 cr; A-F only)
Hands-on clinical experience in a working environment.

RTT 3174. Radiation Therapy: Clinical Radiation IV. (8 cr; A-F only. Prereq–3171, 3172, 3173, Δ)
Hands-on clinical experience in working environment. Students operate state-of-the-art radiotherapy equipment. Treatment decision-making, procedures, planning.

RTT 3501. Introduction to Radiation Therapy. (2 cr; A-F only. Prereq–BAS-RTT student)
Role of radiation therapy as major modality to treat cancer. Procedures/equipment: simulation, dosimetry, treatment units, charting radiation doses. Introduction to cancer data, epidemiology, spread, staging, treatment. Psychosocial aspects of cancer diagnosis and of patient care interactions. Preparation for clinical rotations.

RTT 3521. Patient Care in Radiation Oncology. (2 cr; A-F only. Prereq–BAS RTT student)
Skills to assess/manage patient side effects and psychological conditions resulting from radiation therapy. Concepts of patient care: vital sign determination, emergency management and CPR, medical-surgical asepsis, infection control, nutrition, tube management, patient examinations. Safety considerations for patient/staff.

RTT 3541. Pathology. (1 cr; A-F only. Prereq–BAS RTT student)
Normal/abnormal development of human cells/ tissues. Focuses on cell structure, function, and kinetics. Cellular adaptation/injury. Inflammation/ repair. Hemodynamics and inherited disorders. Types of growth. Causative factors. Biological behavior of neoplastic disease.

RTT 3551. Radiation Oncology Physics. (3 cr. Prereq–BAS RTT student)
General physics principles. Radiation properties, production/control, measurement of emission, attenuation, transmission. Treatment units. Structure of matter. Principles of radioactivity/decay. Sealed sources to place/implant in tumor volume. Low vs high dose rate brachytherapy. Permanent implant techniques.

RTT 3561. Cross-Sectional Anatomy. (2 cr; A-F only. Prereq–BAS RTT student)
Human anatomy via cross-section and in relationship to radiation oncology. Identifying anatomic structures/interrelationships on successive transverse planes via diagrams and CT scan images. Anatomy lab visits explore gross human anatomy, anatomic relationships of organs. Body structure/function.

RTT 3581. Principles and Practices of Radiation Therapy I. (4 cr; A-F only. Prereq–BAS RTT student)
Introduction to management/treatment of oncology patient. Histology, etiology, anatomy, presenting symptoms, diagnosis, staging, treatment regimens. Simulation procedures, patient positioning/ immobilization, planning requirements, treatment techniques, radiation record keeping, managing side effects. Labs in simulator.

RTT 3596. Clinical Practicum I. (3 cr; A-F only. Prereq–BAS RTT student)
Introduction to clinical practice of a radiation therapist. Under direct supervision students observe/ assist in patient radiation treatments and simulation procedures. Technical skills. Cancer care team.

RTT 3601. Clinical Quality Assurance and Computer Applications. (1 cr; A-F only. Prereq–BAS RTT student)
Quality assurance/management principles. Methods/ frequency/limits on patient treatment records, linear accelerators, simulator equipment. National/state regulations. Radiation oncology computer uses/ applications such as digital imaging, tomography, picture archiving, portal/3-D imaging, treatment verification/planning.

RTT 3696. Clinical Practicum II. (3 cr; A-F only. Prereq–3596, RTT BAS student)
Initial application/integration of principles of radiation therapy practice into clinical setting. Students participate in patient care procedures and perform simple/intermediate-level clinical competency exams.

RTT 3701. Advanced Radiobiology and Radiation Protection. (3 cr; A-F only. Prereq–RTT BAS student)
Principles of radiobiology, radiation protection, and safety in radiation oncology. Physiological interactions: cellular, holistic. Tolerance dose, time-dose relationships, fractionation schemes re clinical practice. Radiation health/safety requirements of regulatory/accreditation agencies. Therapist responsibilities.

RTT 3996. Practicum. (1-2 cr [max 2 cr]; A-F only. Prereq–BAS RTT student, Δ)
Supervised practicum work in radiation therapy setting.

RTT 3999. Radiation Therapy Certification Credit. (1-40 cr [max 40 cr])
Evaluation of credits earned for certification.

RTT 4511. Dosimetry and Treatment Planning. (4 cr; A-F only. Prereq–3551, RTT BAS student)
Basic concepts, Isodose charts/distributions, treatment dose calculations, irregular fields, beam weighting, dose limiting structures, selection of optimal treatment field design and other pertinent dosimetry principles. Emerging technologies, their impact on treatment planning.

RTT 4581. Principles and Practices of Radiation Therapy II. (4 cr; A-F only. Prereq–3581, BAS RTT student)
Advanced principles of applying virtual simulations, three dimensional planning, conformal treatments, including intensity modulated radiation therapy. Natural history, diagnosis/management of cancer disease sites. Technical issues relating to simulation, treatment techniques, electronic record keeping.

RTT 4596. Clinical Practicum III. (6 cr; A-F only. Prereq–3596, 3696)
Application/integration of principles of radiation therapy practice in clinical setting. Patient care procedures. Intermediate-level clinical competency exams: methodology behind treatment technique; critical thinking skills.

RTT 4601. Project. (1 cr; A-F only. Prereq–3696, BAS RTT student)
Guided independent study project. Students research a topic of their choice and present their paper to faculty/students. Students are encouraged to submit paper for publication. Faculty provide guidance/input into development of project.

RTT 4696. Clinical Practicum IV. (3 cr; A-F only. Prereq–3596, 3696, 4596)
Practice of clinical competencies, completion of required advanced level clinical competency exams: methodology behind treatment technique; critical thinking. Students rotate through dosimetry and participate in radiation treatment planning.

RTT 4796. Clinical Practicum V. (3 cr; A-F only. Prereq–3596, 3696, 4596, 4696, BAS RTT student)
Final rotation. Students demonstrate full comprehension of all radiation treatment/simulation procedures. Problem solving. Integration of dosimetric changes in a treatment. Participation in advanced level procedures. Completion of remaining clinical competency exams.

RTT 5281. Scientific Foundations. (3 cr; A-F only. §PT 6281. Prereq–Registered rehab science or PT student)

Recreation Resource Management (RRM)

Department of Forest Resources

College of Food, Agricultural and Natural Resource Sciences

RRM 1001. Orientation and Information Systems. (1 cr; A-F only)
Course planning for RRM majors, careers, liberal education requirements, internships, summer jobs. Mentoring/utilizing alumni contacts. Technical tools in the workplace, lab equipment, software, getting around GUIs, navigating the Internet, preparing documents. Making spreadsheet calculations. Using Lumina and periodical indexes.

RRM 1901. Freshman Seminar. (1 cr. Prereq–Freshman)
In-depth study of issues/topics related to natural resources and the environment. Topics vary each semester.

RRM 1905. Freshman Seminar. (1-3 cr [max 3 cr]. Prereq–Freshman)
In-depth study of issues/topics related to natural resources and the environment. Topics vary each semester.

RRM 3101. Nature and Heritage Based Tourism. (3 cr; A-F only. §RRM 5101)
Interaction of resource based tourism with cultural/natural environments. Impacts of tourism on environment.

RRM 3201. Introduction to Travel and Tourism. (3 cr. §RRM 5201)
Travel/tourism is one of the world's largest industries. Course introduces the nature, structure and complexity of the industry. Begins with overview of travel/tourism definition, evolution of travel/tourism, and magnitude globally. Examine types and functions of various sectors, tourism distribution system and role of various stakeholders in creation/delivery of tourism. Explore motivations for travel as means of understanding demand for tourism.

RRM 42000H. Honors Seminar. (1 cr; A-F only. Prereq–RRM upper div honors, #)
Current topics presented by faculty/students. Lectures, discussions.

RRM 4232W. Managing Recreational Lands. (4 cr; A-F only. §RRM 5232)
Recreation management tools from a public agency perspective. Social carrying capacity, recreation opportunity spectrum, limits of acceptable change, benefits based management, visitor experience/ resource protection. Various projects. Group project to develop a management plan.

RRM 4293. Directed Study. (1-5 cr [max 12 cr]. Prereq–#)
Students select/conduct a study of or project on a topic of personal interest in consultation with faculty member. Documented by initial proposal and reports of accomplishment.

RRM 4801H. Honors Research. (2 cr; A-F only. Prereq–RRM upper div honors or #)
First semester of independent research project supervised by faculty member.

RRM 4802H. Honors Research. (2 cr; A-F only. Prereq–RRM upper div honors, #)
Honors thesis. Oral report.

RRM 5101. Nature and Heritage Based Tourism. (3 cr; A-F only. §RRM 3101. Prereq–Grad student or #)
Interaction of resource based tourism with cultural/natural environments. Impacts of tourism on environment.

RRM 5201. Introduction to Travel and Tourism. (3 cr. §RRM 3201. Prereq–Grad student or #)
Nature, structure and complexity of tourism industry. Overview of travel/tourism: definition, evolution, magnitude globally. Types/functions of various sectors, tourism distribution system, role of various stakeholders in creation/delivery of tourism. Motivations for travel as means of understanding demand for tourism.

RRM 5232. Managing Recreational Lands. (4 cr; A-F only. §RRM 4232W. Prereq–Grad student or #)
Recreation management tools from a public agency perspective. Social carrying capacity, recreation opportunity spectrum, limits of acceptable change, benefits based management, visitor experience/ resource protection. Various projects. Group project to develop a management plan.

RRM 5259. Visitor Behavior Analysis. (3 cr; A-F only. Prereq–RRM major or ENR major or grad student or #)
Application of social science theory/methods to recreation and resource-based tourism visitor behavior. Culture and cultural identity. Influences on behavior. Mitigating environmental impacts. Theory/analysis of surveys, observation, and content. Implications for sustainable resource management.

Recreation, Park, and Leisure Studies (REC)

School of Kinesiology

College of Education and Human Development

REC 1501. Orientation to Leisure and Recreation. (3 cr)
Introduction to the history and development of the parks and recreation movement; sociological, economical, psychological, and political considerations of leisure and recreation in contemporary society; interrelationship between professional and service organizations; orientation to the professional field.

REC 2151. Outdoor and Camp Leadership. (3 cr; A-F only)
Practical and theoretical study of leading groups in outdoor and camp settings. Outdoor leadership skills, expedition planning, emergency procedures and risk management, minimum impact approaches, and working with youth in a camp environment.

REC 3281. Research and Evaluation in Recreation, Park, and Leisure Studies. (4 cr; A-F only. Prereq–1501 or #)
Basic techniques; emphasis on social research and evaluation methodology; survey of present status of recreation and park research and evaluation.

REC 3541W. Recreation Programming. (3 cr; A-F only. Prereq–1501 or #, Rec major)
Various methods, skills, materials needed for planning, developing, implementing, evaluating professional recreation programs for diverse populations in various settings.

REC 3551. Administration and Finance of Leisure Services. (4 cr; A-F only. Prereq–3541 or #, Rec major)
Principles and practices of financing and managing leisure service agencies in the public and private sector.

REC 3601W. Leisure and Human Development. (3 cr)
Exploration of relevant issues concerning many roles of leisure in human development from influence on healthy fetal development to viability until death. Examination of diverse, multicultural perspectives on leisure, its centrality throughout history and influence on how civilizations define themselves.

REC 3796. Senior Internship in Recreation, Park, and Leisure Studies. (1-12 cr [max 15 cr]; S-N only. Prereq–Rec sr, #)
Supervised field experience for pre-professional students in selected agencies.

REC 3993. Directed Study in Recreation, Park, and Leisure Studies. (1-9 cr [max 24 cr]. Prereq–Rec major, #)
Scholarly projects (e.g., library or field research) or demonstration projects.

REC 5101. Foundations of Recreation. (3 cr; A-F only. Prereq–MEd or grad student or #)
Investigation of the rational, sociological, psychological, and philosophical foundations of the recreational use of leisure in contemporary society. Includes a survey of leisure services.

REC 5111. Sports Facilities. (3 cr; A-F only. §KIN 5111. Prereq–Kin or Rec major or #)
Steps in planning and building facilities for athletics, physical education, and sport for college, professional, and public use.

REC 5115. Event Management in Sport. (3 cr; A-F only. Prereq–§: KIN 5115; Grad student, #)
Techniques/principles of planning, funding, and managing sport events. Collegiate championships, non-profit events/benefits, professional events.

REC 5161. Recreation Land Policy. (3 cr; A-F only. Prereq–1501 or 5101 or #)
Historical development of recreational land policy in the United States and related contemporary issues in policy, management, interpretation, and research.

REC 5191. Commercial Recreation and Tourism. (3 cr; A-F only. Prereq–3551 or #)
Scope and development of profit-oriented recreation agencies, including an emphasis on the tourism industry.

REC 5211. Introduction to Therapeutic Recreation. (3 cr; A-F only. Prereq–1501 or ¶5101, rec major or #)
Purposeful intervention; roles of specialist/ recreation therapists in meeting cognitive, physical, emotional, social needs of people with disabling conditions through recreation services; roles of specialist/recreation therapists changing societal attitudes toward illness and disability and the self-concepts of individuals with impairments.

REC 5215. Assess and Monitor Patient/Client Functioning in Recreation Therapy. (3 cr. Prereq–TR major or academic health professional or #; majors A-F only)
Selecting appropriate techniques/tools, analysis of individual p/c supports/deficits. Monitoring/ recording progress in RT and in collaborative services: standard notes; team meetings; on-line reporting for quality assurance, referral, augmentation/termination of services.

REC 5221W. Comprehensive Therapeutic Recreation Services Development and Management. (4 cr. Prereq–5211 or #, rec major)
Guided development of written plans including development of protocols and critical pathways, intervention programs/activities, individual treatment plans and standards for appropriate placement of individuals in group intervention, and management of patient/client service delivery, record keeping, and administrative responsibilities.

REC 5231. Therapeutic Recreation and Diagnostic Groups. (3 cr; A-F only. Prereq–5211 or #)
Definitions, philosophies, methodologies regarding therapeutic recreation services for persons in diagnostic groups of cognitive, physical, sensory, communication, and psychiatric impairments/disabilities. Lectures, group discussion. Presentations by parents, professionals, and self-advocates. Clinical or community practicum assignment.

REC 5241. Functional Intervention: Recreation Therapy in Geriatric Care. (3 cr; A-F only. Prereq–3541 or 5111 or #)
Role of leisure in maintenance of mental, physical, social-emotional health/functioning. Issues relative to prevention of impairment/disability. Rehabilitation, support of vital life involvement, effect on design/delivery of recreation services.

REC 5271. Community Leisure Services for Persons with Disabilities. (3 cr; A-F only. Prereq–1501, Rec major or #)
Exploration and application of concepts and techniques of normalization and least restrictive environment strategies to leisure service delivery in inclusive community settings for a range of individuals with disabilities.

REC 5288. Grant Writing in Human Services. (3 cr; A-F only)
Identify, develop, and procure financial assistance for programs in human services, including education, recreation, and social programs. Skills and strategies for preparing and evaluating competitive proposals for grant support through federal agencies and private foundations or corporations.

REC 5301. Wilderness and Adventure Education. (4 cr; A-F only)
Rationale for, methods in applying wilderness/adventure education programs in education, recreation, corporate, human service settings. Emphasizes adventure/wilderness program management.

REC 5311. Programming Outdoor and Environmental Education. (3 cr; A-F only)
Methods, materials, and settings for developing and conducting environmental and outdoor education programs.

REC 5371. Sport and Society. (3 cr; A-F only. §KIN 5371. Prereq–[3126, grad student] or #)
Sport, sporting processes, social influences, systems, and structures that have effected and exist within/among societies, nations, and cultures. Issues concerning social differentiation. Social concerns such as violence and honesty.

REC 5421. Sport Finance. (3 cr; A-F only. §KIN 5421. Prereq–Grad student or #)
Introduction to financial analysis in sport. Cash flow statements, budgeting issues, traditional/innovative revenue producing strategies available to sport organizations. Discussion, practical analysis of current market.

REC 5461. Foundations of Sport Management. (3 cr; A-F only. Prereq–[Rec or Kin] student or #)
Theories/techniques in administering/managing sport enterprises. Organizational theory/policy. Practical examples of sport management skills/strategies.

REC 5511. Women in Sport and Leisure. (3 cr; A-F only. §KIN 5511)
Critically examines women's involvement in/contributions to sport, physical activity, and leisure.

REC 5601. Sport Management Ethics and Policy. (3 cr; A-F only. §KIN 5601. Prereq–Grad student or # #)
Ethical concepts that underpin or inform sport policies. Evaluating sport policies from a normative point of view. Selected sport policy issues are used to illustrate relevance of ethical considerations in policy development, ethical implications of sport policy.

REC 5631. Programming and Promotion in Sport. (3 cr; A-F only. §KIN 5631. Prereq–Kin or Rec grad student or #)
Introduction to marketing concepts as they apply to sport industry. Consumer behavior, market research, marketing mix, corporate sponsorship, licensing concepts. Discussion, practical application.

REC 5701. Positive Youth Development Programming. (3 cr. Prereq–Upper div undergrad or grad student or #)
Youth development programming for out-of-school time. Philosophy/purpose of youth development programs. Principles/procedures for developing out-of-school time programs.

REC 5801. Legal Aspects of Sport and Recreation. (4 cr; A-F only. Prereq–3551 or 5461 or #)
Legal issues related to recreation, park, and sport programs/facilities with public/private sectors.

REC 5900. Special Topics: Contemporary Issues in Leisure Services. (1-12 cr [max 12 cr])
Contemporary issues emphasizing administrative and supervisory functions for recreation and allied professionals; individual offerings, to be determined by faculty, focus on special issues and professional groups.

REC 5981. Research Methodology in Kinesiology, Recreation, and Sport. (3 cr; A-F only. §KIN 5981. Prereq–MEd or grad student or #)
Defines/reviews various types of research in exercise and sport science, physical education, and recreation studies. Qualitative research, field studies, and introspective research strategies as alternatives to traditional scientific paradigm.

REC 5992. Readings: Recreation. (1-3 cr [max 9 cr]. Prereq–REC major, #)
Independent study under tutorial guidance by faculty member on particular topic(s) not covered in regular coursework.

REC 5995. Problems in Recreation, Park, and Leisure Studies. (1-12 cr [max 30 cr]. Prereq–[MEd or grad student], #)
Independent study of leisure service programs, systems, facilities, or policies. Focuses on conduct of recreation programs. Scholarly projects (e.g., library or field research) or demonstration projects.

Religions in Antiquity (RELA)

Department of Classical and Near Eastern Studies

College of Liberal Arts

RELA 1001. Introduction to the Religions of the World. (3 cr)
An introduction to the major religions of the world and the academic study of religion. Hinduism, Buddhism, Judaism, Christianity, Islam, and some pre-Christian religions of Antiquity.

RELA 1031. Introduction to the Religions of South Asia. (3 cr)
Historical study of the three traditional religions of India: Hinduism, Buddhism, and Jainism through literature, art, and film. General topics include myth, yoga, mysticism, and the religious order of society.

RELA 1034. Introduction to Jewish History and Civilization. (3 cr. §JWST 1034, JWST 3034, RELA 3034)
Jewish history, society, and culture from Second Temple period (5th century BCE) to modern era as illuminated by literature, philosophy, art, film, music, religious law/custom, and artifacts of daily life. Emphasizes political, social, and cultural contexts that shapeddevelopment of Jewish ideas, practices, and institutions.

RELA 1035. Introduction to Christianity. (3 cr; A-F only. §RELA 3035)
Christian traditions throughout history. Emphasizes recurrent themes: reform/renewal, relations between church/society, varieties of spiritual formation, elusive pursuit of Christian unity.

RELA 1082. Jesus in History. (3 cr. §CNES 1082)
Jesus of Nazareth in his original setting. Modern approaches to the historical Jesus. Perspectives and needs of early gospel writers and effects of portrayals of Jesus. Shifting representations of Jesus in new historical and cultural situations. Meets with RelA 1182.

RELA 1083. Jesus the Jew. (3 cr. §CLAS 1083, JWST 1083, JWST 3083, RELA 3083)
Historic figure of Jesus within context of first century Palestinian Judaism. Main groups/institutions of Judaism at time of Jesus. Rabbinic literature/traditions. Works describing Jesus. life/sayings (synoptic gospels). Jesus and the Law, Messianic ideals/expectations, problem of religious authority. Positions regarding Rome, its authority. James and the Jerusalem Church.

RELA 1905. Freshman Seminar. (3 cr)
Topics specified in *Class Schedule*.

RELA 3013W. Biblical Law and Jewish Ethics. (3 cr. §JWST 3013W, JWST 5013, RELA 5013)
Significance of religious law in Judaism. Babylonian background of biblical law. Biblical creation of the person as a legal category. Rabbinic transformations of biblical norms. Covenant in Christianity/Islam. Contemporary Jewish literature/philosophy.

RELA 3034. Introduction to Jewish History and Civilization. (3 cr. §JWST 1034, JWST 3034, RELA 1034)
Jewish history, society, and culture from Second Temple period (5th century BCE) to modern era as illuminated by literature, philosophy, art, film, music, religious law/custom, and artifacts of daily life. Emphasizes political, social, and cultural contexts that shapeddevelopment of Jewish ideas, practices, and institutions.

RELA 3035. Introduction to Christianity. (3 cr; A-F only. §RELA 1035. Prereq–§1035)
Christian traditions throughout history. Emphasizes recurrent themes: reform/renewal, relations between church/society, varieties of spiritual formation, elusive pursuit of Christian unity.

RELA 3036. Islam: Religion and CultureIslam. (3 cr. §ARAB 3036, HIST 3493, HUM 3036)
Religion of Islam, faith, practices, sectarian splintering, expansion outside original home to status of world religion, institutions, status in world societies - Asia, Europe, Americas.

RELA 3072. The New Testament. (3 cr. §CNES 3072, CNES 5072, RELA 5072)
Early Jesus movement in its cultural and historical setting: origins in Judaism; traditions about Jesus; Paul, his controversies and interpreters; questions of authority, religious practice, and structure; emergence of the canon of scripture. Contemporary methods of New Testament study.

RELA 3072H. Honors Course: The New Testament. (4 cr. Prereq–Honors)
Early Jesus movement in its cultural/historical setting: origins in Judaism; traditions about Jesus; Paul, his controversies/interpreters; questions of authority, religious practice, structure; emergence of canon. Contemporary methods of New Testament study. Meets with 3072. Additional weekly recitation section.

RELA 3073. Roman Religion and Early Christianity. (3 cr)
Etruscan, Republican religion. Appeal of non-Roman cults. Ruler worship. Christians in Asia Minor, Egypt, and the West. Popular piety, Christian and non-Christian. Rabbinic Judaism. Varieties of Christianity in 2nd and 3rd centuries. Influence of Greco-Roman culture on emerging church. Constantine and Julian.

RELA 3083. Jesus the Jew. (3 cr. §CLAS 1083, JWST 1083, JWST 3083, RELA 1083)
Historic figure of Jesus within context of first century Palestinian Judaism. Main groups/institutions of Judaism at time of Jesus. Rabbinic literature/traditions. Works describing Jesus' life/sayings (synoptic gospels). Jesus and the Law, Messianic ideals/expectations, problem of religious authority. Positions regarding Rome, its authority. James and the Jerusalem Church.

RELA 3112. Jewish Mysticism, Magic, and Kabbalah. (3 cr; A-F only. §JWST 3112, JWST 5112, RELA 5112)
Mystical traditions from early rabbinic traditions to Zohar (Book of Splendor) in 13th century. Literature of heavenly ascent (Hekhalot, Merkavah), Book of Creation (Sefer Yetzirah), precursors of Zohar. the Bahir. Schools of Provence, Gerona, and Zohar. Tension between legal/mystical aspects, magical theurgic techniques, evolution of doctrine of Sefirot, mystical interpretation of Scripture, erotic dimension.

RELA 3115. Mishnah and Midrash in Translation. (3 cr. §JWST 3115, JWST 5115, RELA 5115)
Jewish law studied as a mirror of society and as a way to actualize its value. Consideration of original socioreligious contexts and current applications. Selections include biblical interpretations addressing moral, theological, legal, and literary problems.

RELA 3201. The Bible: Context and Interpretation. (3 cr. §CNES 1201, CNES 3201, JWST 1201, JWST 3201)
Survey of literary and historical narrative texts from the Pentateuch, Joshua, Judges, Samuel, Kings, Ruth. Study of the art of Biblical narrative and major themes of Biblical stories. Comparison with other Ancient Near Eastern Literatures. Literary conventions of the biblical writers.

RELA 3202. Prophecy in Ancient Israel. (3 cr. §ANE 1002, CNES 3202. Prereq–Knowledge of Hebrew not required)
Survey of Israelite prophets, with emphasis on Amos, Hosea, Isaiah, Jeremiah, Ezekiel and Second Isaiah. Prophetic contributions to Israelite religion. Personality of prophets. Politics and prophetic reaction. Textual analysis and Biblical scholarship. Prophecy viewed cross-culturally

RELA 3203. The Bible: Wisdom, Poetry, and Apocalyptic. (3 cr. §ANE 1003, CNES 3203. Prereq–Knowledge of Hebrew not required)
Survey of books of Psalms, Proverbs, Job, Song of Songs, Lamentations, Ecclesiastes (Qoheleth). Characteristics of biblical poetry. Conceptions of Israelite wisdom writing. Traits of early Jewish apocalyptic writing.

RELA 3251. Modern Study of the Old Testament. (3 cr. §ANE 3251. Prereq–No knowledge of Hebrew required)
Methods used in studying the Old Testament, including textual criticism, the anthropological approach, the sociological approach, the history of religion, and the use of archaeology in interpreting the text.

RELA 3501. Ancient Israel: The Origins of Israel in Biblical Traditions. (3 cr. §ANE 3501. Prereq–Hebrew not required)
Foundation of the Hebrew people. Traditions of patriarchal period, development of Israelite religious/legal institution. Ancient Near Eastern context of Israel's origins.

RELA 3502. Ancient Israel: From Conquest to Exile. (3 cr. §CNES 3502, CNES 5502, HIST 3502. Prereq–Hebrew not required; 3501 recommended)
Israelite history in context of what is known from Egyptian, Canaanite, Mesopotamian sources. Focuses on issues raised by archaeological data related to Israelite conquest of Canaan.

RELA 3503. History and Development of Israelite Religion I. (3 cr. §ANE 3503, ANE 5503, CNES 3503, CNES 5503, RELA 5503. Prereq–No knowledge of Hebrew required)
Survey of the evolution of Israelite religion. Cultic practices, law and religion, prophecy, religion and historiography. Relationship to surrounding religious systems.

RELA 3504. Development of Israelite Religion II. (3 cr. §ANE 3504, ANE 5504, RELA 5504)
Ancient Judaism from the Persian restoration (520 BCE) to Roman times (second century CE). Religious, cultural, and historical developments are examined to understand Jewish life, work, and worship under a succession of foreign empires: Persian, Greek, and Roman.

RELA 3535. Death and the Afterlife in the Ancient World. (3 cr. §CNES 3535, CNES 5535, RELA 5535)
Beliefs, attitudes, and behaviors related to death and afterlife found in cultures of ancient Mediterranean and Near East. Literature, funerary art/epitaphs. Archaeological evidence for burial practices and care of dead.

RELA 3993. Directed Studies. (2-4 cr [max 10 cr])
Student works with faculty on a subject decided upon by both.

RELA 5013. Biblical Law and Jewish Ethics. (3 cr. §JWST 3013W, JWST 5013, RELA 3013W)
Significance of religious law in Judaism. Babylonian background of biblical law. Biblical creation of the person as a legal category. Rabbinic transformations of biblical norms. Covenant in Christianity/Islam. Contemporary Jewish literature/philosophy.

RELA 5070. Topics in Ancient Religion. (3 cr [max 18 cr]. §CNES 5070. Prereq–RELA 3071 or 3072 or 3073 or 5071 or 5073 or any RelS course or #)
Study of a specific aspect of religion in Classical and Near Eastern antiquity such as healing cults, magic and divination, Gnosticism, or prophecy and authority. Topics specified in *Class Schedule*.

RELA 5071. Greek and Hellenistic Religions. (3 cr. §CNES 3071, CNES 5071, RELA 3071. Prereq–#)
Greek religion from the Bronze Age to Hellenistic times. Sources include literature, art, and archaeology. Homer and Olympian deities; ritual performance; prayer and sacrifice; temple architecture; death and the afterlife; mystery cults; philosophical religion; Near Eastern salvation religions. Meets with 3071.

RELA 5072. The New Testament. (3 cr. §CNES 3072, CNES 5072, RELA 3072, RELA 5072)
Early Jesus movement in its cultural, historical setting. Origins in Judaism; Jesus traditions. Apostle Paul, his controversies and interpreters. Questions of authority, religious practice, structure; emergence of the canon. Contemporary methods of New Testament study; biblical writings as history and narrative. Meets with 3072.

RELA 5073. Roman Religion and Early Christianity. (3 cr. §CNES 5073)
Etruscan, Republican relgion. Appeal of non-Roman cults. Ruler worship. Christians in Asia Minor, Egypt, and the West. Popular piety, Christian and non-Christian. Rabbinic Judaism. Varieties of Christianity in 2nd and 3rd centuries. Influence of Greco-Roman culture on emerging church. Constantine and Julian.

RELA 5080. New Testament Proseminar. (3 cr [max 18 cr]. §CNES 5080. Prereq–RELA 1082 or 3072 or equiv)
Discussion seminar. Study of some specific aspect of the New Testament and related literature. Topics specified in *Class Schedule*.

RELA 5112. Jewish Mysticism, Magic, and Kabbalah. (3 cr; A-F only. §JWST 3112, JWST 5112, RELA 3112)
Mystical traditions from early rabbinic traditions to Zohar (Book of Splendor) in 13th century. Literature of heavenly ascent (Hekhalot, Merkavah), Book of Creation (Sefer Yetzirah), precursors of Zohar. the Bahir. Schools of Provence, Gerona, and Zohar. Tension between legal/mystical aspects, magical theurgic techniques, evolution of doctrine of Sefirot, mystical interpretation of Scripture, erotic dimension.

RELA 5115. Mishnah and Midrash in Translation. (3 cr. §JWST 3115, JWST 5115, RELA 3115)
Jewish law studies as mirror of society and as way to actualize its value. Original socioreligious contexts, current applications. Selections include biblical interpretations addressing moral, theological, legal, and literary problems.

RELA 5251. Archaeology of Herodian Israel. (3 cr; A-F only. §CNES 5251, RELS 5251. Prereq–One course in [archaeology or ancient history] or grad student)
Archaeological sites in Israel dating to era of Herod the Great (37-4BC). Palaces, religious edifices, and remains from Jewish/gentile settlements throughout the kingdom. Course readings consist of contemporary literary sources and excavation reports.

RELA 5503. History and Development of Israelite Religion I. (3 cr. §ANE 3503, ANE 5503, CNES 3503, CNES 5503, RELA 3503)
Survey of the evolution of Israelite religion. Cultic practices, law and religion, prophecy, religion and historiography. Relationship to surrounding religious systems.

RELA 5504. Development of Israelite Religion II. (3 cr. §ANE 3504, ANE 5504, RELA 3504)
Ancient Judaism from the Persian restoration (520 B.C.E.) to Roman times (2nd century C.E.). Religious, cultural, and historical developments are examined to understand Jewish life, work, and worship under a succession of foreign empires: Persian, Greek, Roman.

RELA 5513. Scripture and Interpretation. (3 cr; A-F only. §JWST 5513)
Idea of divine revelation, its impact upon religion/literature. How history of Bible's creation, transmission, and interpretation helps us think critically about role of idea of revelation in history of religious traditions. What is revelation? How does belief that a text is revealed affect the way it is read within the community for which it constitutes revelation?

RELA 5521. Theory and Method in the Study of Religion. (3 cr. Prereq–Sr or grad student or #)
Fundamental theoretical/methodological issues pertaining to academic study of religion. Influential modern theories of origin, character, and function of religion as a human phenomenon, including psychological, sociological, anthropological, and phenomenological perspectives.

RELA 5535. Death and the Afterlife in the Ancient World. (3 cr. §CNES 3535, CNES 5535, RELA 3535)
Beliefs, attitudes, and behaviors related to death and afterlife found in cultures of ancient Mediterranean and Near East. Literature, funerary art/epitaphs. Archaeological evidence for burial practices and care of dead.

RELA 5993. Directed Studies. (2-4 cr [max 10 cr])
Guided individual reading or study.

Religious Studies (RELS)

Department of Classical and Near Eastern Studies

College of Liberal Arts

RelS 3070. Post-Holocaust Jewish and Christian Theology. (1-4 cr [max 4 cr]; A-F only)
Topics specified in *Class Schedule* and *Course Guide*.

RELS 3521W. History of the Holocaust. (3 cr. §HIST 3727W, JWST 3521W)
Study of the 1933-1945 extermination of six million Jews and others by Nazi Germany on the basis of race. European anti-Semitism, implications of social Darwinism and race theory, perpetrators, victims, onlookers, resistance, and theological responses of Jews and Christians.

RELS 5111. Problems in Historiography and Representation of the Holocaust. (3 cr. Prereq–3521 or 3541 or JWST 3521 or #)
Issues connected with Holocaust. Inclusiveness of other groups, Holocaust versus "Shoah," historiographical conflicts about perpetrators. Problems of representation in literature/art. Problems of narrative theology after Auschwitz.

RELS 5251. Archaeology of Herodian Israel. (3 cr; A-F only. §CNES 5251, RELA 5251. Prereq–One course in [archaeology or ancient history] or grad student)
Archaeological sites in Israel dating to era of Herod the Great (37-4BC). Palaces, religious edifices, and remains from Jewish/gentile settlements throughout the kingdom. Course readings consist of contemporary literary sources and excavation reports.

RelS 5993. Directed Studies. (1-4 cr [max 24 cr])
Directed studies in religion. Credits may vary from term to term to a limit of nine.

Respiratory Care (RC)

College of Continuing Education

RC 2011. Foundations for Clinical Practice of Respiratory Care. (2 cr; A-F only. Prereq–BAS respiratory care major)
Respiratory care profession. Clinical roles, responsibilities, career options. Subspecialties, professional settings. Preparation for clinical practice in respiratory care within a hospital setting. Lab sessions, discussion, simulation, interviews, role-playing.

RC 2021. Patient Care Techniques. (2 cr; A-F only. Prereq–BAS respiratory care major)
Fundamental practice, attitudes, and competencies for all health care providers, including respiratory care. Communication skills, infection control, vital signs, patient assessment. General care techniques of respiratory/nursing personnel. Transfer of patients. Specialized care, including immobilized patients (e.g., mechanical ventilation).

RC 3101. Respiratory Care Modalities and Equipment I. (4 cr; A-F only. Prereq–2210 or equivalent, BAS RC student)
Perform non-invasive monitoring and therapeutic procedures. Medical gas therapy, humidity/aerosol therapy, bronchial drainage, volume expansion therapy. Common aerosol medications. Procedures in context of national practice guidelines: rationale, limitations, hazards/complications. Issues of asepsis and of adaptation to patient needs.

RC 3102. Respiratory Care Modalities and Equipment II. (4 cr; A-F only. Prereq–3101)
Implementation/operation of invasive monitoring and life-support technology for the critically ill. Airway management. Hemodynamic/respiratory monitoring. Mechanical ventilation. Completion of American Heart Association course in advanced cardiac life support (ACLS). Simulated patient care in emergency room or intensive care units.

RC 3201. Cardiopulmonary Patient Assessment. (4 cr; A-F only. Prereq–[2210 or equiv], BAS RC student)
Patient assessment skills to interpret patient data. Chart record, interview, physical exam, medical lab data, pulmonary function reports, electrocardiogram, hemodynamic record, ventilator flow sheet, radiographic imaging. Introduction to cardiopulmonary diseases. Lab emphasizes role playing, practice exams, and assessment.

RC 3301. Clinical Practice I. (3 cr; S-N only. Prereq–BAS respiratory care major)
Clinical rotations at Mayo Medical Center, Rochester. Nine intensive care units, operating room, emergency room, general floor care areas, pulmonary function labs, sleep disorders center, smoking cessation clinic, pulmonary rehabilitation program, home care, outpatient clinic. Supervised performance of procedures, diagnostic testing.

RC 3302. Clinical Practice II. (5 cr; S-N only. Prereq–3301, BAS respiratory care major)
Continued clinical rotations at Mayo Medical Center. Nine intensive care units, operating room, emergency room, general floor care areas, pulmonary function labs, sleep disorders center, smoking cessation clinic, pulmonary rehabilitation program, home care, outpatient clinic. Adult, perinatal, and pediatric critical resp care.

RC 3401. Seminar in Respiratory Care I: Case reports and Fundamentals of Research. (1 cr; A-F only. Prereq–2210)
Critical review of professional medical literature re scientific method and clear writing style. Patient cases for problem solving and critical thinking issues. Collaborative class research project leading to abstract submission. Weekly case conference (pulmonary/critical care medicine or combined critical care). Two-hour seminar.

RC 3402. Seminar in Respiratory Care II: Case reports and Fundamentals of Research. (1 cr; A-F only. Prereq–3401, BAS RC student)
Weekly conferences and seminar of significant respiratory care cases in professional medical literature. Case reviews from standpoint of scientific method and clear writing style. Problem solving, critical thinking strategies. Collaborative class research project leading to submission of abstract.

RC 3501. Advanced Cardiopulmonary Respiratory Physiology and Pathophysiology. (3 cr; A-F only. Prereq–3201, BAS RC student)
Physiology of cardiovascular/pulmonary systems. Adult, pediatric, and perinatal pulmonary and cardiac disorders. Emphasizes presenting assessment, lab evaluation, major pathology, pathophysiologic manifestations, and treatment. Lab observation/measurement of normal and simulated abnormal cardiopulmonary physiology.

RC 4111. Advanced Adult Respiratory Critical Care Techniques. (3 cr; A-F only. Prereq–3102, BAS RC student)
Providing respiratory care to critically ill adults. Emphasizes case examples of cardiopulmonary problems and therapeutic procedures using multi-organ system-wide patient approach. Advanced lab competencies in ventilator management. Critical care monitoring procedures, including hemodynamic monitoring.

RC 4201. Subspecialization in Respiratory Care: Advanced Perinatal and Pediatric Respiratory Care. (2 cr; A-F only. Prereq–3102, BAS RC student)
Role of perinatal/pediatrics specialist as defined by National Board for Respiratory Care (NBRC). Literature on mechanical ventilation, monitoring applied. Emphasizes evidence-based care. Case studies of strategies for extended mechanical ventilation or other forms of long-term support.

RC 4202. Subspecialization in Respiratory Care: Advanced Cardiopulmonary Diagnostics. (2 cr; A-F only. Prereq–3102, BAS RC student)
Preparation for role of advanced pulmonary function technologist and NBRC's CPFT/RPFT board exams. Rationale and methods. Inert gas and body plethysmographic measurement of lung capacity. Diffusion studies. Bronchial provocation. Heart/lung function during maximal exercise. Cases/labs on interpreting results and quality control.

RC 4203. Subspecialization in Respiratory Care: Cardiopulmonary Rehabilitation, Disease Prevention, Case Mgmt. (2 cr; A-F only. Prereq–3102, BAS RC student)
Care for chronically ill patients with lung/heart disorders. Emphasizes respiratory care in the hospital, extended care, and the home. Clinical testing, exercise prescriptions, and practice guidelines for management. Case management and responsibilities unique to respiratory therapist. Preparation for role of certified asthma educator.

RC 4301. Seminar: Research Project and Publication. (2 cr; A-F only. Prereq–3102, BAS respiratory care major)
Students prepare a research project for submission, including assembling a poster, abstract, or manuscript of original research. Research mentors are assigned to allow guided independent study.

RC 4496. Subspecialty Clinical Practicum in Advanced Respiratory Care I. (3 cr; S-N only. Prereq–3302, BAS respiratory care major)
Competencies in areas of advanced-level respiratory care, including clinical subspecialties and related areas important to respiratory care practitioner. A rotation is eight weeks/120 hours of directed clinical experience at facilities within Mayo Health System and UM-affiliated institutions. Maximum two rotations per semester.

RC 4596. Subspecialty Clinical Practicum in Advanced Respiratory Care II. (3 cr; S-N only. Prereq–3302, BAS RC student)
Continued competencies in areas of advanced-level respiratory care, including clinical subspecialties and related areas important to respiratory care practitioner. A rotations is eight weeks/120 hours of directed clinical experience at facilities within Mayo Health System and UM-affiliated institutions. Maximum two rotations per semester.

RC 4993. Directed Study. (1-4 cr [max 4 cr]; A-F only. Prereq–Respiratory care major)
Independent project. Topic arranged with and supervised by respiratory care faculty.

Rhetoric (RHET)

Department of Rhetoric

College of Food, Agricultural and Natural Resource Sciences

RHET 1001. Introduction to Scientific and Technical Communication. (2 cr; A-F only)
Research origins/history. Defining technical communication in professional world. Focuses on audience, purpose, ethics, global communication, and collaboration. Journal articles, student/professional organizations, guest presentations, interviews. Career assessment inventories, in-class/electronic discussions, oral presentations, feasibility report.

RHET 1101. Writing to Inform, Convince, and Persuade. (4 cr; A-F only. §ENGC 1011, ENGC 1011H, ENGC 1012, ENGC 1012H, ENGC 1013, ENGC 1013H, ENGC 1014, ENGC 1014H, ENGC 1015, ENGC 1016, PSTL 1422, PSTL 1423, PSTL 1424)
Writing effectively in an academic setting. Emphasizes analyzing/creating logical arguments. Standards of clarity, cohesion, and correctness.

RHET 1152W. Writing on Issues of Science and Technology. (4 cr; A-F only. Prereq–Exemption from 1101 or equiv)
Ethical, social, and political challenges created by science/technology. Analyzes persuasion strategies through which experts, political decision-makers, and citizens meet these challenges. Bioscience controversies such as cloning, organ transplantation. Controversies over pollution, ozone depletion.

RHET 1223. Oral Presentations in Professional Settings. (3 cr; A-F only. §COMM 1101, COMM 1101H, PSTL 1461)
Techniques for analyzing an audience, determining a purpose, developing an argument, and delivering a presentation. Emphasizes using presentations, basic communication theories.

RHET 1311. The Family in American Experience. (3 cr)
The American family as portrayed in fiction, poetry, drama, and autobiography. Introduction to literature both as artistic and as ideological construct. Analysis of the social critique of American family life.

RHET 1315. The Land in American Experience. (3 cr)
Land in America as idea and as actual space. History of cultural values and the meanings land holds for us. Contrasting views of land, especially those of certain Native American peoples. Rise of the conservation movement and the urbanization of U.S. space.

RHET 1381W. Rhetorical Fictions and 20th Century Conflicts: West Africa, Vietnam, and the Middle East. (4 cr)
Analysis of selected 20th-century documentary novels. Nature of artistic truth in relation to historical truth. Cross-cultural comparisons of responses to impact of Anglo-American policies.

RHET 1910W. Topics: Freshman Seminar. (3 cr. Prereq–Fr)
Topics vary.

RHET 3101. Functional Photography. (3 cr; A-F only)
Basic photographic communication. Emphasizes techniques of producing 35mm color transparencies for use in presentations/publications. Students provide their own camera/film.

RHET 3102. Digital Photography. (2-3 cr [max 3 cr]; A-F only. Prereq–Digital or conventional camera)
Introduction to digital photography. Selecting/using a digital camera. Going digital with a film camera. Editing digital images. Printing/publishing digital images.

RHET 3108. Gender and Ethnicity and the Rhetoric of Science and Technology. (3 cr. Prereq–1101)
How cultural gender roles are affected by science/technology. Influence of gender roles on scientific/technological thinking (e.g., communication strategies, language, image). Values/goals of past/present scientific/technological communities.

RHET 3221W. Theories of Human Communication. (4 cr. Prereq–1101 or 1152 or ENGC 1011 or equiv)
Through lecture, discussion, simulations, and small group work students become familiar with theories and practices of interpersonal, small group, organizational, and scientific, and technical communication.

RHET 3257. Scientific and Technical Presentations. (3 cr. Prereq–1223 or #)
Oral presentation skills for scientific or technical topics. Visual communication, audience analysis, organizing a presentation, presenting complex material. Emphasizes use of computers.

RHET 3266. Group Process, Team Building, and Leadership. (3 cr. Prereq–1223 or equiv or #)
Group processes, team building from perspective of managers/leaders. Communication techniques in small group decision making process. Theories of team/small-group communication. Case studies. Group project for each student.

RHET 3270. Special Topics. (1-3 cr [max 3 cr])
See *Class Schedule*.

RHET 3291. Independent Study. (1-3 cr [max 3 cr]. Prereq–#, Δ)
Supervised reading and research on topics not covered in regularly scheduled offerings. Intended primarily for upper division undergraduate students.

RHET 3302. Science, Religion, and the Search for Human Nature. (3 cr)
Relationship of religion and science as ways of explaining human nature and behavior. Focus on 19th century: impact of Darwin's theory and historical study of Biblical texts. Existentialism and political ecology as modern efforts that problematize "human nature."

RHET 3361. Literature of Social Movements in the United States: 1950 to 2000. (3 cr; A-F only)
Analysis of literature (fictional, nonfictional) of social movements in the United States in last half of 20th century. Artistic truth in relation to historical truth. Roles/obligations of citizens to protest/change social structures.

RHET 3371. Technology, Self, and Society. (3 cr. Prereq–[Jr or sr])
Cultural history of American technology. Social values that technology represents in shifts from handicraft to mass production/consumption to modern transportation, communication, and bioengineering. Ethical issues involved in themes of power, work, identity, and our relation to nature. How technology conditions our way of thinking.

RHET 3376W. Terrorism. (3 cr)
Terrorism is not only an ethical but an international problem. Different cultures have meant different historical trajectories for terrorism. To illustrate this, the course contrasts Algerian, Irish, and Arab terrorism.

RHET 3381. 20th-Century Culture. (3 cr)
Culture represented in historical/political events and arts of the period. Emphasis on European and American painting with units on architecture, literature, film, and theater, as well as a consideration of philosophy and ethics in other disciplines.

RHET 3382W. War. (3 cr)
Claim: If ethics (right/wrong) exist in war, then right/wrong exist everywhere. Students experience this claim through its expression in various arts/humanities media of history, memoir, philosophical meditation, and film.

RHET 3383. In Search of Nature. (3 cr)
The human need for a relationship with nature and the ways we organize our environment to reflect this need. Various images such as the pastoral and wilderness are traced historically. Tensions between rural and urban views of nature.

RHET 3384. From Soil to Civilization: Agriculture and the Emergence of the Modern World. (3 cr; A-F only)
Central importance of emergence of agriculture (i.e., domestication of plants/animals) in development of settled communities, cities, nations, and empires. How it happened, how we know. Differences among agricultural developments on different continents.

RHET 3401. Internet Communication: Tools and Issues. (3 cr. Prereq–Internet access including e-mail, [Netscape 3.0 or higher or equiv])
Current/developing tools/issues of internet-based communication. E-mail, e-commerce, social/cultural context of communication. Discussion topics vary, depending on current issues in existing or emerging technologies. Active online participation required.

RHET 3441. Essentials of Grammar, Punctuation, and Style. (2 cr)
Progressive online instruction, examples of concepts taught, immediate feedback, continual tracking of progress.

RHET 3470. Special Topics in Communication Skills. (2 cr [max 6 cr])
Topics vary, see current *Class Schedule*.

RHET 3562W. Technical and Professional Writing. (4 cr; A-F only. Prereq–[1101 or 1152W or ENGC 1011 or equiv], [jr or sr])
Written/oral communication in professional settings. Gathering information, analyzing audience, assessing conventional formats. Drafting, testing, revising documents. Oral presentation of final reports.

RHET 3577W. Rhetoric, Technology, and the Internet. (3 cr; A-F only. Prereq–[1101 or equiv], [3401 or equiv])
The Internet from a rhetorical perspective. How the Internet is changing language, power to persuade, scientific/technical knowledge, and legal issues such as copyright, privacy, and free speech. Emphasizes how scientific/technical information is conveyed on the Internet. Ethical issues specific to use of computers.

RHET 3671. Visual Rhetoric. (3 cr; A-F only. Prereq–[3562, STC major] or #)
Rhetorical principles applied to visual presentation of information/data in print documents. Students create examples of visual communication and design selected technical publications. Principles of technical writing.

RHET 3672. Project Design and Development . (3 cr; A-F only. Prereq–[3562W, STC major] or #)
Students study, plan, research, design, and develop technical communication print documents, including documentation, brochures, and newsletters. Introduction to workplace project processes. Emphasizes developing production-quality documents.

RHET 3701W. Rhetorical Theory and Scientific and Technical Communication. (4 cr. Prereq–[1101 or 1152W or ENGC 1011 or equiv])
Principles/history of rhetorical theory/criticism. Emphasizes classical theories, especially "Aristotle's Rhetoric." Apply Aristotelian concepts to examples of contemporary communication. Relationship of classical theory to scientific discourse, technical communication.

RHET 4105W. Corporate Video for Technical Communicators. (4 cr; A-F only. Prereq–3562 or equiv or #)
Introduction to products, professionals, and processes of corporate video. Students analyze corporate video; submit a proposal, treatment, and script; maintain a journal; complete an interactive unit on production; and conduct research on a video-related topic of their choice.

RHET 4165. Managerial and Organizational Communication, Planning, and Change. (3 cr; A-F only. Prereq–3266 or #)
A study of organizational theory, communication processes, planning, and change with emphasis on action research in scientific and/or technical settings. Study of organization and management theory to develop organizational consultative skills.

RHET 4196. Internship in Scientific and Technical Communication. (1-3 cr [max 3 cr]; S-N only. Prereq–STC major, #)
Internships sites may include the University, industry, or government agencies. An internship proposal, progress report, internship journal (optional), and final report with a letter from the internship supervisor is required.

RHET 4258. Information-Gathering Techniques in Scientific and Technical Communication. (3 cr; A-F only)
Informational, employment-cycle, and problem-solving interviews. Emphasizes guides, schedules, questioning techniques, and communication theories. Descriptive statistics used to analyze data for various projects.

RHET 4431. Intersections of Scientific and Technical Communication and Law. (3 cr. Prereq–[3562W, [jr or sr or grad student]] or #)
Areas of law relevant to work/interests of scientific/technical communicators. How emerging issues in science/technology are affecting 21st century practice of law. Ownership, access, ethics, information and technology used to frame major topics. Intellectual Property, privacy, health law, and research practice.

RHET 4501. Usability and Human Factors in Technical Communication. (3 cr. Prereq–Sr or grad student or #)
Principles/concepts of human factors/usability testing. Developingobjectives, criteria, and measures. Conducting tests in lab, field, andvirtual environments. Using software programs to analyzequalitative/quantitative data. Lab fee of $36 required for use of theUsability Services Laboratory to conduct usability projects.

RHET 4561. Editing and Style for Technical Communicators. (3 cr. Prereq–[3562, [STC major or grad student]] or #)
Editorial process, style, and ethics for technical subjects. Practice editing skills, cohesion, clarity, coherence, organization, and target audiences for print and online documents. Learn about the writer-editor relationship, mark-up language, electronic editing methods, techniques for editing illustrations and Web content, and copyright issues.

RHET 4562. Theory and Practice in International Business Communication. (3 cr; A-F only. Prereq–3562W or equiv)
Theories/practice in international/intercultural scientific, technical, and business communication. Cultural metaphors, research studies. Interviewing people from other cultures, including international business managers. Case studies.

RHET 4573W. Writing Proposals and Grant Management. (3 cr; A-F only. Prereq–3562W)
Research funding sources. Interpreting an RFP or program announcement. Letters of intent. Grant preparation following guidelines of an RFP or program announcement. Proposals for nonprofits or research/business proposals. Using Microsoft Project.

RHET 4662W. Emerging Technologies in Scientific and Technical Communication. (4 cr; A-F only. Prereq–3562 or equiv)
Creating multimedia, hypertext, online help, and internet documents. Linear/nonlinear design, linking, reading/editing online. Principles of technical communication taught through projects: scripts, online support, mark-up language.

RHET 5001. Introduction to Graduate Studies in Scientific and Technical Communication . (3 cr. Prereq–Jr or sr or grad student)
History of technical communication. Different audiences, purposes, genres, and emerging trends. International/intercultural issues. Students participate within a community of technical communication professionals.

RHET 5111. Information Design: Theory and Practice I. (3 cr; A-F only. Prereq–Grad student or #)
Audience analysis, media selection, message design through various theoretical perspectives, including cognitive/schema, social construction, feminist, intercultural theories. Usability testing, contextual inquiry as means to study effectiveness of messages.

RHET 5112. Information Design: Theory and Practice II. (3 cr; A-F only. Prereq–Grad student or #)
Political, economic, social, and technical aspects of media selection and message design. Media analyses, scripts, budgets, treatments, project-design plans, interactive screens. Online design project.

RHET 5196. Internship in Scientific and Technical Communication. (3-6 cr [max 6 cr]; S-N only. Prereq–STC grad or #)
Internship sites may include the University, industry, or government agencies. An internship proposal, progress report, internship journal (optional), and final report with a letter from the internship supervisor are required.

RHET 5270. Special Topics. (1-3 cr [max 3 cr]; A-F only. Prereq–[[STC or RSTC] [major or grad student]], #)
Topics specified in *Class Schedule*.

RHET 5291. Independent Study. (1-3 cr [max 3 cr]. Prereq–#, Δ)
Supervised reading/research on advanced projects not covered in regularly scheduled offerings.

RHET 5511. Research in Scientific and Technical Communication. (3 cr; A-F only)
Experimental/survey research techniques for quantitative/qualitative methodologies in scientific/technical communication. Face-to-face, phone, focus group interviewing. Questionnaire development, contextual inquiry. Using rating, ranking, q-sort methods. Ethics, experimental bias, inferential statistical analysis.

RHET 5531. Scientific and Technical Communication Course Development and Pedagogy I. (2 cr; A-F only. Prereq–Grad)
Pedagogical philosophy/methodology in beginning writing, speaking, and technical communication class. Introduction to theories underlying teaching/tutoring with technology.

RHET 5532. Scientific and Technical Communication Course Development and Pedagogy II. (1 cr; A-F only. Prereq–5531 or #)
Mentor with faculty, usually concurrently with student's first teaching assignment. Student shares observations, solves teaching problems in seminar setting. Issues facing new teachers. Developing a philosophy of teaching. Focuses on evaluating work in classroom.

RHET 5534. Designing Technical Training for Intercultural Audiences. (3 cr; A-F only)
Select and research a training topic, write learning objectives and outcomes, set the conditions for learning, complete a comprehensive course outline, and one training module.

RHET 5664. Science Writing for Popular Audiences. (3 cr; A-F only. Prereq–RHET 3562 or #)
How science is "translated" for popular audiences. Rhetorical theory used to critique popularized articles. Developing a heuristic for writing articles. Controversial issues surrounding movement from science as "science" to science as "popular."

RHET 5671. Visual Rhetoric. (3 cr. Prereq–Jr or sr or grad student)
Range/development of visuals, especially those in science/technology. Vocabulary for commenting on, criticizing, and creating visuals.

RHET 5775. Major Figures in Rhetorical Tradition: Classical Period. (3 cr)
Classical theories of rhetoric. Epistemological status of rhetoric. Ethical implications of persuasion. Emphasizes "Aristotle's Rhetoric" as founding document. Other figures (e.g., Plato, Isocrates, Cicero, Quintilian).

RHET 5776. Major Figures in Rhetorical Tradition: Modern Era. (3 cr; A-F only)
Aristotelian rhetoric in modern era. Fancis Bacon, scientific revolution. George Campbell, rise of human sciences. Kenneth Burke, semiotics in twentieth century. Perelman/Olbrechts-Tyteca, reconciliation with philosophy.

Russian (RUSS)

Institute of Linguistics, ESL, and Slavic Languages and Literatures

College of Liberal Arts

RUSS 1101. Beginning Russian I. (5 cr)
Listening, speaking, reading, writing.

RUSS 1102. Beginning Russian II. (5 cr. Prereq–1101 or equiv)
Listening, speaking, reading, writing.

RUSS 1304W. Introduction to Russian Literature: 19th-Century Fiction. (3 cr)
Introduction to the study of literature illustrated by materials drawn from Russian literature of the 19th century.

RUSS 1905. Freshman Seminar. (3 cr [max 6 cr]; A-F only)
Topics specified in *Class Schedule*.

RUSS 3001. Intermediate Russian I. (5 cr. Prereq–1102 or equiv)
Conversation, composition, grammar review, translation, readings in literature.

RUSS 3002. Intermediate Russian II. (5 cr. Prereq–3001 or equiv)
Expansion of experience in speaking, reading, and understanding Russian. Reading contemporary texts.

RUSS 3101. Advanced Russian I. (4 cr. Prereq–3002 or equiv)
Advanced grammar, conversation, composition, and reading.

RUSS 3102. Advanced Russian II. (4 cr. Prereq–3101 or equiv)
Advanced grammar, conversation, composition, and reading.

RUSS 3104. Introduction to Literary Analysis. (3 cr. Prereq–3002 or equiv)
Reading and analysis of poetry and prose selections to understand rudiments of studying Russian literature. Readings are in Russian.

RUSS 3105. Russian Poetry and Prose. (3 cr. Prereq–3002)
Appreciation of literary values through stylistic analysis and literary interpretation; analysis of humanistic elements. Readings in Russian.

RUSS 3211. Modern Russian Literature in Translation. (3 cr. §RUSS 5211)
Literary, cultural, and political significance of modern Russian literary works.

RUSS 3311. Russian Major Project. (3 cr; A-F only. Prereq–Advanced Russian major)
Directed research and writing in student's chosen field.

RUSS 3311H. Honors Major Project in Russian. (3-4 cr [max 4 cr]; A-F only. Prereq–Credit will not be granted if credit has been received for RUSS 3311, RUSS 3312; Russ maj, #)
Directed research/writing in student's chosen field.

RUSS 3404. Tolstoy in Translation. (3 cr. §RUSS 5404)
Novels, stories, and philosophical writings of Leo Tolstoy.

RUSS 3407. Stories and Plays of Anton Chekhov in Translation. (3 cr. §RUSS 5407)
Study of literary devices and themes in selected stories and major plays using the intrinsic approach.

RUSS 3409. 19th-Century Russian Novel. (3 cr. §RUSS 5409)
The Russian realistic novel from origin to decline. Social, political, and intellectual circumstances that led to its emergence as the dominant genre of the "age of realism" in Russia.

RUSS 3411. Dostoevsky in Translation. (3 cr. §RUSS 5411)
Novels, stories, and miscellaneous writings of Fyodor Dostoevsky.

RUSS 3421. Literature: Middle Ages to Dostoevsky in Translation. (3 cr. §RUSS 5421)
Russian literature from about 1000 A.D. to mid-19th century; emphasizing writers of the first half of the 19th century.

RUSS 3422. Literature: Tolstoy to the Present in Translation. (3 cr. §RUSS 5422)
Survey of Russian literature from mid-19th century to the present: realism, modernism, feminism and other trends.

RUSS 3512. Russian Art and Culture from Peter I to the Present. (3 cr)
Major trends in Russian visual arts discussed in the context of pertinent social, political, and ideological questions.

RUSS 3601. Methods of Translating Fiction from Russian to English. (3 cr. Prereq–§: 5601; 3102 or equiv)
Learning to appreciate a variety of literary styles through the experience of translation.

RUSS 3900. Topics in Russian Language, Literature, and Culture. (1-4 cr [max 16 cr]. Prereq–1102 for language topics)
Variable topics in Russian language, literature and culture. Consult department for details.

RUSS 3993. Directed Studies. (1-4 cr [max 4 cr]. Prereq–#, Δ, ❑)
Guided individual study.

RUSS 5021. Russia Study Tour. (6-18 cr [max 18 cr]. Prereq–3002 or equiv)
Study of Russian language & culture in an accredited institution in Russia.

RUSS 5104. Introduction to Literary Analysis. (3 cr. Prereq–3002 or equiv)
Reading and analysis of poetry and prose selections to understand rudiments of studying Russian literature. Readings are in Russian.

RUSS 5105. Russian Poetry and Prose. (3 cr. Prereq–3002 or equiv)
Appreciation of literary values through stylistic analysis and literary interpretation; analysis of humanistic elements. Readings in Russian.

RUSS 5211. Modern Russian Literature in Translation. (3 cr. §RUSS 3211)
Literary, cultural, and political significance of modern Russian literary works.

RUSS 5404. Tolstoy in Translation. (3 cr. §RUSS 3404)
Novels, stories, and philosophical writings of Leo Tolstoy.

RUSS 5407. Stories and Plays of Anton Chekhov in Translation. (3 cr. §RUSS 3407)
Study of literary devices and themes in selected stories and major plays using the intrinsic approach.

RUSS 5409. 19th-Century Russian Novel. (3 cr. §RUSS 3409)
The Russian realistic novel from origin to decline; social, political, and intellectual circumstances that led to its emergence as the dominant genre of the "age of realism" in Russia.

RUSS 5411. Dostoevsky in Translation. (3 cr. §RUSS 3411)
Novels, stories, and other writings of Fyodor Dostoevsky.

RUSS 5421. Literature: Middle Ages to Dostoevsky in Translation. (3 cr. §RUSS 3421)
Russian literature from about 1000 A.D. to mid-19th century; emphasizing writers of the first half of the 19th century.

RUSS 5422. Literature: Tolstoy to the Present in Translation. (3 cr. §RUSS 3422)
Survey of Russian literature from mid-19th century to the present: realism, modernism, feminism and other trends.

RUSS 5601. Methods of Translating Fiction from Russian to English. (3 cr. Prereq–§: 3601; 3102 or equiv)
Learning to appreciate a variety of literary styles through the experience of translation.

RUSS 5900. Topics in Russian Language, Literature, and Culture. (1-4 cr [max 3 cr]. Prereq–1102 for language topics)
Variable topics in Russian language, literature, and culture.

RUSS 5993. Directed Studies. (1-4 cr [max 16 cr]. Prereq–#, Δ, ❑)
Guided individual study.

Sanskrit (SKT)

Department of Classical and Near Eastern Studies

College of Liberal Arts

SKT 5001. Beginning Sanskrit. (3 cr)
Introduction to the classical language of ancient India.

SKT 5002. Beginning Sanskrit. (3 cr. Prereq–5001 or equiv)
Introduction to the classical language of ancient India.

SKT 5201. Intermediate Sanskrit. (3 cr. Prereq–5002 or equiv)
Readings in Sanskrit literature.

SKT 5202. Intermediate Sanskrit. (3 cr)
Readings in Sanskrit literature.

SKT 5710. Topics: Language and Literature. (3 cr)
Selected reading and/or study of linguistic problems in Sanskrit.

SKT 5992. Directed Readings. (3 cr. Prereq–5202 or equiv)
Guided individual reading or study.

Scandinavian (SCAN)

Department of German, Scandinavian, and Dutch

College of Liberal Arts

SCAN 1201. Introduction to Scandinavia. (3 cr)
Five Scandinavian countries introduced through literature, art, and film. Historical origins, nationalism, European Union, welfare state, environment, contemporary Scandinavian identity.

SCAN 1904. Topics: Freshman Seminar. (3 cr [max 6 cr]; A-F only. Prereq–Freshman)
Topics specified in *Class Schedule*.

SCAN 1905. Topics: Freshman Seminar. (3 cr [max 6 cr]; A-F only. Prereq–Fr)
Topics specified in *Class Schedule*.

SCAN 1909W. Topics: Freshman Seminar. (3 cr [max 6 cr]; A-F only. Prereq–Freshman)
Topics specified in *Class Schedule*.

SCAN 3011. Readings in Scandinavian Languages. (4 cr. Prereq–[DAN or Nor or SWED][1004 or 4004] or #)
Reading/composition in Danish, Norwegian, and Swedish for advanced proficiency. Introduction to differences between the three languages.

SCAN 3501W. Scandinavian Culture Past and Present. (3 cr)
Cultural, social, and political developments; principal views and core values; major cultural figures; Scandinavian mentality. Readings in translation for nonmajors. Invited lectures on central topics within selected areas of study.

SCAN 3502. Scandinavian Myths. (3 cr)
Literary and cultural investigation of the popular beliefs, myths, and religion of the medieval Scandinavians; the interaction of paganism and Christianity; the reflection of myths in Old Scandinavian literature and art. All readings in English.

SCAN 3503. Scandinavian Folklore. (3 cr)
Literary and folkloristic investigation of Scandinavian folktales and legends. Readings in translation for nonmajors.

SCAN 3504. The Immigrant Experience. (3 cr)
Issues of origin and language, immigration and settlement, traditions and values, culture and politics, and transgressions of boundaries from the old to the new studied through photos, diaries, letters, stories, and novels by Moberg, Rølvaag, Ager, and other pioneers. All readings in translation.

SCAN 3505. Scandinavian Fiction From 1890 to Present. (3 cr)
Modernity's search for new forms to represent changing historical situations. Ibsen, Strindberg, Hamsun, Selma Lagerlöf, Hjalmar Bergman, Pär Lagerkvist, Karen Blixen, Moa Martinson, Tarjei Vesaas, Edith Södergran, Ingmar Bergman, Lars Gustafsson. All readings in translation.

SCAN 3601. Great Literary Works of Scandinavia. (3 cr)
Major literary works from the Middle Ages to the present. Readings in translation.

SCAN 3602. The Literary Fairy Tale in Scandinavia. (3 cr)
Examples of literary fairytales from Scandinavia, especially Hans Christian Andersen. Readings in translation for non-majors.

SCAN 3605. The Scandinavian Short Story. (3 cr)
Short stories by important 19th- and 20th-century authors from all the five Scandinavian countries. Genre theory and practical criticism. Readings in English for non-majors.

SCAN 3612. Images of Scandinavia in Art, Film, and Literature. (3 cr)
Images of Scandinavia(ns) in art, film, and literature by both Scandinavians and foreigners. Images of self-knowledge, self-revelation, and otherness. Representative photos and videos of people, locations, and styles. Readings in English.

SCAN 3613. Children's Literature in Scandinavia. (3 cr)
Analysis and discussion of representative works in Scandinavian children.s literature from picture books to young adult books using a variety of critical methods of interpretation. Taught in English.

SCAN 3618. Scandinavian Drama. (3 cr)
Study of representative plays by Henrik Ibsen, August Strindberg, Hjalmar Bergman, Pär Lagerkvist, Nordahl Grieg, Kjeld Abell, and Ingmar Bergman in the context of modern theater with emphasis on politics and society. All readings in translation.

SCAN 3619. Travel in Literature. (3 cr)
Experiences in literature of Scandinavians going abroad, foreigners coming to Scandinavia. Culture/travel as self-knowledge, self-revelation, otherness. Slides/videos of travel destinations from literature. Readings in English.

SCAN 3634. Scandinavian Women Writers. (3 cr)
Investigation of issues important to women as articulated by Scandinavian women writers. Historical overview of women.s writing in Scandinavia and in-depth investigation of texts by contemporary women writers. All readings in translation.

SCAN 3670. Topics in Scandinavian Studies. (3 cr [max 9 cr])
Topic may focus on a specific author, group of authors, genre, period, or subject matter. Topics specified in *Class Schedule*. Readings in English for nonmajors. May meet with 5670.

SCAN 3993. Directed Studies. (1-4 cr [max 12 cr]. Prereq–#, Δ, ❑)
Guided individual reading and study.

SCAN 4602. Fiction and Film. (3 cr)
Examines film adaptations of classical Scandinavian literary texts and explores similarities and differences between the viewer.s and reader.s experiences in the media of film, drama and epic narration. Includes works by Blixen, Hamsun, Ibsen, Strindberg, Axel, Bergman, Dreyer and Losey.

SCAN 4614. Introduction to Kierkegaard. (3 cr)
The literary, philosophical, theological, and psychological dimensions of Kierkegaard's work. Kierkegaard's influence on 20th-century culture in general and existentialism in particular. Analysis and discussion of selections from Kierkegaard's entire oeuvre. Readings in English.

SCAN 5501. Scandinavian Mythology. (3 cr)
Study of Scandinavian mythology based on primary sources represented by Saxo Grammaticus, Snorri Sturluson.s Edda and Ynglinga Saga, and the Poetic Edda. Myths are analyzed using contemporary critical approaches. All readings in translation.

SCAN 5502. The Icelandic Saga. (3 cr)
Study of the sagas written in 13th-century Iceland. Discussion includes cultural and historical information about medieval Iceland and analysis of a selection of saga texts using contemporary critical approaches. All readings in translation.

SCAN 5613. Contemporary Scandinavian Literature. (3 cr)
An investigation of issues which emerged as extremely important after 1945 in Scandinavia, as articulated by writers and analyzed by researchers in social sciences. All readings in translation.

SCAN 5615. Ibsen and the Beginnings of Modern Drama. (3 cr)
Close reading of Ibsen.s .modern tragedies. from A Doll.s House (1879) to When We Dead Awaken (1899). Focus is on the dialectics between Ibsen and his society, and dramatic structure and staging conventions in the context of modern theater. Readings in English for nonmajors.

SCAN 5616. STRINdberg and the Drama in Revolt and Change. (3 cr)
Strindberg as the master of naturalistic drama and the precursor of modernity in European and American theater. Close reading of plays with emphasis on dramatic structure and staging conventions in the context of modern theater. All readings in English for nonmajors.

SCAN 5670. Topics in Scandinavian Studies. (3 cr [max 9 cr])
Topic may focus on a specific author, group of authors, genre, period, or subject matter. Topics specified in *Class Schedule*. Readings in English for nonmajors. May meet with 3670.

SCAN 5701. Old Norse Language and Literature. (3 cr)
Acquisition of a reading knowledge of Old Norse; linguistic, philological and literary study of Old Norse language and literature.

SCAN 5704. History of the Scandinavian Languages. (3 cr)
Investigation of the development of the Scandinavian languages from the earliest periods to the present.

SCAN 5710. Topics in Old Norse Literature. (3 cr [max 9 cr]. Prereq–5701 or equiv)
Topic may focus on Old Norse prose or poetry. Primary texts read in Old Norse. Critical literature about texts, medieval Icelandic culture in English. Topics specified in *Class Schedule*.

SCAN 5993. Directed Studies. (1-4 cr [max 12 cr]. Prereq–#, Δ, ❑)
Guided individual reading and study.

Slavic (SLAV)

Institute of Linguistics, ESL, and Slavic Languages and Literatures

College of Liberal Arts

SLAV 5900. Topics in Slavic Languages and Literatures. (3 cr)
Topics specified in *Class Schedule*.

Social Work (SW)

School of Social Work

College of Education and Human Development

SW 1001. Introduction to the World of Social Work: A Global Perspective. (3 cr)
Varied dimensions of social work, locally, nationally, and internationally. Origins/emergence of social work as a profession. Effects of worldwide economic/social oppression. Human behavior and the social environment. Child/adult social welfare theories. Policies, programs. Health and mental health. Care at end of life cycle.

SW 1905. Freshman Seminar. (1-3 cr [max 6 cr]. Prereq–Fr)
Interdisciplinary seminar. Topics specified in *Class Schedule*.

SW 2501W. Introduction to Social Justice. (4 cr)
Meanings of social justice. Ways in which social justice advocates work for social change. Focuses on three areas: criminal justice, globalization, and social welfare. Students do service learning in a social justice organization.

SW 3051. Cultural Diversity and the Helping Process. (3 cr)
Ethno-cultural concepts relevant to service delivery. Cross-ethnic issues, practice considerations in human services, issues that produce barriers to services for diverse racial/cultural client groups.

SW 3101. Interventions in Community and Social Policy. (3 cr)
Applying social work skills and values to community organization, social action, and social problems using an ecological framework.

SW 3203. Interventions with Individuals and Groups. (3 cr)
Using an ecological framework, apply social work skills and values to work with individuals and small groups

SW 3301. GLBT Social Movements. (3 cr. §GLBT 3301)
Development of gay, lesbian, bisexual, and transgender (GLBT) social movement historically. Current state of GLBT movement. Readings draw on social movement theory, and GLBT Studies. Interdisciplinary course with classroom and community service learning.

SW 3402. Child Abuse and Neglect: Intervention and Prevention. (3 cr)
Interdisciplinary/comprehensive study of child maltreatment, family violence today. Prevalence, scope, dynamics. Response/preventative strategies for individual, familial, community analysis.

SW 3501. Theories and Practices of Social Change Organizing. (4 cr)
Concepts, theories, and practices of social change organizing. U.S. power relations. Focuses on how people organize to make a difference. Cross-class, multi-racial, and multi-issue organizing. Students do service learning in a social justice organization.

SW 3701. Introduction to Child Maltreatment and Family Violence. (3 cr)
Family violence across lifespan. History, current theories, research, and policies in child maltreatment and family violence. Theories, research, and policies on violence against women (battering, sexual assault, stalking), child maltreatment (physical/sexual abuse, emotional abuse, neglect), and abuse of vulnerable adults (elderly, non-elderly vulnerable populations).

SW 3705. Gender Violence in Global Perspective. (3 cr)
Theories/research on violence in intimate domestic relationships examined through multiple lenses. Overview of interventions in Minnesota, United States, and other societies.

SW 3810. Special Topics. (1-4 cr [max 10 cr]; A-F only)
Topics specified in *Class Schedule*.

SW 4001. Basic Counseling and Interviewing Skills in the Social Work Helping Process. (1 cr; A-F only)
Development/maintenance of a social worker-client helping relationship. Professional values and ethics. Interviewing skills of active listening, empathy, and authenticity. Identifying purpose, roles, and responsibilities through asking questions, reflecting, and clarifying.

SW 4002. Advanced Counseling and Interviewing Skills in the Social Work Helping Process. (1 cr; A-F only. Prereq–4001 or #)
Builds on 4001. Focuses on assessment and on developing reasonable, measurable, and attainable goals. Working with involuntary clients, goal attainment strategies, evaluating progress, and ending.

SW 4501. Senior Seminar in Social Justice. (4 cr. Prereq–2501, 3501)
Capstone course. Students complete a social justice portfolio, do service learning in a social justice organization.

SW 4693. Directed Studies. (1-10 cr [max 10 cr]. Prereq–#)
Guided individual reading or study related to social issues, social work methods, or social work history.

SW 4694. Directed Research. (1-10 cr [max 10 cr]. Prereq–#)
Guided research related to social issues, social work methods, or social work history.

SW 5051. Human Behavior and the Social Environment. (2-3 cr [max 3 cr]; A-F only. Prereq–Grad student or 8 cr social sciences or #)
Social, psychological, biological, and cultural factors of individual and group development as applied to social work practice. Behavior and life-cycle development focusing on diversity and each stage of life. Discuss development in terms of the individual, and in terms of overlapping social systems such as the multigenerational family, culture, community, and society.

SW 5052. Ecologies of Child Development Within Communities of Color. (3 cr. Prereq–Grad or #)
Examine social, affective, and cognitive development of children of color via a life course, ecological systems framework. Family, school, peers, and community are studied as ecological contexts which influence developmental trajectories for these children and youth. Attention is given to poverty, racism, and oppression.

SW 5101. Historical Origins and Contemporary Policies and Programs in Social Welfare. (3-4 cr [max 4 cr]; A-F only. Prereq–Grad or 8 sem cr of social sciences)
Contemporary policies and programs in social welfare are examined in light of their historical origins and evolution. A framework is then developed for analysis of concepts and principles in contemporary social policy for social welfare programs and services. The emergence of the profession of social work also examined.

SW 5105. Women and Public Policy. (3 cr)
Study of feminist organizations; issues and conflicts within organizations and movements; methods and sources for studying feminism.

SW 5107. Child Welfare Policy. (3 cr. §PA 5411. Prereq–Grad or #)
Examine the intersection of conceptual orientations of developmental psychology with policies that affect children and families. Demographic, historic, and social trends underlying the assumptions that drive policies directed at women and children; projections of future policies.

SW 5309. Case Management with Special Populations. (3 cr. Prereq–Grad or non-degree-seeking student or #)
Examine concepts and principles of case management practice with special populations such as older adults, persons with developmental disabilities, and persons with serious and persistent mental illness. The core functions of case management practice in a range of settings are addressed in relationship to issues of diversity, vulnerability, and empowerment.

SW 5313. Social Work with Older Adults. (2 cr. Prereq–Grad or non-degree-seeking student or #)
The practice components of social work with older adults including assessment, intervention, and case management. Taught from the perspective of bio-psycho-social strengths and challenges and within the context of current social policy and delivery systems.

SW 5314. Social Work in the Schools. (2 cr. Prereq–Grad or non-degree-seeking student or #)
Application of social work methods in a school setting. Emphasizes assessment, diagnosis, consultation, advocacy, interdisciplinary team building, and crisis intervention.

SW 5315. Social Work Practice in Hospitals and Health Care Settings. (2 cr. Prereq–Grad or non-degree-seeking student or #)
Prepares students for social work practice in a hospital or health care setting. Focus on integration of conceptual and practice subject matter that covers differential assessment, clinical intervention models, impact of acute and chronic illness, special populations, managed care, legal and ethical issues, interdisciplinary team work, and transition planning in health care.

SW 5316. Brief Treatment and the Task-Centered Approach. (2 cr. §SW 8303. Prereq–§: 8303; grad or non-degree-seeking student or #)
The advent and current prominence of brief treatment models in work with individuals, families, and groups including their theoretical and empirical bases. Practice with diverse populations in a context of managed care. Emphasis on the task-centered approach including skill training and supervised practice.

SW 5317. Social Work With Involuntary Clients. (2 cr. Prereq–Grad or non-degree-seeking student or #)
Includes theory, ethics, effectiveness, and intervention methods for work with client systems that experience involuntary contact with a social worker. Interventions at micro, mezzo, and macro levels are included. Practice in varied settings such as child welfare, mental health, corrections, and public schools as well as practice related to organizational responses to change.

SW 5318. Family Centered Home Based Services. (2 cr. §SW 8314. Prereq–§: 8314; grad or non-degree-seeking student or #)
Ecological, multisystems approach focusing on the family system. Triadic theory, meta-neutrality, strengths-focus, case management and team treatment. Family-based services evaluated for high-risk, multi-problem families and as an alternative to foster placement.

SW 5319. Adolescents: Norms, Culture, and Health. (2 cr)
Relationships among familial, social, societal, political, economic, environmental, psychosocial, and cultural determinants of adolescent behavior that affect health; major public health issues and problems of adolescents.

SW 5481. Child Abuse Prevention I: Research and Theory. (3 cr. Prereq–Bachelor's degree or #)
Foundation of research/theory for level I child abuse prevention studies certificate.

SW 5482. Child Abuse Prevention II: Program Development, Evaluation, and Advocacy. (3 cr. Prereq–5481)
Design and evaluation of policies and programs of interventions to prevent child abuse. This is the second course in the Level I Child Abuse Certificate program.

SW 5483. Child Abuse Prevention III: Skill Building I— Cultural and Legal Issues. (3 cr. Prereq–Bachelor's degree or #)
Risk factors, protective factors, resilience in cultural settings. Identifying/designing strategies appropriate to cultural characteristics. First course for level II child abuse prevention certification.

SW 5484. Child Abuse Prevention IV: Skill Building II— Risk Assessment and Interviewing. (3 cr. Prereq–Bachelor's degree or #)
Designing instruments for child abuse risk assessment. Culturally/ethnically competent interviewing. Ethnographic interviewing. Strengths-based ecosystemic assessment. Strategies for evaluating interventions. Second course for level II child abuse prevention certification.

SW 5519. Mediation and Conflict Resolution. (3 cr. Prereq–§8519)
Develop mediator skills for making informed decisions regarding the appropriateness of mediation for conflicts that frequently confront social worker practitioners such as divorce, neighborhood disputes, conflicts between parents and adolescents, conflicts between spouses, and conflicts between crime victims and offenders.

SW 5525. Global Perspectives on Social Welfare, Peace, and Justice. (3 cr. Prereq–2001 or #)
Role of international social welfare in meeting basic human needs and promoting human rights, social justice, and peace. Theories, models, and social policies in different economic and political systems with emphasis on Third World nations.

SW 5705. Violence in Families. (3 cr. Prereq–§: 5707; grad student or adult special or#)
Prevention/intervention with perpetrators, survivors, and social institutions. Perpetration, effects on victims, social responses to family violence. Child abuse/neglect. Abuse of women/vulnerable adults. Roles of gender, race, culture, age, physical ability, and sexual orientation.

SW 5706. Issues and Interventions in Child Sexual Abuse. (2 cr. Prereq–Grad student or adult special or #)
Major issues/interventions in child sexual abuse. Working with sexually abused children and their families. Perceptions of victims, non-offending parents, perpetrators, and other family members. Interviewing. Justice system. Child protection.

SW 5707. Interventions with Battered Women and Their Families. (2 cr. Prereq–§: 5705; grad or non-degree-seeking student or #)
Current theories, research, and evaluation of interventions with battered women and their families. Focus on practice, e.g., direct work with social institutions, victim-survivors, and assailants and their families.

SW 5708. Substance Abuse and Social Work. (3 cr. Prereq–Grad or non-degree seeking student or #)
Assessment and intervention in situations involving substance abuse with special emphasis on cross cultural practice. Relationships of substance abuse to areas such as child welfare, mental illness, and violence within families are examined.

SW 5709. Applied Psychopharmacology for Human Service Professionals. (2 cr; A-F only)
Categories of psychoactive drugs. Medications to treat mental disorders. Legal drugs such as alcohol, nicotine, cocaine, and marijuana. What is occurring physiologically when someone takes a psychoactive drug.

SW 5711. Co-Occurring Addictive and Mental Health Disorders. (2 cr; A-F only. Prereq–Cannot be taken for cr by MSW students)
Mentally ill, chemically abusive, or dependent clients. Intervention, advocacy, education, and support for client and those who are part of his or her environment. Social, environmental, and multicultural factors. Meets partial state requirements for becoming licensed as an alcohol/drug counselor.

SW 5810. Seminar: Special Topics. (1-4 cr [max 10 cr])
Topics specified in *Class Schedule*.

SW 5811. Social Work Ethics. (2 cr. Prereq–§: 8801, grad student or non-degree seeking student or #)
Acquire knowledge base and develop skills required to identify ethical issues, resolve ethical dilemmas, and make ethical decisions within the context of the professional practice of social work. Values base and ethical standards of the profession and ethical decision-making models examined in-depth.

SW 5813. Child Welfare and the Law. (2 cr. Prereq–2nd yr MSW or advanced standing or #)
Social work practice in juvenile court. Child abuse/neglect reporting laws, risk assessment, reasonable efforts, case plan, custody proceedings, permanency planning, termination of parental rights, child testimony, social worker testimony, adoption laws.

SW 5991. Independent Study in Social Work. (1-4 cr [max 4 cr])
Independent study in areas of special interest to students and faculty.

Sociology (SOC)

Department of Sociology

College of Liberal Arts

SOC 1001. Introduction to Sociology. (4 cr. §SOC 1011V, SOC 1012W)
Scientific study of human societies/behavior. Major theories, methods, concepts, research findings. Characteristics of basic social units, their patterns of interrelation, processes of change.

SOC 1011H. Honors: Introduction to Sociology. (4 cr. §SOC 1001, SOC 1012W. Prereq–Honors)
Scientific study of human societies/behavior. Major theories, methods, concepts, research findings. Characteristics of basic social units, their patterns of interrelation, processes of change.

SOC 1905. Freshman Seminar. (3 cr. Prereq–Freshman or less than 30 credits)
Topics specified in *Class Schedule*.

SOC 3003. Social Problems. (3 cr; A-F only. Prereq–1001 or #)
Analysis of major social problems including, inequality, crime, drug abuse, pollution, racism, among others. Examination of proposed solutions and evaluation of policy consequences.

SOC 3090. Topics in Sociology. (3 cr. Prereq–[1001, soph or above] or #; Soc majors must register A-F)
Topics specified in *Class Schedule*.

SOC 3093. Directed Study. (1-4 cr [max 4 cr]. Prereq–1001, #, Δ, ❑)
Guided individual reading or study at the sophomore level.

SOC 3094. Directed Research. (1-4 cr [max 4 cr]. Prereq–1001, #)
Guided research experience at the sophomore level.

SOC 3101. Introduction to the American Criminal Justice System. (3 cr; A-F only. Prereq–§SOC 3111)
Components, dynamics, and philosophical underpinnings of criminal justice and agencies (law enforcement, courts, corrections).

SOC 3102. Introduction to Criminal Behavior and Social Control. (3 cr. Prereq–Soc majors must register A-F)
Issues in science of crime as a social phenomenon. Creation/use of laws, patterns/causes of crime.

SOC 3201. Inequality: Introduction to Stratification. (3 cr. Prereq–[1001 or equiv], [soc majors must register A-F])
Causes, dimensions, and consequences of inequality in American society. Class, gender, race. Power/status differentials. Cross-national patterns of inequality. Social mobility. Educational/occupational influences. Status attainment. Social stratification and change. Social welfare. Public policies affecting inequality.

SOC 3211W. American Race Relations. (3 cr; A-F only)
Surveys conceptual and theoretical tools sociologists use to study race relations in the United States. Empirical focus on the historical experiences among different racial/ethnic groups in the United States including, American Indians, African-Americans, Latinos, Asian-Americans, and white ethnics.

SOC 3221. Sociology of Gender. (3 cr; A-F only. §WOST 3201. Prereq–1001 or #)
Organization, culture, and dynamics of gender relations as major features of social life. Gender and racial inequalities in the workplace, relationships between gender and race, gender and culture, sexuality, gendered politics, and the women's movement.

SOC 3251W. Sociological Perspectives on Race, Class, and Gender. (3 cr; A-F only. §AFRO 3251W)
Race, class, and gender as aspects of social identity and as features of social organization. Experiences of women of color in the United States; exploration of family life, work, violence, sexuality and reproduction, and the possibilities for social change.

SOC 3301W. Politics and Society. (3 cr; A-F only. Prereq–1001 or #)
Ideas of citizenship. Relationship between politics and society. Public sphere and civil society. Research practicum volunteering at a policy-relevant site using participant observation methods.

SOC 3322W. Social Movements, Protests, and Change. (3 cr. Prereq–1001 or #)
Origins, dynamics, and consequences of social movements. Challenges facing movement organizations. Relationship between movements and political institutions. Role of movements in bringing about social change. Theoretical issues, case studies.

SOC 3411W. Organizations and Society. (3 cr; A-F only. Prereq–1001 or #)
Formal organizations as major social influences in work lives, personality development, social change, and conflict. Life-course analysis of enterprises, bureaucracies, and voluntary organizations. Organizational control, conflict, coordination, and interorganizational sets/relationships.

SOC 3415. Sociology of Consumer Behavior. (3 cr; A-F only. Prereq–1001 or #)
Behaviors related to symbolic value of material goods: how symbols are created, acquired, diffused, and used for organizing personal identity and for maintaining group boundaries. Fashion. Socialization. Structure of retail trade. Role of mass media, advertising, marketing/production strategies. Implications of world-wide markets for manufacturing goods and selling them in retail stores. Readings, classroom discussions, lectures.

SOC 3421W. Sociology of Work. (3 cr; A-F only. Prereq–1001 or #)
Overview of sociological theories and empirical research in study of work. Focuses on work in contemporary American society. History, nature, and organization of work and the U.S. economy. Social aspects/consequences of work for individuals of various races, ethnicities, genders, and ages. Current topics.

For definitions of course numbers, symbols, and abbreviations, see page 300.

SOC 3451W. Cities and Social Change. (3 cr. Prereq–1001 or #)
Survey of social, economic, and cultural foundations of modern city and its people, using theories/models of urbanism from Wirth to Sassen. Migration/ethnic enclaves. Racial segregation and social control. Urban social movements. Urban-suburban divide. Decline of urban liberalism. Contemporary "Brazilianization" of the American city.

SOC 3452. Education and Society. (3 cr. Prereq–Soc majors must register A-F)
Introduction to sociological theories/research about education in modern societies. Effects of education on beliefs/values. Effects of school characteristics on student achievement and educational attainment. Education and inequality. Cross-national differences in educational systems. Link between education and national economic performance. Organizational characteristics of schooling. Prospects for school reform.

SOC 3501. Sociology of Families. (3 cr. Prereq–1001 or #)
Families in contemporary American society. Historical/cross-cultural comparisons. Interrelationships of families with other social institutions. Race, class, and gender in shaping family experiences. Topics may include marriage, divorce, childbearing, parenthood, family violence, gay and lesbian families.

SOC 3511. World Population Problems. (3 cr. Prereq–1001 or #)
Population growth, natural resources, fertility/mortality in less developed nations, population dynamics/forecasts, policies to reduce fertility.

SOC 3613W. Food, Culture, and Society . (3 cr)
Food issues from a sociological perspective. Cross-cultural differences in how groups/societies think about and relate to food.

SOC 3661. Japan and the U.S.: Tides of Change in Race, Class, and Gender. (3 cr; A-F only. Prereq–1001 or courses on or exper in East Asia or #)
Forms of social relations and values, religion, childhood, family, community, education, work, business organization, politics, social classes, crime and deviance, police, popular culture, status of women and minorities, social protest movements, and international relations.

SOC 3701. Social Theory. (4 cr; A-F only. Prereq–1001 or #)
Traditions of social theory that have been basic to sociological knowledge, how they have expanded in contemporary theory, and their applications in selected areas of empirical research.

SOC 3711. Principles of Social Organization. (3 cr; A-F only. Prereq–1001 or equiv)
How and why social organization is possible. Concepts and theories of social structure, primary forms of social organization (groups, communities, networks, formal organizations), basic social processes (integration, differentiation, regulation, change), and how social organization evolves from individual decision making.

SOC 3721. Principles of Social Psychology. (3 cr. Prereq–1001 or #)
Impact of social location on individual attitudes and behaviors, dynamics of interpersonal relationships and small groups, and processes of social interaction.

SOC 3801W. Sociological Research Methods. (4 cr. Prereq–[1001 or 1011V] or #, soc majors must register A-F)
Principles/practice of research design, sampling, data collection including field observation/surveys. Data management, analysis, and reporting of quantitative/nonquantitative data. Ethics/administration in sociological research. Lab.

SOC 3811. Basic Social Statistics. (4 cr. Prereq–GC 0731 or intermediate algebr or #)
Descriptive statistics. Measures of central tendency, deviation, association. Inferential statistics focusing on probability and hypothesis testing. T-tests, Chi-square tests, variance analysis, bivariate regression. Statistical software used to analyze sociological data.

SOC 4090. Topics in Sociology. (3 cr. Prereq–[1001, soph or above] or #; Soc majors must register A-F)
Topics specified in *Class Schedule*.

SOC 4093. Directed Study. (1-4 cr [max 12 cr]. Prereq–#, Δ, ❑)
Guided individual reading or study at junior or senior level.

SOC 4094W. Directed Research: Senior Project. (4 cr; A-F only)
Guided research experience at junior/senior level.

SOC 4101W. Sociology of Law. (3 cr; A-F only. Prereq–1001 or 3101 or 3102 or 3111 or #; 3701 recommended)
Sociological analysis of law/society. Why people obey the law, social forces involved in creating law (both civil and criminal), procedures of enforcement, impact of law on social change.

SOC 4102. Criminology. (3 cr; A-F only. §SOC 4103. Prereq–3101 or 3102 or 3111 or #)
Nature/types of crime. Problems in measuring incidence/trends. Review of sociological theories of crime causation. Implications for crime prevention/control.

SOC 4103. Service-Learning in Criminology. (4 cr. §SOC 4102. Prereq–3102 or #; soc majors must register A-F)
Community-based work in areas of child/adolescent development. Interventions for "at-risk" children and for juvenile offenders with contemporary theory. Research on criminal careers and on offending over the life-course. Direct engagement with criminology and with public responses to crime.

SOC 4105. Sociology of Punishment and Corrections. (3 cr; A-F only. Prereq–3101 or 3102 or 3111 or #)
Advanced study of correctional strategies such as prison, probation, and parole. Theories/structures of diversion, probation, parole, and other community corrections programs. U.S. penal policies/practices compared with those in other countries.

SOC 4108. Current Issues in Crime Control. (3 cr)
Selected current criminal justice policies examined from perspective of courts, legislature, community, and interest groups. Impact of criminal justice policy changes on society and on social control agencies.

SOC 4109. Domestic Criminal Violence. (3 cr. Prereq–3101 or 3102 or 3111 or #)
Survey of research on family violence within criminological framework. Definition of domestic violence. Empirical/theoretical approaches. Response of social control agencies.

SOC 4111. Deviant Behavior. (3 cr; A-F only. Prereq–3101 or 3102 or 3111 or #)
Definition/nature of deviant behavior. Social processes associated with deviant careers and social reintegration. Relationship of deviant behavior to social control.

SOC 4114. Social Control of Women Offenders. (3 cr. Prereq–3101 or 3102 or 3111 or #)
Historical/current explanations for female criminality. Current trends in women.s participation in crime and their treatment in the legal system.

SOC 4125. Policing American Society. (3 cr; A-F only. Prereq–3101 or 3102 or 3111 or #; [4161, 4162] recommended)
Police organizations/operations from social science perspective. Formal/informal policing: role/functions, legal bases, accountability/restraints, community relations, use of force, illegal practices.

SOC 4135. Sociology of White-Collar Crime. (3 cr. Prereq–3101 or 3102 or 3111 or #; Soc majors A-F only)
Causes/consequences of white-collar crime. Control issues, including public perception, legislation, criminal law responses (enforcement, sentencing, punishment), and alternative control mechanisms.

SOC 4141. Juvenile Delinquency. (3 cr; A-F only. Prereq–3101 or 3102 or 3111 or #)
Childhood and delinquency. Measuring extent/distribution of delinquent behavior. Applying theories to relationships within family, school, and peer group. Institutional responses to delinquency. Evaluating programs for treatment, prevention, and control.

SOC 4142. Juvenile Justice and Law. (3 cr. Prereq–[3101 or 3102 or 3111 or #], [jr or sr or grad student]; grad students may register S/N)
Evolution of juvenile court. Organizational relationships among court, police, and other agencies. Policies regarding serious/status offenders. Intake, diversion, pretrial detention, waiver to adult court, sentencing. Conflicts over due process and treatment objectives. Current movements to abolish juvenile justice system.

SOC 4147. Sociology of Mental Illness. (3 cr. Prereq–1001 or 3101 or 3102 or 3111 or #)
Sociological theory/research related to definitions/origins. Epidemiology, reaction patterns, use of mental health services.

SOC 4148. Criminal Psychopathology. (3 cr. Prereq–Sr or grad; grad students only may enroll S-N)
Psychiatric/psychological aspects of antisocial/criminal behavior as related to issues faced in courts and in criminal justice system.

SOC 4149. Killing. (3 cr. Prereq–Sr or grad; grad students only may enroll S-N)
Sociological, legal, and psychological aspects of diverse types of killing. The topic of .normal. killings is contrasted with various pathological types. Subtopics include: mentally disturbed killings, sexual killings, killings within families, gang killings, and terrorist killings.

SOC 4161. Criminal Law in American Society. (3 cr. Prereq–3101 or 3102 or 3111 or #)
Purposes of criminal law and of principles of criminal liability, justification, and excuse. Applications to law of criminal homicide, sexual assault, drugs, and crimes against property, public order, and morals.

SOC 4162. Criminal Procedure in American Society. (3 cr. Prereq–3101 or 3102 or 3111 or #)
How constitutional democracy balances need to enforce criminal law and rights of individuals to be free of unnecessary government intrusion.

SOC 4170. International Law and Cultural Change. (3 cr; A-F only. Prereq–1001 or 3101 or 3102 or 3111 or #)
In a globalized world, which cultural values/practices take precedence? Which are criticized, altered, eliminated? What role does international law play in these processes? Immigration, terrorism, Americanization, structure of international legal system.

SOC 4175. Law, Politics, and Inequality. (3 cr. Prereq–1001 or 3101 or 3102 or 3111 or #; soc major must register A-F)
Critically evaluates law as a resource that defines, reinforces, and alters social relationships. Connection between law and justice. Law seen from perspective of class, race, or gender.

SOC 4190. Topics in Sociology With Law/Criminology/Deviance Emphasis. (3 cr. Prereq–1001 or #)
Topics specified in *Class Schedule*.

SOC 4246. Sociology of Health and Illness. (3 cr; A-F only. Prereq–One sociology course or #)
Health/illness in context of social, political, economic, and cultural forces and of medical knowledge. Social meanings of illness. How people seek help for and manage their illnesses. How doctors, nurses, and patients interact. Social movements surrounding health.

SOC 4305. Society and the Environment: A Growing Conflict. (3 cr; A-F only. Prereq–1001 or environmental course or #)
Societal causes and cures of ecological problems such as global warming, species extinction, and resource exhaustion.

SOC 4309. Religion and Public Life in the United States. (3 cr. Prereq–1001 or #)
How diversity/vitality of American religion shape public life. How religious groups engage in political action, foster understandings of democracy and styles of civic participation, influence volunteering/service activities, and form individuals views on issues such as race, poverty, the family, and sexuality.

SOC 4311. Race, Class, and the Politics of Nature. (3 cr)
Global debates over how nature is produced, consumed, degraded, sustained, and defended. Analytics of race/class. Politics of North-South relations.

SOC 4321. Sociology of Globalization: Culture, Norms, and Organization. (3 cr; A-F only. §GLOS 4221. Prereq–1001 or #)
Globalization of organizations, political relations, and culture. Dependency and world systems theories. Growth of international nongovernmental organizations and their impact on state policies and civil society. Expansion of international norms governing nation-state behavior. Globalization of popular culture (e.g., movies, computer games). Effects on societies/individuals.

SOC 4441. Work-Family Links. (3 cr. Prereq–1001 or #)
Effects of spouses' work experiences on the family, organization of household work, adolescent employment, occupational attainment; and changes in work organizations related to the increasing prevalence of female employment and dual-earner families.

SOC 4461. Sociology of Ethnic and Racial Conflict. (3 cr. Prereq–1001 or #)
Effects of ethnic migration and of social movements. Construction of ethnic/national identities. Questions of citizenship. Rise of transnational movements, how they help shape racial/ethnic conflicts.

SOC 4521. Love, Sex, and Marriage. (3 cr)
Sociological approaches to intimate human relationships. Love, romance, dating, and mate selection. Sexuality, cohabitation, marriage, and related public policy debates. Current U.S. practices in historical/cross-cultural context.

SOC 4551. Sociology of Sexualities. (3 cr. Prereq–1001 or #; soc majors must register A-F)
Social scientific approaches to sexual attitudes, behaviors and identities. Taken-for-granted beliefs about naturalness of various sexual phenomena. How social forces shape people's sexual lives. Focuses on diversity of thought, behavior, and lived experience of individuals with regard to sexuality.

SOC 4601. Comparative Social Structure. (3 cr; A-F only. Prereq–1001 or #)
Comparative analysis of selected societies. Application of comparative methods to explain differences, similarities in social structure, development, trends. Topics include, social class, status, political economy, policies, social movements, ethic identities, multicultures, demography. Methods include network models, Boolean analysis.

SOC 4681. Sociology of German Society. (3 cr; A-F only. Prereq–1001 or #)
The making of German society; institutions in cross-national comparison (including family, education, welfare state, social movements, law); and current issues of German society.

SOC 4703. Contemporary American Culture. (3 cr. Prereq–1001 or #)
Key changes in cultural life in the United States and internationally. Theories that have been developed to understand them. Topics may include work, family, social movements, media and popular culture, and politics.

SOC 4966W. Major-Project Seminar. (4 cr; A-F only. Prereq–3701, 3801, 3811, 12 cr upper div sociology, Δ)
Defining research problem. Collecting/selecting data. Analyzing data. Writing report.

SOC 4967W. Advanced Senior Project Independent Study. (1 cr; A-F only. Prereq–3701, 3801, 3811, 12 additional upper div sociology cr, Δ)
Guided individual research for the sociology major's senior project requirement, conducted in conjunction with enrollment in an upper division sociology course.

SOC 4977W. Senior Honors Proseminar I. (3 cr; A-F only. Prereq–3701, 3801, 3811, 9 additional upper div sociology cr, sr soc honors major, Δ)
Exploring contemporary research for senior thesis. Guidance in defining a problem and reviewing prior theory/research. Presentation/discussion with faculty researchers.

SOC 4978W. Senior Honors Proseminar II. (3 cr; A-F only. Prereq–[4977V or #], 3701, 3801, 3811, at least 9 additional upper div soc cr, sr soc honors major, Δ)
Developing the methodology of senior project, researching it, and writing the thesis. Students work individually or in small groups in consultation with seminar director and other faculty. Group discussion of individual projects.

SOC 5090. Topics in Sociology. (1-3 cr [max 9 cr]. Prereq–1001 or #)
Topics specified in *Class Schedule*.

SOC 5455. Sociology of Education. (3 cr. §EDPA 5041. Prereq–1001 or equiv or #)
Structures and processes within educational institutions. Links between educational organizations and their social contexts, particularly as these relate to educational change.

SOC 5811. Intermediate Social Statistics. (4 cr. Prereq–3811 or equiv)
Measurement, theory of probability, and bivariate statistics. Focus on multiple regression analyses of sociological data. Primarily for first-year sociology graduate students who need preparation for advanced social statistics. Undergraduates preparing for graduate programs may register upon availability.

Soil, Water, and Climate (SOIL)

Department of Soil, Water, and Climate

College of Food, Agricultural and Natural Resource Sciences

SOIL 1125. The Soil Resource. (4 cr. §SOIL 2125, SOIL 5125)
Basic physical, chemical, and biological properties of soil. Soil genesis classification and principles of soil fertility. Soil survey information used to make a land-use plan. WWW used for lab.

SOIL 2125. Basic Soil Science. (4 cr; A-F only. §SOIL 1125, SOIL 5125. Prereq–CHEM 1011 or CHEM 1021 or equiv)
Basic physical, chemical, and biological properties of soil. Soil genesis classification, principles of soil fertility. Use of soil survey information to make a land-use plan. WWW used for lab preparation information.

SOIL 3416. Plant Nutrients in the Environment. (3 cr. Prereq–2125)
Fundamental concepts in soil fertility and plant nutrition. Discuss dynamics of mineral elements in soil, plants, and the environment. Evaluation, interpretation, and correction of plant nutrient problems.

SOIL 3521. Soil Judging. (1 cr [max 3 cr]; A-F only. Prereq–4511)
Learn about collegiate soil judging by participating in a regional or national soil judging contest.

SOIL 4005. Lab and Field Techniques in Soil Science. (2 cr §SOIL 5005. Prereq–2125)
Field/lab experiences for analysis of soils/landscapes. Students describe soils along a hillslope sequence, take soil samples, and perform suite of chemical, biological, and physical soil analyses. Analytical techniques, safety, quality control issues.

SOIL 4093. Directed Study. (1-7 cr [max 20 cr]. Prereq–#)
Research, readings, and instruction.

SOIL 4094. Directed Research. (1-7 cr [max 7 cr]. Prereq–#)
Research under the direction of department faculty.

SOIL 4111. Introduction to Precision Agriculture. (3 cr; A-F only. Prereq–§: MAST 2420; Basic sciences, statistics, soil, Agronomy)
Soil, landscape, and crop spatial variability. GIS, DEM, GPS technologies. Variable rate machinery, PA software, remote sensing. Geostatistics, sampling, experimental designs. Precision integrated crop management. Data acquisition, processing, and management. Socio-economical and e-marketing aspects.

SOIL 4505. Soil Geography: Soil Variability on Planet Earth. (2 cr. Prereq–1125 or 2125 or equiv)
Distribution/formation of soils on earth's surface. Soil variability/taxonomy. How various soils interact with water, plants, microorganisms, and pollutants. Use/management of land via appreciation of earth's varied soil resources.

SOIL 4511. Field Study of Soils. (2 cr; A-F only. Prereq–2125)
Learn to write soil profile descriptions in the field. Class requires hands-on experience to determine soil texture, color, and horizon designations in the field.

SOIL 5005. Lab and Field Techniques in Soil Science. (2 cr §SOIL 4005. Prereq–2125)
Field/lab experiences for analysis of soils/landscapes. Students describe soils along a hillslope sequence, take soil samples, and perform a suite of chemical, biological, and physical soil analyses. Lab analytical techniques, safety, quality control issues.

SOIL 5111. Practicum Internship in Precision Agriculture. (2-5 cr [max 5 cr]; S-N only)
Practical experience in precision agriculture in agri-industry/business. Content and extent of work at the internship site is jointly decided by the instructor, host business representative, and student's principal adviser.

SOIL 5125. Soil Science for Teachers. (3 cr. §SOIL 1125, SOIL 2125)
Basic physical, chemical, and biological properties of soil. Soil genesis classification and principles of soil fertility. WWW used for lab. Soil survey information used to make a land-use plan. Similar to 2125 with less emphasis on chemistry.

SOIL 5232. Vadose Zone Hydrology. (3 cr. Prereq–[MATH 1271 or equiv], [PHYS 1042 or equiv])
Basic soil physical properties/processes governing transport of mass/energy in soils. Emphasizes water/solute transport through unsaturated root/vadose zones, their impact on subsurface hydrology and on water quality. Lectures, hands-on laboratory exercises, discussion of real world problems, problem solving.

SOIL 5311. Soil Chemistry and Mineralogy. (3 cr. Prereq–[[CHEM 1022 or equiv], PHYS 1102, grad] or #)
Structural chemistry, origin/identification of crystalline soil clay minerals. Structure of soil organic matter. Chemical processes in soil: solubility, adsorption/desorption, ion exchange, oxidation/reduction, acidity, alkalinity. Solution of problems related to environmental degradation, plant nutrition, and soil genesis.

SOIL 5515. Soil Genesis and Landscape Relations. (3 cr; A-F only. Prereq–2125 or #)
Basic soil morphology and soil profile descriptions; pedogenic processes and models of soil development; soil geomorphology, hydrology, and hillslope processes; digital spatial analysis; soil classification; soil surveys and land use; soil geography.

SOIL 5555. Wetland Soils. (3 cr; A-F only. §ESPM 5555. Prereq–1125 or 2125 or equiv or #; ¶4511 recommended)
Morphology, chemistry, hydrology, formation of mineral/organic soils in wet environments. Soil morphological indicators of wet conditions, field techniques of identifying hydric soils for wetland delineations. Peatlands. Wetland benefits, preservation, regulation, mitigation. Field trips, lab, field hydric soil delineation project.

For definitions of course numbers, symbols, and abbreviations, see page 300.

SOIL 5611. Soil Biology and Fertility. (3 cr. Prereq–2125, BIOL 1009 or equiv, CHEM 1021 or equiv, sr or grad; BIOC 3xxx, MICB 3xxx recommended)
Soil microbial populations and biodiversity. Soil microorganisms. Biogeochemical cycles. Macro and micronutrient fertilization, and element function in plants and microbes. Composts, sludge and manures in fertilization. Plant microbe associations: nitrogen fixation, mycorrhizal fungi, and biological control of root pathogens. Pollution and bioremediation.

SOIL 5711. Forest Soils. (2 cr. Prereq–1125 or 2125)
Factors affecting tree growth; estimation, modification, and management effects on site productivity; regeneration.

South Asian Languages and Cultures (SALC)

Department of Asian Languages and Literatures

College of Liberal Arts

SALC 1506. Introduction to Contemporary South Asia. (3 cr)
Land, people, modern historical development, contemporary problems, global setting, and future outlook of South Asia.

SALC 1607. Introduction to Indian Civilization. (3 cr)
Indian civilization in light of its development. Social, cultural, economic, and political life. Hindu, Muslim, and Buddhist contributions.

SALC 3201. Ancient Indian Literature in Translation. (3 cr)
Literary achievements of Indian civilization from the ancient period.

SALC 3202. Modern Indian Literature in Translation. (3 cr)
Literary achievements of Indian civilization from the modern period.

SALC 3204. Folklore of India. (3 cr)
A study of the main genres of Indian folklore: folk tales, folk songs, folk epics, folk dramas, proverbs, and riddles; their relationship to Indian society and inter-relationship with literary traditions, both great and small.

SALC 3411. Introduction to Indian Philosophy. (3 cr)
Major concepts; principal schools of Indian philosophy; traditional and contemporary views.

SALC 3412. Hinduism. (3 cr)
Development of Hinduism focusing on sectarian trends, modern religious practices, myths and rituals, pilgrimage patterns and religious festivals, and the interrelationship between Indian social structure and Hinduism.

SALC 3413. Buddhism. (3 cr. §SALC 5413)
Historical account of Buddhist religion in terms of its rise, development, various schools, and common philosophical concept. Indian Buddhism, compared with Hinduism; Buddhism's demise and revival on the Indian subcontinent.

SALC 3414. Comparative Religions of South Asia. (3 cr. §SALC 5414)
Compares and contrasts basic philosophical concepts, literatures, ideologies, and ritualistic practices of Hinduism, Buddhism, and Jainism with those of Islam and Sikhism.

SALC 3456. The Cinema of India. (3 cr. §SALC 5456)
Survey of cinema of South Asia; aesthetic, social, economic, and political perspectives.

SALC 3506. Introduction to Contemporary South Asia. (3 cr)
Land, people, modern historical development, contemporary problems, global setting, and future outlook of South Asia.

SALC 3521. Gandhi and Non-Violent Revolution. (3 cr. §SALC 5521)
Character of Gandhi, his influence over contemporaries, and his hold on the world today.

SALC 3556. Women in India: Role and Repression. (3 cr. §SALC 5556)
Representation of Indian women studied through literature of contemporary Indian women and against background of traditional Indian values and roles.

SALC 3607. Introduction to Indian Civilization. (3 cr)
Indian civilization in light of its development. Social, cultural, economic, and political life. Hindu, Muslim, and Buddhist contributions.

SALC 3900. Topics in South Asian Literature. (1-4 cr [max 12 cr]. Prereq–Topics in South Asian literature)
Topics specified in *Class Schedule*.

SALC 5011. Indo-Aryan Linguistics. (3 cr)
Phonological, morphological, and syntactic developments; Indo-European, Old Indo-Aryan, Middle Indo-Aryan, Hindi, and other major modern Indo-Aryan languages.

SALC 5090. Instruction in South Asian Languages. (3-5 cr [max 5 cr])
Individualized instruction in one of the South Asian languages.

SALC 5201. Ancient Indian Literature in Translation. (3 cr)
Literary achievements of Indian civilization from the ancient period.

SALC 5202. Modern Indian Literature in Translation. (3 cr)
Literary achievements of Indian civilization from the modern period.

SALC 5204. Folklore of India. (3 cr)
A study of the main genres of Indian folklore—folk tales, folk songs, folk epics, folk dramas, proverbs, and riddles—their relationship to Indian society and inter-relationship with literary traditions, both great and small.

SALC 5411. Introduction to Indian Philosophy. (3 cr)
Major concepts; principal schools of Indian philosophy; traditional and contemporary views.

SALC 5412. Hinduism. (3 cr)
Development of Hinduism focusing on sectarian trends, modern religious practices, myths and rituals, pilgrimage patterns and religious festivals, and the interrelationship between Indian social structure and Hinduism.

SALC 5413. Buddhism. (3 cr. §SALC 3413)
Historical account of Buddhist religion in terms of its rise, development, various schools, and common philosophical concept. Indian Buddhism compared with Hinduism; Buddhism's demise and revival on the Indian subcontinent.

SALC 5414. Comparative Religions of South Asia. (3 cr. §SALC 3414)
Compares and contrasts basic philosophical concepts, literatures, ideologies, and ritualistic practices of Hinduism, Buddhism, and Jainism with those of Islam and Sikhism.

SALC 5456. The Cinema of India. (3 cr. §SALC 3456)
Survey of cinema of South Asia; aesthetic, social, economic, and political perspectives.

SALC 5500. Problems in Indian Philosophy. (3 cr. Prereq–3411 or 3412 or 3413 or 5411 or 5412 or 5413)
An introduction to Indian philosophy emphasizing analyses of mind and knowledge.

SALC 5521. Gandhi and Non-Violent Revolution. (3 cr. §SALC 3521)
Character of Gandhi, his influence over contemporaries, and his hold on the world today.

SALC 5556. Women in India: Role and Repression. (3 cr. §SALC 3556)
Representation of Indian women studied through literature of contemporary Indian women and against background of traditional Indian values and roles.

SALC 5710. Seminar in South Asian Languages. (4-5 cr [max 5 cr])
Selected topics on South Asian languages; no knowledge of South Asian languages required.

SALC 5720. Seminar in South Asian Literature. (3-4 cr [max 4 cr])
Selected topics on South Asian literature.

SALC 5730. Seminar in South Asian Culture. (4-5 cr [max 5 cr])
Selected topics on South Asian cultures.

SALC 5833. India's Gods and Goddesses. (3 cr)
Indian history examined by following development of the deities Krishna, Shiva, and Kali.

SALC 5993. Directed Studies. (1-5 cr [max 5 cr]. Prereq–#, Δ, ❑)
Guided individual reading and study of topics not covered in regular courses. Open to qualified students for one or more semesters.

SALC 5994. Directed Research. (1-5 cr [max 5 cr]. Prereq–#, Δ, ❑)
Directed research on topics of language, literature, or civilization selected by qualified students with consent of instructor and studied on tutorial basis.

Spanish (SPAN)

Department of Spanish and Portuguese Studies

College of Liberal Arts

SPAN 144. Intermediate Medical Spanish. (0 cr; S-N only. Prereq–[1st yr college-level Spanish or equiv], Δ)
Vocabulary of Spanish medical terms, skills in report writing, proper format for medical communications. Developing conversational fluency for medical-related topics.

SPAN 221. Reading Spanish. (0 cr; S-N only)
Intensive reading of a variety of texts to provide a basic reading knowledge of Spanish. At the end of the semester students may take the equivalent of the Spanish Graduate Reading Examination.

SPAN 344. Advanced Medical Spanish. (0 cr; S-N only. Prereq–Span 0144, 2 yrs. Spanish College Level or equiv, Δ)
0 cr. course designed to further develop and strengthen the language skills and cultural awareness students have been exposed to and acquired in Interm Med Span 0144, a course designed to help care professionals communicate with patients who speak Spanish.

SPAN 1001. Beginning Spanish. (5 cr. Prereq–Less than 2 yrs of high school Spanish, Δ, no college-level Spanish)
Listening, speaking, reading, writing. Emphasizes development of communicative competence. Cultural readings.

SPAN 1002. Beginning Spanish. (5 cr. Prereq–1001 completed at UMNTC, Δ)
Listening, speaking, reading, writing. Emphasizes development of communicative competence. Cultural readings.

SPAN 1003. Intermediate Spanish. (5 cr. Prereq–[1002 or 1022] or EPT placement)
Speaking/comprehension. Developing reading/writing skills based on materials from Spain/Spanish America. Grammar review. Compositions, oral presentations.

SPAN 1004. Intermediate Spanish. (5 cr. §SPAN 1014, SPAN 1044. Prereq–1003 or EPT placement)
Speaking/comprehension. Developing reading/writing skills based on materials from Spain/Spanish America. Grammar review. Compositions, oral presentations.

SPAN 1014. Business Spanish. (4 cr. §SPAN 1004, SPAN 1044. Prereq–1003 or [Δ, #])
Vocabulary, report writing skills, proper format for business communications, conversational fluency on trade-related topics.

SPAN 1022. Alternate Second-Semester Spanish. (5 cr. Prereq–Placement above 1001)
For students who have studied Spanish in high school or at a community college, or who are transfer students. Begins with an accelerated review of 1001 followed by material covered in 1002.

SPAN 1041. Beginning Medical Spanish. (4 cr; A-F only)
Practical Spanish terminology, functional grammar, conversational fluency on medical-related topics.

SPAN 1044. Intermediate Medical Spanish. (5 cr. §SPAN 1004, SPAN 1014. Prereq–1003 or equiv)
Language needed by health-care workers who interact with Spanish-speaking patients. Basic medical vocabulary, questions/answers in common medical situations. Vocabulary/phrases to conduct patient interviews and physical exams. Readings on Latin American view of health and health care.

SPAN 1054. Spanish for Heritage Students. (5 cr. Prereq–#, LPE for diagnostic purposes)
Development of academic Spanish through reading/writing. Advanced grammar/orthography.

SPAN 1905. Freshman Seminar. (3 cr; A-F only. Prereq–Fr with no more than 29 cr)
Topic specified in *Class Schedule*.

SPAN 1907W. Topics: Freshman Seminar. (3 cr; A-F only. Prereq–Fr with no more than 29 cr)
Topics specified in *Class Schedule*.

SPAN 1910W. Freshman Seminar. (3 cr. Prereq–Fr)
Topics specified in Course Guide.

SPAN 3015. Spanish Composition and Communication. (4 cr. Prereq–[1004 or 1014 or 1044], LPE high pass)
Comprehending written/spoken texts. Speaking, reading, writing beyond intermediate level.

SPAN 3021. Advanced Communication Skills. (4 cr. Prereq–3015)
Improving language skills for fluency/accuracy in Spanish.

SPAN 3022. Advanced Business Spanish. (4 cr. Prereq–[[1014 or 1004 or 1044 or equiv], LPE in Spanish] or #)
Vocabulary of Spanish business terms, Skills in report writing, proper format for business/formal communications. Developing conversational fluency on trade-related topics.

SPAN 3044. Advanced Medical Spanish. (4 cr. Prereq–[[1004 or 1014 or 1044 or equiv], LPE in Span] or #)
How to communicate more effectively in linguistic/cultural terms with Spanish speaking patients. Students explore more advanced/specific medical vocabulary, communication strategies, and related cultural aspects. Conducting patient interviews and medical history. Using vocabulary/conversation to conduct physical exams. Latin American views on health and health care.

SPAN 3104W. Introduction to the Study of Hispanic Literatures. (3 cr; A-F only. §TLDO 3104. Prereq–[3015 with grade of at least B-], LPE high pass)
Various ways of understanding structure of diverse texts, interpreting their meaning.

SPAN 3105W. Introduction to the Study of Hispanic Cultures. (3 cr. Prereq–[3015 with grade of at least B-], LPE high pass)
Cultural issues generated by integration of Americas into emerging world system via Spanish/Portuguese empires.

SPAN 3107W. Introduction to the Study of Hispanic Linguistics. (3 cr. Prereq–[3015 with grade of at least B-], LPE high pass)
Phonology, morphology, syntax, semantics, lexicology, pragmatics, discourse analysis, sociolinguistics, history of Spanish language. Hispanic linguistics as theoretical discipline. Its relationships with social, cultural, literary studies.

SPAN 3211. Discourses of Imperial Spain, 1492-1800. (3 cr. §TLDO 3211. Prereq–3104)
Major literary genres of Spain (epic, lyric, narrative, dramas, novels, essays) from Middle Ages/Golden Age to Enlightenment. Representative works (ballads, picaresque "vidas," tragedies, mystical verse, novellas) within historical/cultural contexts.

SPAN 3212. Discourses of Modern and Contemporary Spain, 1800-Present. (3 cr. Prereq–3104)
Representative works of fiction, drama, poetry, essay, and film of the past two centuries. Intellectual/literary movements, from romanticism to postmodernism.

SPAN 3221. Latin American Colonial Discourses Since 1492. (3 cr. Prereq–3104 or 3105)
Critical account of conquest, colonization, and resistance in Spanish America.

SPAN 3222. Discourses of Modern and Contemporary Latin America. (3 cr. §TLDO 3222. Prereq–3104 or 3105)
Development of Spanish American modernity, its literary expression since independence from colonial rule. Case studies (e.g., Cuba).

SPAN 3401. Service Learning in the Chicano/Latino Community. (3 cr. Prereq–[3015 with grade of at least B-], LPE high pass)
Students participate in Spanish-speaking community organizations; analyze academic materials dealing with race, class, gender, and current patterns of power in the United States; and relate their findings to their community experience.

SPAN 3404. Medical Spanish and Community Health Service. (3 cr. Prereq–3015 with grade of at least B- or [1044, high pass on at least three sections of LPE])
How to create materials for effective communication with Spanish-speaking patients. Students apply academic knowledge in work with community health care partners who serve Chicano/Latino population.

SPAN 3501. Roots of Modern Spain and Latin America. (3 cr. §SPAN 3501H. Prereq–3105W)
Cultural, political, and economic development of Spain and Latin America, from origins to beginning of 19th century. Hispania under Roman Empire. Coexistence of Jews, Christians, and Muslims in Medieval Spain. Mexican and indigenous pre-Hispanic cultures. Arrival of Europeans to New World. Culture in Golden Age. Crisis of Spanish Empire. Architecture, historic documents, music, and visual arts

SPAN 3502. Modern Spain. (3 cr. Prereq–3105)
Spanish culture, from beginning of 19th century to present. Cultural change and its conflicts as represented in Spanish art, literature, film, and Nationalisms.

SPAN 3510. Issues in Hispanic Cultures. (3 cr [max 9 cr]; A-F only. Prereq–3105W)
Practices that have shaped cultural identity of Spanish-/Portuguese-speaking areas. Folklore, religion, armed conflict, drug traffic, language/citizenship, political movements, commodification of national myths/icons. Topics vary.

SPAN 3512. Modern Latin America. (3 cr; A-F only. Prereq–3105W)
Impact of various forms of modernization on symbolic production in Latin American racial, ethnic, class relations, institutional, and ideological structures.

SPAN 3612. The *Man of La Mancha* and Quixotic Discourse. (3 cr)
Narrative techniques and points of view in *Don Quixote*; historical, cultural, and intellectual conditions under which the novel was read and debated. Taught in English.

SPAN 3653. Contemporary Latino and Latin American Drama Written in English. (3 cr. Prereq–1001 or equiv)
Established works and works-in-progress of the most active Latino playwrights in the United States and historical, political, and cultural developments that make them possible. Lectures, discussion, performances, and visual material. Taught in English.

SPAN 3699. Study of Advanced Spanish Language Abroad. (1-5 cr [max 5 cr]. Prereq–Two yrs college-level Spanish, Δ)
Study of advanced Spanish language in a Spanish-speaking country.

SPAN 3701. Structure of Spanish: Phonology and Phonetics. (3 cr. §SPAN 3701H. Prereq–3107)
Phonetics/phonology of modern Spanish. Regional/social variants of the language in Spain and Spanish America.

SPAN 3702. Structure of Spanish: Morphology and Syntax. (3 cr. §SPAN 3702H. Prereq–3107)
Derivational/inflectional morphology. Using linguistic concepts such as morpheme, flexional affix, noun phrase, subject, subordination, and coordination to identify different morphological/syntactic components of Spanish.

SPAN 3703. Origins and History of Spanish and Portuguese. (3 cr. §TLDO 3703. Prereq–3107 or #)
Relationships with Latin; intermediate stages of evolution not considered. Phonetic, morphological, syntactic, and sociolinguistic aspects of diachronic variation.

SPAN 3704. Sociolinguistics of the Spanish-Speaking World. (3 cr. §SPAN 3704H. Prereq–3107)
Social variants of Spanish dialects, Spanish in contact with other languages, bilingualism, language attitudes, pragmatic analysis of Spanish. Impact of recent cultural, political, and socioeconomic transformations on language.

SPAN 3705. Semantics and Pragmatics of Spanish. (3 cr. §SPAN 3705H. Prereq–3107)
Sense relations. Semantics and grammar. Theme, rhyme, and focus. Spanish lexicon. Context, style, culture. Communicative competence. Speech acts.

SPAN 3706. Spanish Applied Linguistics. (3 cr. Prereq–3107)
Introduction to main areas of Spanish applied linguistics. Second language acquisition processes, Spanish language from English-speaking learner s point of view. Sociolinguistic aspects of language learning.

SPAN 3707. Linguistic Accuracy Through Translation. (3 cr. Prereq–3104 or 3105 or 3107)
Various texts in Spanish examined in terms of style/audience/lexicon (popular press, business, academic) as framework for training to communicate with accuracy in various contexts. Students apply lexical/grammatical choices in translating a text.

SPAN 3730. Topics in Hispanic Linguistics. (3 cr [max 9 cr]. Prereq–3107)
Topics specified in *Class Schedule*.

SPAN 3800. Film Studies in Spanish. (3 cr [max 9 cr]. Prereq–3104W or 3105W)
Films from Spanish-speaking worlds in their historical, (geo)political, and socio-economic contexts. Production/consumption, popular/high cultures, and national/trans-national identities within various theoretical backgrounds. Films from various countries analyzed under interdisciplinary framework noting cinematographical rhetorics.

SPAN 3910. Topics in Spanish Peninsular Literature. (3 cr [max 9 cr]; A-F only. Prereq–3104)
Focus on a central theme related to important groups of writers, literary movements, trends, critical approaches, and methods. Topics specified in *Class Schedule*.

SPAN 3920. Topics in Spanish-American Literature. (3 cr [max 9 cr] §SPAN 3920H. Prereq–3104)
Central theme related to important groups of writers, literary movements, trends, critical approaches, and methods. Topics specified in *Class Schedule*.

SPAN 3950. Figures in Spanish American Literature. (3 cr [max 9 cr]; A-F only. §SPAN 3950H. Prereq–3104)
One major writer or group of writers whose work has had an impact on thought, literature, or social problems. Figures are specified in *Class Schedule*.

SPAN 3970. Directed Studies. (1-4 cr [max 9 cr]. Prereq–#, Δ, ❑)
Guided individual reading or study in Hispanic linguistics, language acquisition, cultural studies, and peninsular, Latin American, and U.S. Latino theatre and literatures.

SPAN 3972V. Honors: Graduation Seminar. (3 cr; A-F only. §SPAN 3972W. Prereq–§: 3972W, 3974; 31 cr of 3xxx, honors, Δ)
Work on major project about Hispanic linguistics, language acquisition, or cultural studies, or about peninsular or Latin American or U.S. Latino theatre/literatures.

SPAN 3972W. Graduation Seminar. (3 cr; A-F only. §SPAN 3972V. Prereq–§: 3972V, 3974; 31 cr of 3xxx, #)
Work on major project about Hispanic linguistics. Language acquisition. Cultural studies. Peninsular, Latin American, U.S. Latino theatre/literatures.

SPAN 5106. The Literature of the Reconquest and Feudal Spain. (3 cr. Prereq–Three 3xxx or 5xxx literature courses in Spanish)
The major literary genres developed in Spain from the Reconquest to 1502, with reference to the crucial transformations of the Middle Ages, including primitive lyric, epic, clerical narrative, storytelling, debates, collections, chronicles, "exempla," and the Celestina (1499-1502).

SPAN 5107. The Literature of the Spanish Empire and Its Decline. (3 cr. Prereq–Three 3xxx or 5xxx literature courses in Spanish or Portuguese)
Major Renaissance and Baroque works of the Spanish Golden Age (16th- and 17th-century poetry, nonfiction prose, novel, drama) examined against the historical background of internal economic decline, national crisis, and ideological apparatus developed by the modern state.

SPAN 5108. *Don Quixote.* (3 cr. Prereq–three 3xxx or 5xxx literature courses in Spanish or Portuguese)
Analysis of Cervantes' *Don Quixote* in its sociohistorical context; focus on the novel's reception from the romantic period to postmodern times.

SPAN 5109. The Crisis of the Old Regime: Spanish Literature of the Enlightenment and Romanticism. (3 cr. Prereq–Three 3xxx or 5xxx literature courses in Spanish or #)
Major literary works and intellectual movements and conflicts represented in written culture, of the 18th and early 19th centuries (1680-1845), examined as expressions of the long crisis of Spain's Old Regime and the rise of bourgeois liberalism.

SPAN 5110. Discursive Formations at the Threshold of 20th-Century Spain. (3 cr. Prereq–Three 3xxx or 5xxx literature courses in Spanish or #)
Theory and representative examples of the realist/naturalist novel (Galdós, Pardo Bazán) in the context of its antecedents ("costumbrismo"), opposites (the idealist/sentimental novel), and turn-of-the-century innovations of modernism and the "generation of 1898."

SPAN 5111. Contemporary Spanish Literature Since 1915. (3 cr. Prereq–Three 3xxx or 5xxx literature courses in Spanish or #)
Major literary works and movements in Spain from 1915 to 2000. Neomodernism; surrealism; social realism; literatures of dictatorship and exile; postmodernism. Poetry, novel, drama, essays, film, video/TV; problems of literary history.

SPAN 5221. Spanish Drama in Performance: 17th-Century Comedia. (3 cr. Prereq–Three 3xxx or 5xxx literature courses in Spanish or Portuguese)
Major dramatists of the Spanish comedia (e.g., Cervantes, Lope, Tirso, Calderón). Traditional genres such as tragedy, farce, interludes or auto sacramentales and problems of honor, blood purity, free will, city vs. country, and poetic justice examined against the background of cultural and social history.

SPAN 5234. Feminism and Literature in Spain. (3 cr. Prereq–Three 3xxx or 5xxx literature courses in Spanish or Portuguese or #)
Spanish feminist thought and practice; literature, cultural discourse, literary and critical theory.

SPAN 5316. Spanish Picaresque Narratives. (3 cr. Prereq–three 3xxx or 5xxx literature courses in Spanish or Portuguese)
Major picaresque narratives—*Lazarillo, Guzmán, Buscón,*] Cervantes' *Picaros, Estebanillo González*—in relation to Spanish ambience, Western tradition, European novel, realism. Literary autobiography, episodic structure, themes of roguery, delinquency, sin, marginality, social criticism, moral preoccupations. Comparison to European counterparts.

SPAN 5525. Caribbean Literature: An Integral Approach. (3 cr. Prereq–Three [3xxx or 5xxx] literature courses in Spanish or #)
Literature of Spanish-speaking Caribbean. Emphasizes historical legacy of slavery, African culture, and independence struggles.

SPAN 5526. Colonial Discourse in Spanish American Writing. (3 cr. Prereq–Three 3xxx or 5xxx literature courses in Spanish)
Discourse production in Spanish America between 1492 and 1700. Conquest and colonial writing/counterwriting. Historical origin, evolution, and impact of cultural, political, and socioeconomic factors.

SPAN 5528. Popular Literary Consciousness: 1900-1950. (3 cr. Prereq–Three 3xxx or 5xxx lit courses in Spanish or Portuguese or Δ)
Spanish-American literature between the eve and aftermath of the two world wars. Impact of modernization, industrialization, and nationalistic and populist thought on emergence of distinctive writing, thematic trends, and literary genre conventions.

SPAN 5529. National Affirmation and Transnationalization. (3 cr. Prereq–Three 3xxx or 5xxx literature courses in Spanish or #)
Literary trends of the contemporary period (1950 to present) as a reaction to internal social demands for development of independent national cultures and in response to international cultural pressures.

SPAN 5531. Hispanic Literature of the United States. (3 cr. Prereq–Three 3xxx or 5xxx Spanish or Portuguese literature courses or #)
Interdisciplinary approach providing a framework for deconstructing issues of national identity, marginalization, and gender. U.S. Hispanic theatre/literature and its ethnic diversity, regional variations, cultural links, and scope of its genres.

SPAN 5532. Literature and National Disintegration. (3 cr)
Literary reaction to contemporary structural changes in world economic system (1970 to present). Effects on literature as institution. Texts related to revolutionary trends and social movements (feminism, theology of liberation, defense of human rights).

SPAN 5701. History of Ibero-Romance. (3 cr. Prereq–3703, two other 3xxx or 5xxx Spanish linguistics courses or #)
Origins and developments of Ibero-Romance languages; evolution of Spanish, Portuguese, and Catalan.

SPAN 5711. The Structure of Modern Spanish: Phonology. (3 cr. Prereq–3701, two 3xxx or 5xxx linguistics courses in Spanish or #)
Formulating and evaluating a phonological description of Spanish. Approaches to problems in Spanish phonology within metrical, autosegmental, and lexical phonological theories.

SPAN 5713. The Structure of Modern Spanish: Syntax. (3 cr. Prereq–3702, two 3xxx or 5xxx Spanish linguistics courses or #)
Study and analysis of the principal constructions found in the syntax of Spanish.

SPAN 5714. Theoretical Foundations of Spanish Syntax. (3 cr. Prereq–5713 or #)
Linguistic types/processes that appear across languages. Grammatical relations, word order, transitivity, subordination, information structure, grammaticalization. How these are present in syntax of Spanish.

SPAN 5715. The Structure of Modern Spanish: Semantics. (3 cr)
Applying semantic theory to Spanish: conceptual organization and the structuring of experience; meaning and cultural values; semantic fields; categorization and prototypes; cognitive model theory; metaphor, metonymy, and mental imagery as source and change of meaning.

SPAN 5716. The Structure of Modern Spanish: Pragmatics. (3 cr. Prereq–#)
Concepts used in current literature in Spanish pragmatics, such as deixis, presupposition, conversational implicature, speech act theory, and conversational structure.

SPAN 5717. Spanish Sociolinguistics. (3 cr. Prereq–Two 3xxx or 5xxx linguistics courses in Spanish or #)
Sociolinguistic variation, cross-dialectal diversity in different varieties of Spanish in Latin America and Spain. Impact of recent cultural, political, and socioeconomic transformations on language.

SPAN 5718. Spanish Language Contact. (3 cr. Prereq–Two 3xxx or 5xxx linguistics courses in Spanish or #)
Analysis of different types/results of Spanish language contact globally, taking into account varying social conditions under which contact occurs.

SPAN 5721. Spanish Laboratory Phonology. (3 cr; A-F only. Prereq–[5711, honors] or grad student or #)
Core literature on Spanish laboratory phonology. Phonology from a laboratory perspective. Students evaluate laboratory research methodologies, perform basic acoustic analyses, and design laboratory phonology studies.

SPAN 5910. Topics in Spanish Peninsular Discourses. (3 cr [max 9 cr]. Prereq–Three 3xxx or 5xxx literature courses in Spanish or Portuguese)
Problems in Spanish cultural history and their applicability to studies of artistic movements, ideological trends, formal methods, or literary genres. Topics specified in *Class Schedule*.

SPAN 5920. Topics in Spanish-American Discourses. (3 cr [max 9 cr]. Prereq–3104 or Δ)
Spanish-American literature analyzed according to important groups, movements, trends, methods, and genres. Specific approaches depend on topic and instructor. Topics specified in *Class Schedule*.

SPAN 5930. Topics in Ibero-Romance Linguistics. (3 cr [max 9 cr])
Problems in Hispanic linguistics; a variety of approaches and methods.

SPAN 5970. Directed Readings. (1-4 cr [max 9 cr]. Prereq–MA or PhD candidate, #, Δ, ❑)
Students must submit reading plans for particular topics, figures, periods, or issues. Readings in Spanish and/or Spanish-American subjects.

SPAN 5985. Sociolinguistic Perspectives on Spanish in the United States. (3 cr. Prereq–Three 3xxx or 5xxx linguistics courses in Spanish or #)
Sociolinguistic analysis of issues such as language maintenance/shift in U.S. Latino communities, code switching, attitudes of Spanish speakers toward varieties of Spanish and English, language change in bilingual communities, and language policy issues.

SPAN 5990. Directed Research. (1-4 cr [max 9 cr]. Prereq–#, Δ, ❑)

SPAN 5991. The Acquisition of Spanish as a First and Second Language. (3 cr. Prereq–Three 3xxx or 5xxx linguistics courses in Spanish or #)
Analysis of issues such as the acquisition of Spanish and English by bilingual children; Spanish in immersion settings; developmental sequences in Spanish; classroom language learners' attitudes, beliefs, and motivation; development of pragmatic competence.

Spanish and Portuguese (SPPT)

Department of Spanish and Portuguese Studies

College of Liberal Arts

SPPT 5930. Selected Topics in Hispanic and Lusophone Cultural Discourse. (3 cr [max 9 cr]; A-F only. Prereq–Reading knowledge of Span and Port)
Cultural discourses in Spanish- and Portuguese-speaking areas. Historical intersections/divergences. Taught in Spanish or Portuguese, and in English when cross-listed. Topics specified in *Class Schedule*.

SPPT 5999. The Teaching of College-Level Spanish: Theory and Practice. (3 cr. Prereq–Grad or #)
Theoretical grounding in the general principles of second language acquisition and guidance with their practical applications to the teaching of first- and second-year Spanish at the college-level.

Speech-Language-Hearing Sciences (SLHS)

Department of Speech-Language-Hearing Sciences (SLHS)

College of Liberal Arts

SLHS 1301V. Physics & Bio Honors. (4 cr; A-F only)
Physics/biology of spoken language, from talker's production of sounds/words, to transmission of sound, to listener's perception of what was said. Computer analysis/synthesis of speech.

SLHS 1301W. The Physics and Biology of Spoken Language. (4 cr)
Physics and biology of spoken language, from the talker's production of sounds and words, to the transmission of sound, to the listener's perception of what was said. Computer analysis and synthesis of speech.

SLHS 1302. Rate Your World: Quantifying Judgments of Human Behavior. (3 cr)
Basic quantitative methods as they apply to measuring human behavior. Mathematical principles applied to measuring behaviors such as rating personality/attention, evaluating infant speech perception, studying opinion polls, measuring voice/sound, quantifying speech recognition through cochlear implants. Lecture, hands-on activities.

SLHS 1401. Communication Differences and Disorders. (3 cr. §SLHS 3401)
Disorders of spoken communication, their functional effect on quality of life for individuals with communication disorders. Intervention techniques for specific disorders of speech, language/hearing in context of social, cultural, linguistic diversity.

SLHS 1402. The Talking Brain. (3 cr)
How brain produces/understands speech/language. Basic anatomy/physiology of parts of nervous system involved in producing/understanding speech/language. Differences in brain structure/function among normal individuals and people with brain injury. How brain and brain injuries are presented in mass media.

SLHS 1902. Freshman Seminar. (3 cr; A-F only. Prereq–Freshman)
Topics vary. See *Class Schedule*.

SLHS 1905. Freshman Seminar. (3 cr; A-F only)

SLHS 3301. Introduction to Acoustics. (3 cr)
Elements of acoustics necessary to understand quantitative aspects of speech and hearing science, speech-language pathology, and audiology. Nature of sound, sound transmission, simple harmonic motion, sound intensity and pressure, complex waves, resonance and filtering, and distortion.

SLHS 3302. Anatomy and Physiology of the Speech and Hearing Mechanisms. (3 cr)
Gross anatomy and basic physiology of the nervous, auditory, respiratory, laryngeal, velopharyngeal, and orofacial systems with emphasis on normal communication processes.

SLHS 3303. Language Acquisition and Science. (3 cr)
Survey of typical language development, major theoretical perspectives about development. Applications of current theory to analysis of children's language.

SLHS 3304. Phonetics. (3 cr. §SLHS 5304)
Phonetic analysis, transcription of speech. Articulatory correlates of speech sounds. Extensive practice transcribing. Emphasizes narrow transcription of normal adult English, special populations in Speech-Language Pathology. Non-English IPA sounds needed for special populations.

SLHS 3305W. Speech Science. (4 cr. Prereq–[3301, 3302, 5303] or [Cdis 3301, Cdis 3302, Cdis 3304] or #)
A survey of theories, methods, and research in the discipline of speech science, including speech acoustics, speech perception, and speech production.

SLHS 3306. Hearing Science. (3 cr. Prereq–[3301, 3302] or [CDis 3301, CDis 3302] or #)
Theories, methods, and research in psychological/physiological acoustics. Emphasizes relation between physiological measures and perception. Cochlear mechanics, auditory nerve firing patterns, scaling, object perception.

SLHS 3401. Communication Differences and Disorders. (3 cr. §SLHS 1401)
Disorders of spoken communication, their functional effect on quality of life for individuals with communication disorders. Intervention techniques for specific disorders of speech/language/hearing in context of social, cultural, linguistic diversity.

SLHS 3402W. Major Project in Speech and Hearing Science. (3 cr; S-N only. Prereq–Jr or sr CDis or SLHS major)
Seminar for completion of undergraduate major project.

SLHS 3555H. Honors Thesis. (1-2 cr [max 2 cr]; A-F only. Prereq–See dir of undergrad studies for [thesis adviser, forms])
Research/writing under direction of faculty member. Details of work are determined in consultation with faculty thesis adviser selected based on availability/topic.

SLHS 3900. Topics: Speech-Language-Hearing Sciences. (1-3 cr [max 3 cr])

SLHS 3994. Directed Research. (1-12 cr [max 24 cr]. Prereq–Undergrad doing Research)

SLHS 4301. Introduction to the Neuroscience of Human Communication. (3 cr)
Basic neuroanatomy and neurophysiology, especially as they relate to normal speech, language, and hearing processes.

SLHS 4502. Atypical Speech and Language. (3 cr)
Language conveyed through speech. Normal variation in speech/language that guides understanding of individual differences among speakers will be studied. Breakdowns in speech/language across lifespan in context of cultural/linguistic diversity.

SLHS 4602. Communication and Problem Behavior. (3 cr)
Social/environmental variables on young children's propensity for problem behavior. Communication strategies that have been validated as a component in reducing problem behavior.

SLHS 4801. Hearing Measurement and Disorders. (3 cr. Prereq–[3301, 3302] or [CDis 3301, CDis 3302] or #)
Introduction to theory, administration, and interpretation of behavioral/physiological hearing tests for all age groups. Immittance, pure tone, speech, otoacoustic emissions, evoked potential measures. Emphasizes hearing-screening protocols.

SLHS 4802. Rehabilitative Audiology. (3 cr. Prereq–[3305, 4801] or [CDis 3305, CDis 4801] or #)
Survey of sensory aids/methods used in rehabilitation across life span after diagnosis of hearing loss. Degree of hearing loss, developmental level, communication modalities, client/family choice, disability, cultural considerations.

SLHS 5304. Phonetics. (3 cr. §SLHS 3304)
Phonetic analysis, transcription of speech. Articulatory correlates of speech sounds. Extensive practice transcribing. Emphasizes narrow transcription of normal adult English, special populations in Speech-Language Pathology. Non-English IPA sounds needed for special populations.

SLHS 5401. Counseling and Professional Issues. (3 cr. Prereq–[¶ 8720 or ¶8820], grad student] recommended)
Basic counseling principles and current professional issues in communication disorders. Application of counseling theory to clinical practice. Analysis of regulation, practice, and future direction of communication disorders.

SLHS 5402. Assessment and Treatment in Speech-Language Pathology. (3 cr; A-F only. Prereq–Grad student or #)
Introduction to clinical methods/issues in communication disorders. Professional/legal mandates, collection/analysis of clinical data, principles/models of intervention with adults/children, clinical reporting.

SLHS 5501. Fluency and Phonological Disorders. (3 cr. Prereq–Grad student or #)
Description, nature, and treatment of fluency disorders in children/adults. Involvement in therapeutic/research activities.

SLHS 5502. Voice and Cleft Palate. (3 cr. Prereq–[3305, 4301] or [CDis 3305, CDis 4301] or #)
Normal/disordered aspects of voice and resonance. Organic/functional voice disorders, laryngectomy, cleft palate. Nature and clinical management of these disorders.

SLHS 5503. Dysphagia and Motor Speech Disorders. (3 cr. Prereq–[3305, 4301] or [CDis 3305, CDis 4301] or #)
Nature/management of motor speech disorders in adults/children. Dysarthria, apraxia.

SLHS 5603. Language and Cognitive Disorders in Children. (3 cr. Prereq–3303 or CDis 3303 or equiv or grad student or #)
Language assessment, teaching procedures used with children/adolescents. Procedures apply to children who face language disabilities such as developmental delays, autism, learning disabilities.

SLHS 5605. Language and Cognitive Disorders in Adults. (3 cr. Prereq–[3302, 4301] or [CDis 3302, CDis 4301] or #)
Neurogenic communicative and cognitive disorders in adults, including aphasia, right-hemisphere syndrome, traumatic brain injury, and dementia. Consideration of neurologic substrates, assessment and diagnosis, and clinical intervention.

SLHS 5606. Introduction to Augmentative and Alternative Communication. (3 cr)
Description of the range of augmentative and alternative communication applications for persons with developmental and acquired disabilities.

SLHS 5607. Electronic Communication Aids. (3 cr. Prereq–5606 or #)

SLHS 5608. Clinical Issues in Bilingualism and Cultural Diversity . (3 cr. Prereq–3303 or equiv or #)
Topics in cultural diversity, bilingualism, and second language learning needed for clinical competency in speech-language pathology. Basic/applied issues across a broad range of culturally/linguistically diverse populations.

SLHS 5801. Audiologic Assessment I. (3 cr. Prereq–4801 or CDis 4801 or#)
Basic audiometric battery, including pure tones, speech, masking, and immittance in adults. Industrial audiology, otoacoustic emissions.

SLHS 5802. Hearing Aids I. (3 cr. Prereq–[3305, 4801] or [CDis 3305, CDis 4801] or #)
Survey of modern hearing aids including history of development, electroacoustic functions, clinic and laboratory measurement techniques, sound field acoustics, techniques for selection.

SLHS 5803. Hearing Loss in Children: Diagnosis. (3 cr. Prereq–4801 or CDis 4801 or #)
Behavioral, physiological approaches to assessment and identification, development of the auditory mechanism, etiologies of hearing losses in infants, children, selection of sensory aids, principles of case management with children and families.

SLHS 5804. Cochlear Implants. (3 cr; A-F only. Prereq–[4802, 5801, 5802] or [CDis 4802, CDis 5801, CDis 5802] or #)
Implantable auditory prostheses. History of device development, including cochlear implants and auditory brainstem implants. Signal processing. Techniques for selection, fitting, and rehabilitation. Behavioral/physiological changes across lifespan.

SLHS 5805. Advanced Rehabilitative Audiology. (3 cr. Prereq–4802 or [equiv, #])
Analysis of speech perception/production. Communication skills/strategies. Sensory modalities. Rehabilitative techniques in adults, children, and infants with hearing losses.

SLHS 5806. Auditory Processing Disorders. (2 cr; A-F only. Prereq–4802 or CDis 4802)
Normal/disordered auditory processing abilities. Anatomy/physiology of central auditory pathway, assessments to evaluate auditory processing skills, techniques to address auditory processing weaknesses. Current/historical theories/controversies surrounding auditory processing assessment.

SLHS 5807. Noise and Hearing Conservation. (3 cr; A-F only. Prereq–[8801, 8802] or [CDis 8801, CDis 8802])
Formative Assessment in Hearing Conservation. Auditory/nonauditory effects of noise on humans. Designing a hearing conservation program. Measuring noise levels. Monitoring hearing. Measuring hearing protection devices. Developing educational materials Describe federal/state regulations on hearing conservation. Students work in groups to measure noise in campus settings, perform real-ear assessment of hearing protectors, and develop/pilot-test educational materials on effects of noise on hearing.

SLHS 5808. Hearing Disorders. (3 cr; A-F only. Prereq–[8801, 8802] or [CDis 8801, CDis 8802])
Disorders of auditory system, including anatomical, physiological, perceptual, and audiological manifestations of pathologies affecting hearing.

SLHS 5810. Laboratory Module in Audiology. (1-2 cr [max 5 cr]. Prereq–4801 or CDis 4801 or#)
Intensive study of clinical methods in audiology. Supplements didactic courses in audiology curriculum. Laboratory study, individually or in small groups.

SLHS 5820. Clinical Research and Practice: Grand Rounds. (1-6 cr [max 6 cr]; S-N only. Prereq–4801 or CDis 4801 or equiv or #)
Students participate in group discussions of current professional issues in audiology. Case presentations, guest presentations on current technology, clinical/research ethics. Group meet for an hour weekly with faculty coordinator who leads discussion. Integrates academic/clinical education.

SLHS 5900. Topics: Speech-Language-Hearing Sciences. (1-3 cr [max 6 cr])
Topics in Speech-Language-Hearing Sciences.

SLHS 5993. Directed Study. (1-12 cr [max 18 cr]. Prereq–#)
Directed readings and preparation of reports on selected topics.

Sport Studies (SPST)

School of Kinesiology

College of Human Education and Development

SPST 1701. Introduction to Sport Studies. (2 cr; A-F only)
Scope/motive of the study of sport from a sociological, psychological, historical, economic, and scientific perspective. Issues in sport.

SPST 3111. Sports Facilities. (2 cr; A-F only. Prereq–SPST major only)
A general identification of sports facilities including the special features that make them unique. Emphasis on understanding the role and purpose of planning for such facilities.

SPST 3112. Applied Sport Science. (2 cr; A-F only. Prereq–SPST or Kin or Rec major or #)
Introduction to historical discovery, transitional development, and current application of scientific principles/technology to improvement of sport performance.

SPST 3143. Organization and Management of Sport. (3 cr; A-F only. §KIN 3143. Prereq–SPST major)
Principles, policies, and procedures involved in the administration and management of sports programs at the interscholastic and intercollegiate levels.

SPST 3301. Gender and Diversity in Sport. (2 cr; A-F only. Prereq–1701)
Development of women and girls in sport; minority involvement and influence in sport and legal mandates; sexuality issues; feminism and political issues in sport.

SPST 3421. Business of Sport. (2 cr; A-F only. Prereq–SPST or Kin or Rec major or #)
Economic/business aspects of professional, collegiate, school-based and amateur sport. Financing issues/methods. Economic impact of sport on communities, regions, and states. Sport/leisure market.

SPST 3501. Sport in a Diverse Society. (3 cr; A-F only. Prereq–SPST major only)
Relationship between sport and contemporary social institutions (politics, religion, economics, education, mass media). Emphasizes groups/individuals who have historically been marginalized or excluded from sport participation. Variables such as race, sex, social class, sexual orientation, physical (dis)abilities also emphasized.

SPST 3601. Ethics and Values in Sport. (2 cr; A-F only. Prereq–SPST major only; 3611 recommended)
The study of violence, demonstrative behavior, sportsmanship, and other ethical issues involved in the playing of sport, and in the management and governance of the sport industry.

SPST 3611. Sport Psychology. (2 cr; A-F only. Prereq–SPST major only)
Introduction to sport psychology. Examines people and their behavior in sport contexts.

SPST 3621. Applied Sport Psychology. (2 cr; A-F only. Prereq–SPST or Kin or Rec major or #)
Psychological theories/techniques as they apply to sport performance and personal growth of sport participants.

SPST 3631. Sport Promotion and Programming. (3 cr; A-F only. Prereq–SPST major or #)
Fundamental theories/issues in sport marketing, grounded within traditional marketing principles. Emphasizes unique application to sport business industry.

SPST 3641. Training and Conditioning for Sport. (2 cr; A-F only. Prereq–[Kin or SpSt] major)
Overview of history, development, current philosophies of physical training methods used in sport. Theory, scientific basis for training methods, methods for evaluation/prescription.

SPST 3861. Legal Aspects of Sport. (2 cr; A-F only. Prereq–SPST major only)
Survey of legal issues in sport, including governance, contracts, civil rights, civil liberties, torts, due process, and employment and work-related legalities.

SPST 3881W. Senior Seminar in Sport Studies. (3 cr; A-F only. Prereq–SPST major, completion of major coursework, #)
Presentations/discussions on sport-related topics of interest.

SPST 3996. Practicum: The Sport Experience. (1-10 cr [max 10 cr]; S-N only. Prereq–3881, SPST major, #)
Practical experience in one or more sport settings.

Statistics (STAT)

School of Statistics

College of Liberal Arts

STAT 1001. Introduction to the Ideas of Statistics. (4 cr. Prereq–High school algebra)
Controlled vs. observational studies; presentation and descriptionof data; chance variation; correlation and causality; confidenceintervals; statistical tests.

STAT 1905. Freshman Seminar. (3 cr [max 6 cr]; A-F only)
Topics specified in *Class Schedule*.

STAT 3011. Introduction to Statistical Analysis. (4 cr. §ANSC 2211, STAT 5021. Prereq–Two yrs high school math)
Describing data/relationships. Discrete/continuous random variables. Sampling distributions. Confidence intervals. 1-/2-samplesignificance tests. Simple linear regression.

STAT 3021. Introduction to Probability and Statistics. (3 cr. Prereq–MATH 1272)
Elementary probability, probability distributions. Sampling, elements of statistical inference. Regression.

STAT 3022. Data Analysis. (4 cr. Prereq–3011 or 3021)
Practical survey of applied statistical inference and computing covering widely used statistical tools: multiple regression, variance analysis, experiment design, nonparametric methods, model checking and selection, variable transformation, categorical data analysis, logistic regression.

STAT 4101. Theory of Statistics I. (4 cr. §STAT 5101. Prereq–MATH 1272)
Random variables/distributions. Generating functions. Standard distribution families. Data summaries. Sampling distributions. Likelihood/sufficiency.

STAT 4102. Theory of Statistics II. (4 cr. §STAT 5102. Prereq–4101)
Estimation. Significance tests. Distribution free methods. Power. Application to regression and to analysis of variance/count data.

STAT 4893W. Senior Paper. (1 cr. Prereq–Stat major)
Either (1) paper on specialized area or (2) consulting project or (3) original computer program. Directed study.

STAT 4931. Topics in Statistics. (3 cr)
Topics vary according to student needs and available staff.

STAT 4932. Topics in Statistics. (3 cr. Prereq–#)
Topics vary according to student needs and available staff.

STAT 5021. Statistical Analysis. (4 cr. §ANSC 2211, STAT 3011. Prereq–§: 3011; College algebra or #; Stat course recommended)
Intensive introduction to statistical methods for graduate students needing statistics as a research technique.

STAT 5031. Statistical Methods for Quality Improvement. (4 cr. Prereq–[3021 or 3022 or 4102 or 5021 or 5102 or 8102], MATH 1272)
Random variability/sampling. Controlling statistical process. Shewhart/accumulative charting. Analyzing plant data, trend surface, and variance/design of experiments.

STAT 5041. Bayesian Decision Making. (3 cr. Prereq–4101 or 5021 or 5101 or #)
Axioms for subjective probability/utility. Optimal statistical decision making. Sequential decisions/ decision trees. Backward induction. Bayesian data analysis.

STAT 5101. Theory of Statistics I. (4 cr. §STAT 4101. Prereq–Math 2263)
Logical development of probability, basic issues in statistics. Probability spaces. Random variables, their distributions and expected values. Law of large numbers, central limit theorem, generating functions, multivariate normal distribution.

STAT 5102. Theory of Statistics II. (4 cr. §STAT 4102. Prereq–5101 or MATH 5651)
Sampling, sufficiency, estimation, test of hypotheses, size/power. Categorical data. Contingency tables. Linear models. Decision theory.

STAT 5201. Sampling Methodology in Finite Populations. (3 cr. Prereq–3011 or 3021 or 5021 or #)
Simple random, systematic, stratified, unequal probability sampling. Ratio, model based estimation. Single stage, multistage, adaptive cluster sampling. Spatial sampling.

STAT 5302. Applied Regression Analysis. (4 cr. Prereq–3022 or 4102 or 5021 or 5102 or #)
Simple, multiple, and polynomial regression. Estimation, testing,prediction. Use of graphics in regression. Stepwise and othernumerical methods. Weighted least squares, nonlinear models,response surfaces. Experimental research/applications.

STAT 5303. Designing Experiments. (4 cr. Prereq–3022 or 4102 or 5021 or 5102 or #)
Analysis of variance. Multiple comparisons. Variance-stabilizing transformations. Contrasts. Construction/analysis of complete/incomplete block designs. Fractional factorial designs. Confounding split plots. Response surface design.

STAT 5401. Applied Multivariate Methods. (3 cr. Prereq–5302 or 8102 or #)
Bivariate and multivariate distributions. Multivariate normal distributions. Analysis of multivariate linear models. Repeated measures, growth curve and profile analysis. Canonical correlation analysis. Principle components and factor analysis. Discrimination, classification, and clustering.

STAT 5421. Analysis of Categorical Data. (3 cr. Prereq–5302 or #)
Varieties of categorical data, cross-classifications, contingency tables. Tests for independence. Combining 2x2 tables. Multidimensional tables/ loglinear models. Maximum-likelihood estimation. Tests for goodness of fit. Logistic regression. Generalized linear/multinomial-response models.

STAT 5601. Nonparametric Methods. (3 cr. Prereq–3022 or 4102 or 5021 or 5102 or #)
Order statistics. Classical rank-based procedures (e.g., Wilcoxon, Kruskal-Wallis). Goodness of fit. Topics may include smoothing, bootstrap, and generalized linear models.

STAT 5931. Topics in Statistics. (3 cr)
Topics vary according to student needs and available staff.

STAT 5932. Topics in Statistics. (3 cr)
Topics vary according to students' needs and available staff.

STAT 5993. Tutorial. (1-6 cr [max 12 cr]. Prereq–#)
Directed study in areas not covered by regular offerings.

Studies in Cinema and Media Culture (SCMC)

Department of Cultural Studies and Comparative Literature

College of Liberal Arts

SCMC 1201. Introduction to Cinema and Media Culture. (4 cr. §CSCL 1201. Prereq–§: CSCL 1201)
Critical analysis of films, particularly as they emerge within context of mass culture. Determining discursive specificity of cinema, network of institutions that expose this discourse to other media discourses. Rudiments of film theory. Brief engagement with production.

SCMC 3001W. History of Cinema and Media Culture. (4 cr)
Genealogy of cinema in relation to other media, notably photography, radio, television/video and the Internet. Representative films from decisive moments in global development of cinema. Rise/fall of Hollywood studio system, establishment of different national cinemas, cinematic challenges to cultural imperialism, emergence of post-cinematic technologies.

SCMC 3201. Fundamentals of Digtal Filmmaking. (4 cr. Prereq–ARTH 1921W or CSCL 1921 or equiv or #)
Practice of digital filmmaking. Emphasizes digital techniques and practical tools required to produce films. Students master optical/digital devices as artistic tools. Historical/theoretical issues of cinema, its relation to other art forms.

SCMC 3202. Intermediate Digital Filmmaking. (4 cr. Prereq–3201 or #)
Students complete a film of any length, 24 frames or feature-length. Emphasizes formal analysis of frames, shots, sequences, and relations of unit (frame or shot) to whole.

SCMC 3993. Directed Study. (1-3 cr [max 6 cr])
Guided individual reading or study.

SCMC 4993. Directed Study. (1-3 cr [max 6 cr])
Guided individual reading or study.

SCMC 5001. Critical Debates in the Study of Cinema and Media Culture. (4 cr)
Basic concepts in historical/international debates over production/reception of media culture. Emphasizes cinema. Advanced orientation toward intellectual traditions that inform contemporary scholarship.

SCMC 5993. Directed Study. (1-3 cr [max 6 cr])
Guided individual reading or study.

Sumerian (SUM)

Department of Classical and Near Eastern Studies

College of Liberal Arts

SUM 5011. Elementary Sumerian I. (3 cr. Prereq–Adv undergrads with 2 yrs of another foreign lang, grads)
Sumerian writing and grammar. Readings from classical Sumerian literary and historical texts.

SUM 5012. Elementary Sumerian II. (3 cr. Prereq–5011)
Reading from classical literary and historical texts.

Swedish (SWED)

German, Scandinavian, and Dutch

College of Liberal Arts

SWED 1001. Beginning Swedish. (5 cr. §SWED 4001)
Emphasis on working toward novice-intermediate low proficiency in all four language modalities (listening, reading, speaking, writing). Topics include everyday subjects (shopping, directions, family, food, housing, etc.).

SWED 1002. Beginning Swedish. (5 cr. §SWED 4002. Prereq–1001)
Continues the presentation of all four language modalities (listening, reading, speaking, writing), with a proficiency emphasis. Topics include free-time activities, careers, and the Swedish culture.

SWED 1003. Intermediate Swedish. (5 cr. §SWED 4003. Prereq–1002)
Emphasis on intermediate proficiency in listening, reading, speaking, and writing. Contextualized work on grammar and vocabulary is combined with authentic readings and essay assignments.

SWED 1004. Intermediate Swedish. (5 cr. §SWED 4004. Prereq–1003)
Emphasis on developing intermediate mid-high proficiency in listening, reading, speaking, and writing. Contextualized work on grammar and vocabulary is supported by work with authentic readings and essay assignments.

SWED 3011. Advanced Swedish. (3 cr. Prereq–1004 or 4004)
Achieving advanced proficiency in Swedish. Fiction, film, journalistic, and professional prose. Grammar, vocabulary building exercises, review of oral/written modes of communication.

SWED 3012. Advanced Swedish. (3 cr. Prereq–1004 or 4004)
Novels, short stories, plays, articles. Structural, stylistic, vocabulary-building exercises.

SWED 4001. Beginning Swedish. (2 cr. §SWED 1001. Prereq–1004 in another language or passing score on LPE or grad student)
Meets concurrently with 1001. See 1001 for description.

SWED 4002. Beginning Swedish. (2 cr. §SWED 1002. Prereq–1004 in another language or passing score on LPE or grad student)
Meets concurrently with 1002. See 1002 for description.

SWED 4003. Intermediate Swedish. (2 cr. §SWED 1003. Prereq–1004 in another language or passing score on LPE or grad student)
Meets concurrently with 1003. See 1003 for description.

SWED 4004. Intermediate Swedish. (2 cr. §SWED 1004. Prereq–1004 in another language or passing score on LPE or grad student)
Meets concurrently with 1004. See 1004 for description.

Teaching English as a Second Language (TESL)

Institute of Linguistics, ESL, and Slavic Languages and Literatures

College of Liberal Arts

TESL 1904. Freshman Seminar. (3 cr; A-F only. Prereq–Freshman)
Topics vary. See *Class Schedule*.

TESL 1905. Freshman Seminar. (3 cr; A-F only. Prereq–Freshman)
Topics specified in *Class Schedule*.

TESL 3001. Basics in Teaching English as a Second Language. (4 cr. Prereq–Have studied another language, [native speaker or [C-TOEFL score of at least 213 or equiv])
Basic orientation to current theories/methods of English as a second language (ESL) instruction. Emphasizes methodologies for teaching/assessing listening, speaking, pronunciation, reading, writing skills. Contexts of teaching English to adults in the U.S. and abroad. Internship at school or agency teaching ESL.

TESL 3501. Practical Language Learning for International Communication. (3 cr)
Getting a handle on language learning. Having a sense of one's learning/language strategy preferences. Motivation to learn languages in general and a given language in particular. Motivation to do specific language tasks.

TESL 5101. Academic Writing in TESOL. (1 cr; S-N only. Prereq–[5721, grad ESL student] or #)
Research writing conventions in the profession. University rules on ethical use of human subjects, research paper rhetorical structure, literature sources/searches, literature review coherence, hedging markers, basic research methods, research result reporting, APA-formatted bibliographies, writing strategies.

TESL 5401. Language Analysis for Teachers of English as a Second Language. (4 cr. Prereq–LING 3001 or LING 5001 or #)
Overview of the structure of the English language geared to the needs of teachers of English to speakers of other languages. Study the structures of English from the point of view of second-language speakers as well as native speakers. Phonetics, phonology, morphology, and some aspects of the syntax of the English language. Part of a two-course sequence.

TESL 5402. Language Analysis for Teachers of English as a Second Language. (4 cr. Prereq–5401, LING 5001)
Overview of the structure of the English language geared to the needs of teachers of English to speakers of other languages. Study the structures of English from the point of view of second-language speakers as well as native speakers. More complex structures of English syntax, as well as English semantics, pragmatics, and discourse structures. Second in a two-course sequence.

TESL 5610. Research Methods in Applied Language Study. (3 cr [max 12 cr]. Prereq–LING 5505 or #)
Key issues in second language acquisition/learning research. Focuses on learning a second or foreign language in the classroom.

TESL 5721. Methods in Teaching English as a Second Language. (3 cr. Prereq–LING 3001 or 5001 or #)
Introduction to methods for teaching English as a second language to adults.

TESL 5722. Practicum in Teaching English as a Second Language. (6 cr [max 12 cr]; S-N only. Prereq–[[5401 or ¶5401], [5402 or ¶5402], 5721, ESL major or ESL minor] or #)
Observation of, and practice in, teaching English as a second language to adults at college or university level.

TESL 5723. Materials for Teaching English as a Second Language. (3 cr. Prereq–[5721, 5722] or #)
Principles for evaluating/preparing materials for teaching second languages as applied especially to English as a second language.

TESL 5724. Intro to Language Assessment. (3 cr; A-F only)
How to engage in meaningful, appropriate, and fair second-language assessment practices; interpret test results; and construct new forms of assessment.

TESL 5900. Topics in Second Language Learning and Teaching. (1-4 cr [max 16 cr])
Topics vary. See *Class Schedule*.

TESL 5910. Seminar in Teaching English as a Second Language. (3 cr [max 9 cr])
Topics related to second language learning/teaching. Focuses on learning/teaching English as a second language. Topics specified in *Class Schedule*.

TESL 5993. Directed Studies. (1-4 cr [max 9 cr]. Prereq–#, Δ, ❑)
Directed study for teaching English as a second language.

Theatre Arts (TH)

Department of Theatre Arts and Dance

College of Liberal Arts

TH 1101V. Honors Section: Introduction to the Theater. (4 cr. Prereq–Honors)
Introduction to art/craft of theater. Appreciation/critical analysis of plays/performances. Examples of theater's diverse interactions with society considered from various cultural perspectives.

TH 1101W. Introduction to the Theatre. (4 cr)
Introduction to art/craft of theatre. Appreciation/critical analysis of plays/performances. Examples of theatre's diverse interactions with society considered from various cultural perspectives.

TH 1102. Drama and the Media. (3 cr)
Drama and cultural values implicit in media. Study of primary texts (biography, history, the novel, plays), video clips, and complete films. How the film medium shapes cultural identity.

TH 1111. Introduction to the Theatre—Condensed Version. (3 cr. Prereq–Theatre majors/premajors should not enroll)
Art/craft of theatre. Appreciation, critical analysis of plays/performances. Ways theatre interacts with society. Examples from diverse theatre over the ages and from various cultural perspectives. Seven weeks.

TH 1112. Drama and the Media—Condensed Version. (3 cr)
Drama/cultural values implicit in media. Study of primary texts (biography, history, the novel, plays); video clips; complete films. How film/television shape collective cultural identity. Seven weeks.

TH 1301. Acting/Non-Majors. (3 cr)
Background/techniques of acting as viewed/practiced in theatre, society, and student's own relationships.

TH 1321. Beginning Acting: Fundamentals of Performance. (3 cr. Prereq–1101 or ¶1101)
Vocabulary/techniques for practical performance studies. Use/training of body/voice. Creation of choices and dramatic phrases. Storytelling. Training the will, the instrument, and the imagination.

TH 1322. Creating the Performance. (3 cr. Prereq–1321)
Responsibilities/techniques of modern stage director as creative/interpretive artist. Creation of directed performance of invented/pre-existing forms, from happenings to traditional psychological/poetic realism.

TH 1361. Singing for Musical Theatre. (3 cr; A-F only)
Beginning singing, interpretation, part singing, phonetics, audition techniques. Solo/ensemble presentations at final class performance.

TH 1362. Dance for Musical Theatre. (2 cr; A-F only. §DNCE 1362)
Movement based lab. Dance skills in musical theatre performance. Focuses on various styles/disciplines of dance throughout its culturally diverse heritage. Character development necessary to execution of various dance styles.

TH 1391. BFA Acting I. (3 cr; A-F only. Prereq–Accepted into BFA acting program)
Acting.

TH 1392. BFA Voice and Speech I. (2 cr; A-F only. Prereq–Accepted into BFA acting prog)
Study/practice in breath centering/expansion; vocal resonance, musicality, placement; ear training; strengthening and making more flexible the muscles of speech.

TH 1393. BFA Movement I. (2 cr; A-F only. Prereq–BFA-acting major)
Focuses on building a foundation for further work in program.

TH 1395. BFA Acting II. (3 cr; A-F only. Prereq–1391)
Continuing the process of interpreting dramatic material.

TH 1396. BFA Voice and Speech II. (2 cr; A-F only. Prereq–1392)
Building a foundation for further work in the program. Emphasizes practicing the sounds of good American speech and of the written phonetic alphabet.

TH 1397. BFA Movement II. (2 cr; A-F only. Prereq–1393)
May include sections such as African dance, yoga, movement for actors, and circus techniques. Focuses on building a foundation for further work in the program.

TH 1904. Freshman Seminar. (3 cr [max 6 cr]; A-F only. Prereq–Freshman)
Topics specified in *Class Schedule*.

TH 1905. Freshman Seminar. (3 cr [max 6 cr]; A-F only. Prereq–Freshman)
Topics specified in *Class Schedule*.

TH 1909W. Topics: Freshman Seminar. (3 cr; A-F only. Prereq–Freshman)
Topics specified in *Class Schedule*.

TH 1910W. Topics: Freshman Seminar. (3 cr; A-F only. Prereq–Freshman)
Topics specified in *Class Schedule*.

TH 1911W. Freshman Seminar: Theatre, Entertainment With Attitude. (3 cr; A-F only. Prereq–Fr with no more than 30 cr)
Richness/diversity of live theatre as performance/text. Developing critical language/eye with which to think about live performance. Students attend performances at Twin Cities theatres. In-class discussions, talks with theatre/dance professionals.

TH 1950. Topics in Theater. (1-3 cr [max 6 cr])
Topics specified in *Class Schedule*.

TH 2391. BFA Acting III. (3 cr; A-F only. Prereq–BFA student in theatre arts)
Applying concepts of first year of training to an ensemble performance project. Beginning of Shakespeare foundation unit.

TH 2392. BFA Voice and Speech III. (2 cr; A-F only. Prereq–BFA student in theatre arts)
Continuing to build a strong, healthy voice. Mastering written phonetics, sounds of good American speech for stage. Students begin to explore speaking of heightened verse, particularly Shakespearean text.

TH 2393. BFA Movement III. (2 cr; A-F only. Prereq–BFA student in theatre arts)
Deepens/refines foundation laid in BFA Movement I/II.

TH 2395. BFA Acting IV. (3 cr; A-F only. Prereq–BFA-Acting sophomore)
Application of process towards performance. Emphasizes Shakespeare.

TH 2396. BFA Voice and Speech IV. (2 cr; A-F only. Prereq–BFA-acting, sophmore)
Continuing to build a strong, healthy voice. Mastering written phonetics and the sounds of good American speech for the stage. Students begin basic dialect acquisition work for the stage. Emphasizes English/Irish dialects.

TH 2397. BFA Movement IV. (2 cr; A-F only. Prereq–BFA-acting sophmore)
May include sections such as jazz dance, partner dances, and movement for actors.

TH 3100. Theatre Practicum. (1 cr [max 4 cr]; S-N only. Prereq–1101; only two enrollments as actor may count toward a major)
Participation in University Theatre main stage play as actor, construction/running crew personnel, or theatre management operations personnel.

TH 3115. Introduction to Playwriting. (3 cr)
Study of traditional play structure, characterization, dialogue, dramatic action, and theme. Final project is a one-act play.

TH 3120. Theatre: Theory and Practice. (3 cr [max 6 cr]. Prereq–1101)
Introdution to diverse ways of thinking about theatre and its representational practices. Students explore traditional/non-traditional modes of performance through readings, discussions, and hands-on performance projects. Seminar-style course.

TH 3171. History of the Theatre: Ancient Greece Through Neo-Classicism. (3 cr. Prereq–Th major or #)
History of Western theatre and drama; theatrical practices, staging conventions, and dramatic structure of plays. Ancient to mid-18th century.

TH 3172. History of the Theatre: Age of Enlightenment to Present. (3 cr. Prereq–Th major or #)
Theatrical practices, staging conventions, dramatic structure of plays.

TH 3261. Dramas of Culture: 20th-Century French and Francophone Theater. (3 cr [max 9 cr]. §FREN 3260. Prereq–FREN 3101)
Key movements, dramatists, and contexts of 20th-century French and Francophone theatre. Naturalist and symbolist legacies as well as existentialist, avant-garde, and contemporary performance and drama.

TH 3314. Text and the Actor. (3 cr; A-F only. Prereq–1101, 1321, 1322)
Standard stage speech, international phonetic alphabet transcription, and textual analysis to perform heightened language texts such as Shakespearean/Shavian monologues, Chaucer's Canterbury Tales, and Beowulf. Videos viewed/discussed.

TH 3321. Stanislavski and Techniques for Characterization. (3 cr. Prereq–1322, [3314 or ¶3314], audition)
Analysis of text, character, and relationship in scenes/monologues from contemporary/modern psychologically-based drama, early 20th-century texts, and classical repertoire. Lecture, discussion, exercises, performance.

TH 3322. Advanced Techniques for Characterization. (3 cr. Prereq–3321)
Analysis of text, character, and relationship in scenes/monologues from contemporary/modern psychologically-based drama and from early 20th-century texts. Lecture, discussion, exercises, performance.

TH 3331. Physical Approaches to Acting. (3 cr. Prereq–1322, [3314 or ¶3314], audition)
Dynamic physical approach to acting. Expanding expressiveness/creativity. Strengthening connections between physical/vocal expression. Uniting instinct and intellectual analysis. Techniques as advanced by Delsarte, Meyerhold, Grotowski, Kantor, Suzuki, Barba, etc., and structured improvisation, are incorporated in solo/collaborative performance projects.

TH 3361. Introductory Musical Theatre. (3 cr; A-F only. Prereq–[1361 or 1362 or DNCE 1362] or #)
History of American musical theatre featuring videos/discussions, basic music theory, voice, dance, acting, audition techniques. Solo/ensemble presentations for public class performance.

TH 3365. Intermediate Musical Theatre. (3 cr; A-F only. Prereq–3361 or #)
American musical theatre history. Singing, interpretation, dance techniques. Culminates in solo/ensemble presentations in public class performance.

TH 3381. Theatre Storytelling and Solo Performance. (3 cr. Prereq–3314 or ¶3314)
Live storytelling and solo performance as theatrical art form. How to turn personal experiences into engaging stage stories. Guests perform, discuss their work, and critique student work. Students develop several short monologues/performances and conclude with original solo theatre performance/story.

TH 3391. BFA Acting V. (3 cr; A-F only)
Experiencing a foreign theater culture/history. Applying process of interpreting dramatic material to plays of that culture.

TH 3392. BFA Voice and Speech V. (2 cr; A-F only)
Experiencing a foreign theater culture/history. Applying voice training to dramatic material of that culture.

TH 3393. BFA Movement V. (2 cr; A-F only. Prereq–BFA student in theatre arts)
Experiencing a foreign theatre culture/history, applying training to dramatic material of that culture.

TH 3395. BFA Intensive I. (2 cr; A-F only. Prereq–BFA-acting jr)
Incorporating disciplines of acting/voice/movement.

TH 3398. BFA Rehearsal & Performance I. (2 cr; A-F only. Prereq–BFA-acting jr)
Continuing the application of process towards performance.

TH 3399. BFA Rehearsal and Performance II. (2 cr; A-F only. Prereq–BFA-acting jr)
Continuing the application of process towards performance.

TH 3503. Design and Technical Production I: BFA. (3 cr. Prereq–§: 3513; BFA theatre arts student)
Theory, process, and execution of design/technology from script to production on stage. Scenery/properties.

TH 3505. Design and Technical Production II: BFA. (3 cr. Prereq–3513, BFA theatre arts student)
Theory, process, and execution of design/technology from script to production on stage. Costumes/lighting.

TH 3513. Design and Technical Production I. (4 cr. Prereq–1101; BFA registration permitted)
Theory, process, and execution of design/technology from script to production on stage. Scenery/properties.

TH 3515. Design and Technical Production II. (4 cr. Prereq–1101)
Theory, process, and execution of design/technology from script to production on stage. Costumes/lighting.

TH 3950. Topics in Theatre. (1-4 cr [max 8 cr]. Prereq–Varies by topic)
Topics specified in the *Class Schedule*.

TH 3993. Directed Study. (1-4 cr [max 12 cr]. Prereq–6 Th cr, #, Δ, ❑)
Guided individual reading or study.

TH 4115. Intermediate Playwriting. (3 cr. Prereq–3115 or [writing sample, #])
New methods of play construction. How characteristic plays from particular contemporary styles create original theatrical effects by using/breaking dramatic conventions. Writing exercises, workshoping of student plays.

TH 4131. Shakespeare: Comedies, Romances, and Problem Plays. (3 cr. Prereq–1101 or #)
Shakespeare's plays as live theatre, both for the stage and in various media. Work of actors, directors, and designers in Shakespearean plays.

TH 4132. Shakespeare: Histories and Tragedies. (3 cr. Prereq–1101 or #)
Shakespeare's plays as live theatre, both for the stage and in various media. Work of actors, directors, and designers in Shakespearean plays.

TH 4177W. Survey of Dramatic Literature I: Strategic Interpretation. (3 cr. Prereq–[[3171, 3172], [jr or sr]] or #)
Basic principles of script analysis as applied to stage practice from traditional/postmodern approaches. Students read plays, critical perspectives. Discussion, critical writing, performance.

TH 4178W. Survey of Dramatic Literature II: Representation and its Effects. (3 cr. Prereq–[[3171, 3172], [jr or sr]] orr #)
In-depth look at how plays actively participate in production of social values and of society itself. Emphasizes consequences of choices theatre artists make.

TH 4321. Career Preparation for the Actor. (3 cr. Prereq–3322)
Information/techniques necessary for professional acting career.

TH 4322. Acting for the Camera. (3 cr. Prereq–3321)
Differences between stage acting and acting for camera. Hands-on experience with film equipment. Scenes/monologues rehearsed/performed for camera. Videotape playback for class critique.

TH 4380. Creative Collaboration. (1-3 cr [max 12 cr]. Prereq–Audition, interview, #)
Ensemble creation of a single theatre performance work. Creative/dramaturgical work. Public showing of work, completed or in-progress. Students work collaboratively with faculty or affiliate guest artists.

TH 4391. BFA Intensive II. (2 cr; A-F only. Prereq–BFA student in theatre arts)
Applying first three years of training toward performance. Seventh in sequence of eight. Acting, voice, and movement. Integrating the disciplines.

TH 4392. BFA Acting VIII. (7 cr; A-F only. Prereq–4391)
Application of first three years of training toward performance. Career preparation. Eighth in sequence of eight.

TH 4393. BFA Rehearsal and Performance III. (2 cr; A-F only. Prereq–BFA student in theatre arts)
Acting, voice, movement. Application of process toward performance.

TH 4394. BFA Rehearsal and Performance IV. (2 cr; A-F only. Prereq–BFA student in theatre arts)
Acting, voice and movement. Application of process toward performance.

TH 4395. BFA Intensive III. (2 cr; A-F only. Prereq–BFA-acting sr)
Incorporating the disciplines of acting/voice/movement.

TH 4398. BFA Rehearsal and Performance V. (2 cr; A-F only. Prereq–BFA-acting sr)
Acting, voice and movement. Continuing the application of process towards performance.

TH 4399. BFA Rehearsal and Performance VI. (2 cr; A-F only. Prereq–BFA-acting sr)
Acting, voice, and movement. Continuing the application of process towards performance.

TH 4532. Makeup for the Actor. (2 cr)
Topics vary. May include functions/aesthetics of stage makeup, application techniques, prosthetics, and facial hair.

TH 4550. Video Technology. (3 cr)
Lighting, camera operation, audio, and recording for video/film production, using the state-of-the-art equipment in Studio B. Hands-on training in tools of video technology. Students create a final group project.

TH 4554. Graphics and Animation for Video. (3 cr)
Students explore and experiment with graphic/animation software. Video production, live performance.

TH 4555. Audio Technology. (3 cr)
Sound as science. Technology to create/manipulate sound. Recording techniques. Effects/signal processing. Microphone/mixing techniques.

TH 4556. Digital Audio and MIDI for Performance. (3 cr)
Hands-on computer/CPU-generated audio technology. Use of MIDI language protocol for performance in all aspects of the arts.

TH 4557. Audio for Film and Video. (3 cr. Prereq–[4550, 4555] or #)
Processes/techniques used in capturing, manipulating, and producing audio for use in film/television production. Students experiment and create audio. Challenges in creating audio for various mediums.

TH 4560. Pre-Production and Planning for Video and Film. (3 cr. Prereq–4550, #)
Forum for pre-planning video projects. Students undertake pre-production planning for a specific video project, including script development, scheduling, location scouting, casting, fund-raising, equipment lists/rentals, and permits.

TH 4711. Intermediate Stage Direction. (3 cr. Prereq–1322 or #)
Coordinating/guiding collaborative artistic team. Script selection, textural analysis, concept development, space use, composition, movement, dialogue. Final presentation of scene. Intensive research, textural examination, journal.

TH 4901. Senior Seminar. (2 cr; S-N only. §DNCE 4901. Prereq–Sr, [Th or DNCE major]; offered fall semester only)
Development of senior project, alone or in groups, under guidance of faculty members.

TH 4905H. Honors: Tutorial Seminar in Theatre Arts. (2-4 cr [max 4 cr] Prereq–§4905; honors, theatre arts, Δ; limit [2 cr for [cum laude or magna cum laude], 4 cr for summa cum laude])
Independent reading/research in preparing honors thesis or selected creative project.

TH 5100. Theatre Practicum. (1-4 cr [max 20 cr]. Prereq–#, Δ; 4 cr of 3100 for undergrads)
Individual creative projects in production of approved plays as an actor, director, dramaturg, or playwright. (See 5500 for design practicums.)

TH 5103. The Theatre Dramaturg. (3 cr. Prereq–[4177 or 4178], [jr or sr], #)
Theoretical/practical aspects of dramaturgy in American theater. Historical perspectives. Research/production history of classics. Development of new scripts. Dramaturgical structure and interpretive choices. Dramaturgy as it relates to playwrights/directors. Preparing/editing the rehearsal script. Production dramaturgy.

TH 5117. Performance and Social Change. (3 cr; A-F only. Prereq–Jr or sr or grad student)
Reading, writing, research, presentations and workshops explore activist performance projects. Theories of social formation and ideology provide framework to discuss/animate theater's potential for social change.

TH 5178. History and Theory of Performance Conventions. (3 cr; A-F only. Prereq–[1322, [3171 or 3172]] or grad student)
Draws on visual materials, practical exercises, and theories of spatial representation in context of political/social function. Historical/cross-cultural overview of performance conventions and theatrical space from City of Dionysia to site-specific happenings of 20th century.

TH 5179. Text and Performance. (3 cr; A-F only. Prereq–[1322, [3171 or 3172]] or grad student)
How to read texts toward performance in various dramatic/nondramatic material. Method of unlocking metaphoric energy of texts. Vocabulary/techniques of analysis that transform text from page to stage.

TH 5181. Blacks in American Theatre. (3 cr. §AFRO 5181)
Historical survey of significant events in the development of American Black theatrical tradition; essays, plays, playwrights, and theatres from early colonial references to Black Arts Movement.

TH 5182. Contemporary Black Theatre: 1960-Present. (3 cr. §AFRO 5182)
Essays, plays, playwrights, and theatres that have contributed to contemporary Black theatre. From the beginning of the Black Arts Movement to the present.

TH 5355. Puppetry: Techniques and Practice in Contemporary Theater. (3 cr. Prereq–[[3513 or ¶3513], #] or grad student)
Fundamentals of puppet and object theater/performance are introduced through traditional/contemporary puppetry forms. Focuses on object theater, toy theater, hand puppets, and shadow/Bunraku-style puppets. Readings, in-class screenings of videos/slides. Students build/create series of short works for in-class performance.

TH 5500. Theatre Design Practicum. (1-3 cr [max 20 cr]. Prereq–3515, #, Δ)
Individual projects in production of approved plays as a designer of scenery/properties, costumes, lighting, or sound. (See 5100 for other creative practicums.)

TH 5510. Drawing, Rendering, and Painting for the Theatre Designer I. (3 cr. Prereq–3515 or grad or #)
Development of skills necessary for presentation of theatre scene/costume designs. Materials, layout, and techniques in scene painting. Basic drawing/graphic skills.

TH 5515. Design Composition and Collaboration. (3 cr. Prereq–Grad or 3515, 3711, #)
Classical composition of art and its application to stage design and directing through the collaborative process.

TH 5520. Scene Design. (3 cr [max 9 cr]. Prereq–3515 or grad or #)
Conceiving/communicating design ideas in both two-dimensional sketches and three-dimensional models for theatre and allied venues. Drafting.

TH 5530. Costume Design. (3 cr [max 9 cr]. Prereq–3515 or grad or #)
Theory and process of costume design for theatrical productions (e.g., dance, opera, film) through hypothetical productions.

TH 5540. Lighting Design for the Theatre. (3 cr [max 9 cr]. Prereq–3515 or grad or #)
Design aesthetics and exploration of design for various stage forms and venues. Development of the lighting plot and paperwork; use of the computer in lighting design.

TH 5545. Stage Lighting Technology. (3 cr. Prereq–3515 or grad or #)
The lighting technician's skills and crafts: equipment, techniques, control operation, wiring, and maintenance.

TH 5550. Video Project. (3 cr [max 6 cr]. Prereq–[4550 or 4560 [preferred]], #)
Students participate in a video-shoot project serving in various positions, including camera operator, gaffer, grip, audio engineer, cast, and possibly director and director of photography.

TH 5551. Editing and Post Production for Video and Film. (3 cr. Prereq–#)
Students manipulate software and other technologies used in post production. Editing, audio, image manipulation.

TH 5553. Video Production Design and Aesthetics. (3 cr. Prereq–4553 or #)
Use of technologies in video/film in making a statement or communicating an idea/emotion. Creativity, sensitivity to an audience. Students explore different creative uses of technologies/medium.

TH 5554. Multimedia Production for Live Performance. (3 cr. Prereq–5553 or #)
Use of multimedia production technologies in actual production. Students apply knowledge/skill in conjunction with an artistic team on a production and are an integral part of the development/realization of that production.

TH 5556. Audio Engineering. (3 cr. Prereq–4555 or #)
Miking/recording techniques specific to music and dramatic dialogue. Students explore recording different styles of music. Hands-on experience in recording bands and doing final mixes to a demo CD. Field trips to professional studios and club/concert recordings.

TH 5558. Audio Systems Analysis and Installation. (3 cr. Prereq–4555 or #)
Analyzing, designing, developing specifications, and installing sound systems. Students work from client program lists, with given resources and given spaces, to arrive at best possible audio system. Hands-on experience.

TH 5559. Sound Design for Performance. (3 cr. Prereq–4555 or #)
Audio technology/psychology, their impact on audience in a performance. Communication, design process, psychoacoustics, script analysis.

TH 5560. Drawing, Rendering, and Painting for the Theatre Designer II. (3 cr. Prereq–5510)
Development of skills necessary for presentation of theatre scene/costume designs. Materials, layout, and techniques in scene painting. Rendering and scene painting skills.

TH 5570. Properties/Scenery Technology. (1-3 cr [max 15 cr]. Prereq–3515 or grad or #)
Management, structures, upholstery, mask-making, furniture construction, stage mechanics, soft properties, faux finishes. Topics specified in *Class Schedule*.

TH 5580. Costume Technology. (3 cr [max 15 cr]. Prereq–3515 or grad or #)
Fabric enhancement techniques, masks, wig-making, millinery, makeup prosthetics, pattern drafting, and draping. Topics specified in *Class Schedule*.

TH 5590. Theatre Technology Practicum. (1-3 cr [max 15 cr]. Prereq–3515, #, Δ; 4 cr max for undergrads)
Individual creative project in technology/craft area of theatre. Practical work in costume, lighting, makeup, props, scenery, sound, or theatre management.

TH 5711. Advanced Stage Direction. (3 cr. Prereq–[4711, #] or grad student)
Realistic/nonrealistic dramatic forms. Theory/technique of rehearsal. Production problems. Includes directing of three one-act plays.

TH 5713. Theory and Practice of Performance. (3 cr; A-F only. Prereq–[3171, 3172, [4177 or 4178], 5711] or grad student)
Traditions of thinking about theatre, from ancient Greece to present, in practical applications. Focuses on epistemological significance of performance in current critical practices of postmodernism, psychoanalysis, and phenomenology.

TH 5714. The Drama of Myth. (3 cr. Prereq–[1322, 3171, 3172] or #)
Role of myth in performance. Students choose a myth and study its iconography, tracing its journey in painting, sculpture, music, and other texts that accumulated around it throughout history. Course culminates in creation of a non-traditional performance score that embodies/reveals energies of contemporary culture within ancient metaphor of a chosen myth.

TH 5715. Actor-Director Collaboration. (3 cr. Prereq–Grad or 3322, 3711)
Applying advanced acting and directing technique to an artistic, collaborative process that promotes flexibility and creativity. Actors and directors are exposed to a challenging range of roles, styles, and scenes.

TH 5716. Stage Management for the Theatre. (4 cr. Prereq–[1101, 1321, soph] or grad)
Theories, practicalities, and techniques for rehearsal/performance. Organizing/managing various types of performance venues.

Th 5718. Principles of Theatre Management. (3 cr. Prereq–#)
Nonprofit theatre structure: concept; mission; organization; financial, marketing, fund-raising, and grant-writing strategies. Discussion/guest professionals from Twin Cities' arts/funding communities.

TH 5725. The Alchemy of an Object. (3 cr. Prereq–[[1322, 3171, 3172] or #], grad student)
Stage object as vehicle for investigating role of drama in culture from Middle Ages to present. Object as first connection that dramatic text makes with material world. Object as culturally inscribed link between language of drama and world of action in a historically given moment. Object as metaphor of cultural praxis.

TH 5753. Text Analysis for Drama. (3 cr. Prereq–5711 or grad)
Tools for intensive textual analysis for advanced directors/designers. Traditional, Aristotelian analysis and contemporary approaches covered through theories/writings of Bertolt Brecht and Howard Barker.

TH 5760. Advanced Stage Management. (2-3 cr [max 3 cr]. Prereq–5716 or ¶5716, #; [4 cr max for undergrads])
Practical experience in stage management for specific productions of the University Theatre with emphasis on rehearsal and performance.

TH 5780. Advanced Topics in Theatre Management. (2-4 cr [max 8 cr]. Prereq–5718)
Study and apply theatre management theories and techniques learned in 5718. Marketing/audience development, fundraising and grant writing strategies, and financial management of a nonprofit theatre organization.

TH 5950. Topics in Theatre. (1-4 cr [max 20 cr])
Topics specified in *Class Schedule*.

TH 5993. Directed Study. (1-5 cr [max 20 cr]. Prereq–6 Th cr, #, Δ, ❑)
Guided individual reading or study.

Toxicology (TXCL)

Veterinary Diagnostic Medicine

College of Veterinary Medicine

TXCL 5000. Directed Research in Toxicology. (1-4 cr [max 16 cr]; A-F only. Prereq–#)
Special project that addresses specific issue in toxicology. Under guidance of faculty member.

TXCL 5011. Principles of Toxicology. (2 cr; A-F only. Prereq–Grad txcl major or #)
Introduction to fundamentals of poisoning in individuals and the environment, assessment of potential health hazards, and application of toxicology in various professional careers.

TXCL 5195. Veterinary Toxicology. (3 cr; A-F only. §CVM 6195. Prereq–Grad student or #)
Toxicology of minerals, pesticides, venoms, and various toxins. Identification of poisonous plants. Recognition, diagnosis, and treatment of animal poisons.

TXCL 5545. Introduction to Regulatory Medicine. (2 cr; A-F only. §CVM 6545. Prereq–Grad student or #)
Explanation of products requiring pre-market approval and those that may be marketed without approval. Post-market surveillance. Adverse reactions, removal of product from market.

Translation and Interpreting (TRIN)

College of Continuing Education

TRIN 1201. Fundamentals of Health Care for Interpreters. (3 cr; A-F only)
Technical vocabulary, oral discourse patterns used by healthcare providers in talking to patients, family members. Language of American health care interview.

TRIN 1301. American Law for Interpreters. (3 cr)
American legal system. Technical vocabulary used in courts and other legal settings. Oral legal discourse. Presentations by specialists, discussion, exercises for review/practice.

TRIN 3001. Introduction to Translation. (3 cr. Prereq–Bilingual proficiency in [English, second language of instruction], Δ)
Theory of and supervised practice in translation. Re-expressing meaning in a second language. Translation primarily of English language texts concerning public health/safety, legal/voting rights, regulations, and procedures.

TRIN 3002. Intermediate Translation. (3 cr. Prereq–3001)
Additional instruction and supervised practice in translation.

TRIN 3005. Principles of Translation. (3 cr. Prereq–Fluent in English, proficient in a second language, not in CCE certificate prog in interpreting; basic knowledge of English grammar recommended)
Key linguistic principles that help us understand how language makes meaning. Applying principles to translation.

TRIN 3101. Introduction to Interpreting. (3 cr. Prereq–high level of proficiency in spoken English and another language; 3001 recommended)
Practical and theoretical introduction to interpreting in health, human service, and legal settings. Emphasis on understanding the unique role of the interpreter, current models and modes of interpreting, ethical issues and professional standards of practice, and developing pre-interpreting skills.

TRIN 3102. Consecutive Interpreting. (3 cr. Prereq–3101, high level of proficiency in [spoken English, another language] as demonstrated by application, Δ)
Practice/theory at professional level in interpreting in health, human service, legal settings. Emphasizes professional/client dialogues. Consecutive interpreting skills, vocabulary research/storage, intercultural issues. Analyzing interpretive process. Performance assessment through audio/videotaping. Subject languages (e.g., Spanish, Russian, Somali) specified for each section.

TRIN 3900. Topics in Translation and Interpreting. (1-4 cr [max 16 cr])
Topics specified in *Class Schedule*.

TRIN 4201. Interpreting in Health Care Settings. (3 cr; A-F only. Prereq–1201, 3102)
Practice in interpreting simulated clinical encounters and monologues. Emphasizes fluency/accuracy in consecutive/simultaneous modes. Sight translation, medical vocabulary in two languages, ethical/situational considerations in health care interpreting. Coursework is done mainly in bilingual sections (English, another language).

TRIN 4301. Interpreting in Legal Settings. (3 cr; A-F only. Prereq–1301, 3102)
Principles/practice of interpreting in legal settings. Skill-building for fluency/accuracy in simultaneous/consecutive modes. Sight translation. Legal register in two languages. Ethical considerations, courtroom conduct. Observation of actual court proceedings. Coursework is done mainly in bilingual sections (English and another language).

TRIN 5900. Topics in Translation and Interpreting. (1-4 cr [max 16 cr])
Topics specified in *Class Schedule*.

TRIN 5993. Directed Study. (1-3 cr [max 3 cr]. Prereq–#, Δ, ❑)
Directed study in translation and interpretation.

Turkish (TURK)

Institute of Linguistics, ESL, and Slavic Languages and Literatures

College of Liberal Arts

TURK 1001. Beginning Turkish I. (5 cr. §TURK 4001)
Listening, speaking, reading, writing.

TURK 1002. Beginning Turkish II. (5 cr. §TURK 4002. Prereq–1001)
Listening, speaking, reading, and writing.

TURK 1511. Introduction to Turkish and Ottoman Culture, History, and Society: Intersection of Europe and Asia. (4 cr)
Turkish/Ottoman culture, history, and society, and its pivotal placement between East and West, through popular media, film, literature, and the visual arts. Issues raised by primary source materials from multi-disciplinary perspectives. Modern urban/rural life, recent history, religion, terrorism/violence, migration, ethnicity, Turkic/non-Turkic peoples.

TURK 3001. Intermediate Turkish I. (5 cr. §TURK 4003. Prereq–1002 or #)
Listening, speaking, reading, and writing skills in modern standard Turkish.

TURK 3002. Intermediate Turkish II. (5 cr. §TURK 4004. Prereq–3001 or #)
Listening, speaking, reading, and writing skills in modern standard Turkish.

TURK 3900. Topics in Turkish Language, Literature, and Culture. (1-4 cr [max 12 cr])
Variable topics in Turkish language, literature and culture. Consult Institute for details.

TURK 4001. Beginning Turkish I. (3 cr. §TURK 1001. Prereq–4th sem course in another language or grad student)
Listening, speaking, reading, writing.

TURK 4002. Beginning Turkish II. (3 cr. §TURK 1002. Prereq–[4001, 4th sem course in another language] or grad student)
Listening, speaking, reading, writing.

TURK 4003. Intermediate Turkish I. (3 cr. §TURK 3001. Prereq–[4002, 4th semester course in another language] or grad student)
Listening, speaking, reading, and writing skills in modern standard Turkish.

TURK 4004. Intermediate Turkish II. (3 cr. §TURK 3002. Prereq–[4003, 4th semester course in another language] or grad student)
Listening, speaking, reading, and writing skills in Modern Standard Turkish.

TURK 5900. Topics in Turkish Language, Literature, and Culture . (1-4 cr [max 12 cr])
Variable topics in Turkish language, literature, and culture. Consult Institute for details.

University College (UC)

College of Continuing Education

UC 1000. Exploring Educational Options. (1 cr [max 20 cr]; S-N only. Prereq–Δ, #)
Clarifying expectations, resources, and challenges for transition into (back to) college. Students assess their interests and learning style as they relate to a college major. Internet as means of gaining options for education. Individualized degrees at the University, how to prepare an application for them. Campbell Skills and Interest Survey, Learning Styles Inventory, written assignments. Materials fee: $25.

UC 3201. Web Designer Introduction. (4 cr; A-F only)
Web design process: plan, design, launch, and publish. Design principles, business practices, site analysis. Students use industry standard Web design software, including Adobe Photoshop, Macromedia Dreamweaver, and Flash, to build Web site. HTML, CSS. Lectures, exercises, lab.

UC 3202. Web Designer Introduction II. (4 cr; A-F only. Prereq–3201 or #)
Designing with Adobe Photoshop vector tools, using batch processing. Macromedia Flash as an animation tool. Developing an environment through ActionScripts. DHTML Layers, HTML frames, form processing. Internet service providers, hosting, search engines, Web site marketing.

UC 3950. Special Topics. (1-4 cr [max 12 cr])
Special topics course.

UC 4001. Professional Practice of Addictions Counseling. (4 cr. Prereq–Adds student, #)
Core addictions counseling functions including clinical assessment, case management, documentation treatment planning, and ethical issues. Students begin process of securing internship.

UC 4002. Internship in Substance Abuse Counseling I. (2-8 cr [max 8 cr]; S-N only. Prereq–Adds 4001, Adds student, #)
Supervised field work experience. Practical application of substance abuse counseling skills such as assessment, treatment planning, and case management.

For definitions of course numbers, symbols, and abbreviations, see page 300.

UC 4003. Internship in Substance Abuse Counseling II. (4 cr; S-N only. Prereq–Adds 4001, Adds 4002, Adds student, #)
Students' knowledge, internship site functioning, and counseling skills are advanced through clinical experience/supervision.

UC 4301. Perspectives: Interrelationships of People and Animals in Society Today. (2 cr [max 3 cr]. §CVM 6050, VCS 3050)
Interrelationships of people and animals from several viewpoints. Social, economic, and health consequences of these relationships, including issues such as pets and people sharing an urban environment, animal rights, and the influence of differences in cultures on animal-human relationships.

UC 4525. Garbage and the Human Environment. (3 cr; A-F only)
Human development, use of natural resources, waste production, pollution of environment, waste management. Comparative look at issues/problems associated with rapid technological development. Laws to control waste production and manage accumulated waste.

UC 5075. Directed Study. (1-8 cr; A-F only)
Directed study.

UC 5950. Special Topics. (1-8 cr [max 16 cr])
Special topics.

Urban Studies (URBS)

Department of Geography

College of Liberal Arts

URBS 1001W. Introduction to Urban Studies: The Complexity of Metropolitan Life. (3 cr; A-F only)
Interdisciplinary course, ranging across spatial, historical, economic, political, and design perspectives, among many others.

URBS 3201. Urban Studies Colloquium. (1 cr [max 4 cr]; A-F only. Prereq–Δ)
Urban/metropolitan issues. Topics vary to reflect current concerns. In-depth reading, intensive group discussion.

URBS 3202. Urban Studies Colloquium. (1 cr [max 4 cr]; A-F only)
Urban/metropolitan issues. Topics vary to reflect current concerns. In-depth reading, intensive group discussion.

URBS 3301W. American Cities As Settings for Cultural Diversity. (3 cr)
Explores cultural diversity in American cities, considering patterns of and reasons for racial and class segregation and interaction. Its foci are the problems, conflicts, and successes of cultural diversity from a multidisciplinary perspective.

URBS 3500. Urban Studies Workshop. (3 cr [max 9 cr]; A-F only. Prereq–#)
Links academic learning to actual urban problems/issues. Focuses on specific topic using local community as laboratory. Field work, contact with local institutions/agencies.

URBS 3751. Understanding the Urban Environment. (3 cr; A-F only)
Examine links between cities and the environment with emphasis on air, soil, water, pollution, parks and green space, undesirable land uses, environmental justice, and the basic question of how to sustain urban development in an increasingly fragile global surrounding.

URBS 3771. Fundamentals of Transit. (3 cr)
Importance of transit to an urban area. Issues surrounding development/operation of transit. Defining various modes of transit, evaluating why/where each may be used. Making capital improvements to transit system. Finance, travel demand forecasting, environmental assessment, scheduling, evaluation of effectiveness/accessibility.

URBS 3800. Topics in Urban Studies. (3 cr [max 6 cr])
Topics specified in *Class Schedule*.

URBS 3900. Urban Studies Internship Seminar. (2 cr [max 4 cr]; A-F only. Prereq–Sr, internship placement, Δ, #)
Weekly seminar integrates internship experience with academic program.

URBS 3955W. Senior Paper Seminar. (2 cr; A-F only. Prereq–Δ)
Methods/resources for research. Substantial writing.

URBS 3993. Urban Studies Directed Study. (2-3 cr [max 6 cr]; A-F only. Prereq–URBS majors, #, Δ)
For students with a specific educational objective that cannot be satisfied through regular curriculum (e.g., foreign study) and for honors students to complete an honors opportunity.

URBS 5101. The City and the Metropolis: An Exploration. (3 cr. Prereq–Grad student or [adv URBS undergrad, #])
The City and the Metropolis as places that result from important acts of human creativity. Interdisciplinary/exploratory perspectives. Building/developing (North American) cities, Construction of "urban culture."

Urdu (URDU)

Asian Languages and Literatures

College of Liberal Arts

URDU 1001. Introducstion to conversational Urdu. (3 cr)
Development of spoken Urdu. Fundamentals of composition.

URDU 1101. Beginning Urdu. (5 cr)
Basic listening, speaking, reading, and writing skills. Emphasizes development of communicative competence.

URDU 1102. Beginning Urdu. (5 cr. Prereq–1101 or #)
Basic listening, speaking, reading, and writing skills. Emphasizes development of communicative competence.

URDU 3131. Intermediate Urdu. (5 cr. Prereq–1102 or #)
Development of reading, writing, speaking, and listening skills. Grammar review, basic compositions, oral presentations.

URDU 3132. Intermediate Urdu. (5 cr. Prereq–3131 or #)
Development of reading, writing, speaking, and listening skills. Grammar review, basic compositions, oral presentations.

URDU 4001. Beginning Urdu. (3 cr. Prereq–Passing score on GPT in another language or grad student)
Listening, speaking, reading, writing. Emphasizes development of communicative competence.

URDU 4002. Beginning Urdu. (3 cr. Prereq–Passing score on GPT in another language or grad student)
Listening, speaking, reading, and writing skills. Emphasizes development of communicative competence.

Veterinary Medicine (CVM)

CVM 1000. Introduction to Veterinary Medicine. (1 cr; S-N only)
History of veterinary profession, careers within the profession, employment trends. Information about admission to DVM. Veterinary technology programs.

Vietnamese (VIET)

Asian Languages and Literatures

College of Liberal Arts

VIET 1015. Accelerated Beginning Vietnamese. (5 cr. Prereq–Ability in basic spoken Vietnamese)
Oral, reading, and writing skills. Grammar/usage, practice in reading/writing. Vietnamese literature, other formal writing. Vietnamese culture.

VIET 1016. Accelerated Intermediate Vietnamese. (5 cr. Prereq–1015 or #)
Oral, reading, and writing skills. Grammar/usage, practice in reading/writing. Vietnamese literature, other formal writing. Vietnamese culture.

Water Resources Science (WRS)

Water Resources Center

College of Food, Agricultural and Natural Resource Sciences

WRS 5001. Introduction to Field Research in Water Resources. (2 cr. Prereq–Grad WRS major or #)
Introduction to field research techniques and opportunities during two-week summer excursion to regional sites. Data acquisition in large/small lakes, streams, and wetlands for biota and chemical/physical water quality; surface and groundwater hydrologic measurements and sampling.

WRS 5101. Water Resources: Individuals and Institutions. (3 cr. Prereq–Grad student or #)
Socio-cultural, legal, and economic forces that affect use of water resources by individuals/institutions. Historical trends in water policy, resulting water laws in the United States. Institutional structures whereby water resources are managed at federal, state, and local levels.

WRS 5241. Ecological Risk Assessment. (3 cr. Prereq–#)
Evaluating current/potential impact of physical, chemical, and biological agents on ecosystems. Identifying ecological stressors, assessing level of exposure, measuring ecological responses, communicating/managing risks. Class participation, two reaction papers, final exam, small-group project.

Women's Studies (WOST)

Department of Women's Studies

College of Liberal Arts

WOST1001. Introduction to Women's Studies. (3-4 cr [max 4 cr]. §WOST 1051)
U.S. multi-/cross-cultural studies of contemporary social, cultural, and personal conditions of women's lives. Includes honors recitation.

WOST 1002. Politics of Sex. (3-4 cr [max 4 cr]. §WOST 1052)
Introductory survey of historical, cultural, psychological, and sociopolitical dimensions of analyzing gender/sexuality. Norms/deviances pertaining to gender/sexuality as differently enacted/understood by social groups in different time-/place-specific locations.

WOST 1003W. Women Write the World. (3-4 cr [max 4 cr])
Concepts in literary studies. Poems, plays, short stories, novels, essays, letters by women from different parts of world. Focuses on lives, experiences, and literary expression of women, including basic concepts of women's studies.

WOST 1902. Freshman Seminar. (3 cr; A-F only. Prereq–Fr with no more than 29 cr)
Topics/description vary. See *Class Schedule, Course Guide*.

WOST 1904. Freshman Seminar. (3 cr; A-F only. Prereq–Freshman)
Topics specified in *Class Schedule*.

WOST 1905. Freshman Seminar. (3 cr [max 6 cr]; A-F only. Prereq–Freshman)
Topics/description vary. See *Class Schedule, Course Guide*.

WOST 3002. Gender, Race, and Class: Women's Lives in the United States. (3-4 cr [max 4 cr]. §WOST 3002H)
Comparative study of women/gender, race, class, and sexuality in two or more U.S. ethnic cultures. Includes honors recitation.

WOST 3002H. Honors: Gender, Race, and Class: Women's Lives in the United States. (3-4 cr [max 4 cr]. §WOST 3002. Prereq–Honors)
Comparative study of women/gender, race, class, sexuality in two or more U.S. ethnic cultures. Honors recitation.

WOST 3003. Gender and Global Politics. (3-4 cr [max 4 cr]. §WOST 3003H)
Similarities/differences in women's experiences throughout world, from cross-cultural/historical perspective. Uses range of reading materials/media (feminist scholarship, fiction, film, news media, oral history, autobiography).

WOST 3003H. Honors: Gender and Global Politics. (3-4 cr [max 4 cr]. §WOST 3003. Prereq–honors)
Similarities/differences in women's experiences throughout world from cross-cultural/historical perspective. Uses range of reading materials/media (feminist scholarship, fiction, film, news media, oral history, autobiography). Includes honors recitation.

WOST 3004V. Honors: Point/Counterpoint: Contemporary Feminist Debates. (3-4 cr [max 4 cr]. §WOST 3004W. Prereq–Honors)
Contemporary debates of concern to many women. Abortion, affirmative action, marriage rights, welfare rights, sex education, children's rights, date rape. In-depth study of several issues. Debate pros/cons of relevant perspectives. Includes honors recitation.

WOST 3004W. Point/Counterpoint: Contemporary Feminist Debates. (3-4 cr [max 4 cr]. §WOST 3004V)
Contemporary debates of concern to many women. Abortion, affirmative action, marriage rights, welfare rights, sex education, children's rights, date rape. In-depth study of several issues. Debate pros/cons of relevant perspectives. Includes honors recitation.

WOST 3102V. Honors: Feminist Thought and Theory. (3-4 cr [max 4 cr]. §WOST 3102W)
Feminist theoretical perspectives. How theory develops in response to traditions/forms of practice.

WOST 3102W. Feminist Thought and Theory. (3-4 cr [max 4 cr]. §WOST 3102V)
Feminist theoretical perspectives. How theory develops in response to traditions/forms of practice.

WOST 3190. Topics: Theory, Knowledge, and Power. (3 cr [max 12 cr])
Topics specified in *Class Schedule*.

WOST 3201. Sociology of Gender. (3 cr; A-F only. §SOC 3221. Prereq–1001 or 1002 or #)
Organization, culture, and dynamics of gender relations. Gender/racial inequalities in workplace. Relationships between gender/race, gender/culture. Sexuality, gendered politics, women's movement.

WOST 3202. Biology of Women. (4 cr)
Biological aspects of female life from early development to old age. Biology of sex differences/sexuality, menarche/menstrual cycles, gestation/parturition, female-specific diseases/conditions, menopause/aging. Ways of knowing biology of female body. Includes lab.

WOST 3202H. Honors: Biology of Women. (4 cr)
Biological aspects of female life from early development to old age. Biology of sex differences/sexuality, menarche, gestation/parturition, female-specific diseases/conditions, menopause. Ways of knowing biology of female body. Includes lab.

WOST 3203W. Skin, Sex, and Genes. (3 cr. Prereq–3202 or #)
Ways in which modern biology has been site of conflict about race/gender. Race/gender demographics of scientific professions.

WOST 3204. Women's Psychologies: Feminist and Multicultural Perspectives. (3 cr)
Examines culture, gender, ethnicity, class, sexual identity, and age as factors that influence women's diverse psychologies.

WOST 3206. Women and Madness in History and Literature. (3 cr. §WOST 5203. Prereq–Jr)
The representation of madness and how it intersects with gender as well as class, race, sexual orientation, and nationality.

WOST 3207. Gender and the Global Politics of Health. (3 cr; A-F only. §GLOS 3607)
Politics, global processes, and social relations that shape health/disease patterns world wide. Case studies, including HIV/AIDS in Africa, diabetes and health care in the U.S., new reproductive technologies, and access to food. How gender, poverty, geographic/social location, citizenship, sexuality, and other factors help determine degree of vulnerability to disease or right to health.

WOST 3290. Topics: Biology, Health, and Environmental Studies. (3 cr)
Topics specified in *Class Schedule*.

WOST 3290H. Topics: Biology, Health, and Environmental Studies: Enviro/ Feminism. (3 cr. Prereq–Honors)
Concepts of environmental biology, changing conditions of life on earth, creating a sustainable future. Connection between feminism and environmental justice. Disproportionate impact of environmental crises on women, children, and economically disadvantaged communities.

WOST 3301W. Women Writers. (3 cr. Prereq–Intro literature course)
Literature in various genres (e.g., novels, short stories, poems, essays, plays, autobiography) written by women of various racial/ethnic backgrounds.

WOST 3302. Women and the Arts. (3 cr)
Study of women in the arts, as represented and as participants (creators, audiences). Discussion of at least two different art forms and works from at least two different U.S. ethnic or cultural communities.

WOST 3303W. Writing Differences: Literature by U.S. Women of Color. (3 cr)
Interpret/analyze poetry, fiction, and drama of U.S. women minority writers. Relationship of writer's history, ethnicity, race, class, and gender to her writings.

WOST 3305. Language and Gender. (3 cr. §COMM 3405)
Gender and communication with an emphasis on interdisciplinary theory. Role of communication in creating, maintaining, reinforcing, and sometimes changing gender relations in society.

WOST 3306. Pop Culture Women. (3 cr)
Contemporary U.S. feminism as political/intellectual movement. Ways in which movement has been represented in popular culture.

WOST 3307. Feminist Film Studies. (3 cr)
Construction of different notions of gender in film, social uses of these portrayals. Lectures on film criticism, film viewings, class discussions.

WOST 3308W. Women's Contemporary Fiction. (3 cr)
Themes and features of style and content related to changes in women's roles in novels and short stories by English-language women writers of the late 20th century. Significance of race, sexual orientation, class, and age in the conditions of women's lives and their portrayal in literature.

WOST 3390. Topics: Visual, Cultural, and Literary Studies. (3 cr)
Topics specified in *Class Schedule*.

WOST 3403W. Jewish Women in the United States. (3 cr. §AMST 3632W, JWST 3632W)
Twentieth century American Jewish women—historically, sociologically, religiously, and culturally; key developments over the century.

WOST 3404. International Lesbian and Queer Studies. (3 cr. Prereq–1001 or 1002 or 3001 or #)
Lesbian/gay lives throughout world. Culturally-specific/transcultural aspects of lesbian/gay identity formation, political struggles, community involvement, and global networking. Lesbian/gay life in areas other than Europe and the United States.

WOST 3405. Latin American Women's Lives. (3 cr. §LAS 3405. Prereq–1001, 1002 or 1003 or LAS 3131 or #)
An interdisciplinary approach to understanding women's lives in Latin America. Use of ethnography, history, poetry, fiction, and "testimonio" to understand the conditions of women's lives in Latin America.

WOST 3406. Gender, Labor, and Politics. (3 cr)
Historical changes in women's labor force participation in the United States from 1890 to present. Systematic/institutional processes that maintain/reproduce sex segregation. Women's efforts to change their work situations.

WOST 3407. Women in Early and Victorian America: 1600-1890. (3 cr. §HIST 3347)
Varied experiences of women in American history from European settlement in North America to the end of the 19th century.

WOST 3408. Women in Modern America. (3-4 cr. §HIST 3348. Prereq–3407)
History of women in the United States from 1890 to the present. Women's changing roles in politics, in the labor force, in the family, and in the popular culture. Themes include work, family, sexuality, gender ideologies, women's right struggles, and the different experiences of women based on race, class, religion, and region.

WOST 3409W. Asian American Women's Cultural Production. (3 cr)
Diversity of cultures designated "Asian American." Understanding women's lives in historical, cultural, economic, and racial contexts.

WOST 3410. La Chicana. (3 cr. §CHIC 3212)
Focus on Chicanas or politically defined women of the Mexican-American community. Method is interdisciplinary emphasizing the importance of historical context and cultural process to any discussion of the Chicana experience.

WOST 3411. Las Mujeres. (3 cr. §CHIC 3402)
Focus on Chicanas; women of the Mexican-American community. Exploration of racial, economic, political, and gender issues of concern to all Mexican Americans and diverse Latino cultures.

WOST 3412. American Indian Women: Ethnographic and Ethnohistorical Perspectives. (3 cr; A-F only. §AMIN 3409, AMIN 5409)
Comparative survey of ethnographic/ethnohistorical writings by/about American Indian women.

WOST 3413. Women and Gender in Latin American History. (3 cr. §HIST 3424)
Changing gender norms in Latin America over time as compared with lives of women/men of diverse classes, ethnic groups. How women responded to their position in society, on continuum from accomodation to resistance.

WOST 3414. Women in Medieval Europe. (3 cr; A-F only)
Women's role in family, politics, religion, work, and social movements. Representations of women in religious texts, art, literature, scientific studies, and law. Methods/approaches to study of women's history.

WOST 3490. Topics: Political Economy and Global Studies. (3 cr)
Topics specified in *Class Schedule*.

WOST 3503. Women and the Law. (3 cr)
Legal system as it relates to women: historical legal approach to issues related to constitutional rights of women.

WOST 3590. Topics: Social Change, Activism, Law, and Policy Studies. (3 cr)
Topics specified in *Class Schedule*.

WOST 3690. Topics: Women, Society, and Race in the United States. (3 cr)
Topics specified in *Class Schedule*.

WOST 3880H. Honors Directed instruction. (1-8 cr [max 12 cr]. Prereq–Honors)
Directed instruction.

WOST 3890H. Topics: Honors Seminar. (1-8 cr [max 12 cr]. Prereq–Honors)
Topics vary. Topics that students would like faculty to develop into a course or topics closely related to faculty research/scholarship or contemporary issues.

WOST 3893H. Honors Directed Study. (1-8 cr [max 12 cr]. Prereq–Honors)
Honors directed study.

WOST 3894H. Honors Directed Research. (1-8 cr [max 12 cr]. Prereq–Honors)
Honors directed research.

WOST 3980. Directed Instruction. (1-12 cr [max 12 cr]. Prereq–#, Δ, ❑)

WOST 3993. Directed Study. (1-12 cr [max 12 cr]. Prereq–#, Δ, ❑)

WOST 3994. Directed Research. (1-12 cr [max 12 cr]. Prereq–#, Δ, ❑)

WOST 4102. Women, Gender, and Science. (3 cr. §HSCI 4455. Prereq–1001 or 1002 or 3102 or #)
Three intersecting themes analyzed from 1700s to the present: women in science, sexual and gendered concepts in modern sciences, and impact of science on conceptions of sexuality and gender in society.

WOST 4103H. Honors: International Feminist Theories. (3 cr. §WOST 5104. Prereq–[3102, 8 cr WoSt] or grad or #)
Western/nonwestern feminist theories in conversation. Historical, cultural, and political context. Relation of theory to activism.

WOST 4108W. Senior Seminar: Writing. (3 cr. Prereq–WoSt [jr or sr])
Writing seminar for senior project. Writing process. Project is completed under supervision of instructor and faculty adviser.

WOST 4109. Field Learning. (2 cr. Prereq–WoSt major)
Projects that involve an internship or learning practicum.

WOST 4122. Philosophy and Feminist Theory. (3 cr. §PHIL 4622, PHIL 5622, WOST 5122. Prereq–8 crs in [philosophy or women's studies] or #)
Encounters between philosophy/feminism. Gender's influence in traditional philosophical problems/methods. Social role of theorist/theorizing as they relate to politics of feminism.

WOST 4190. Topics: Theory, Knowledge, and Power. (3 cr. Prereq–Sr or grad student or #)
Topics specified in *Class Schedule*.

WOST 4201. The Older Woman: A Feminist Perspective. (3 cr. Prereq–12 cr in WoSt or substantial work in psych or soc sci)
Myths and realities surrounding conceptualizations of older women in public, private, personal, social, sexual, professional, and community interactions.

WOST 4290. Topics: Biology, Health, and Environmental Studies. (3 cr. Prereq–Sr or grad student or #)
Topics specified in *Class Schedule*.

WOST 4302H. Honors: Women's Personal Narratives. (3 cr. Prereq–3301 or 3302 or 3 cr literary studies or 3 cr AFROAm or #)
Literary autobiography, journals, travel narratives, essays, slave narratives, and ethnographies used to consider content of and methodological, theoretical, and aesthetic issues in constructing/producing women's experience.

WOST 4390. Topics: Visual, Cultural, and Literary Studies. (3 cr. Prereq–Sr or grad student or #)
Topics specified in *Class Schedule*.

WOST 4401. Chicana/Latina Cultural Studies. (3 cr. §CHIC 4401. Prereq–3002 or 3410 or 3411 or 3 cr Chicano studies or #)
Diversity of cultures called "Hispanic"; women in these cultures. Chicanas/Latinas living in United States or migrating from their home nations to United States.

WOST 4402. Rebels, Radicals, and Revolutionaries: History of Western Feminisms. (3 cr [max 4 cr])
Survey of main currents in history of western feminist thought, politics, and social movements from 1770s to present.

WOST 4403. Queering Theory. (3 cr. Prereq–1002 or 3102 or #)
Lesbianism and lesbian identities as products of cultural practices, relations, and meanings that are historically specific/changing.

WOST 4404. Gender, Nation, and Literature in Latin America. (3 cr. Prereq–[1001 or course on feminist theory], [jr or sr])
Latin American literature/film concerning gendered nature of Latin American politics, society, and history. Texts by (mostly) women writers/filmmakers. Texts are in English but available in Spanish or Portuguese.

WOST 4490. Topics: Political Economy and Global Studies. (3 cr. Prereq–Sr or grad student or #)
Topics specified in *Class Schedule*.

WOST 4502. Women and Public Policy. (3 cr. Prereq–[Jr or sr] WoSt major or 9 cr [WoSt or pol sci or sociology] or #)
Public policy issues, processes, and histories as these affect women-, children-, and gender-related issues.

WOST 4504. Women and the Legislative Process. (3 cr. Prereq–Jr or sr or grad student or #)
Current/historical roles, impacts, and interactions of women as legislators, constituents, and professional or citizen lobbyists in state/national legislatures. Unique contributions, issues, challenges of women. Ways in which gender is operative in legislative process.

WOST 4505. Honors: Legislative Internship. (3 cr. Prereq–4504 or equiv or grad, Δ)
Discussion group and learning community for students working as interns for a Minnesota legislator during the year's legislative session.

WOST 4590. Topics: Social Change, Activism, Law, and Policy Studies. (3 cr. Prereq–Jr or sr or grad student)
Topics specified in *Class Schedule*.

WOST 4690. Topics: Women, Society, and Race in the United States. (3 cr)
Topics specified in *Class Schedule*.

WOST 4790. Topics: Sexuality Studies. (3 cr)
Topics specified in *Class Schedule*.

WOST 4900W. Women's Studies Seminar. (3 cr [max 12 cr]; A-F only. Prereq–WoSt major, junior or senior standing, or #)
Includes a component on research methods/writing. Capstone experience. Culminates in a 20-25 page paper.

WOST 4980. Directed Instruction. (1-8 cr [max 12 cr])

WOST 4993. Directed Study. (1-8 cr [max 12 cr])

WOST 4994. Directed Research. (1-8 cr [max 12 cr])

WOST 5101. Feminist Approaches to Ethnography. (3 cr)
Preparation for feminist ethnographic research in the social sciences. Using recent works by feminist ethnographers, focus is on the methods, politics, and ethics, as well as gender, race, class, and cross-cultural issues pertaining to fieldwork.

WOST 5102. Feminist Approaches to History. (3 cr. Prereq–8 cr WoSt or grad or #)
Analysis and practice of feminist history. Theories, methods, and sources that address the interrelationship of gender, race, class, and sexuality.

WOST 5103. Feminist Pedagogies. (3 cr. Prereq–Grad or #)
Theory and practice of feminist pedagogies by comparing and evaluating various multicultural feminist theories of education/teaching and the application of specific theories, techniques, and teaching strategies.

WOST 5104. International Feminist Theory. (3 cr. §WOST 4103H)
Third World and transnational feminisms. Interrogating the categories of "women," "feminism," and "Third World." Varieties of power/oppression that women have endured/resisted, including colonization, nationalism, globalization, and capitalism. Concentrates on postcolonial context.

WOST 5105W. Gendered Rhetoric of Science and Technology. (3 cr. Prereq–[§RHET 5108, §Rhet 8530]; 8 cr WoSt or grad or #)
How cultural gender roles are affected by science and technology as well as influence scientific and technological thinking and communication strategies.

WOST 5107. Gender, Culture, and Science. (3 cr)
Critical study of some of the major papers concerning the relations of gender and scientific inquiry produced in the past 20 years.

WOST 5122. Philosophy and Feminist Theory. (3 cr. §PHIL 4622, PHIL 5622, WOST 4122. Prereq–8 crs in [philosophy or women's studies] or #)
Encounters between philosophy/feminism. Gender's influence in traditional philosophical problems/methods. Social role of theorist/theorizing as they relate to politics of feminism.

WOST 5190. Topics: Theory, Knowledge, and Power. (3 cr)
Topics specified in *Class Schedule*.

WOST 5201. Global Processes and the Politics of Sexuality. (3 cr. Prereq–12 cr WoSt or feminist studies grad student or #)
Comparative examination of the social construction of sexuality. Formal/informal norms/regulations, categories of deviance, representation of sex in the media/arts, role of sexuality in relation to agency/subjectivity.

WOST 5203. Women and Madness in History and Literature. (3 cr. §WOST 3206. Prereq–Jr, 4 cr WoSt or #)
The representation of madness and how it intersects with gender as well as class, race, sexual orientation, and nationality.

WOST 5290. Topics: Biology, Health, and Environmental Studies. (3 cr)
Topics specified in *Class Schedule*.

WOST 5300. Communication and Gender. (3 cr; A-F only. §COMM 5406. Prereq–one women's studies course or #)
How gender affects verbal communication. Development of analytical skills through readings, exercises, research that raise awareness of the power of language and the influence of gender prescriptions.

WOST 5390. Topics: Visual, Cultural, and Literary Studies. (3 cr)
Topics specified in *Class Schedule*.

WOST 5403. Chicana/Latina Feminisms. (3 cr. Prereq–8 cr WoSt and/or Chic or grad or #)
The historical and social development of Chicana and Latina feminisms in general and their various specific types.

WOST 5404. Working Class Women's Cultures. (3 cr. Prereq–12 cr WoSt or #)
Myths and realities surrounding working class women and their cultures. Use sociological and literary material in an effort to learn about working class women and to hear their own voices.

WOST 5405. Chicanas: Women and Work. (3 cr. Prereq–#)
Chicanas, their various relationships to family/community. Local, national, and global work forces. Questions/issues related to growing integration of world.s systems of production.

WOST 5490. Topics: Political Economy and Global Studies. (3 cr [max 12 cr])
Topics specified in *Class Schedule*.

WOST 5501. Women and the Law. (3 cr. Prereq–9 cr [WoSt or pre-law grad] or #)
Legal system as it relates to women: historical legal approach to issues related to constitutional rights of women.

WOST 5590. Topics: Social Change, Activism, Law, and Policy Studies. (3 cr [max 12 cr])
Topics specified in *Class Schedule*.

WOST 5690. Topics: Women, Society, and Race in the United States. (3 cr)
Topics specified in *Class Schedule*.

WOST 5790. Topics: Sexuality Studies. (3 cr)
Topics specified in *Class Schedule*.

WOST 5993. Directed Study. (1-12 cr [max 12 cr])

WOST 5994. Directed Instruction. (1-12 cr [max 36 cr])

WOST 5995. Directed Research. (1-8 cr [max 36 cr])

Work and Human Resource Education (WHRE)

Work and Human Resource Education

College of Education and Human Development

WHRE 1301. Introduction to Career and Technical Education Teaching. (2 cr; A-F only. Prereq–Occupationally certifiable individual)
Entry-level skills to function as a teacher. Philosophy of career/technical education, planning of instruction, instructional methods, student evaluation, working with students who have special needs, ancillary duties of career/technical education faculty. Emphasizes microteaching and feedback.

WHRE 3011W. Introduction to Technology and Public Ethics. (3 cr)
Nature of technology. Values, ethical issues related to technology. Technology and transformation of workplace, family, community life.

WHRE 3105. Introduction to Strategic Planning Through Human Resources. (3 cr; A-F only. Prereq–3001)
Processes organizations use when engaged in strategic planning. How to participate in planning, implementing, and evaluating strategic innitiatives to improve performance.

WHRE 3121. Communication, Energy and Power, Transportation and Machinery Technologies. (3 cr; A-F only)
Instruction and laboratory experiences in communication, information, power, energy, and transportation technologies. Topics include power systems; transportation systems; information and communication systems; graphic communication and computer applications.

WHRE 3301. Foundations of Philosophy and Practice of Career and Technical Education. (2 cr; A-F only)
Introduction to contemporary career/technical education. Purposes/goals, governance structure, historical perspectives, industry-education relationship, current education practices. Possible future trends and their implications. Development of a personal philosophy of career/technical education.

WHRE 3601. Foundations of Student and Trainee Assessment. (2 cr; A-F only)
Developing tests of knowledge, affect, and processes for programs focused on instruction of skills associated with business/industry. Developing learning-progress reporting systems. Evaluating instructional effectiveness. Applying tests and other evaluation instruments to assess/report learning in business/industry and in career/technical education fields.

WHRE 3629. Foundations of Course Development for Business and Industry. (2 cr; A-F only)
Designing instructional programs/courses focused on helping learners develop desired competence. Designing instruction for performance-based training and vocational/technical education. Developing course syllabus components that clarify broad course expectations. Developing academic/community-based elements that complement course goals.

WHRE 3661. Foundations of Instructional Methods for Business and Industry. (2 cr; A-F only. §HRD 3661)
Theory/practice in instructional methods/techniques for career/technical education (CTE) instructors and for human resources and development (HRD) professionals. How to deliver instruction using various teaching methodologies, select appropriate methodologies, and plan for their delivery.

WHRE 3990. Special Topics for Undergraduates in WHRE. (1-4 cr [max 12 cr])
Course content varies by offering.

WHRE 4990. Special Topics: Professional Issues in WHRE. (1-4 cr [max 12 cr])
Course content varies by offering.

WHRE 5001. Survey: Human Resource Development and Adult Education. (3 cr)
Overview of fields of human resource development and adult education. Includes societal context, theories, processes, definitions, philosophies, goals, sponsoring agencies, professional roles, participants, and resources. Focus on the unique characteristics and ways the fields overlap and enhance one another.

WHRE 5002. Thinking, Learning, and Teaching in Work and Human Resource Education. (3 cr; A-F only)
Nature of thinking/learning in everyday life contexts of work and human resource education. Theory/practice relevant to stimulating/supporting thinking/learning in/for these contexts.

WHRE 5011W. Technology and Public Ethics. (3 cr; A-F only)
Nature of technology. Values, ethical issues related to technology. Technology and transformation of workplace, family, community life. Critique of technology.

WHRE 5021. Learning Through Service. (3 cr)
Service as philosophy and as method of learning. Theory/practice of service in school-based, work-based, and community-based organizations.

WHRE 5031. Information Resources in Education. (3 cr; S-N only)
Sources of knowledge and search strategies for accessing library, electronic, institutional, and informal resources of interest to educators.

WHRE 5101. Introduction to Leadership and Administration of WHRE. (3 cr)
Finance, public relations, communications, legal aspects, leadership, personnel policies/management, program planning/development, evaluation. Inter-institutional collaboration of work and human resource education programs in school-based settings.

WHRE 5102. Leadership in WHRE. (2 cr)
Leadership, leadership roles/responsibilities. Application to work and human resource education.

WHRE 5121. Principles of Supervisory Management. (3 cr)
Introduction to the principles of supervision in education, business, industry, government, and service organizations.

WHRE 5131. Planning WHRE. (3 cr)
Educational planning. Evaluation of work and human resource education in formal/informal settings.

WHRE 5141. Evaluation of WHRE. (3 cr)
Designing/conducting project, program, and systems evaluations in work and human resource education contexts/settings.

WHRE 5201. Family and Work Relationships. (3 cr; A-F only)
Examination of the interactions of work and family to prepare professionals to improve work and family relationships.

WHRE 5301. Philosophy and Practice of Career and Technical Education. (2 cr; A-F only)
Purposes/goals of contemporary career/technical education. Governance structure, historical perspectives, industry-education relationship, current education practices. Possible future trends and their implications. Development of a personal philosophy of career/technical education.

WHRE 5331. Coordination Techniques for Work and Human Resource Education. (3 cr)
Purposes of cooperative work and community education. Responsibilities of instructor coordinator. guidance, selection, placement, supervision, and evaluation of students. Articulation of related instruction. Training sponsor identification, orientation, development, and evaluation. Program management.

WHRE 5341. Global Program Delivery Techniques and Technology of Extension. (2 cr; A-F only. §AFEE 5341)
Special educational activities and teaching and communications methods and techniques for youth and adults, ranging from outreach to extension services, with an emphasis on youth and adult education programs in different global settings.

WHRE 5351. Methods for Change in Developing Countries. (3 cr; A-F only. §AFEE 5351)
Sociological and cultural parameters as they pertain to promoting the adoption of improved practices in rural, community, and agricultural development, including formal and informal education institutions. Project planning, implementation, and evaluation related to actual change and development situations in developing countries.

WHRE 5401. Distance Learning in Adult Education and Training. (3 cr; A-F only)
Distance learning concepts, theory, history, present practice, delivery systems, course design, major issues, future directions.

WHRE 5501. Organizational Learning. (3 cr; A-F only)
Theoretical, empirical, and practical aspects of learning in organizations. Historical context. Definitions, theories, and applications of organizational learning. Learning organization, knowledge management, intellectual capital.

WHRE 5511. Education for Work. (3 cr)
Examination of contextual bases underlying education for work; implications for practice.

WHRE 5521. Work-Based Learning Policies. (2 cr)
Aims/purposes of federal, state, and local policies, related to work-based learning.

WHRE 5522. Work-Based Learning Practices. (3 cr)
Learning in context. Curricular integration. Educational systems articulation. Educational partnerships. Best practices in school-/work-/service-based learning/connecting activities. Building community support. Leadership relating to active, community-based learning.

WHRE 5601. Student and Trainee Assessment. (2 cr; A-F only. §HRD 5601. Prereq–§: BIE 5601)
Developing learning progress reporting systems and tests of knowledge, affect, and processes for programs focused on instruction of skills associated with business/industry. Evaluating instructional effectiveness. Applying tests and other evaluation instruments to assess/report learning in business/industry and career/technical education fields. Students develop each type of test and an overall evaluation plan for a course.

WHRE 5612. Managing and Consulting in Human Resource Development and Adult Education. (3 cr. Prereq–5001)
The theory of managing and consulting in human resource development and adult education. Includes a personal assessment of role requirements and experimentation with management and consultation processes and techniques.

For definitions of course numbers, symbols, and abbreviations, see page 300.

WHRE 5628. Multimedia Presentations in Business. (3 cr. Prereq–5011 or equiv)
Designing, creating, and presenting information using multimedia resources in business settings.

WHRE 5629. Course Development for Business and Industry. (2 cr; A-F only. §HRD 5629)
Designing instructional programs/courses that help learners develop desired competence. Designing instruction for performance based training and vocational/technical education. Developing course syllabus components that clarify course expectations. Developing academic/community-based elements that complement course goals. Reflect on and compare performance-based instruction with other curriculum models for the field.

WHRE 5661. Instructional Methods for Business and Industry. (2 cr. Prereq–§: HRD 5661 or BIE 5661)
Theory/practice in instructional methods for career/technical education (CTE) instructors and human resources/development (HRD) professionals. How to select various teaching methods and plan for their delivery. Preparing an instructional methods plan to clarify course content, teaching methods selected, rationale for their selection, and how a student organization might facilitate student learning.

WHRE 5696. Teaching Internship: Introduction. (1 cr. §CI 5924. Prereq–Admission to initial licensure program)
Initial experiences in teaching profession. Observation of school organization/administration, seminars, relationship building with cooperating teachers, reflection on personal involvement as a beginning student teacher.

WHRE 5697. Teaching Internship: School and Classroom Settings. (2 cr. Prereq–5696 for initial licensure program)
Part-time supervised teaching experience in a school. Seminars on managing student's learning in context of work and human resource education programs in contemporary schools and on becoming a reflective educator.

WHRE 5698. Teaching Internship. (3-8 cr [max 8 cr]. Prereq–Admission to initial licensure program)
Teaching experience in a school system that provides programs for grades 5-12.

WHRE 5699. Teaching Internship: Extended. (1 cr. §CI 5927. Prereq–5698)
Extended student teaching experience in a school system that provides programs for grades 5-12.

WHRE 5771. Teaching Entrepreneurship: Small Business Management. (3 cr)
Methods, organization, curriculum development and modification, and implementation of educational programs for entrepreneurs.

WHRE 5801. Educating Special Populations in Work and Human Resource Education Settings. (3 cr)
Identifying/accommodating in work and human resource education settings educational traits of students with disabilities and disadvantaging conditions.

WHRE 5802. Enhancing Work-based Learning Through Collaboration. (2 cr)
Interagency planning issues/practices relating to special populations for educational, business, and human service organization personnel, family members, and advocates.

WHRE 5803. Developmental Writing and the College Student: Theory and Practice. (3 cr. Prereq–Bachelor's degree)
Basic grounding in theory/practice of college-level developmental writing instruction. History of "basic writing," development of notions of "academic discourse," error/grammar in student writing, best classroom practices, current issues.

WHRE 5804. Research in Postsecondary Developmental Education. (3 cr. Prereq–Bachelor's degree, courses in [intro psychology, basic statistics])
Strategies for conducting three types of research that are central to developmental education: placement test validation, program evaluation, and classroom research. Students read examples and learn what constitutes best practices in each type.

WHRE 5821. Diversity Issues and Practices in Work and Human Resource Education Settings. (3 cr)
Nature of diverse populations, their unique learning/training needs. Exemplary programs. Collaborative efforts among persons representing work and human resource education settings.

WHRE 5822. Diversity and Organizational Transformation in Work and Human Resource Education. (3 cr)
Developing models for understanding impact of diversity on individual, organizational, and community outcomes. Discussing organizational change in relation to diversity.

WHRE 5823. Program Planning and Improvement for Special Populations in Work and Human Resource Education. (2 cr)
Concepts, issues, and practices related to the design, implementation, and evaluation of efforts focused on developing new programs or modifying existing programs, in work and human resource education settings, for individuals with special learning needs.

WHRE 5901. Using Research in Work and Human Resource Education. (3 cr)
Role of work and human resource education research in professional practice. Problems of practice for research. Alternative modes of research. Synthesis/application of results of research.

WHRE 5990. Special Topics in Work and Human Resource Education. (1-4 cr [max 4 cr])
Topics vary.

WHRE 5993. Directed Study in WHRE. (1-4 cr [max 4 cr])
Self-directed study, with faculty advice, in areas not covered by regular courses.

Youth Development and Research (YOST)

School of Social Work

College of Education and Human Development

YOST 1001. Seeing Youth, Thinking Youth: Media, Popular Media, and Scholarship. (3 cr)
Use of life-experience, news and popular media to explore everyday realities of being a young person, as it varies by age social class, race/ethnicity, geography, time period, sexual orientation, and capacity.

YOST 2001. The Everyday Lives of Youth. (4 cr)
Introduction to everyday lived experience of youth. Ways of knowing youth. Social/cultural foundations of youthwork. How to "read" life-worlds of young people. At least 15 hours of service learning required.

YOST 2002W. Introduction to Youth Studies: Understanding Youth, Young People, Youthood, and Youth Work. (4 cr)
Introduces youth studies minor. Prepares students for more in-depth departmental offerings and for continued scholarship or later work with youth, directly or on their behalf.

YOST 2101. Urban Youth and Youth Issues. (4 cr. Prereq–1001 or #)
What it is like to be a young person in a city, in the United States and worldwide.

YOST 2241. Experiential Learning. (4 cr. §YOST 5241. Prereq–[1001, 2001] or #)
History/theory of experiential learning, its application in youthwork. Observation, reflection, program design, and evaluation skills grounded in experiential learning theory. 15 hours of field observation required.

YOST 3001. Introduction to History and Philosophy of Youthwork. (4 cr. Prereq–2xxx or #)
Foundations of youthwork. Where contemporary American youthwork stands, particularly in comparison with international perspectives on youth/youthwork.

YOST 3002. Observation Lab: Youth, Youth Development, and Youth Work. (1 cr; A-F only. Prereq–SOC 1001, PSY 1001, 2001, ¶3001 and 3003)
Field observation of young people. Field visits to youth programs.

YOST 3003. Bridging Theories, Research, Practices, and Observations about Youth Development and Youth Work. (1 cr; A-F only. Prereq–PSY 1001, SOC 1001, 2001, ¶3001 and 3002)
Reflective seminar to carry out, at beginning level, guided reflection of one's/others' ideas, experiences, feelings about courses, self, youth work.

YOST 3004. Youth in Community Context: Home, School, Neighborhood, Geography, Programs, Policies. (2 cr; A-F only. Prereq–3001, ¶3005 and 3006)
Introduces community, sociocultural context of "growing up," "coming of age" as primary site for healthy youth development. Community introduced also as home to youth agencies/programs along intervention continuum. How community-based cultural identity, social expectations of young people frame young people's roles in school, work, neighborhoods.

YOST 3006. Fieldwork Seminar: Youth, Youthworker, Context, Programs, Organizations, Place. (1 cr; A-F only. Prereq–3001, current enrollment in 3004 and 3005)
Beginning youth work, youth agency, program, organization, service as found in students' youth work field experience.

YOST 3007. Integrative Seminar: Analysis, Experience, Reflection on Youth Studies and Youth Work. (2 cr; A-F only. Prereq–3001, 3006)
Students integrate their two years of observation, analysis, experiences, and reflections about youth, youth work, youth programs. Work/career paths for beginning/advanced youth workers.

YOST 3031. International Youthwork. (3 cr; S-N only. §YOST 5031. Prereq–2xxx or #)
Lives of young people living outside the United States and of immigrants/refugees now resident in this country. Working with and on behalf of such groups. Socio-political analysis of globalization, its impact on young people, youthwork, and youth policy worldwide.

YOST 3032. Adolescent and Youth Development for Youthworkers. (4 cr. §YOST 5032. Prereq–1001 or 2001 or 2002W or 2101, [any Psych or CPSY course])
Application of theory/research about children/adolescents. How findings can be used. How theories facilitate understanding of behavior.

YOST 3101. Introduction to Youthwork. (4 cr. Prereq–One gen psy course, one gen soc course)
Historical/contemporary approaches to youthwork, diverse settings in which it is done, importance of worker's life experience in crafting ethical, effective practice. At least 15 hours of field experience.

YOST 3234. Youth Agencies, Organizations, and Youth Service Systems. (3 cr. §YOST 5234. Prereq–[Two soc/ANTH courses, work experience in youth [agency or org]] or #)
Communities/governmental responses to young people as potential problems through agencies, programs, and other organizational forms. Purpose, structure, and activities of such forms. How the forms are/are not integrated into youth service systems.

YOST 3235. Community Building, Civic Engagement, and Civic Youthwork. (4 cr. §YOST 5235. Prereq–[2001, One basic course in Pol, one basic course in Soc] or #)
Reciprocities between youth development and community development brought about by young people's civic engagement. Individual, social, and political change by/for young people and their community.

YOST 3240. Special Topics in Youth Studies. (2-8 cr [max 10 cr]. §YOST 5240. Prereq–[Two social sci courses, exp working with youth] or #)
In-depth investigation of one area of youth studies. Teaching procedure/approach determined by specific topic and student needs. Topic announced in advance.

YOST 3291. Independent Study in Youth Studies. (1-8 cr [max 8 cr]. Prereq–#)
Independent reading or research under faculty supervision.

YOST 4002W. Constructing Personal Models of Youth Scholarship and Youth Work. (4 cr. Prereq–2002)
Integrates/ends University-wide undergraduate youth studies minor. Students analyze/reflect on youth studies minor course content, especially those models, theories, and concepts presented in 2002. Youth, young people, youthhood, youth work. Models, personal responds to youth. Occupational/ vocational callings. Class discussion, written assignments.

YOST 4160H. Honors Capstone Project. (2 cr [max 4 cr]. Prereq–YOST honors or #)
Individualizes the honors experience by connecting aspects of major program with special academic interests.

YOST 4301. Communicating With Adolescents About Sexuality. (3 cr. Prereq–1001 or 2002W or #)
How to communicate sensitively/effectively with adolescents and their concerned persons about sexuality in everyday life. Focuses on healthy sexual development (physical, emotional, ethical) and sexual diversities. Adolescent sexual issues: gender, body image, disease, sexual violence, intimacy, sex in cyberspace.

YOST 4315. Youthwork in Schools. (4 cr. §YOST 5315. Prereq–Introductory course in education or #)
Craft of youthwork as a framework to understand life-worlds of young people and a practice to enhance healthy development. How young people often divide their lives into artificial/harmful divide: school and not school.

YOST 4319. Understanding Youth Subcultures. (3 cr. §YOST 5319. Prereq–2001 or one course each in [anth, soc] or #)
Young people's participation in and understanding of subcultures, life-styles, and event cultures. Place of these in young people's identity, friendship, and life chances.

YOST 4321. Work with Youth: Individual. (2 cr. Prereq–1001 or 2101 or #)
Assumptions underlying individual work with youth. Issues/concerns of adolescents and of persons who work with them in one-to-one interactions.

YOST 4322. Work with Youth: Families. (2 cr. Prereq–1001 or 2002W or #)
Theories /techniques of working with youth and their families. Emphasizes practical methods of structural change, developing effective communication, decision-making and problem-solving systems, winning the family's cooperation. Role of professional in influencing healthy family development.

YOST 4323. Work with Youth: Groups. (2 cr. Prereq–[[1001 or 2002W], 4321] or #)
Social group work, adolescent group needs/ associations. Group process. Working with diverse groups of youth in community, in group living situations, and in group therapy.

YOST 4401W. Young People's Spirituality and Youthwork: An Introduction. (4 cr. §YOST 5401. Prereq–1001 or 2002W or #)
Adolescent spirituality, its relation to working with young people. Faith/spirituality as necessary for healthy youth development. Knowledge, attitudes, and skills to recognize spirituality in cultural, social, economic, and political worlds.

YOST 4402. Youth Policy: Enhancing Healthy Development in Everyday Life. (4 cr. §YOST 5402. Prereq–[2001, one course each in [FSoS, PolSci, Soc]] or #)
Youth policy as formulated in response to youth issues, problems, and community/public concerns. Policy as a political response to youth panics, as indirect youthwork, and as a community's moral compact with its young people. Perspectives explored are specific to student interests.

YOST 5031. International Youthwork. (3 cr. §YOST 3031. Prereq–2xxx or #)
Lives of young people living outside the United States and of immigrants/refugees now resident in this country. Working with and on behalf of such groups. Socio-political analysis of globalization. Its impact on young people, youthwork, and youth policy worldwide.

YOST 5032. Adolescent and Youth Development for Youthworkers. (4 cr. §YOST 3032. Prereq–[1001 or 2001 or 2002W or 2101], [any Psych or CPSY course])
Application of theory/research about children/ adolescents. How findings/theories facilitate understanding of behavior.

YOST 5101. Youth Work Practice I: Internship. (3 cr. Prereq–3101, 5032 or equiv, ¶5111, #)
First course of a sequential internship that includes 15 hours per week working with youth in a community youth-serving organization. Develop and enhance competence and identity as a youth worker, and reflect on and integrate knowledge about youth with on-going experience in youth work.

YOST 5102. Youth Work Practice II: Internship. (3 cr. Prereq–5101, ¶5112, #)
Second course of a sequential internship that includes 15 hours per week of work with youth in a community youth-serving organization. Develop and enhance competence and identity as a youth worker, and reflect on and integrate knowledge about youth with ongoing experience in youth work.

YOST 5111. Youth Work Methods I: Seminar. (1 cr. Prereq–3101, 5032 or equiv, ¶5101, #)
Weekly discussion seminar taken concurrently with 5101 to integrate theory and praxis with youth work experience. Written and experiential assignments to increase knowledge, competency, and skills related to working with youth.

YOST 5112. Youth Work Methods II: Seminar. (1 cr. Prereq–5111, ¶5102, #)
Weekly discussion seminar taken concurrently with 5102 to integrate theory and praxis with youth work experience. Written and experiential assignments to increase knowledge, competency, and skills related to working with youth.

YOST 5234. Youth Agencies, Organizations, and Youth Service System. (3 cr. §YOST 3234. Prereq–[Two soc/ANTH courses, work experience in [youth agency or org]] or #)
Communities/governmental responses to young people as potential problems through agencies/ programs and other organizational forms. Purpose, structure, activities of such forms. How forms are/are not integrated into youth service systems.

YOST 5235. Community Building, Civic Engagement, and Civic Youthwork. (4 cr. §YOST 3235. Prereq–[2001, one basic course in Pol, one basic course in Soc] or #)
Reciprocities between youth development and community development brought about by young people's civic engagement. Individual, social, and political change by/for young people and their community.

YOST 5240. Special Topics in Youth Studies. (2 cr [max 10 cr]. §YOST 3240. Prereq–Two social sci courses, exper working with youth or #)
In-depth investigation of one area of youth studies. Teaching procedure and approach determined by specific topic and student needs. Topic announced in advance.

YOST 5241. Experiential Learning. (4 cr. §YOST 2241. Prereq–[1001, 2001] or #)
History/theory of experiential learning, its application in youthwork. Observation, reflection, program design, and evaluation skills grounded in experiential learning theory. 15 hours of field observation required.

YOST 5291. Independent Study in Youth Studies. (1-8 cr [max 8 cr])
Independent reading and/or research under faculty supervision.

YOST 5301. Communicating With Adolescents About Sexuality. (3 cr. Prereq–[Upper div AdPy course, exper working with youth] or #)
How to communicate sensitively/effectively with adolescents and their concerned persons about sexuality in everyday life. Healthy sexual development (physical, emotional, ethical), sexual diversities. Gender/body image, disease, sexual violence, intimacy, sex in cyberspace.

YOST 5313. Direct Work with Adolescents. (2 cr. Prereq–Two social sci courses, exper working with youth or #)
Designed to give an understanding of direct work with troubled and at-risk adolescents in a wide range of settings where youth workers or social workers are typically involved. Emphasis on young people in groups in the "lifespace" in everyday life, rather than in one-to-one office-based interactions.

YOST 5315. Youthwork in Schools. (4 cr. §YOST 4315. Prereq–Introductory course in education or #)
Craft of youthwork as a framework to understand life-worlds of young people and a practice to enhance healthy development. How young people often make artificially/harmfully divide their lives into school and not school.

YOST 5319. Understanding Youth Subcultures. (3 cr. §YOST 4319. Prereq–2001 or one course each in [Anth, Soc] or #)
Young people's participation in and understanding of subcultures, life-styles, and event cultures. Place of these in young people's identity, friendship, and life chances.

YOST 5321. Work with Youth—Individual. (2 cr. Prereq–5032 or equiv or #)
Examination of basic assumptions underlying individual work with youth. Attention to special issues and concerns of adolescents and of persons who work with them, especially those who work with youth in one-to-one interactions.

YOST 5322. Work with Youth—Families. (2 cr. Prereq–5321 or upper div AdPy course, family theory course or #)
Theories and techniques of working with youth and their families. Emphasis on practical methods of structural change, developing effective communication, decision-making and problem-solving systems, winning the family's cooperation; the role of the professional to influence healthy family development.

YOST 5323. Work with Youth—Groups. (2 cr. Prereq–5321 or CPSY or EPSY course or #)
Adolescent group needs/associations. Group process. Working with groups of adolescents in the community, in group living situations, and in group therapy.

YOST 5401. Young People's Spirituality and Youthwork: an Introduction. (4 cr; A-F only. §YOST 4401W. Prereq–[2001, one course each in [Anth, Soc, CPsy]] or #)
Adolescent spirituality, its relation to working with young people. Faith/spirituality as actual/necessary aspects of healthy youth development. Research, active community-based programs. Knowledge, attitudes, and skills to meet adolescent needs/wants.

YOST 5402. Youth Policy: Enhancing Healthy Development in Everyday Life. (4 cr. §YOST 4402. Prereq–[2001, one course each in [FSoS, PolSci, Soc]] or #)
Youth policy as formulated in response to youth issues, problems, and community/public concerns. Policy as political response to youth panics, as indirect youthwork, and as a community's moral compact with its young people. Perspectives are explored specific to student interests.

For definitions of course numbers, symbols, and abbreviations, see page 300.

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Note: The information in this catalog is subject to change without notice. Many departments make changes in their degree requirements and course descriptions frequently. For the most current information, check with department offices.

* *Recipient of the Horace T. Morse-Minnesota Alumni Association Award for Outstanding Contributions to Undergraduate Education*

§ *Recipient of other teaching or advising award(s)*

University Regents

Anthony R. Baraga, Congressional District 8, Chair
Patricia Simmons, Congressional District 1, Vice Chair
Clyde Allen, Jr., Congressional District 7
Peter Bell, Congressional District 5
Frank R. Berman, At Large
Dallas Bohnsack, Congressional District 2
John Frobenius, Congressional District 6
Steven D. Hunter, At Large
David M. Larson, Congressional District 3
Cynthia L. Lesher, At Large
David R. Metzen, Congressional District 4
Lakeesha K. Ransom, At Large

University Administrators

Robert H. Bruininks, President
E. Thomas Sullivan, Senior Vice President for Academic Affairs and Provost
Frank B. Cerra, Senior Vice President for Health Sciences
Robert J. Jones, Senior Vice President for System Administration
Nancy Rusty Barceló, Vice President and Vice Provost for Equity and Diversity
Kathryn F. Brown, Vice President and Chief of Staff
Carol Carrier, Vice President for Human Resources
R. Timothy Mulcahy, Vice President for Research
Charles Muscoplat, Vice President for Statewide Strategic Resource Development
Kathleen O'Brien, Vice President for University Services
Richard Pfutzenreuter, Vice President and Chief Financial Officer
Linda L. Thrane, Vice President for University Relations
Mark B. Rotenberg, General Counsel

College of Biological Sciences (CBS)

Administration

Robert P. Elde, Dean

Huber R. Warner, Associate Dean for Research

Robin Wright, Associate Dean for Academic and Faculty Affairs

Elizabeth Wroblewski, Chief Administrative Officer

Jeff Thomas, Director of Finance

Barb Theno, Director of Human Resources

Fed Dulles, Director of Information Technology

Peggy Rinard, Director of Communications

Jean M. Underwood, Director of Student Services

Nikki Letawsky Shultz, Director of Student Life and Transitions

Faculty

Department of Biochemistry, Molecular Biology, and Biophysics

Adolph, Kenneth W., Associate Professor
Ph.D., University of Chicago
Gene structure and regulation, chromosome structure, non-histone proteins, virus assembly, biological assembly process

***§ Anderson, John S., Professor**
Ph.D., University of Nebraska, Lincoln
Structure and biosynthesis of bacterial cell walls and membranes

Armitage, Ian M., Professor
Ph.D., University of British Columbia
Multinuclear magnetic resonance, metal homeostasis and immunophilins

Banaszak, Len J., Professor and Dietrich Chair
Ph.D., Loyola of Chicago
Protein design, structure and function, X-ray crystallography

§ Bernlohr, David A., Distinguished McKnight University Professor and Department Head
Ph.D., University of Illinois, Urbana-Champaign
Mechanism of insulin action, regulation of gene expression by lipids

Bielinsky, Anja-Katrin, Assistant Professor
Ph.D., Heinrich Heine University, Germany
Regulation of DNA replication, cell cycle, cancer

Bloomfield, Victor A., Professor and Associate Vice President for Public Engagement
Ph.D., University of Wisconsin, Madison
Physical biochemistry of nucleic acids, polyelectrolytes, hydrodynamics laser light scattering, scanning tunneling microscopy

Conti-Fine, Bianca M., Distinguished McKnight University Professor
M.D., University of Milan, Italy
Structure and function of nicotinic receptors in brain and muscle, immunology of myasthenia gravis

Das, Anath, Professor
Ph.D., University of Nebraska, Lincoln
Molecular mechanisms of plant-pathogen interactions and plant gene expression

Flickinger, Michael C., Professor
Ph.D., University of Wisconsin, Madison
Fermentation, cell culture technology, cellular energetics, regulation of protein synthesis, protein separation

Fuchs, James A., Professor
Ph.D., Texas A&M University, College Station
Deoxynucleotide metabolism, DNA synthesis, regulation of metabolic pathways

Griffin, Timothy J., Assistant Professor
Ph.D., University of Wisconsin
Biological mass spectrometry, quantitative proteomics, protein and peptide chemistry

Harris, Reuben S., Assistant Professor
Ph.D., University of Alberta, Edmonton
The causes and consequences of mutation

Hendrickson, Eric A., Associate Professor
Ph.D., Harvard Medical School
Deoxynucleotide metabolism; DNA synthesis; regulation of metabolic pathways

Herrera, Julio E. Assistant Professor
Ph.D., University of Mississippi Medical Center, Jackson
Regulation of gene expression by chromatin structure and dynamics, modulation of chromatin structure by covalent modifications and non-histone chromosomal proteins

*** Hooper, Alan B., Professor**
Ph.D., Johns Hopkins University
Microbial biochemistry, redox proteins, N-oxidation, microbial detoxification

Kazlanskas, Romas J., Associate Professor
Ph.D., Massachusetts Institute of Technology
Enzyme selectivity, molecular biology, molecular modeling

Khodursky, Arkady B., Assistant Professor
PhD., University of California, Berkeley
Functional genomics, analysis of gene expression patterns, whole genome microarrays

Kim, Do-Hyung, Assistant Professor
PhD., Pohang University of Science and Technology
Biological networks that coordinate metabolism and growth

Lange, Alex J., Associate Professor
Ph.D., Cornell University
Therapeutic intervention in diabetes via manipulation of carbohydrate metabolism enzymes and their genes

LaPorte, David C., Professor
Ph.D., University of Illinois
Gene expression, protein phosphorylation cascades

Lipscomb, John D., Professor
Ph.D., University of Illinois
Oxygenase mechanisms, metalloproteins, magnetic resonance techniques, kinetics

Livingston, Dennis M., Professor
Ph.D., Harvard University
Mutation, DNA repair and genetic recombination

Matsuo, Hiroshi, Assistant Professor
Ph.D., Osaka University, Japan
Nuclear magnetics resonance, structure of protein-RNA complexes

Mayo, Kevin H., Professor
Ph.D., University of Massachusetts
Cell adhesion, protein-protein/carbohydrate interactions

Murphy, Sharon E., Associate Professor
Ph.D., University of Colorado
Carcinogen metabolism and exposure

Nelsestuen, Gary L., Professor
Ph.D., University of Minnesota
Protein-membrane interactions, blood coagulation, proteomics

Ohlendorf, Douglas H., Professor
Ph.D., Washington University
Protein engineering, structural biology, X-ray crystallography, molecular biology

Potter, Lincoln R., Assistant Professor
Ph.D., Vanderbilt University
Natriuretic peptide receptors, guanylyl cyclases and cGMP

Roon, Robert J., Associate Professor
Ph.D., University of Michigan
Mechanism and regulation of amino acid neurotransmission in mammalian brain, mechanism of amino acid transport in mammalian brain

Sanders, Michel M., Professor
Ph.D., University of Michigan
Eucaryotic molecular biology, hormone action, gene expression

Schmidt-Dannert, Claudia, Assistant Professor
Ph.D., University of Braunschweig, Germany
Directed evolution of emetabolic pathways, natural product biosynthesis, metabolic engineering

§ Schottel, Janet L., Professor
Ph.D., Washington University, St. Louis
Nucleic acid biochemistry, molecular biology, plant-pathogen interactions

Sheaff, Robert J., Assistant Professor
Ph.D., University of Colorado, Boulder
Cell cycle progression in mammalian cells, protein degradation, signal transduction

Siliciano, Paul G., Associate Professor and Associate Department Head
Ph.D., University of Pennsylvania
Nucleic acid biochemistry, molecular genetics

Thomas, David D., Professor
Ph.D., Stanford University
Molecular dynamics in muscle

Towle, Howard C., Professor and Associate Department Head
Ph.D., Michigan State University
Nutritional and hormonal regulation of mammalian gene expression

Van Ness, Brian G., Professor
Ph.D., University of Minnesota
Molecular immunology, gene expression, lymphoid cancers

Wackett, Lawrence P., Distinguished McKnight University Professor
Ph.D., University of Texas, Austin
Biodegradation, dehalogenases, industrial biotransformations, metalloenzymes

Walters, Kylie, Assistant Professor
Ph.D., Harvard University
Nuclear magnetic resonance, structure-based drug design

Wilmot, Caroline M., Assistant Professor
Ph.D., Birkbeck College, University of London
Structural enzymology, metal ions and organic co-factors

Department of Ecology, Evolution, and Behavior

Alstad, Donald N., Professor
Ph.D., University of Utah
Population ecology and evolution of insects

***§ Barnwell, Franklin H., Professor**
Ph.D., Northwestern University
Invertebrate behavior and physiology, emphasizing ecological relationships

Bee, Mark, Assistant Professor
Ph.D., University of Missouri
Acoustic communication, auditory perception, neurophysiology, auditory scene analysis, honest signaling and vocally mediated social recognition

Borrello, Mark, Assistant Professor
Ph.D., Indiana University
History of biology, evolutionary theory, genetics and ecology, biology of behavior, biology and society

Cavender-Bares, Jeannine, Assistant Professor
Ph.D., Harvard University
Evolution of plant form and function, physiological mechanisms that plants use to survive in their environment

Corbin, Kendall W., Professor Emeritus
Ph.D., Cornell University
Evolutionary ecology and genetics, biochemical systematics

Cotner, James B., Associate Professor
Ph.D., University of Michigan
Biological limnology and oceanography, biogeochemistry, microbial ecology

Curtsinger, James W., Professor
Ph.D., Stanford University
Population/quantitative genetics—experimental and theoretical

Cushing, Edward J., Professor Emeritus
Ph.D., University of Minnesota
Paleoecology and ecology of plant communities

§Davis, Margaret B., Regents Professor Emeritus
Ph.D., Harvard University
Paleoecology, paleolimnology, forest community ecology

Finlay, Jacques C., Assistant Professor
Ph.D., University of California, Berkeley
Limnology, biogeochemistry, food web and ecosystem ecology, land-water interactions, stable isotope applications in ecological research

Gorham, Eville, Regents Professor Emeritus
Ph.D., University of London, England
Chemical aspects of ecology, limnology, and soil science

Hobbie, Sarah E., Assistant Professor
Ph.D., University of California, Berkeley
Ecosystem and community ecology

Jansa, Sharon A., Assistant Professor
Ph.D., University of Michigan
Mammalian systematics, biogeography, speciation, molecular evolution

Jones, Susan, Associate Professor
Ph.D., University of Pennsylvania
History of biomedical sciences, history of life sciences, historical ecology of disease, role of science in mediating human-animal interactions over time

King, Jennifer Y., Assistant Professor
Ph.D., University of California, Irvine
Ecosystem ecology, biogeochemistry and earth system science

Lanyon, Scott M., Professor and Director, Bell Museum of Natural History
Ph.D., Louisiana State University
Biochemical systematics and evolution of mating systems

Larson, Diane L., Adjunct Professor
Ph.D., University of Illinois, Chicago
Ecological effects of alien plants in grassland ecosystems

Lehman, Clarence L., Adjunct Professor
Ph.D., University of Minnesota
Theoretical ecology, computational biology

May, Georgiana, Associate Professor
Ph.D., University of California, Berkeley
Evolution of fungi, interactions with plants and their mating systems

McFadden, Joseph P., Assistant Professor
Ph.D., University of California, Berkeley
Global ecology, biosphere-atmosphere interactions

Muller-Landau, Helene, Assistant Professor
Ph.D., Princeton University
Plant community ecology, especially of tropical forests, ecological and evolutionary theory, anthropogenic influences on plant community structure and dynamics

McNaught, Donald, Professor Emeritus
Ph.D., University of Wisconsin
Zooplankton ecology, Great Lakes limnology, ecosystem contamination

Megard, Robert O., Professor Emeritus
Ph.D., Indiana University
Limnology

Merrell, David, Professor Emeritus
Ph.D., Harvard University
Genetics

Morrow, Patrice, Professor
Ph.D., Stanford University
Plant-insect interactions and community ecology

Neuhauser, Claudia M., Professor, Director of Graduate Studies, and Department Head
Ph.D., Cornell University
Theoretical ecology, role of space in community dynamics, theoretical population genetics, coalescent theory

Packer, Craig, Distinguished McKnight University Professor
Ph.D., University of Sussex, England
Behavioral ecology and sociobiology

Phillips, Richard E., Professor Emeritus
Ph.D., Cornell University
Animal behavior and physiology

Polasky, Stephen, Fesler-Lampert Professor of Ecological/Environmental Economics (Adjunct)
Ph.D., University of Michigan
Ecological/environmental economics

Pusey, Anne E., Distinguished McKnight University Professor
Ph.D., Stanford University
Animal behavior

Regal, Philip J., Professor
Ph.D., University of California, Los Angeles
Evolution, physiological ecology and behavior, herpetology

Schmid, William D., Professor Emeritus
Ph.D., University of Minnesota
Comparative physiology and ecology

Shaw, Ruth, Professor
Ph.D., Duke University
Ecological genetics

Siniff, Donald B., Professor Emeritus
Ph.D., University of Minnesota
Vertebrate ecology and population ecology of large mammals

§ Starfield, Anthony M., Professor Emeritus
Ph.D., University of Witwatersrand, South Africa
Ecological modeling

Stephens, David W., Associate Professor
Ph.D., The Queen's College, Oxford University, England
Experimental games, spatially explicit models of feeding behavior

Sterner, Robert W., Professor
Ph.D., University of Minnesota
Limnology: plankton ecology, food webs, and aquatic biogeochemistry

Sugita, Shinya, Assistant Professor
Ph.D., University of Washington
Paleoecology

Tester, John R., Professor Emeritus
Ph.D., University of Minnesota
Vertebrate ecology and ecosystem ecology

Tilman, G. David, McKnight Presidential Chair in Ecology
Ph.D., University of Michigan
Experimental and theoretical population, community ecology

Tordoff, Harrison B., Professor Emeritus
Ph.D., University of Michigan
Systematic and evolutionary biology, ornithology

Wright, Herbert E., Regents Professor Emeritus
Ph.D., Harvard University
Quaternary paleoecology and glacial geology

Zink, Robert M., Professor
Ph.D., University of California, Berkeley
Ornithology, systematics

Department of Genetics, Cell Biology, and Development

Bardwell, Vivian J., Associate Professor
Ph.D., University of Wisconsin, Madison
Transcriptional regulation in cancer and development

Bauer, G. Eric, Professor
Ph.D., University of Minnesota
Pancreatic islet physiology and islet adhesion molecules

Berman, Judith G., Professor
Ph.D., Weizmann Institute of Science
Yeast morphogenesis, cell cycle and genome organization

Berry, Susan A., Professor
M.D., Kansas University
Growth hormone responsive gene expression

Blumenfeld, Martin, Associate Professor
Ph.D., Case Western Reserve University
Genomics

Brooker, Robert J., Professor
Ph.D., Yale University
Molecular biology of the lactose permease

Chen, Lihsia, Assistant Professor
Ph.D., Johns Hopkins University
Cell adhesion, signal transduction, cytoskeleton, C. elegans

Clarke, Duncan, Assistant Professor
Ph.D., University of Cambridge
Cell cycle checkpoint controls

Conklin, Kathleen F., Associate Professor
Ph.D., Tufts University
Virally- and non-virally-induced tumors

Conner, Sean, Assistant Professor
Ph.D., Brown University
Clathin-mediated endocytic pathway, mammalian vesicular trafficking

Coucouvanis, Electra, Assistant Professor
Ph.D., Stanford University
Cell death, differentiation, cell lineage specification

Cunningham, William P., Professor Emeritus
Ph.D., University of Texas, Austin
Conservation biology, land-use issues, environmental ethics

Ekker, Stephen C., Associate Professor
Ph.D., Johns Hopkins University
Embryonic patterning, zebrafish, transposons, gene discovery, gene therapy, angiogenesis

Fan, David P., Professor
Ph.D., Massachusetts Institute of Technology
Computer management of information, impact of information on society

Gale, Cheryl, Assistant Professor
M.D., University of Minnesota
C. albicans morphogenesis and hyphal guidance mechanisms

§ Goldstein, Stuart F., Professor
Ph.D., California Institute of Technology
Cell motility, especially spirochetes and eukaryotic flagella

Hackett, Perry B., Professor
Ph.D., University of Colorado Medical Center
Gene expression in Sleeping Beauty transposons, human gene therapy

Hamilton, David W., Professor
Ph.D., Cambridge University
The sperm plasma membrane

Hays, Thomas S., Professor
Ph.D., University of North Carolina
Cytoskeletal-based motility, functions of cytoplasmic dynein

Herman, Robert K., Professor
Ph.D., Yale University
Developmental genetics of C. elegans

Herman, William S., Professor
Ph.D., Northwestern University
Arthropod peptide hormones

Hirsch, Betsy A., Associate Professor
Ph.D., University of Minnesota
Chromosome abnormalities

Iwanij, Victoria, Associate Professor
Ph.D., Rockefeller University
Characterization of the glucagon receptor

Johnson, Ross G., Professor
Ph.D., Iowa State University
Cell communication mediated by gap junctions, junction assembly mechanisms and role in embryos

King, Richard A., Professor
Ph.D., University of Minnesota; M.D., Jefferson Medical
Genetic analysis of complex human disease

Kirkpatrick, Catherine, Assistant Professor
Ph.D., Massachusetts Institute of Technology
Cell-cell signaling during development, roles of proteoglycans in tissue patterning

Kirkpatrick, David T., Assistant Professor
Ph.D., Massachusetts Institute of Technology
DNA repair during meiosis in S. cerevisiae, DNA repair and antifungal drug resistance in C. albicans

Kuriyama, Ryoko, Professor
Ph.D., University of Tokyo
Cell division and cell-cycle control in animal cells

Largaespada, David A., Assistant Professor
Ph.D., University of Wisconsin, Madison
Identification and understanding of genes involved in myeloid leukemia development

LeRoy, Bonnie S., Program Director
M.S., Sarah Lawrence College
Education and clinical preparation of genetic counseling professionals, ethical and professional challenges to the practice of genetic counseling

Linck, Richard W., Professor
Ph.D., Brandeis University
Molecular assembly and function of the microtubule cytoskeleton

Magee, P. T., Professor
Ph.D., University of California, Berkeley
Analysis of the genome of C. albicans

Marker, Paul C., Assistant Professor
Ph.D., Stanford University
Molecular genetics of prostate development and prostate cancer

McIvor, R. Scott, Professor
Ph.D., University of Minnesota
Genes introduced into the hematopoietic cells in vivo

McKinnell, Robert, Professor Emeritus
Ph.D., University of Minnesota
Prevalence and distribution of pigment pattern variants of the Northern Leopard Frog

Miller, Jeffrey R., Assistant Professor
Ph.D., Drake University
Cell-cell signaling in vertebrate development, regulation of cell adhesion and migration during vertebrate development

Nakato, Hiroshi, Assistant Professor
Ph.D., Tokyo Metropolitan University
Proteoglycan functions in development, growth factor signaling, morphogen gradient formation

Neufeld, Thomas P., Assistant Professor
Ph.D., University of California, Berkeley
Developmental control of growth and cell proliferation in Drosophila

Norrander, Jan, Assistant Professor
Ph.D., University of Minnesota
Molecular assembly and function of the microtubule cytoskeleton

O'Connor, Michael B., Professor and Howard Hughes Associate Investigator
Ph.D., Tufts University
Cell-cell interactions in growth, differentiation, and development

Oetting, William, Assistant Professor
Ph.D., University of Nebraska
Molecular analysis of albinism, analysis of complex genetic disorders

Orr, Harry T., Professor
Ph.D., Washington University
Molecular genetics of brain development and neurodegeneration

Petryk, Anna, Assistant Professor
M.D., Medical University in Wroclaw, Poland
Craniofacial development, bone biology, mammalian embryogenesis, organogenesis, brain development

Porter, Mary E., Associate Professor
Ph.D., University of Pennsylvania
Regulation of dynein-based motility

Ranum, Laura P. W., Professor
Ph.D., University of Minnesota
Molecular genetics of neurodegenerative diseases

Rougvie, Ann E., Associate Professor
Ph.D., Cornell University
Developmental timing in C. elegans

Selleck, Scott, Professor and Harrison Chair
M.D., Ph.D., Washington University School of Medicine
Regulation of growth factor signaling, proteoglycan modulation of morphogen function, nervous system assembly and synapse development

Shaw, Jocelyn E., Associate Professor
Ph.D., University of Toronto
C. elegans embryonic development

Shawlot, William, Assistant Professor
Ph.D., Baylor College of Medicine
Genetic control of pattern formation during mouse embryogenesis

Sheridan, Judson, Professor
D.Phil. in Neurophysiology, Oxford University
Functional studies of gap junction communication, quantitative analysis of hemichannel and gap junction permeability

Shima. Naoko, Assistant Professor
Ph.D., Saitama University, Japan
Genomic instability and cancer, DNA replication, recombination and repair in mice

*** Simmons, Michael J., Professor**
Ph.D., University of Wisconsin, Madison
Transposable genetic elements in Drosophila

Simon, Jeffrey A., Associate Professor
Ph.D., Cornell University
Animal development, control of gene expression, chromatin mechanisms

Sinha, Akhouri A., Adjunct Professor
Ph.D., University of Missouri, Columbia
Stromal-epithelial interaction in tumors

Somia, Nikunj V., Assistant Professor
PhD., University of Edinburgh
Retrovirus biology, gene therapy and gene discovery

Sorenson, Robert L., Professor
Ph.D., University of Minnesota
Cell biology of insulin secretion and cell division in islets of Langerhans

Steer, Clifford, Professor
M.D., University of Minnesota
Membranes and receptors, cell interactions, gene expression, gene therapy, apoptosis

Tao, Wufan, Assistant Professor
Ph.D., Fudan University
Tumor suppressor, cancer biology

Titus, Margaret A., Associate Professor
Ph.D., Brandeis University
Molecular genetic analysis of unconventional myosin function

Van Ness, Brian G., Professor and Department Head
Ph.D., University of Minnesota
Molecular immunology

Wright, Robin, Professor and Associate Dean
Ph.D., Carnegie-Mellon University
Cell biology, with emphasis on regulation of organelle biogenesis, membrane structure and dynamics, sterol metabolism, protein targeting and localization, genetic and genomic approaches to organelle biogenesis, microscopic analysis of cell structure, undergraduate education

Zarkower, David A., Associate Professor
Ph.D., University of Wisconsin, Madison
Molecular genetics of sex determination and gene regulation

Department of Plant Biology

*** Biesboer, David D., Professor**
Ph.D., Indiana University
Ecophysiology and anatomy of angiosperms

Brambl, Robert M., Professor
Ph.D., University of Nebraska
Function of chaperone proteins and regulation of gene expression

***§ Charvat, Iris D., Professor**
Ph.D., University of California, Santa Barbara
Mycorrhizal associations, fungal development, seed bank dynamics in wetlands

Gantt, J. Stephen, Associate Professor
Ph.D, University of California, Irvine
Gene expression in plants

Gibson, Susan, Associate Professor
Ph.D., Cornell University
Plant genomics, sugar signaling in Arabidopsis

Glazebrook, Jane, Associate Professor
Ph.D., Massachusetts Institute of Technology
Mechanisms by which plants defend themselves from attack by microbial pathogens

Gleason, Florence K., Professor
Ph.D., University of Iowa
Physiological function of thioredoxin in cyanobacteria

Gray, William, Assistant Professor
Ph.D., University of Iowa
Molecular basis of auxin-regulated growth and development, ubiquitin-mediated proteolysis

Katagari, Fumi, Associate Professor
Ph.D., Rockefeller University
Plant genomics, disease resistance in plants

Lefebrve, Paul (Pete), Professor
Ph.D., Yale University
Chlamydomonas genomics, cytoskeleton and cell motility

Marks, M. David, Associate Professor
Ph.D., Purdue University
Control of cell fate and differentiation in plants

McLaughlin, David J., Professor
Ph.D., University of California, Berkeley
Evolution and systematics of fungi, especially basidiomycetes

Ni, Min, Assistant Professor
Ph.D., University of Oklahoma, Norman
Light signal transduction and photomorphogenesis

Olszewski, Neil E., Professor
Ph.D., University of Minnesota
Molecular mechanisms of hormone action, molecular genetics of DNA viruses

Sanderfoot, Anton, Assistant Professor
Ph.D., University of Illinois
Vesicle trafficking in Arabidopsis

Silflow, Carolyn, Professor
Ph.D., University of Georgia
Chlamydomonas genomics, cytoskelton and cell motility

***§ Snustad, Peter, Professor**
Ph.D., University of California, Davis
Cytoskeleton and cell motility, gene expression, developmental mechanisms

Soulen, Thomas K., Associate Professor Emeritus
Ph.D., University of Wisconsin
Plant metabolism and development

Springer, Nathan, Assistant Professor
Ph.D., University of Minnesota
Molecular basis of epigenetic phenomena

Tiffin, Peter, Assistant Professor
Ph.D., Duke University
Evolutionary and ecological genetics, molecular and phenotypic evolution of plant defenses

VandenBosch, Kathryn, Professor and Department Head
Ph.D., University of Massachusetts
Cell biology of plant/microbe symbioses, functional genomics of legumes

Ward, John, Assistant Professor
Ph.D., University of Maryland
Membrane proteins and transport physiology

Weiblen, George, Assistant Professor
Ph.D., Harvard University
Plant systematics, molecular phylogenetics, coevolution and plant/pollinator interactions

Weinig, Cynthia, Assistant Professor
Ph.D., Indiana University
Evolution of developmental plasticity in plants

§ Wick, Susan M., Professor
Ph.D., Stanford University
Cellular, molecular, and developmental biology of the cytoskeleton

General Biology Program and Instructional Laboratories

John S. Anderson, Director of General Biology

Sehoya Cotner, Teaching Assistant Professor

Mark Decker, Teaching Assistant Professor

Bruce Fall, Associate Education Specialist

Kathryn Hanna, Associate Professor

Richard Peifer, Education Specialist

Jane Phillips, Coordinator of CBS Instructional Labs

Contributing Faculty From Other University Units

Department of Microbiology—Medical School

Anderson, Dwight L., Professor
Ph.D., University of Minnesota
Bacillus subtilis bacteriophage Ø29 morphogenesis

Armstrong, Sandra, Associate Professor
Ph.D., University of Missouri, Columbia
Iron acquisition and iron-regulated gene expression in pathogenic bacteria

Judith Berman, Professor
Ph.D., Weizmann Institute of Science
Morphogenesis in C. albicans; Telomere function, aging and chromatin assembly in Saccharomyces cerevesiae

Bey, Russell, Associate Professor
Ph.D., University of Minnesota
Bovine mastitis

Bohjanen, Paul, Assistant Professor
M.D., Ph.D., University of Michigan
T lymphocyte mRNA stability

Bond, Daniel, Assistant Professor
Ph.D., Cornell University
Environmental microbiology, bioenergy from microbes

Bresnahan, Wade, Assistant Professor
Ph.D., University of Texas Medical Branch
Molecular mechanisms of human cytomegalovirus replication and pathogenesis

Cleary, P. Patrick, Professor
Ph.D., University of Rochester, New York
Molecular basis for streptococcal disease

Davis, Dana A., Assistant Professor
Ph.D., University of Arizona
C. albicans genetics and pathogenesis

Dunny, Gary, Professor
Ph.D., University of Michigan
Molecular biology of conjugative gene transfer in gram-positive bacteria

Dworkin, Martin, Professor Emeritus
Ph.D., University of Texas, Austin
Developmental biology, Myxobacteria

Faras, Anthony J., Professor Emeritus
Ph.D., University of Colorado
Tumor viruses, oncogenesis, gene transfer

Germaine, Gregory, Professor
Ph.D., University of Minnesota
Oral microbiology, microbial physiology

Gralnick, Jeffrey A., Assistant Professor
Ph.D., University of Wisconsin, Madison
Physiology of Shewanella, geomicrobiology

Haase, Ashley T., Regents Professor and Department Head
M.D., Columbia College of Physicians and Surgeons
Molecular mechanisms of HIV pathogenesis

Hanson, Richard S., Professor Emeritus
Ph.D., University of Illinois, Urbana-Champaign
Ecology, biochemistry, and genetics of methylotropic bacteria

Jemmerson, Ronald, Professor
Ph.D., Northwestern University
b-cell and antibody recognition of protein antigens, apoptosis and the fate of intracellular autoantigens

Jenkins, Marc K., Distinguished McKnight University Professor
Ph.D., Northwestern University
CD4 T cell biology

Johnson, Russell C., Professor
Ph.D., University of Wisconsin, Madison
Molecular pathogenesis, Lyme disease and human granulocytic ehrlichiosis

Kapur, Vivek, Professor
Ph.D., Pennsylvania State University
Molecular mechanisms of bacterial pathogenicity and evolution

Magee, Paul T., Professor
Ph.D., University of California, Berkeley
Genetics and molecular biology of C. albicans

Mansky, Louis M., Associate Professor
Ph.D., University of Iowa
Cell and molecular biology of HIV and HTLV, HIV drug resistance, HTLV particle assembly and release, evolution of emerging viruses

McKay, Larry L., Professor
Ph.D., Oregon State University
Plasmid biology, physiology and genetics of lactococci used in milk fermentations

Mohr, Christian, Assistant Professor
Ph.D., University of Texas, San Antonio
Molecular pathogeneis of Burkholderia cepacia

Plagemann, Peter G. W., Professor
Ph.D., Case Western Reserve University
Mechanisms of viral infections, and modulation by host immune responses

Rice, Stephan, Assistant Professor
Ph.D., University of Utah
Herpes simplex virus gene expression

Sadowsky, Michael, Professor
Ph.D., University of Hawaii
Soil microbiology, biodegradation, Rhizobium and Bradyrhizobium-host interactions

*** Schiff, Leslie A., Professor**
Ph.D., Tufts University
Virus-host cell interactions and viral protein structure-function

Schlievert, Patrick M., Professor
Ph.D., University of Iowa
Immunobiology, and genetic control of staphylococcal and streptococcal pyrogenic toxins

Southern, Peter J., Associate Professor
Ph.D., Edinburgh University
Molecular basis of persistent virus infection and virus-induced disease

Vernick, Kenneth, Associate Professor
Ph.D., University of Maryland
Malaria parasite interactions with the mosquito vector

Department of Neuroscience—Medical School

Amirikian, Bagrat, Assistant Professor
Ph.D., Moscow State University
Neural networks and motion

Ashe, James, Professor
M.D., University College Dublin, Ireland
Neural control of movement

Branton, Dale, Associate Professor
Ph.D., University of California, San Francisco
Cellular and molecular aspects of physiological regulatory mechanisms

Chafee, Matthew, Assistant Professor
Ph.D., Yale University
Neural basis of spatial cognition and working memory, cortical system dysfunction in psychiatric disease

Dubinsky, Janet, Professor
Ph.D., University of North Carolina, Chapel Hill
Neurodegeneration as a result of glutamate toxicity

Ebner, Timothy J., Professor and Department Head
M.D., Ph.D., University of Minnesota
Neurophysiology of cerebellum and motor cortex

Elde, Robert P., Professor
Ph.D., University of Minnesota
Central and peripheral nervous systems

Engeland, William, Professor
Ph.D., University of California, San Francisco
Neuroendocrinology of stress

Flanders, Martha, Professor
Ph.D., Michigan State University
Neural control of movement

Georgopoulos, Apostolos P., Professor
M.D., Ph.D., University of Athens School of Medicine
Neurophysiology of motor function and cognition

Giesler, Glenn J., Jr., Professor
Ph.D., University of California, Los Angeles
Somatic sensory processing, pain

Ghose, Geoffry, Assistant Professor
Ph.D., University of California, Berkeley
Strategies in visual cortex

Honda, Christopher N., Professor
Ph.D., University of North Carolina, Chapel Hill
Anatomical and physiological bases of somesthesis, with emphasis on mechanisms of pain

Kofuji, Paulo, Assistant Professor
Ph.D., University of Maryland
Ion channels

Lanier, Lorene, Assistant Professor
Ph.D., University of California, Berkeley
Growth cone motility, axon guidance

Letourneau, Paul C., Professor
Ph.D., Stanford University
Developmental neurobiology

Leuthold, Arthur, Assistant Professor
Ph.D., University of Wisconsin, Madison
Magnetocardiography

Liao, Dezhi, Assistant Professor
Ph.D., University of Iowa
Molecular and cellular mechanisms of synaptic plasticity

McLoon, Steven C., Professor
Ph.D., University of Illinois, Chicago
Development and regeneration of axonal connections

Mermelstein, Paul, Assistant Professor
Ph.D., University of Michigan
Calcium signaling and cellular excitability

Miller, Robert F., Professor
M.D., University of Utah
Synaptic transmission in the retina and relationships of single, identified neurons and glial cells

Nakagawa, Yasushi, Assistant Professor
M.D., Ph.D., University of Tokyo
Cellular and molecular mechanisms of brain development and plasticity

Newman, Eric A., Professor
Ph.D., Massachusetts Institute of Technology
Physiology and functions of glial cells

Pellizzer, Giuseppe, Associate Professor
Ph.D., University of Geneva, Switzerland
Neural control of cognitivo-motor behavior

Poppele, Richard E., Professor
Ph.D., University of Minnesota
Neurophysiology and motor control

Redish, A. David, Assistant Professor
Ph.D., Carnegie Mellon University
Spatial reasoning and navigation—from neurons to behavior

Seybold, Virginia S., Professor
Ph.D., University of Minnesota
Neuroanatomy, neuropharmacology, pain, autonomic nervous system, neuroendocrines

Soechting, John F., Professor
Ph.D., Cornell University
Motor control neurophysiology

Thomas, Mark, Assistant Professor
Ph.D., University of California, Los Angeles
Neurobiology of drug-induced plasticity and addiction, behavioral neuroscience

Wessendorf, Martin W., Associate Professor
Ph.D., University of Illinois, Chicago
Brainstem control of spinal function, methods in fluorescence microscopy

Wilcox, George L., Professor
Ph.D., University of Colorado, Boulder
Psychotherapeutic toxicity, pain transmission, drugs of abuse

Yuan, LiLian, Assistant Professor
Ph.D., University of Wisconsin-Madison
Dendritic function in neuronal information processing

Zirpel, Lance, Assistant Professor
Ph.D., University of Washington
Cellular and molecular mechanisms of activity-dependent neural development and survival

School of Dentistry and Division of Dental Hygiene

Administration

Patrick M. Lloyd, D.D.S., M.S., Dean, School of Dentistry

Kathleen J. Newell, R.D.H., Ph.D., Director, Division of Dental Hygiene

Faculty

§ Dittmar, Susan, R.D.H., Clinical Dental Specialist
B.S., University of Iowa, Iowa City
Preclinical/clinical dental hygiene, biomaterials, local anesthesia

Blue, Christine M., R.D.H., Clinical Dental Specialist
M.S., Old Dominion University
Head and neck anatomy, special needs patients, clinic, pre-clinic

Jacobsen, Steven, D.D.S., Associate Clinical Dental Specialist
D.D.S., University of Minnesota
Clinical dental hygiene, local anesthesia

Newell, Kathleen J., R.D.H., Associate Professor
Ph.D., University of Minnesota
Writing in the curriculum, ethics, diversity, domestic violence

§ Osborn, Joy B., R.D.H., Associate Professor
M.A., University of Minnesota
Periodontology, preclinic and advanced instrumentation, ergonomics

Stoltenberg, Jill L., R.D.H., Associate Professor
M.A., University of Minnesota
Periodontal diseases, dental caries, fluoride, clinical dental hygiene

Young, Lynda J., R.D.H., Associate Professor and Director, Continuing Dental Education
M.A., University of Minnesota
Continuing dental education

College of Design

Administration

Thomas Fisher, Dean

Lance Neckar, Associate Dean for Curriculum and Academic Affairs

Janet Abrams, Director, Design Institute

John Carmody, Director, Center for Sustainable Building Research

Ann Forsyth, Director, Design Center for American Urban Landscape

Faculty

In this faculty listing, R.A. designates licensure as a registered architect; R.L.A. designates licensure as a registered landscape architect; A.I.A. designates member, American Institute of Architects (a member of the A.I.A. must be a registered architect); F.A.I.A. designates fellow, American Institute of Architects; A.S.L.A. designates member, American Society of Landscape Architects; F.A.S.L.A. designates fellow, American Society of Landscape Architects; A.I.C.P. designates member by examination of the American Institute of Certified Planners; and P.E. designates licensure as a professional engineer.

Architecture

Anderson, Lee, Associate Professor
M.Arch., University of Minnesota
Computer aids to design conception and presentation

Bergert, Douglas, Adjunct Teaching Instructor
M.Arch., Harvard University
Design

Berkovskaya, Olga, Adjunct Teaching Instructor
M.Arch., University of Minnesota
Representation

Bhatt, Ritu, Assistant Professor
Ph.D., Massachusetts Institute of Technology
History, theory, and criticism

Bleyhl, Christine, Adjunct Teaching Instructor
M.Arch., University of Minnesota
Representation

Brigham, Jonee Kulman, Research Fellow
B.Arch., University of Minnesota
Energy, thermal, environmental technology

Buetow, Steve, Adjunct Assistant Professor (A.I.A.)
B.Arch., University of Minnesota
Residential and historical architecture

Carmody, John, Senior Research Associate and Director, Center for Sustainable Building Research
M.Arch., University of Minnesota
Environmental technology, sustainable design

Chen, Arthur, Associate Professor
Ph.D., Georgia Institute of Technology
Architectural thinking, drawing, urbanism, design, representation theory

Cheng, Renee, Associate Professor and Department Head
M.Arch., Harvard University
Design, technology

Christensen, Michael, Lecturer/Adjunct Assistant Professor
M.Arch., University of Minnesota
Digital technology

Clark, Daniel, Adjunct Assistant Professor
M.Arch., University of Minnesota
Design

Conway, William, Associate Professor (A.I.A.)
M.Arch., Yale University
Design, theory, practice

deLaittre, Mary, Adjunct Assistant Professor
M.Arch., University of Minnesota
Urban design, neighborhood development

Dimond, David, Adjunct Teaching Instructor (A.I.A.)
M.Arch., Virginia Polytechnic Institute and State University
Design, representation

Dittmar, Gunter, Associate Professor
M.Arch., Yale University
Architectural theory, design process, design

Dozier, James, Adjunct Assistant Professor
B.A., Rice University
Digital technology, electronic imaging

Ebbighausen, Nina, Adjunct Assistant Professor
B.Arch., Syracuse University
Design

El Hindi, Walid, Adjunct Assistant Professor
B.Arch., University of Minnesota
Design

Ferguson, Robert, Lecturer and Adjunct Assistant Professor
M.Phil., Pembroke College of Cambridge
History and philosophy, design

Fisher, Thomas, Professor and Dean
M.I.S., Case Western Reserve University
Architectural criticism, writing/communication, design theory

Franck, Bruno, Adjunct Associate Professor
Ph.D., University of Minnesota
Architectural structure

Fuller, Timothy, Adjunct Assistant Professor
M.Arch., University of Minnesota
Urban design, residential design and construction

Good, Robert, Adjunct Teaching Instructor
M.Arch., University of Minnesota
Design

Guzowski, Mary, Associate Professor
M.Arch., University of Washington
Sustainable design, daylighting, environmental technology

Isenberg, Jay, Adjunct Assistant Professor
M.Arch., University of Minnesota
Practice

Jacques, Tracey, Adjunct Teaching Instructor (A.I.A.)
B.Arch., University of Minnesota
Representation

Jara, Cynthia, Associate Professor (R.A.)
M.A., M.Arch., Columbia University
Design theory: historic reference

Johnson, Michael, Professor in Practice
B.Arch., University of Oregon
Design

LaVine, Lance, Professor (R.A.)
M.Arch., M.C.P., University of Pennsylvania
Technology and design, elemental form, philosophical premises

Lew, Douglas, Adjunct Associate Professor
M.F.A., Bradley University
Watercolor

Mack, Robert, Adjunct Professor (F.A.I.A.)
B.Arch., University of Minnesota
Historic preservation and rehabilitation

McQuade, Martha, Adjunct Assistant Professor
M.Arch., University of Minnesota
Design, representation

Miller, Nancy, Lecturer
Ph.D., Pennsylvania State University
Architecture history

Mulfinger, Dale, Professor in Practice (A.I.A.)
B.Arch., University of Minnesota
Architect Edwin Lundie, pattern language, design

Nelson, Ralph, Adjunct Associate Professor
M.Arch., Columbia University
Design

Olmstead, Kathryn, Adjunct Assistant Professor
M.Arch., University of Minnesota
Design

Orton, Charles, Adjunct Teaching Instructor
M.Arch., Yale University
Representation

Parker, B. Aaron, Adjunct Assistant Professor (A.I.A.)
M.S., Columbia University
Architectural design, urban design

Piotrowski, Andrzej, Associate Professor (R.A.)
M.I.Arch., Politechnika Warszawska, Poland
Visual studies, design, theory

Porycky, Anna, Lecturer
M.Arch., University of Minnesota
Representation

Quigley, Timothy, Adjunct Assistant Professor (A.I.A.)
M.Arch., University of Minnesota
19th- and 20th-century architecture, design

Rhoades, Todd, Professor in Practice (R.A.)
M.Arch., Cranbrook Academy of Art
Art, design

Robinson, Julia, Professor (A.I.A.)
M.A., University of Minnesota
Housing, culture and architecture, design methods, representation

Roe, Sharon, Senior Lecturer and Adjunct Assistant Professor
M.Arch., University of California, Berkeley
Design

Saloojee, Ozayr, Assistant Professor
M.Arch., Carleton University, Ottawa, Ontario, Canada
Design, representation

Satkowski, Leon, Professor
Ph.D., Harvard University
Architectural history

Schulte, Marcy, Adjunct Assistant Professor (A.I.A.)
M.Arch., Syracuse University
Design

Singh, Virajita, Research Fellow
M.Arch., University of Minnesota
Sustainable design, design

Solomonson, Katherine, Associate Professor
Ph.D., Stanford University
American and contemporary architecture

Soranno, Joan, Professor in Practice
B.Arch., Notre Dame
Design

Springer, Mary, Lecturer
M.Arch., Rice University
Design, representation

Srivastava, Malini, Adjunct Assistant Professor
M.Arch., University of Minnesota
Design

Strothman, Susan, Adjunct Instructor
M.Arch., University of Minnesota
Structures, design

Swackhammer, Marc, Assistant Professor
M.Arch., Rice University
Design, representation, housing

Tambornino, Mark, Adjunct Teaching Instructor
M.Arch., University of Minnesota
Design

Thorbeck, Duane, Adjunct Professor (F.A.I.A.)
M.Arch., Yale University
Public buildings, interpretative architecture, urban/rural issues

§ Tollefson, Lee, Adjunct Associate Professor (A.I.A.)
M.Arch., University of Pennsylvania
Design practices, Native American architecture, monastic architecture

Valdes, Marcelo, Adjunct Assistant Professor
M.Arch., University of Minnesota
Design

Van Duzer, Leslie, Associate Professor and Director of Undergraduate Studies
M.Arch., University of California, Berkley
Design fundamentals

Webber, William, Adjunct Assistant Professor
M.Arch., University of Minnesota
Environmental technology

§ Weeks, J. Stephen, Associate Professor and Director of Graduate Studies (R.A.)
B.Arch., University of Minnesota
Construction materials and methods, masonry design, design

Weinstein, Joshua, Adjunct Assistant Professor (R.A.)
B.Arch., Pratt Institute
Architectural and environmental design

Wentzell, Mark, Adjunct Assistant Professor (R.A.)
M.Arch., Syracuse University
Community, institutional, and educational design practice

Westbrook, Thomas, Adjunct Assistant Professor
M.Arch., University of Minnesota
Representation

Yoos, Jennifer, Professor in Practice
M.Arch., University of Minnesota
Urban revitalization, contemporary cities, design

Design Center for American Urban Landscape

Ann Forsyth, Professor, Dayton-Hudson Chair in Urban Design (R.A.), and Director

Ph.D., Cornell University

City and regional planning

Design, Housing, and Apparel

Program Committee Chairpersons

Karen LaBat—Clothing Design

Carol Waldron—Graphic Design

Becky L. Yust—Housing Studies

Stephanie Watson Zollinger—Interior Design

Kim K. P. Johnson—Retail Merchandising

Angell, William J., Professor

M.S., Iowa State University

Indoor air quality in residential, school, and health care environments

Bruin, Marilyn J., Associate Professor

Ph.D., Iowa State University

Housing and neighborhood environments of low-income households

Boyd-Brent, James, Assistant Professor

M.F.A., University of Minnesota

Drawing, print making, alternative design technologies

Bye, Elizabeth, Assistant Professor

Ph.D., University of Minnesota

Apparel technology, textile product development, sizing/fit

Chu, Sauman S., Associate Professor
Ph.D., University of Minnesota
Multiculturalism/design education, cross-cultural differences in design

Crump, Jeffrey, Associate Professor
Ph.D., University of Nebraska, Lincoln
Urban and economic geography, housing policy

DeLong, Marilyn R., Professor
Ph.D., The Ohio State University
Aesthetics and historic aspects of clothing

Gahring, Sherri A., Associate Professor
M.S., Iowa State University
Small retailer survival in a Big Box world

***§ Guerin, Denise A., Professor**
Ph.D., Michigan State University
Sustainable interior design, relationship of culture and design

Hokanson, Brad, Associate Professor
Ph.D., University of Minnesota
Computer interface design, speech synthesis, generated poetry, imaging

Jasper, Daniel, Assistant Professor
M.F.A., Yale University
Contemporary criticism, design history, corporate/consumer branding

Johnson, Kim K. P., Professor
Ph.D., University of Wisconsin, Madison
Social psychology of dress, consumer behavior, and retailing

LaBat, Karen L., Professor
Ph.D., University of Minnesota
Textile product development, user group psychological/physical needs

Lee, Seung-Eun, Assistant Professor
Ph.D., Iowa State University
Consumer behavior, non-store retailing, textiles/apparel, international development

Martin, Caren, Assistant Professor
Ph.D., University of Minnesota
Interior design profession, public opinion, body of knowledge

*** Martinson, Barbara E., Associate Professor and Director of Graduate Studies**
Ph.D., University of Minnesota
Design education/design history/communication and perception

McCarthy, Steven, Associate Professor
M.F.A., Stanford University
Self-authored graphic design, artist's books, interactive design

Waldron, Carol C., Assistant Professor
M.A., University of Minnesota
Typography, books, material, color, legibility, and expression
Williams, Gloria M., Associate Professor
Ph.D., University of Minnesota
Knowledge of structures, ideologies appearance, textile/apparel labor issues

Yust, Becky Love, Professor and Department Head
Ph.D., The Ohio State University
Social and technological aspects of housing

Ziebarth, Ann C., Associate Professor
Ph.D., Louisiana State University
Housing policy, rural/small town housing, housing affordability/availability

Zollinger, Stephanie A. Watson, Associate Professor
Ed.D., University of Arkansas
Vernacular architecture, design education issues

The Goldstein Museum of Design

Lin Nelson-Mayson, Director

Marilyn DeLong, Costume Curator

Steven McCarthy, Graphic Design Curator

Rodney Allen Schwartz, Decorative Arts Curator

Gloria Williams, Textiles Curator

Landscape Architecture

Abbott, Dean, Senior Lecturer
M.L.A., Harvard University
Graphics, art of design

Agee, Bradley, Lecturer
B.L.A., University of Minnesota
Design

Clemence, Roger, Professor Emeritus
M.L.A., M.Arch., University of Pennsylvania
Art of design

Colberg, Donald, Adjunct Assistant Professor
M.L.A., University of Minnesota
Design technology

Favour, Joseph, Adjunct Assistant Professor
M.L.A., Harvard University
Construction technology

Grotta, Stephanie, Adjunct Assistant Professor
M.L.A., University of Minnesota
Design technology

Gunderson, Robert, Adjunct Assistant Professor (A.S.L.A., R.L.A.)
M.L.A., University of Pennsylvania
Construction technology

Hewitt, Clinton, Associate Professor
M.L.A., Michigan State
Campus planning

Koepke, John, Associate Professor and Department Head (R.L.A.)
M.L.A., University of Washington
Ecological design, Native American design issues

Krinke, Rebecca, Assistant Professor and Director of Graduate Studies
M.F.A., Massachusetts College of Art
Art of design, sculpture

MacDonagh, Peter, Adjunct Assistant Professor
B.L.A., University of Minnesota
Ecological design

§ Martin, Roger B., Professor Emeritus (F.A.S.L.A., R.L.A.)
M.L.A., Harvard University
Design research, design education

Miller, Kristine, Assistant Professor
Ph.D., Edinburgh University, M.L.A., Cornell University
Public space design issues

Murphy, Richard, Jr., Adjunct Assistant Professor
M.L.A., Harvard University
Professional practice

Musacchio, Laura, Assistant Professor
Ph.D., Texas A&M University; M.L.A., State University of New York
Landscape ecological planning and technology

§ Neckar, Lance, Professor and Associate Dean (R.L.A.)
M.A., University of Wisconsin; M.L.A., Harvard University
Landscape architecture history and theory, urban design practice

Nunnally, Patrick, Adjunct Assistant Professor
Ph.D., University of Iowa
Landscape architecture and urban and regional design

Olin, Peter, Associate Professor (A.S.L.A., R.L.A.)
M.L.A., Cornell University
Director, Minnesota Landscape Arboretum
Design, horticultural issues

Pitt, David G., Professor (A.I.C.P.)
Ph.D., University of Arizona
Landscape perception, regional landscape research, GIS assessment

Robin, James
B.L.A., University of Minnesota
Design and construction technology

Roos, Stephen, Adjunct Assistant Professor
M.L.A., University of Minnesota
GIS technology

Rozumalski, Fred, Adjunct Assistant Professor
M.L.A., University of Minnesota
Planting design and ecological restoration

Shaw, Daniel, Adjunct Assistant Professor
M.L.A., University of Minnesota
Horticultural design

Sykes, Robert D., Associate Professor (A.S.L.A., R.L.A.)
M.L.A., Harvard University
Surface water and transportation systems, design theory

College of Education and Human Development (CEHD)

Administration

Darlyne Bailey, Dean

Robert Serfass, Associate Dean for Academic Affairs

Frances Lawrenz, Associate Dean for Research

Mary Bents, Associate Dean for Undergraduate and Professional Programs

Faculty are listed below for the following CEHD departments:
- Curriculum and Instruction
- Educational Policy and Administration
- Educational Psychology
- Family Social Science
- Institute of Child Development
- Kinesiology, School of
- Music Education
- Postsecondary Teaching and Learning
- Social Work, School of
- Work and Human Resource Education

Curriculum and Instruction

Avery, Patricia, Professor
Ph.D., Emory University
Social studies education, history of American education, political education

§ Beach, Richard, Professor
Ph.D., University of Illinois
English education

Bequette, James, Assistant Professor
Ph.D., Stanford University
Art education

Bigelow, Martha, Assistant Professor
Ph.D., Georgetown University
Second languages and cultures

Clarkson, Lesa, Assistant Professor
Ph.D., University of Minnesota
Mathematics education

Clover, Faith, Lecturer
Ph.D., University of Arizona
Art education

Cramer, Kathleen, Associate Professor
Ph.D., University of Minnesota
Mathematics education

Dillon, Deborah, Professor
Ph.D., University of Georgia
Literary research and qualitative research methods

Doering, Aaron, Assistant Professor
Ph.D., University of Minnesota
Learning technologies

Finley, Fred, Associate Professor
Ph.D., Michigan State University
Science education, environmental education

§ Galda, Lee, Professor
Ph.D., New York University
Children's literature, response to literature

Graves, Michael, Professor
Ph.D., Stanford University
Reading and English education

Helman, Lori, Assistant Professor
Ph.D., University of Nevada
Literacy, teacher education, reading

Hooper, Simon, Associate Professor
Ph.D., Pennsylvania State University
Learning technologies

Hughes, Joan, Assistant Professor
Ph.D., Michigan State University
Learning technologies

Jacobs, Benjamin, Assistant Professor
Ph.D., Columbia University
Social studies education

Johnson, Roger, Professor
Ed.D., University of California, Berkeley
Elementary and science education, cooperative learning

Lensmire, Timothy, Associate Professor
Ph.D., Michigan State University
Literacy education, elementary school writing instruction

Lewis, Cynthia, Professor
Ph.D., University of Iowa
Social, cultural, and critical dimensions of literacy; literacy, identity, and discourse; digital and new-media literacies; teacher study groups

McClelland, Jerry, Associate Professor
Ph.D., Iowa State University
Family education, parent education

Ngo, Bic, Assistant Professor
Ph.D., University of Wisconsin
Social and cultural contexts of education, refugee/immigrant education, urban and multicultural education

O'Brien, David, Professor
Ph.D., University of Georgia
Literacy education, use of information technologies

Plihal, Jane E., Associate Professor
Ph.D., University of Chicago
Research methodology, integration of vocational and academic education, international education

Post, Thomas, Professor
Ph.D., Indiana University
Elementary education, mathematics education

Ranney, Susan, Lecturer
Ph.D., University of Minnesota
Second languages and cultures education

Roehrig, Gillian, Assistant Professor
Ph.D., University of Arizona
Supporting beginning teachers, science education

Sato, Mistilina, Assistant Professor
Ph.D., Stanford University
Teacher development

§ Taylor, Barbara, Professor
Ed.D., Virginia Polytechnic Institute and State University
Literacy education, reading difficulties

Tedick, Diane, Associate Professor
Ph.D., The Ohio State University
Second languages and cultures education

§ Thomas, Ruth, Professor and Department Head
Ph.D., University of Minnesota
Thinking, learning, and teaching in context of everyday life

Upadhyay, Bhaskar, Assistant Professor
Ph.D., University of Texas at Austin
Science teaching and learning; issues of access, ethnicity, and race that surround science education in urban schools

Walker, Constance, Associate Professor
Ph.D., University of Illinois, Urbana-Champaign
Second languages and cultures, serving bilingual populations

Wyberg, Terrence, Lecturer
Ph.D., University of Minnesota
Mathematics education

Educational Policy and Administration

Alexander, Nicola, Assistant Professor
Ph.D., State University of New York, Albany
Public administration, school finance

Ammentorp, William, Professor
Ph.D., University of Chicago
Organizational systems and theory, higher education administration and finance

§ Anderson, Melissa, Associate Professor
Ph.D., University of Minnesota
Higher education administration and policy, equity and finance

Brunner, C. Cryss, Associate Professor
Ph.D., University of Kansas
Educational management and leadership

§ Chapman, David, Professor
Ph.D., Syracuse University
Educational development, program evaluation, education policy

§ Cogan, John, Professor
Ph.D., The Ohio State University
Comparative and international development education

DeJaeghere, Joan, Lecturer
Ph.D., University of Minnesota
Comparative and international development education

§ Fry, Gerald, Professor
Ph.D., Stanford University
Southeast Asia, comparative education, international education reform

§ Harkins, Arthur, Associate Professor
Ph.D., University of Kansas
Educational and workplace futures, knowledge-based education, anticipatory leadership

Hendel, Darwin, Associate Professor
Ph.D., University of Minnesota
Undergraduate education, evaluation of teaching and learning, strategic planning

Johnson, David R., Professor
Ph.D., University of Minnesota
Special education administration, evaluation studies, disability policy analysis

§ King, Jean, Professor
Ph.D., Cornell University
School change, program evaluation, action research

Lewis, Darrell, Professor
Ph.D., Louisiana State University
Economics of education, economic evaluation, equity issues

Magnusson, Deanne, Lecturer
Ph.D., University of Minnesota
Comparative educational systems, leadership and policy development in U.S. and international schools

§ McLeod, Scott, Assistant Professor
J.D., Ph.D., University of Iowa
Educational leadership and information technology, education law

Nickerson, Neal, Lecturer
Ph.D., Columbia University
School administrative leadership and development

§ Paige, R. Michael, Professor and Department Head
Ph.D., Stanford University
International development education, intercultural education and training, multicultural education

Scearcy, Lynn, Lecturer
Ph.D., University of Minnesota
Middle school, retention of administrative personnel

Schneider, Byron, Associate Professor
Ph.D., University of Chicago
Youth development leadership, youth policy

Seashore, Karen, Professor
Ph.D., Columbia University
Organizational theory, planned change, schools as workplaces, leadership

Wahlstrom, Kyla, Lecturer
Ph.D., University of Minnesota
School change, applied research

Werner, Ann, Lecturer
Ph.D., University of Minnesota
Principalship, competency-based licensure

Wotipka, Christine Min, Assistant Professor
Ph.D., Stanford University
Women in higher education and international human rights

Yeh, Stuart, Assistant Professor
Ph.D., Stanford University
Education program evaluation

§ York-Barr, Jennifer, Associate Professor
Ph.D., University of Wisconsin
Interprofessional collaboration, staff development, school restructuring, developmental disabilities

Zhang, Liang, Assistant Professor
Ph.D., University of Arizona
Ph.D., Cornell University
Economic issues in higher education

Educational Psychology

Counseling and Student Personnel Psychology

Goh, Michael, Assistant Professor
Ph.D., University of Minnesota
Counseling and student personnel psychology

Hummel, Thomas, Professor
Ph.D., The Ohio State University
Computer applications, experimental design as applied to counseling research

Romano, John, Professor and Department Head
Ph.D., Arizona State University
Stress, coping, and wellness; college student development; international education

*** § Skovholt, Thomas, Professor**
Ph.D., University of Missouri
Professional psychology, counselor training, sex roles

Turner, Sherri, Assistant Professor
Ph.D., University of Missouri, Columbia
Counseling and student personnel psychology

§ Veach, Patricia McCarthy, Professor
Ph.D., The Ohio State University
Counseling process and self-disclosure research; practica, supervision, and counseling

Wahl, Kay Herting, Associate Professor
Ed.D., University of South Dakota
School psychology

Psychological Foundations

§ Bart, William, Professor
Ph.D., University of Chicago
Cognitive process in reasoning, cognitive diagnostic testing and associated psychometric models, educational reform and improvement

§ Davenport, Ernest, Associate Professor
Ph.D., University of North Carolina at Chapel Hill
Computers in social science research, exploratory data analysis

Davison, Mark, Professor
Ph.D., University of Illinois, Urbana-Champaign
Educational and psychological measurement, psychological scaling, statistics

*** § Garfield, Joan, Professor**
Ph.D., University of Minnesota
Applied statistics, survey design, evaluation methods

Harwell, Michael, Professor
Ph.D., University of Wisconsin, Madison
Educational statistics

Johnson, David W., Professor
Ed.D., Columbia University
Cooperation and competition, conflict resolution, social psychology of groups

§ Lawrenz, Frances, Professor
Ph.D., University of Minnesota
Science education, program and evaluation studies

Long, Jeffrey, Associate Professor
Ph.D., University of Southern California
Educational statistics

Maruyama, Geoffrey, Professor
Ph.D., University of Southern California
Diversity in education, educational applications of social psychology

Pellegrini, Anthony, Professor
Ph.D., The Ohio State University
Children's play, observational research methods

Rapp, David, Assistant Professor
Ph.D., State University of New York at Stony Brook
Reader-guided processes of multimedia comprehension

Rodriguez, Michael, Associate Professor
Ph.D., Michigan State University
Measurement and evaluation

§ Samuels, S. Jay, Professor
Ed.D., University of California
Learning and cognition, psychology of values, character education

Tennyson, Robert, Professor
Ph.D., Brigham Young University
Adult learning, instructional psychology and technology, educational technology

§ van den Broek, Paulus, Professor
Doctoraals, University of Leiden, The Netherlands; Ph.D., University of Chicago
Performance of complex cognitive tasks (learning, reading, remembering, reasoning)

School Psychology

Burns, Matthew, Associate Professor
Ph.D., Andrews University
School psychology

Christ, Theodore, Assistant Professor
Ph.D., University of Massachusetts
Developing and evaluating alternative academic assessments

Christenson, Sandra, Professor
Ph.D., University of Minnesota
Home-school-community collaboration, ecological assessment

§ Ysseldyke, James, Professor
Ph.D., University of Illinois
Educational outcomes, assessment, education of students with mild disabilities

Special Education

Bruininks, Robert, Professor
Ph.D., Vanderbilt University
Developmental disabilities

Craig-Unkefer, Lesley, Assistant Professor
Ed.D., Vanderbilt University
Special education

Deno, Stanley, Professor
Ph.D., University of Minnesota
Mild disabilities

Espin, Christine, Professor
Ph.D., University of Minnesota
Learning disabilities

Hupp, Susan, Professor
Ph.D., University of Illinois
Moderate/severe disabilities

McComas, Jennifer, Associate Professor
Ph.D., University of Iowa
Emotional and behavioral disorders

McConnell, Scott, Professor
Ph.D., University of Oregon
Early childhood, prenatal exposure to drugs and alcohol

McMaster, Kristen, Assistant Professor
Ph.D., Vanderbilt University
Special education

Rose, Susan, Associate Professor
Ph.D., The Ohio State University
Deaf/hard-of-hearing

Symons, Frank, Associate Professor
Ph.D., Vanderbilt University
Special education/social, emotional, and behavioral difficulties

Family Social Science

Program Committee Chairperson—William Goodman

Bauer, Jean, Professor
Ph.D., University of Illinois, Urbana-Champaign
Family economic well-being, welfare reform, family policy

Baugher, Shirley, Professor, Dean
Ph.D., University of Missouri, Columbia
Leadership, strategic planning, human ecology

Caron, Wayne, Senior Lecturer and Assistant Teaching Professor
Ph.D., University of Minnesota
Family gerontology, aging families, family relationships

Danes, Sharon, Professor
Ph.D., Iowa State University
Family financial issues, family businesses, work and family

Doherty, William, Professor
Ph.D., University of Connecticut
Family relationships, marriage and family therapy, fatherhood, ethics

Dworkin, Jodi, Assistant Professor
Ph.D., University of Illinois, Urbana-Champaign
Promoting positive family development, strengthening families and communities, normative adolescent development, parenting adolescents

Goodman, William J., Senior Lecturer and Associate Teaching Professor
Ph.D., Purdue University
Undergraduate education, field study supervision, marriage and family therapy, gay/lesbian families

§ Grotevant, Harold D., Professor
Ph.D., University of Minnesota
Adoptive families, adolescent development, identity development, family assessment

McCulloch, B. Jan, Professor and Department Head
Ph.D., University of North Carolina-Greensboro
Family gerontology, rural aging, older women

Meyer, Cynthia, Lecturer
Ph.D., University of Minnesota
Sexuality and families; gay, lesbian, and bisexual families; marriage and family therapy

Olson, Patricia, Area Program Leader—Personal and Family Financial Education
Ph.D., The Ohio State University
Limited income families, cultural perspectives of resource management, and policies impacting families

Rettig, Kathryn, Professor
Ph.D., Michigan State University
Justice issues, family decision-making, legal-economic conflicts

§* Rosenblatt, Paul C., Professor
Ph.D., Northwestern University
Family loss, business families, family diversity, family theory

Rueter, Martha, Associate Professor
Ph.D., Iowa State University
Rural families, developmental family psychopathology, vulnerable rural youth

Solheim, Catherine, Associate Professor
Ph.D., University of Minnesota
Family resources, cultural diversity, gender roles

Stum, Marlene, Associate Professor
Ph.D., University of Wisconsin, Madison
Aging families, long-term care, intergenerational resource transfers

Turner, William L., Professor
Ph.D., Virginia Polytechnic Institute and State University
Drug and alcohol abuse, marriage and family therapy, African American families

Wieling, Elizabeth, Associate Professor
Ph.D., Iowa State University
Cross-cultural families, intercultural marriages, marriage and family therapy, Hispanic families

Zuiker, Virginia S., Associate Professor
Ph.D., The Ohio State University
Family resources, home-based employment, Hispanic family economics

Institute of Child Development

Cicchetti, Dante, Professor
Ph.D., University of Minnesota
Developmental psychopathology

***§ Collins, W. Andrew, Professor**
Ph.D., Stanford University
Socialization, social cognition, family relations

Crick, Nicki, Distinguished McKnight University Professor and Institute Director
Ph.D., Vanderbilt University
Relational and overt aggression, peer victimization, social information processing, gender

§ Egeland, Byron, Professor
Ph.D., State University of Iowa
Developmental psychopathology, abuse and maltreatment

§ Georgieff, Michael, Professor
M.D., Washington University
Neonatology, brain development, cognitive neuroscience

Gunnar, Megan, Distinguished McKnight University Professor
Ph.D., Stanford University
Social and biological aspects of development

Karatekin, Canan, Associate Professor
Ph.D., University of California, Los Angeles
Cognitive neuroscience, child clinical neuropsychology, ADHD

Maratsos, Michael, Professor
Ph.D., Harvard University
Language development, psycholinguistics

***§ Masten, Ann, Distinguished McKnight University Professor**
Ph.D., University of Minnesota
Developmental psychopathology, stress and coping, humor

Pick, Herbert, Jr., Professor
Ph.D., Cornell University
Perceptual development, learning

Reynolds, Arthur, Professor
Ph.D., University of Illinois
Child development; preventive research and program evaluation

Sera, Maria, Professor
Ph.D., Indiana University
Cognitive and linguistic development

§ Sroufe, L. Alan, Professor
Ph.D., University of Wisconsin
Socioemotional development, developmental psychopathology

Thomas, Kathleen, Assistant Professor
Ph.D., University of Minnesota
Cognitive development, implicit learning, pediatric neuroimaging, fMRI

§ Weinberg, Richard, Professor
Ph.D., University of Minnesota
Behavior genetics, assessment, preschool education

Yonas, Albert, Professor
Ph.D., Cornell University
Perceptual development

Yussen, Steven, Professor
Ph.D., University of Minnesota
Children's learning and cognitive development

Adjunct Faculty

Christenson, Sandra, Associate Professor
Ph.D., University of Minnesota
Family-school partnerships, family learning environments

Grotevant, Harold, Professor
Ph.D., University of Minnesota
Adolescent development, family relationships, adoptive families, family assessment

Hupp, Susan, Professor
Ph.D., University of Illinois
Social behavior, personality development

Leon, Gloria, Professor
Ph.D., University of Maryland
Eating disorders, stress and coping health psychology

McConnell, Scott, Professor
Ph.D., University of Oregon
Early childhood development

Oberg, Charles, Associate Professor
M.D., University of Minnesota
Child and family policy

Pellegrini, Anthony, Professor
Ph.D., The Ohio State University
Children's play, observational research methods

Shapiro, Elsa, Associate Professor
Ph.D., University of Minnesota
Neurology

Tellegen, Auke, Professor
Ph.D., University of Minnesota
Personality assessment, personality theory, hypnosis, behavior genetics

Temple, Judy, Associate Professor
Ph.D., Michigan State University
Public sector economics, economics of education, policy evaluation, cost-benefit analysis

Thomas, Ruth, Professor
Ph.D., University of Minnesota
Teaching and learning cognitive theory, parent-child relations

§ van den Broek, Paulus, Professor
Doctoraals, University of Leiden, The Netherlands; Ph.D., University of Chicago
Learning, cognition

Warren, Susan, Assistant Professor
M.D., Brown University
Emotional development of young children

Williams, Carolyn, Associate Professor
Ph.D., University of Georgia
Health care psychology

Kinesiology, School of

Dengel, Donald, Associate Professor
Ph.D., University of Georgia
Exercise science, exercise physiology

Ingraham, Stacy, Lecturer
Ph.D., University of Minnesota
Exercise physiology, wellness and health promotion, sport specific training and conditioning, eating disorders in female athletes, coaching

Kane, Mary Jo, Professor and School Director
Ph.D., University of Illinois
Social-psychological parameters of sport/physical activity, women in sport

Konczak, Jürgen, Associate Professor
Ph.D., University of Wisconsin
Neuromotor control, biomechanics of coordination, pathokinesiology, developmental kinesiology

Koscheyev, Victor, Senior Fellow
M.D., Ph.D., Institute of Biophysics, Moscow
Human factors and exercise physiology, human performance in extreme environments

LaVoi, Nicole, Education Specialist
Ph.D., University of Minnesota
Sport psychology, sport sociology, moral development and education

Leitschuh, Carol, Research Associate
Ph.D., Oregon State University
Developmental/adapted physical education, early childhood special education

Leon, Arthur, Professor
M.D., University of Wisconsin
Exercise physiology, physical activity's role in chronic disease

Petit, Moira, Assistant Professor
Ph.D., University of British Columbia
Childhood and youth obesity prevention; interrelationships of physical activity, nutrition, and endocrine status on bone health and fracture prevention

Pickert, Robert, Assistant Professor
M.A., University of South Dakota
Physical activity programming, management, coaching, sport facilities, undergraduate advising

Rodgerson, Richard, Teaching Specialist
B.A., University of Minnesota
Motor development, behavioral biology

Serfass, Robert, Associate Professor
Ph.D., University of Minnesota
Exercise physiology, sport training, fitness, sport nutrition

Spletzer, Elizabeth, Education Specialist
M.S., Eastern Michigan University
Pedagogy, biomechanics

Stoffregen, Thomas, Professor
Ph.D., Cornell University
Human factors

Wade, Michael, Professor and Chair, Department of Work and Human Resource Education
Ph.D., University of Illinois
Motor skill development, human factors, developmental disabilities, aging

Wiese-Bjornstal, Diane, Associate Professor
Ph.D., University of Oregon
Sport psychology, youth sport, psychology of sport injury

Recreation and Sport Studies

Buysse, JoAnn, Education Specialist
Ph.D., University of Minnesota
Gender issues in sport, social psychology of sport, ethics, media

Feldman, Harvey, Teaching Specialist
M.Ed., University of Minnesota
Recreation and park administration

Kane, Mary Jo, Professor
Ph.D., University of Illinois
Social-psychological parameters of sport/physical activity, women in sport

Kihl, Lisa, Assistant Professor
Ph.D., University of British Columbia
Sport management studies

§ McAvoy, Leo, Professor
Ph.D., University of Minnesota
Outdoor recreation programs and resources, park planning and management

Outley, Corliss, Assistant Professor
Ph.D., Texas A&M University
Recreation, resources, and youth development in urban communities

Ross, Stephen, Assistant Professor
Ph.D., University of Illinois, Urbana-Champaign
Sport management studies

Russell, Keith, Associate Professor
Ph.D., University of Idaho
Adventure and wilderness therapy and education, program evaluation, recreation and park administration and management

§ Tabourne, Carla, Associate Professor
Ph.D., New York University
Recreation therapy, geriatrics, intergenerational programming, comprehensive program and patient management

Music Education

Addo, Akosua, Associate Professor
Ph.D., University of British Columbia
International issues in music education, multimedia ethnography

Haack, Paul, Professor
Ph.D., University of Wisconsin
Music education, psychology and sociology of music, aesthetics

Hamann, Keitha Lucas, Associate Professor
Ph.D., University of Miami
Choral music education

Jackson, Elizabeth, Teaching Specialist
Ph.D., The Ohio State University
Music education

Zahler, Clara, Teaching Specialist
M.A., Connecticut College
Music education, string techniques

Postsecondary Teaching and Learning

Adamson, William Delancey (Del), Associate Professor
Ph.D., University of Minnesota
Literature, film and the arts

Arendale, David R., Assistant Professor
Ph.D., University of Missouri–Kansas City
Developmental education, world history

Barajas, Heidi L., Associate Professor
Ph.D., University of Minnesota
Sociology

***Barnum, Jill, Professor**
Ph.D., University of North Dakota
Literature, writing

*** Brothen, Thomas F., Professor**
Ph.D., University of Minnesota
Psychology

Bruch, Patrick L., Associate Professor
Ph.D., Wayne State University
Writing

*** Collins, Terence G., Professor**
Ph.D., University of Minnesota
Writing, literature

§ delMas, Robert C., Assistant Professor
Ph.D., University of Minnesota
Statistics, mathematics

Detzner, Daniel F., Professor
Ph.D., University of Minnesota
American studies, immigrant families

Duranczyk, Irene M., Assistant Professor
Ed.D., Grambling State University
Mathematics, developmental education

Fayon, Annia K., Assistant Professor
Ph.D., Arizona State University
Geology

Ghere, David L., Associate Professor
Ph.D., University of Maine
History

Gray Brown, Katy, Assistant Professor
Ph.D., University of Minnesota
Philosophy

Grier, Tabitha L., Assistant Professor
Ph.D., University of Minnesota
Educational psychology, career development

***§ Hatch, Jay T., Associate Professor**
Ph.D., University of Minnesota
Biology, environment

Higbee, Jeanne L., Professor
Ph.D., University of Wisconsin, Madison
Developmental education

Hsu, Leonardo, Assistant Professor
Ph.D., University of California, Berkeley
Physics, physical science

Jacobs III, Walter R., Associate Professor
Ph.D., Indiana University
Sociology

James, Patricia A., Associate Professor
Ph.D., University of Minnesota
Art, creativity

Jehangir, Rashné R., Assistant Professor
Ph.D., University of Minnesota
Educational policy and administration, international literature

*** Jensen, Murray S., Associate Professor**
Ph.D., University of Minnesota
Biology, anatomy, physiology

Kahn, Peter T., Assistant Professor
J.D., University of Minnesota
Law, social studies

*** Koch, Laura Coffin, Associate Professor**
Ph.D., University of Minnesota
Mathematics

*** Lee, Amy M., Associate Professor**
Ph.D., University of Massachusetts, Amherst
Writing

Madyun, Na'im, Assistant Professor
Ph.D., University of Minnesota
Psychology

Miksch, Karen L., Assistant Professor
J.D., University of California, Berkeley
Law, social sciences

Moore, Randy C., Professor
Ph.D., University California, Los Angeles
Biology, botany

Pedelty, Mark H., Associate Professor
Ph.D., University of California, Berkeley
Social sciences, anthropology

Reynolds, Thomas J., Associate Professor
Ph.D., University of Minnesota
Writing

***§ Robertson, Douglas F., Professor**
Ph.D., University of Minnesota
Mathematics, computing

*** Sirc, Geoffrey M., Professor**
Ph.D., University of Minnesota
Writing

Staats, Susan K., Assistant Professor
Ph.D., Indiana University
Mathematics, anthropology

Uthe, Richard E. (Rick), Associate Professor
Ph.D., University of New Brunswick
General chemistry, geology, physical science

*** Wambach, Cathrine A., Associate Professor**
Ph.D., University of Minnesota
Psychology

Xiong, Zha Blong, Assistant Professor
Ph.D., University of Minnesota
Family social science, social science

Yahnke, Robert E., Professor
Ph.D., University of Wisconsin, Madison
Literature, film and the arts

School of Social Work

***Albrecht, Lisa, Associate Professor**
Ph.D., SUNY-Buffalo
Feminist alliance politics, social justice, working for racial justice

§Baizerman, Michael, Professor
Ph.D., University of Pittsburgh
Adolescent/youth studies and public policy, healthy youth development

§Bradshaw, William, Associate Professor
Ph.D., University of Southern California
Mental health services: research, development, evaluation

Davila-Williams, Sonia, Teaching Specialist
M.S.W., University of Pittsburgh
Service delivery strategies for Chicano/Latino and underprivileged families

Dimock, Peter, Teaching Specialist
M.S.W., University of Minnesota
Gender socialization, sexual abuse of males, restorative justice

Edleson, Jeffrey, Professor
Ph.D., University of Wisconsin, Madison
Research methods, family violence, domestic abuse, electronic information

Gibson, Priscilla, Associate Professor
Ph.D., University of Denver
African American grandmothers, kinship care, research methods

Gilgun, Jane F., Professor
Ph.D., Syracuse University
Child sexual abuse, development of violent behavior

§Hollister, C. David, Professor
Ph.D., University of Michigan
Program evaluation, organizational analysis, substance abuse, immigrant populations

Jones, Linda, Associate Professor
Ph.D., University of Wisconsin, Madison
Lesbian/gay families, women and social policy issues, ethics

Kivnick, Helen Q., Professor
Ph.D., University of Michigan
Life strengths, CitySongs, elder role models, life-cycle development

Lightfoot, Elizabeth, Assistant Professor
Ph.D., Indiana University at Bloomington
Social welfare policy, disability policy, strategic planning, community organizing

Lum, Terry, Associate Professor
Ph.D., Washington University
Public policy, social/economic/political environments, health care policy

Menanteau-Horta, Dario, Professor
Ph.D., University of Minnesota
Social organization, community change, rural development, Latin America

§Morrissey, Megan, Lecturer
Ph.D., University of Minnesota
Social welfare history/policy, community practice, historical research methods

Quam, Jean K., Professor and Director
Ph.D., University of Wisconsin, Madison
Aging, older women, chronically mentally ill, social work history

§Reinardy, James, Associate Professor
Ph.D., University of Minnesota
Long-term care, older adult assessments, social welfare policy

Rooney, Ronald, Professor
Ph.D., University of Chicago
Involuntary clients, time-limited practice, public social services, technology-enhanced learning

Taylor, Edward, Associate Professor
Ph.D., University of Southern California
Children/adolescents with mental disorders, mental illness and violence

Umbreit, Mark, Professor
Ph.D., University of Minnesota
Mediation/conflict resolution, victim issues, peacemaking and spirituality

Van Slyke, Victoria, Lecturer
Ph.D., University of Minnesota
Supervision models, interdisciplinary teams, practice with diverse populations

Wells, Susan, Gamble-Skogmo Professor
Ph.D., University of Southern California
Child welfare service evaluation and policy, risk assessment

§Williams, Oliver, Professor
Ph.D., University of Pittsburgh
Domestic violence, homelessness, families/children, aging, ethno-cultural issues

Work and Human Resource Education

Bartlett, Kenneth, Associate Professor
Ph.D., University of Illinois, Urbana-Champaign
Human resource development, adult education

Brown, James, Professor
Ph.D., Bowling Green State University
Special learning needs, diversity in education and work settings

Greiman, Bradley, Assistant Professor
Ph.D., University of Missouri, Columbia
Agricultural education

Joerger, Richard, Associate Professor
Ph.D., University of Minnesota
Agricultural, food, and environmental education

Johansen, Barry-Craig, Assistant Professor
Ph.D., University of Minnesota
Human resource development, adult education

Jones, Stephen, Associate Professor
Ph.D., Iowa State University
Agricultural education and extension, extension education

Krueger, Richard, Professor
Ph.D., University of Minnesota
Program evaluation, focus group interviews

Lambrecht, Judith, Professor
Ph.D., University of Wisconsin
Business teacher education, instructional use of business software

Lewis, Theodore, Professor
Ph.D., The Ohio State University
Technology education curriculum, technology and work, workplace literacy

***§ McLean, Gary, Professor**
Ed.D., Columbia University
International management development, organizational quality and productivity, keyboarding

Park, Rosemarie, Associate Professor
Ed.D., Harvard University
Adult literacy education, workplace literacy, women's issues

Peterson, Shari, Assistant Professor
Ph.D., University of Minnesota
Adult education, human resource development, career decision-making

Pucel, David, Professor
Ph.D., University of Minnesota
Education and training systems

Stone, James, III, Associate Professor
Ed.D., Virginia Polytechnic Institute and State University
Education and work transitions for youth and adults, work-based learning

Yang, Baiyin, Associate Professor
Ph.D., University of Georgia
Adult education, human resource development

Youth Development Leadership Cooperating Faculty

Baizerman, Michael, Professor
Ph.D., University of Pittsburgh
Everyday lives of youth; comprehensive work, community, and family education

Kimball, Lisa, Teaching Specialist
M.Ed., University of Minnesota
Experiential learning, youth development, spirituality and youth

Outley, Corliss, Assistant Professor
Ph.D., Texas A&M University
Recreation, resources, and youth development in urban communities

Rodrigues, Leon, Professor
Ph.D., University of Minnesota
Multicultural education, youth development leadership

Schneider, Byron, Associate Professor
Ph.D., University of Chicago
Education and youth policy

Schumer, Rob, Lecturer
Ph.D., University of California, Los Angeles
Youth studies

Stein, Jerry, Senior Fellow
Ph.D., University of Minnesota
Community youth development, community building and education

Toole, James, Lecturer
Ph.D., University of Minnesota
Youth studies

Walker, Joyce, Professor
Ph.D., University of Minnesota
Community youth organizations, youth policy, youth development leadership

College of Food, Agricultural and Natural Resource Sciences

Administration

TBA, Dean
(At the time this catalog went to print, the University was conducting a national search for a new dean. See the CFANS Web site for updated information.)

Ann Hill Duin, Associate Dean for Faculty and Academic Affairs

Michael A. Schmitt, Associate Dean for Extension

Robert A. Stine, Associate Dean; Coordinator, Cloquet Forestry Center

Melvin J. Baughman, Associate Dean for Undergraduate Programs

F. Abel Ponce de León, Associate Dean for Research

Cynthia Cashman, Director of Development

TBA, Director of Information Services

Mary Buschette, Director of Alumni Relations

Marty Moen, Director of Communications

William K. Ganzlin, Director of Student Services

Deb Karner, Director of Human Resources

Milly Theis, Director of Budget and Finance

John Vreyens, Director of International Programs

Faculty

Agricultural, Food, and Environmental Education

Greiman, Bradley, Assistant Professor
Ph.D., University of Missouri
Reflective judgment, mentor-protégé relationships, effective teaching

Hartle, Darrell, Senior Fellow, Interim Division Coordinator
Teaching, leadership and agricultural industry

Joerger, Richard, Associate Professor
Ph.D., University of Minnesota
Teacher induction of career, technical, and management education teachers, leadership development strategies for career and technical education students, program planning and evaluation

Klingbeil, Larry, Lecturer
Ph.D., University of Minnesota
Teaching, student teacher supervision, farm business management education

Nordquist, Dale, Professor and Extension Educator
M.S., University of Minnesota
Agricultural finance, planning, farm business management education

Agronomy and Plant Genetics

Anderson, James A., Associate Professor
Ph.D., Cornell University
Plant breeding and genetics—wheat

Anderson, Robert N., Adjunct Professor Emeritus
Ph.D., University of Minnesota
Weed management

Barnes, Donald K., Adjunct Professor Emeritus
Ph.D., Pennsylvania State University
Plant breeding alfalfa

Becker, Roger L., Professor
Ph.D., Iowa State University
Weed control for forages, pastures, and non-cropland areas

Behrens, Richard, Professor Emeritus
Ph.D., University of Wisconsin
Weed management

Bernardo, Rex N., Professor
Ph.D., University of Illinois
Plant breeding and genetics, corn

Burnside, Orvin C., Professor Emeritus
Ph.D., University of Minnesota
Alternative weed management systems

Busch, Robert H., Adjunct Professor Emeritus
Ph.D., Purdue University
Wheat genetics and breeding methods

*** Cardwell, Vernon B., Professor**
Ph.D., Iowa State University
Undergraduate education and advising, crop management and physiology

Comstock, Vern E., Adjunct Professor Emeritus
Ph.D., University of Minnesota
Plant breeding and genetics, flax

Cuomo, Gregory J., Professor
Ph.D., University of Nebraska
Pasture management and ecology

Durgan, Beverly R., Professor
Ph.D., North Dakota State University
Weed management for small grains, sunflowers, minor crops

Ehlke, Nancy Jo, Professor
Ph.D., Pennsylvania State University
Forage, legumes and turf grasses, genetics, breeding methods, seed production

Forcella, Frank, Adjunct Associate Professor
Ph.D., University of Oklahoma
Integrated ecology and management of weeds

Garvin, David F., Adjunct Assistant Professor
Ph.D., Cornell University
Wheat genetics and germplasm improvement

Geadelmann, Jon Lee, Adjunct Professor
Ph.D., Iowa State University
Corn breeding and genetics

Gengenbach, Burle G., Professor
Ph.D., University of Illinois
Corn and soybeans molecular genetics

Goodding, John A., Professor Emeritus
Ph.D., Washington State University
Agronomy—range plant ecology

Gronwald, John W., Adjunct Professor
Ph.D., University of Illinois
Biological control of invasive weeds in legumes and wetlands

Gunsolus, Jeffrey L., Professor
Ph.D., North Carolina State University
Weed management in corn and soybeans

Haar, Milton J., Assistant Professor
Ph.D., Iowa State University
Education and research, crop/weed ecology

Hardman, Leland L., Professor Emeritus
Ph.D., University of Minnesota
Production and utilization of crops, including biotechnology issues

Hicks, Dale R., Professor
Ph.D., University of Illinois
Corn and sunflower management

Johnson, Gregg, Associate Professor
Ph.D., University of Nebraska
Integrated weed management

Johnson, Herbert W., Professor Emeritus
Ph.D., University of Nebraska
Agronomy—soybean variety development

Jones, Robert J., Professor
Ph.D., University of Missouri
Maize physiology

Joo, Pilju Kim, Adjunct Professor
Ph.D., Cornell University
Crop genetics and international development

Jordan, Nicholas R., Professor
Ph.D., Duke University
Application of plant population ecology to agricultural problems

Jung, Hans-Joachim G., Adjunct Professor
Ph.D., University of Illinois
Cell wall lignification of forages

Lamb, JoAnn F., Adjunct Associate Professor
Ph.D., University of Nebraska, Lincoln
Alfalfa breeding/genetics

Lueschen, William E., Professor
Ph.D., University of Illinois
Perennial native legumes and weed management in Canola

Marten, Gordon C., Adjunct Professor Emeritus
Ph.D., University of Minnesota
Forage production and management

Muehlbauer, Gary J., Associate Professor
Ph.D., University of Minnesota
Molecular genetics of wheat and barley

Naeve, Seth, Assistant Professor
Ph.D., Iowa State University
Soybean management

Oelke, Ervin, Professor Emeritus
Ph.D., University of Wisconsin, Madison
Small grains, wild rice and minor crops management

Orf, James H., Professor
Ph.D., University of Illinois
Soybean genetics and breeding

Peterson, Paul R., Assistant Professor
Ph.D., University of Minnesota
Forage management and utilization

Phillips, Ronald L., Regents Professor
Ph.D., University of Minnesota
Crop tissue culture, genomics and cytogenetics

Porter, Paul, Associate Professor
Ph.D., University of Illinois
Cropping systems

Rasmusson, Donald C., Professor Emeritus
Ph.D., University of California, Davis
Barley genetics and breeding

Rines, Howard W., Adjunct Professor
Ph.D., Yale University
Genetics and biotechnology investigations in oat

Scott, Lori K., Assistant Professor
Ph.D., University of Wisconsin
Education and research, soybean breeding

Sheaffer, Craig C., Professor
Ph.D., University of Maryland
Alfalfa and forage management, sustainable cropping systems

*** Simmons, Steve R., Professor**
Ph.D., University of Minnesota
Ecology of diversified cropping systems

Smith, Kevin P., Associate Professor
Ph.D., University of Wisconsin, Madison
Barley genetics and breeding

Smith, Lawrence H., Professor Emeritus
Ph.D., Michigan State University
Undergraduate education

Somers, David A., Adjunct Professor
Ph.D., Washington State University
Molecular genetics of soybean and oat

Stucker, Robert E., Professor Emeritus
Ph.D., North Carolina State University

Stuthman, Deon D., Professor
Ph.D., Purdue University
Durable pest resistance, oat genetics and breeding

Vance, Carroll P., Adjunct Professor
Ph.D., The Ohio State University
Physiology/molecular biology of nitrogen fixation in legumes

Wedin, Walter F., Adjunct Professor
Ph.D., University of Wisconsin, Madison
Forage management

Wiersma, Jochum J., Assistant Professor
Ph.D., University of Minnesota
Small grains production and management

Wyse, Donald L., Professor
Ph.D., Michigan State University
Perennial weed control for grass/legume seed production

Animal Science

Baidoo, Samuel L., Associate Professor
Ph.D., University of Alberta
Swine nutrition and management

Chester-Jones, Hugh, Associate Professor
Ph.D., Virginia Tech
Dairy and beef production systems

Crooker, Brian A., Professor
Ph.D., University of Illinois
Nutritional physiology of ruminants

Da, Yang, Associate Professor
Ph.D., University of Illinois, Urbana-Champaign
Quantitative and molecular genetics

Dayton, William R., Professor
Ph.D., Iowa State University
Animal growth biology

DiCostanzo, Alfredo, Associate Professor
Ph.D., University of Minnesota
Beef cattle nutrition and management

Donker, John D., Professor Emeritus
Ph.D.
Ruminant nutrition

El Halawani, M.E., Professor
Ph.D., University of California, Davis
Avian endocrinology

Endres, Marcia, Assistant Professor
Ph.D., University of Minnesota
Dairy management

Fahrenkrug, Scott, Associate Professor
Ph.D., University of Minnesota
Functional genomics

Foster, Douglas N., Professor
Ph.D., University of California
Molecular biology, avian endocrinology

*** Hansen, Leslie B., Professor**
Ph.D., Iowa State University
Dairy genetics

Hathaway, Marcia, Professor
Ph.D., University of Minnesota
Muscle biology

Hawton, Jerry D., Professor Emeritus
Ph.D., University of Minnesota
Swine nutrition

*** Hunter, Alan G., Professor Emeritus**
Ph.D., Michigan State University
Animal physiology

Jacob, Jacqueline, Assistant Professor
Ph.D., University of British Columbia
Poultry management

Johnson, Dennis G., Professor
Ph.D., University of Minnesota
Dairy production systems

Johnston, Lee J., Professor
Ph.D., Michigan State University
Swine nutrition and management

Lamb, G. Cliff, Associate Professor
Ph.D., Kansas State University
Reproductive physiology and beef cattle management

Li, Yuzhi, Assistant Professor
Ph.D., Hiroshima University, Japan
Animal behavior, alternative swine production

Linn, James Gary, Professor
Ph.D., University of Minnesota
Dairy nutrition

Marx, George D., Professor Emeritus
Ph.D., University of Minnesota
Dairy management

Mauro, Laura , Associate Professor
Ph.D. University of Minnesota
Animal physiology/neuroscience, cell signaling

Noll, Sally L., Professor
Ph.D., University of Minnesota
Poultry (turkeys) science

O'Grady, Scott M., Professor
Ph.D., University of Illinois
Electrolyte physiology

Otterby, Donald E., Professor Emeritus
Ph.D., North Carolina State University
Dairy cattle nutrition and management

Ponce de León, F. Abel, Professor
Ph.D., University of Massachusetts
Genome mapping, genetic markers

Reneau, Jeffrey K., Professor
D.V.M., University of Minnesota
Dairy management

Seykora, Anthony J., Professor
Ph.D., North Carolina State University
Dairy genetics

§Shurson, Gerald C., Professor
Ph.D., Michigan State University
Swine nutrition management

Stern, Marshall D., Professor
Ph.D., University of Maine
Ruminant nutrition

Walker, Roger D., Professor
Ph.D., University of Kentucky
Swine management systems and swine breeding and genetics

Wheaton, Jonathan E., Professor
Ph.D., Oregon State University
Reproductive endocrinology

***§ White, Michael E., Professor**
Ph.D., University of Minnesota
Muscle biology and growth

Applied Economics

Apland, Jeffrey D., Professor
Ph.D., Purdue University
Production economics, managerial economics and mathematics

Blank, O. Uel, Professor Emeritus
Ph.D., Michigan State University

Buhr, Brian L., Professor and E. Fred Koller Professor in Agricultural Management Information Systems
Ph.D., Iowa State University
Agricultural marketing and price analysis

Cochrane, Willard W., Professor Emeritus
Ph.D., Harvard University
Farm price analysis and policy

Coggins, Jay S., Associate Professor
Ph.D., University of Minnesota
Resource and environmental economics, political economy

Crewdson, Buddy G., Associate Professor Emeritus
M.S., University of Minnesota
Business development

Dahl, Dale C., Professor Emeritus
Ph.D., University of Minnesota
Agricultural marketing and price analysis, agricultural law

Dahl, Reynold P., Professor Emeritus
Ph.D., University of Minnesota
Agricultural marketing, futures markets and prices, agricultural cooperatives

§ Davis, Elizabeth E., Associate Professor
Ph.D., University of Michigan
Labor economics, public policy, poverty, rural economics

Easter, K. William, Professor
Ph.D., Michigan State University
Resource economics and development, environment/non-point pollution

Egertson, Kenneth, Professor Emeritus
M.S., University of Minnesota

Eidman, Vernon R., Professor
Ph.D., University of California, Berkeley
Production economics and agribusiness management

Fruin, Jeremiah E., Associate Professor
Ph.D., University of California, Berkeley
Transportation economics, agricultural marketing and logistics

Fuller, Earl I., Professor Emeritus
Ph.D., University of Minnesota
Farm management, production economics

Gartner, William, Professor
Ph.D., Michigan State University
Tourism development

Glewwe, Paul, Associate Professor
Ph.D., Stanford University
Development economics, applied microeconomics and econometrics

Hammond, Jerome W., Professor Emeritus
Ph.D., University of Wisconsin, Madison
Agricultural marketing and pricing

Hawkins, Richard O., Professor Emeritus
M.S., University of Minnesota
Production economics, farm management

§ Homans, Frances R., Associate Professor
Ph.D., University of California
Resource economics

Hoyt, John S., Professor Emeritus
Ph.D., American University of Washington

Hurley, Terrance M., Associate Professor
Ph.D., Iowa State University
Agricultural production and policy, environmental economics

Kalambokidis, Laura, Assistant Professor
Ph.D., University of Michigan
Community and regional development, public finance

§ King, Robert P., Professor
Ph.D., Michigan State University
Management information systems, managerial economics, agribusiness management

Kinsey, Jean D., Professor
Ph.D., University of California, Davis
Consumption economics, retail food distribution

Lazarus, William F., Professor
Ph.D., University of Illinois
Farm business and financial management

Levins, Richard A., Professor Emeritus
Ph.D., Mississippi State University
Farm management

§ Liu, Donald J., Associate Professor
Ph.D., University of Minnesota
Agricultural marketing and price analysis, futures and option

Maki, Wilbur R., Professor Emeritus
Ph.D., Iowa State University
Regional economics

Martin, Lee R., Professor Emeritus
Ph.D., Harvard University

McCullough, Gerard John, Associate Professor
Ph.D., Massachusetts Institute of Technology
Transportation economics and applied economics

Morse, George W., Professor
Ph.D., University of Wisconsin, Madison
Community and regional economics

Nefstead, Ward E., Associate Professor
M.S., University of Minnesota
Farm management and marketing

§ Olson, Kent D., Professor
Ph.D., Iowa State University
Production economics and farm management, agribusiness management

Pardey, Philip G., Professor
Ph.D., University of Minnesota
Agricultural research policy, economics of technical change

Parliament, Claudia D., Professor
Ph.D., University of California, Berkeley
Community economic development and economic education

Pederson, Glenn D., Professor
Ph.D., Michigan State University
Agricultural finance, international agricultural development

Polasky, Stephen, Fesler Lampert Professor of Ecological and Environmental Economics
Ph.D., University of Michigan
Environmental and resource economics, industrial organization

Raup, Philip M., Professor Emeritus
Ph.D., University of Wisconsin
Land economics, world agricultural development

Roe, Terry Lee, Professor
Ph.D., Purdue University
Economic development, trade, political economy, prices

Rose, Gordon D., Professor Emeritus
Ph.D., South Dakota State University

Runge, Carlisle Ford, Distinguished McKnight University Professor
Ph.D., University of Wisconsin, Madison
Agricultural and natural resources policy, welfare economics

Ruttan, Vernon, Regents Professor Emeritus
Ph.D., University of Chicago
Economic development, agricultural research policy and development

Schuh, G. Edward, Regents Professor
Ph.D., University of Chicago
Economic development, international trade and exchange rate policy

Senauer, Benjamin H., Professor
Ph.D., Stanford University
Consumption economics and food policy

Smith, Pamela, Associate Professor
Ph.D., University of Wisconsin, Madison
International trade, economics, econometrics

Smith, Rodney B., Associate Professor
Ph.D., University of Maryland
Government regulation, policy and prices, resource and environment

Snyder, Robert W., Professor Emeritus
Ph.D., Cornell University

Stevens, Stanley C., Associate Professor Emeritus
Ph.D., University of Illinois
Grain marketing

Stinson, Thomas F., Associate Professor
Ph.D., University of Minnesota
Public finance and regional economic development

Sundquist, Wesley B., Professor Emeritus
Ph.D., Michigan State University
Production economics, policy

Taff, Steven J., Associate Professor
Ph.D., University of Wisconsin, Madison
Agricultural policy, local public finance, environmental policy

Thomas, Kenneth H., Professor Emeritus
Ph.D., University of Minnesota
Farm management

§ Welsch, Delane E., Professor Emeritus
Ph.D., Michigan State University
International agriculture and rural development, natural resources

Yeap, Clarissa, Assistant Professor
Ph.D., Michigan State University
Industrial organization, applied microeconomics, food marketing

Yoho, Carole J. B., Associate Professor Emeritus
M.A., University of Minnesota
Public policy education, local government, public finance

Bio-based Products

*** Bowyer, James L., Professor**
Ph.D., University of Minnesota
Life cycle analysis, marketing

Bratkovich, Stephen M., Adjunct Faculty
Ph.D., The Ohio State University
Extension education

Erickson, Robert W., Professor Emeritus
Ph.D., University of Minnesota
Wood physics and moisture relations

Gertjejansen, Roland O., Professor Emeritus
Ph.D., University of Minnesota
Fiber and particle products technology

Grimsrud, David T., Associate Professor Emeritus
Ph.D., University of Minnesota
Indoor air quality and building energy efficiency

Hendricks, Lewis T., Professor Emeritus
Ph.D., Michigan State University
Forest products extension and training

Huelman, Patrick H., Associate Professor
M.S., Iowa State University
Energy-efficient buildings

Petersen, Harlan D., Assistant Professor
M.S., University of Minnesota
Wood moisture relations

Ramaswamy, Shri, Professor and Department Head
Ph.D., State University of New York
Paper science and engineering

Reichenbach, Michael R., Adjunct Faculty
M.S., University of Illinois
Extension educator

Ruan, Roger, Adjunct Faculty
Ph.D., University of Illinois
Bioprocessing

Sarkanen, Simo, Professor
Ph.D., University of Washington
Wood and lignin chemistry

Schmidt, Elmer L., Professor
Ph.D., University of Minnesota
Wood deterioration/protection

Seavey, Robert T., Research Associate
Ph.D., University of Minnesota
Wood physics

Severtson, Steven J., Associate Professor
Ph.D., Institute of Paper Science and Technology
Surface chemistry

Smith, Timothy M., Associate Professor
Ph.D., Pennsylvania State University
Forest products marketing

Suh, Sangwon, Assistant Professor
Ph.D., Leiden University, Netherlands
Life cycle analysis

Tschirner, Ulrike W., Associate Professor
Ph.D., University of Karlsruhe, Germany
Lignin chemistry

Tze, William Tai Yin, Assistant Professor
Ph.D., University of Maine
Wood science, composites

Yin, Kewen Karen, Professor
Ph.D., University of Maryland
Process monitoring and control

Biosystems and Agricultural Engineering

In the following list, P.E. designates licensure as a professional engineer in Minnesota, unless otherwise indicated. P.S.S. designates licensure as a professional soil scientist.

Bhattacharya, Mrinal, Professor
Ph.D., University of Nebraska
Biodegradable polymers, biomaterials, tissue engineering, biosensors

Boedicker, James, Adjunct Associate Professor
Ph.D., North Carolina State University
Machinery systems, machine safety, livestock environment

Chaplin, Jonathan, P.E., Associate Professor
Ph.D., Iowa State University
Engineering safety, machinery systems design, instrumentation and control, energy systems

Clanton, Charles, P.E., P.S.S., Professor
Ph.D., University of Minnesota
Agricultural waste management: water, air quality, odor, and storage

Goodrich, Philip, P.E., Associate Professor
Ph.D., Purdue University
Biomass, renewable energy systems, odor control

Iznuno, Forrest, Professor
Ph.D., Colorado State University
Water management, irrigation, drainage, water quality

Jacobson, Larry, P.E., Professor and Extension Engineer
Ph.D., University of Minnesota
Environmentally friendly and energy conserving animal housing systems; airborne emissions, odor control, and indoor air quality for agricultural, industrial, and residential buildings; waste management

Janni, Kevin, P.E., Professor, Extension Engineer, and Department Head
Ph.D., Purdue University
Animal housing systems, ventilation, odor control, air quality, biofiltration

Morey, R. Vance, Professor
Ph.D., Purdue University
Biomass densification, biomass for electricity and process heat at ethanol plants, post-harvest technology

Nieber, John, P.E., Professor
Ph.D., Cornell University
Watershed hydrology, biochemistry of watersheds, wetland hydrology, engineering of water resources quality and quantity, flow and transport in geological media and biological systems

Ruan, Roger, Professor
Ph.D., University of Illinois
Food engineering, value-added processing, biorefining, renewable energy, MRI (magnetic resonance imaging) and NMR (nuclear magnetic resonance) applications, non-thermal plasma

Sands, Gary, Associate Professor and Extension Engineer
Ph.D., Colorado State University
Hydrology, water quality, water resources conservation and management

Shutske, John, Professor and Extension Agricultural Safety Specialist
Ph.D., Purdue University
Safe design of products and production systems, homeland security risk assessment and communication, worker/public health impacts from technology/demographic change in biological industries

Wilcke, William, P.E. (Iowa), Professor and Extension Engineer
Ph.D., Iowa State University
Post-harvest technology, sustainable agriculture, agricultural energy sources

Wilson, Bruce, P.E. (Oklahoma), Professor
Ph.D., University of Kentucky
Hydrologic/water quality modeling, transport of surface water contaminants

Wright, Jerry, P.E., Associate Professor and Extension Engineer
M.S., North Dakota State University
Irrigation design, irrigation water management, drainage, ground water quality

Zhu, Jun, Associate Professor and Extension Engineer
Ph.D., University of Illinois
Animal waste management and treatment techniques, manure odor control, nutrient recycling, renewable energy

Entomology

Andow, David A., Professor
Ph.D., Cornell University
Insect ecology, evolution, conservation biology

Ascerno, Mark E., Professor and Department Head
Ph.D., Pennsylvania State University
Floricultural entomology, greenhouse biological control

Brooks-Wallace, Marion, Professor Emeritus
Ph.D., University of Minnesota
Insect physiology

Cutkomp, Laurence, K., Professor Emeritus
Ph.D., Cornell University
Insect toxicology

Fallon, Ann M., Professor
Ph.D., Queen's University
Molecular biology of insects, mosquito cell culture and reproduction

Ferrington, Leonard C., Professor
Ph.D., University of Pittsburgh
Aquatic entomology

Harein, Phillip K., Professor Emeritus
Ph.D., Kansas State University
Stored product entomology

Heimpel, George E., Associate Professor
Ph.D., University of California
Biological control, behavioral and evolutionary ecology

§ Holzenthal, Ralph W., Professor
Ph.D., Clemson University
Systematics, cladistics, Trichoptera

Hutchison, William D., Professor
Ph.D., University of Wisconsin, Madison
Integrated pest management for vegetable crops

Kells, Stephen A., Assistant Professor
Ph.D., Purdue University
Urban and industrial entomology

Krischik, Vera A., Associate Professor
Ph.D., University of Maryland
Integrated pest management, ornamentals, plant resistance, biological control

Kurtti, Timothy J., Professor
Ph.D., University of Minnesota
Insect microbiology and physiology

MacRae, Ian V., Associate Professor
Ph.D., Oregon State University
Integrated pest management (IPM) of field crops, site-specific IPM

Mesce, Karen A., Professor
Ph.D., University of Oregon
Neurobiology, behavior and neurohormones in arthropods and annelids

Moon, Roger D., Professor
Ph.D., University of California, Davis
Veterinary entomology, biological control, sampling

Ostlie, Kenneth R., Professor
Ph.D., Iowa State University
Corn and soybean integrated pest management

Peterson, Allan G., Professor Emeritus
Ph.D., University of Minnesota
Economic entomology

Price, Roger D., Professor Emeritus
Ph.D., University of Kansas
Systematics

Radcliffe, Edward B., Professor
Ph.D., University of Wisconsin, Madison
Integrated pest management: potato and alfalfa

Ragsdale, David W., Professor
Ph.D., Louisiana State University
Integrated pest management and biological control of insect

§ Spivak, Marla S., Associate Professor
Ph.D., University of Kansas
Apiculture and social insects

Weller, Susan J., Associate Professor
Ph.D., University of Texas
Systematics of Lepidoptera using molecular and morphological approaches

Fisheries, Wildlife, and Conservation Biology

Adelman, Ira R., Professor
Ph.D., University of Minnesota
Fisheries management, physiology, aquaculture

Andersen, David E., Associate Professor
Ph.D., University of Wisconsin, Madison
Avian ecology and conservation

Arnold, Todd W., Assistant Professor
Ph.D., University of Western Ontario
Ecology and management of prairie ducks, population modeling

Blair, Robert B., Assistant Professor
Ph.D., Stanford University
Peri-urban wildlife, avian conservation, land use, habitat fragmentation, environmental education

Cohen, Yosef, Professor
Ph.D., University of California, Berkeley
Populations, mathematical ecology, ecosystem conservation

Cooper, James A., Associate Professor Emeritus
Ph.D., University of Massachusetts
Waterfowl and wetland ecology

Cuthbert, Francesca J., Professor
Ph.D., University of Minnesota
Conservation and biology of birds, endangered species conservation

Fulton, David C., Assistant Professor
Ph.D., Colorado State University
Human dimensions of biological conservation

Gutierrez, R. J., Professor
Ph.D., University of California, Berkeley
Game bird ecology, endangered species conservation, habitat ecology, sustainable wildlife management strategies

Jordan, Peter A., Associate Professor Emeritus
Ph.D., University of California, Berkeley
Ecology and management of mammalian herbivores

Kapuscinski, Anne R., Professor
Ph.D., Oregon State University
Fisheries genetics, aquatic biotechnology assessment

Loegering, John, Associate Professor, Crookston
Ph.D., Oregon State University
Avian ecology, wildlife-habitat relationships, quantitative ecology

Nelson, Kristen C., Assistant Professor
Ph.D., University of Michigan
Human dimensions of natural resources, environmental management

Newman, Raymond M., Associate Professor
Ph.D., University of Minnesota
Aquatic ecology and fisheries management

Oberhauser, Karen S., Assistant Professor
Invertebrate conservation and ecology with particular interest in Monarch butterflies, citizen science and ecological monitoring

*** Perry, James, Professor**
Ph.D., Idaho State University
Water quality, applied aquatic ecology, environmental management

Simons, Andrew M., Assistant Professor
Ph.D., University of Alabama, Tuscaloosa
North American freshwater fish systematics

Smith, James L. D., Professor
Ph.D., University of Minnesota
Biology and conservation of Asian mammals

Sorensen, Peter W., Professor
Ph.D., University of Rhode Island
Fish behavior, physiology and chemoreception

Spangler, George R., Professor
Ph.D., University of Toronto
Population dynamics of fish, native American resource management

Vondracek, Bruce C., Adjunct Professor
Ph.D., University of California, Davis
Stream ecology and restoration

Food Science and Nutrition

Brady, Linda J., Professor
Ph.D., Michigan State University
Culture and health and cross-cultural engagement, role of culture in teaching and learning

Chen, Xiaoli, Assistant Professor and General Mills Chair in Genomics for Healthful Foods
Ph.D., University of Georgia
Obesity and insulin resistance and type 2 diabetes

Croll, Jillian, Lecturer and Adjunct Assistant Professor
Ph.D., University of Minnesota
Nutrition and eating disorders

Csallany, A. Saari, Professor
D.Sc., University of Technical Science; Budapest, Hungary
Lipid chemistry, nutritional biochemistry, free radicals, oxidative degradation

Diez-Gonzalez, Francisco, Associate Professor
Ph.D., Cornell University
Food safety, food-borne pathogens and bacterial detection methods

Earthman, Carrie P., Assistant Professor
Ph.D., University of Arizona
Clinical nutrition, medical nutrition therapy and energy metabolism and body composition

Feirtag, Joellen M., Associate Professor
Ph.D., University of Minnesota
Food safety education/HACCP, rapid assays detection development, prebiotic/probiotic physiology

Gallaher, Daniel D., Professor
Ph.D., University of California, Davis
Dietary influences (whole grains, cruciferous vegetables and fats) and colon cancer relationships, whole grains and diabetes

Hassel, Craig A., Associate Professor
Ph.D., University of Arizona
Cross cultural engagement with underserved audiences having their own knowledge of food and health that does not correspond to scientific understanding

§ Kurzer, Mindy S., Professor
Ph.D., University of California, Berkeley
Dietary regulation of sex hormones, plant estrogen (phytoestrogen) exposure and effects, diet and cancer

***§ Labuza, Theodore P. Professor**
Ph.D., Massachusetts Institute of Technology
Physical chemistry of foods as related to water activity, glass transition and stability, shelf life prediction models and kinetics of food deterioration

Marquart, Leonard F., Assistant Professor
Ph.D., University of North Carolina
Whole grains and health, consumer understanding and factors influencing dietary intake of whole grain foods

Mashek, Douglas G., Assistant Professor
Ph.D., University of Wisconsin-Madison
Fatty acid metabolism

*** McKay, Larry L., Professor**
Ph.D., Oregon State University
Food fermentations/genetics/biotechnology of lactic acid bacteria

Metzger, Lloyd E., Associate Professor and MN-SD Dairy Center and Pilot Plant Director
Ph.D., Cornell University
Evaluation of cheese functionality and manufacturing parameters

Orchard, Elizabeth, R.D., Assistant Program Director
M.A., University of St. Thomas
Dietetic education, nutrition, women's health

O'Sullivan, Daniel J., Associate Professor
Ph.D., University of College Cork, Ireland
Molecular fingerprinting and genetic characterization of lactic acid bacteria, expression and regulation of bacteriophage resistance

Peterson, Carolyn M., Assistant Clinical Specialist
M.S., University of Minnesota
Dietetic education, sports nutrition

Peterson, Kerry D., Lecturer
Ph.D., University of Minnesota
Lipid metabolism, energy balance and regulation of food intake

Peterson, Sabrina, Assistant Professor
Ph.D., University of Washington
Food and cancer, particularly related to cruciferous and apiaceous (carrot family) plants

Reicks, Marla M., Professor
Ph.D., Iowa State University
Nutrition education and programming for limited resource audiences, application of behavior change theory to improve eating patterns

Reineccius, Gary A., Professor
Ph.D., Pennsylvania State University
Food chemistry and food flavors, including analytical instrumentation and processing variables

Slavin, Joanne L., Professor
Ph.D., University of Wisconsin
Human feeding studies, including dietary fiber, carbohydrates, and whole grains; measurement of biological markers relevant to disease prevention; nutrition and exercise; diet and cancer

Smith, Chery F., Associate Professor
Ph.D., Indiana University
Domestic and international community nutrition, population biology issues

§ Smith, David E., Professor
Ph.D., University of Wisconsin
Dairy and food technology, effects of new technology/ingredients on dairy products

Splett, Patricia L., Lecturer
Ph.D., University of Minnesota
Nutrition education, program evaluation and outcomes

Vickers, Zata M., Professor
Ph.D., Cornell University
Food pleasantness and acceptability, factors influencing judgments of food acceptability, sensory specific satiety, odor mixture perception

Forest Resources

Alm, Alvin A., Professor Emeritus
Ph.D., University of Minnesota
Silviculture, reforestation

§ Anderson, Dorothy H., Professor
Ph.D., Colorado State University
Recreation resources management and policy analysis

Anderson, William H., Adjunct Faculty
Ph.D., University of Michigan
Remote sensing

Ascerno, Mark E., Jr., Adjunct Faculty
Ph.D., Pennsylvania State University
Forest entomology: forest and urban plant pest control

Bauer, Marvin E., Professor
Ph.D., University of Illinois
Remote sensing of soils, crops and forests

Baughman, Melvin J., Professor and Assistant Dean
Ph.D., University of Minnesota
Policy, taxation, economics and management

Becker, Dennis R., Assistant Professor
Ph.D., University of Idaho
Natural resources policy

Befort, William A., Adjunct Faculty
Ph.D., University of Idaho
Remote sensing

Bengston, David N., Adjunct Faculty
Ph.D., University of Minnesota
Economics, technical change, research planning, evaluation

Berglund, Erwin R., Adjunct Faculty
Ph.D., University of Minnesota
Hydrology

Blanchette, Robert A., Adjunct Faculty
Ph.D., Washington State University
Forest pathology: forest and shade tree diseases

Blinn, Charles R., Professor
Ph.D., Virginia Polytechnic Institute and State University
Management, economics, marketing, and harvesting

Bolstad, Paul V., Associate Professor
Ph.D., University of Wisconsin
Geographic information systems and forest ecology

Brooks, Kenneth N., Professor
Ph.D., University of Arizona
Forest hydrology, modeling impacts of land use on water resources

Burk, Thomas E., Professor
Ph.D., University of Minnesota
Biometrics: forest growth modeling and experimental design

Carlson, Stephan P., Professor
Ph.D., Michigan State University
Youth development, park and recreation resources

Current, Dean A., Research Associate
Ph.D., University of Minnesota
Resource analysis, international forestry

David, Andrew J., Associate Professor
Ph.D., Michigan State University
Forest genetics

Eckman, Karlyn, Adjunct Faculty
Ph.D., University of Minnesota
Community/social forestry planning

Ek, Alan R., Professor and Department Head
Ph.D., Oregon State University
Resource survey design, modeling forest dynamics, research planning

Ellefson, Paul V., Professor Emeritus
Ph.D., Michigan State University
Economics, policy, and administration

Enzler, Sherry A., Research Fellow
J.D., William Mitchell College of Law
Environment and natural resource law

Erkkila, Dan L., Adjunct Faculty
Ph.D., University of Minnesota
Resource analysis

Frelich, Lee E., Research Associate
Ph.D., University of Wisconsin
Forest ecology

Gilmore, Daniel W., Assistant Professor
Ph.D., University of Maine
Silviculture

Gregersen, Hans M., Professor Emeritus
Ph.D., University of Michigan
Economics, social cost-benefit analysis, international forestry

Grigal, David F., Adjunct Faculty
Ph.D., University of Minnesota
Forest soils

Gustafson, Kent E., Professor and Extension Educator
M.A., University of Minnesota
Tourism

Haight, Robert G., Adjunct Faculty
Ph.D., Oregon State University
Economics and operations research

Hallgren, Alvin R., Professor Emeritus
Ph.D., University of Minnesota
Forest management and harvesting

Hansen, Mark H., Adjunct Faculty
Ph.D., University of Minnesota
Forest survey, DBMS

Hoganson, Howard M., Associate Professor
Ph.D., University of Minnesota
Management and economics: timber supply and harvest scheduling

Irving, Frank D., Professor Emeritus
Ph.D., University of Minnesota
Public administration, management, and forest fires management

Jakes, Pamela, Adjunct Faculty
Ph.D., University of Minnesota

Johnson, Gary R., Professor
M.S., Western Illinois University
Urban and community forestry

Johnson, Gerald W., Adjunct Faculty
Ph.D., University of Wisconsin
Surveying, mapping, photogrammetry

Kilgore, Michael A., Assistant Professor
Ph.D., University of Minnesota
Natural resources economics

Kurmis, Vilis, Professor Emeritus
Ph.D., University of Minnesota
Forest ecology

Leary, Rolfe A., Adjunct Faculty
Ph.D., University of Minnesota
Modeling forest dynamics

Levy, Louise S., Adjunct Faculty
M.S., Oregon State University
Sustainable forestry education

Lime, David W., Senior Research Associate Emeritus
Ph.D., University of Pittsburgh
Recreation resources management and tourism

McRoberts, Ronald E., Adjunct Faculty
Ph.D., University of Minnesota
Forest growth modeling

Merriam, Lawrence C., Jr., Professor Emeritus
Ph.D., University of Minnesota
Recreation resources management

Messer, Cynthia, Associate Professor and Extension Educator
M.A., George Washington University
Tourism development, travel

Mohn, Carl A., Professor Emeritus
Ph.D., University of Minnesota
Forest genetics, tree improvement

Montgomery, Rebecca A., Assistant Professor
Ph.D., University of Connecticut
Forest ecology, ecophysiology, tropical ecology

Nelson, Kristen C., Associate Professor
Ph.D., University of Michigan
Human dimensions of natural resources and environmental management

Nieber, John L., Adjunct Faculty
Ph.D., Cornell University
Forest hydrology

O'Brien, Joseph G., Adjunct Faculty
Ph.D., University of Minnesota
Forest pathology

Oleksyn, Jacek, Research Associate
Ph.D., Silesian University, Poland
Ecophysiology, tree biology

Ostry, Michael E., Adjunct Faculty
Ph.D., University of Minnesota
Forest pathology

Palik, Brian J., Adjunct Faculty
Ph.D., University of Michigan
Forest ecology

Phillips, Michael J., Adjunct Faculty
Ph.D., University of Canterbury, New Zealand
Forest soils

Pitt, David G., Adjunct Faculty
Ph.D., University of Arizona
Scenic resource management

Polasky, Stephen, Adjunct Faculty
Ph.D., University of Michigan
Ecological/environmental economics

Reich, Peter B., Professor and F.B. Hubachek Senior Chair in Forestry
Ph.D., Cornell University
Forest ecology, ecophysiology

Reichenbach, Michael R., Adjunct Faculty
M.S., University of Illinois
Forest economic development

Riemenschneider, Donald E., Adjunct Faculty
Ph.D., University of Minnesota
Genetics: tree improvement

Rose, Dietmar W., Professor Emeritus
Ph.D., University of Wisconsin
Forest economics, planning, timber supply analysis

Runge, C. Ford, Adjunct Faculty
Ph.D., University of Wisconsin
Natural resource economics

Rusterholz, Kurt A., Adjunct Faculty
Ph.D., University of Wisconsin
Ecology of old growth forests

Sagor, Eli S., Adjunct Faculty
M.S., Yale University
Forest and landscape ecology

Schmidt, Thomas L., Adjunct Faculty
Ph.D., University of Nebraska, Lincoln
Multi-resource assessment

Schneider, Ingrid E., Associate Professor
Ph.D., Clemson University
Recreation resource management

Scholten, Harold S., Professor Emeritus
Ph.D., University of Minnesota
Silviculture, windbreaks, shelterbelts

Skok, Richard A., Dean Emeritus
Ph.D., University of Minnesota
Forest economics and policy

Smith, James L. David, Adjunct Faculty
Ph.D., University of Minnesota
Conservation biology

Snyder, Stephanie A., Adjunct Faculty
Ph.D., Johns Hopkins University
Systems analysis, operations research

Splett, Philip J., Instructor Emeritus
M.S., University of Minnesota
Plant taxonomy

Stine, Robert A., Adjunct Faculty
Ph.D., University of Minnesota
Forest genetics, forest policy, Cloquet Forestry Center

Sucoff, Edward I., Professor Emeritus
Ph.D., University of Maryland
Tree physiology, nutrient-water interactions, forest decline

Taff, Steven J., Adjunct Faculty
Ph.D., University of Wisconsin, Madison
Natural resource economics and policy

Thompson, Jerrilyn L., Adjunct Faculty
M.S., University of Minnesota
Recreation resources management

Verry, Elon S., Adjunct Faculty
Ph.D., Colorado State University
Hydrology

Vogt, Carl E., Instructor
B.S., University of Minnesota
Conservation education, hardwood management, specialty crops

Zasada, J. C., Adjunct Faculty
Ph.D., University of Michigan
Silviculture and regeneration ecology

Zenner, Eric K. Assistant Professor
Ph.D., Oregon State University
Silviculture

Horticultural Science

Anderson, Neil O., Associate Professor
Ph.D., University of Minnesota
Floriculture breeding and genetics

Ascher, Peter D., Professor Emeritus
Ph.D., University of Wisconsin, Madison
Genetics/floriculture

Brown, Deborah L., Professor Emeritus
M.S., University of Minnesota
Consumer horticulture, communications

Carter, John V., Professor Emeritus
Ph.D., Purdue University
Environmental stress

Cline, Van W., Adjunct Associate Professor
Ph.D., University of Minnesota
Turfgrass science

Cohen, Jerry D., Professor and Bailey Chair
Ph.D., Michigan State University
Plant biochemistry, cellular and molecular biology

Davis, David W., Professor Emeritus
Ph.D., Oregon State University
Vegetable breeding

Desborough, Sharon, Professor Emeritus
Ph.D., University of Wisconsin
Genetics

Eisel, Mervin, Associate Professor Emeritus
M.Ed., University of Minnesota
Extension education—horticulture/ornamentals

Erwin, John E., Associate Professor
Ph.D., Michigan State University
Floriculture

Fritz, Vincent, Professor
Ph.D., Michigan State University
Vegetable physiology

§ Galatowitsch, Susan M., Associate Professor
Ph.D., Iowa State University
Landscape ecology

Gardner, Gary M., Professor
Ph.D., Harvard University
Growth regulation, plant hormones, photomorphogenesis

Gillman, Jeffrey H., Associate Professor
Ph.D., University of Georgia
Nursery management

Hackett, Wesley P., Professor Emeritus
Ph.D., University of California, Davis
Ornamental horticulture—plant physiology

Hertz, Leonard B., Professor Emeritus
Ph.D., University of Wisconsin
Weed control, vegetable and fruit crops

Hokanson, Stan C., Assistant Professor
Ph.D., Michigan State University
Woody landscape plant breeding, stress physiology

*** Hoover, Emily E., Professor**
Ph.D., University of Minnesota
Fruit science, director of educational programs, Minnesota Landscape Arboretum

Horgan, Brian, Assistant Professor
Ph.D., University of Illinois
Turf

Lauer, Florian, Professor Emeritus
Ph.D., University of Minnesota
Potato breeding and genetics

Li, Pen Hsiang, Professor Emeritus
Ph.D., Oregon State University
Environmental stress physiology and plant hardiness

Luby, James J., Professor
Ph.D., University of Minnesota
Fruit breeding and genetics

Markhart, Albert H., Professor
Ph.D., Duke University
Environmental physiology

McKinnon, Jane P., Professor Emeritus
M.S., University of Minnesota
Extension horticulture

Meyer, Mary Hockenberry, Associate Professor and Director, Master Gardener Program
Ph.D., University of Minnesota
Environmental horticulture

Michaels, Thomas E., Professor and Department Head
Ph.D. University of Wisconsin
Plant breeding, plant genetics

Mullin, Robert, Professor Emeritus
Ph.D., University of Minnesota
Ornamentals

Munson, Shirley T., Professor Emeritus
M.S., University of Minnesota
Horticultural food quality evaluation

Olin, Peter J., Professor
M.L.A., University of Massachusetts
Director of Minnesota Landscape Arboretum

§ Pedersen, Bradley W., Professor
M.Ed., University of Minnesota
Turf, landscape design

Pellett, Harold M., Professor Emeritus
Ph.D., Iowa State University
Woody landscape, plant breeding

Rosen, Carl J., Professor
Ph.D., University of California, Davis
Soil fertility, plant nutrition

Smith, Alan G., Associate Professor
Ph.D., University of Florida
Molecular biology of plant development

Sowokinos, Joseph R., Professor
Ph.D., University of North Dakota
Potato physiology, carbohydrate metabolism

Stadelmann, Edward J., Professor Emeritus
Ph.D., University of Innsbruck
Plant physiology

Swanson, Bert T., Professor Emeritus
Ph.D., University of Minnesota
Nursery management

Thill, Christian A., Associate Professor
Ph.D., University of Wisconsin, Madison
Potato breeding and genetics

Tong, Cindy B. S., Associate Professor
Ph.D., University of California
Postharvest physiology

Watkins, Eric, Assistant Professor
Ph.D., Rutgers University
Turfgrass breeding

White, Donald B., Professor Emeritus
Ph.D., Iowa State University
Turf breeding, physiology, hardiness, and nutrition

Wildung, David K., Professor
Ph.D., University of Minnesota
Physiology of fruits, vegetables, and potatoes

Wilkins, Harold F., Professor Emeritus
Ph.D., University of Illinois
Floriculture physiology

Zins, Michael E., Associate Professor Emeritus
M.S., University of Minnesota
Extension horticulture, woody landscape plants

Plant Pathology

Anderson, Neil A., Professor Emeritus
Ph.D., University of Minnesota
Genetics of plant pathogens

Banttari, Ernest E., Professor Emeritus
Ph.D., University of Minnesota
Virus, mycoplasma diseases: potato and small grain diseases

Blanchette, Robert A., Professor
Ph.D., Washington State University
Forest pathology, deterioration of wood products

Bradeen, James, Assistant Professor
Ph.D., University of Wisconsin, Madison
Potato diseases

Borlaug, Norman E., Professor Emeritus
Ph.D., University of Minnesota
1970 Nobel Peace Prize for the "Green Revolution"

Carson, Martin, Professor
Ph.D., University of Illinois
Cereal disease

Chen, Senyu, Associate Professor
Ph.D., University of Florida
Soybean cyst nematode control

Dill-Macky, Ruth, Associate Professor
Ph.D., University of Queensland
Small grains pathology

Herzfeld, Dean E., Associate Professor and Extension Educator
M.S., University of Minnesota
Chemical control, pesticide application training

Hollingsworth, Charla, Assistant Professor
Ph.D., University of Wyoming
Small grains plant pathology

Jin, Yue, Associate Professor
Ph.D., North Dakota State University
Soybean disease diagnosis and management

Juzwik, Jennifer, Assistant Professor
Ph.D., University of Minnesota
Oak wilt, forest tree nursery diseases

Kinkel, Linda L., Professor
Ph.D., University of Wisconsin, Madison
Epidemiology and microbial ecology

Kistler, H. Corby, Professor
Ph.D., Cornell University
Fungal pathogen genetics

Kolmer, James, Professor
Ph.D., University of North Carolina
Cereal rust fungi, genetics of rust resistance in cereals

Kommedahl, Thor, Professor Emeritus
Ph.D., University of Minnesota
Biological control of root diseases, diseases of maize

Krupa, Sagar V., Professor
Ph.D., Uppsala University
Effects of air pollutants and global climate change on plants

Kurle, James E., Assistant Professor
Ph.D., University of Minnesota
Fungal diseases of plants

Larsen, Philip O., Professor
Ph.D., University of Arizona
Research administration

Leonard, Kurt J., Professor Emeritus
Ph.D., Cornell University
Epidemiology of cereal rust diseases

Lockhart, Benham E., Professor
Ph.D., University of California
Virus diseases, diagnostic technology

MacDonald, David H., Professor
Ph.D., Cornell University
Plant parasitic nematodes

Malvick, Dean, Assistant Professor
Ph.D., University of Minnesota
Soybean pathology

Percich, James A., Professor
Ph.D., Michigan State University
Plant disease management: wild rice and vegetables

Roelfs, Alan P., Professor Emeritus
Ph.D., University of Minnesota
Rusts of cereals, physiologic specialization

Samac, Deborah A., Professor
Ph.D., University of Wisconsin, Madison
Molecular biology of host-parasite interactions

Steffenson, Brian, Professor
Ph.D., University of California, Davis
Cereal disease research

Szabo, Les J., Associate Professor
Ph.D., Oregon State University
Molecular genetics of rust fungi

Windels, Carol E., Professor
Ph.D., University of Minnesota
Field crop diseases

Young, Nevin Dale, Professor
Ph.D., Yale University
Molecular genetics of plant disease resistance

Zeyen, Richard J., Professor
Ph.D., University of Minnesota
Physiological and molecular control of disease resistance

Rhetoric

Becker, Sandra, Teaching Specialist
M.A., Pennsylvania State University
Workplace writing, corporate video

Berkenkotter, Carol A., Professor
Ph.D., University of Iowa
Genre theory, rhetoric of science, qualitative research methodology

Bennett, J. Michael, Professor Emeritus
M.A.E., University of Florida
Reading and communication

§ Breuch, Lee-Ann Kastman, Associate Professor
Ph.D., Iowa State University
Technical communication programs, computer pedagogy, writing instruction

Connolly, James E., Professor Emeritus
Ph.D., University of Minnesota
Speech and managerial communication

Dotts, Douglas P., Teaching Specialist
M.A., Colorado State; M.F.A., Hamline University

Duin, Ann Hill, Professor
Ph.D., University of Minnesota
Distance learning, partnerships

Ferguson, Richard W., Professor Emeritus
Ph.D., University of Minnesota
American studies, technical writing

Gore, Warren Y., Professor Emeritus
M.A., University of Iowa
Speech and small group decision making

Graff, Richard J., Associate Professor
Ph.D., Northwestern University
Rhetorical theory and practice, rhetorical criticism, classical rhetoric

Gross, Alan G., Professor
Ph.D., Princeton University
Rhetoric of science, scientific controversy, history of scientific article

Gurak, Laura J., Professor and Department Head
Ph.D., Rensselaer Polytechnic Institute
Rhetorics of science and technology, internet studies, intellectual property

Holloway, James R., Professor Emeritus
D.D., Sioux Falls College
Speech

Horberg, Richard O., Professor Emeritus
Ph.D., University of Minnesota
Creative writing

Horvath, Barb, Teaching Specialist and Assistant Director, Undergraduate Major
M.S., University of Minnesota
Instructional design and online course development

Logie, John, Assistant Professor
Ph.D., Pennsylvania State University
Rhetoric of electronic media, intellectual property, computer-mediated communication

Longo, Bernadette C., Associate Professor
Ph.D., Rensselaer Polytechnic Institute
Cultural histories of technical communication, computer-assisted pedagogy

§ Marchand, William M., Professor
Ph.D., University of Minnesota
History of ideas, conflict between science and religion

McDowell, Earl E., Professor
Ph.D., University of Nebraska, Lincoln
Technical communication apprehension, technical communication, employment cycle interviewing

Mikelonis Victoria M., Professor
Ph.D., Indiana University of Pennsylvania
Intercultural communication, design of intercultural training materials

Nichols, Capper E., Lecturer
Ph.D., University of Minnesota
Nature literature; representations of wildlife; environmental history; Western American literature and history; cultures of technology; postmodern literature; professional writing; creative nonfiction; travel writing

§ Pearsall, Thomas E., Professor Emeritus
Ph.D., University of Denver
Technical communication

§ Philippon, Daniel J., Associate Professor
Ph.D., University of Virginia
Environmental rhetoric, history and ethics, nature writing

Savage, Edward B., Professor Emeritus
Ph.D., University of Minnesota
Literature/English

*** § Scanlan, Thomas M., Associate Professor Emeritus**
Ph.D., University of Minnesota
Landscape as index to cultural values, the prairie in American life

Schuelke, L. David, Professor Emeritus
Ph.D., Purdue University
Organizational communication

Schuster, Mary Lay, Professor
Ph.D., University of New Mexico
Rhetoric of midwifery, gender and technical communication

Wahlstrom, Billie J., Professor
Ph.D., University of Michigan
Design of distance learning materials, media selection

§ Walzer, Arthur E., Professor
Ph.D., University of Minnesota
Rhetorical theory and criticism, 18th-century rhetorical theory

Wharton, W. Keith, Professor Emeritus
Ph.D., Colorado State University
Managerial communication

Wright, Eugene S., Professor Emeritus
Ph.D., University of Minnesota
Technical writing

Soil, Water, and Climate

Allan, Deborah L., Professor
Ph.D., University of California, Riverside
Soil organic matter, soil quality, roots and rhizosphere processes

Anderson, James L., Professor
Ph.D., University of Wisconsin, Madison
Sewage treatment, water quality, soil survey, soil classification

Baker, Donald G., Professor Emeritus
Ph.D., University of Minnesota
Climatology

§ Bell, James C., Professor
Ph.D., Pennsylvania State University
Soil classification/survey, landscape analysis, soil morphology/genesis

Bloom, Paul R., Professor
Ph.D., Cornell University
Soil chemistry, environmental chemistry

Cheng, H. H., Professor Emeritus
Ph.D., University of Illinois
Soil biochemistry

*** Cooper, Terence H., Professor**
Ph.D., Michigan State University
Soil classification, soil morphology, environmental education

Graham, Peter H., Professor
Ph.D., University of West Australia
Soil biology/microbiology, microbial ecology

Griffis, Timothy J., Assistant Professor
Ph.D., McMaster University, Canada
Land-atmosphere interactions via flux measurements and stable isotope techniques, atmospheric science/biometeorology

Grigal, David F., Professor Emeritus
Ph.D., University of Minnesota
Forest vegetation, air pollutants, forest ecosystems, nutrients

Gupta, Satish Chander, Professor
Ph.D., Utah State University
Soil physics and landscape hydrology, contaminant transport and water quality, antibiotics in the environment, soil structure and unsaturated soil mechanics, waste and manure management

Halbach, Thomas R., Professor
M.S., University of Wisconsin, Madison
Waste management, remediation and water quality

King, Jennifer, Assistant Professor
Ph.D., University of California, Irvine
Biogeochemistry, biosphere-atmosphere interactions, carbon cycling, earth system science

Lamb, John A., Professor
Ph.D., University of Nebraska, Lincoln
Agricultural production management systems, soil properties, soil fertility/management

Larson, William E., Professor Emeritus
Ph.D., Iowa State University

Malzer, Gary L., Professor
Ph.D., Purdue University
Nitrogen, precision agriculture, water quality, soil chemistry/fertility

Molina, Jean A., Professor
Ph.D., Cornell University
Carbon and nitrogen transformations in soil, soil microbiology

Moncrief, John F., Professor
Ph.D., University of Wisconsin, Madison
Soil management, water quality

Mulla, David J., Professor and Endowed Chair for Soil and Water Resources
Ph.D., Purdue University
Water quality, soil physics, watershed management, precision agriculture

Munter, Robert C., Associate Professor Emeritus
M.S., University of Minnesota

§ Nater, Edward A., Professor and Department Head
Ph.D., University of California, Davis
Soil genesis/clay mineralogy

Randall, Gyles, Professor
Ph.D., University of Wisconsin, Madison
Soil fertility/management, water quality

Rehm, George W., Professor
Ph.D., University of Minnesota
Soil fertility, fertilizer management, water quality

Rosen, Carl J., Professor
Ph.D., University of California
Soil fertility/plant nutrition, horticultural crops

Rust, Richard H., Professor Emeritus
Ph.D., University of Illinois

Sadowsky, Michael J., Professor
Ph.D., University of Hawaii, Manoa
Environmental microbiology, water quality, biodegradation, nitrogen fixation, molecular biology

Schmitt, Michael A., Professor
Ph.D., University of Illinois
Soil fertility management, crop production

Seeley, Mark W., Professor
Ph.D., University of Nebraska, Lincoln
Climatology

Sims, Albert L., Associate Professor
Ph.D., North Carolina State University
Soil management/fertility

Strock, Jeffrey S., Associate Professor
Ph.D., North Carolina State University
Soil and water management and conservation, water quality, nitrogen

Wang, Dong, Assistant Professor
Ph.D., University of Wisconsin, Madison
Soil environmental physics/biophysics

Zanner, C. William, Assistant Professor
Ph.D., University of Minnesota
Soil genesis, forest soils, soils geomorphology

College of Liberal Arts (CLA)

Administration

Steven J. Rosenstone, Dean

James Parente, Associate Dean for Faculty

Arlene A. Teraoka, Associate Dean for Undergraduate Programs

Jo-Ida C. Hansen, Associate Dean for Graduate Programs

Mark Pharis, Associate Dean for Space Planning

Philip O'Brien, Chief Financial Officer

Chris Kearns, Assistant Dean of Student Services

Richard McCormick, Director of Honors Division

Victor Collins, Director of the Martin Luther King, Jr. Program

Carl Brandt, Director of the Career and Community Learning Center

Mary Hicks, Director of External Relations

Sue Banovetz, Director of Media and Public Relations

Francine Morgan, Director of Human Resources

Faculty

African American and African Studies

Atkins, Keletso, Associate Professor
Ph.D., University of Wisconsin, Madison
South African history

*** Brewer, Rose, Associate Professor**
Ph.D., Indiana University
Sociology

Coifman, Victoria, Assistant Professor
Ph.D., University of Wisconsin, Madison
African history

Farah, Caesar, Professor
Ph.D., Princeton University
Arabic and Islamic studies

Fletcher, Pamela, Visiting Assistant Professor
M.A., University of Minnesota
Creative writing

Githire, Njeri, Assistant Professor
Ph.D., The Pennsylvania State University
Comparative literature

Khalek, Hisham, Teaching Specialist
M.A., University of Minnesota
Political science

Mayes, Keith, Assistant Professor
Ph.D., Princeton University
African American history

Mohammed, Sidow, Lecturer
Ph.D., Omdurman Islamic University, Sudan
Arabic language

Pate, Alexs, Visiting Assistant Professor
B.A., Temple University
Journalism, political science

Pike, Charles, Assistant Professor Emeritus
Ph.D., University of Wisconsin, Madison
African language and literature

Williams, Yolanda, Teaching Specialist
M.A. University of Minnesota
Music

Wright, John, Associate Professor
Ph.D., University of Minnesota
Afro-American literature

American Indian Studies

Albers, Patricia, Professor
Ph.D., University of Wisconsin
Anthropology, ethnohistory

Child, Brenda, Associate Professor
Ph.D., Iowa State University
History, American Indian boarding schools, multiculturalism

Martinez, David, Assistant Professor
Ph.D., SUNY at Stony Brook, New York
Philosophy and American Indian religions

*** Miller, Carol, Associate Professor**
Ph.D., University of Oklahoma
American Indian women's narratives, intercultural studies, American literatures

Nichols, John, Professor
Ph.D., Harvard University
American Indian language planning, oral literature and folklore, ethno history and traditional arts, anthropological linguistics, sociolinguistics, general linguistics, indigenous languages of North America

O'Brien-Kehoe, Jean, Associate Professor
Ph.D., University of Chicago
Indians of the Northeast, U.S. colonial history

Wilkins, David, Professor
Ph.D., University of North Carolina, Chapel Hill
American Indian sovereignty, tribal government, comparative politics

American Studies

Castellanos, Bianet, Assistant Professor
Ph.D., University of Michigan
Indigenous communities and cultures, migration, colonialization, Chicano/a studies, Latin America, global capitalism

§ Child, Brenda, Associate Professor
Ph.D., Iowa State University
American Indian history, history of Indian education, Great Lakes Indian communities

Delattre, Roland, Professor Emeritus
Ph.D., Yale University
Religion and ethics

Fajardo, Kale Bantigue, Assistant Professor
Ph.D., University of California, Santa Cruz
Globalization and Filipino/a diaspora, Filipino/a migration and immigration to the Americas, maritime cultures and history, Philippine nationalisms, colonialism

Ferguson, Roderick, Assistant Professor
Ph.D., University of California, San Diego
Social theory, race, sexuality, gender

Karjanen, David, Visiting Assistant Professor
Ph.D., University of Michigan
Political economy, international labor migration, health inequalities, critical theory

§ May, Elaine Tyler, Professor
Ph.D., University of California, Los Angeles
History, women and family

*** May, Lary, Professor**
Ph.D., University of California, Los Angeles
Post–World War II American history, popular culture

§ * Miller, Carol, Associate Professor
Ph.D., University of Oklahoma
American literatures, American Indian women's narratives, intercultural studies

*** Noble, David, Professor**
Ph.D., University of Wisconsin, Madison
History, literature and language, philosophy and religion

Pierce, Jennifer, Associate Professor
Ph.D., University of California, Berkeley
Gender, contemporary labor studies

§ Prell, Riv-Ellen, Professor
Ph.D., University of Chicago
Anthropology of American Jews and Judaism, ethnicity and gender

Yates, Gayle Graham, Professor Emeritus
Ph.D., University of Minnesota
American women's literature and cultures of the 20th century; contemporary American religions

Anthropology

Berdahl, Daphne, Associate Professor
Ph.D., University of Chicago
Sociocultural anthropology, identity, consumption, memory, gender, Europe, United States

Dunnigan, Timothy, Associate Professor Emeritus
Ph.D., University of Arizona
Semantic anthropology, linguistic acculturation, Middle America, North America

Gerlach, Luther, Professor Emeritus
Ph.D., University of London
Natural resources, social movements, political ecology, Africa, United States

Gibbon, Guy, Professor
Ph.D., University of Wisconsin, Madison
North American archaeology, history and theory of archaeology, Midwest

Gudeman, Stephen, Professor
Ph.D., University of Cambridge, England
Social, structural, economic anthropology; Latin America

Ho, Karen, Assistant Professor
Ph.D., Princeton University
Cultural studies of late capitalism, globalization, anthropology of finance, comparative race/ethnicity, United States

Ingham, John M., Professor
Ph.D., University of California, Berkeley
Culture and personality, symbolic anthropology, Middle America

Laden, Greg, Assistant Professor
Ph.D., Harvard University
Human evolution and paleoanthropology, archaeology of Africa, North American prehistoric and historic archaeology

Langford, Jean, Associate Professor
Ph.D., University of Washington
Cultural anthropology, medical anthropology, postcolonial theory, politics of representation

Lipset, David M., Associate Professor
Ph.D., University of California, San Diego
Social and political anthropology, history of anthropology; Melanesia

McLean, Stuart, Assistant Professor
Ph.D., Columbia University
Social and cultural theory, anthropology of modernity, historical anthropology, anthropology of landscape; Ireland, European Union

Miller, Frank, Professor Emeritus
Ph.D., Harvard University
Change, development strategies, applied anthropology, Middle America, North America

***§ Penn, Mischa, Associate Professor**
B.A., University of Minnesota
Philosophical anthropology, culture theory, methodology, history of anthropology

Raheja, Gloria Goodwin, Professor
Ph.D., University of Chicago
Social, cultural; gender, caste; language; colonial discourses; India

Song, Hoon, Assistant Professor
Ph.D., University of Chicago
Biopolitics, convereignty, cyberculture, capitalism, modernity, critical theory, psychoanalysis, United States, South Korea

Tappen, Martha, Associate Professor
Ph.D., Harvard University
Paleoanthropology, paleoenvironments, taphonomy and faunal analysis, ethnoarcheology

Taussig, Karen-Sue, Assistant Professor
Ph.D., Johns Hopkins University
Social-cultural anthropology, science and technology (genetics, biotechnologies), medical anthropology, Europe, United States

Tostevin, Gilbert, Assistant Professor
Ph.D., Harvard University
Paleolithic archaeology, paleoanthropology, prehistoric technology, Old World prehistory, material-culture studies, culture-contact studies

Valentine, David, Assistant Professor
Cultural/linguistic anthropology, gender and sexuality, embodiment, transgenderism; urban United States

Wells, Peter S., Professor
Ph.D., Harvard University
Culture contact, economic behavior, signs and symbols, prehistoric and medieval Europe

Art

Baldwin, Guy, Associate Professor Emeritus
M.F.A., University of Wisconsin
Sculpture

Baeumler, Christine, Assistant Professor
M.F.A., Indiana University
Drawing, painting

Bethke, Karl, Professor Emeritus
M.F.A., University of Minnesota
Printmaking

Bohls, Margaret, Assistant Professor
M.F.A., Louisiana State University
Ceramics

Cowette, Thomas, Associate Professor Emeritus
B.F.A., Minneapolis College of Art and Design
Drawing, painting

Estep, Jan, Assistant Professor
M.F.A., University of Illinois
Photography

Feinberg, David, Associate Professor
M.F.A., Cranbrook Academy of Art
Drawing, painting

Gray, Lynn, Associate Professor
M.F.A., University of Oklahoma
Drawing, painting

Hallman, Gary, Associate Professor
M.F.A., University of Minnesota
Photography

Henkel, James, Associate Professor
M.F.A., Florida State University
Photography

Hoard, Curtis, Professor
M.F.A., University of Wisconsin
Ceramics

Katsiaficas, Mary Diane, Professor
M.F.A., University of Washington, Seattle
Drawing, painting

Krepps, Jerald, Associate Professor
M.F.A., Indiana University
Printmaking

Kuhr, Alexis, Associate Professor
M.F.A., Stanford University
Drawing, painting

Lane, Thomas, Associate Professor
M.F.A., Pennsylvania State University
Ceramics

Lukkas, Lynn, Associate Professor
M.F.A., Rhode Island School of Design
Time and interactivity

§ Lyon, Joyce, Associate Professor
M.F.A., University of Minnesota
Drawing, painting

Morgan, Clarence, Professor
M.F.A., University of Pennsylvania
Drawing, painting

Pharis, Mark, Professor
University of Minnesota
Ceramics

Potratz, Wayne, Professor
M.A., University of California, Berkeley
Sculpture

Rose, Thomas, Professor
M.A., University of California, Berkeley
Sculpture

Schmid, Jenny, Assistant Professor
M.F.A., University of Michigan
Printmaking

Stanislav, Andrea, Assistant Professor
M.F.A., Alfred University
Sculpture

Willow, Diane, Assistant Professor
M.S., Massachusetts Institute of Technology, Center for Advanced Visual Studies
Time and interactivity

Yamada, Tetsuya, Assistant Professor
M.F.A., Alfred University
Ceramics

Art History

Asher, Catherine, Associate Professor
Ph.D., University of Minnesota
Islamic and South Asian art and culture

Asher, Frederick, Professor
Ph.D., University of Chicago
South Asian sculpture and architecture

Blocker, Jane, Associate Professor
Ph.D., University of North Carolina at Chapel Hill
Contemporary art and theory

*** Cooper, Frederick, Professor**
Ph.D., University of Pennsylvania
Greek art and architecture

Gaudio, Michael, Assistant Professor
Ph.D., Stanford University
Early modern and trans-atlantic art

Marling, Karal Ann, Professor
Ph.D., Bryn Mawr College
American art and popular culture

McNally, Sheila, Professor
Ph.D., Harvard University
Greek and Roman art and archaeology

Poor, Robert, Professor
Ph.D., University of Chicago
East Asian art

Silberman, Robert, Associate Professor
Ph.D., Columbia University
Film studies, history of photography, 20th-century American art

Steyaert, John, Associate Professor
Ph.D., University of Michigan
Northern European art, 14th-16th centuries; late Gothic sculpture

Stoughton, Michael, Associate Professor Emeritus
Ph.D., University of Michigan
European painting, sculpture, and architecture, 17th-18th centuries

Weisberg, Gabriel, Professor
Ph.D., Johns Hopkins University
19th/early 20th-century art, decorative arts, graphic arts

Asian Languages and Literatures

Allen, Joseph, Professor
Ph.D., University of Washington
Chinese literature and culture, Taiwan studies

Anderson, Mark, Assistant Professor
Ph.D., Cornell University
Japanese literature, film studies, gender, postcolonialism, science and technology, Marxism

Marran, Christine L., Assistant Professor
Ph.D., University of Washington
Japanese literature and cultural studies, early Meiji writing, gender and representation in Japanese fiction, Asian film, Japanese popular culture from the 1870s to the present

McGrath, Jason, Assistant Professor
Ph.D., University of Chicago
Modern Chinese literature and film

Molasky, Michael, Associate Professor
Ph.D., University of Chicago
Modern Japanese literature, U.S. occupation era, Okinawa, race, gender, jazz

Morinaga, Maki Isaka, Assistant Professor
Ph.D., University of Pennsylvania
Japanese literature and theater, women's studies and gender studies

Rouzer, Paul, Associate Professor
Ph.D., Harvard University
Chinese literature

Sawhney, Simona, Assistant Professor
Ph.D., University of California, Irvine
South Asian literature, Sanskrit literature, postcolonial literature, critical and literary theory

Chicano Studies

Castellanos, Bianet, Assistant Professor
Ph.D., University of Michigan
Indigenous cultures of the Americas; Chicano/a and Latino/a studies; anthropology of gender, work, migration, consumption, and transnationalism

Martinez, Richard, Assistant Professor
Ph.D., University of California, Los Angeles
Urban planning, sociology, Chicano and Latino studies

Mendoza, Louis, Associate Professor
Ph.D., University of Texas, Austin
Chicano/a literary and cultural studies, U.S. ethnic studies, prison literature, U.S. immigration literature, language and identity, gender studies

Rojas, Guillermo, Associate Professor Emeritus
Ph.D., University of Illinois
Chicano literature

Torres, Eden, Associate Professor
Ph.D., University of Minnesota
Women's studies, Chicano literature, migrant issues, Chicana feminist studies

Classical and Near Eastern Studies

Belfiore, Elizabeth, Professor
Ph.D., University of California, Los Angeles
Greek literature, Greek tragedy, philosophy

Berlin, Andrea, Professor
Ph.D., University of Michigan
Greek, Roman, and Near Eastern archaeology; ancient ceramics

Boustan, Ra'anan, Assistant Professor
Ph.D., Princeton University
Early Jewish mysticism, Jewish-Christian relations in late antiquity

*** Cooper, Frederick, Professor (Department of Art History)**
Ph.D., University of Pennsylvania
Greek, Roman art and archaeology, architecture, folklore

Krevans, Nita, Associate Professor
Ph.D., Princeton University
Hellenistic and Roman literature

Levinson, Bernard, Associate Professor and Berman Family Chair in Jewish Studies and Hebrew Bible
Ph.D., Brandeis University
Bible, ancient Near Eastern law

McNally, Sheila, Professor (Department of Art History)
Ph.D., Harvard University
Greek and Roman art and archaeology

Monroe, Lauren, Assistant Professor
Ph.D., New York University
Hebrew bible, Syro-Palestinian archaeology, ancient Israelite religious and social history

Nappa, Christopher, Associate Professor
Ph.D., University of Virginia
Latin literature, Augustan Rome

§ Nicholson, Oliver, Associate Professor
D.Phil., Oxford University
Late antiquity, later Latin, church history, Byzantium

Olson, S. Douglas, Professor
Ph.D. Bryn Mawr College
Greek poetry

Roetzel, Calvin, Sundet Professor of New Testament and Christian Studies
Ph.D., Duke University
Paul, New Testament

Schneller, Renana S., Education Specialist and Hebrew Language Coordinator
A.B.D., Erlangen-Nuremberg University
Modern Hebrew language and literature, biblical Hebrew, Arabic

Sellew, Philip, Associate Professor
Th.D., Harvard University
New Testament, early church, Greco-Roman religions, Coptic

Sheets, George, Associate Professor
Ph.D., Duke University
Roman literature, historical linguistics, legal theory

Smith, Stephen C., Education Specialist and Latin Language Coordinator
Ph.D., University of Virginia
Latin language, language pedagogy, Augustan Latin literature

von Dassow, Eva, Assistant Professor
Ph.D., New York University
Bible and ancient Near East

Wilcox, Amanda, Assistant Professor
Ph.D., University of Pennsylvania
Roman prose of the late republic and early empire, epistolography, Roman philosophy

Communications Studies

Albert, Rosita, Associate Professor
Ph.D., University of Michigan
Intercultural communication, international relations, cross-cultural methods, health communication

Bormann, Ernest G., Professor Emeritus
Ph.D., University of Iowa
Rhetorical theory, American public address, small group communication

Browne, Donald, Professor
Ph.D., University of Michigan
Comparative international media, media and minorities, historical research methodology

Campbell, Karlyn Kohrs, Professor
Ph.D., University of Minnesota
Rhetorical theory/criticism, women in communication, presidential rhetoric

Greene, Ronald W., Associate Professor
Ph.D., University of Illinois
Rhetorical studies, cultural studies/policy, citizenship philosophy of communication

Hewes, Dean, Professor
Ph.D., Florida State University
Communication theory, small group and organization decision-making

Jensen, J. Vernon, Professor Emeritus
Ph.D., University of Minnesota
British public address, argumentation, ethics, rhetoric in Asia

Jones, Susanne, Assistant Professor
Ph.D., Arizona State University
Interpersonal communication, communication of emotions, communication of social support and comforting

Koerner, Ascan, Associate Professor
Ph.D., University of Wisconsin
Cognitive processes in interpersonal communication, marital and family communication, persuasion

Ouellette, Laurie, Assistant Professor
Ph.D., University of Massachusetts
Media theory, media history, television studies, cultural studies

Rarick, David, Associate Professor Emeritus
Ph.D., The Ohio State University
Communication theory, media ethics, audience analysis, telecommunications media

Rodman, Gilbert B., Associate Professor
Ph.D., University of Illinois
Critical media studies, cultural studies, race and ethnicity, popular culture, communication technologies

Schiappa, Edward, Professor
Ph.D., Northwestern University
Contemporary rhetorical theory, classical rhetoric, public address, argumentation

§ Scott, Robert, Professor Emeritus
Ph.D., University of Illinois
Rhetorical theory, public address criticism, value implications in research

Shapiro, George L., Professor Emeritus
Ph.D., University of Minnesota
Leadership, organizational and interpersonal communication, communication between subcultures

Sheldon, Amy, Professor
Ph.D., University of Texas
First- and second-language acquisition, discourse analysis, gender

Vavrus, Mary, Associate Professor
Ph.D., University of Illinois
Media studies, feminist theory, cultural studies, critical theory

§ Wilson, Kirt, Associate Professor
Ph.D., Northwestern University
Rhetorical theory, rhetoric, U.S. public address, political persuasion

Cultural Studies and Comparative Literature

§ Archer, John, Associate Professor
Ph.D., Harvard University
Architecture, space, cities and suburbia

Bizri, Hisham, Assistant Professor
M.F.A., University of Illinois, Chicago
Filmmaking; modernist cinema, literature, and music; avant-garde cinema; Arabic thought and poetry

Brennan, Timothy, Professor
Ph.D., Columbia University
19th- and 20th-century comparative literature, postcolonial theory, cultural theory, globalization, music

***§ Brown, Robert, Associate Professor**
Ph.D., University of Michigan
Rhetoric, discourse theory, pedagogy, language/culture relations

Casarino, Cesare, Associate Professor
Ph.D., Duke University
Philosophy, queer theory, cinema, literature

Chen, Leo, Instructor
Ph.D., University of California, Los Angeles
Film, television and digital media, comparative cinemas, aesthetics and visual theory

Ganguly, Keya, Associate Professor
Ph.D., University of Illinois, Urbana-Champaign
Critical theory, film, politics and practice of ethnography, sociology of culture

Kotz, Liz, Assistant Professor
Ph.D., Columbia University
Media theory, visual culture, psychoanalysis, modernism and technology

*** Leppert, Richard, Professor**
Ph.D., Indiana University
Music, visual culture, critical theory, aesthetics, history of modernity

Mowitt, John, Professor
Ph.D., University of Wisconsin
History and politics of critical theory, cinema and media studies, music

Pepper, Thomas, Associate Professor
Ph.D., Yale University
Psychoanalytic theory, gender, textual theory, philosophy of language

§ Sarles, Harvey, Professor
Ph.D., University of Chicago
Pragmatism, cultural critique, human nature and experience

Schulte-Sasse, Jochen, Professor
Dr. ph. habil., Ruhr University, Bochum, Germany
Intellectual and cultural history, literary and aesthetic theory, European Romanticism, popular culture, German literature after 1700

Tageldin, Shaden, Assistant Professor
Ph.D., University of California, Berkeley
Comparative literatures in English/Arabic/French, empire and postcolonial studies, translation theory, language politics, ideologies of genre

*** Thomas, Gary, Associate Professor**
Ph.D., Harvard University
Cultural theory, music, gender-sexuality, comic theory, German literature

Economics

Allen, Beth, Professor
Ph.D., University of California, Berkeley
Game theory, economics of information and uncertainty

Arellano, Cristina, Assistant Professor
Ph.D., Duke University
Business cycles in emerging economies

Bassetto, Marco, Assistant Professor
Ph.D., University of Chicago
Macroeconomic theory, applications of game theory to macroeconomics, design and consistency of macroeconomic policy

Boldrin, Michele, Professor
Ph.D., University of Rochester
Development and use of dynamic general equilibrium models

Chari, V. V., Professor and Paul Frenzel Land Grant Chair in Economics
Ph.D., Carnegie Mellon University
Public economics, macroeconomics, industrial organization

Chipman, John S., Regents Professor
Ph.D., Johns Hopkins University
Econometrics, international trade, measurement of economic welfare

De Nardi, Cristina, Assistant Professor
Ph.D., University of Chicago
Macroeconomics, wealth distribution, social security

Eckstein, Zvi, Professor
Ph.D., University of Minnesota
Immigration and transition of immigrants to a new labor market, labor search models, labor market discrimination

Feldman, Roger D., Professor
Ph.D., University of Rochester
Health economics, labor economics, human capital, human resources

Foster, Edward, Professor
Ph.D., Massachusetts Institute of Technology
Public finance, microeconomic theory

Holmes, Tom, Professor and Carlson Chair
Ph.D., Northwestern University
Applied microeconomics, industrial organization

Hurwicz, Leonid, Regents Professor Emeritus
LL.M., Warsaw University
Mathematical economics, economic organization, welfare economics, social choice

Jones, Larry, Professor
Ph.D., University of California, Berkeley
Macroeconomic theory with emphasis on development and growth and public finance

Kehoe, Patrick, Professor
Ph.D., Harvard University
International trade and finance, macroeconomics

Kehoe, Timothy, Distinguished McKnight University Professor
Ph.D., Yale University
Applied general equilibrium modeling, trade theory, public finance

Kocherlakota, Narayana, Professor
Ph.D., University of Chicago
Financial economics, public finance and monetary economics

Kortum, Sam, Professor
Ph.D., Yale University
Industrial organization, international trade, economic growth

Luttmer, Erzo, Associate Professor
Ph.D., University of Chicago
Financial economics, macroeconomics

McLennan, Andrew, Professor
Ph.D., Princeton University
Game theory, mathematical economics, microeconomics

Mohring, Herbert, Professor Emeritus
Ph.D., Massachusetts Institute of Technology
Industrial organization and antitrust, urban economics, resource economics

Richter, Marcel K., Professor
Ph.D., Massachusetts Institute of Technology
Mathematical economics, rational choice theory, general equilibrium theory

Rustichini, Aldo, Professor
Ph.D., University of Minnesota
Decision theory, microeconomic theory, models of bounded rationality, economic dynamics and microeconomic theory

Ruttan, Vernon, Regents Professor Emeritus
Ph.D., University of Chicago
Economics of agricultural development, technical change, research policy

Sahi, Simran, Assistant Professor
Ph.D., University of Pittsburgh
International trade and finance

Schuh, G. Edward, Regents Professor
Ph.D., University of Chicago
Agricultural and food policy, economic development, international trade and exchange rate policy, international financial markets, family policy and population, poverty

Smith, Harlan, Professor Emeritus
Ph.D., University of Chicago
Economic philosophy, economic problems, world order studies

Swan, Craig, Professor
Ph.D., Yale University
Macroeconomics, econometrics, money, banking, housing policy, mortgage markets

Thomas, Julia, Assistant Professor
Ph.D., University of Virginia
Aggregate implications of discrete individual choices, quantitative macroeconomics, stochastic dynamic general equilibrium models

Werner, Jan, Professor
Ph.D., University of Bonn, West Germany
Microeconomic theory, mathematical economics, general equilibrium, financial markets

English

Anderson, Chester, Professor Emeritus
Ph.D., Columbia University
Modern literature in English, Irish literature, literary criticism

Augst, Thomas, Assistant Professor
Ph.D., Harvard University
American literature/culture, history and theory of reading

Bales, Kent, Professor
Ph.D., University of California, Berkeley
American literature, romanticism, literature and the other arts

Brennan, Timothy, Professor
Ph.D., Columbia University
Atlantic cultures, American ethnic literatures, 20th-century literary/cultural theory

Brown, Tony C., Assistant Professor
Ph.D., University of Chicago
18th-century British literature, colonial and postcolonial literature, theory of the novel

§ Browne, Michael Dennis, Professor
M.A., University of Iowa
Creative writing, modern and contemporary poetry and poetics

Ch'ien, Evelyn, Assistant Professor
Ph.D., University of Virginia
Literature after 1945, minority literature, postcolonial theory, English vernaculars

***§ Clayton, Thomas, Professor**
D.Phil., Oxford University
Shakespeare, 17th-century English literature, classical literature, literary criticism

Craig, Siobhan S., Assistant Professor
Ph.D., University of Massachusetts, Amherst
Film spectatorship, feminist theory, queer cinema, fascism and film

Cucullu, Lois, Assistant Professor
Ph.D., Brown University
British modernism, Victorian literature, popular culture and media

Damon, Maria, Associate Professor
Ph.D., Stanford University
Modern poetry, poetics

Elfenbein, Andrew, Professor
Ph.D., Yale University
Romanticism, Victorian literature, intertextuality and influence, gender

Escure, Genevieve, Professor
Ph.D., Indiana University
Sociolinguistics, language universals, linguistic theory, phonology, syntax

Farber, Lianna Hope, Assistant Professor
Ph.D., Harvard University
Medieval literature and culture

Firchow, Peter, Professor
Ph.D., University of Wisconsin
Modern British, American literature; comparative literature; utopian literature

Fitzgerald, M. J., Associate Professor
M.A., York University
Fiction writing, contemporary fiction

Fruman, Norman, Professor Emeritus
Ph.D., New York University
The Romantics, 18th century, literary criticism (antiquity to present)

*** Garner, Shirley, Professor**
Ph.D., Stanford University
Renaissance literature, 16th-century poetry, Shakespeare, autobiography, feminist criticism

§ Geffen, Arthur, Associate Professor Emeritus
Ph.D., University of Chicago
American literature, fiction, poetry, drama, humor, Jewish-American literature

Goldberg, Brian, Assistant Professor
Ph.D., Indiana University
British Romantic literature, 18th-century literature

Gonzalez, Ray, Professor
M.F.A., Southwest Texas State University
Creative writing, Latin American studies, poetry, creative nonfiction

§ Griffin, Edward, Professor
Ph.D., Stanford University
American literature, American studies, American religion, teaching

Haley, David, Professor
Ph.D., Harvard University
Renaissance and Enlightenment poetry, philosophy, drama, politics; the Bible

§ Hampl, Patricia, Professor
M.F.A., University of Iowa
Creative writing, autobiographical writing, contemporary American poetry, fiction

Hancher, Michael, Professor
Ph.D., Yale University
Victorian literature, pragmatics and literature, literary illustration, book history

*** Hirsch, Gordon, Professor**
Ph.D., University of California, Berkeley
Victorian literature, English novel, psychological approaches, critical theory

Ismail, Qadri, Associate Professor
Ph.D., Columbia University
Marxism, nationalism, feminist theory, postcolonial studies, literary theory

*** Kendall, Calvin, Professor Emeritus**
Ph.D., University of California, Berkeley
Old English literature, Middle English literature, medieval Latin

Lee, Josephine, Associate Professor
Ph.D., Princeton University
Modern British, American, world drama; performance theory; Asian-American studies

***§ Leyasmeyer, Archibald, Associate Professor Emeritus**
Ph.D., Princeton University
Drama (especially modern), 18th-century literature, verbal and visual satire

Luke, David, Assistant Professor
Ph.D., State University of New York—Buffalo
Romantic literature (especially Keats), Victorian literature (especially Arnold)

***§ McNaron, Toni, Professor Emeritus**
Ph.D., University of Wisconsin
Shakespeare, Woolf, Dickinson, lesbian poetry, feminist criticism/pedagogy, Milton

Messer-Davidow, Ellen, Professor
Ph.D., University of Cincinnati
Literary/cultural theory, feminist studies, 18th-century literature, academic knowledge-production

Miner, Valerie, Professor
M.J., University of California, Berkeley
Fiction writing, contemporary fiction

Mowitt, John, Professor
Ph.D., University of Wisconsin
Metacriticism, cultural studies and popular practices (film, music, and literature)

Rabinowitz, Paula, Professor
Ph.D., University of Michigan
20th-century American writers, women, minorities, Marxist criticism, feminist criticism

§ Reed, Peter, Professor Emeritus
Ph.D., University of Washington
20th-century British novel, poetry, and drama

Ross, Donald, Professor
Ph.D., University of Michigan
American "Renaissance," theory of novel, computers in writing instruction

Roth, Marty, Professor Emeritus
Ph.D., University of Chicago
19th-century American fiction, popular culture, film, culture and addiction

Scandura, Jani, Associate Professor
Ph.D., University of Michigan
American, British literature; cultural studies; literary, architectural, feminist theory

Scheil, Andrew, Assistant Professor
Ph.D., University of Toronto
Medieval literature and culture

Schumacher, Julie, Associate Professor
M.F.A., Cornell University
Fiction writing, contemporary fiction, novels, short stories

Solotaroff, Robert, Professor Emeritus
Ph.D., University of Chicago
American literature, theory of fiction, modernism

Sprengnether, Madelon, Professor
Ph.D., Yale University
Feminist criticism, Renaissance literature, women writers, creative writing

Stekert, Ellen, Professor Emeritus
Ph.D., University of Pennsylvania
American folksong, lesbian folklore, "disability" folklore, horror genres

***§ Sugnet, Charles, Associate Professor**
Ph.D., University of Virginia
Shakespeare, novels, feminist criticism, American nature writing, Romantic period

Tinsley, Natasha, Assistant Professor
Ph.D., University of California—Berkeley
African diaspora literature and theory, Caribbean literature and theory, poetry and poetics

Treuer, David, Assistant Professor
Ph.D., University of Michigan
Native American literature, creative writing, 20th-century novel

Watkins, John, Professor
Ph.D., Yale University
Medieval and Renaissance literature, poetics

*** Weinsheimer, Joel, Professor**
Ph.D., Ohio University
Late 18th-century literature (especially Johnson, Austen), literary theory

*** Wright, John, Associate Professor**
Ph.D., University of Minnesota
American and Afro-American literature, intellectual history, folklore, orality, sociology of literature

Wright, Michelle M., Associate Professor
Ph.D., University of Michigan
African diaspora studies, African American literature and theory

English as a Second Language

Cohen, Andrew, Professor
Ph.D., Stanford University
Applied linguistics, second-language acquisition

Lazaraton, Anne, Associate Professor
Ph.D., University of California, Los Angeles
Applied linguistics, discourse analysis

***§ Tarone, Elaine, Professor**
Ph.D., University of Washington
Applied linguistics, second-language acquisition

French and Italian

Akehurst, F. R. P., Professor
Ph.D., University of Colorado
Old French language, law, and literature

Brewer, Daniel, Associate Professor
Ph.D., Johns Hopkins University
Early modern French literature and culture, literary theory

Brewer, Mária, Associate Professor
Ph.D., Yale University
20th-century literature; theater; literary, cultural theory; gender

Chaouat, Bruno, Associate Professor
Ph.D., Emory University
20th-century French thought and literature

Cherbuliez, Juliette, Associate Professor
Ph.D., University of Pennsylvania, Philadelphia
17th-century literature and culture

Ferlito, Susanna, Associate Professor
Ph.D., University of California, Los Angeles
19th-20th century Italian literature and culture

Kerr, Betsy, Associate Professor
Ph.D., Indiana University
French linguistics, applied linguistics, pragmatics

Noakes, Susan, Professor
Ph.D., Yale University
Late medieval/early Renaissance French and Italian literature

Paganini, Maria, Professor
Ph.D., Zurich University, Switzerland
20th-century novel

Preckshot, Judith, Associate Professor
Ph.D., University of California, Irvine
Francophone and 20th-century literature

Robinson, Peter, Associate Professor
Ph.D., University of Pennsylvania
19th-century poetry

Sivert, Eileen, Associate Professor
Ph.D., University of California, Riverside
19th-century narrative, literature of Quebec, women's studies

Smith, Alan, Assistant Professor
Ph.D., Cornell University
Early modern French and Italian literature

Geography

Adams, John, S., Professor Emeritus
Ph.D., University of Minnesota
American cities, regional analysis, Russia and environs

Barrett, Ward, Professor Emeritus
Ph.D., University of California, Berkeley
Middle America, Oceania, historical geography

Braun, Bruce W., Associate Professor
Ph.D., University of British Columbia
Society-environment relations; political ecology; social, cultural theory

Brown, Dwight, Professor
Ph.D., University of Kansas
Physical geography, cartography, paleoenvironments, water resources, geographic information science and systems

§ Gersmehl, Philip, Professor
Ph.D., University of Georgia
Physical geography, education, North America, geographic information science and systems

Gidwani, Vinay, Assistant Professor
Ph.D., University of California, Berkeley
Labor geographies, agrarian change, nature-society relations, politics of globalization and development

Hart, John, Professor
Ph.D., Northwestern University
Regional geography, North America

Harvey, Francis, Associate Professor
Ph.D., University of Washington
Geographic information science and systems, GIS implementation in local government, geographic information overlay

Henderson, George, Associate Professor
Ph.D., University of California, Berkeley
Social and cultural geography, political economy of nature, culture and society, geography and ethics, U.S. geography

Hsu, Mei Ling, Professor Emeritus
Ph.D., University of Wisconsin
East Asia, cartography (design and automation)

Kipfmueller, Kurt, Assistant Professor
Ph.D., University of Arizona
Physical geography, biogeography, tree-ring analysis

Klink, Katherine, Associate Professor
Ph.D., University of Delaware
Climate-biosphere interaction, climate dynamics, quantitative methods

Leitner, Helga, Professor
Ph.D., University of Vienna
Urban and regional development, international labor migration, Europe

Lukermann, Fred, Professor Emeritus
Ph.D., University of Minnesota
Historical-geographical thought

McMaster, Robert B., Professor
Ph.D., University of Kansas
Cartography and geovisualization, geographic information science and systems, quantitative and spatial analysis, geographic methods

Manson, Steven, Assistant Professor
Ph.D., Clark University
Environmental science, socio-theoretic frameworks, computational modeling, geographic information science and systems

*** Martin, Judith A., Professor**
Ph.D., University of Minnesota
Urban planning, environmental perception

*** Miller, Roger, Associate Professor**
Ph.D., University of California, Berkeley
Urban and historical geography, geographical methodology and theory

Porter, Philip, Professor Emeritus
Ph.D., University of London
Cartography, Africa, tropical agriclimatology and development

Rice, John, Professor Emeritus
Fil. lic., University of Uppsala
Historical geography, Europe (especially Scandinavian states and Finland)

Saldanha, Arun, Assistant Professor
Ph.D., Open University
Cultural and social geography, the geography of music

Samatar, Abdi, Professor
Ph.D., University of California, Berkeley
Third World development and regional planning, East Africa

Schwartzberg, Joseph, Professor Emeritus
Ph.D., University of Wisconsin
South and Southeast Asia, political geography, historical cartography

Scott, Earl, Professor Emeritus
Ph.D., University of Michigan
Cultural and economic geography, Africa

Sheppard, Eric, Professor
Ph.D., University of Toronto
Economic geography, political economy, quantitative methods, philosophical foundations

Shuman, Bryan, Assistant Professor
Ph.D., Brown University
Climatic change and associated biogeographical dynamics, quaternary paleoclimates and paleoecology, global change

Skaggs, Richard, Professor
Ph.D., University of Kansas
Climatology, physical geography, long-term temperature trends, drought

Squires, Roderick, Associate Professor
Ph.D., University of Durham, England
Public land policy

Till, Karen E., Associate Professor
Ph.D., University of Wisconsin, Madison
Urban, social theory, historic landscapes, Europe, North America

*** Weil, Connie, Associate Professor**
Ph.D., Columbia University
Medical geography, Latin America

Ziegler, Susy, Assistant Professor
Ph.D., University of Wisconsin, Madison
Biogeography, forest dynamics, human impacts on vegetation, forest decline in Central Europe, environmental change, dendrochronology

German, Scandinavian, and Dutch

Baker, Eric, Assistant Professor
Ph.D., Johns Hopkins University
German enlightenment to romanticism, aesthetic theory and literature of the sublime and the comic sublime, theory of rhetoric

Duroche, Leonard, Associate Professor
Ph.D., Stanford University
Men's studies, literary theory, phenomenology, children's literature, romanticism

Firchow, Evelyn Scherabon, Professor
Ph.D., Harvard University
Germanic philology and medieval German literature

Fullerton, Gerald Lee, Associate Professor
Ph.D., University of Michigan
German and Germanic linguistics

Gailus, Andreas, Associate Professor
Ph.D., Columbia University
18th- to 20th-century literature and philosophy, psychoanalysis, textual theory

Grimstad, Kaaren, Associate Professor
Ph.D., Harvard University
Old Norse languages/literatures, Icelandic sagas, Scandinavian mythology, Swedish

Houe, Poul, Professor
Ph.D., Aarhus University, Denmark
Modern Danish and Swedish literature, European humanism, travel and exile literature

Hüeser, Rembert, Assistant Professor
Dr.phil., University of Bielefeld
Cultural studies, film studies, literary criticism

Joeres, Ruth-Ellen Boetcher, Professor
Ph.D., Johns Hopkins University
18th- to 20th-century literature, comparative feminist theories, women's history and literature

Liberman, Anatoly, Professor
Dr. phil., University of Leningrad
General linguistics, Germanic philology, folklore, poetic translation, medieval literature

McBride, Patrizia Carollo, Associate Professor
Ph.D., Indiana University
20th-century literature, Austrian literature, literature and philosophy

McCormick, Richard, Professor
Ph.D., University of California, Berkeley
Film studies, 20th-century literature and culture, feminism and gender studies

Melin, Charlotte, Associate Professor
Ph.D., University of Michigan
Postwar German poetry, German-American literary relations, second-language acquisition

Morris, Leslie, Associate Professor
Ph.D., University of Massachusetts, Amherst
20th-century German and Austrian literature, poetry, Jewish studies

Parente, James A., Jr., Professor
Ph.D., Yale University
Medieval and early modern German, Netherlandic and Scandinavian literature and culture

Schulte-Sasse, Jochen, Professor
Dr. phil., Ruhr University, Bochum, Germany
Literature 1700-1820, 1885-present; theory of literature, popular literature

Stockenström, Göran, Professor
Ph.D., Uppsala University, Sweden
Swedish language/literature, modern drama, Scandinavian immigrant culture

Teraoka, Arlene A., Professor
Ph.D., Stanford University
20th-century and minority literature, intellectual history, cultural criticism

Wakefield, Ray, Associate Professor
Ph.D., Indiana University
Second-language acquisition, medieval literature, Dutch

***§ Weiss, Gerhard, Professor Emeritus**
Ph.D., University of Wisconsin, Madison
17th-, 19th-, and 20th-century literature, German studies

Zagar, Monika, Associate Professor
Ph.D., University of California, Berkeley
Norwegian language and literature, modernism, Scandinavian women writers

Zipes, Jack, Professor
Ph.D., Columbia University
Fairy tales, 20th-century literature; German, women's and Jewish studies

Global Studies

Berdahl, Daphne, Associate Professor
Ph.D., University of Chicago
Anthropology, sociocultural anthropology, identity, consumption, memory, gender, Europe

Boyle, Elizabeth, Associate Professor
Ph.D., Stanford University
Sociology of law, comparative sociology, political sociology, sociology of gender

Broadbent, Jeffrey, Associate Professor
Ph.D., Harvard University
Comparative, political, cultural, and environmental sociologies, social movements, network analysis, macro-meso-micro links, power structures, change processes, complexity, Japan, East Asia

Craddock, Susan, Associate Professor
Ph.D., University of California, Berkeley
Women's studies, geography, critical health geography, political ecologies of disease, medical practices in global perspective

Gidwani, Vinay, Assistant Professor
Ph.D., University of California, Berkeley
Labor geographies, agrarian change, nature-society relations, politics of globalization and development

Goldman, Michael, Associate Professor
Ph.D., University of California, Santa Cruz
Transnational, environmental, development, and political sociology; sociology of knowledge and power; transnational institutions; World Bank; NGO networks

Kaminsky, Amy, Professor
Ph.D., Pennsylvania State University
Women's studies, feminist theory, Latin American literature, gender and nation

Leitner, Helga, Professor
Ph.D., University of Vienna
Geography, urban and regional development, international labor migration, Europe

McLean, Stuart, Assistant Professor
Ph.D., Columbia University
Social and cultural theory, anthropology of modernity, historical anthropology, anthropology of landscape; Ireland, European Union

Raheja, Gloria, Professor
Ph.D., University of Chicago
Anthropology, politics of cultural production, India

Skaria, Ajay, Associate Professor
Ph.D., Trinity College and Gonville and Caius College, Cambridge, U.K.
History, colonialism, nationalism, South Asia

Wolfe, Thomas, Associate Professor
Ph.D., University of Michigan
History, anthropology, Europe/Soviet Union/Russia, 20th century, media, communications, culture

History

Bachrach, Bernard, Professor
Ph.D., University of California, Berkeley
Europe before 1200, medieval military history

Bamford, Paul, Professor Emeritus
Ph.D., Columbia University
Oceanic history, expansion of Europe

Berman, Hyman, Professor Emeritus
Ph.D., Columbia University
American labor and radicalism, 20th century, Minnesota history

Casale, Giancarlo, Assistant Professor
Ph.D., Harvard University
Islamic world, Ottoman Empire

***Chambers, Clarke, Professor Emeritus**
Ph.D., University of California, Berkeley
American social history, social welfare history

Chambers, Sarah, Associate Professor
Ph.D., University of Wisconsin, Madison
Colonial Latin America, women

Chang, David, Assistant Professor
Ph.D., University of Wisconsin, Madison
Colonial Latin America, women

Clark, Anna, Professor
Ph.D., Rutgers University
Modern European history, British/Irish history, women's history, history of sexuality

Cohen, Gary B., Professor
Ph.D., Princeton University
Austrian studies, Eastern Europe, modern European social history

Deutsch, Tracey, Assistant Professor
Ph.D., University of Wisconsin, Madison
20th-century U.S. political, business, and social history

Evans, John, Professor
Ph.D., McMaster University, Canada
Roman history

Evans, Sara, Regents Professor
Ph.D., University of North Carolina, Chapel Hill
American women's history, family history, social movements

Farah, Caesar, Professor
Ph.D., Princeton University
Modern Near East, Arabic, Islamic history

***Farmer, Edward, Professor**
Ph.D., Harvard University
Modern Chinese history, comparative early modern history

Fischer, Kirsten, Associate Professor
Ph.D., Duke University
Colonial/revolutionary America, U.S. social and intellectual history

Gabaccia, Donna, Professor
Ph.D., University of Michigan
Italian, American and migration history

Gallia, Andrew, Assistant Professor
Ph.D., University of Pennsylvania
Rome and ancient Mediterranean

Giles-Vernick, Tamara, Associate Professor
Ph.D., Johns Hopkins University
African history, ethno- and environmental history, history of public health

Good, David F., Professor
Ph.D., University of Pennsylvania
European economic history, Hapsburg Empire

***Green, George, Associate Professor**
Ph.D., Stanford University
American economic and business history, historiography, historical methods

Hakim, Carol, Assistant Professor
D. Phil, Oxford University
Modern Middle East history

Howe, John, Professor Emeritus
Ph.D., Yale University
18th- and 19th-century American political history

§ Isaacman, Allen, Regents Professor
Ph.D., University of Wisconsin
Southern Africa, peasant studies, historical methodology

Isett, Christopher, Associate Professor
Ph.D., University of Los Angeles
Modern Chinese social, economic history

Karras, Ruth, Professor
Ph.D., Yale University
Medieval history, early modern Britain, Viking age

Kelly, Thomas, Professor Emeritus
Ph.D., University of Illinois
Ancient Greece

***Kieft, David, Associate Professor Emeritus**
Ph.D., University of California, Berkeley
European diplomatic history, German history

Kopf, David, Professor Emeritus
Ph.D., University of Chicago
South and Southeast Asian cultural history, comparative world history

Lee, Erika, Associate Professor
Ph.D., University of California, Berkeley
20th-century United States, Asian-American history, immigration history

§ Lehmberg, Stanford, Professor Emeritus
Ph.D., Cambridge University
Tudor-Stuart England

Lindquist, Malinda Alaine, Assistant Professor
Ph.D., Princeton University
Post-1865 U.S. history, African American history, gender history

Lorcin, Patricia, Associate Professor
Ph.D., Columbia University
Modern Europe

Lower, Michael, Assistant Professor
Ph.D., Cambridge University
Medieval Europe, the crusades, popular religion, the papacy

Marshall, Byron K., Professor Emeritus
Ph.D., Stanford University
Asian history, 19th- and 20th-century Japanese history

***§ May, Elaine Tyler, Professor**
Ph.D., University of California, Los Angeles
American history, American studies, women

***May, Lary, Professor**
Ph.D., University of California, Los Angeles
American history, American studies

Maynes, Mary Jo, Professor
Ph.D., University of Michigan
Modern European social history, family, women, education, Germany

McCaa, Robert, Professor
Ph.D., University of California, Los Angeles
Modern Latin America, demographic history, quantitative methods

McNamara, Patrick, Assistant Professor
Ph.D., University of Wisconsin, Madison
Colonial/modern Latin America, history of Mexico

Menard, Russell, Professor
Ph.D., University of Iowa
Early American history

Mizuno, Hiromi, Assistant Professor
Ph.D., University of California, Los Angeles
Modern Japan, gender, cultural science and technology

§ Munholland, Kim, Professor Emeritus
Ph.D., Princeton University
Contemporary French social and political history, French imperialism

Murphy, Kevin, Assistant Professor
Ph.D., New York University
U.S. urban, political, intellectual, and cultural history; sexuality; masculinity

Norling, Lisa, Associate Professor
Ph.D., Rutgers University
American social and cultural history, gender, maritime history

O'Brien-Kehoe, Jean M., Associate Professor
Ph.D., University of Chicago
Indians of the Northeast (17th and 18th centuries), colonial America

Phillips, Carla Rahn, Professor
Ph.D., New York University
Early modern Europe (1450–1750), economy and society, Spain

Phillips, William, Professor
Ph.D., New York University
Medieval and early modern Europe, Spain, European expansion

Pilcher, Jeffery, Associate Professor
Ph.D., Texas Christian University
Latin American history, world and food history

Reyerson, Kathryn, Professor
Ph.D., Yale University; Doctorat d'Etat, Montpellier Law School
Medieval Europe; social, economic, and legal history; France

Rudolph, Richard, Professor Emeritus
Ph.D., University of Wisconsin
Russia, central and Eastern Europe

Ruggles, Steven, Professor
Ph.D., University of Pennsylvania
Historical demography, history of family, U.S. social history

§ Samaha, Joel, Professor
Ph.D., Northwestern University
Criminal justice history, criminal law and criminal procedure

Shank, J. B., Assistant Professor
Ph.D., Stanford University
Early modern Europe, France, European intellectual history of science

Skaria, Ajay, Associate Professor
Ph.D., Trinity College, University of Cambridge
19th- and 20th-century South Asian history, environmental history

Spear, Allan, Associate Professor Emeritus
Ph.D., Yale University
20th-century U.S. history

***§ Stavrou, Theofanis, Professor**
Ph.D., Indiana University
Russia, modern Greece, Eastern Orthodoxy

Taylor, Romeyn, Professor Emeritus
Ph.D., University of Chicago
History of Chinese society, late imperial Chinese history

Thayer, John, Professor Emeritus
Ph.D., University of Wisconsin
Modern European political-cultural history, historiography and method

Tracy, James, Professor
Ph.D., Princeton University
Early modern Europe, 16th century, the Low Countries

Vecoli, Rudolph, Professor Emeritus
Ph.D., University of Wisconsin, Madison
History of American immigration, ethnicity and pluralism

Wagner, Michele, Assistant Professor
Ph.D., University of Wisconsin, Madison
African history, Great Lakes Africa, East Africa, human rights, oral history

Waltner, Ann, Professor
Ph.D., University of California, Berkeley
Chinese social history, religion, gender, fiction, ritual, law

Wang, Liping, Associate Professor
Ph.D., University of California, San Diego
Social and cultural history of nationalist/communist period in modern China

Weitz, Eric, Professor
Ph.D., Boston University
Early modern and modern Germany, social/intellectual history, modern Russia/Soviet Union

Welke, Barbara, Associate Professor
Ph.D., University of Chicago
19th- and 20th-century U.S. legal, constitutional, and women's history

Wolfe, Thomas, Associate Professor
Ph.D., University of Michigan
Contemporary Russia, history of media, modernity/postmodernity, anthropology of complex societies

Wright, William, Professor Emeritus
Ph.D., University of Colorado
Austrian history

Humanities

Kliger, George, Assistant Professor
Ph.D., University of Minnesota
Modern European philosophy, psychology, literature, art; pre-Muslim India

Norwood, James, Senior Lecturer
Ph.D., University of California, Berkeley
Generalist in the western humanities (art, literature, philosophy, history), French drama, Shakespeare authorship controversy

Journalism and Mass Communication

Abraham, Linus, Assistant Professor
Ph.D., University of Pennsylvania
Visual media studies; structure, interpretation, and social functions of visual media

Brazeal, Donald, Assistant Professor
Ph.D., University of Maryland
News reporting and writing, publications editing, media development

Carter, Roy, Professor Emeritus
Ph.D., Stanford University
International mass communication, theory and methodology

Chang, Tsan-Kuo, Associate Professor
Ph.D., University of Texas at Austin
International communication, theory and methodology, mass communication diplomacy

§ Dicken-Garcia, Hazel, Professor
Ph.D., University of Wisconsin, Madison
Mass communication history, news-editorial

Doyle, Kenneth, Associate Professor
Ph.D., University of Minnesota
Quantitative and qualitative research methodology, financial psychology, cross-cultural studies

Eighmey, John, Professor
Ph.D., University of Iowa
Advertising and consumer research, management and public policy

Faber, Ronald, Professor
Ph.D., University of Wisconsin, Madison
Advertising, mass media effects, political communication

Fang, Irving, Professor Emeritus
Ph.D., University of California, Los Angeles
Broadcast journalism, communication technology, history of photography, motion pictures

Forde, Kathy, Assistant Professor
Ph.D. University of North Carolina at Chapel Hill
Media law, journalism history of the American press, literary or narrative journalism

*** Gillmor, Donald, Professor Emeritus**
Ph.D., University of Minnesota
Media and constitutional law, communication agencies as social institutions

Hansen, Kathleen, Professor
M.A., M.L.S., University of Wisconsin, Madison
Information access/communication, sociology of news, bibliographic retrieval

Huh, Jisu, Assistant Professor
Ph.D., University of Georgia, Athens
Advertising effects research, advertising campaigns, new media advertising and graphic communication

Jones, Robert, Professor Emeritus
Ph.D., University of Minnesota
Advertising

Kirtley, Jane, Professor
J.D., Vanderbilt University
Media law and ethics, international communication, constitutional and administrative law

Lee, Chin Chuan, Professor Emeritus
Ph.D., University of Michigan
International mass communication, theory and methodology, political communication

Schwartz, Dona, Associate Professor
Ph.D., University of Pennsylvania
Visual communication, photography, qualitative approaches to mass communication

Schwitzer, Gary, Assistant Professor
B.A., Marquette University
Health journalism, health care consumer decision making, television and radio news

Southwell, Brian, Assistant Professor
Ph.D., University of Pennsylvania
Strategic communication research, advertising, health journalism

Sullivan, Daniel, Professor
Ph.D., Yale University
Media strategy, future of media, new media

Tichenor, Phillip, Professor Emeritus
Ph.D., Stanford University
Theory and methodology, science journalism, public opinion

Tims, Albert, Associate Professor and Director
Ph.D., University of Wisconsin, Madison
Communication theory/methodology, public opinion and political communication

Wackman, Daniel, Professor
Ph.D., University of Wisconsin, Madison
Media management, advertising, theory and methodology

***Ward, Jean, Professor Emeritus**
Ph.D., University of Minnesota
Sociology of news, neighborhood press, language and communication

Wells, William, Professor Emeritus
Ph.D., Stanford University
Advertising/marketing, information management, statistics, consumer behavior/attitudes

Yzer, Marco, Assistant Professor
Ph.D. University of Groningen, Netherlands
Behavioral theory, health communications, evaluation of mass media communications campaigns
Japanese Language and Linguistics

Szatrowski, Polly, Professor
Ph.D., Cornell University
Ph.D., University of Tsukuba
Japanese language and linguistics

Linguistics

Downing, Bruce, Associate Professor
Ph.D., University of Texas
Syntax, English linguistics, bilingualism

Gundel, Jeanette, Professor
Ph.D., University of Texas
Syntax, semantics, pragmatics, discourse analysis, language processing

Soh, Hooi Ling, Assistant Professor
Ph.D., Massachusetts Institute of Technology
Syntactic theory, phonology-syntax interface, syntax-semantics interface

Stenson, Nancy, Professor
Ph.D., University of California, San Diego
Syntax; Irish, Celtic, and American Indian languages; applied linguistics

Music

Addo, Akosua, Associate Professor
Ph.D., University of British Columbia
Music education

Anderson, John, Professor
Ed.D., Columbia University
Woodwind coordinator, clarinet, pedagogy and literature, woodwind ensembles

Argento, Dominick, Regents Professor Emeritus
Ph.D., Eastman School of Music
Composition, orchestration

Artymiw, Lydia, Professor
B.A., Philadelphia College of Performing Arts
Piano

Ashworth, Thomas, Professor
M.M., North Texas State University
Trombone, euphonium

Baldwin, David, Professor
D.M.A., Yale University
Brass coordinator, trumpet, trumpet pedagogy, transcription for winds

Billmeyer, Dean, Associate Professor
D.M.A., Eastman School of Music
Organ literature and pedagogy, church music, advanced keyboard harmony

Bjork, Mark, Associate Professor
B.M., Indiana University
Violin, Suzuki pedagogy

Braginsky, Alex, Professor
D.M.A. (equiv.), Moscow Conservatory
Piano, chamber music

Bribitzer-Stull, Matthew, Assistant Professor
Ph.D., Eastman School of Music
Tonal theory and analysis

Cherlin, Michael, Professor
Ph.D., Yale University
Tonal and post-tonal theory, analysis; text and music

Damschroder, David, Associate Professor
Ph.D., Yale University
Tonal theory and analysis, history of music theory

Davis, Immanuel, Assistant Professor
M.M., The Julliard School
Flute, pedagogy and literature, woodwind ensembles

De Haan, John, Assistant Professor
M.M., University of Nebraska
Voice (tenor), diction

del Santo, Jean, Associate Professor
M.M., Indiana University
Voice (soprano), vocal literature, diction

Diem, Timothy, Assistant Professor
M.M., University of Northern Colorado
Band

Furman, Charles, Associate Professor
Ph.D., Florida State University
Music therapy, music education, psychology of music

Gast, Michael, Instructor
B.M., The Curtis Institute
Horn

Geers, Douglas, Assistant Professor
D.M.A., Columbia University
Composition, electronic music

Gopinath, Sumanth, Assistant Professor
Ph.D., Yale University
Music theory, music and globalization, sound art

Grayson, David, Professor
Ph.D., Harvard University
Historical musicology, 19th and 20th centuries, Debussy studies

Haack, Paul, Professor
Ph.D., University of Wisconsin
Music education, psychology of music

Hamann, Keitha, Associate Professor
Ph.D., University of Miami
Music education

Harness, Kelley, Associate Professor
Ph.D., University of Illinois, Urbana-Champaign
Musicology

Jackson, Donna, Professor
Ph.D., Harvard University
Historical musicology, medieval and Renaissance

Kim, Young Nam, Associate Professor
M.M., Syracuse University
Violin, chamber music, string orchestra

Kirchhoff, Craig, Professor
M.M., University of Wisconsin
Director of bands, conducting

Konkol, Korey, Professor
M.M., New England Conservatory
Viola

Lancaster, Thomas, Professor Emeritus
D.M., Indiana University
Choral conducting

Lausevic, Mirjana, Assistant Professor
Ph.D., Wesleyan University
Ethnomusicology

Lovelace, Timothy, Assistant Professor
D.M.A., SUNY at Stony Brook, New York
Accompanying and coaching

***§ Lubet, Alex, Professor**
Ph.D., University of Iowa
Composition, 20th-century theory, theory pedagogy

Luckhardt, Jerry, Assistant Professor
M.M., University of Michigan
Band, conducting methods

Maurice, Glenda, Professor
M.M., Manhattan School of Music
Voice (mezzo-soprano), vocal literature

Mehaffey, Matthew, Assistant Professor
D.M.A., University of Arizona, Tucson
Choral conducting

Mercer-Taylor, Peter, Assistant Professor
Ph.D., University of California, Berkeley
Musicology

Meza, Fernando, Associate Professor
M.M., University of Michigan
Percussion, percussion literature/techniques/pedagogy

O'Reilly, Sally, Professor
M.M., Indiana University
Violin

Remenikova, Tanya, Professor
D.M.A. (equiv.), Moscow Conservatory
Cello, cello pedagogy, string techniques, chamber ensembles

Romey, Kathy Saltzman, Assistant Professor
D.M.A. (equiv.), Hochschule für Musik (Frankfurt, Germany)
Choral conducting

Rousseau, Eugene, Instructor
Ph.D., University of Iowa
Saxophone

Shaw, Paul, Associate Professor
D.M.A., The Julliard School
Piano, piano ensemble

Shockley, Rebecca, Professor
D.M.A., University of Colorado
Piano, class piano, pedagogy, piano ensembles

Snow, John, Instructor
M.M., Yale University
Oboe

Sorenson, Dean, Instructor and Interim Director of Jazz Studies
M.M., Eastman School of Music
Jazz combo and ensemble, jazz theory, jazz history

Sutton, Everett, Professor Emeritus
Ph.D., University of Minnesota
Opera theater/workshop

Van, Jeffrey, Instructor
M.F.A., University of Minnesota
Guitar

Walsh, David, Assistant Professor
Performer's Certificate in Theatre Science, University of Toronto
Opera theatre/workshop

Ware, D. Clifton, Professor
D.M., Northwestern University
Voice (tenor), pedagogy

Weller, Lawrence, Associate Professor
M.M., University of Illinois
Voice (baritone), diction, vocal literature

Zahler, Noel, Professor and Director
D.M.A., Columbia University
Composition, electronic music

Zaimont, Judith, Professor Emeritus
M.A., Columbia University
Composition, theory

Philosophy

Bix, Brian, Professor
D.Phil., Oxford University
Legal philosophy, philosophy of language, moral philosophy, political philosophy

Dahl, Norman, Professor Emeritus
Ph.D., University of California, Berkeley
Moral philosophy, ancient philosophy

Eaton, Marcia M., Professor Emeritus
Ph.D., Stanford University
Aesthetics

Giere, Ronald, Professor Emeritus
Ph.D., Cornell University
Philosophy of science

Gunderson, Keith, Professor
Ph.D., Princeton University
Philosophy of mind, aesthetics

Hanks, Peter, Assistant Professor
Ph.D., University of California
Philosophy of language, philosophy of mind

*** Hanson, William, Professor**
Ph.D., Yale University
Logic, philosophy of logic

Hellman, Geoffrey, Professor
Ph.D., Harvard University
Philosophy of natural science, mathematics and logic, aesthetics

Holtman, Sarah, Associate Professor
Ph.D., University of North Carolina at Chapel Hill
Ethics, political philosophy, philosophy of law

Hopkins, Jasper, Professor
Ph.D., Harvard University
Ancient and medieval philosophy, philosophy of religion, medical ethics

Kac, Michael, Professor
Ph.D., University of California, Los Angeles
Linguistics, cognitive science

§ Lewis, Douglas, Professor
Ph.D., University of Iowa
17th- and 18th-century philosophy, metaphysics

Mason, Michelle, Assistant Professor
Ph.D., University of Chicago
Ethics, moral psychology and practical rationality, aesthetics

Nounou, Antigone, Assistant Professor
Ph.D., London School of Economics
Philosophy of physics

§ Owens, Joseph, Professor
Ph.D., University of California, Los Angeles
Philosophy of mind, language, metaphysics

§ Peterson, Sandra, Professor
Ph.D., Princeton University
Ancient philosophy, moral philosophy

§ Root, Michael, Associate Professor
Ph.D., University of Illinois, Urbana-Champaign
Philosophy of language, philosophy of social science

Savage, C. Wade, Professor Emeritus
Ph.D., Cornell University
Philosophy of science, epistemology, philosophy of psychology

§ Scheman, Naomi, Professor
Ph.D., Harvard University
Feminist theory, epistemology, Wittgenstein

Tiberius, Valerie, Associate Professor
Ph.D., University of North Carolina at Chapel Hill
Value theory, practical reason, metaethics

§ Wallace, John, Professor
Ph.D., Stanford University
Philosophy of language political philosophy, philosophy of education

Waters, C. Kenneth, Associate Professor
Ph.D., Indiana University
Philosophy of science, philosophy of biology, epistemology, history of biology

Political Science

Abernathy, Scott, Assistant Professor
Ph.D., Princeton University
American politics, education policy

Ansell, Ben, Assistant Professor
Ph.D. (expected 2006), Harvard University
Comparative politics, democratization

Beaumont, Elizabeth, Assistant Professor
Ph.D., Stanford University
Political theory, public law

Caraway, Terri, Assistant Professor
Ph.D., Northwestern University
Comparative politics, Southeast Asia

Collins, Kathleen, Assistant Professor
Ph.D., Stanford University
Comparative politics, democratization

§ Dietz, Mary, Professor
Ph.D., University of California, Berkeley
Development of political thought

Disch, Lisa, Professor
Ph.D., Rutgers University
Political theory

***§ Duvall, Raymond, Professor**
Ph.D., Northwestern University
International relations, comparative political economy

Fang, Songying, Assistant Professor
Ph.D., University of Rochester
Methodology, international relations

***§ Farr, James, Professor**
Ph.D., University of Minnesota
Political theory

Federico, Christopher, Assistant Professor
Ph.D., University of California, Los Angeles
Political psychology

***§ Freeman, John, Distinguished McKnight University Professor**
Ph.D., University of Minnesota
Political economy, methodology

Gingrich, Jane, Assistant Professor
Ph.D. (expected 2006), University of California, Berkeley
Comparative politics, Western Europe

Goren, Paul, Assistant Professor
Ph.D., University of Pittsburgh
American politics, political behavior

Hilbink, Elisabeth, Assistant Professor
Ph.D., University of California, San Diego
Comparative judicial politics, democratization, transitional justice

Jacobs, Lawrence, Professor
Ph.D., Columbia University
American public policy, American politics

Johnson, Timothy, Assistant Professor
Ph.D., Washington University
American politics, judicial process

Kahl, Colin, Assistant Professor
Ph.D., Columbia University
International relations

***§ Kelliher, Daniel, Associate Professor**
Ph.D., Yale University
Comparative politics, China

Krebs, Ronald, Assistant Professor
Ph.D., Columbia University
International relations

Kvavik, Robert, Professor
Ph.D., Stanford University
Political organizations, Scandinavia

Lomonaco, Jeffrey, Assistant Professor
Ph.D., Johns Hopkins University
Political theory

Miller, Joanne, Assistant Professor
Ph.D., The Ohio State University
Political psychology

§ Nimtz, August, Professor
Ph.D., Indiana University
Africa, comparative and community politics

Pearson, Kathryn, Assistant Professor
Ph.D., University of California, Berkeley
American politics, Congress

Rahn, Wendy, Associate Professor
Ph.D., University of Minnesota
American politics, political psychology

Roberts, Jason, Assistant Professor
Ph.D., Washington University
American politics, Congress

Rosenstone, Steven, Professor
Ph.D., University of California, Berkeley
American politics, methodology

*** Sampson, Martin, Associate Professor**
Ph.D., Indiana University
International relations, foreign policy

Samuels, David, Associate Professor
Ph.D., University of California, San Diego
Comparative politics, Latin American politics

Scott, Thomas, Professor
Ph.D., Northwestern University
Urban government and politics, American politics

*** Shively, W. Phillips, Professor**
Ph.D., University of North Carolina
Comparative politics, Western Europe

Sikkink, Kathryn, Arleen Carlson Professor
Ph.D., Columbia University
Comparative politics, Latin America

Soper, Paul, Lecturer
Ph.D., University of Minnesota
American politics, political theory

*** Strolovitch, Dara, Assistant Professor**
Ph.D., Yale University
American politics

*** Sullivan, John, Regents Professor and Arleen Carlson Professor**
Ph.D., University of North Carolina
Methodology, political psychology

Treier, Shawn, Assistant Professor
Ph.D., Stanford University
Methodology, American politics

Psychology

Berscheid, Ellen, Regents Professor
Ph.D., University of Minnesota
Interpersonal attraction, close relationships, emotion, social perception/cognition

Bono, Joyce E., Assistant Professor
Ph.D., University of Iowa
Leadership, personality, emotions, motivation

***§ Borgida, Eugene, Professor**
Ph.D., University of Michigan
Social cognition, attitude theory, psychology and law, psychology and politics

Bouchard, Thomas, Professor
Ph.D., University of California, Berkeley
Twins, adoptees, mental ability, behavior genetics, personality interests

Burkhardt, Dwight, Professor
Ph.D., Brown University
Sensory psychobiology: vision, retinal neuron function, human psychophysics

Butcher, James, Professor Emeritus
Ph.D., University of North Carolina
Personality assessment, cross-cultural psychology

Campbell, John, Professor
Ph.D., University of Minnesota
Personnel selection, performance modeling and assessment, occupational structures

Cuthbert, Bruce, Professor
Ph.D., University of Wisconsin, Madison
Psychophysiology, emotion, temperament, mood and anxiety disorders, personality disorders, diagnostic issues

Dawis, René, Professor Emeritus
Ph.D., University of Minnesota
Vocational psychology, individual differences, psychological measurement, industrial/organizational psychology

Dunnette, Marvin, Professor Emeritus
Ph.D., University of Minnesota
Personnel selection, performance appraisal, task and job analysis

Federico, Christopher, Assistant Professor
Ph.D., University of California, Los Angeles
Political psychology, intergroup relations, and racial attitudes; psychology of legitimacy; political enterprise

Fletcher, Charles, Associate Professor
Ph.D., University of Colorado, Boulder
Cognitive science, discourse comprehension, memory

Frazier, Patricia, Professor
Ph.D., University of Minnesota
Counseling and social psychology, coping with stressful life events

Garmezy, Norman, Professor Emeritus
Ph.D., Iowa State University
Clinical psychology, personality, developmental psychopathology, childhood stressors, resistance and resilience

Gewirtz, Jonathon, Assistant Professor
Ph.D., Yale University
Biological bases of learning, memory, mental illness, and the startle reflex

***§ Gonzales, Marti, Associate Professor**
Ph.D., University of California, Santa Cruz
Accountability, applied social psychology, impression management, interpersonal conflict, political socialization

Grove, William, Associate Professor
Ph.D., University of Minnesota
Mood disorders, schizophrenia, behavior genetics, assessment, classification methodology

Hansen, Jo-Ida, Professor
Ph.D., University of Minnesota
Vocational interest measurement, inventory construction, career development, vocational psychology

He, Sheng, Associate Professor
Ph.D., University of California, San Diego
Human vision and attention, visual awareness, cognitive neuroscience

Iacono, William, Professor
Ph.D., University of Minnesota
Schizophrenia, substance abuse, psychophysiology, detection of deception

Kersten, Daniel, Professor
Ph.D., University of Minnesota
Perception, computational vision, neural networks, brain imaging

Koutstaal, Wilma, Assistant Professor
Ph.D., Harvard University
Human memory and judgment, cognitive neuroscience, neuropsychology, aging

Krueger, Robert, Associate Professor
Ph.D., University of Wisconsin, Madison
Clinical, personality, individual differences, assessment, behavior genetics

Kuncel, Nathan, Assistant Professor
Ph.D., University of Minnesota
Structure and prediction of performance in academic and work settings

Lee, Richard, Associate Professor
Ph.D., Virginia Commonwealth University
Ethnic minority mental health and counseling, ethnic identity and family, personality and adjustment

Legge, Gordon, Professor
Ph.D., Harvard University
Visual perception

Leon, Gloria, Professor
Ph.D., University of Maryland
Stress and coping in extreme situations, eating disorders

Luciana, Monica, Associate Professor
Ph.D., University of Minnesota
Neurotransmitters and behavior, prefrontal development, neuropsychology, biology and psychopathology

Lykken, David, Professor Emeritus
Ph.D., University of Minnesota
Personality, psychophysiology, behavior genetics, forensic psychology

MacDonald, Angus, III, Assistant Professor
Ph.D., University of Pittsburgh
Basic cognitive and affective neuroscience using fMRI, neural and genetic bases of schizophrenia and other mental illnesses, psychometrics of measuring group differences

Marsolek, Chad, Associate Professor
Ph.D., Harvard University
Human memory, vision, and learning; cognitive neuroscience

McGue, Matthew, Professor
Ph.D., University of Minnesota
Behavior genetics, individual differences, substance abuse, aging

Olman, Cheryl, Assistant Professor
Ph.D., University of Minnesota
Biological basis of functional magnetic resonance imaging, modulation of low-level visual responses by scene perception

Ones, Deniz, Associate Professor
Ph.D., University of Iowa
Ability and personality assessment, personnel selection and classification

Overmier, J. Bruce, Professor
Ph.D., University of Pennsylvania
Learning, memory, stress and its psychosomatic consequences

Oxenham, Andrew, Assistant Professor
Ph.D., University of Cambridge, England
Auditory perception and cognition, computational models of perception, hearing impairment and cochlear implants

Patrick, Christopher, Professor
Ph.D., University of British Columbia
Emotion, psychopathy and criminal behavior, substance abuse, psychophysiology

§ Peterson, Gail, Associate Professor
Ph.D., Indiana University
Behavior change: basic theory and applications

Rothman, Alexander, Associate Professor
Ph.D., Yale University
Social cognition, health beliefs and behavior, persuasion, stereotyping

Sackett, Paul, Professor
Ph.D., The Ohio State University
Personnel selection, employment testing, workplace deviance, performance measurement

Schrater, Paul, Assistant Professor
Ph.D., University of Pennsylvania
Computational cognitive science, human and computer vision and motor control, statistical pattern recognition

Simpson, Jeffry, Professor
Ph.D., University of Minnesota
Social, interpersonal relationships, attachment, evolution and social behavior, personality and social behavior, social influence

Snyder, Mark, Professor
Ph.D., Stanford University
Social perception and interpersonal behavior, personality and social interaction

Tellegen, Auke, Professor Emeritus
Ph.D., University of Minnesota
Personality assessment and research, clinical psychology

Thomas, Mark, Assistant Professor
Ph.D., University of California, Los Angeles
Neurobiology of drug-induced plasticity and addiction, behavioral neuroscience, transgenic mice, cellular electrophysiology

Viemeister, Neal, Professor
Ph.D., Indiana University
Auditory perception, psychophysics, models of perceptual processes

Waller, Niels, Professor
Ph.D., University of Minnesota
Quantitative models of individual differences, psychometrics, factor analysis, taxometrics, item response theory

Weiss, David, Professor
Ph.D., University of Minnesota
Psychometric methods, computerized adaptive testing, item response theory

Slavic and Central Asian Languages and Literatures

§ Bashiri, Iraj, Professor
Ph.D., University of Michigan
Iranian linguistics and literature, Central Asian studies

Corten, Irina, Associate Professor Emeritus
Ph.D., University of California, Berkeley
Modern Russian and Soviet literature, Soviet culture

Jahn, Gary, Professor
Ph.D., University of Wisconsin
19th-century Russian literature, Tolstoy

***§ Polakiewicz, Leonard, Associate Professor**
Ph.D., University of Wisconsin
19th-century Russian literature, Chekhov, Polish language and literature

Sociology

§ Aminzade, Ronald, Professor
Ph.D., University of Michigan
Historical and comparative sociology, political sociology, social movements, democratic theory, sociology of higher education, sociology of development, race relations

Anderson, Ronald, Professor Emeritus
Ph.D., Stanford University
Methodology, technology, education, gender, organizations, computer simulations

Boyle, Elizabeth, Associate Professor
Ph.D., Stanford University
Sociology of law, comparative sociology, political sociology, sociology of gender

Broadbent, Jeffrey, Associate Professor
Ph.D., Harvard University
Comparative, political, cultural, and environmental sociologies; social movements; network analysis; macro-meso-micro links; power structures; change processes; complexity; Japan; East Asia

Donohue, George, Professor Emeritus
Ph.D., Washington State University
Rural sociology, theory

Edgell, Penny, Associate Professor
Ph.D., University of Chicago
Sociology of religion, sociology of culture, qualitative methods, work and family, organizations

Eliason, Scott, Associate Professor
Ph.D., Pennsylvania State University
Quantitative methodology, work, occupations, and labor markets, stratification, life course

Ellenbogen, B. L., Professor Emeritus
Ph.D., University of Wisconsin
Social organization, developmental change, Latin America

Fulton, Robert, Professor Emeritus
Ph.D., Wayne State University
Sociology of death, AIDS, social stratification

Gerteis, Joseph, Assistant Professor

Ph.D., University of North Carolina, Chapel Hill
Social theory, historical sociology, politics and social movements, social class and race

Goldman, Michael, Associate Professor
Ph.D., University of California, Santa Cruz
Transnational, environmental, development, and political sociology, sociology of knowledge and power, transnational institutions (World Bank, NGO networks)

Gowan, Terea, Assistant Professor
Ph.D., University of California, Berkeley
Urban sociology, ethnography, poverty and inequality, comparative welfare states, deviance and social control

Hartmann, Douglas, Associate Professor
Ph.D., University of California, San Diego
Race and ethnicity, culture (including popular culture, sport, and religion), social movements and social change, American society, field methods, contemporary theory

Hironaka, Ann, Assistant Professor
Ph.D., Stanford University
Political sociology, comparative and historical sociology, globalization, quantitative research methods, environmental sociology, race and ethnicity

Hull, Kathleen, Assistant Professor
Ph.D., Northwestern University
Culture, law, social movements, family, gender and sexuality, qualitative methods

Johnson, Arthur, Professor Emeritus
Ph.D., University of Minnesota
Religion, applied sociology/evaluation research

Kelly, Erin, Assistant Professor
Ph.D., Princeton University
Organizations and work, gender, family and life course, law and social policy

Kennedy, Robert, Associate Professor Emeritus
Ph.D., University of California, Berkeley
Demography, medical sociology

Knoke, David, Professor
Ph.D., University of Michigan
Organizations and work, social networks, methods and statistics

Kruttschnitt, Candace, Professor
Ph.D., Yale University
Law and criminology and deviance, gender, life course

Laslett, Barbara, Professor Emeritus
Ph.D., University of Chicago
Historical sociology, family, gender, sociology of knowledge, social theory

Leik, Robert, Professor Emeritus
Ph.D., University of Wisconsin, Madison
Mathematical models, methods and statistics, family, social psychology, Nordic health care

Liebler, Carolyn, Assistant Professor
Ph.D., University of Wisconsin, Madison
Mathematical models, methods and statistics, family, social psychology, Nordic health care

Logan, Enid, Assistant Professor
Ph.D., University of Michigan
Race and ethnicity, family, marriage and gender, sociology of Afro-Latin populations, historical and comparative methods, religion and Catholic Church history

Macmillan, I. Ross, Associate Professor
Ph.D., University of Toronto
Life course studies; law, crime, and deviance; research methodology and social statistics

Malmquist, Carl, Professor
M.D., University of Minnesota
Juvenile justice, homicide, adolescence, law, mental health system

Meier, Ann, Assistant Professor
Ph.D., University of Wisconsin, Madison
Family and life course, adolescent and young adult development, stratification, methods and statistics

Moen, Phyllis, Professor
Ph.D., University of Minnesota
Gender, careers and life course dynamics, sociology of work and family, aging, medical sociology, social policy

Mortimer, Jeylan, Professor
Ph.D., University of Michigan
Life course, social psychology, work

Nelson, Joel, Professor
Ph.D., Yale University
Sociology of consumer behavior, organizations and occupations, stratification

Reiss, Ira L., Professor Emeritus
Ph.D., Pennsylvania State University
Human sexuality, gender roles, family, theory construction

Savelsberg, Joachim, Professor
Dr. rer. pol., University of Trier, Germany
Sociology of law, criminology, theory, comparative

Schofer, Evan, Assistant Professor
Ph.D., Stanford University
Comparative political sociology, sociology of education, quantitative methods and statistics, globalization, sociology of science, environmental sociology, organizations

Schurman, Rachel, Associate Professor
Ph.D., University of Wisconsin, Madison
Sociology of food and agriculture, development sociology with a focus on Latin America, sociology of the environment, political economy, neoliberalism

Spitzer, Stephan, Associate Professor Emeritus
Ph.D., University of Washington
Social psychology, visual sociology, microcomputing

Robin Stryker, Professor
Ph.D., University of Wisconsin, Madison
Law and society, political sociology, economic sociology, comparative and historical sociology, theory, stratification, historical methods, culture

Swartz, Teresa, Assistant Professor
Ph.D., University of California, San Diego
Families, race, class and gender, Asian American studies, care work, qualitative research methods, foster care

Uggen, Christopher, Professor
Ph.D., University of Wisconsin, Madison
Crime, law, and deviance; life course; work and occupations; methods and statistics

Warren, John Robert, Assistant Professor
Ph.D., University of Wisconsin, Madison
Social stratification, sociology of education

Ward, David, Professor Emeritus
Ph.D., University of Illinois
Criminology, penology

South Asian Languages and Cultures

§ Junghare, Indira, Professor
Ph.D., University of Texas
South Asian languages and cultures
Spanish and Portuguese Studies

Arenas, Fernándo, Associate Professor
Ph.D., University of California, Berkeley
Luso-Afro-Brazilian studies, critical theory

Egea, Alberto, Assistant Professor
Ph.D., Emory University
Modern Spanish literature and culture, literary theory

Face, Timothy, Assistant Professor
Ph.D., The Ohio State University
Hispanic linguistics, phonology and phonetics

Ferrán, Ofelia, Assistant Professor
Ph.D., Cornell University
Modern peninsular literature and literary theory

Ferreira, Ana Paula, Professor
Ph.D., New York University
Portuguese and Brazilian literatures, women's studies, critical theory

Jara, René, Professor
Ph.D., Arizona State University
Spanish-American literature: narrative, poetry, essay, literary theory, semiotics

Klee, Carol, Associate Professor
Ph.D., University of Texas, Austin
Hispanic linguistics, applied linguistics and sociolinguistics

Machín, Horacio, Assistant Professor
Ph.D., Stanford University
Contemporary Latin American literature, cultural criticism, cultural studies

O'Connell, Joanna, Associate Professor
Ph.D., University of California, Berkeley
Spanish-American literature: Mexico, Caribbean, Central America; feminism

Ocampo, Francisco, Associate Professor
Ph.D., University of Southern California
Hispanic linguistics, syntax and pragmatics

Ramos-Garcia, Luis, Associate Professor
Ph.D., University of Texas at Austin
U.S. Latino/Latin American theater, literature, cultural studies

Ramos-Gascon, Antonio, Professor Emeritus
Ph.D., University of California, San Diego
Spanish literature: 18th-20th-century prose and poetry

Spadaccini, Nicholas, Professor
Ph.D., New York University
Spanish Golden Age/colonial literature and culture, comparative literature

Sullivan, Constance, Associate Professor
Ph.D., University of Illinois
18th-20th-century Spanish literature, Spanish feminism

Vidal, Hernán, Professor Emeritus
Ph.D., University of Iowa
Latin American literature and cultural studies

Weissberger, Barbara, Associate Professor
Ph.D., Harvard University
Medieval and early modern literature

Zahareas, Anthony, Professor Emeritus
Ph.D., The Ohio State University
History of Spanish literature: early to modern times

Speech-Language-Hearing Sciences

Angerman, Sarah, Assistant Clinical Specialist
Ph.D., University of Minnesota
Clinical audiology

Avery, Jack, Assistant Clinical Specialist
M.A., University of Minnesota
Adult speech and language disorders, traumatic brain injury, alaryngeal speech

Broen, Patricia, Professor Emeritus
Ph.D., University of Minnesota
Language acquisition, phonological development

Carlstrom, Jane, Clinical Specialist
M.A., University of Iowa
Clinical audiology

Carney, Arlene, Professor
Ph.D., University of Minnesota
Rehabilitative audiology, speech perception

Davis, Julia, Professor Emeritus
Ph.D., University of Southern Mississippi
Rehabilitative audiology

DeRuiter, Mark, Associate Clinical Specialist
Ph.D., University of Minnesota
Auditory and language processing in children and adults

Fabry, David A., Adjunct Associate Professor
Ph.D., University of Minnesota
Audiology

Glaze, Leslie, Adjunct Assistant Professor
Ph.D., University of Wisconsin
Voice and resonance disorders, alaryngeal speech

Haroldson, Samuel, Professor Emeritus
M.A., University of Minnesota
Stuttering, laryngectomy

Hinderscheit, Linda, Clinical Specialist
M.A., University of Minnesota
Speech and language disorders

Kennedy, Mary, Associate Professor
Ph.D., University of Washington
Neurological disorders of communication

Kohnert, Kathryn, Associate Professor
Ph.D., University of California, San Diego
Language acquisition and disorders in bilingual and monolingual populations

McDermott, Richard, Professor Emeritus
Ph.D., University of Iowa
Phonological disorders

Moller, Karlind, Adjunct Professor
Ph.D., University of Minnesota
Craniofacial anomalies

Munson, Benjamin, Assistant Professor
Ph.D., The Ohio State University
Phonological development and disorders in children, language disorders in children

Nelson, Peggy, Associate Professor
Ph.D., University of Kansas
Psychoacoustics and speech perception, signal processing in hearing aids, pediatric audiology

Reichle, Joe, Professor
Ph.D., University of Wisconsin
Preschool language, augmentative communication

Schlauch, Robert, Associate Professor
Ph.D., University of Washington
Diagnostic audiology, cognitive influences on hearing

§ Siegel, Gerald, Professor Emeritus
Ph.D., University of Iowa
Stuttering, ethnographic approaches to communication disorders

***§ Speaks, Charles, Professor**
Ph.D., University of Michigan
Speech perception

Trine, Timothy D., Adjunct Assistant Professor
Ph.D., University of Minnesota
Hearing aids

Van Tasell, Dianne J., Adjunct Professor
Ph.D., Northwestern University
Hearing aids

Viemeister, Neal, Adjunct Professor
Ph.D., Indiana University
Auditory psychophysics and perceptions

Watson, Peter, Assistant Professor
Ph.D., University of Arizona, Tucson
Normal and disordered aspects of motor speech control, voice production

Windsor, Jennifer, Professor
Ph.D., Purdue University
Language acquisition and disorders, cognitive-linguistic processing

Wojtczak, Magdalena, Adjunct Assistant Professor
Ph.D., Adam Mickiewicz University, Poland
Auditory psychophysics

Zang, Yang, Assistant Professor
Ph.D., Yale University
Directional data analysis, time series analysis, chronobiometry

Statistics

Bingham, Christopher, Professor
Ph.D., Yale University
Directional data analysis, time series analysis, chronobiometry

Chatterjee, Singdhansu, Assistant Professor
Ph.D., Indian Statistical Institute
Resampling techniques, small area estimation, curve estimation, stochastic processes

Cook, R. Dennis, Professor
Ph.D., Kansas State University
Linear and nonlinear models, regression diagnostics, graphical methods

Dickey, James, Professor
Ph.D., University of Michigan
Bayesian statistics, expert opinion modeling, smoothing analysis, foundations of inference

Eaton, Morris, Professor Emeritus
Ph.D., Stanford University
Multivariate analysis, probability inequalities, decision theory, Bayesian analysis

Geyer, Charles, Professor
Ph.D., University of Washington
Markov chain Monte Carlo, constrained maximum likelihood, statistical genetics

Grund, Birgit, Associate Professor
Ph.D., Humboldt-Universität, Berlin
Curve estimation, kernel smoothing, AIDS research

Hawkins, Douglas, Professor
Ph.D., University of the Witwatersrand, Johannesburg, South Africa
Quality improvement, case diagnostics, geostatistics

Jiang, Tiefeng, Associate Professor
Ph.D., Stanford University
Mathematical biology, pattern recognition, large deviations, Chen-Stein method

Jones, Galin, Assistant Professor
Ph.D., University of Florida
Convergence of Markov chains, generalized linear mixed models

Lindgren, Bernard, Professor Emeritus
Ph.D., University of Minnesota
Statistical education, general theory

Martin, Frank, Associate Professor
Ph.D., Iowa State University
Experimental design, analysis of variance procedures, population sampling

Meeden, Glen, Professor
Ph.D., University of Illinois
Decision theory, Bayesian inference, finite population sampling

Oehlert, Gary, Professor
Ph.D., Yale University
Data analysis, environmental trend analysis, nonparametric regression

Qiu, Peihua, Associate Professor
Ph.D., University of Wisconsin, Madison
Nonparametric regression, curve/surface fitting, image processing, calibration

Shen, Xiaotong, Professor
Ph.D., University of Chicago
Likelihood methods, semi/nonparametric models, classification, applications in health engineering and health sciences

Sudderth, William, Professor
Ph.D., University of California, Berkeley
Probability theory, stochastic games, foundations of statistics

Wang, Lan, Assistant Professor
Ph.D., Pennsylvania State University
Model with large number of parameters, nonparametric ANCOVA, lack-of-fit test in nonparametric regression

Weisberg, Sanford, Professor
Ph.D., Harvard University
Regression and modeling, diagnostics, graphical methods, computing

Theatre Arts and Dance

Bartl, Judy, Associate Program Director and Director, B.F.A.-Guthrie Acting Program
B.A., Mankato State University

Bellamy, Louis, Associate Professor
M.A., University of Minnesota
Directing, acting

Bernstein, David, Associate Development Officer
A.B., University of Rochester, New York
Theatre critique

Binder, Susan, Lecturer
M.F.A., Temple University, Philadelphia
Costume technology

Brockman, C. Lance, Professor
M.S., Kansas State Teachers College
Scene design, scene painting

Carlson, Elisa, Teaching Specialist
M.F.A., University of Wisconsin
Voice and speech training

Chatterjea, Ananya, Associate Professor
Ed.D., Temple University
Dance history and theory

Flink, Carl, Associate Professor
J.D., Stanford Law School
Modern dance technique and dance composition

Geier, Heidi, Lecturer
Dance history

Grotting, Karla, Teaching Specialist
Jazz dance technique and tap

Gwinup, Martin, Associate Professor
M.F.A., Yale University
Technical production, digital audio, computer control and visual systems

Henry, Brent, Associate Educational Specialist
M.F.A., University of Arizona
Design and technical production

Holshue, Lucinda, Lecturer
M.F.A., University of California, San Diego
Voice and speech training

Jakovljevic, Branislav, Assistant Professor
Ph.D., City University of New York
Theatre history, introduction to theatre

Kobialka, Michal, Associate Professor
Ph.D., City University of New York
Theatre history/theory; medieval, avant-garde, postmodern theatre, historiography

Kuftinec, Sonja, Associate Professor
Ph.D., Stanford University
Theatre history, performance art and theory, American theatre

LeFebvre, Matthew, Associate Professor
M.F.A., University of Minnesota
Costume design, drawing and rendering

Maddux, Margaret L., Associate Professor
M.A., Sarah Lawrence College
Modern dance, choreography, ethnic and theory

Mann, Paula, Lecturer
Modern dance technique, improvisation and dance composition

Margolis, Kari, Teaching Specialist
Acting, movement

Montgomery, Jean, Associate Professor
M.F.A., University of Minnesota
Lighting design, stage management

Nash, Elizabeth, Associate Professor
Ph.D., Indiana University
Voice, speech, singing

Pierce-Sands, Toni, Teaching Specialist
Modern dance technique and performance training

Smith, Joan Anne, Associate Professor
M.A., University of California, Los Angeles

Modern dance, choreography
Sommers, Michael, Teaching Specialist
Puppetry

Stephens, Kent, Teaching Specialist
B.A., Yale University
Stanislavski and characterization techniques

Venard Dierks, Shirley, Teaching Specialist
B.A., University of Minnesota
Career preparation for the actor

Wagner, Matthew, Assistant Professor
Ph.D., University of Minnesota
Theatre history and theory

Wagner-Henry, Sherry, Teaching Specialist
M.B.A., Illinois State University
Theatre management

Werry, Margaret, Assistant Professor
Ph.D., Northwestern University
Theatre history and theory, drama and the media

Wolska, Aleksandra, Assistant Professor
Ph.D., Stanford University
Directing

Women's Studies

Craddock, Susan, Associate Professor
Ph.D., University of California, Berkeley
Health and medicine; gender, race, and social equity

Desai, Jigna, Associate Professor
Ph.D., University of Minnesota
Postcolonialism, Asian-American, South Asian diaspora, globalization, transnational cultural studies

Kaminsky, Amy, Professor
Ph.D., Pennsylvania State University
Feminist literary theory, Latin American women writers, exile

Nagar, Richa, Associate Professor
Ph.D., University of Minnesota
Feminist ethnography, cultural geography, international feminisms, development theory

§ Scheman, Naomi, Professor
Ph.D., Harvard University
Feminist epistemology, theories of individual and collective identity

Torres, Eden, Associate Professor
Ph.D., University of Minnesota
Chicana feminist/cultural theory, race, class, gender, ethnicity

***§ Zita, Jacquelyn, Associate Professor**
Ph.D., Washington University
Feminist theory and philosophy, gender, lesbian/gay studies

Carlson School of Management (CSOM)

Administration

Alison Davis-Blake, Dean

John Fossum, Associate Dean of Faculty and Research

Robert W. Ruekert, Associate Dean of Undergraduate Programs

Michael Houston, Associate Dean of International Programs

Ed Joyce, Associate Dean of MBA Programs

Deb Cundy, Assistant Dean of External Relations

Carolyn Chase, Assistant Dean of Operations

Michelle Wills, Chief Financial Officer

Mahmood Zaidi, Director of International Program Development

Kathryn Johnson, Director of Diversity

Doug Lund, Director of the Office of Information Technology

Lori Kocer, Director of Alumni Relations

Chris Mayr, Chief Development Officer

Louise Muldoon, Director of Marketing Services

William T. Scheurer, Director of Executive Development Center

Paul Johnson, Director of Graduate Studies, Ph.D. Program in Business Administration

Kathryn Carlson, Assistant Dean and Director of Part-time M.B.A. and Executive M.B.A. Programs

Carleen Kerttula, Assistant Dean and Director of Full-time M.B.A. Programs

Mary Maus Kosir, Assistant Dean and Director of Undergraduate Programs

Frederick R. Jacobs, Director of Graduate Studies, M.B.T. Program

Laurence Kallio, Director of MAcc Program

Avner Ben-Ner, Director of Ph.D. Programs in Industrial Relations

John Budd, Director of M.A. Program in Industrial Relations

Connie Wanberg, Director of Industrial Relations Center

Howard Kling, Director of Labor Education Service

Clare Foley, Director, Graduate Business Career Center

Morgan Kinross-Wright, Director of Undergraduate Business Career Center

Faculty

Accounting

Beil, Frank, Senior Lecturer
A.B.D., Webster University

Biondich, Nick, Senior Lecturer
M.S., University of North Dakota

Caliendo, Charles, Senior Lecturer
M.B.A., University of Minnesota

Carter, Gary, Senior Lecturer
Ph.D., University of Texas, Austin

Dickhaut, John W., Professor and Curtis L. Carlson Chair in Accounting
Ph.D., The Ohio State University
Economic and psychological determinants of accounting phenomena

Duke, Gordon L., Associate Professor
Ph.D., University of Georgia
Accounting systems, statistics, quantitative methods

Gigler, Frank, Associate Professor and Honeywell Professor in Accounting
Ph.D., University of Minnesota
Financial disclosure theory, industrial organization of audit markets

§ Gutterman, Paul, Senior Lecturer
L.L.M. in Taxation, New York University

Felton, Mark, Senior Lecturer
M.B.A, University of Minnesota

Jacobs, Fred, Senior Lecturer and Director of M.B.T.
Ph.D., University of Wisconsin, Madison

Joyce, Edward J., Professor
Ph.D., University of Illinois
Behavioral decision-making

Kallio, Larry, Senior Lecturer
M.B.A., University of Minnesota Duluth

Kanodia, Chandra, Professor and Arthur Andersen & Co/Duane R Kullberg Chair in Accounting and Information Systems
Ph.D., Carnegie Mellon University
Auditor liability and audit pricing

Rayburn, Judy D., Professor, and Department Chair
Ph.D., University of Iowa
Capital markets

Shroff, Pervin, Associate Professor
Ph.D., Columbia University
Capital market based accounting

Tranter, Terry, Senior Lecturer
Ph.D., University of Washington

Venkataraman, Ramgopal, Assistant Professor
Ph.D., Penn State University

Financial accounting, disclosure
White, Paul, Teaching Specialist
B.S.B., University of Wisconsin, Eau Claire

Zhang, Ivy, Assistant Professor
A.B.D., University of Rochester
Financial Accounting

Business Law

Andrews, Albert, Jr., Senior Lecturer
L.L.B., University of Minnesota
Finance

Alexander, Gordon J., Professor, John Spooner Chair in Investment Management, and Department Chair
Ph.D., University of Michigan
Investments, portfolio theory and management

Aggarwal, Rajesh, Associate Professor
Ph.D., Harvard
Corporate finance, economics of organizations, optimal capital structure, executive compensation

Benzoni, Luca, Assistant Professor
Ph.D., Northwestern University
Asset pricing, time series econometrics, empirical finance

Boyd, John H., Professor and Frederick R. Kappel Chair in Business and Government Relations
Ph.D., University of Pennsylvania
Finance and development, financial intermediation, banking, contract theory

Carkovic, Maria, Senior Fellow
Ph.D., University of California, Los Angeles
International economics, development economics, macroeconomics

Chang, Chun, Professor and Minnesota Banking & Finance Term Professor
Ph.D., Northwestern University
Economics of incentives and information, comparative economic institutions

Frank, Murray, Professor, Piper Jaffrey Chair in Finance
Ph.D., Queens University
Corporate finance

Gahlon, James, Senior Lecturer
Ph.D. University of Illinois

Goldstein, Robert, Associate Professor
Ph.D., University of California at Berkeley
Term structure of interest rates, credit risk, capital structure theory, general equilibrium

Levine, Ross, Professor, Curtis L. Carlson Professor of Finance
Ph.D., University of California, Los Angeles
International finance, financial regulations and policies, economic development

Meschke, Felix, Assistant Professor
A.B.D., Arizona State University
Corporate finance, corporate governance, mutual funds, international finance

Nantell, Timothy J., Professor
Ph.D., University of Wisconsin
Corporate finance, corporate restructuring

Nelson, Richard, Senior Lecturer
M.B.A., University of Minnesota

Parente, Stephen, Assistant Professor
Ph.D., Johns Hopkins University
Managed care, health information technology, heath economics

Polkovnichenko, Valery, Assistant Professor
Ph.D., Northwestern University
Asset pricing, incomplete markets, portfolio choice

Povel, Paul, Assistant Professor
Ph.D., London School of Economics
Financial contracting, corporate finance, corporate restructuring

Singh, Rajdeep, Associate Professor and Minnesota Banking & Finance Term Professor
Ph.D., Carnegie Mellon University
Corporate finance, auction theory, agency models, mergers and acquisitions, market microstructure

Wang, Tracy Yue, Assistant Professor
Ph.D., University of Maryland, College Park
Corporate finance, corporate governance, behavioral finance

Whitman, Andrew, Professor
Ph.D., University of Wisconsin, Madison
Insurance law, coverage, and claims; corporate risk management

Winton, Andrew, Professor and Minnesota Banking Chair
Ph.D., Wharton School, University of Pennsylvania
Financial contracting, corporate finance

Yu, Frank, Senior Lecturer
A.B.D., University of Chicago
Human Resources and Industrial Relations

Arvey, Richard D., Professor and Industrial Relations Land-Grant Chair
Ph.D., University of Minnesota
Staffing, training, and development

Azevedo, Ross E., Associate Professor
Ph.D., Cornell University
Compensation systems, human resource planning and skills inventories

Ben-Ner, Avner, Professor and Department Chair
Ph.D., State University of New York, Stony Brook
Theory of organization, employee ownership, nonprofit organizations

§ Bognanno, Mario F., Professor
Ph.D., University of Iowa
Labor markets, collective bargaining, arbitration

§ Budd, John, Professor and Industrial Relations Land-Grant Professor
Ph.D., Princeton University
Collective bargaining and industrial relations, labor policy

§ Fossum, John A., Professor and Acting Associate Dean of Faculty and Research
Ph.D., Michigan State University
Compensation

Glomb, Theresa, Associate Professor and Carlson School Professor Human Resources & Industrial Relations
Ph.D., University of Illinois
Workplace aggression and violence, sexual harassment

Lluis, Stephanie, Assistant Professor
PhD., University of Montreal
Labor economics, applied economics

§ McCall, Brian, Professor
Ph.D., Princeton University
Applied econometrics, econometric theory, economics of information

Remington, John, Professor
Ph.D., University of Michigan
Collective bargaining and industrial relations, labor arbitration

Scoville, James G., Professor
Ph.D., Harvard University
International and comparative industrial relations

Wanberg, Connie, Professor and Curtis L. Carlson Professor of Industrial Relations
Ph.D., Iowa State University
Psychological experience of unemployment, job-seeking behavior

Wang, Yijiang, Professor
Ph.D., Harvard University
Organization theory, theory of the firm, monetary economics

Zaidi, Mahmood A., Professor
Ph.D., University of California, Berkeley
International labor market analysis, human capital and multinationals

Information and Decision Sciences

Adams, Carl R., Professor
Ph.D., Purdue University
Problem-solving methodology

Adomavicius, Gediminas, Assistant Professor
Ph.D., New York University
Personalization technologies and customer relationship management, knowledge discovery and data mining

Chervany, Norman L., Professor and Carlson School Professor of Information and Decision Sciences
Ph.D., Indiana University
Management of technology-based change

Curley, Shawn P., Professor
Ph.D., University of Michigan
Decision and judgment processes, belief processing

Gupta, Alok, Professor and Carlson School Professor of Information and Decision Sciences
Ph.D., University of Texas
Electronic commerce, data communication

Johnson, Paul E., Professor and Curtis L. Carlson Chair in Decision Sciences
Ph.D., Johns Hopkins University
Decision making, intelligent systems, knowledge work

Kauffman, Robert J., Professor and Department Chair
Ph.D., Carnegie Mellon University
Information technology and financial services

Naumann, David J., Associate Professor
Ph.D., University of Minnesota
Telecommunications, information systems analysis and design programming, systems development

Riggins, Frederick J., Assistant Professor
Ph.D., Carnegie Melon University
Business models for internet-based commerce, e-business strategy

Subramani, Mani, Associate Professor
D.B.A., Boston University
Management of effective IS-user relationships, determinants of governance in IT mediated interorganizational relationships

Xia, Weidong, Assistant Professor
Ph.D., University of Pittsburgh
Organizational impact of information technology, IT infrastructure management, adoption/usage of IT

Marketing and Logistics Management

Ahluwalia, Rohini, Associate Professor
Ph.D., The Ohio State University
Consumer processing of negative and counter-attitudinal information in the marketplace, branding/information processing perspective

§ Bergen, Mark, Professor and Carolyn I. Anderson Professor in Business Education Excellence
Ph.D., University of Minnesota
Channels of distribution, pricing

Chandy, Rajesh, Associate Professor and Carlson School Professor of Marketing
Ph.D., University of Southern California
Radical innovation, technology management

Cui, Tony, Assistant Professor
Ph.D., University of Pennsylvania
Behavioral economics, pricing, trade promotions, competitive strategies with limited supply, game theory

Dong, Yan, Assistant Professor
Ph.D., University of Maryland
Supply chain management and optimization

Ebert, Jane, Assistant Professor
Ph.D., Harvard University
Consumer behavior, information processing

Hansen, Robert A., Associate Professor
Ph.D., University of Wisconsin
Developing marketing strategies for public sector services

Houston, Michael J., Professor, Interim Co-Dean, and Ecolab-Grieve Chair in International Marketing
Ph.D., University of Illinois
Consumer behavior and culture, international marketing

John, Deborah Roedder, Professor and Curtis L. Carlson Chair in Marketing
Ph.D., Northwestern University
Children's consumer behavior, consumer information processing

John, George, Professor and Pillsbury/ Gerot Chair in Marketing
Ph.D., Northwestern University
Marketing channels, industrial marketing, high technology markets

Loken, Barbara J., Professor
Ph.D., University of Illinois
Consumer behavior: brand equity, attitude measurement, categorization

Meyers-Levy, Joan, Professor
Ph.D., Northwestern University
Consumer information processing and psychology, gender differences in information processing

Mueller, Wayne, Senior Lecturer
M.B.A., University of Saint Thomas

Mukherji, Prokriti, Assistant Professor
Ph. D., University of Southern California
Structured econometric modeling with emphasis on models of quality learning

Narasimhan, Om, Assistant Professor
Ph.D., University of Southern California
Inter-organizational arrangements, competitive advantage

Rao, Akshay, Professor, General Mills Professor of Marketing, and Department Chair
Ph.D., Virginia Polytechnic Institute and State University
Pricing

§ Roering, Kenneth J., Professor
Ph.D., University of Iowa
Marketing planning and corporate strategy, market-driven new product development

Ruekert, Robert W., Professor and Acting Associate Dean of Programs
Ph.D., University of Wisconsin
Marketing strategy, marketing organization and implementation

Upton, Kevin, Senior Lecturer
M.B.A., University of Minnesota

Vohs, Kathleen, Assistant Professor
Ph.D., Dartmouth College
Consumer psychology
Operations and Management Science

Anderson, John C., Professor
Ph.D., University of Minnesota
Quality management, operations strategy, operations analysis

Connor, Robert, Associate Professor
Ph.D., Wharton School, University of Pennsylvania
Market structure and access to service in the health sector

Donohue, Karen, Associate Professor
Ph.D., Northwestern University
Supply chain management, design and analysis of manufacturing systems

Hill, Arthur V., Professor and John and Nancy Lindahl Professorship for Excellence in Business Education
Ph.D., Purdue University
Operations management, production and inventory management, international operations management

Huchendorf, Steve, Senior Lecturer
Ph.D., Illinois State University

Li, William, Associate Professor
Ph.D., University of Waterloo
Experimental design, optimal design, robust design

Linderman, Kevin, Associate Professor
Ph.D., Case Western Reserve University
Statistical quality control, quality management, manufacturing planning and control systems, six sigma

Mallick, Debasish, Assistant Professor
Ph.D., University of Texas, Austin
Management of technology, new product development

Meyer Goldstein, Susan, Associate Professor
Ph.D., The Ohio State University
Quality management in health care, service process management, operations strategy

Nachtsheim, Christopher J., Professor, Curtis L. Carlson Professor of Operations and Management Science, and Department Chair
Ph.D., University of Minnesota
Experimental design, regression and analysis of variance

*** Schroeder, Roger G., Professor, Frank A. Donaldson Chair in Operations Management**
Ph.D., Northwestern University
Operations strategy, quality management, process and product innovation

Sinha, Kingshuk, Professor and Curtis L. Carlson Family Foundation Professor of Management Science
Ph.D., University of Texas, Austin
Management of technology, operations strategy

Shah, Rachna, Assistant Professor
Ph. D., The Ohio State University
Lean manufacturing systems, supply chain management

Strategic Management and Organization

Abrams, Lori, Senior Lecturer
Ph.D., University of Minnesota

Albert, Stuart, Associate Professor
Ph.D., The Ohio State University
Organizational change, metaphor and organizational change

Benraouane, Sid, Senior Lecturer
Ph.D., University of Minnesota

Bowie, Norman E., Professor and Elmer Andersen Chair in Corporate Responsibility
Ph.D., University of Rochester, New York
Corporate responsibility, international business ethics, leadership

Bromiley, Philip, Professor, Curtis L. Carlson Chair in Strategic Management
Ph.D., Carnegie Mellon University
Risk-taking in organizations, strategic decision processes

DeVaughn, Michael, Assistant Professor
Ph. D., University of Wisconsin, Madison
Organizational learning

Erickson, W. Bruce, Professor
Ph.D., Michigan State University
Antitrust economics, venture capital, Minnesota small businesses

Forbes, Daniel, Assistant Professor
Ph.D., New York University
Strategic decision making, venture creation in internet-related industries

Fox, Isaac, Senior Lecturer
Ph.D., University of Minnesota

Maitland, Ian, Professor
Ph.D., Columbia University
Business ethics, ethics and markets, international business

Marcus, Alfred A., Professor
Ph.D., Harvard University
Acquisition of competence and organizational learning

Murtha, Thomas, Associate Professor
Ph.D., New York University
Global sourcing strategy and management, industrial policy

Nichols, Mary L., Professor
Ph.D., University of Kansas
Individual and organizational decision making, organizational design

Rao, Dileep, Senior Lecturer
Ph.D., University of Minnesota

Sapienza, Harry, Professor and Curtis L. Carlson Chair in Entrepreneurial Studies
Ph.D., University of Maryland
Inter-organizational relationships, strategic decision making

Schnatterly, Karen, Assistant Professor
Ph.D., University of Michigan
Internal and external governance, white collar crime

Shah, Priti P., Associate Professor
Ph.D., Northwestern University
Social networks, group goal setting, negotiation

Shaver, J. Myles, Professor and Carlson School Professor of Strategic Management and Organization
Ph.D., University of Michigan
Firm exporting strategies, investment location choice

Spruth, Steve, Senior Lecturer
M.B.A., Yale School of Management

Van de Ven, Andrew H., Professor and Vernon H. Heath Chair of Organizational Innovation and Change
Ph.D., University of Wisconsin
Organization and management theory, management of innovation and change

Zaheer, Aks, Professor and Curtis L. Carlson Professor of Strategic Management and Organization
Ph.D., Massachusetts Institute of Technology
Competitive advantage for inter-firm relationships

Zaheer, Srilata, Professor and Curtis L. Carlson Professor of Strategic Management and Organization, and Department Chair
Ph.D., Massachusetts Institute of Technology
Dynamic competitive advantage, the process of globalization

Zahra, Shaker, Professor and Robert E. Buuck Chair in Entrepreneurship
Ph.D., University of Mississippi
Corporate entrepreneurship, internationalization of entrepreneurial firms, learning/dynamic capability development in technology-based new firms

Zellmer-Bruhn, Mary, Assistant Professor
Ph.D., University of Wisconsin
Class cultural issues in teamwork, time related effects in organizational behavior

Zhao, Minyuan, Assistant Professor
Ph.D., New York University
International R&D strategy, international management and innovation

Medical Technology

Administration

Spannaus-Martin Donna, Yvonne C. Cooke Professor and Director
Ph.D., Iowa State University
Clinical chemistry, distance education

Solberg, Patricia, Administrative Associate
B.A., Gustavus Adolphus College
Education, student recruitment and retention, clinical chemistry

Faculty

Gleason, William, Associate Professor
Ph.D., University of Minnesota
Clinical chemistry, biomaterials, biomolecular recognition

Hanson, Naomi, Assistant Professor
M.S., University of Minnesota
Clinical chemistry, molecular biology

Swinehart, Cheryl, Assistant Professor
M.S., University of Minnesota
Hemostasis, hematology

Tsai, Michael, Professor
Ph.D., Medical College of Wisconsin
Biochemical/molecular genetics, cardiovascular disease, clinical chemistry

Tudor, Kim-Sue, Assistant Professor
Ph.D., University of Cincinnati
Regulation of B-lymphopoiesis in mice and humans

Wells, Carol, Mildred King Rohwer Professor
Ph.D., University of Wisconsin, Madison
Diagnostic microbiology and microbial pathogenesis

Teaching Specialists

Clysdale, Sarah, Teaching Specialist
B.S., University of Minnesota
Clinical chemistry

Coley, Nancy, Teaching Specialist
B.S., University of Minnesota
Immunohematology

George, Joanna, Manager, Teaching Laboratories
B.S., Minot State University, S.B.B., Tidewater Red Cross, Norfolk, Virginia
Immunohematology, microbiology, laboratory safety

Lorenz, Janet, Teaching Specialist
B.S., Moorhead State University
Hematology

King, Lynn, Teaching Specialist
B.S., University of Minnesota
Clinical chemistry

Porisch, Katherine, Teaching Specialist
B.S., University of Minnesota
Clinical chemistry

Ramey, Mary, Teaching Specialist
B.S., University of North Dakota
Hematology

Yue, Mary Jane, Teaching Specialist
M.S., Northeastern University
Hematology

Mortuary Science

Faculty and Staff

LuBrant, Michael P., Assistant Professor and Director
M.A., St. Bernard's Institute
Embalming, restorative art

Amatuzio, Janis, Teaching Specialist
M.D., University of Minnesota
Forensic pathology

Burger, Earl, Assistant Professor
M.A., University of St. Thomas
Restorative art

Dougherty, Michael, Instructor
B.S., University of Minnesota
Embalming, restorative art

Grayson, Peter, Teaching Specialist
J.D., William Mitchell College of Law
Business law, funeral service law

LaCourt, Jody, Instructor
B.S., University of Minnesota
Embalming

Mathews, Michael C., Assistant Professor
M.A., University of St. Thomas
History, embalming chemistry, microbiology, embalming theory, funeral practice

McArthur, Angela, Instructor
B.S., University of Minnesota
Human anatomy, embalming

Roach Thomas, Gloria, Teaching Specialist
M.Ed., Winthrop University
Cultural diversity, religion

Tibbetts, Steven P., Assistant Professor
M.A., University of Minnesota Duluth
Funeral psychology and counseling

Nursing

Administration

Connie W. Delaney, Ph.D., Dean

Ruth Lindquist, Ph.D., Senior Associate Dean for Academic Affairs

Donna Bliss, Ph.D., Interim Associate Dean for Research

Ann Garwick, Ph.D., Interim Associate Dean for Research

Kathleen Krichbaum, Ph.D., Division I Head

Marsha Lewis, Ph.D., Director of Graduate Studies

Mary Rowan, Ph.D., Director, Post-Baccalaureate Certificate Program

Ann Jones, D.N.Sc., Director of Undergraduate Studies and Interim Director of Student Services

Linda Herrick, Ph.D., Coordinator UMR

Paul Sodergren, B.S., Administrative Director

Kim Zemke, M.S., Director of Faculty Practice

Mary Pattock, B.A., Communications Director

Laurel Mallon, B.S., Development Officer

Faculty

Avery, Melissa, Associate Professor
Ph.D., University of Minnesota
Exercise in pregnancy, exercise and gestational diabetes

Bearinger, Linda, Professor
Ph.D., University of Minnesota
Multiethnic issues in adolescent health

Bliss, Donna, Interim Associate Dean for Research and Professor
Ph.D., University of Pennsylvania
Managing fecal incontinence with dietary fiber

Carney Anderson, Lisa, Lecturer
Ph.D., University of Minnesota
Anesthesia management for Parkinson's patients

Chlan, Linda L., Associate Professor
Ph.D., University of Minnesota
Outcomes and effectiveness of nursing interventions

Delaney, Connie, Dean and Professor
Ph.D., University of Iowa
Health informatics

Disch, Joanne, Professor
Ph.D., University of Michigan
Nursing leadership and management

*** Duckett, Laura, Associate Professor**
Ph.D., University of Minnesota
Breastfeeding behaviors, parent-infant attachment

Edwardson, Sandra, Professor
Ph.D., University of Minnesota
Administrative and health care policy issues related to outcomes

Fagerlund, Kathy, Assistant Professor
Ph.D.
Nurse anesthesia

Fulkerson, Jayne, Associate Professor
Ph.D., University of Minnesota
Risk and protective factors in the development of eating disorders, obesity, substance use, and mental health among children and adolescents

Garwick, Ann, Interim Associate Dean for Research and Professor
Ph.D., University of Minnesota
Family health and care-giving, family stress and coping

Gaugler, Joseph, Assistant Professor
Ph.D., Pennsylvania State University
Longitudinal implications of family care for chronically disabled adults

Gerdner, Linda, Assistant Professor
Ph.D., University of Iowa
Management of agitation in Alzheimer's disease and related disorders (ADRD), culturally sensitive care for persons with ADRD and their family caregivers

Gross, Cynthia, Professor
Ph.D., Yale University
Quality of life after transplantation

Gulzar, Laila, Assistant Professor
Ph.D., University of Illinois, Chicago
International and inter-organizational collaboration, cross-cultural health and cultural competence

Gustafson, Marilyn R., Associate Professor Emeritus
Ph.D., Walden University
Education, international nursing

Halcón, Linda, Associate Professor
Ph.D., University of Minnesota
Complementary therapies and infectious diseases

Hansen, Helen, Associate Professor
Ph.D., University of Kansas, Lawrence
Leadership, collaboration, and systems management

Henly, Susan J., Professor
Ph.D., University of Minnesota
Psychometric methods for health sciences research

Herrick, Linda, Assistant Professor
Ph.D., University of Minnesota
Postoperative pain management, patient satisfaction, nursing management, research utilization

Ann Jones, Director of Undergraduate Studies and Assistant Professor
D.N.Sc., Rush University
Transition experiences of new graduate nurses

Josten, LaVohn, Associate Professor Emeritus
Ph.D., University of Minnesota
Effectiveness of interventions with high-risk families

§ Kaas, Merrie, Associate Professor
D.N.Sc., University of California, San Francisco
Nursing interventions: women with late life depression

Kerr, Madeline, Associate Professor
Ph.D., University of Michigan
Preventing occupational hearing loss

Kreitzer, Mary Jo, Associate Professor and Director, Center for Spirituality and Healing
Ph.D., University of Minnesota
Prayer/spirituality for MS and transplant patients

Krichbaum, Kathleen, Associate Professor and Division I Head
Ph.D., University of Minnesota
Developing healthy self-care abilities in elders

Kubik, Marti, Assistant Professor
Ph.D., University of Minnesota
School and community-based intervention research

Leonard, Barbara, Professor and Director, Center for Children With Special Health Care Needs
Ph.D., University of Minnesota
Children and adolescents with type I diabetes

Lewis, Marsha, Associate Professor and Director of Graduate Studies
Ph.D., University of Minnesota
Decision making training: dementia patient caregivers

Liaschenko, Joan, Associate Professor
Ph.D., University of California, San Francisco
Nursing ethics, study of nursing practice

Lichtblau, Len, Lecturer
Ph.D., University of Minnesota
Pharmacology

Lindeke, Linda, Associate Professor
Ph.D., University of Minnesota
Health care issues of children and families

Lindquist, Ruth, Senior Associate Dean for Academic Affairs and Professor
Ph.D., University of Minnesota
Quality of life and adjustment to cardiovascular and neurological diseases, behavior change adherence

Looman, Wendy, Assistant Professor
Ph.D., University of Michigan
Social capital, family-community interactions: special needs children

Moss, Margaret, Assistant Professor
D.S.N., University of Texas, Houston
Making medical anthropology clinically relevant for urban and reservation-based American Indians

Mueller, Christine, Associate Professor
Ph.D., University of Maryland, Baltimore
Quality of care in nursing homes

O'Boyle, Carol, Assistant Professor
Ph.D., University of Minnesota
International health, nursing theory, infectious disease, infection control, nursing leadership

O'Connor-Von, Susan, Assistant Professor
D.N.Sc., Rush University
Pediatric pain, nonpharmacologic interventions, child stress and coping

Peden-McAlpine, Cynthia, Associate Professor
Ph.D., Adelphi University, Garden City, New York
Hermeneutic and phenomenological methods

Plumbo, Margaret, Instructor
M.S., C.N.M., University of Minnesota
Nurse midwifery, women's health, depression and the family

Robertson, Cheryl, Assistant Professor
Ph.D., University of Minnesota
Refugee health, war trauma and torture

Sieving, Renee, Associate Professor
Ph.D., University of Minnesota
Youth-health promotion

Snyder, Mariah, Professor Emeritus
Ph.D., University of Minnesota
Nursing interventions, identification and determining efficacy

Treat-Jacobson, Diane, Assistant Professor
Ph.D., University of Minnesota
Outcomes of exercise training in patients with claudication from peripheral arterial disease (PAD)

Urueta, Romana, Assistant Professor
M.S., University of California, Los Angeles
Pediatric nursing

Weisensee, Mary G., Assistant Professor Emeritus
Ph.D., Michigan State University
Caregivers' perceptions

Westra, Bonnie, Assistant Professor
Ph.D., University of Wisconsin, Milwaukee
Informatics, business process improvement, systems analysis, quality improvement, public policy, health policy

Wyman, Jean, Professor
Ph.D., University of Washington
Urinary incontinence, outcomes and measurement

Zunkel, Gretchen, Assistant Professor
Ph.D., University of Washington
Women's mental health; self regulation

Teaching Specialists

Alaniz, Karin
Ph.D., University of Minnesota
Asthma self-management in children, chronic illness in children

Anderson, Joyce
M.S., F.N.P., University of Minnesota

Aspen, Fern
M.S., C.N.M., University of Minnesota

Bata-Jones, Bonnie
M.S., F.N.P., University of North Dakota, Grand Forks
Diabetes education

Benbenek, Mary
M.S., F.N.P., P.N.P., University of Minnesota
Primary care, pharmacology, pediatrics

Bernardy, David
Ph.D.

Beyer, Nancy
M.S., University of Minnesota

Botz, Dana
M.S.N., University of Minnesota

Boyer, Cindy
Ph.D., Case Western Reserve University

Caines, Karen
M.S.N., Vanderbilt University

Carey, Kris
M.S.N., University of Minnesota
Oncology, diabetes, renal-adult medical/surgical

Coates, Jennifer
M.S.N., Emory University

Daniels, Jessie
M.A., University of Iowa
Medical surgical nursing

Dean, Patrick
M.S., Winona State University

Dierich, Mary
M.S.N., University of Minnesota
Urinary incontinence disorders

Eichten, Ellen
M.S.N., University of Minnesota

Eschle, Roseanne
M.A.

Fjone, Andra
M.N.

Flaten, Carol
M.S., University of Minnesota

Friedrich, Cheri
M.S., P.N.P., University of Minnesota

Frisvold, Melissa
M.S.N., C.N.M., University of Minnesota

Goering, Mary
M.S., University of Minnesota

Grimsrud, Nancy
M.A., P.N.P.

Hanninen, Linda
M.S., University of Minnesota
Maternal child health

Harpin, Scott
M.S., M.P.H., University of Minnesota

Hinck, Pat
M.S.

Juve, Cathy
Ph.D., University of Minnesota
Substance abuse in pregnancy

Kessler, Penny
M.N.

Larson, Karin
M.S., C.N.M., University of Utah

Larson, Karina
M.S., University of Minnesota

Leaman, Karen
M.S., University of Cincinnati

Moreland, Dee
M.S.N., University of Minnesota

Nuxoll, Kim
M.S.N.

Nygaard, Georgia
M.A., A.N.P., College of St. Catherine, St. Paul
Primary care of adults

Pfeiffer, Jeanne
M.P.H., University of Minnesota

Poe, Christine
M.P.H., P.N.P., University of Minnesota
Pediatric nurse practitioner

Pollard, Mary
M.Ed.

Quast, Sharon
M.P.H., University of Minnesota
Education/mental health and pediatrics, role modeling

Ringdahl, Deborah
M.S., C.N.M., University of Minnesota
Nurse midwifery

Rossi, Mary
M.S., C.N.M., University of Minnesota

§ Rowan, Mary, Director, Post-Baccalaureate Certificate Program
Ph.D., University of Minnesota
Maternal-child health/childbearing families

Schadewald, Diane
M.S.N., University of North Carolina, Chapel Hill

Smith, Kevin
M.S.N., F.N.P., University of Kentucky
Family nurse practitioner, advanced nurse assessment

Steffes, Mary
M.S., University of Minnesota
Adult health, critical care

Wachdorf, Cecilia
Ph.D.

Wilking, Judy
M.S., University of Minnesota

Zaccagnini, Mary
M.S., University of Minnesota

Institute of Technology (IT)

Administration

Steven Crouch, Professor and Dean

Mos Kaveh, Associate Dean, Research and Planning

Peter Hudleston, Associate Dean, Student Affairs

Roberta Humphreys, Associate Dean, Academic Affairs

Sara Beyer, , Director, Alumni Relations

Mark Sorenson-Wagner, Director, Career Center for Science and Engineering

James Leger, Director, Lower Division Programs

Madonna Monette, Director, Finance

TBA, Director, Development

Robert Pepin, Director, Honors

Benjamin G. Sharpe, Director, Admissions

Frank Snowden, Director, Academic Program for Excellence in Engineering and Science

Rhonda Zurn, Director, Communications

Karen Wolterstorff, Associate to the Dean

Faculty

In the following list, P.E. designates licensure as a professional engineer in Minnesota, unless otherwise indicated.

Aerospace Engineering and Mechanics

Balas, Gary J., Professor
Ph.D., California Institute of Technology
Aerospace control systems: experimental and theoretical

§ Beavers, Gordon S., Professor Emeritus
Ph.D., Cambridge University
Experimental fluid mechanics, rheological fluid mechanics

Candler, Graham V., Distinguished McKnight University Professor
Ph.D., Stanford University
Hypersonic aerodynamics, computational fluid dynamics, high-temperature gas physics thermochemical non-equilibrium flows

Elliott, Ryan, Assistant Professor
Ph.D., University of Michigan
Martensitic phase transformations; shape memory alloys; atomistic materials simulation; stability and bifurcation.

Enns, Dale F., Adjunct Associate Professor
Ph.D., Stanford University
Controls, dynamics, aeroelasticity, flight mechanics, dynamical systems

Fosdick, Roger L., Professor
Ph.D., Brown University
Thermodynamics and continuum mechanics at the applies and foundation levels, non-linear material behavior using the methods of applied mathematics

Garrard, William L., Professor
Ph.D., University of Texas at Austin
Dynamics and control of aerospace vehicles, parachute flight dynamics

Gebre-Egziabher, Demoz, P.E., Assistant Professor
Ph.D., Stanford University
Sensor fusion, design of multi-sensor systems for navigation, guidance and control of aerospace vehicles, global position system (GPS), inertial navigation, GPS-based precision landing systems

Hammer, Jeff, P.E., Industrial Professor of Design
B.A.E., University of Minnesota
Systems engineering, design, design analysis by simulation and experimental means; extensive industrial experience in systems simulation, control, design, and marketing

James, Ashley, Assistant Professor
Ph.D., Georgia Institute of Technology
Fluid dynamics, interfacial fluid flow and computational fluid dynamics

James, Richard D., Russell J. Penrose Professor and Distinguished McKnight University Professor
Ph.D., Johns Hopkins University
Thermodynamics of solids, phase transformations, micromagnetics; active materials, multiscale mathematical methods

Joseph, Daniel D., Regents Professor
Ph.D., Illinois Institute of Technology
Two phase flow, rheology, fluid mechanics, stability bifurcation

Ketema, Yohannes, Associate Professor
Ph.D., Royal Institute of Technology
Dynamics: stability and control of formations, astrodynamics

Leo, Perry H., Professor
Ph.D., Carnegie Mellon University
Phase transformations, micromechanics of defects in solids, biological materials, composites

Longmire, Ellen K., Professor
Ph.D., Stanford University
Experimental fluid mechanics, particle-laden and multiphase flow, turbulence, vortex dynamics microscale flows

Lundgren, Thomas S., Professor Emeritus
Ph.D., University of Minnesota
Fluid mechanics of vorticity as applied to turbulence structure, rotating flows and numerical analysis

Mahesh, Krishnan, Associate Professor
Ph.D., Stanford University
Numerical simulation and modeling of fluid flows

Marusic, Ivan, Associate Professor
Ph.D. University of Melbourne, Australia
Experimental and theoretical fluid mechanics, turbulent shear flows

Mettler, Bernard, Assistant Professor
Ph.D., Carnegie Mellon University
Autonomous guidance and control, trajectory planning, automated maneuvering, environment and task representation, system identification modeling

Shield, Thomas W., Professor
Ph.D., University of California, Berkeley
Experimental solid mechanics, mechanics of materials, elasticity, single crystal plasticity, shape-memory and magenetostrictive materials, fracture mechanics

Warner, William H., Professor Emeritus
Ph.D., Carnegie Institute of Technology
Optimal design problems for elastic bodies and structural elements using energy methods, biorthogonal series solutions of polyharmonic equations with application to thick plate and shell problems

Wilson, Theodore A., Professor Emeritus
Ph.D., Cornell University
Respiratory mechanics: modeling lung structure and deformation, respiratory flow, chest wall mechanics

§ Zhao, Yiyuan, Professor
Ph.D., Stanford University
Guidance/control, optimization, dynamics, air-traffic management, rotocraft flight trajectories

Astronomy

Davidson, Kris, Professor
Ph.D., Cornell University
Theoretical astrophysics, luminous stars, primordial element abundances

§ Gehrz, Robert, Professor and Director, Mt. Lemmon and O'Brien observatories
Ph.D., University of Minnesota
Infrared astronomy, novae, comets

§ Humphreys, Roberta, Professor
Ph.D., University of Michigan
Luminous stars, stellar evolution, optical spectroscopy, galactic structure

§ Jones, Terry, Professor and Assistant Director, Mt. Lemmon and O'Brien observatories
Ph.D., University of Hawaii
Infrared astronomy, late type stars, polarimetry

Jones, Thomas, Professor
Ph.D., University of Minnesota
Computational astrophysics, cosmic ray production, supernovae remnants, shocks

***§ Rudnick, Lawrence, Professor**
Ph.D., Princeton University
Galactic and extragalactic radio astronomy, supernova remnants

§ Skillman, Evan, Professor
Ph.D., University of Washington
Extragalactic observational astronomy, cosmic elemental abundances, dwarf galaxies

Williams, Liliya, Associate Professor
Ph.D., University of Washington
Cosmology, gravitational lensing

Woodward, Charles, Professor
Ph.D., University of Rochester, New York
Infrared astronomy, novae, comets

Woodward, Paul, Professor and Director of Laboratory for Computational Science and Engineering
Ph.D., University of California, Berkeley
Computational astrophysics, numerical techniques

Bio-based Products Engineering

Bowyer, James L., Professor
Ph.D., University of Minnesota
Applied wood science, life cycle analysis, environmental and forest policy

Bratkovich, Stephen M., Adjunct Associate Professor
Ph.D., Ohio State University
Extension education

Cheple, Marilou, Extension Educator and Instructor
M.S., University of Minnesota
Moisture in new construction

Erickson, Robert W., Professor Emeritus
Ph.D., University of Minnesota
Wood physics and moisture relations

Gertjejansen, Roland O., Professor Emeritus
Ph.D., University of Minnesota
Fiber and particle products technology

Grimsrud, David T., Professor Emeritus
Ph.D., University of Minnesota
Indoor air quality and building energy efficiency

Hendricks, Lewis T., Professor Emeritus
Ph.D., Michigan State University
Energy efficient buildings

Huelman, Patrick, Associate Professor and Extension Educator
M.S., Iowa State University
Energy efficient buildings

Petersen, Harlan D., Assistant Professor and Extension Educator
M.S., University of Minnesota
Wood drying and moisture relations

Ramaswamy, Shri, Professor and Department Head
Ph.D., State University of New York
Paper science and engineering

Sarkanen, Simo, Professor
Ph.D., University of Washington
Wood and lignin chemistry

Schmidt, Elmer L., Professor
Ph.D., University of Minnesota
Wood deterioration/protection

Seavey, Robert, Research Associate and Instructor
Ph.D., University of Minnesota
Wood physics

Severtson, Steven J., Associate Professor
Ph.D., Institute of Paper Science and Technology

Smith, Timothy M., Associate Professor
Ph.D., Penn State University
Environmental communications, integrated marketing communications, new product development

Sangwon Suh, Assistant Professor
Ph.D., Leiden University (Netherlands)
Corporate environmental management, life cycle assessment, industrial ecology

Ulrike Tschirner, Associate Professor
Ph.D., University of Karlsruhe, Germany
Lignin chemistry

Tze, William T. Y., Assistant Professor
Ph.D., University of Maine
Bio-composites, adhesion interphase, and micro-analyses

Jerrold Winandy, Adjunct Faculty
Ph.D., Oregon State University
Engineered biocomposites engineering properties of wood

Dr. K. Karen Yin, Professor
Ph.D., U of Maryland
Signal processing, industrial process simulation, design, optimization and control

Biomedical Engineering

Akkin, Taner, Assistant Professor
Ph.D., University of Texas, Austin
Biomedical optics and imaging

Barocas, Victor H., Assistant Professor and Director of Graduate Studies
Ph.D., University of Minnesota
Tissue engineering, ocular biomechanics, microfluidics, computer modeling

Bischof, John C., Professor
Ph.D., University of California, Berkeley
Experimental techniques to measure biophysics in cells and tissues during freezing, improved cryopreservation of sperm and tissue systems, characterization of cell injury

He, Bin, Professor and Director of Undergraduate Studies
Ph.D., Tokyo Institute of Technology
Functional biomedical imaging, electrophysiological neuroimaging, electrocardiographic tomography

Odde, David J., Associate Professor
Ph.D., Rutgers University
Cytoskeletal basis of cell growth and division

Sachs, Jonathan N., Assistant Professor
Ph.D., Johns Hopkins University
Molecular-level membrane interactions

Shen, Wei, Assistant Professor
Ph.D., California Institute of Technology
Biomaterials, tissue engineering, biomolecular engineering, cell-material interactions

Siegel, Ronald A., Professor and Department Head of Pharmaceutics
Sc.D., Massachusetts Institute of Technology
Drug/delivery, hydrogels, microfabrication, pharmacodynamics

Tranquillo, Robert T., Professor and Department Head
Ph.D., University of Pennsylvania
Cardiovascular and neural tissue engineering, cell

Wang, Chun, Assistant Professor
Ph.D., University of Utah
Biomaterials for drug and gene delivery and tissue engineering

Biosystems and Agricultural Engineering

Bhattacharya, Mrinal, Professor
Ph.D., University of Nebraska
Biodegradable polymers, biomaterials, tissue engineering, biosensors

Boedicker, James, Adjunct Associate Professor
Ph.D., North Carolina State University
Machinery systems, machine safety, livestock environment

Chaplin, Jonathan, P.E., Associate Professor
Ph.D., Iowa State University
Engineering safety, machinery systems design, instrumentation and control, energy systems

Clanton, Charles, P.E., Professor
Ph.D., University of Minnesota
Manure management: water and air quality, odor, manure storage, land application, and nutrient management

Goodrich, Philip, P.E., Associate Professor
Ph.D., Purdue University
Biomass renewable energy systems, odor control

Izuno, Forrest, Professor
Ph.D., Colorado State University
Water management, irrigation, drainage, water quality

Jacobson, Larry, P.E., Professor, and Extension Engineer
Ph.D., University of Minnesota
Environmentally friendly and energy conserving animal housing systems, airborne emissions, odor control, indoor air quality for agricultural, industrial, and residential buildings, waste management

Janni, Kevin, P.E., Professor, Extension Engineer, and Department Head
Ph.D., Purdue University
Animal housing systems, ventilation, odor control, air quality, biofiltration

Morey, R. Vance, Professor
Ph.D., Purdue University
Biomass densification, biomass for electricity and process heat at ethanol plants, post-harvest technology

Nieber, John, P.E., Professor
Ph.D., Cornell University
Watershed hydrology, biogeochemistry of watersheds, wetland hydrology, engineering of water resources quantity and quality, flow and transport in geological media and biological systems

Ruan, Roger, Professor
Ph.D., University of Illinois
Food engineering, value-added processing, biorefining, renewable energy, MRI and NMR applications, non-thermal plasma

Sands, Gary, Associate Professor and Extension Engineer
Ph.D., Colorado State University
Hydrology, water quality, water resources conservation and management

Shutske, John, Professor and Extension Agricultural Safety and Health Specialist
Ph.D., Purdue University
Safe design of products and production systems, homeland security risk assessment and communication, worker/public health impacts from technology/demographic change in biological industries

Wilcke, William, P.E. (Iowa), Professor and Extension Engineer
Ph.D., Iowa State University
Post-harvest technology, sustainable agriculture, agricultural energy sources

Wilson, Bruce, P.E. (Oklahoma), Professor
Ph.D., University of Kentucky
Hydrologic/water quality modeling, transport of surface water contaminants

Wright, Jerry, P.E., Associate Professor and Extension Engineer
M.S., North Dakota State University
Irrigation design, irrigation water management, drainage design, ground water quality

Zhu, Jun, Associate Professor and Extension Engineer
Ph.D., University of Illinois
Animal waste management and treatment techniques, manure odor control, nutrient recycling, renewable energy

Chemical Engineering and Materials Science

Bates, Frank S., Distinguished McKnight Professor
Sc.D., Massachusetts Institute of Technology
Thermodynamics and dynamics of polymers and polymer mixtures

Caretta, Raul, Professor
Ph.D., University of Minnesota
Unit operations, safety, surface characterization

§ Carter, C. Barry, Professor
D.Phil., Oxford University
Electron microscopy of semiconductors and ceramics, solid-state reaction and growth of thin films

§ Chelikowsky, James R., Professor
Ph.D., University of California, Berkeley
Structural/electronic properties of solids

Cococcioni, Matteo, Assistant Professor
Ph.D., International School for Advances Studies (SISSA)
Electronic conduction, cathode materials, electron transfer reactions

Cook, Robert F., Associate Professor
Ph.D., University of New South Wales
Fracture and deformation of materials and thin films

§ Cussler, Edward L., Professor
Ph.D., University of Wisconsin
Mass transfer, novel separation processes

Dahler, John S., Professor Emeritus
Ph.D., University of Wisconsin
Nonequilibrium statistical mechanics, atomic collision theory

Daoutidis, Prodromos, Professor
Ph.D., University of Michigan
Nonlinear process control, process analysis and design

Davis, H. Ted, Regents Professor
Ph.D., University of Chicago
Colloid and interface science, statistical mechanics

Derby, Jeffrey J., Professor
Ph.D., Massachusetts Institute of Technology
Process modeling, materials processing, high-performance computing

Dorfman, Kevin, Assistant Professor
PhD., Massachusetts Institute of Technology
Transport phenomena, microfluidics, electrophoresis, biophysics

Francis, Lorraine Falter, Professor
Ph.D., University of Illinois at Urbana-Champaign
Ceramics processing, electrical and mechanical properties of ceramics

Fredrickson, Arnold G., Professor Emeritus
Ph.D., University of Wisconsin
Biochemical engineering, microbial populations

Frisbie, C. Daniel, Associate Professor
Ph.D., Massachusetts Institute of Technology
Organic electronic materials, materials chemistry

Geankoplis, Christie J., Professor
Ph.D., University of Pennsylvania
Biochemical engineering, reactors and mass transport

Gerberich, William W., Professor
Ph.D., University of California, Berkeley
Fracture micromechanics, interfacial defects

Hu, Wei-Shou, Professor
Ph.D., Massachusetts Institute of Technology
Biochemical engineering, mammalian cell cultures

Kaznessis, Yiannis, Assistant Professor
Ph.D., University of Notre Dame
Computer modeling of biological systems, bioinformatics

Keller, Kenneth H., Professor
Ph.D., Johns Hopkins University
Transport in biological systems, biomedical engineering

Kokkoli, Efrosini, Assistant Professor
Ph.D., University of Illinois, Urbana-Champaign
Biomimetic surface science, bioengineering, biomaterials, colloidal interactions

Kumar, Satish, Assistant Professor
Ph.D., Stanford University
Transport processes, interfacial phenomena, microfluidics

Leighton, Christopher, Assistant Professor
Ph.D., University of Durham, England
Magnetic and electronic properties of thin film, magnetic materials

Lodge, Timothy P., Professor
Ph.D., University of Wisconsin
Polymer structure and dynamics, polymer characterization

Macosko, Christopher W., Professor
Ph.D., Princeton University
Polymer processing, rheology, polymer networks and blends

Maynard, Jennifer, Assistant Professor
Ph.D., University of Texas
Biotechnology, protein engineering, infectious diseases

McClurg, Richard B., Assistant Professor
Ph.D., California Institute of Technology
Thermodynamics and kinetics of phase changes

McCormick, Alon V., Professor
Ph.D., University of California, Berkeley
Ceramic synthesis, adsorption and diffusion, polymerization kinetics

Morse, David C., Associate Professor
Ph.D., University of Pennsylvania
Macromolecular and complex fluids, statistical mechanics and dynamics

Norris, David J., Associate Professor
Ph.D., Massachusetts Institute of Technology
Photonic crystals, nanomaterials, molecular spintronics

Palmstrom, Chris J., Professor
Ph.D., University of Leeds
Epitaxial growth processes and heterostructure formation, properties of thin films

Schmidt, Lanny D., Regents Professor
Ph.D., University of Chicago
Surface chemistry, catalysis and reactor modeling

Scriven, L. E., Regents Professor
Ph.D., University of Delaware
Flow processing solidification, porous media, microstructured liquids

Shores, David A., Professor
Ph.D., Pennsylvania State University
High temperature corrosion, fuel cells

Smyrl, William H., Professor
Ph.D., University of California, Berkeley
Electrochemical engineering, modeling electrochemical systems

Snowden, Frank W., Professor
Ph.D., University of New Orleans
Intraocular lens design and performance, cooperative education

Srienc, Friedrich, Professor
Ph.D., Technical University of Graz
Biochemical engineering, cell cycle kinetics

Tsapatsis, Michael, Professor
Ph.D., California Institute of Technology
Materials, separations, catalysis

Tranquillo, Robert T., Professor
Ph.D., University of Pennsylvania
Cell and tissue engineering

Ward, Michael D., Distinguished McKnight Professor
Ph.D., Princeton University
Molecular materials, piezoelectric transducers

Wentzcovitch, Renata M. M., Associate Professor
Ph.D., University of California, Berkeley
Electronic and structural properties of solids, ab initio molecular dynamics

Chemistry

Arriaga, Edgar, Associate Professor
Ph.D., Dalhousie University in Nova Scotia
Analytical chemistry

Barany, George, Distinguished McKnight University Professor
Ph.D., Rockefeller University
Organic and biological chemistry

Blank, David, Assistant Professor
Ph.D., University of California, Berkeley
Experimental physical chemistry

Bowser, Michael, Assistant Professor
Ph.D., University of British Columbia
Bioanalytical chemistry

Buhlmann, Philippe, Assistant Professor
Ph.D., Swiss Federal Institute of Technology
Analytical chemistry and materials

Carr, Peter, Professor
Ph.D., Pennsylvania State University
Analytical chemistry

Cramer, Christopher, Associate Professor
Ph.D., University of Illinois, Urbana-Champaign
Organic, physical, and computational chemistry

Dahler, John, Professor Emeritus
Ph.D., University of Wisconsin
Physical chemistry

Davis, H. Ted, Regents Professor
Ph.D., University of Chicago
Chemical engineering

Distefano, Mark, Associate Professor
Ph.D., Massachusetts Institute of Technology
Biological chemistry

Ellis, John, Professor
Ph.D., Massachusetts Institute of Technology
Inorganic chemistry

Forsyth, Craig, Professor
Ph.D., Cornell University
Organic and biological chemistry

Gao, Jiali, Professor
Ph.D., Purdue University
Biological and computational chemistry

Gentry, W. Ronald, Professor Emeritus
Ph.D., University of California, Berkeley
Physical chemistry

Gladfelter, Wayne, Professor
Ph.D., Pennsylvania State University
Inorganic, materials, and organic chemistry

§ Gray, Gary, Professor
Ph.D., University of Iowa
Biological and organic chemistry

Haynes, Christy, Assistant Professor
Ph.D., Northwestern University
Physical chemistry, analytical chemistry, materials science

Hillmyer, Marc, Associate Professor
Ph.D., California Institute of Technology
Organic chemistry

Hoye, Thomas, Professor
Ph.D., Harvard University
Organic chemistry

Kass, Steven, Professor
Ph.D., Yale University
Organic and physical chemistry

Leopold, Doreen, Associate Professor
Ph.D., Harvard University
Physical chemistry

Leopold, Ken, Professor
Ph.D., Harvard University
Physical chemistry

Lipsky, Sanford, Professor
Ph.D., University of Chicago
Physical chemistry

Lodge, Timothy, Professor
Ph.D., University of Wisconsin
Analytical, materials, and physical chemistry

§ Mann, Kent, Professor
Ph.D., California Institute of Technology
Inorganic chemistry

McNeill, Kristopher, Assistant Professor
Ph.D., University of California, Berkeley
Environmental chemistry

§ Miller, Larry, Professor Emeritus
Ph.D., University of Illinois, Urbana-Champaign
Organic and materials chemistry

Miller, Wilmer, Professor Emeritus
Ph.D., University of Wisconsin
Physical chemistry

Musier-Forsyth, Karin, Professor
Ph.D., Cornell University
Biological and physical chemistry

Noland, Wayland, Professor
Ph.D., Harvard University
Organic chemistry

Penn, R. Lee, Assistant Professor
Ph.D., University of Wisconsin, Madison
Environmental, materials, and physical chemistry

***§ Pignolet, Louis, Professor**
Ph.D., Princeton University
Inorganic and materials chemistry

Que, Larry, Professor
Ph.D., University of Minnesota
Inorganic and biological chemistry

Roberts, Jeffrey, Professor
Ph.D., Harvard University
Physical, inorganic, and materials chemistry

Siepmann, J. Ilja, Professor
Ph.D., University of Cambridge
Physical, materials, and computational chemistry

Stankovich, Marian, Professor
Ph.D., University of Texas
Analytical and biological chemistry

Stein, Andreas, Professor
Ph.D., University of Toronto
Inorganic, physical, and materials chemistry

Taton, T. Andrew, Assistant Professor
Ph.D., Harvard University
Organic and materials chemistry

§ Tolman, William, Professor
Ph.D., University of California, Berkeley
Inorganic, organic, and biological chemistry

§ Truhlar, Donald, Professor
Ph.D., California Institute of Technology
Physical and theoretical chemistry

Veglia, Gianluigi, Assistant Professor
Ph.D., University of Rome
Physical chemistry

York, Darrin, Associate Professor
Ph.D., University of North Carolina, Chapel Hill
Physical, theoretical, and computational chemistry

Zhu, Xiaoyang, Professor
Ph.D., University of Texas at Austin
Materials, physical, and analytical chemistry

Civil Engineering

Arndt, Roger E. A., Professor
Ph.D., Massachusetts Institute of Technology
Cavitation and bubble dynamics, hydropower, noise generated by fluid flow

Arnold, William A., Associate Professor
Ph.D., Johns Hopkins University
Transformations of anthropogenic chemicals aquatic systems, , partitioning and fate of organic chemicals

Barnes, Randal J., Associate Professor
Ph.D., Colorado School of Mines
Applied statistics, mathematical modeling, groundwater mechanics

Brezonik, Patrick L., Professor
Ph.D., University of Wisconsin
Impacts of human activity on water quality/chemistry

Capel, Paul D., Adjunct Professor
Ph.D., University of Minnesota
Environmental water chemistry, chemodynamics, fate and transport

Crouch, Steven L., Professor
Ph.D., University of Minnesota
Boundary element methods applied to rock mechanics problems

Davis, Gary A., Professor
Ph.D., University of Washington
Statistics in transportation planning, traffic control, traffic safety

Detournay, Emmanuel, Professor
Ph.D., University of Minnesota
Mathematical modeling of geomechanical processes, poroelasticity

§ Drescher, Andrew, Professor
Dr. Inz., Institute of Fundamental Technological Research, Poland
Testing and modeling mechanical behavior of geomaterials

Foufoula-Georgiou, Efi, Professor
Ph.D., University of Florida
Stochastic hydrology, multiscale processes, landform morphology, climate modeling

§ French, Catherine E., Professor
Ph.D., University of Illinois
Concrete behavior, materials/structural systems, earthquake engineering, durability

Galambos, Theodore V., Professor Emeritus
Ph.D., Lehigh University
Structural stability, behavior and design

Gulliver, John S., Professor
Ph.D., University of Minnesota
Environmental fluid mechanics, chemical fate and transport

Guzina, Bojan B., Associate Professor
Ph.D., University of Colorado
Mathematical modeling of wave propagation, seismic site characterization

Hill, Kimberly, Assistant Professor
Ph.D., University of Minnesota
Granular flows and segregation, non-Newtonian fluids

Hondzo, Miki, Associate Professor
Ph.D., University of Minnesota
Experimental work and numerical prediction techniques in environmental fluid dynamics

Hozalski, Raymond M., Associate Professor
Ph.D., Johns Hopkins University
Water/wastewater treatment, biofilms, natural organic matter characterization

§ Johnson, Gerald W., Associate Professor
Ph.D., University of Wisconsin
Applications of surveying and mapping

Khazanovich, Lev, Associate Professor
Ph.D., University of Illinois, Urbana-Champaign
Concrete and asphalt pavements, finite element analysis of soil-structure interaction

§ Labuz, Joseph F., Professor
Ph.D., Northwestern University
Experimental geomechanics, fracture of quasi-brittle materials

LaPara, Timothy, Assistant Professor
Ph.D., Purdue University
Biological wastewater treatment, wastewater microbiology, environmental microbiology, structure-function relationships in mixed microbial communities, microbial ecology, microbial evolution

Levinson, David M., Associate Professor
Ph.D. University of California, Berkeley
Transportation economics and financing, network deployment, integrated transportation and land use planning

Liu, Henry, Assistant Professor
Ph.D., University of Wisconsin
Traffic controlled operations, transportation network modeling

Marasteanu, Mihai, Assistant Professor
Ph.D., Pennsylvania State University
Applications of fundamental theories to bituminous materials characterization, modeling, and experimental testing

Michalopoulos, Panos G., Professor
Ph.D., University of Florida
Traffic engineering operations and control, traffic flow theory

Novak, Paige J., Associate Professor
Ph.D., University of Iowa
Toxic compound biodegradation, interactions between anaerobes and metals

Okazaki, Taichiro, Assistant Professor
Ph.D., University of Texas at Austin
Steel structures, welded connections

Porte-Agel, Fernando, Associate Professor
Ph.D., Johns Hopkins University
Fluid mechanics in the environment, hydrology, micrometerology, atmospheric boundary layer

Schultz, Arturo E., Associate Professor
Ph.D., University of Illinois, Urbana-Champaign
Concrete behavior, masonry systems, steel-concrete construction, earthquake engineering

Semmens, Michael J., Professor
Ph.D., University College London
Physical-chemical processes in environmental science and engineering

Shield, Carol K., Associate Professor
Ph.D., University of Illinois, Urbana-Champaign
Solid mechanics modeling, composite materials

*** Smith, Karl A., Professor**
Ph.D., University of Minnesota
Project management, modeling systems, engineering education

Stefan, Heinz G., Professor
Ph.D., University Paul Sabatier, Toulouse, France
Water quality modeling, environmental fluid mechanics, hydraulic structures

§ Stolarski, Henryk K., Professor
Ph.D., Institute of Fundamental Technological Research, Warsaw, Poland
Nonlinear structural mechanics, plates and shells, computational mechanics

Strack, Otto D. L., Professor
Dr. Ir., Delft University of Technology, The Netherlands
Computer and mathematical modeling of groundwater and transport

Voller, Vaughan R., Professor
Ph.D., Sunderland Polytechnic, UK
Numerical modeling of free and moving boundary problems

Wojtkiewicz, Steven F., Assistant Professor
Ph.D., University of Illinois, Urbana-Champaign
Stochastic modeling, control of structural systems

Computer Science

Boley, Daniel, Professor
Ph.D., Stanford University
Numerical analysis, linear algebra, control theory

Carlis, John, Professor
Ph.D., University of Minnesota
Database systems

Chen, Baoquan, Assistant Professor
Ph.D., SUNY, Stony Brook, New York
Computer graphics, visualization

Du, David Hung-Chuang, Professor
Ph.D., University of Washington, Seattle
High-speed networking, multimedia applications, high-performance computing

Fox, David W., Professor Emeritus
Ph.D., University of Maryland
Applied mathematics, eigenvalue problems

Gini, Maria, Professor
Doctor of Physics, University of Milan
Artificial intelligence, robotics

Heimdahl, Mats, Associate Professor
Ph.D., University of California, Irvine
Software engineering, safety critical systems

Hsu, Wei, Associate Professor
Ph.D., University of Wisconsin, Madison
Compiler optimization, run-time optimization systems, system architectures

Interrante, Victoria, Associate Professor
Ph.D., North Carolina at Chapel Hill
Visualization, visual perception, computer graphics, image processing, virtual reality

Janardan, Ravi, Professor
Ph.D., Purdue University
Computational geometry, algorithm and data structure design, computer graphics

Karypis, George, Associate Professor
Ph.D., University of Minnesota
Data mining, bioinformatics, information retrieval, e-commerce, parallel processing

Kim, Yongdae, Assistant Professor
Ph.D., University of Southern California
Group security, network security

Konstan, Joseph, Professor
Ph.D., University of California, Berkeley
Human-computer interaction, collaborative filtering, multimedia systems, hypermedia

Kumar, Vipin, Professor
Ph.D., University of Maryland
Parallel processing, data mining

Liang, Donglin, Assistant Professor
Ph.D., Georgia Institute of Technology
Software engineering, software visualization, program testing and analysis

Meyer, Gary, Associate Professor
Ph.D., Cornell University
Computer graphics, color synthesis and reproduction

Nadathur, Gopalan, Associate Professor
Ph.D., Pennsylvania State University
Computational logic, programming language design and implementation

Norberg, Arthur, Professor Emeritus
Ph.D., University of Wisconsin
History of science and technology

Papanikolopoulos, Nikolaos, Professor
Ph.D., Carnegie Mellon University
Robotics, computer vision, sensors for transportation applications

Riedl, John, Professor
Ph.D., Purdue University
Collaborative systems, database systems, fault tolerance, computer networks, object-oriented systems

Roumeliotis, Stergios, Assistant Professor
Ph.D., University of Southern California
Robotics, autonomous vehicle navigation, distributed robotics

Rosen, J. Ben, Professor Emeritus
Ph.D., Columbia University
Numerical optimization, parallel computing

Saad, Yousef, Professor
Doctorat, University of Grenoble, France
Sparse matrix computations, parallel computation, eigenvalue problems, nonlinear equations

Schrater, Paul, Assistant Professor
Ph.D., California State University, Long Beach
Human and computer vision, motor control and haptics, statistical inference, pattern recognition

Schuler, William, Assistant Professor
Ph.D., University of Pennsylvania
Speech and natural language processing

Shekhar, Shashi, Professor
Ph.D., University of California, Berkeley
Data and knowledge engineering, spatial database, geographic information systems

Shragowitz, Eugene, Professor
Ph.D., National Science Research Laboratory, Moscow
Computer aided design (CAD) of electronic systems, soft computing, combinatorial optimization

Slagle, James R., Professor Emeritus
Ph.D., Massachusetts Institute of Technology
Artificial intelligence (expert systems, neural networks, automated temporal logic)

Srivastava, Jaideep, Professor
Ph.D., University of California, Berkeley
Databases, multimedia systems, data mining

Stein, Marvin, Professor Emeritus
Ph.D., UCLA
Machine arithmetic, organization of programming systems

Terveen, Loren, Associate Professor
Ph.D., University of Texas at Austin
Human-computer interaction, computer-supported cooperative work

Tripathi, Anand, Professor
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Distributed and network computing systems, object-oriented programming

Van Wyk, Erik, Assistant Professor
Ph.D., University of Iowa
Programming languages

Voyles, Richard, Associate Professor
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Real-time systems, robotics, multiagent systems, teletaction

Weissman, Jon, Associate Professor
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Distributed systems, metacomputing, cluster computing

Yew, Pen-Chung, Professor
Ph.D., University of Illinois, Urbana-Champaign
Computer architecture, parallel machine design, parallelizing compilers

Zhang, Zhi-Li, Associate Professor
Ph.D., University of Massachusetts
Computer networking and multimedia systems

Electrical Engineering

Albertson, Vernon D., P.E., Professor Emeritus
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Electric power analysis and transients, geomagnetic pulse effects

Amin, Massoud, Professor and Director for the Development of Technological Leadership
D.Sc., Washington University
Reconfigurable and self-repairing controls, infrastructure security

Bailey, Fredric N., Professor Emeritus
Ph.D., University of Michigan
Control systems, integrating new semiconductor technology

Bazargan, Kiarash, Assistant Professor
Ph.D., Northwestern University
Computer-aided design of VLSI

§ Campbell, Stephen A., Professor
Ph.D., Northwestern University
Materials and fabrication processes for silicon-based structures

Champlin, Keith S., Professor Emeritus
Ph.D., University of Minnesota
New devices for fabricating monolithic microwave integrated circuits

Cherkassky, Vladimir S., Professor
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Parallel processing, computer networks, fault-tolerant computing

Cohen, Philip I., Professor
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Microelectronics materials, crystal growth

Drayton, Rhonda Franklin, Assistant Professor
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High-frequency and microwave circuits

Ebbini, Emal S., Associate Professor
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Digital signal processing and biomedical engineering

Ernie, Douglas W., Associate Professor
Ph.D., University of Minnesota
Gaseous electronics and plasma engineering

Georgiou, Tryphon T., Professor
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Control and systems theory, recursive modeling and identification

Giannakis, Georgios B., Professor
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Statistical signal processing and its application to wired and wireless communications

§ Gopinath, Anand, Professor
Ph.D., University of Sheffield
Microelectronics, microwaves, optics, optoelectronic devices

Harjani, Ramesh, Associate Professor
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Computer-aided design of analog circuits

Higman, Ted K., Associate Professor
Ph.D., University of Illinois
Electron device fabrication

Holte, James E., Associate Professor
Ph.D., University of Minnesota
Bioelectrical sciences and biomedical engineering

Jacobs, Heiko, Associate Professor
Ph.D., ETH in Zurich
Micro- and nanotechnology

Jindal, Nihar, Assistant Professor
Ph.D., Stanford University
Information theory, communication theory

Jovanovic, Mihaile, Assistant Professor
Ph.D., University of California, Santa Barbara
Distributed control systems

Judy, Jack H. , Professor Emeritus
Ph.D., University of Minnesota
Magnetics and magnetic recording, multilayer thin film materials

Kain, Richard Y., Professor Emeritus
Sc.D, Massachusetts Institute of Technology
Computer system architecture

§ Kaveh, Mostafa, Professor and Associate Dean for Research and Planning
Ph.D., Purdue University
Statistical signal processing, communications, and image processing

Kieffer, John, Professor
Ph.D., University of Illinois, Urbana-Champaign
Information theory, communications, digital signal processing

Kiehl, Richard A., Professor
Ph.D., Purdue University
Microelectronics and nanoelectronics

Kim, Hyung-il , (Chris) Assistant Professor
Ph.D., Purdue University
High performance, low power VLSI design

Kinney, Larry L., Professor
Ph.D., University of Iowa
Digital system and digital computer design

Kumar, K. S. P., Professor Emeritus
Ph.D., Purdue University
Adaptive control, self-tuning regulators, and system identification

Lambert, Robert F., Professor Emeritus
Ph.D., University of Minnesota
Acoustics, computer-controlled automatic measurement of sound

Lee, Thomas (Shao-Chung) S., Professor Emeritus
Ph.D., University of Minnesota
Waves and fluids

§ Leger, James R., Professor
Ph.D., University of California, San Diego
Micro-optics, Fourier optics and holography

§ Lilja, David, Professor and Department Head
Ph.D., University of Illinois, Urbana-Champaign
High-performance computer architecture, parallel processing, supercomputing

Luo, Zhi-Quan (Tom), Professor
Ph.D., Massachusetts Institute of Technology
Optimization, communication, signal processing

§ Mohan, Ned, Professor
Ph.D., University of Wisconsin, Madison
Power electronics and electromechanics for motion control

Moon, Jaekyun, Professor
Ph.D., Carnegie Mellon University
Communications and signal processing

Nathan, Marshall I., Professor Emeritus
Ph.D., Harvard University
High speed III-V semiconductor device physics

Oh, Sang-Hyun, Assistant Professor
Ph.D., Stanford University
Microsystems, biotechnology

Parhi, Keshab K., Professor
Ph.D., University of California, Berkeley
VLSI signal and image processing

§ Peria, William T., Professor Emeritus
Ph.D., University of British Columbia
Physical electronics, fabrication of integrated circuits

§ Polla, Dennis L., Professor
Ph.D., University of California, Berkeley
Design and fabrication of integrated microsensors and microactuators

Riedel, Marc, Assistant Professor
Ph.D., California Institute of Technology
Digital circuits, data structures and algorithms, computational biology

Riaz, Mahmoud, Professor Emeritus
Sc.D., Massachusetts Institute of Technology
Electrical energy conversion, control, and processing

Robbins, William P., Professor
Ph.D., University of Washington
Sonics and ultrasonics, sensors and microactuators

Roychowdhury, Jaijeet, Associate Professor
Ph.D., University of California, Berkeley
Computer-aided verification of analog circuits

Ruden, P. Paul, Professor
Ph.D., University of Stuttgart, FRG
Theory of novel semiconductor devices

Sapatnekar, Sachin, Professor
Ph.D., University of Illinois at Urbana-Champaign
Computer aided design of VLSI systems

Sapiro, Guillermo, Professor
D.Sc., Technion University, Israel
Computer vision systems

Sobelman, Gerald E., Associate Professor
Ph.D., Harvard University
VLSI design

Stadler, Bethanie, Assistant Professor
Ph.D., Massachusetts Institute of Technology
Advanced materials for devices and systems

Talghader, Joseph, Associate Professor
Ph.D., University of California, Berkeley
Microelectronics, optoelectronics

Tewfik, Achmed H., Professor
Sc.D., Massachusetts Institute of Technology
Signal processing for multimedia

Victora, Randall, Professor
Ph.D., University of California, Berkeley
Magnetics

Wang, Jian Ping, Associate Professor
Ph.D., Chinese Academy of Science
Magnetics, storage technology

Warner, R. M., Jr., Professor Emeritus
Ph.D., Case Institute of Technology
Electronic device and circuit development

Wollenberg, Bruce F., Professor
Ph.D., University of Pennsylvania
Power systems engineering

Yoon, Guisik, Associate Professor
Ph.D., University of Michigan
Integrated MEMS, VLSI circuit and system design

Geological Engineering

Faculty listed under Civil Engineering

Geology and Geophysics

*** Alexander, E. Calvin, Jr., Professor**
Ph.D., University of Missouri, Rolla
Hydrogeology, karst hydrogeology and geomorphology, isotope geochemistry, groundwater pollution

Almendinger, James, Adjunct Faculty
Ph.D., University of Minnesota
Quaternary paleoecology

Banerjee, Subir K., Professor
Ph.D., Sc.D., Cambridge University
Paleomagnetism, geomagnetism, climate change

Chandler, Val W., Adjunct Faculty
Ph.D., Purdue University
Gravity and magnetic exploration, Precambrian geology

Edlund, Mark, Adjunct Faculty
Ph.D., University of Michigan
Quaternary paleoecology

Edwards, R. Lawrence, Professor
Ph.D., California Institute of Technology
Isotope geochemistry, climatic and oceanographic changes

Engstrom, Daniel R., Adjunct Faculty
Ph.D., University of Minnesota
Paleolimnology, limnochronology, geochemistry

Fox, David L., Assistant Professor
Ph.D., University of Michigan
Paleobiology, paleoclimatology, stable isotope ecology

Hirschmann, Marc M., Associate Professor
Ph.D., University of Washington
Geochemistry and experimental petrology, igneous petrogenesis, mantle melting

Hudleston, Peter J., Professor
Ph.D., Imperial College
Structural geology, deformation, faults and folds, tectonic history

Ito, Emi, Professor
Ph.D., University of Chicago
Stable isotope geochemistry and paleoclimatology

Jackson, Michael, Adjunct Faculty
Ph.D., University of Michigan
Rock magnetism

Jennings, Carrie J., Adjunct Faculty
Ph.D., University of Minnesota
Glacial processes, Minnesota glacial history, ice sheet dynamics

Johnson, Robert, Adjunct Faculty
Ph.D., Iowa State University
Mechanisms of climate change

Kirkby, Kent C., Adjunct Faculty
Ph.D., University of Wisconsin, Madison
Sedimentary geology, petroleum geology

Kleinspehn, Karen L., Associate Professor
Ph.D., Princeton University
Tectonics and basin analysis, neotectonics, sedimentary basins

Kohlstedt, David L., Professor
Ph.D., University of Illinois
Earth and planetary materials, mechanical properties of rocks, geodynamics and geochemistry

Matsumoto, Katsumi, Assistant Professor
Ph.D., Columbia University
Geochemistry and oceanography

Miller, James D., Jr., Adjunct Faculty
Ph.D., University of Minnesota
Geologic mapping, petrology, metallogeny

Moskowitz, Bruce M., Professor
Ph.D., University of Minnesota
Rock magnetism, paleomagnetism, biogeomagnetism

*** Paola, Christopher, Professor**
Sc.D., Massachusetts Institute of Technology/Woods Hole Oceanographic Institution
Sedimentology, fluvial processes and morphology, stratigraphy

Perg, Leslie, Assistant Professor
Ph.D., University of California, Santa Cruz
Surface processes, geochronology

Pfannkuch, Hans-Olaf, Professor
Dr.Ing., Paris University
Hydrogeology, groundwater-surface interactions, hydrocarbon contamination of shallow aquifers

Revenaugh, Justin, Professor
Ph.D., Massachusetts Institute of Technology
Seismology, geostatistics

Runkel, Anthony C., Adjunct Faculty
Ph.D., University of Texas at Austin
Stratigraphic and sedimentologic attributes of Paleozoic strata

Saar, Martin, Assistant Professor
Ph.D., University of California, Berkeley
Hydrogeology and geofluids

Seyfried, William E., Jr., Professor
Ph.D., University of Southern California
Aqueous geochemistry, experimental and theoretical modeling of hydrothermal systems

Stout, James H., Professor
Ph.D., Harvard University
Petrology, geochemistry, materials science, igneous and metamorphic petrology

Thorleifson, Harvey, Professor
Ph.D., University of Colorado
Quaternary geology

Weiblen, Paul W., Professor Emeritus
Ph.D., University of Minnesota
Precambrian geology of Minnesota, crustal evolution and mineralization

Whitney, Donna L., Professor
Ph.D., University of Washington
Metamorphic geology and tectonics, petrology and geochemistry of mountain belts

Wright, Herbert E., Jr., Regents Professor Emeritus
Ph.D., Harvard University
Quaternary paleoecology, paleolimnology, paleoclimatology, glacial geomorphology

Yuen, David A., Professor
Ph.D., University of California, Los Angeles
Numerical modeling of geophysical and geological phenomena, mantle convection

Mathematics

Adams, Scot, Professor
Ph.D., University of Chicago
Dynamical systems, foliations, ergodic theory

Aeppli, Alfred, Professor Emeritus
Ph.D., ETH, Zurich, Switzerland
Topology and geometry

Agard, Stephen, Professor
Ph.D., University of Michigan
Actuarial mathematics, complex variables

Anderson, Greg, Professor
Ph.D., Princeton University
Algebraic number theory, algebraic geometry

Aronson, Donald, Professor Emeritus
Ph.D., Massachusetts Institute of Technology
Partial differential equations, applied mathematics

Baxter, John R., Professor
Ph.D., University of Toronto
Probability

Bobkov, Sergey, Professor
Ph.D., Steklov Institute
Partial differential equations

Bramson, Maury, Professor
Ph.D., Cornell University
Probability

Calderer, Maria Carme, Professor
Ph.D., Heriot-Watt University
Applied mathematics, partial differential equations

Ciocan-Fontanine, Ionut, Associate Professor
Ph.D., University of Utah
Algebraic geometry

Cockburn, Bernardo, Associate Professor
Ph.D., University of Chicago
Numerical analysis

Conn, Jack, Associate Professor
Ph.D., Princeton University
Mathematical physics, differential geometry

Diaconu, Adrian, Assistant Professor
Ph.D., Brown University
Number theory

Eagon, John A., Professor Emeritus
Ph.D., University of Chicago
Commutative algebra

Feshbach, Mark, Professor
Ph.D., Stanford University
Topology

§ Frank, David, Associate Professor
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Topology

Fristedt, Bert, Professor
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Probability

Fuhrken, E. Gebhard, Associate Professor Emeritus
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Logic

Garrett, Paul, Professor
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Number theory

Gershenson, Hillel, Associate Professor Emeritus
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Topology

Goldman, Jay, Professor Emeritus
Ph.D., Princeton University
Combinatorics and knots

Gray, Lawrence, Professor
Ph.D., Cornell University
Probability

Gulliver, Robert, Professor
Ph.D., Stanford University
Partial differential equations, differential geometry

Harris, Morton, Professor Emeritus
Ph.D., Harvard University
Group theory

Hejhal, Dennis, Professor
Ph.D., Stanford University
Analysis, number theory

Jain, Naresh, Professor
Ph.D., Stanford University
Probability

Jiang, Dihua, Professor
Ph.D., The Ohio State University
Group representation theory, number theory, harmonic analysis

Jodeit, Max A., Jr., Professor
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Harmonic analysis

Kahn, Donald, Professor
Ph.D., Yale University
Topology

Keel, Markus, Assistant Professor
Ph.D., Princeton University
Partial differential equations, harmonic analysis

Keynes, Harvey B., Professor
Ph.D., Wesleyan University
Topological dynamics, ergodic theory

§ Krylov, N. V., Professor
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Probability and partial differential equations

Lerman, Gilad, Assistant Professor
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Computational harmonic analysis

Li, Tian-Jun, Associate Professor
Ph.D., Brandeis University
Differential geometry, symplectic topology

Littman, Walter, Professor
Ph.D., New York University
Partial differential equations

Luskin, Mitchell, Professor
Ph.D., University of Chicago
Numerical analysis

Lyubeznik, Gennady, Professor
Ph.D., Columbia University
Commutative algebra, algebraic geometry

Marden, Albert, Professor
Ph.D., Harvard University
Complex dynamics

McCarthy, Charles, Professor Emeritus
Ph.D., Yale University
Functional analysis

McGehee, Richard, Professor
Ph.D., University of Wisconsin
Dynamical systems, visualization

Messing, William, Professor
Ph.D., Princeton University
Algebraic geometry

Meyers, Norman, Professor
Ph.D., Indiana University
Partial differential equations

Miller, Ezra, Assistant Professor
Ph.D., University of California, Berkeley
Algebraic geometry, combinatorics, commutative algebra, discrete geometry

Miller, Willard, Professor
Ph.D., University of California, Berkeley
Applied mathematics

Miracle, Chester, Associate Professor
Ph.D., University of Kentucky
Math education, harmonic analysis

Moeckel, Richard, Professor
Ph.D., University of Wisconsin
Dynamical systems, celestial mechanics

Neuhauser, Claudia, Adjunct Associate Professor
Ph.D., Cornell University
Probability

Ni, Wei-Ming, Professor
Ph.D., New York University
Partial differential equations, nonlinear functional analysis

Nitsche, Johannes, Professor Emeritus
Dr. Phil., University of Göttingen, Germany
Partial differential equations, minimal surfaces

Nykamp, Duane, Assistant Professor
Ph.D., New York University
Analysis

Odlyzko, Andrew, Professor
Ph.D., Massachusetts Institute of Technology
Computational complexity

Olver, Peter, Professor
Ph.D., Harvard University
Mathematical physics

Othmer, Hans, Professor
Ph.D. University of Minnesota
Bio-mathematics

Polacik, Peter, Professor
Ph.D., Comenius University
Partial differential equations, dynamics systems

Pour-El, Marian B., Professor Emeritus
Ph.D., Harvard University
Mathematical logic

Prikry, Karel, Professor
Ph.D., University of California, Berkeley
Logic and set theory

Reich, Edgar, Professor Emeritus
Ph.D., University of California, Los Angeles
Complex variables

Reiner, Victor, Professor and McKnight Land-Grant Professor
Ph.D., Massachusetts Institute of Technology
Combinatorics

Reitich, Fernando, Associate Professor
Ph.D., University of Minnesota
Applied mathematics

Rejto, Peter, Professor
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Functional analysis

Richter, Wayne, Associate Professor
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Logic and set theory

Roberts, Joel, Professor
Ph.D., Harvard University
Commutative algebra

Safonov, Mikhail, Professor
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Probability and partial differential equations

Santosa, Fadil, Professor
Ph.D., University of Illinois
Applied mathematics

Scheel, Arnd, Professor
Ph.D., Free University of Berlin
Partial differential equations

Sell, George R., Professor
Ph.D., University of Michigan
Differential equations

Shen, Jianhong, Assistant Professor
Ph.D., Massachusetts Institute of Technology
Image and vision analysis

Sibuya, Yasutaka, Professor Emeritus
D.Sc., Tokyo University
Ordinary differential equations

Sperber, Steven I., Professor
Ph.D., University of Pennsylvania
Algebraic number theory and geometry

Stanton, Dennis, Professor
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Combinatorics

Storvick, David, Professor Emeritus
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Complex variables

Sverak, Vladimir, Professor
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Calculus of variations, nonlinear elasticity

Voronov, Alexander, Associate Professor
Ph.D., Moscow State University
Mathematical physics, algebra

Wang, Jiaping, Associate Professor
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Differential geometry

Webb, Peter, Professor
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Group theory

Weinberger, Hans, Professor Emeritus
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Applied mathematics, fluid analysis

White, Dennis, Professor
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Combinatorics

Zeitouni, Ofer, Professor
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Probability theory, random matrices, communication and information theories

Mechanical Engineering

Aksan, Alptein, Assistant Professor
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Biopreservation/biothermodynamics, desiccation/vitrification phenomena, applications of MEMS in bioengineering and bioheat and mass transfer

Alexander, Jennifer K., Assistant Professor
Ph.D., University of Washington, Seattle
Comparative history of industrial culture

§ Arora, Sant Ram, Professor
Ph.D., Johns Hopkins University
Optimization concepts, resource allocation, capacity sizing, production facilities

§ Benjaafar, Saifallah, Professor
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Modeling, design and control of automated manufacturing of production systems

§ Bischof, John C., Professor
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Bioengineering, bioheat and mass transfer, cryobiology, hyperthermia

§ Blackshear, Perry L., Jr., Professor Emeritus
Ph.D., Case Institute of Technology
Bioengineering, combustion, applied thermodynamics

§ Chase, Thomas R., Professor
Ph.D., University of Minnesota
Computer-aided design, mechanical engineering database, kinematics, machine design

Cooper, William L., Associate Professor
Ph.D., Georgia Institute of Technology
Stochastic models, revenue management, queuing theory

Cui, Tianhong, Associate Professor
Ph.D., Chinese Academy of Sciences
Micro/nanomanufacturing, MEMS/NEMS (micro/nano electro mechanical systems), polymer/organic microelectronics

§ Davidson, Jane H., Professor
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Fluid mechanics, solar energy, environmental engineering

§ Donath, Max, Professor
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Sensors and control systems as applied to robotics and vehicles

Dumitrica, Traian, Assistant Professor
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Theoretical and computational aspects of materials science, mechanical properties, stability and behavior of distinct nanoscale objects

§ Durfee, William K., Professor
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Product design, real-time control, biomechanics, rehabilitation engineering

***§ Erdman, Arthur G., P.E., Professor**
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Computer-aided design, kinematics, biomechanics, microelectromechanical systems

§ Fletcher, Edward A., Professor Emeritus
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Manufacturing process modeling and control theory

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§ Kuehn, Thomas H., P.E., Professor
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Biomechanics

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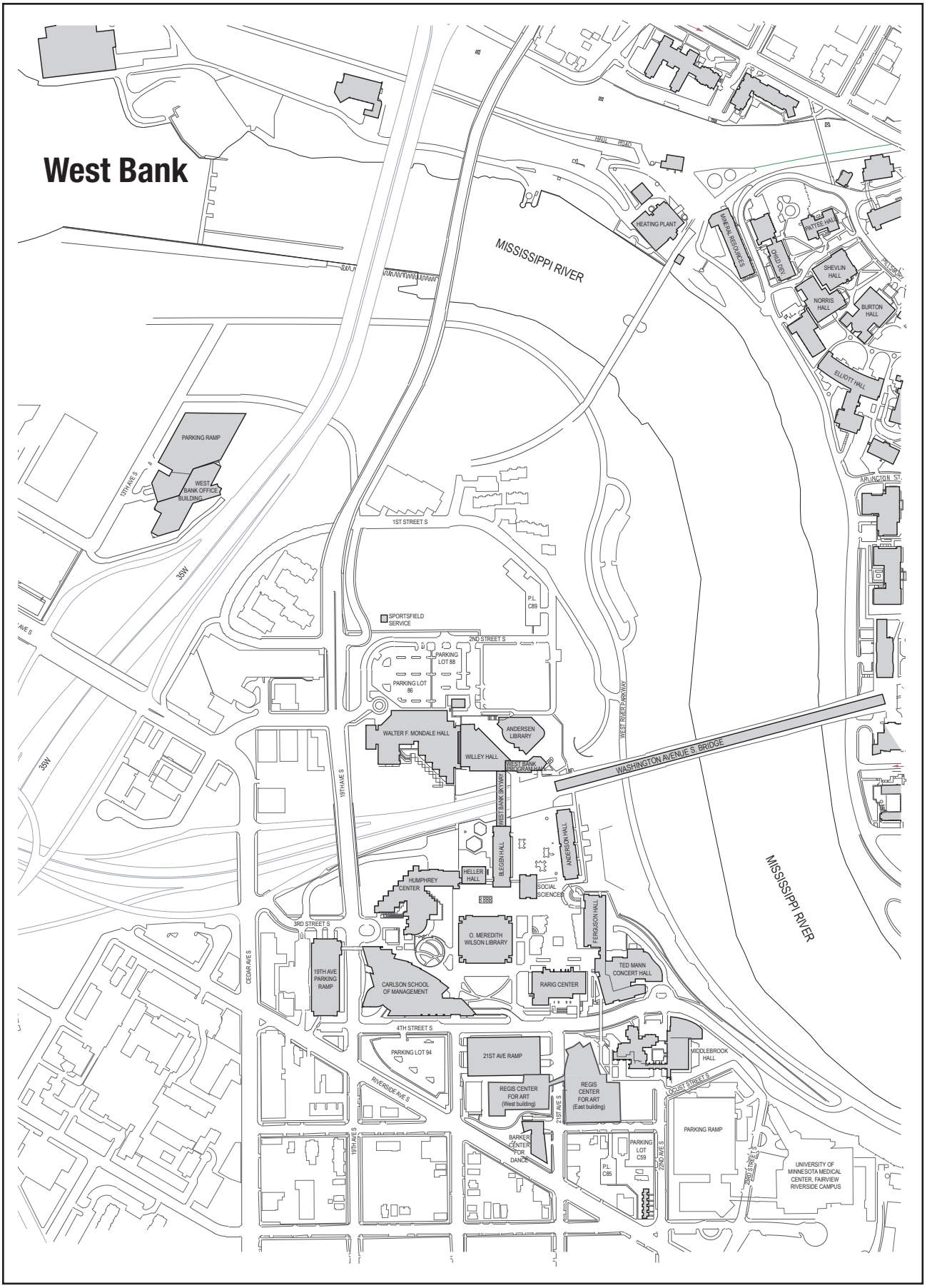
East Bank


DINKYTOWN
1313 5TH STREET SE
GIBSON-NAGURSKI FOOTBALL PRACTICE FACILITY
SIEBERT BASEBALL STADIUM
BIERMAN TRACK AND FIELD STADIUM
BIERMAN FIELD
COWLES SOFTBALL STADIUM
BASEBALL CLUBHOUSE
BIERMAN FIELD ATHLETIC BLDG.
SANFORD HALL
PROF. WILKINS HALL
UNIVERSITY AVE SE
10TH STREET SE
4TH STREET SE
5TH STREET SE
7TH STREET SE
8TH STREET SE
CAMPUS SUBSTATION
FOURTH STREET PARKING RAMP
PARKING LOT 37
LIONS RESEARCH BUILDING
McGUIRE TRANSLATIONAL RESEARCH BUILDING
BIDDER ARENA AND BASELINE TENNIS FACILITY
MARUCCI ARENA
HAWKEYE LOT
PARKING LOT C51
1901 UNIV. AVE.
PARKING LOT 36
GOPHER LOT
MUSIC ED.
PEK GYM
PEK HALL
SHEVLIN HALL
NORRIS HALL
BURTON HALL
EDDY HALL
FOLWELL HALL
BELL MUSEUM
WILLIAMSON HALL
ELLIOTT HALL
NICHOLSON HALL
PILLSBURY HALL
ARMORY
UNIVERSITY OF MINNESOTA FIELD HOUSE
SPORTS PAVILION
WILLIAMS ARENA
NORTHROP AUDITORIUM
RAPSON HALL
CIVIL ENG.
COOKE HALL
REGISTRATION CENTER
UNIVERSITY AVE. RAMP
AQUATIC CENTER
POUCHER BUILDING
HOLMAN BUILDING
HURON BOULEVARD
APPLEBY HALL
JOHNSTON HALL
MORRILL HALL
SHEPHERD LABS
FRASER HALL
WALTER LIBRARY
TATE LAB OF PHYSICS
MECHANICAL ENG.
ACKERMAN HALL
MALL
SCHOLARS WALK
McNAMARA ALUMNI CTR.
PARKING LOT 72
INFORMATION TECHNOLOGY
SMITH HALL
ELECTRICAL ENG. AND COMPUTER SCIENCE
WASHINGTON AVE. PARKING RAMP
RADISSON METRODOME
TRANSPORTATION & SAFETY BLDG.
SCIENCE CLASSROOM
KOLTHOFF HALL
FORD HALL
AMUNDSON HALL
WASHINGTON AVE SE
STADIUM VILLAGE
THE CUBE (Union entrance)
WEISMAN ART MUSEUM
COFFMAN MEMORIAL UNION
HASSELMO HALL
JACKSON HALL
MOLECULAR AND CELLULAR BIOLOGY
WEAVER-DENSFORD HALL
MOOS TOWER
MEDICAL CENTER PARKING RAMP
717 DELAWARE STREET SE
DELAWARE STREET SE
OAK STREET PARKING RAMP
COMSTOCK HALL
BOYNTON HEALTH SERVICE
MAYO MEMORIAL BUILDING
PHILLIPS WANGENSTEEN
NEW CANCER RESEARCH CTR.
CENTENNIAL HALL
TERRITORIAL HALL
YUDOF HALL
EAST RIVER PARKWAY GARAGE
CHILD DEVELOPMENT
DIEHL HALL
MASONIC CANCER CTR.
ESSEX STREET SE
VARIETY RESEARCH CTR.
DVCCRC CCRB
UNIVERSITY OF MINNESOTA MEDICAL CENTER, FAIRVIEW
PIONEER HALL
FRONTIER HALL
FULTON STREET SE
MISSISSIPPI RIVER
WEST RIVER PARKWAY
EAST RIVER PARKWAY


West Bank
MISSISSIPPI RIVER
HAUL ROAD
HEATING PLANT
MINERAL RESOURCES
CHUD DEV
PATTEE HALL
SHEVLIN HALL
NORRIS HALL
BURTON HALL
ELLIOTT HALL
ARLINGTON ST
PARKING RAMP
WEST BANK OFFICE BUILDING
19TH AVE S
35W
1ST STREET S
P.L. C89
SPORTSFIELD SERVICE
2ND STREET S
PARKING LOT 88
PARKING LOT 86
WEST RIVER PARKWAY
WALTER F. MONDALE HALL
ANDERSEN LIBRARY
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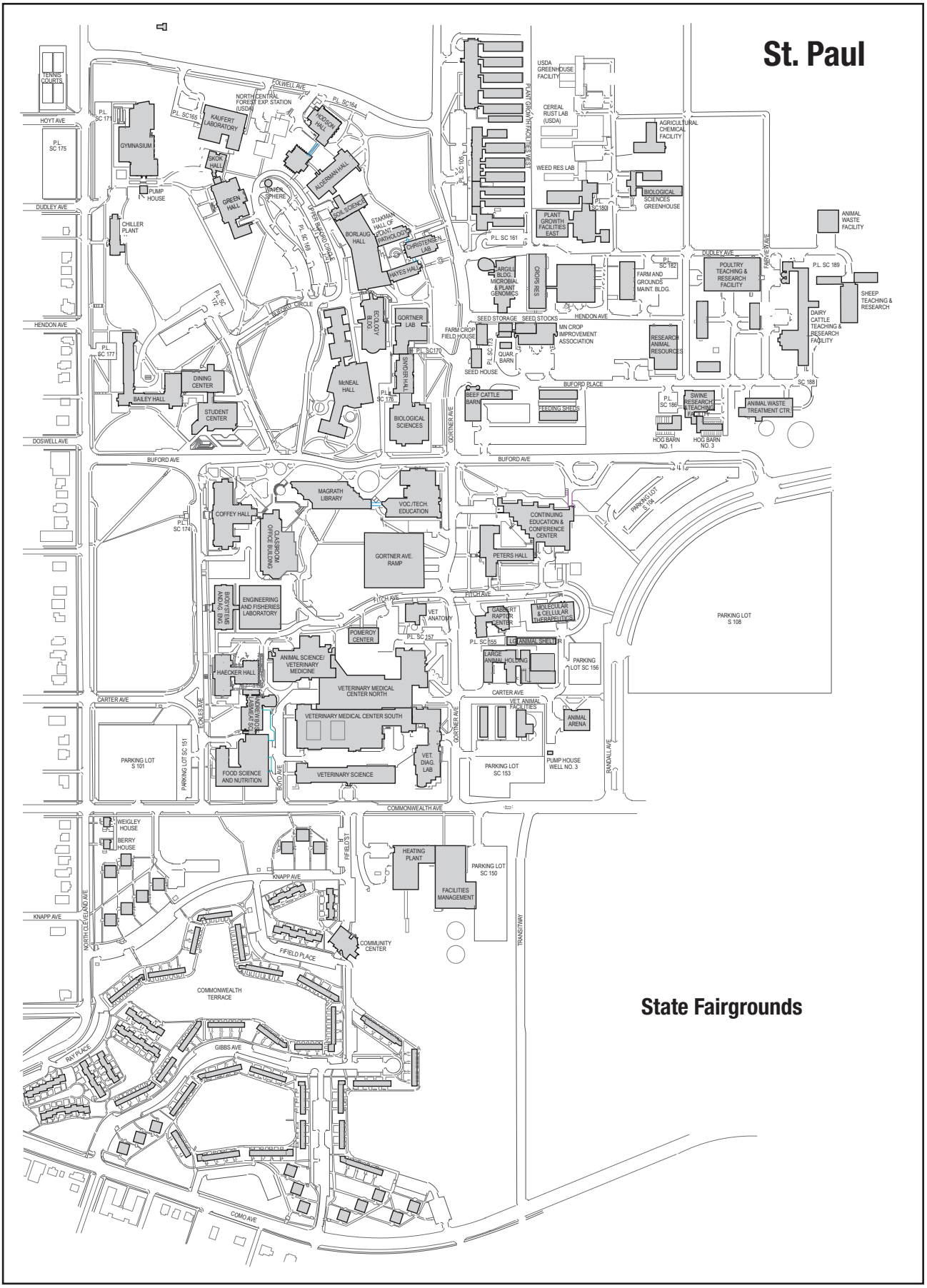
WASHINGTON AVENUE S. BRIDGE
WEST BANK SKYWAY
BLEGEN HALL
ANDERSON HALL
HELLER HALL
HUMPHREY CENTER
SOCIAL SCIENCES
3RD STREET S
O. MEREDITH WILSON LIBRARY
FERGUSON HALL
TED MANN CONCERT HALL
CEDAR AVE S
19TH AVE PARKING RAMP
CARLSON SCHOOL OF MANAGEMENT
RARIG CENTER
4TH STREET S
PARKING LOT 94
21ST AVE RAMP
MIDDLEBROOK HALL
REGIS CENTER FOR ART (West building)
REGIS CENTER FOR ART (East building)
RIVERSIDE AVE S
21ST AVE S
AUGUST STREET S
PARKING RAMP
BARKER CENTER FOR DANCE
PARKING LOT C59
P.L. C85
20TH AVE S
26TH STREET S
UNIVERSITY OF MINNESOTA MEDICAL CENTER, FAIRVIEW RIVERSIDE CAMPUS


St. Paul
TENNIS COURTS
HOYT AVE
P.L. SC 175
P.L. SC 177
GYMNASIUM
PUMP HOUSE
DUDLEY AVE
CHILLER PLANT
COLWELL AVE
NORTH CENTRAL FOREST EXP. STATION (USDA)
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KAUFERT LABORATORY
P.L. SC164
HODSON HALL
SNYDER HALL
ALDERMAN HALL
GREEN HALL
GREEN SPHERE
THE BARTON CIRCLE
P.L. SC 168
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STAKMAN HALL OF PLANT PATHOLOGY
BORLAUG HALL
CHRISTENSEN LAB
HAYES HALL
BUFORD CIRCLE
P.L. SC 172
HENDON AVE
P.L. SC 177
BAILEY HALL
DINING CENTER
STUDENT CENTER
ECOLOGY BLDG.
GORTNER LAB
P.L. SC170
SANGER HALL
McNEAL HALL
P.L. SC 176
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DOSWELL AVE
BUFORD AVE
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PLANT GROWTH FACILITIES WEST
CEREAL RUST LAB (USDA)
AGRICULTURAL CHEMICAL FACILITY
WEED RES LAB
P.L. SC 105
P.L. SC 159
BIOLOGICAL SCIENCES GREENHOUSE
PLANT GROWTH FACILITIES EAST
P.L. SC 161
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P.L. SC 182
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POULTRY TEACHING & RESEARCH FACILITY
P.L. SC 189
SHEEP TEACHING & RESEARCH
DAIRY CATTLE TEACHING & RESEARCH FACILITY
ARGILI BLDG. MICROBIAL & PLANT GENOMICS
CROPS RES
SEED STORAGE
SEED STOCKS
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MN CROP IMPROVEMENT ASSOCIATION
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FARM CROP FIELD HOUSE
P.L. SC 175
QUAR. BARN
SEED HOUSE
BUFORD PLACE
BEEF CATTLE BARN
FEEDING SHEDS
P.L. SC 186
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HOG BARN NO. 1
HOG BARN NO. 3
SC 188
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VOC./TECH. EDUCATION
COFFEY HALL
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CLASSROOM OFFICE BUILDING
GORTNER AVE. RAMP
CONTINUING EDUCATION & CONFERENCE CENTER
PARKING LOT S 109
PETERS HALL
PARKING LOT S 108
BIOSYSTEMS AND AG. ENG.
ENGINEERING AND FISHERIES LABORATORY
PITCH AVE
VET ANATOMY
POMEROY CENTER
P.L. SC 157
CARPENTER RAPTOR CENTER
MOLECULAR & CELLULAR THERAPEUTICS
P.L. SC 155
LG. ANIMAL SHELTER
LARGE ANIMAL HOLDING
PARKING LOT SC 156
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ANIMAL SCIENCE VETERINARY MEDICINE
VETERINARY MEDICAL CENTER NORTH
CARTER AVE
COKLES AVE
MONTGOMERY ANIM. SCI.
VETERINARY MEDICAL CENTER SOUTH
VET. ANIMAL FACILITIES
ANIMAL ARENA
PARKING LOT S 101
PARKING LOT SC 151
FOOD SCIENCE AND NUTRITION
BUCK AVE
VETERINARY SCIENCE
VET. DIAG. LAB
PARKING LOT SC 153
PUMP HOUSE WELL NO. 3
RANDALL AVE
COMMONWEALTH AVE
WEIGLEY HOUSE
BERRY HOUSE
FIFIELD ST
HEATING PLANT
PARKING LOT SC 150
FACILITIES MANAGEMENT
KNAPP AVE
NORTH CLEVELAND AVE
COMMUNITY CENTER
TRANSITWAY
FIFIELD PLACE
COMMONWEALTH TERRACE
GIBBS AVE
RAY PLACE
COMO AVE
State Fairgrounds

Academic Calendars 2006-2008

2006-2007

Fall Semester 2006 (70 class days)

September 4	Labor Day
September 5	Classes begin
November 23-24	Thanksgiving holiday
December 13	Last day of instruction
December 14-16, 18-20	Final examinations
December 17	Study day

Spring Semester 2007 (74 class days)

January 15	Martin Luther King holiday
January 16	Classes begin
March 12-16	Spring break
May 4	Last day of instruction
May 5-6	Study days
May 7-12	Final examinations

May Session 2007 (14 class days)

May 21	3-week session begins
May 28	Memorial Day holiday
June 8	3-week session ends

2007-2008

Fall Semester 2007 (70 class days)

September 3	Labor Day
September 4	Classes begin
November 22-23	Thanksgiving holiday
December 12	Last day of instruction
December 13, 16	Study days
December 14, 15, 17-20	Final examinations

Spring Semester 2008 (74 class days)

January 21	Martin Luther King holiday
January 22	Classes begin
March 17-21	Spring break
May 9	Last day of instruction
May 10-11	Study days
May 12-17	Final examinations

May Session 2008 (14 class days)

May 26	Memorial Day holiday
May 27	3-week session begins
June 13	3-week session ends