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University of Minnesota 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.


This catalog contains information that is current as of spring quarter 1999.

A student normally may fulfill degree requirements identified in any combination of University of Minnesota Duluth (UMD) catalogs that have been in effect since entering a college or university and within eight years before graduation from UMD. The contents of this catalog and other University catalogs, publications, and announcements are subject to change without notice to accommodate requirements of accrediting agencies, budgetary restrictions, and policy modifications, and these changes may be applied to current students. Information about any changes can be obtained from appropriate department and college offices or the Office of the Registrar.

Students may use a different catalog to determine degree requirements for each major, minor, and the liberal education distribution requirements. Only one catalog may be used, however, to determine a student's individual major, minor, or liberal education requirements.

If a student re-enrolls at UMD after completing a baccalaureate degree, the student will be considered a new entrant. As a new entrant, a re-enrolling student will be expected to complete the requirements listed in the catalog in effect at the time of re-enrollment or in a subsequent catalog printed within eight years before graduation from UMD.

This catalog also is available in alternative formats upon request. Please contact the Access Center, University of Minnesota Duluth, 138 Library (218/726-8217).

This catalog also is available in electronic format on the Internet and may be accessed at <http://www1.umn.edu/comppub/umd/umd.html> on the World Wide Web.
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.

In adhering to this policy, the University abides by the Minnesota Human Rights Act, Minnesota Statute Ch. 363; by the Federal Civil Rights Act, 42 U.S.C. 2000e; by the requirements of Title IX of the Education Amendments of 1972; by Sections 503 and 504 of the Rehabilitation Act of 1973; by the Americans With Disabilities Act of 1990; by Executive Order 11246, as amended; by 38 U.S.C. 2012, the Vietnam Era Veterans Readjustment Assistance Act of 1972, as amended; and by other applicable statutes and regulations relating to equality of opportunity.

Inquiries regarding compliance may be directed to Deborah Petersen-Perlman, Director, Office of Equal Opportunity, University of Minnesota Duluth, 255 Darland Administration Building, 10 University Drive, Duluth, MN 55812-2496 (218/726-6849), or Julie Sweitzer, Director, Office of Equal Opportunity and Affirmative Action, University of Minnesota, 419 Morrill Hall, 100 Church Street S.E., Minneapolis, MN 55455-0134 (612/624-9547).

### Department Offices

After reading all pertinent sections in this catalog, students should feel free to contact department offices for more information about specific programs. Listed below are UMD’s 42 academic departments along with their main office address (see map in back for full building name) and telephone (area code 218).

| Accounting | 125 SBE (726-7966) |
| Aerospace Studies | ROTC (726-8159) |
| American Indian Studies | 116 Cina (726-8771) |
| Anatomy and Cell Biology | 208 Med (726-7901) |
| Art | 317 H (726-8225) |
| Behavioral Sciences | 236 Med (726-7144) |
| Biochemistry and Molecular Biology | 252 Med (726-7922) |
| Biology | 211 LSci (726-6262) |
| Chemical Engineering | 207 Engr (726-7126) |
| Chemistry | 246 Chem (726-7212) |
| Communication | 465 ABAH (726-8576) |
| Communication Sciences and Disorders | 221 BohH (726-7974) |
| Composition | 420 H (726-8131) |
| Computer Science | 320 HH (726-7607) |
| Economics | 165 SBE (726-7284) |
| Education | 120 MonH (726-7233) |
| Electrical and Computer Engineering | 271 MWAH (726-6147) |
| English | 410 H (726-8228) |
| Family Medicine | 141 Med (726-7916) |
| Finance and Management Information Sciences | 150 SBE (726-7532) |
| Foreign Languages and Literatures | 457 H (726-7951) |
| Geography | 329 Cina (726-6300) |
| Geological Sciences | 229 HH (726-8385) |
| Health, Physical Education, and Recreation | 110 SpHC (726-7120) |
| History | 265 ABAH (726-7253) |
| Industrial Engineering | 105 VKH (726-6161) |
| Management Studies | 110 SBE (726-8992) |
| Mathematics and Statistics | 140 CCtr (726-8747) |
| Medical and Molecular Physiology | 352 Med (726-8551) |
| Medical Microbiology and Immunology | 336 Med (726-7561) |
| Music | 231 H (726-8208) |
| Pathology and Laboratory Medicine | 222 Med (726-7911) |
| Pharmacology | 308 Med (726-8512) |
| Philosophy | 369 ABAH (726-8548) |
| Physics | 371 MWAH (726-7124) |
| Political Science | 304 Cina (726-7534) |
| Psychology and Mental Health | 320 BohH (726-7117) |
| Social Work | 220 BohH (726-7245) |
| Sociology-Anthropology | 228 Cina (726-7801) |
| Supportive Services Program | 78 Ctr (726-8728) |
| Theatre | 141 MPAC (726-8562) |
| Women’s Studies | 469 ABAH (726-7953) |
Setting

Duluth is at the western end of the largest freshwater lake in the world, Lake Superior. The city stretches nearly 25 miles along the 600-foot-high headlands of the lake. Duluth truly is a unique city. It is a popular tourist attraction and a busy international port hundreds of miles from the ocean.

The city is part of a seven-county area in northeastern Minnesota called the Arrowhead Region. The region offers unlimited opportunities to round out the college experience: sightseeing and rock climbing along the North Shore of Lake Superior, canoeing and camping in the Boundary Waters Canoe Wilderness Area north of Duluth, sailing on Lake Superior, and skiing at Spirit Mountain in Duluth. A popular spot for in-line skating, walking, and biking is Duluth’s Minnesota Point. Just four miles from campus, Canal Park offers shopping, sightseeing, and a connection to the scenic Lakewalk.

Superior, Wisconsin, is Duluth’s sister city across the bay. Duluth and Superior’s combined population of more than 110,000 people supports activities of many cultural organizations in addition to those the campus offers. These organizations include the Duluth-Superior Symphony Orchestra, Minnesota Ballet, Duluth Art Institute, and Duluth Playhouse (the nation’s oldest continuous community theatre). Twin Ports’ residents live only 150 miles from the Twin Cities of Minneapolis and St. Paul and the many additional cultural activities available there.

Organization

The University of Minnesota was established in 1851 by an act of the Minnesota territorial legislature. It is governed by an autonomous Board of Regents that enacts laws governing the institution, controls expenditures, and acts upon all staff changes. The board is composed of 12 individuals appointed by the state legislature. The president of the University is the ex-officio head of the board and is directly responsible to the regents as the University’s chief executive officer.

UMD became a coordinate campus of the University of Minnesota by legislative act on July 1, 1947. The campus is administered by a chancellor, who reports to the president of the University. The Duluth campus is organized into three broad functional areas: academic administration, finance and operations, and academic support and student life. Each area is headed by a vice chancellor who reports directly to the chancellor.

UMD has five undergraduate colleges and schools, each headed by a dean who reports to the vice chancellor for academic administration:

- School of Business and Economics
- College of Education and Human Service Professions
- School of Fine Arts
- College of Liberal Arts
- College of Science and Engineering

Academic support units, including Information Technology Systems and Services, the library, and University College Duluth, are under the jurisdiction of the vice chancellor for academic administration, who also oversees the Natural Resources Research Institute. The School of Medicine, which offers a two-year basic science curriculum, is headed by a dean who reports to the vice president for health sciences.

The vice chancellor for academic support and student life has administrative jurisdiction over admissions, financial aid and registrar, Access Center, equity programs, Career Services, First-Year Experience, Supportive Services Program, Student Assistance Center, Health Services, Kirby Student Center, Recreational Sports, Student Life, and Systems Operation and Control Unit.

Financial records, collection of tuition and fees, disbursement of funds, parking and transportation, the transportation pool, real estate, inventory, payroll, and loan collections are the responsibility of the vice chancellor for finance and operations. Auxiliary Services, the Business Office, Facilities Management, and the Departments of Human Resources, Intercollegiate Athletics, and Police and Parking report to this vice chancellor unit.


Mission

UMD serves northern Minnesota, the state, and the nation as a medium-sized comprehensive university dedicated to excellence in all its programs and operations. As a university community in which knowledge is sought as well as taught, its faculty recognize the importance of scholarship and service, the intrinsic value of research, and the significance of a primary commitment to quality instruction.
At UMD, a firm liberal arts foundation anchors a variety of traditional degree programs, outreach offerings, and selected professional and graduate studies. Active learning through internships, honors programs, research, and community service promotes the development of skills, critical thinking, and maturity sought by society. Demanding standards of performance for students, faculty, and staff make UMD attractive to students with strong academic potential.

The campus contributes to meeting the cultural needs of the region and serves as a central resource point for the economic development of the region through community outreach and through an emphasis on the sea-grant and land-grant components of its program.

UMD significantly contributes to enhancing the national stature of the University of Minnesota by emphasizing quality programs central to the University's mission and UMD's distinctive mission within the University system, including graphic design and freshwater undergraduate research.

Providing an alternative to both large research-oriented universities and small liberal arts colleges, UMD attracts the student looking for a program that emphasizes a personalized learning experience on a medium-sized campus of a major university.

The UMD learning experience includes undergraduate research opportunities for all students in the arts, humanities, and sciences plus an expectation of involvement in volunteerism and value-added leadership development opportunities. Maintenance of a high-quality residential learning environment makes a critical contribution to the strength of the undergraduate learning environment.

Technology continues to provide support and definition throughout the curriculum, operations, and outreach. Integration of cutting-edge technology is a focus in all planning efforts.

The UMD Student Life Creed*

The University of Minnesota Duluth is a community dedicated to fostering personal and academic growth for all its members. We are united in this common cause, because empowering all members of the community to achieve personal and academic excellence requires order, respect, integrity, and trust. When joining the community, an individual is agreeing to live by certain ideals and strive for the level of achievement and values suggested by the following:

*I will practice personal and academic integrity.
A commitment to this ideal pledges honesty in relationships and academic work. It encourages doing one's own work, being truthful, giving credit where it is due, and being loyal in personal relationships.

*I will respect the rights and property of others.
This ideal pledges respect for the personal rights of others to move about freely, express themselves appropriately, and enjoy privacy. It respects the property of individuals and the community.

*I will practice personal responsibility in all manner of thought and action.
A commitment to this ideal presupposes an attitude of accountability and dependability toward others. It expects respect for the UMD society and anticipates an active participation within the community.

*I will acknowledge diversity in people, ideas, and opinions and strive to learn from differences in others.
A commitment to this ideal pledges support for equal rights and opportunities for all individuals regardless of their age, sex, race, religion, disability, ethnic heritage, socioeconomic status, sexual preference, and political, social, or other affiliation or disaffiliation.

*I will demonstrate caring and concern for others, their feelings, and their need for conditions that support their growth and development.
A commitment to this ideal is a pledge to be compassionate and considerate. It means being sensitive, hospitable, and supportive in order that all members of the UMD community are provided optimal conditions to be successful in their pursuit of academic and personal goals.

*I will uphold generally accepted and respected principles of citizenship.
A commitment to this ideal is a promise to respect the welfare of the whole, understand membership privileges, and contribute to this community. It recognizes that each person is a valuable and unique community member. This community has behavioral standards to which each of us is accountable. Each of us has an affirmative obligation to confront, challenge, and respond to or report inappropriate behavior whenever and wherever encountered.

* Excerpts used with permission (The Carolinian Creed, University of South Carolina).
Academic Programs

UMD offers
- four-year baccalaureate degree programs in accounting and business administration, some areas of engineering, fine arts, liberal arts and sciences, applied arts and sciences, and elementary, middle, and secondary school teaching.
- master’s degree programs in applied and computational mathematics, biology, business administration, chemistry, communication sciences and disorders, computer science, counseling psychology (emphases in community counseling, college counseling, and school counseling), education, English, fine arts in art (emphasis in graphic design), geology, industrial safety, liberal studies, music, physics, and social work.
- a two-year basic sciences medical school program leading toward the M.D. degree through transfer to the University of Minnesota Medical School or another medical school.
- cooperative master’s and Ph.D. programs with the Twin Cities campus in biochemistry, microbiology, pharmacology, and physiology.
- all-University graduate programs (master’s and Ph.D.) in toxicology and water resources science.

Accreditation

As a campus of the University of Minnesota, UMD is accredited by the Commission on Institutions of Higher Education of the North Central Association of Colleges and Schools, 30 N. LaSalle Street, Suite 2400, Chicago, IL 60602 (800/621-7440). In addition, individual programs are accredited by appropriate organizations, including the National Council for Accreditation of Teacher Education, American Chemical Society, National Association of Schools of Music, American Association of University Women, Liaison Committee on Medical Education of the Association of American Medical Colleges, Accreditation Board for Engineering and Technology, American Speech-Language-Hearing Association, Commission of the Computing Sciences Accreditation Board, Council on Social Work Education, and Council for Accreditation of Counseling and Related Educational Programs.

Expenses

Cost of attendance for Minnesota residents who are full-time students living in dormitories is approximately $11,892 per year. This figure will be lower for students who live at home, carry lunches, or otherwise economize on board and room. University tuition and fees are subject to change by the Board of Regents.

Tuition

Listed below are 1999-2000 tuition rates for undergraduate, Graduate School, master of business administration (M.B.A.) degree program, and School of Medicine students. For more information on the resident/nonresident breakdown, see Residence Status in this section of the catalog.

<table>
<thead>
<tr>
<th>PROGRAM</th>
<th>Resident</th>
<th>Nonresident</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNDERGRADUATE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>All units (per credit)</td>
<td>$141.00</td>
<td>$400.00</td>
</tr>
<tr>
<td>UCD same as day</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DEPARTMENT MASTER’S</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Master of Education (M.Ed.)</td>
<td>200.00</td>
<td>400.00</td>
</tr>
<tr>
<td>Master of Industrial Safety (M.I.S.)</td>
<td>200.00</td>
<td>400.00</td>
</tr>
<tr>
<td>M.B.A. PROGRAM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(per credit)</td>
<td>400.00</td>
<td>400.00</td>
</tr>
<tr>
<td>GRADUATE SCHOOL (except M.B.A.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Part-time Enrollment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 credit (total)</td>
<td>420.00</td>
<td>825.00</td>
</tr>
<tr>
<td>2 credits (total)</td>
<td>840.00</td>
<td>1,650.00</td>
</tr>
<tr>
<td>3 credits (total)</td>
<td>1,260.00</td>
<td>2,475.00</td>
</tr>
<tr>
<td>4 credits (total)</td>
<td>1,680.00</td>
<td>3,300.00</td>
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<tr>
<td>5 credits (total)</td>
<td>2,100.00</td>
<td>4,125.00</td>
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<tr>
<td>Full-time Enrollment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6-14 credits</td>
<td>2,520.00</td>
<td>4,950.00</td>
</tr>
<tr>
<td>Above 14 credits</td>
<td>420.00</td>
<td>825.00</td>
</tr>
<tr>
<td>SCHOOL OF MEDICINE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Years 1 and 2:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-5 credits</td>
<td>1,498.00</td>
<td>2,783.00</td>
</tr>
<tr>
<td>6-10 credits</td>
<td>2,996.00</td>
<td>5,566.00</td>
</tr>
<tr>
<td>11-15 credits</td>
<td>4,494.00</td>
<td>8,439.00</td>
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<tr>
<td>16+ credits</td>
<td>5,992.00</td>
<td>11,132.00</td>
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<tr>
<td>Years 3 and 4:</td>
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<td></td>
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<tr>
<td>Term Rate</td>
<td>4,280.00</td>
<td>7,951.00</td>
</tr>
<tr>
<td>Medical Fellow Specialists</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(per term)</td>
<td>333.00</td>
<td>333.00</td>
</tr>
<tr>
<td>Deposits</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chemistry breakage card</td>
<td></td>
<td>30.00</td>
</tr>
<tr>
<td>Chemical engineering usage card</td>
<td></td>
<td>30.00</td>
</tr>
<tr>
<td>Music key deposit</td>
<td></td>
<td>5.00</td>
</tr>
<tr>
<td>Special Fees</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minnesota Public Interest Research Group (MPIRG)</td>
<td>4.12</td>
<td></td>
</tr>
<tr>
<td>Per semester (optional)</td>
<td>3.40</td>
<td></td>
</tr>
<tr>
<td>Student Legislative Coalition (SLC)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Per semester (optional)</td>
<td>3.40</td>
<td></td>
</tr>
</tbody>
</table>
Student Health Insurance

All degree-seeking students registered for 6 or more credits (3 or more credits during summer sessions) must carry health insurance. Students covered by family or other private insurance policies fulfill this requirement. It is valid 24 hours a day, worldwide. A student health insurance policy may be purchased by qualified students for a full 12 months.

For more information, contact the Student Health Insurance Office (218/726-8000).

Student Identification Card

Each student is issued a student identification card (U card) at the time of initial registration in the University. The card bears the student’s name, student file number, social security number, and photograph, and is a permanent identification to be used during the entire time the student attends the University. The card should be in a student’s possession at all times and must be presented to obtain various University services and to register each semester. The cost to replace an identification card is $10.

Student Service Fee

The student service fee for the 1999-2000 academic year is $175.55 plus $9.00 for recreational sports facilities, for a total of $184.55 per semester. This fee is subject to change.

The fee is required of all students registered for 6 or more credits in any semester and 3 or more credits in any summer session, except those living beyond the commuting area while doing research away from campus, those registered only for the purpose of working on starred papers, and those registered only for the purpose of consulting with their major adviser by mail or on occasional visits to campus. Any student not required to pay the fee may elect to do so and thus become eligible for all services it covers.

Health Services Fee

This fee, subject to change, provides students with access to Health Services for professional health care and services. X-ray and laboratory services and minor surgery may be billed to the patient’s health insurance. The fee is required of all students registered for 6 or more credits in any semester or 3 or more credits in any summer session, except those living beyond the commuting area while doing research away from campus, those registered only for the purpose of working on starred papers, and those
registered only for the purpose of consulting with their major adviser by mail or on occasional visits to campus. Any student (including University College Duluth) not required to pay the fee may elect to do so and thus become eligible for all services it covers. Spouses of students may also elect to pay the fee and become eligible for services.

Refunds

There are two refund schedules: one for new students and one for continuing students.

**New** students receive a 100 percent tuition and course fee refund if they cancel up through Tuesday of the second week of the semester; 90 percent during the remainder of the second week; 80 percent during the third and fourth weeks; 70 percent during the fifth week; 60 percent during the sixth and seventh weeks; 50 percent during the eighth week; 40 percent during the ninth week; and no refund thereafter. **Note:** These refund rates apply to the first semester of enrollment only. After the first semester, rates for continuing students apply.

**Continuing** students receive a 100 percent tuition and course fee refund if they cancel up through Tuesday of the second week of the semester; 90 percent during the second week; 50 percent during the third and fourth weeks; 25 percent during the fifth through eighth weeks; and no refund thereafter.

No retroactive refunds are given for either canceling a course or withdrawing from school. The date a student processes a course cancellation via the Web registration system or notifies the Information Desk (in the Campus Center) of their intent to withdraw from school is the date used to determine the refund amount.

Special consideration is given for course cancellations due to medical problems, attendance at other academic institutions, rules of individual academic departments, active military duty, or disciplinary actions. The student must provide documentation to 139 Darland Administration Building for exemption from the refund policy.

Financial aid recipients may have some funds returned to the aid source.

Residence Status

**Residence**—Because the University is a state institution, Minnesota residents pay lower tuition than nonresidents and, in many programs, receive priority consideration for admission. To qualify for resident status, students must reside in Minnesota for at least one continuous calendar year before the first day of class attendance. For more information, contact the Resident Classification and Reciprocity Chair, 139 Darland Administration Building, 10 University Drive, Duluth, MN 55812 (218/726-7849).

**Reciprocity**—The University has undergraduate reciprocity agreements with Kansas, Michigan, Missouri, Nebraska, North Dakota, South Dakota, Wisconsin, and Manitoba. If you are a resident of any of these states or this province, you may qualify for reciprocity tuition rates, which are lower than nonresident tuition rates and, in some cases, comparable to resident rates. For more information, contact the Resident Classification and Reciprocity Office Chair, 139 Darland Administration Building, 10 University Drive, Duluth, MN 55812 (218/726-7849).

Reciprocity agreements for admitted Graduate School students exist with only North Dakota, South Dakota, Wisconsin, and Manitoba.

Financial Aid

All students requesting financial aid at UMD must submit the Free Application for Federal Student Aid (FAFSA). These forms are available from the UMD Office of Admissions and Financial Aid and high school counselors. The U.S. Department of Education determines a student’s financial need from information provided on the FAFSA.

After UMD receives a student’s information from the Department of Education, it mails the student a financial aid notification letter. UMD knows that every student has a somewhat different financial situation. A financial aid award package consists of funding from one or more aid programs and helps meet a student’s financial need.

Financial aid recipients must show reasonable academic progress to be eligible for federal and state aid. An Academic Policy brochure is available for review at the Campus Center Information Desk.
Questions regarding financial aid can be answered in the Student Assistance Center, 21 Campus Center.

**Types of Financial Aid**

**Federal Pell Grants**—Federal Pell Grants are awarded to undergraduates working toward a first baccalaureate degree. In 1998-99, these grants ranged from $400 to $3,000. The actual award received depends on the student’s family financial situation, whether the student attends school full or part time, and other criteria.

**Federal Supplemental Educational Opportunity Grants**—These are federal grants awarded to undergraduate students who demonstrate exceptional financial need. Award amounts depend on the availability of funds.

**Minnesota State Grant**—Minnesota residents who will be enrolled for at least three credits as undergraduates are eligible for a State Grant. Students may not have attended postsecondary institutions more than the equivalent of eight semesters full time. The actual award received varies based on cost of attendance, financial need, number of credits, and the amount the student is eligible for in the Federal Pell Grant.

**University Grants and Scholarships**—These are awards supported by foundations, organizations, alumni, and friends of the University. Many of the scholarships are awarded by scholarship committees of the University College Duluth and departments in consultation with the financial aid office.

**Air Force ROTC College Scholarships**—These scholarships are available to qualified students regardless of financial need. Grants are based on applicants’ organizational leadership potential as demonstrated by scores earned on the Air Force Officer Qualifying Test, their academic and extracurricular achievements, and the recommendation of an AFROTC scholarship committee. For more information, contact Air Force ROTC at (218)726-8159; e-mail: air@d.umn.edu.

**American Indian /Alaskan Native Scholarships**—Candidates for state or federal American Indian/Alaskan native scholarships who plan to attend UMD must submit the FAFSA. American Indians/Alaskan natives who are Minnesota residents may be eligible for special scholarship assistance. Information regarding opportunities for financial assistance from state and federal sources may be obtained from the financial aid minority counselor, 139 Darland Administration Building.

**Outside Scholarships**—Donors from civic groups, churches, and businesses offer many scholarships to students. Local libraries, high school counselors, and the UMD Student Assistance Center provide listings of available scholarships.

**Student Employment Options**—The Student Employment Office, 255 Darland Administration Building, has positions available at the University and in Duluth through two employment programs: Work-Study and miscellaneous employment. Job vacancies under both programs are posted outside 139 Darland Administration Building.

**Work-Study Employment**—Federal and state Work-Study programs fund jobs for students with financial need. Work-Study gives students a chance to earn money to help pay for educational expenses.

**Miscellaneous Employment**—Positions are available on campus and in the Duluth community. Students employed by the University must register for a minimum number of credits each semester: undergraduates, six credits; graduate students and adult special students, three credits.

**Federal Direct Student Loans**—Federal Direct Student Loans are low-interest loans for students and parents. The federal government makes these loans directly to students and parents through UMD.

For students, Direct Loans are either subsidized or unsubsidized. A subsidized loan is awarded on the basis of financial need. If a student qualifies for a subsidized loan, the federal government pays interest on the loan until a student begins repayment.

An unsubsidized loan is not awarded on the basis of need. If a student qualifies for an unsubsidized loan, he or she will be charged interest from the time the loan is disbursed until it is paid in full.

Annual limits for subsidized and unsubsidized loans vary from $2,625 to $10,500, depending on grade level and status (independent or dependent). Graduate students can borrow up to $18,500 each academic year; at least $10,000 of this amount must be in unsubsidized loans.

For parents, the Direct PLUS loan is available. This loan enables parents with good credit histories to borrow to pay the educational expenses of each child who is a dependent undergraduate student enrolled at least half time. The yearly limit on PLUS loan is equal to the student’s cost of attendance minus any other financial aid received.
Federal Perkins Loans—A Federal Perkins Loan is a low-interest-rate loan for students who demonstrate exceptional financial need. Federal Perkins Loans are made through UMD. UMD is the lender and the loan is made with government funds. Interest and principal payments begin nine months after a student graduates, leaves school, or drops below half-time status.

Student Educational Loan Fund—The Minnesota Student Educational Loan Fund (SELF) is a loan program for use by Minnesota residents or nonresidents at Minnesota schools. Undergraduate students may borrow up to $6,000 per year. Graduate students may borrow up to $9,000 per year. Under the SELF program, the borrower must pay interest while in school. To qualify for a SELF loan, a student needs a credit-worthy cosigner.

Veterans Benefits
Students eligible for veterans benefits should contact the Veterans Resource Center (VRC) on the UMD campus, 102 Darland Administration Building (218/726-8791).

UMD Buildings
The Duluth campus consists of several tracts of land in Duluth’s eastern section and outlying areas. The major development is on the 244-acre campus. A few blocks away, two buildings on the 3.5-acre lower campus provide office and research space. UMD’s campus affords not only a scenic view of Lake Superior but also quick access to downtown Duluth and area community centers.

UMD joined a regional and national trend by prohibiting smoking in campus buildings. Smoking is prohibited in all indoor facilities, including faculty and staff offices and the Kirby Student Center cafeteria.

Buildings on the UMD campus include:
Campus Center Building—Provides offices, computer labs, conference rooms, and classrooms. Houses the Department of Mathematics and Statistics, Career Services, Achievement Center, Office of Admissions, and Center for Professional Development.
Darland Administration Building—Provides offices, conference rooms, and special purpose workrooms. Student services, including records and financial aid, are on the first floor. The upper floors of the building house the Business Office, University Relations Office, Facilities Management, Academic Support and Student Life, University College Duluth, the Chancellor’s Office, Academic Administration, Research and Technology Transfer Administration Office, and the Graduate School. The Administrative Data Processing Center, printing service, and mailroom are in the basement.
Marshall W. Alworth Hall—Houses the departments of Computer Engineering and Physics, classrooms, the observatory, Information Technology Systems and Services, a general purpose computer lab, and a lecture hall for 156 persons.
Marshall W. Alworth Planetarium—The planetarium, at the western end of the campus building complex, is used by UMD students, area public school students, and the public. The planetarium is named for Marshall W. Alworth, who provided funds for the facility.
A. B. Anderson Hall—Accommodates the departments of History, Philosophy, Communication, and Women’s Studies. It also contains uniquely designed case-study rooms and several art studios.
William R. Bagley Nature Area—This 13-acre tract is a unique study and recreational area immediately adjacent to the campus. Included in the area are two miles of nature trails, an observation deck, and flora of unusual diversity. Much of the area included in the arboretum was donated to the University by the William R. Bagley family.
Bohannon Hall—Provides classrooms and offices for the departments of American Indian Learning Resource Center, Communication Sciences and Disorders, Psychology and Mental Health, and Social Work. Special facilities include psychology laboratories, a reading clinic, closed circuit television studios, a general purpose computer lab, and a 395-seat auditorium. The offices of the College of Education and Human Service Professions are on the first floor.
School of Business and Economics Building—Houses the School of Business and Economics, which includes a general purpose computer lab and the departments of Accounting, Economics, Finance and Management Information Sciences, Management Studies, and the Center for Economic Development.
Chemistry Building—The Department of Chemistry, classrooms, laboratories, and a 100-seat and a 400-seat lecture hall.
Cina Hall—Classrooms, laboratories, and offices for Interdisciplinary Programs, Political Science, Sociology-Anthropology, Geography, the Institute for International Studies, as well as psychology research laboratories are in this building. The offices of the College of Liberal Arts are on the first floor.

Engineering Building—Contains classrooms and engineering laboratories, the offices of the College of Science and Engineering, the departments of Industrial Engineering and Chemical Engineering.

Field House—Connected to the Sports and Health Center by a tunnel, this 240-by-164-foot open-span structure with composition floor provides indoor track, tennis courts, volleyball courts, and other facilities for physical education classes, intramural sports, recreation, and athletic practice.

Griggs Field—Named after Richard L. Griggs, who provided funds for the facility. It includes a 3,800-seat stadium with lighting for night football games.

Heller Hall—Houses the departments of Computer Science, Geology, and general purpose classrooms.

Montague Hall—On Ordean Court; includes the laboratories for Communication Sciences and Disorders, as well as several general purpose classrooms, two auditorium units, a general purpose computer lab, offices, and classrooms used by the Education Department.

Humanities Building—Accommodates the classrooms, studios, and faculty offices of the departments of Art, Music, Composition, English, and Foreign Languages and Literatures; KUMD-FM; a general purpose computer lab; and the offices of the School of Fine Arts.

Voss-Kovach Hall—Laboratories, classrooms, and faculty offices of the Departments of Industrial and Technical Studies, Industrial Engineering, and Music are in this building.

Library—Contains the library, the Achievement Center, a large general purpose computer lab, a two-way interactive video classroom/conference room, and instructional space.

Life Science Building—The Department of Biology, laboratories, the Olga Lakela Herbarium, a greenhouse, classrooms, and two 200-seat lecture halls.

Lund Complex—Just off College Street; houses the heating plant, the chiller, various shops, and some Facilities Management offices.

Marshall Performing Arts Center—Includes a 600-seat theater, the Dudley Experimental Theatre, classrooms, and offices; provides performance and rehearsal space for the Department of Theatre and performance space for many music, dance, and other performing groups from on and off campus.

School of Medicine—Houses the School of Medicine, providing space for classrooms, laboratories, offices, research, and the medical school’s administrative offices.

Ordean Court—On the east side of the campus, this courtyard is a memorial to Albert L. Ordean. It contains the statue of Daniel Greysolon, Sieur du Luth, which was created by Jacques Lipchitz with funds provided by Mr. Ordean.

ROTC Building—Provides offices for the AFROTC staff, classrooms, a cadet lounge, and supply and other facilities.

Sports and Health Center—Includes a large and small gymnasium; locker rooms; swimming pool; offices for the Departments of Health, Physical Education, and Recreation, Intercollegiate Athletics, Outdoor Program, and Recreational Sports; classrooms; and weight and other special purpose rooms. The multipurpose facility contains an Olympic-size ice rink and accommodates a variety of sports activities. A jogging track is suspended above the rink area on the third-floor level. Outdoor track facilities, playing fields, and tennis courts are near the building.

Tweed Museum of Art—Established in 1958, the Tweed Museum of Art is considered the region’s major resource for the visual arts. Over a period of years, Alice Tweed Tuohy donated a collection of 650 works of art that she and her husband, George P. Tweed, acquired since 1923. Alice and her daughter, Bernice Brickson, provided major funding to help construct a state-of-the-art museum facility that has undergone three major expansions. In 1988, the Sax Sculpture Conservatory was built with funds from a museum endowment provided by the estates of Jonathon, Simon, and Milton Sax. Today, the Tweed collection has grown to nearly 3,500 fine art objects. Considered a state and national treasure, the Tweed Museum of Art exhibits a permanent collection of old master, 17th- through 19th-century European and 19th- and 20th-century American art. Innovative exhibitions of contemporary art and related public programs broaden University and community access, encourage participation through interactive education, and facilitate understanding of the creative forces that generate them.
Introduction and General Information

University Housing Facilities—Four residence halls (Bumtside, Griggs, Vermilion, Lake Superior), Goldfine Hall, and four apartment complexes (Stadium, Junction Avenue, Heaney Hall, Oakland Avenue) are on campus. See Housing.

Lower Campus
The lower campus includes buildings constructed before 1947. They accommodated UMD's predecessors, the Duluth State Teachers College and the Duluth State Normal School. Buildings on the lower campus include:

Research Laboratory Building—Originally housing the Laboratory School, this building now provides research office and laboratory space for the Large Lakes Observatory and geology and archeometry research.

Washburn Hall—A former residence hall, Washburn now is used for office and research space for the Sea Grant Program, the Marine Advisory Service, the Cooperative Extension Office, and the South St. Louis County Agricultural Extension Service.

Other Property
Donors also have contributed other property to UMD, including

Coleraine—Formerly a USX research facility, this minerals research laboratory, on approximately 25 acres, is under the direction of the Natural Resources Research Institute.

Glensheen—This 22-acre historic estate is listed on the National Register of Historic Places. The property was given to the University of Minnesota in 1968 by the Congdon family. It includes a 39-room Jacobean revival mansion flanked by a carriage house, gardener's cottage, boat house, clay tennis court, bowling green, and formal gardens. The estate was opened as a museum in July 1979.

Limnological Research Center—This center for limnological work on Lake Superior is at the mouth of the Lester River.

Natural Resources Research Institute—Houses administrative offices, a natural resources library, research and development laboratories, a composite wood products pilot plant, and a Geographic Information System facility in support of research programs in the areas of forest products and peat and minerals development. Laboratories also support work on water and the environment with particular emphasis on environmental chemistry and ecosystem studies.

Research and Field Studies Center—Approximately 100 acres that formerly were part of the Northeastern Agricultural Experiment Station, the center now provides facilities for animal holding, plastics laboratories, biological field studies, and materials and equipment storage.

WDSE-TV—On campus, this public television facility offers opportunities for cooperative programming and production experience.

Services

Alumni Association
The UMD Alumni Association serves as liaison between UMD and its approximately 44,000 graduates. All graduates of UMD, the Duluth State Teachers College, and the Duluth State Normal School are members at no cost. Alumni Association members receive the magazine, The Bridge, have access to UMD educational and recreational facilities, are invited to social and educational activities, and are represented on several campus committees.

UMD Stores

Campus Books—Campus Books provides a variety of products and services to UMD students, faculty, and staff. Along with textbooks and school supplies, Campus Books sells general books, art and office supplies, film, cassettes, and much more. At the end of each semester, a “cash for books” buyback allows students to receive cash for textbooks they no longer wish to use.

Computer Corner—The UMD Computer Corner, on the second floor of the Kirby Student Center, sells calculators and electronics, computers, and computer software, accessories, magazines, and books. The Computer Corner also sells lab access cards, acts as a drop off for computer maintenance, and has many demonstration machines and software packages available to view. Educational pricing is available for all students, faculty, and staff of UMD.

Bulldog Shop—The Bulldog Shop, on the second floor of the Kirby Student Center, is the official outlet of UMD clothing and gifts. Sweatshirts, T-shirts, shorts, sweatpants, jackets, caps, children's clothing, mugs, and more are available.

Marketplace—The UMD Marketplace, on the first floor of the Kirby Student Center, sells greeting cards, magazines, posters, health and beauty items, candy, beverages, ice cream, grocery items, stationery, and more.
Varsity Shop—The Department of Intercollegiate Athletics, during selected events throughout the year, provides a variety of quality sport-specific athletic apparel. Sweatshirts, scout jackets, T-shirts, shorts, and more are available.

Food Services
A complete variety of food services is available, ranging from a la carte dining (including Domino’s Pizza, sandwich bar, grill, and salad bar) in the Kirby Cafe to vending services offering snacks and beverages in many locations around campus.

In addition, anyone may purchase a meal ticket, good for individual meals of your choice, in the Dining Center. Purchasing this ticket allows a great deal of flexibility and variety in eating on campus. Contact the Dining Center cashier for purchase and additional information.

University Catering Operations, a division of University Food Service, also provides a wide variety of options from banquets to small luncheons to receptions, including weddings. Contact the catering supervisor in 270 Kirby Student Center for additional information.

Contact the Housing Office for details of room and board accommodations.

Housing
Requests for information about or assistance in securing accommodations in the residence halls or apartment complexes at UMD should be addressed to the Housing Office, 149 Lake Superior Hall, 2404 Oakland Avenue, Duluth, MN 55812-1107. Application for housing and application for admission are two separate processes. The housing contract is binding for the entire academic year.

Recreational and educational opportunities are an integral part of student life in all residence halls and University apartments. Each residence area has trained, live-in student-staff members available to assist students with concerns or problems.

University Residence Halls—Four residence halls (Burntside, Griggs, Vermilion, and Lake Superior) house men and women on campus. All rooms are furnished with beds, mattresses, desks, dressers, chairs, lamps, draperies, wastebaskets, telephone with voice mail, computer connection outlets, and compact refrigerator. Students should bring their own bed linens, pillow, towels, and other personal necessities. Each hall provides study areas, television lounges, vending machines, and laundry facilities.

Goldfine Hall—This three-building complex includes 24 suites and 52 apartments. Each suite can accommodate four students and has two bedrooms, one bathroom, living room, and study area. Furnishings include beds, mattresses, desks, chairs, desk lamps, wastebaskets, draperies, couch and cushioned chair, coffee table, study table and chairs, telephone with voice mail, computer connection outlets, and compact refrigerator.

The apartments have two bedrooms, one bathroom, living room, kitchen, and eating area. They are furnished like the suites with the addition of stove and refrigerator. Students must provide their own bedding, wastebaskets, dishes, and kitchen utensils. Each apartment can accommodate four students.

Study areas, vending machines, and laundry facilities are available.

Meal Plan Options—Students living in residence halls and suites must choose a meal plan option. Meals are served in the Dining Center, between Kirby Student Center and the residence hall complex.

University Apartments—In addition to Goldfine Hall, four campus apartment complexes are available for UMD students. All apartments are furnished with stove, refrigerator, dining table and chairs, couch and chair, end table, desks and chairs, desk lamps, closet and dresser space, beds and mattresses, draperies, shower curtain, computer connection outlets, and telephone with voice mail. All utilities are included in the rental rate.

Apartment residents must provide their own wastebaskets, cooking and eating utensils, bed sheets, pillow and pillow case, blankets, bedspread, and other personal necessities.

Stadium Apartments—This three-building complex, adjacent to a tree-bordered creek, has 78 apartments. Each apartment can accommodate four students and has two single bedrooms, one double bedroom, a bath and half-bath, a kitchen, and a living-dining area. Laundry facilities are available in each building.

Junction Avenue Apartments—(Mesabi and Cuyuna Halls) This two-building complex has 37 apartments. Each apartment can accommodate four students and has two bedrooms, a complete bath, a kitchen, and a dining-living area. Laundry facilities and study lounges are available in each building.
Oakland Avenue Apartments—(Oak, Aspen, Birch, Balsam, and Basswood Halls) This five-building complex has 127 apartments. Each apartment can accommodate four students and has two bedrooms, a complete bath, a kitchen, and a dining-living area. Laundry facilities and study lounges are available in this complex.

Heaney Hall—This two-building complex, opened in 1995, has 56 apartments. Each apartment can accommodate four students and has two bedrooms, a complete bath, a kitchen, and a dining-living area. Study lounges and recreational and laundry facilities are in the Service Center, connected to the complex.

Semester Break Housing—Burntside Hall, Vermilion Hall, and Stadium Apartments are the only University housing facilities open for semester break (December 24, 1999-January 17, 2000). All other housing facilities are closed during the semester break.

To qualify for semester break housing, residents must meet all of the following requirements:

1. Reside in Burntside Hall, Vermilion Hall, or Stadium Apartments on or before December 19, 1999; and
2. Complete a semester break housing request form and submit it to 149 Lake Superior Hall on or before Friday, December 17, 1999.

Residents who wish to stay during the semester break but are not residing in Burntside Hall, Vermilion Hall, or Stadium Apartments during fall semester, may submit a request for assignment change to one of these facilities. Requests are approved on a first-come first-served basis, dependent on availability of space.

There is no charge for semester break housing.

Off-Campus Housing—Listings of available privately owned off-campus housing facilities for students are maintained by the Kirby Student Center, 115 Kirby Student Center. Arrangements for off-campus housing are the responsibility of the individual student. These off-campus facilities are not inspected by the University. Usually, landlords require a lease and an advance deposit. Students should be certain that the accommodations are acceptable before making a deposit and should establish the exact rental period.

The UMD Food Service provides meal options for students who live off campus.
• support for applications related to student data, staff demographics, personnel and payroll, storehouse, University financial information, research administration, and Graduate School information.
• hardware and software maintenance for certain microcomputers and UNIX-based workstations.

**Intercollegiate Athletics**

A variety of intercollegiate varsity sports, including eight men's and nine women's programs, is available to all UMD students. UMD competes nationally at the NCAA Division II level, except for men's and women's ice hockey (NCAA Division I). The men's and women's athletic teams are members of the Northern Sun Intercollegiate Conference, again with the exception of ice hockey (which belongs to the prestigious Western Collegiate Hockey Association). Facilities used by the various UMD teams include the Duluth Entertainment and Convention Center (men's and women's ice hockey), Griggs Field (football, women's soccer, and men's and women's outdoor track and field), Bulldog Park (baseball), Junction Avenue Field (softball), Romano Gymnasium (men's and women's basketball, and women's volleyball), Ward Wells Fieldhouse (men's and women's indoor track and tennis), and the Lester Park Golf Club (men's and women's cross-country).

**Library**

The UMD library provides services and access to both traditional paper resources and electronic information resources that support the learning, teaching, and research activities of the UMD community. The traditional library collection of books, periodicals, government documents, videotapes, maps, microformats, records, and manuscripts totals more than 739,000 volumes, subscriptions, and nonprint items. The library also subscribes to numerous electronic indexing and abstracting services, full-text reference sources, and more than 2,000 on-line journals. All of the library's collections are accessible through its on-line catalog, which is Web-based and is accessible to faculty, students, and staff from the library, campus computer labs, and office and home computers. The library also houses the Northeastern Minnesota Historical Center and its special collections.

Library staff offer a variety of services, including classroom and individual instruction and assistance to individuals with physical or sensory impairments. During the regular academic year the library is open 96 hours a week. It is open additional hours during final exam weeks.

The library participates in MINITEX and MNLINK. These state programs facilitate resource sharing between Minnesota libraries and make it possible for faculty, students, and staff to borrow information resources that are not available at UMD.

A new UMD library building will open beginning fall semester 2000. The 136,000 square-foot facility will house electronic and paper collections, an interactive television classroom, three electronic instruction classrooms, a multimedia laboratory, as well as thirty group study rooms with network connections.

**Recreational Sports**

Recreational Sports offers a variety of sports and fitness programs to meet the needs of students and the entire University community. The office, 121 Sports and Health Center, provides information on programs, policies, and schedules.

Recreational Sports provides:

• Intramural Sports—structured league and tournament competition in individual, dual, and team sports.
• Life Fitness Sports—informal and self-structured opportunities to participate in such sports as weight training, jogging, swimming, and pick-up basketball. Fitness and wellness programs are structured and offer activities for all fitness levels.
• Club Sports—clubs organized about a sport for social and/or competitive purposes. Each semester a schedule of programs and facilities hours can be obtained in the Recreational Sports office. Locker and towel service is available.

Recreational Sports has some of the finest facilities and most extensive programming in the Midwest. All students are encouraged to participate in some form of sport or fitness program.

A new academic major in recreational sports programming has been added for those who wish to pursue a degree and profession in this field.
Speech-Language-Hearing Clinic

The Robert F. Pierce Speech-Language-Hearing Clinic provides services for the community and UMD students and faculty with communication disorders. Those who have concerns about hearing, voice, stuttering, accent reduction, or other communication problems should contact the clinic early in the semester (5 Montague Hall, 218/726-8199).

Health Services

Health Services (HS), 815 East University Circle between Goldfine Hall and Lake Superior Hall, is open from 8:00 a.m. to 4:30 p.m., Monday through Friday. Appointments are made by calling 726-8155. Patients without appointments are seen by the triage nurse.

Services available to students who have paid the health fee include general outpatient medical care, physical exams, gynecologic services, and sports medicine. Laboratory and X-ray services and minor surgery may be billed to patients' health insurance. Medications are available at reasonable prices at HS's pharmacy. In addition, HS provides individual and group counseling and therapy services to students experiencing ongoing or situational psychological or behavioral difficulties. HS also has an active health education department and wellness outreach program to help students develop healthier lifestyles. Trained peer educators teach students about health issues important to student life.

Programs focus on the developmental needs of University students to maximize their potential, so they benefit from the academic environment and University experience.

Students with after-hours and weekend emergencies are cared for by emergency physicians at St. Luke's Hospital (726-5616), St. Mary's Medical Center (726-4357), St. Luke's Urgent Care (725-6095), or Duluth Clinic Walk-In (725-3292). These services are at the student's expense. An ambulance for students with serious emergencies can be summoned by calling 911. The University police (726-7000) may transport students with less serious medical problems. For mental health emergencies, call the Miller Dwan Crisis Line (723-0099).

KUMD-103.3 FM

KUMD offers the UMD community and people of the Northland an exciting choice in various styles of music as well as news and information. KUMD programming includes The World Cafe weekday afternoons, R.P.M. (postmodern rock) evenings, blues and rock on weekends, and Northland Morning weekday mornings. KUMD also offers opportunities for students to gain experience as on-air hosts or for-credit interns in news and public affairs or marketing. KUMD is in 130 Humanities Building.

Student Life

American Indian/Alaskan Native Student Advisers

These student advisers introduce UMD and register new American Indian/Alaskan Native students, supporting them throughout their college experience by helping with financial, academic, and personal matters. For more information, contact the American Indian Learning Resource Center, 209 Bohannon Hall.

Convocations, Lectures, and Concerts

The University offers a varied series of lectures, concerts, and dramatic performances presented by students and faculty, as well as guest artists and lecturers. The School of Fine Arts, Kirby Student Center Program Board, and student organizations join to bring to the campus noted American and international attractions. Information about these presentations and community programs can be obtained by contacting the Kirby Student Center Information Desk.

International Student Program

More than 100 international students from 30 countries around the world are enrolled at UMD. The international student adviser provides support and counseling for these students concerning admission, orientation and registration, and adjusting to the United States, as well as assisting with U.S. Immigration and Naturalization Service regulations.

The UMD International Club is an exceptionally active student organization with members from the United States and abroad. The club meets regularly and members participate in a variety of social and service activities. Members of the community volunteer organization, Friends of International Students (FIS), host special events and assist students in
many ways, such as offering a tour of Duluth for new students and inviting students to share holiday celebrations.

The international student adviser, UMD International Club, and FIS work together with the University and the community to provide an excellent educational, social, and cultural experience for international students.

For more information, contact the Office of Admissions, 23 Campus Center.

All international students, except those from Canada, must have a skin test for tuberculosis within 45 days of their initial registration at UMD. The test costs the student nothing and is performed at UMD Health Services, 815 East University Circle.

**Kirby Student Center**

Named for Stephen R. Kirby, the Duluth and Iron Range civic and business leader who made the major individual contribution toward its construction, this center includes the Information Desk, Games Room and Outing Center, Music Listening Room, University Credit Union, University for Seniors Office, MPIRG, Women’s Resource and Action Center, Council of Religious Advisers, Black Student Association, International Students’ Office, AAA Travel Agency, Student Activities Center, Kirby Program Board, Student Association, Kirby Leadership Institute, Room Reservations, and the *UMD Statesman* office. The center also includes the Dining Center, a cafe, a ballroom, and many meeting rooms. For shoppers, the center offers the Bulldog Shop, Campus Books, the Marketplace, ATM Instant Cash machines, Self Service Copy Center, Poster Service, and the Computer Comer.

Kirby Student Center is a busy place seven days a week for students, faculty, staff, and visitors. It is a place to discover an internationally known speaker, an award-winning film, a quiet corner, or a new friend. Music, artwork, a games room, and comfortable lounges provide a pleasant setting for leisure-time or educational pursuits. Exhibits, debates, and musical performances are among the center’s scheduled activities. Leadership programs, which give students the opportunity to gain practical knowledge as well as learn more about themselves and others, are offered year-round by Kirby’s Student Activities Center staff. Their home page is on the UMD Web site under Student Services, Kirby Student Center.

**UMD Statesman**

UMD’s weekly newspaper, the *UMD Statesman*, is written, edited, and managed by students. Every student receives the paper through the student service fee. Students can get involved with the paper in various ways. Positions range from editor-in-chief, section editors, copy editors, and reporters to advertising representatives, business manager, photographers, and production artists. The paper is published every Thursday. The office includes an updated computer system, layout work area, darkroom, and business office.

**Student Government**

The UMD Student Association (SA) is a representative system of student government open to any member of the UMD student body. SA provides an arena in which students can discuss existing University policies and recommend new ones to meet the demands of an ever-changing institution. Its cabinet consists of a president, an administrative assistant, a vice president of academic affairs, a vice president of business affairs, a vice president of student affairs, and a student representative to the Board of Regents.

**Student Organizations**

There are more than 130 student organizations open to any interested student. By joining an organization, students can meet others with similar interests, learn new skills, participate in leadership opportunities, and make a difference in the campus community. The organizations are organized into the following categories: recreation, special interest, Greek life, political and social action, religious, professional, departmental, honorary, student government, campus-wide programming, student newspaper, and community service. Stop by the Student Activities Center to find out how to join a student group, or look on the UMD Web site for more information.
In addition to the basic academic programs offered by UMD and the University of Minnesota Graduate School, many other educational opportunities are available to UMD students, faculty, and to residents of northeastern Minnesota. Students are urged to carefully examine these opportunities when considering UMD and when planning their UMD programs.

**Academic Support**

The Office of the Vice Chancellor for Academic Support and Student Life (ASSL) provides services that empower students to achieve academic success and participate actively in the academic community from the time of initial admission to UMD through successful completion of a degree and beyond. These services include orientation, support and outreach to new students, academic assessment, tutoring, supplemental instruction, major and career exploration, and academic support courses.

Student equity programs include the Access Center, which serves students with disabilities; Africana Student Services; Hispanic/Latino/Chicano Student Services; Southeast Asian-American Student Services; and the Women's Resource and Action Center.

Academic advising is provided to many students by ASSL staff in cooperation with the colleges' and schools' student affairs offices.

**Access Center**

The Access Center provides appropriate and/or reasonable accommodations to students with disabilities. Commonly provided services include assistance with adaptive equipment, note-taking assistance, sign language interpreters, test accommodations, priority registration, advocacy, and problem resolution. Specific accommodations and services depend on the students' documented needs and are provided on request. In addition to direct services, the Access Center serves as a liaison to academic units and university offices, vocational rehabilitation programs, and community programs. It also provides disability-related training, technical assistance, and consultation for faculty and staff.

For more information or to request services, contact the Access Center, University of Minnesota Duluth, 138 Library, 10 University Drive, Duluth, MN 55812 (218/726-8217 or 218/726-7380 TTY), or see the center's Web page at <www.d.umn.edu/access>.

**Africana Student Services**

This office provides support services to Africana students, including recruitment, counseling, academic advising, tutoring, and financial aid services. This office also coordinates campus-wide efforts to increase understanding of minority issues and foster an appreciation of cultural diversity. Africana Student Services works with the Black Student Association in coordinating UMD's celebration of Dr. Martin Luther King, Jr.'s birthday, Black History Month, and other cultural events.

**Career Services**

Career Services is a centralized office where students may get professional, confidential help in identifying and achieving career goals. Students are encouraged to consult a career counselor early so they may begin investigating the world of work in relation to their values, interests, and abilities. Help is available for choosing courses, majors, and careers; dealing with academic difficulties; identifying internship possibilities; learning job search skills; and researching professional and graduate study options. Counselors are also available to address particular concerns of current and potential University College Duluth students.

Students may use the Career Information Center to learn about different majors, occupations, and employers. Appointments may be made to use the Minnesota Career Information System (MCIS), a computer program, also available in campus computer labs, that includes assessments for lists of occupations and information on education, training, occupations, and employment. Students may also get help with résumé writing, interviewing, other job-seeking skills, and graduate school admission. In addition, Career Services publishes and makes available through its Web page <http://careers.d.umn.edu> Employment Opportunities, a listing of job openings for graduates, and Opportunities for Experience, a listing of internship possibilities. Career Services' Web page also includes current information about recruiters on campus, job fairs and workshops, and links to Internet sources for career information, job hunting, and employers' Web pages. Career Services also sponsors a Graduate and Professional School Day each fall and the Head of the Lakes Job Fair each spring.

Current students and alumni may register with Career Services using JobLink, The UMD Résumé Referral Service. Registration provides the opportunity to be included in a database for
referral to employers requesting graduates or interns, and to be eligible for on-campus interviews. All seniors must complete a Graduate Follow-up Form.

For more information or to schedule an appointment, contact Career Services (21 Campus Center, 218/726-7985, carserv@d.umn.edu).

First-Year Experience
This office helps students through the transition to college by sponsoring programs and services to enhance new student success such as Academic Orientation, Bulldog Bash, Introduction to College Learning, and Parents’ Weekend. Students are encouraged to stop by 60 Campus Center, call 218/726-6393, or e-mail pknudson@d.umn.edu.

Hispanic/Latino/Chicana (HLC) Student Services
HLC Student Services provides and facilitates support services to Hispanic/Latino/Chicana students, including recruitment, counseling, academic advising, tutoring, housing and employment assistance, and financial aid counseling.

HLC Student Services also coordinates campus-wide efforts to increase understanding of minority issues and foster an appreciation of cultural diversity. It works with the Latino/Chicana Organization in coordinating the Latino/Chicana Heritage Celebration, Latin American Awareness Month, Annual Fiesta, and other cultural events.

Southeast Asian-American Student Services (SEAA)
The goal and mission of the SEAA office is to recruit, retain, and graduate SEAA students by providing services to assist SEAA students adjust, integrate, and achieve at UMD both socially and academically. The supportive services provided include academic advising, counseling, tutoring, financial aid counseling, and housing and employment assistance.

The office coordinates campus-wide efforts in diversity education by providing cultural programming, guest lectures, presentations, and increasing SEAA awareness through the SEAA Association. The office coordinates public events and outreach activities to the SEAA communities through seminars, conferences, forums, speakers, and social gatherings. The office provides educational opportunities for students seeking information about and understanding of the Asian/Southeast Asian culture so they can be effective competitors in the global market.

Supportive Services Program (SSP)
Associate Professor: Paul Treuer; Assistant Professors: Robert L. Flagler, Dale S. Olson; Instructors: Shirley Reierson, Jill R. Strand

SSP offers assessment, advising, tutoring, and developmental courses. Course offerings include skills development in writing, mathematics, study strategies, and a personal development course that emphasizes self-concept and human relationships. Upper division courses in Teaching Assistant, Student Adviser, and Tutor Training are offered for selected students. These courses are listed in Course Descriptions under the Supportive Services Program.

Tutoring Program
The Tutoring Center, 40 Campus Center, offers free, walk-in tutoring to all UMD students. Peer tutors selected by academic departments and trained in the Supportive Services Program are available to help students in accounting, chemistry, computer science, economics, some foreign languages, mathematics, physics, and writing. Supplemental instruction also is available for selected courses.

Women’s Resource and Action Center (WRAC)
WRAC works to empower women both individually and collectively. It provides extracurricular services to UMD students, staff, and faculty. WRAC maintains networks with women’s organizations and services in the region. In 193 Kirby Student Center, the women’s center is a safe and supportive place for people to meet, study, and relax. It is also a resource center for information about women’s issues and events, both locally and nationally. The center maintains a book exchange, a subject file for research and coursework, and a convenient place for messages and announcements.

WRAC is not only a specific place but also people, programs, and services. Throughout the year the center sponsors special events such as well-known speakers, topical seminars, and informal social gatherings. The quarter-time coordinator, work-study student, and volunteers offer advice about University opportunities or make referrals to resources on campus and in the community. They serve as peer counselors and volunteer advocates for a variety of issues.
including sexual assault, Title IX (a federal education amendment act that provides protection against exclusion based on gender), and other student issues. Support groups, seminars, and workshops are organized for classes and campus groups on various topics such as interpersonal relationships, workplace issues, and date and acquaintance rape. The coordinator works in conjunction with UMD Health Services to provide education on date and acquaintance rape and sexual harassment.

Royal D. Alworth, Jr. Institute for International Studies

*College of Liberal Arts*

The objective of the Royal D. Alworth, Jr. Institute for International Studies is to promote understanding among nations by facilitating international research and study, exchanges and visits of scholars, and a greater awareness of the global environment in which political, economic, social, and cultural relations are conducted. The institute provides financial support for visiting speakers and scholars who teach and conduct international research at UMD. A weekly brown bag speakers series, an occasional international lecture series, and the Royal D. Alworth, Jr. Annual Memorial Lecture are the centerpiece of its outreach activities to the off-campus community.

For more information, contact the Royal D. Alworth, Jr. Institute for International Studies, 108 Cina Hall (218/726-8229, ints@d.umn.edu), or visit the Web site at <www.d.umn.edu/~ints>.

American Indian Learning Resource Center (AILRC)

*College of Education and Human Service Professions*

AILRC’s primary goal is to encourage American Indian/Alaskan Native students to continue their education at UMD. Advisers provide academic, financial, and personal counseling and assist new students with orientation, registration, and tutoring.

AILRC has an extensive, culturally sensitive library with books, periodicals, videos, and music and language tapes. The center also sponsors public events such as conferences, forums, seminars, and speakers.

**Fine Arts Program**

Students interested in the fine and performing arts may participate in a variety of activities in art, music, theatre, and dance.

The Department of Theatre offers opportunities for students interested in performance, design, and technical theatre experiences. The department stages five major productions each year, including musicals, dramas, comedies, and dance performances. All University students, regardless of major or vocational interest, are encouraged to participate. Credit is offered for all phases of production work.

The Department of Music offers opportunities for students interested in participating in music ensembles, bands, orchestras, vocal and instrumental jazz ensembles, opera theatre, and chamber music. Groups in these areas give regular campus concerts, and some tour the state or nation or travel internationally. Applied lessons are also available for all instruments and voice.

The Department of Art offers many courses of general interest in both studio work and art history and sponsors an ongoing artist lecture series. The Tweed Museum of Art and Glensheen offer activities and exhibitions. Interdisciplinary fine arts courses and museum and arts internships are also available.

Institute of Foreign Study Program

The Institute of Foreign Study, an English language school with branches in Osaka and Tokyo, Japan, provides counseling services to Japanese students seeking admission to universities in the United States. The University of Minnesota Duluth has an agreement with the institute to facilitate the admission and enrollment of Japanese students at UMD. Applicants assisted by the institute must satisfy the normal admissions criteria of UMD.
Instructional Development Service (IDS)

College of Education and Human Service Professions

Associate Professor: Linda R. Hilsen; Assistant Professor: LeAne Rutherford

IDS's mission is to improve teaching and learning by facilitating the UMD community's use of traditional and innovative teaching methods, including established and emerging technologies. Through workshops, the IDS newsletter, and mini-libraries, IDS brings faculty together for dialogue and support. Individual and group consultation are offered to enhance teaching/learning for both students and teachers. Consultation services are voluntary and strictly confidential. IDS focuses on formative development rather than summative evaluation. It has three instructional and four technology consultants available for faculty and staff.

IDS plays an important role in the intensive teaching orientation program for graduate teaching assistants. IDS also participates in New Faculty Orientation and other faculty development efforts.

Minnesota Public Interest Research Group (MPIRG)

MPIRG is a nonprofit, nonpartisan, student-controlled corporation through which students address issues such as environmental quality, consumer protection and education, renters' rights, solid waste management, racial and sexual discrimination, and corporate and government responsibility. The optional/refundable fee of $4.12 for the Duluth campus is charged each semester at registration.

Student Legislative Coalition (SLC)

SLC lobbies to express student views on University quality, affordability, and accessibility. The optional/refundable fee of $3.40 for the Duluth campus is charged each semester at registration. For information about lobby efforts, contact a Student Association officer.

Large Lakes Observatory (LLO)

LLO researchers study large lake systems worldwide, including the systems' sedimentology, paleoecology, isotope geochemistry, basin structure, circulation dynamics, zooplankton dynamics, inorganic aquatic chemistry, and nutrient dynamics. LLO's sedimentological and geochemical laboratories are equipped with a range of analytical instrumentation, including an inductively coupled plasma mass spectrometer. For field programs LLO operates the largest university-owned research vessel in the Great Lakes, the R/V Blue Heron, as well as a smaller vessel for work near shore. The Blue Heron is equipped with an acoustic Doppler current profiler, high-resolution seismic reflection and multi-beam sonar systems, CTDs, computer systems for data collection and archiving, water column sampling equipment, several sediment corers, sediment traps, and benthiclanders.

Students may pursue graduate studies with LLO faculty through M.S. programs in geology, chemistry, and physics, or through new M.S. and Ph.D. programs in water resources science that serve the Twin Cities and Duluth campuses. LLO also employs several undergraduate science majors each year.

Minnesota Sea Grant College Program

This program is a partnership between the University of Minnesota, the federal government, and the state of Minnesota. It is a statewide program and one of 31 programs in coastal and Great Lakes states and territories that make up the National Sea Grant Program. Minnesota Sea Grant supports research and public education programs on Lake Superior and Minnesota's inland waters in order to sustain and enhance Minnesota's economy and environment. Minnesota Sea Grant works with other agencies, institutions, and organizations across the state, region, and country to maximize the resources available for dealing with Great Lakes issues.

Minnesota Sea Grant provides competitive research funding for University researchers to address basic and applied problems and opportunities associated with Lake Superior and Minnesota's inland waters. Research focus areas include: 1) developing an understanding of ecosystem processes necessary for improved
management of Lake Superior, the other Great Lakes, and smaller Minnesota lakes, rivers, and streams; 2) solving current problems associated with stressed aquatic resources; 3) enabling coastal communities to adapt to changing social and economic conditions; and 4) improving and enhancing sustainable economics for coastal regions. Recently funded areas have included biotechnology, aquaculture, K-12 marine science curricula, water quality/contaminant issues, public policy, exotic species, and fisheries.

Minnesota Sea Grant’s Outreach Program is the University’s link to local communities. Outreach staff are dedicated to providing technical assistance, research-based information, and education programs for a variety of Great Lakes issues, including fisheries, aquaculture, water quality, exotic species, recreation, and tourism. Minnesota Sea Grant produces publications for audiences ranging from research scientists to the general public to keep them informed about the issues and findings that affect Minnesota’s aquatic resources. Minnesota Sea Grant’s outreach staff also provide the conduit for pressing local problems to be considered by University researchers. This allows Minnesota Sea Grant’s funded University research to be relevant to the needs of Minnesota’s citizens.

Minnesota Sea Grant provides M.S. and Ph.D. assistantships for University students working on Minnesota Sea Grant-funded research projects.

**Natural Resources Research Institute (NRRI)**

NRRI is composed of scientists, engineers, and business specialists who provide technical, research, and economic development assistance relating to forest products, peat, minerals, water, and the environment.

The institute was established in 1983 to “foster economic development of Minnesota’s natural resources in an environmentally sound manner to promote private sector employment.”

Institute members work with other University faculty, government agencies, private industries, and the individual entrepreneur by providing technical assistance to existing and start-up businesses and by creating new products and business opportunities.

The NRRI facilities are available in special circumstances for laboratory work associated with courses in the sciences and engineering. On joint NRRI-UMD research projects, financial assistance is available for graduate students in the form of research assistantships.

**ROTC—U.S. Air Force**

The Air Force Reserve Officers Training Corps (AFROTC) is a college-level educational program that gives students the opportunity to become Air Force officers while completing their degrees. AFROTC offers postcollegiate opportunities in more than 100 career specialties. Air Force officers are challenged with organizational responsibilities and experiences not often available to new college graduates. This program is for students who want to challenge themselves as Air Force leaders and managers while serving their country in a professional, high-tech environment. High school students seeking scholarships should review requirements and submit an application before December 1 of their senior year. College students seeking scholarships should contact UMD's AFROTC unit (218/726-8159 or 1-800-232-1339, press 1, ext. 8159).

**Four-Year Program**

The four-year program is divided into the General Military Course (GMC), primarily for freshmen and sophomores, and the Professional Officer Course (POC), primarily for juniors and seniors. The GMC allows a student to “try out” AFROTC without incurring an obligation (unless receiving an AFROTC scholarship). At UMD, the GMC consists of a one-credit hour lecture and a 75-minute leadership lab every week. Students learn leadership and officer skills; Air Force career opportunities; educational benefits; the life and work of an officer; the organization and missions of the Air Force; and historic development of aerospace doctrine and strategies. In the second year of the GMC, cadets compete for selection to Field Training before entering the POC.

Enrollment in the GMC does not confer military status. Normal course progression for GMC students is Air 1101, 1102, 2101, 2102.

After successfully completing field training, cadets enter the POC and take a 3-credit hour lecture plus the 75-minute leadership lab. In the POC, cadets get advanced training in leadership, management, and communication skills focusing on Air Force
Education, Service, and Research Centers

situations. They examine a broad range of American, domestic, and international military relationships within the context of American national security policy development and implementation. The class is combined with the leadership lab where the POC cadets plan, organize, and direct the cadet corps. As a POC student, cadets receive a tax-free allowance for each month in school. Normal course progression for POC students is Air 3101, 3102, 4101, 4102.

Two-Year Program
The two-year program is identical to the POC, available to full-time college students who have at least two years remaining (undergraduate, graduate, or a combination of the two). Entry into the two-year program is highly competitive so it is important to apply as early as possible (no later than January of the year before entering the program). Admitted students enter directly into the POC without participating in the GMC. They satisfy the prerequisite by completing a five-week field training program during the summer immediately preceding their last two years of university study.

Veterans
Veterans may use prior military experience as credit for advanced placement. They may also take full advantage of all veterans’ benefits they have accrued in addition to the financial aid they receive from AFROTC.

Study Abroad
International Education Office—UMD provides several opportunities for students to study abroad. One of the most popular is the Study in England Program, a full academic year of interdisciplinary studies in Great Britain. Each year about 50 undergraduates and 5 UMD faculty travel to Westhill College in Birmingham for an academically challenging and personally rewarding experience. There are grade point average (GPA) and completed college credit requirements for participation in the program.

UMD also offers its students the chance to study and travel in Sweden and Finland. Various full-year or semester programs taught in English are available at Växjö, Luleå, KarlKrona-Ronneby, and Umeå Universities in Sweden and Joensuu University in Finland. Areas of study include Swedish culture and language, education, the sciences, business and management, computer science, environmental studies, and the social sciences. In most cases students are integrated into the classroom with Scandinavian and international students. Students may choose to live in student apartments or, during the spring semester program in Växjö, Sweden, with a host family, which provides a great opportunity to meet Scandinavian students and families. Courses are for UMD credit and financial aid may be applied.

The Department of Foreign Languages and Literatures encourages study abroad for those students at the intermediate level of college Spanish, German, and French. Consult with department faculty and the International Education Office about study abroad language opportunities.

UMD participates in cooperatively sponsored study abroad programs, including those offered by the International Reciprocal Student Exchange Program (IRSEP) and the University of Minnesota, Twin Cities. The International Education Office assists students in finding study abroad options from universities all over the United States to destinations all over the world.

For more information, contact the International Education Office, 108 Cina Hall (218/726-8764, dgood@d.umn.edu).

Summer Session
See the UMD Summer Session Catalog.

Supportive Services Program
See Academic Support and Student Life.

Undergraduate Research Opportunities Program (UROP)
UROP offers financial awards to undergraduates for research, scholarly, or creative projects undertaken in partnership with a faculty member. UROP affords undergraduates the unique educational experience of collaborating with a faculty member on the design and implementation of a project. At the same time, faculty have the opportunity to work closely with students and receive valuable assistance with their own research or professional activity. UROP adds new dimension to the undergraduate
experience. It encourages students to conduct research and pursue academic interests outside of their regular courses by employing them to work on special projects. UROP applications are judged on the quality of the proposed project and educational benefit to the student. Since funding is limited, awards are granted to the strongest proposals.

For more information and applications, contact UROP coordinators in college offices.

University College Duluth (UCD)

Director: Louis F. Poirier

UCD, formerly Continuing Education and Extension, serves as UMD’s major point of access and educational opportunity for adult learners. As a University outreach unit, UCD develops and delivers a variety of credit and noncredit courses, workshops, conferences, and certificate and degree programs offered at on- and off-campus locations. UCD programs are designed especially for continuing, nontraditional, part-time, and professional students; many are working adults seeking degrees or developing skills and expertise for professional or personal reasons. Dedicated to enhance lifelong learning opportunities for Minnesotans, UCD draws on telecommunications, information technology and networks, and a variety of support services to augment instruction, outreach, and learning.

UCD programs are generally offered in collaboration with other UMD colleges and departments. Students who plan to use credits earned through UCD to meet certificate and degree requirements must meet all UMD curricular requirements as stated in this catalog. In addition, students must contact their chosen major department and apply for admission to the appropriate UMD school or college through the Office of Admissions. Credit courses taken through UCD are included on UMD fee statements and billings and are automatically added to transcripts. There are restrictions on the total amount of credits earned through UCD that may be applied toward a Graduate School degree; students should contact the Graduate School in advance of beginning studies for information about these restrictions.

For more information, contact the UCD director (403 Darland Administration Building, 218/726-8113).

Support Services

UMD’s Career Services offers academic counseling for UCD students. Counselors are available to assist with course selection, registration, planning for a certificate or degree program, career counseling, applying for admission and financial aid, dealing with academic difficulties, and learning job-seeking skills. Career Services is in 21 Campus Center (218/726-7985, e-mail carserv@d.umn.edu).

UCD Registration Center staff provide phone, fax, in-person, or mail-in service for students needing assistance with registration or general information about UCD and UMD programs.

Certificate Programs

UCD certificates are regarded by many employers as valuable preparation for employment and promotion. With careful planning, a certificate can be a stepping stone to a baccalaureate or graduate degree. UCD offers the following certificate programs: human services (undergraduate), 34 credits minimum; liberal arts (undergraduate), 30 credits minimum; educational computing and technology (undergraduate, graduate, noncredit), 16 credits; environmental education (postbaccalaureate/professional), 18 credits minimum.

Certificates can be completed through day school, evening, weekend, Individualized Learning Program, and summer session coursework. Transfer credits from other accredited institutions of higher education may also apply, although a minimum of 25 percent of the credits required must be earned at UMD.

Certificates are awarded by UCD upon completion of a specified program with a 2.00 minimum overall grade point average (GPA), including a 2.00 GPA in UMD courses. Certificate requirements may occasionally be modified and students are bound to the requirements in force at the time of official admission to the certificate program. If a certificate is discontinued, UCD makes every reasonable effort to assist students in completing their program. For specific information about UCD certificate programs, call a UCD counselor at 218/726-7985, or refer to the UCD certificate programs brochure. To request a brochure, call 218/726-7878, or e-mail bkiheri@d.umn.edu.

Degree Programs

For the master in education (M.Ed.) program, see the College of Education and Human Service Professions section of this catalog.
For the master of liberal studies (M.L.S.) program, see the Graduate School section of this catalog.

**Individualized Learning Program (ILP)**

ILPs, modified independent study courses, are self-paced, individualized instruction using mixed media and/or read/study coursework. Students do not meet in a classroom setting. Credits earned in ILP courses may be applied toward major, minor, or liberal education requirements. ILP coursework does not apply toward Graduate School program requirements.

For more information, call 218/726-6536 or refer to the University College Duluth ILP brochure; to request a brochure, call 218/726-7878 or e-mail kandersl@d.umn.edu.

**Postsecondary Programs for High School Students**

The state Post-Secondary Enrollment Options (PSEO) Act enables eligible high school juniors and seniors to attend college tuition-free. For more information, contact the PSEO counselor (218/726-8149 or e-mail npeters3@d.umn.edu).

College In The Schools (CITS) is a cooperative program linking area high schools with UMD. The program enables high-ability students to take college courses for credit while remaining in high school. In addition, it provides qualified high school teachers the opportunity to teach at a college level. Participating in this program helps teachers and students gain an understanding of the skills and knowledge necessary for higher education success. For more information about CITS, call 218/726-6819 or e-mail merickso@d.umn.edu.

**Elder Learner Programs**

University for Seniors (US), an Institute for Learning in Retirement, provides opportunities for intellectual and cultural exploration and development for adults aged 50 and older. US members, having diverse backgrounds, meet to share interests and develop appreciation and knowledge. The only program admission requirements are an interest in continuing education and support through participation and a membership fee. US was developed by its members with the support of University College Duluth.

Elderhostel, an education program for those 55 years and older, offers residential programs at different sites focusing on the history and culture of northern Minnesota. Programs are generally several days in length.

For more information about US or Elderhostel, call 218/726-6819 or e-mail jpeters6@d.umn.edu.

**Summer Programs**

UCD annually coordinates two summer programs, The Educators’ Institute and the American Language and Culture Program.

The Educators’ Institute is an array of courses and workshops designed to meet personal and professional development goals of teachers, administrators, support services staff, and parents. Institute offerings provide opportunities to gain new knowledge and learn practical skills in a concentrated format. Many of the graduate courses satisfy requirements in licensure areas. The institute is scheduled during July and August. For more information, call 218/726-6536.

The American Language and Culture Program (ALC) is primarily for international students interested in a concentrated English language program and orientation to American culture through a residential summer experience at UMD. ALC is recommended for students who have attended at least one year of college and have either a TOEFL score of at least 500 or an intermediate proficiency in the English language. For more information, call 218/726-7637 or e-mail cschweig@d.umn.edu.

**Travel Programs**

Each year UCD offers travel programs to destinations such as Mexico and Italy. Excursions include field trips and opportunities to explore local cultures. Travel programs are offered for credit or noncredit. For more information, e-mail kandersl@d.umn.edu or call 218/726-6536.

**Professional Conferences, Workshops, and Training**

UCD offers a variety of conferences, workshops, and training opportunities to meet community needs. These programs range from one-half day to several weeks in length and are generally publicized through advertisements and direct-mail brochures. Some programs are offered for credit, while others are offered noncredit and may be eligible for Continuing Education Units (CEUs) or Hours (CEHs).

UCD also collaborates with business and industry professionals to develop customized training programs in computer software, education, human services, engineering and related professions, environment and natural sciences, and organizational development. For information about customized education or training, call UCD’s professional training and development coordinator at 218/726-6298 or e-mail jgarriso@d.umn.edu.
Students With Disabilities

To be eligible for disability-related services, students must have a documented disability as defined by the Americans With Disabilities Act of 1990 (ADA) and Section 504 of the Rehabilitation Act of 1973. Under the ADA and Section 504, a person has a disability if he or she has a physical or mental impairment that substantially limits one or more of the major life activities (walking, standing, seeing, speaking, hearing, sitting, breathing, taking care of oneself, learning).

At UMD, the Access Center handles disability-related documents, certifies eligibility for services, and determines and arranges reasonable accommodations. These accommodations are provided to ensure access to all University courses, programs, services, jobs, activities, and facilities, including those that are off-site such as study abroad, field trips, student teaching, internships, and fieldwork.

Inquiries regarding UMD’s policies and guidelines for accommodating students with disabilities may be directed to the Access Center, University of Minnesota Duluth, 138 Library, 10 University Drive, Duluth, MN 55812 (218/726-8217 or 218/726-7380 TTY).

High School Preparation Requirements

UMD requires students to take at least the following high school courses in grades 9-12 in preparation for University work: a) four years in English with emphasis on writing and including instruction in reading and speaking skills and in literary understanding and appreciation; b) two years in social studies, including American history; c) three years in mathematics, including one year each of elementary algebra, geometry, and intermediate algebra; d) three years in science, including one year each of biological and physical science; e) two years in a single second language. All students not satisfying these preparation requirements by the time they have earned 90 credits, including transfer credits, will have a registration hold placed on their records. (Individual colleges, at their discretion, may request that a hold be placed earlier.) In addition, one year of instruction in the arts (music, drama, visual arts) and familiarity with microcomputers and common types of software are recommended.

The visual and performing arts are an integral part of life at UMD; therefore, in addition to the other areas of academic preparation outlined above, UMD encourages students to participate in creative expression and the fine arts as they prepare for University life and the contribution they will make to UMD.

Four-Year Graduation Plan

Incoming fall freshmen have the opportunity to participate in UMD’s four-year graduation plan. Under this plan if a student is unable to graduate within eight continuous semesters of registration due to the unavailability of a course (or courses) in the initially declared major, the University will pay the tuition (minus other forms of financial aid exclusive of loans) for the unavailable course(s) in a fifth year. There is no penalty if a student signs the agreement and later decides to pursue another opportunity that may prevent graduation in four years. Further information and forms are available in college student affairs offices.

UMD’s Responsibilities

• Provide the student with appropriate advising on a continual and timely basis.
• Assure the student that all required courses needed to complete the degree are available.

Student’s Responsibilities

• Have completed all high school preparation requirements at the time of first registration.
• Sign a Four-Year Graduation Agreement at or before the beginning of the first semester of registration.
• Have a declared major upon admission.
• Enroll as a full-time student (30 credits per year) and maintain continuous registration for eight semesters.
• Remain in good academic standing as determined by the department and college offering the major.
• Meet with adviser at specified times to discuss progress toward degree and appropriate course selection.
Admission Procedures

The Office of Admissions is where admission information may be obtained and campus visits may be arranged by calling toll free 1-800-232-1339 or 218/726-7171. Correspondence regarding undergraduate admission to any UMD school or college should be addressed to the Office of Admissions, University of Minnesota Duluth, 23 Campus Center, 10 University Drive, Duluth, MN 55812-2496.

Admission applications should be submitted by August 1 for fall semester and by November 15 for spring semester. Applications are available at all Minnesota high schools and the UMD Office of Admissions. When applying, follow these procedures:

1) Complete an application.
2) Specify on the application the school or college—School of Business and Economics, College of Education and Human Service Professions, School of Fine Arts, College of Liberal Arts, College of Science and Engineering—that offers your intended program. Students are admitted directly into schools and colleges at UMD according to their intended degree program, preprofessional goals, or course interests. Students undecided about a major but leaning toward a specific area (e.g., fine arts, business, humanities, teaching) should indicate this and are enrolled in the appropriate school or college. Students undecided and considering several areas of interest are enrolled in the College of Liberal Arts. (See the Colleges and Schools section for program descriptions and college locations.)
3) Attach the $25 application fee to the application.
4) Request that appropriate official transcripts be sent to the Office of Admissions:
   • Freshmen—transcript from high school(s)
   • Transfer students with fewer than 26 semester credits attempted—transcript from high school(s) and previous college(s)
   • Transfer students with 26 or more semester credits attempted—transcript from high school(s) and previous college(s)
Admission will not be granted without these transcripts. Failure to reveal all prior college work is grounds for dismissal.
5) For admission, freshmen must submit ACT or SAT scores when they apply. High school students are advised to take the ACT or SAT during their junior year. Admission decisions are not made until applications are complete. Notification of admission decisions are made on a rolling basis.

Admission Requirements

Admission to UMD does not necessarily mean admission to a specific program, because some departments have more stringent requirements for degree candidacy than for initial admission to a college unit. Students should refer to the Colleges and Schools section for further information.

Freshmen-No Previous College Work

Students with no previous college work are admitted if their high school rank is at or above the 65th percentile, they have submitted results from the ACT or SAT, and they have met all University course preparation requirements. Admission is contingent upon completion of high school diploma requirements.

Students with a high school rank below the 65th percentile or who have a General Equivalency Diploma (GED) are admitted selectively on a space-available basis.

Students with a high school rank below the 65th percentile are required to participate in an academic assessment process as part of their first registration. This assessment will identify areas in which improvement may be needed to assure a successful college experience. Enrollment in Supportive Services Program skills courses, some of which are for non-degree credit, may be recommended or required. For more information, see the Educational, Service, and Research Centers section.

Dismissed and Non-Degree Seeking Students University College Duluth

Academically dismissed students may register for courses through University College Duluth after completion of the registration queue. Registration is on a space-available basis with signed permission from either the college (for the College of Liberal Arts, the College of Education and Human Service Professions, and the College of Science and Engineering) or the department (for the School of Fine Arts). College of Liberal Arts students are limited to a maximum of 7 credits. See the following page for the specific requirements of the School of Business and Economics.
Non-degree seeking students are admitted to the University through University College Duluth using the "quick enroll" process. Individuals who might qualify for admission as non-degree seeking students include older students, high school students, and college graduates who wish to take a limited number of courses and do not intend to earn a degree; high school students who, with the approval of their high school counselors or principals and their parents, may be considered for concurrent college and high school registration; college graduates who have not been admitted to a graduate program and who want to do coursework in preparation for graduate school; and individuals pursuing coursework for vocational purposes.

Non-degree seeking students are not required to pay an application fee, but they must file a separate quick enroll form and follow all registration policies and procedures. Non-degree seeking students in all colleges except the School of Business and Economics may register on a space-available basis after all other students have registered. Written permission from the college is not required.

**School of Business and Economics**
Dismissed Students—Students dismissed by the School of Business and Economics (SBE) will NOT be eligible to register as a day school student in SBE. Dismissed students may be eligible to apply to other UMD colleges, including University College Duluth (UCD), as a means of improving their grade point average. However, permission to register in SBE courses must be granted by the Student Affairs Office. If permission is granted, registration is on a space-available basis after all other students have registered. For more information, call 218/726-6594.

Pre-M.B.A. Students—Students who are working on prerequisites for SBE's M.B.A. program should consult with either the M.B.A. director or associate administrator for advisement and discussion regarding admission criteria by calling 218/726-8986.

**College of Education and Human Service Professions**
Teacher Licensure—Students who are enrolled in the teacher licensure program should be admitted into CEHSP as a new undergraduate student. It is necessary to consult with the CEHSP Student Affairs Office for advisement and discussion regarding admission criteria.

**Senior Citizens**
Minnesota residents who are 62 or older may take University courses for $9 per credit or audit them without charge if they meet necessary prerequisites and space is available after tuition-paying students are accommodated. Written confirmation must be obtained from the instructor after the first class meeting. Registration should then be completed at the Campus Center Information Desk. Any laboratory or materials fees must be paid by the student. For more information, contact the Campus Center Information Desk.

**Graduate Students**

**College of Education and Human Service Professions**—This college offers the master of education program. Students interested in enrolling in this program should refer to the appropriate headings in the Colleges and Schools section of this catalog for information about admission criteria and procedures.

**College of Science and Engineering**—This college offers a master's degree program in industrial safety (M.I.S.) that prepares qualified personnel for industrial safety and industrial hygiene positions in business, government, and industry. Students interested in applying to the M.I.S. program should refer to the College of Science and Engineering section of this catalog for information about admission criteria and procedures.

**Graduate School**—Any student with a U.S. bachelor's degree or a comparable foreign degree from a recognized college or university may seek admission to the Graduate School. (The Graduate School standard for admission is an undergraduate grade point average [GPA] of 3.00.) Individual programs may require a higher GPA. Applicants should consult the program to which they are applying for more specific information about admission standards.

UMD offers the master of fine arts in art (emphasis in graphic design); master of arts in communication sciences and disorders, counseling psychology (emphases in community counseling, college counseling, and school counseling), and English; master of science in applied and computational mathematics, biology, chemistry, computer science, geology, and physics; master of business administration; master of liberal studies; master of music; and master of social work.
All-University M.S./Ph.D. programs in toxicology and water resources science are offered jointly with the Twin Cities campus. In addition, several graduate programs operate at UMD under the aegis of graduate programs on the Twin Cities campus. These include cooperative programs offered at both the master’s and doctoral levels in biochemistry, microbiology, pharmacology, and physiology. For more information, consult the Graduate School section of this catalog or the Graduate School Office, 431 Darland Administration Building, University of Minnesota Duluth, MN 55812.

**International Students**

Citizens of foreign countries are encouraged to apply for admission to UMD. Applicants are evaluated on an individual basis, with consideration given to the academic record of each student in relation to the educational system of her or his native country. Students applying must show evidence of exceptional academic achievement and probability of success at UMD. Letters of reference from individuals under whom the applicant has studied and evidence of good health are required. The Test of English as a Foreign Language (TOEFL) is required of all students applying from outside the United States unless their native language is English. The TOEFL examination is offered worldwide at selected locations. Students who cannot obtain a TOEFL Bulletin of Information for Candidates, International Edition, and registration forms locally should write to the Test of English as a Foreign Language, Box 899, Princeton, New Jersey 08540, USA.

Undergraduates with a TOEFL score of 550 (213 on the computer-based test) or above are considered for admission at any time and may be required to enroll in a beginning or advanced ESL course following advisement. The operational standard for admission to the Graduate School is a TOEFL score of 550 (213 on the computer-based test); individual programs may require a higher TOEFL score.

The University has a limited number of tuition scholarships that are awarded to foreign students on a competitive basis. Scholarships do not provide assistance for room, board, or travel expenses.

**School of Medicine, Duluth Students**

The School of Medicine considers applicants who are legal residents of Minnesota; Ashland, Bayfield, Burnett, Douglas, Iron, Price, Sawyer, and Washburn counties of Wisconsin; and the Canadian province of Manitoba who wish to become family practice physicians in a small-town setting. Applicants from other states (except for under-represented minorities) are not considered. Applicants must be U.S. citizens or have permanent resident status.

At present, three of the most significant qualifications that applicants can present to the Committee on Admissions are a demonstrated capacity for scholastic excellence in an academic discipline of their choice, personal and background traits that indicate a high potential for becoming a rural family physician, and experience in a medically related field. Applicants also will be evaluated on the basis of letters of evaluation and impressions gained from any personal interviews that may be held.

Representatives of the School of Medicine will discuss premedical programs with college students, teachers, and advisers, either in person or through correspondence. A useful reference book, Medical School Admission Requirements, summarizes admission requirements and application procedures for all medical schools in the United States and Canada. It can be purchased from the Association of American Medical Colleges, 2450 N. Street N.W., Washington, DC 20037, and is also available in most college reference libraries.

**Summer Session Students**

Regular University courses are offered during one three-week term and one eight-week term, as well as special terms, each summer at UMD. All regularly enrolled students may attend summer session; admission as summer-only students is open to all who wish to register. Application fees are not required and usual admission criteria and application procedures for freshmen and advanced standing students do not apply. However, students who plan to register for courses during the subsequent academic year must apply for regular admission, meeting admission requirements described previously in the sections on admission criteria.

A summer session catalog is available in early February. The catalog contains all necessary registration forms, explanations of procedures, and listings of course offerings. For more information, contact the Office of Summer Session, University of Minnesota.
Planning to Transfer?

Minnesota's public colleges and universities are working to make transfer easier. You can help if you PLAN AHEAD, ASK QUESTIONS, and USE PATHWAYS created by transfer agreements.

2+2 Agreement

UMD and six northeastern Minnesota community colleges have completed 91 comprehensive agreements in 21 major fields of study regarding college courses and credit transfers. The agreements, collectively referred to as the 2+2 transfer agreement, ensure the seamless transfer of credits to UMD in specific majors from the following community colleges: Fond du Lac Tribal Community College, Hibbing Community College, Itasca Community College, Laurentian Community and Technical College District (Vermilion Community College and Mesabi Range Community and Technical College), and Rainy River Community College.

The 2+2 agreement will facilitate ease of transfer for northeastern Minnesota community college students by specifying exactly how community college courses and credits will be counted for each student upon transferring into a major at UMD.

Preparing for Transfer

If you are currently enrolled in a college or university:

- Discuss your plans with the campus transfer specialist, Office of Admissions, 23 Campus Center (218/726-8800).
- Call or visit your intended transfer college. You should obtain the following materials and information:
  - college catalog
  - transfer brochure
  - 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 GPA.
  - information on financial aid (how to apply and by what date)

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

If you are not currently enrolled in a college or university, you might begin by meeting with a transfer specialist or an admissions officer at your intended transfer college to plan the steps you 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 your sending and your receiving institution can affect the transfer of the credits you earn.
- Institutions accept credits from courses and programs like those they offer. They look for similarity in course goals, content, and level.
- Not everything that transfers will help you graduate. Baccalaureate degree programs usually count credits in three categories: general education, major/minor courses and prerequisites, and electives. The key question is, "Will your credits fulfill requirements of the degree or program you choose?"
- If you change your career goal or major, you might not be able to complete all degree requirements within the usual number of graduation credits.

Applying for Transfer Admission

- Complete the application as early as possible and enclose the application fee.
- Request that official transcripts be sent from every academic institution you have attended, including high school(s). Upon receipt, your transcripted credits will be evaluated for transfer. A written evaluation should tell you which courses transfer and which do not. How your courses specifically meet degree requirements may not be decided until you arrive for orientation or have chosen a major.
- Recheck to be certain you supplied the college or university with all the necessary paperwork. Most colleges make no decisions until all required documents are in your file.
- If you have heard nothing from your intended college of transfer after one month, call to check on the status of your application.
• If you have questions about your evaluation, 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 if you understand why decisions were made. If you are not satisfied, you can appeal. See the following “Your Rights as a Transfer Student.”

Your 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: 1) Student fills out an appeals form. Supplemental information you provide to reviewers—a syllabus, course description, or reading list—can help; 2) department or committee will review; 3) student receives, in writing, the outcome of the appeal; 4) student can appeal decision to the college dean’s office.
• At your request, a review of your eligibility for financial aid or scholarships.
  For help with your transfer questions or problems, see your campus transfer specialist.

Transfer Students from Outside the University—Fewer Than 26 Credits Attempted
Students with previous college work but fewer than 26 semester credits attempted (fewer than 21 semester credits for the College of Liberal Arts) are admitted if they have: a) a high school rank at or above the 50th percentile, b) a GPA of at least 1.80 in their previous college work, and c) successfully completed at least 75 percent of all college work attempted. Students seeking exceptions to admission requirements must petition the appropriate school or college. Petition forms are enclosed with letters of denial for students who are eligible to appeal.

Students who are not in the upper half of their high school class or who have a General Equivalency Diploma (GED) are selectively admitted on a space-available basis if they meet requirements (b) and (c) in the above paragraph. Students whose high school rank is 25 or lower are admitted only if they are residents of northeastern Minnesota. See the Freshmen section for information about academic assessment.

Transfer Students From Outside the University—26 or More Credits Attempted
Students who will have attempted 26 or more semester credits of baccalaureate-level college work should request admission with advanced standing. Official transcripts from all high school(s) and colleges or universities previously attended must be provided before a decision can be made.

Advanced standing students who have completed an associate of arts or baccalaureate degree at another accredited Minnesota college or university are exempt from UMD’s liberal education requirements.

Students are admitted on the basis of criteria established by the UMD school or college to which they are applying.

School of Business and Economics—Students who have attempted 20 to 59 semester credits must have an overall GPA of at least 2.00 (the overall GPA is for all college work, except courses defined by UMD as nondegree credit, attempted at any institution). Students who have attempted 60 or more semester credits must have an overall and an internal GPA of at least 2.00 (the internal GPA is for all work attempted in accounting, business law, economics, finance and management information sciences, and management studies, regardless of where or when taken). Students seeking exceptions to admission requirements must petition the appropriate school or college. Petition forms are enclosed with letters of denial for students who are eligible to appeal. Students admitted to the School of Business and Economics are not guaranteed admission to upper division, i.e., candidacy status.

College of Education and Human Service Professions, College of Liberal Arts, College of Science and Engineering—Transfer students with 26 or more semester credits attempted (21 or more semester credits for the College of Liberal Arts) must have a cumulative GPA of at least 2.00 and have successfully completed at least 75 percent of all credits attempted. Students seeking exceptions to admission requirements must petition the appropriate school or college. Petition forms are enclosed with letters of denial for students who are eligible to appeal. For the School of Fine Arts, grades of C or above must be earned in all credits to be transferred to the major. For the College of Science and Engineering courses in which a grade of D has been earned (at an institution other than the University of
Minnesota) cannot be used to meet the specified course requirements of the engineering degrees (B.S.Ch.E., B.S.E.C.E., B.S.I.E.) unless the following course in the sequence is completed with a grade of C or better.

School of Fine Arts—Transfer students with 31 or more semester credits attempted must have a cumulative GPA of at least 2.00. Students who have attempted 30 or fewer semester credits must have a cumulative GPA of 1.80.

Transfer Students From Within the University
Students who are transferring from one academic unit to another within the University of Minnesota must submit a Request for Change of College. This form may be obtained from the Campus Center Information Desk or college student affairs offices on each campus. The completed form should be returned to the college office on the campus from which the student is transferring. Requests must be submitted at least 60 days before the beginning of the semester for which transfer is desired.

School of Business and Economics—Students seeking transfer to the School of Business and Economics from another college unit of the University of Minnesota and who have attempted fewer than 20 semester credits are automatically admitted after filing a completed Request for Change of College. Students who have attempted 21 to 59 semester credits must have an overall GPA (GPA for all college work attempted at any institution) and a transcript GPA (GPA for all work attempted at the University of Minnesota, including University College) of at least 2.00. Students who have attempted 60 or more semester credits must have an overall, transcript, and internal GPA (GPA for all work attempted in accounting, business law, economics, finance, management information sciences, and management studies regardless of where or when taken) of 2.00 or above. Students admitted to the School of Business and Economics are not guaranteed admission to upper division, i.e., candidacy status.

College of Education and Human Service Professions, School of Fine Arts, College of Liberal Arts, College of Science and Engineering—The academic criteria for students transferring from within the University of Minnesota are the same as those for students transferring from outside the University. For the College of Science and Engineering, students must have at least two semesters of residence at the University to transfer to CSE.

Readmission
Students previously registered at UMD may be readmitted, exclusive of Summer Session, if they meet the academic standing policy of their intended school or college and have no record holds. For questions or to request a Class Schedule, call the Registration Help Desk (218/726-8000).

Students seeking exceptions to the academic standing policy must petition the appropriate school or college.

See the appropriate college section of this catalog for each unit's policy.

Orientation
Academic Orientation at UMD helps new students become integrated with the academic community by helping them understand the value of higher education and the expectations of the University. During Academic Orientation, students plan their academic programs, register for courses, and learn about the educational aspects of the University. A program for parents of freshmen is held concurrently with the Academic Orientation program. All new students must attend Academic Orientation and pay the first-time registration fee. Social orientation is the focus of UMD's fall welcome program, Bulldog Bash, which introduces new students to the University's curricular, cocurricular, social, and student services components.

Registration
Registration for classes at the University takes place before each academic semester. Before they start their first semester, new students receive orientation-registration instructions. Students currently enrolled at UMD should refer to the UMD Statesman and Class Schedule for registration dates and procedures.

Advising
Each UMD student is assigned a faculty or professional adviser according to the course of study, major, or curriculum the student plans to follow, as indicated on the Application for Admission. When the student's interests or major objectives change, the student should request a change of adviser at the office of the college that offers the desired program or major.
Students should establish a close working relationship with their academic adviser. The adviser will help them develop a better understanding of their responsibilities, the requirements of their curriculum, and other regulations.

Auditing Courses
To audit a course, a student follows the same registration procedures and pays the same fees as for courses bearing credit. Audited courses do not carry credits or offer grades and may not be used to fulfill degree requirements. To register as an auditor, the registration symbol V must be used; upon completion of the term, the V will be recorded on the transcript. Registration for a course as an auditor must be completed before the end of the second week of the semester.

Cancel/Add
Cancel/add requests can be processed after initial registration and according to appropriate policies and procedures. If students change their course schedules in any way (including changing a section of the same course), the change must be processed via Web registration. After the second day of the semester, instructor approval is required to add a course. Courses may be added during the first two weeks of the semester with course approval codes from the instructor or department; courses cannot be added after the second week. Students may cancel courses through the last day of the eighth week of the semester. After that date, students who believe they have an extenuating circumstance may submit a petition to withdraw from the course; approval of the petition would be given with the understanding that the student would be assigned a W. For courses canceled during the first two weeks of the semester, no record is maintained. Courses canceled during the third through eighth weeks are noted with a W on the transcript.

Student Classification
For the purpose of assigning registration priority, students are assigned to class years according to the number of credits they have completed, as follows: <30: freshman; 30 to <60: sophomore; 60 to <90: junior; 90 to 120: fourth-year senior; >120: fifth-year senior.

Course Prerequisites
The student is responsible for adhering to all prerequisites specified in the course descriptions. Exemption from prerequisites can only be granted by the instructor, department, or college unit involved and by using course entry approvals.

Cross-Registration
UMD undergraduates have the opportunity to register concurrently at the College of St. Scholastica and the University of Wisconsin-Superior.

Cross-registration with the College of St. Scholastica and the University of Wisconsin-Superior—Students registering and paying fees for at least 12 day school credits at UMD may register for a combined maximum of two courses per term at the College of St. Scholastica and at the University of Wisconsin-Superior. Additional UMD tuition charges for the cross-registered courses are computed as if the courses had been taken at UMD. Information and registration forms are available at the Campus Center Information Desk.

Admitted day school or UCD students having a cumulative credit load (day school and UCD) of 12 or more credits per semester are considered full-time students for internal and external verification purposes.

Forfeit of Enrollment
Unless first excused by the instructor, students who do not report to the first meeting of a class or laboratory section may forfeit their course enrollment, requiring their official withdrawal from the course.

Immunization Requirements
All students enrolled in a Minnesota college or university for more than one course must provide dates of immunizations against measles, rubella, mumps, diphtheria, and tetanus on the required form. Students must have two doses of MMR (measles, mumps, rubella) after their first birthday and have a DT (diphtheria, tetanus) booster within ten years of first registering at the University. The immunization form must include month and year of each immunization. Immunizations are not required if the student submits a statement signed by a physician showing that

- for medical reasons, the student did not receive an immunization; or
- the student has experienced the natural disease against which the immunization protects; or
- a laboratory has confirmed the presence of adequate immunity; or
- the student submits a notarized statement that the student has not been immunized as required because of the student's conscientiously held beliefs; or
- the student was born before 1957.
All students must complete an immunization form (even those with the above exemptions) and return it to UMD Health Services.

Repeating Courses
Students may retake a course in which they received a grade of C- or lower or an N. Only the last passing grade earned is used in calculating the GPA. Students receiving a grade of C or above or an S must obtain department permission before retaking a course. Credits can be applied toward graduation requirements only once. Students must complete a course repeat form at the Campus Center Information Desk.

Once a student has graduated, repeating a course taken as an undergraduate is not permitted. Transfer students may retake, at UMD or at their previous college, a course for which a grade of C- or lower or an N was originally assigned. Students may not retake a course at another college to replace a grade received at UMD.

Withdrawal From the University
To withdraw from all academic coursework at the University, a student must go to the Information Desk in the Campus Center. Students withdrawing from the University after the eighth week of the semester must be doing satisfactory work to receive a W for courses in which they are registered. Students with outstanding financial obligations to the University are not eligible to receive grades or official transcripts of coursework completed. All University property such as library books, athletic equipment, band equipment, laboratory materials, locker keys or locks, and athletic tickets must be turned in to the appropriate office. Students must also make arrangements for an exit interview if they had a student loan. Veterans must also notify the Veterans Office, 102 Darland Administration Building.

Scholastic Progress

Academic Standing
Each college unit at UMD establishes its own policy for academic standing. See the appropriate college section of this catalog for information.

Appeal and Petition
After consultation with the adviser, a student seeking exception to the academic policies of his or her college or school may petition the dean of the unit for exemption from a regulation.

Admission to Upper Division
All college units require the filing of some type of upper division papers or degree requirement forms as a prerequisite to admission to upper division status or candidacy for degree. Students should check the policies of their college unit for specific degree and program/major requirements. Students must successfully complete the lower division composition requirement before they are admitted to the upper division.

All-University Degree Requirements
Degrees from the University of Minnesota are granted by the Board of Regents on recommendation of the faculty. Degree requirements include the following.

• All undergraduate degrees require a minimum of 120 semester credits.
• Undergraduates must meet all course, credit, and grade average requirements of the University school, college, or division in which they are enrolled, including liberal education requirements and an advanced writing requirement.
• Undergraduates must meet residency credit requirements specified by the school or college from which they will receive their degrees. In addition, degree candidates must earn at least 30 semester degree credits or the equivalent awarded by the University of Minnesota Duluth. For policies on obtaining more than one major or degree, see the degree requirements described for each of the college units in the Colleges and Schools section of this catalog.
• Graduate School students must meet only the academic and residency requirements of their graduate departments and the Graduate School.
• All students must meet all financial obligations to the University.
• Prospective graduates must file their degree application one semester before their expected commencement date; all degrees requested must be on this application. Graduates receive their diplomas approximately three months after commencement.

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Liberal Education Program

The liberal education program is the overall framework around which all UMD baccalaureate degree programs are designed. While depth is achieved through requirements for majors and minors, breadth is achieved by exposure to disciplined inquiry in the liberal education program's ten categories of knowledge.

In addition to providing breadth of knowledge, the liberal education program encourages critical and creative thinking, develops oral and written skills, provides practice in analytical study methods, examines basic values, encourages active citizenship and social responsibility, and provides awareness of historical traditions, intellectual and artistic endeavors, global issues and concerns in today's world, and diverse cultural values in the United States. Objectives for each of the ten categories are indicated in the brief statement at the beginning of each category in the following list.

Candidates for any UMD baccalaureate degree must complete the lower division liberal education program. Some baccalaureate degree programs have requirements that exceed those specified here. Students should check their degree program requirements, as well as those below.

Most students are expected to complete the liberal education program in their first two years of study. It is the student's responsibility to select, in consultation with an adviser, specific liberal education courses that are prerequisites for upper division courses in their major, minor, or degree programs. Students enrolled in preprofessional programs who do not intend to complete their degree at UMD are not required to complete the lower division liberal education program. However, these students should carefully select liberal education courses in consultation with their adviser to meet requirements of the institution in which they intend to complete their degree, especially if that institution requires the Minnesota Transfer Curriculum.

Advanced standing transfer students who are candidates for a UMD baccalaureate degree may have completed the 40 credits required in the Minnesota Transfer Curriculum at another institution as part of an associate of arts or baccalaureate degree program. Students who have completed the Minnesota Transfer Curriculum elsewhere have met UMD lower division liberal education requirements and are not required to complete additional lower division liberal education coursework.

Composition Requirements

Comp 1120—College Writing (3 cr) or its equivalent must be completed during the first two semesters of attendance at UMD as part of the UMD liberal education program or Minnesota Transfer Curriculum. UMD also requires all students to take one upper division composition course. This requirement is clarified under each program's description.

Entering freshmen who score a 3 or above on either of the Educational Testing Service Advanced Placement examinations in English: Literature and Composition or Language and Composition are granted 3 credits for Comp 1120 after completing the word processing component of Comp 1120 or passing the Comp 1100 test-out. Credit for Comp 1120 is also granted for a score of 6 or 7 on the International Baccalaureate examination. Students may complete the word processing component of Comp 1120 either by taking Comp 1100 or passing the Comp 1100 test-out. Students scoring a 32 or above on the ACT are exempt from Comp 1120.

Examination for Credit—Students who have earned transfer credit in composition without the required Comp 1120 word processing component may complete the requirement either by successfully completing Comp 1100 for credit or earning credit by examination for Comp 1100.

The Department of Composition offers the Comp 1100 and Comp 1120 tests once each semester (excluding summer sessions).

For more information, contact the Department of Composition.

Minnesota Transfer Curriculum

The Minnesota Transfer Curriculum is a collaborative effort among two- and four-year public colleges and universities in Minnesota to help students transfer their work in general education. Completion of a defined transfer curriculum at one institution enables a student to receive credit for such work upon admission to any other participating institution. This transfer curriculum consists of ten areas of competency and completion of these is certified by faculty at the sending institution. Admission to UMD or another institution is an issue separate from transfer. Transfer students must meet all necessary admission requirements.
Students who choose not to complete a transfer curriculum will continue to have their courses evaluated for transfer by existing lists of course equivalencies.

Students who transfer to UMD and have completed the Minnesota Transfer Curriculum elsewhere have met UMD lower division liberal education requirements and are not required to complete additional lower division liberal education coursework.

If only some, but not all, competencies of the Minnesota Transfer Curriculum have been completed elsewhere, these competencies will satisfy equivalent competencies at UMD.

**Distribution Requirements**

Effective fall 1999, students intending to graduate from UMD are required to take at least 35 semester credits to fulfill liberal education program requirements, including 3 credits from Category 1. Students intending to transfer within Minnesota can fulfill Minnesota Transfer Curriculum requirements by taking 40 semester credits, including 3 credits from Category 1.

Among selections made, one course might be designated as emphasizing global and international perspectives in today's world (IP) and one emphasizing cultural diversity in the United States (CD). No course may be designated as fulfilling both IP and CD. Also, a maximum of 2 credits from approved PE and Rec courses may be included in the total liberal education credit requirement, but these courses are not applied to any category.

One course must be selected from each of the ten categories, except where an option is provided: for Category 5, another course from Category 4 may be taken, but it must have a different course designator (designators are abbreviations of study area names, e.g., Chem, Econ, Hist); 2) for Category 10, another course from Category 9 may be taken, but it must have a different course designator; and Art and ArtH count as one designator. Within any category, the equivalent of one course is defined for the purposes of distribution requirements and theme distribution as at least 2 credits from a single course designator (2 credits for IP; 2 credits for CD).

A maximum of 10 credits of S-N courses may be applied to the liberal education requirements or Minnesota Transfer Curriculum, and a maximum of 3 of these credits may be applied to any one of the following ten categories.

All freshmen seminars, under various designators and categories, carry liberal education credit. For more information, students should refer to the Class Schedule.

**Cultural Diversity and International Perspective Requirements**

First-year students must complete one course emphasizing cultural diversity in the United States (CD) and one course emphasizing an international perspective in today's world (IP). These are also required for students following the Minnesota Transfer Curriculum.

Cultural diversity courses focus on being sensitive to and understanding significant differences among people in the United States. International perspective courses focus on understanding issues or topics in today's world from a global perspective or on understanding cultures and societies different from the United States. Liberal education courses that meet the cultural diversity requirement are indicated by *. Liberal education courses that meet the international perspective requirement are indicated by **.

**Category 1—Composition**

Courses in this category should develop skills in composition and written communication.

Comp 1120—College Writing (3) or its equivalent

**Category 2—Math, Logic, and Critical Thinking**

Courses in this category should develop the ability to use and analyze formal symbolic systems. Emphasis should be on the theory and/or development of skills in specific symbolic systems, logic, linguistics and linguistic analysis, mathematics, statistics, and critical thinking.

Educ 1111—Developing Critical Thinking Skills (3)

Geog 2552—Introduction to Maps and Cartographic Methods (3)

Ling 1811—Introduction to Language (3)

Math 1024—Introduction to Contemporary Mathematics (3)

Math 1160—Finite Mathematics and Introduction to Calculus (5)

Math 1250—Precalculus Analysis (4)

Math 1290—Calculus for Modeling (5)

Math 1296—Calculus I (5)

Phil 1001—Problems of Philosophy (3)

Phil 1008—Critical Thinking (3)

Phil 1018—Logic (4)

Stat 1411—Introduction to Statistics (3)

Stat 2411—Statistical Methods (3)

**Category 3—Communication, Computer Science, and Foreign Languages**

Courses in this category should develop the ability to use and analyze human and computer languages. Emphasis should be on the theory and/or development of skills in the methods of human and computer languages, and rhetoric.
Courses in this category should focus on the observation, identification, description, experimental investigation, and theory of natural phenomena.

Category 5—Physical and Biological Sciences Without Lab

Courses in this category should focus on the observation, identification, description, experimental investigation, and theory of natural phenomena.

Category 6—The Social Sciences

Courses in this category should deal with the empirical/descriptive study of individual behavior and social institutions affecting individuals as members of society, including psychological, social, cultural, economic, and political phenomena.

Anth 1604**—Cultural Anthropology (4)
Anth 1612—Introduction to Archaeology (4)
Comm 2929**—Intercultural Communication (4)
Econ 1022—Principles of Economics: Macro (3)
Econ 1023—Principles of Economics: Micro (3)
Geog 1304**—Human Geography (3)
Geog 2313—Economic Geography (3)
Hist 1301—American Government and Politics (3)
Hist 1305—American Challenges (3)
Hist 2245—Science and Society: 1500 to Present (3)
Hist 2265**—Russia in the 20th Century (3)
Hist 2515**—Protocol African (3)
HmCI 1004—From Classical Antiquity to Medieval Culture (4)
HmCI 1025**—Zen Buddhism (3)
Phil 1011—Ethics and Society (3)
Phil 1007—Philosophy and World Religions (3)
Pol 1610—Politics and Society (3)
WS 1000**—Introduction to Women's Studies (3)

Category 7—Historical and Philosophical Foundations

Courses in this category should focus on the study of societies and/or cultures and the analysis of basic philosophical issues and traditions.

Amin 1120**—American Indians in the 20th Century (3)
Ams 1031—Landscape, Environments, and U.S. Culture (3)
Ams 1041*—Frontier Heritage in Canada and the United States (4)
Anth 1602**—Prehistoric Cultures (4)
Econ 3031—History of Economic Thought (3)
Econ 3036—Radical Economics (3)
Educ 1101—Education in Modern Society (3)
Hist 1207—Dawn of Modern Europe (3)
Hist 1208—Europe in the Modern Age (3)
Hist 1304—American Heritage (3)
Hist 1305—American Challenges (3)
Hist 2245—Science and Society: 1500 to Present (3)
Hist 2265**—Russia in the 20th Century (3)
Hist 2357**—Women in American History (3)
Hist 2515**—Precolonial Africa (3)
HmCI 1004—From Classical Antiquity to Medieval Culture (4)
HmCI 1025**—Zen Buddhism (3)
Phil 1003**—Ethics and Society (3)
Phil 1007**—Philosophy and World Religions (3)
Pol 1610—Politics and Society (3)
WS 1000**—Introduction to Women's Studies (3)

Category 8—Contemporary Social Issues and Analysis

Courses in this category should analyze contemporary issues and their relationship to individuals and/or social institutions in economic, political, educational, or religious systems.

Acct 2005—Survey of Accounting (3)
Amin 3106*—Indian-White Relations (3)
Ams 1061*—American Immigrant Heritage (3)
Category 9—Literary and Artistic Expression: Analysis and Criticism
Courses in this category should familiarize students with the basic aims, elements, and principles of interpretation and criticism of literature, folklore, myth, the visual arts, dance, film, music, and theatre. Emphasis should be on principles and techniques of analysis, interpretation, and criticism.

Amin 1106—American Indian Prose, Poetry, and Oratory (3)
Amin 2105—Survey of North American Indian Arts (3)
Art 1001**—Art Today (3)
Art 2814—Creating Across Cultures (3)
Art 2900—Visual Literacy (3)
Arth 1303—History of World Art I (3)
Arth 1304**—History of World Art II (3)
Arth 2305—Classical Themes in Art History (3)
Arth 2390—American Art of the 20th Century (3)
DN 1001**—Introduction to the World of Dance (3)
Engl 1001—Great American Authors (3)
Engl 1101—Literature Appreciation (3)
Engl 1507—Time and Place (3)
Engl 1535—King Arthur in History, Literature, and Art (3)
Engl 1575—20th-Century Literature (3)
Engl 1582—Introduction to World Literatures (3)
Engl 1666— Tales of Terror (3)
Engl 1907—Introduction to Literature (3)
Engl 2571—Contemporary Literature (3)
Engl 2581*—Women Writers (3)
Engl 3223—Shakespeare (3)
Fr 2315—French Cinema (4)
HmCl 1005—From Renaissance to Revolutions (4)
HmCl 1021—Classical Mythology (3)
HmCl 1022—The Bible as Literature (3)
HmCl 1023*—Folklore (3)
Mu 1001**—Introduction to Music (3)
Mu 1003—Beethoven to the Beatles (3)
Mu 1005*—Jazz Studies (3)
Mu 2001**—Ethnic and Folk Music of the World (3)
Mu 2003—Survey of American Music (3)
Mu 2005*—African Roots of American Music (3)
Mu 2007—The Power of Music (3)

Category 10—Literary and Artistic Expression: Performance
Courses in this category should provide opportunities for creative expression through participation, production, or performance of literary or artistic expression and should pay significant attention to larger theoretical issues.

Art 1002—Introduction to Art (3)
Art 1009—Fundamentals of Drawing (3)
Art 1405—Fundamentals of Ceramics (3)
Art 1605—Fundamentals of Photography (3)
DN 1101—Modern Dance Technique I (2)
DN 1111—Jazz Dance Technique I (2)
DN 1131—Ballet Technique I (2)
Mu 1501—Concert Band (1)
Mu 1502**—Symphonic Wind Ensemble (1)
Mu 1503**—Symphony Orchestra (1)
Mu 1504—Chamber Orchestra (1)
Mu 1505—Jazz Ensemble (1)
Mu 1510—Concert Chorale (1)
Mu 1511*—University Singers (1)
Mu 1512—Chamber Singers (1)
Mu 1513*—Jazz Choir (1)
Th 1099—Production Practicum I (1)
Th 1111—Acting Fundamentals I (3)
Th 1199—Performance Practicum I (1)

PE and Rec Courses
A maximum of 2 credits of 1xxx physical education and recreation courses may be included in the total liberal education credit requirement, but these courses are not applied to any category.

PE 1200—Beginning Swimming (1)
PE 1220—Intermediate Swimming (1)
PE 1300—Ballroom Dance (1)
PE 1302—Folk Dance (1)
PE 1304—Square Dance (1)
PE 1400—Badminton (1)
PE 1402—Tennis (1)
PE 1410—Golf (1)
PE 1414—Bowling (1)
PE 1500—Cross-Country Skiing (1)
PE 1502—Alpine Skiing (1)
PE 1504—Ice Skating (1)
PE 1506—Sailing (1)
PE 1507—Flatwater Kayaking (1)
PE 1508—Flatwater Canoeing (1)
PE 1510—Whitewater Kayaking (1)
PE 1512—Fishing Skills (1)
PE 1530—Rock Climbing (1)
PE 1600—Physical Fitness (1)
PE 1601—Aerobics (1)
PE 1612—Karate (1)
PE 1614—Self Defense (1)
PE 1616—Weight Training (1)
PE 1620—Aikido (1)
PE 1702—Soccer (1)
PE 1706—Volleyball (1)
PE 1708—Basketball (1)
PE 1710—Softball (1)
Rec 1201—Outdoor Skills I (2)
Rec 1202—Outdoor Skills II (2)
Credit Options

College Level Examination Program (CLEP)

CLEP offers two kinds of examinations. General examinations measure achievement in the five basic areas of liberal arts and subject examinations measure achievement in specific college courses.

UMD accepts scores from the general examinations and allows up to 22 credits to be applied toward the liberal education requirements. For the general examination in humanities, mathematics, science, and social science, credit is awarded according to the following schedule: 25-49 percentile, 4 credits; 50-74 percentile, 6 credits; 75 percentile and above, 8 credits. No grade is recorded for these credits and they are not calculated into the GPA. Cutoff scores are subject to change.

CLEP credits awarded at another institution are not automatically accepted by UMD. The student must submit the original transcript of CLEP scores for evaluation. All scores are evaluated according to UMD policy and appropriate credit is awarded.

UMD also accepts scores and allows credit for some of the CLEP subject examinations. Students should check with the appropriate department to determine the level of achievement required to receive credit for each of these examinations. The following subject tests can be taken for credit.

College of Education and Human Service Professions
Psychology (Psy 1003)

College of Science and Engineering
Biology (Biol 1011)
Chemistry (Chem 1102)
Geology (Geol 1110)

College of Liberal Arts
Political Science (Pol 1011)

School of Business and Economics
Accounting (Acct 2001)
Economics (Econ 1003, 1022, 1023)

CLEP examinations are given the third week of September, January, April, and June at the College of St. Scholastica. The registration deadline for each CLEP examination is 15 working days before the examination date; students who miss the deadline should check with the test center. Students may pick up the CLEP registration guide from UMD's Office of the Registrar or Office of Admissions.

Advanced Placement

Advanced placement is sponsored by the College Entrance Examination Board in certain high schools. Satisfactory examination scores (typically 4 or 5) may earn UMD credit in an existing course subject to approval by the department offering the course. In those cases in which a suitable existing course does not exist, "blanket credit" may be granted. When a department or college determines that a score of 3 merits credit, credit may be granted. With the appropriate campus approval, "blanket credits" may be used to meet certain liberal education requirements. For more information, contact the Office of the Registrar.

International Baccalaureate

The International Baccalaureate is an accelerated course of study for high school students. Satisfactory examination scores (usually 5, 6, or 7) earn UMD credit in accordance with the University's policies and practices. For more information, contact the Office of the Registrar.

University College Twin Cities (UCTC) Credit

If appropriate, college-level, degree-credit courses offered by UCTC may be used to meet degree requirements. Independent study (correspondence) credits earned through UCTC may also be used to meet degree requirements. Note: There is a strict limitation on the number of correspondence credits that may be used to fulfill degree requirements. Correspondence credits may not be used to fulfill Graduate School degree requirements. Students receiving financial aid should check with a customer service representative at the Student Assistance Center, 21 Campus Center, or call 218/726-8000.

Examinations for Proficiency

Neither credits nor grades are granted for courses satisfied through proficiency examinations. If proficiency is demonstrated, a notation is made on the student's transcript that reads, "Course X satisfied by proficiency examination." Proficiency may be certified for the beginning sequences of foreign languages. Through department evaluation to determine proficiency, a student may be allowed to start within the beginning sequence or at the intermediate level of a language sequence.
Courses satisfied through proficiency examination do not reduce the total credit requirements for graduation. Courses listed as major requirements that are satisfied through proficiency examination do reduce the credit requirements in the major field.

Examinations for proficiency may be requested from a department at any time. A $30 fee is required in advance; in addition, a service charge may be assessed when a nationally standardized examination is given. No exceptions are made for students enrolled for the first time or after an absence from the University.

Examinations for Credit
Credit may be earned through examination for the following courses only if a student has less than the required high school preparation (as noted in parentheses) in the area: beginning sequences of foreign languages (two years of high school credit in a single foreign language), elementary algebra—Math 1004 (two years of high school credit in algebra), and geometry—Math 1002 (one year of high school credit in geometry).

With the restrictions noted above, credit may be earned through examination by any registered UMD student in any UMD course. (By college action, certain courses such as practica, student teaching, internships, research courses, independent study, and seminars are excluded.) Students may not, however, take an examination for credit in a course in which they are currently enrolled. To earn credit, the work must be of C quality. Only credits, not grades, are granted upon successful completion.

Credits earned through examination are not considered as regular, residence, or transfer credits. They are listed separately on the transcript and designated as being earned through examination.

Departments offer examinations for credit at least once each semester. The date, time, and nature of the examinations are set by each department. To take an examination for credit, the student must obtain a Request for Special Examination form from the Campus Center Information Desk, and complete the outlined procedures. A $30 fee is required in advance; in addition, a service charge may be assessed when a nationally standardized examination is given. No exceptions are made for students enrolled for the first time or after an absence from the University.

Grades and Grading for Undergraduate Programs
There are 11 permanent grades—A (highest), A-, B+, B, B-, C+, C-, D+, D (lowest), and S (ungraded but of at least C [2.00] level performance) that may be assigned when a student successfully completes the work for a course. There are two permanent grades—F and N—that may be assigned when a student does not successfully complete the work for a course.

Incompletes
The temporary grade I (incomplete) is assigned only when a student has made an agreement with the instructor to complete the course requirements before the instructor submits final grades for a semester. The I remains in effect for one calendar year after the end of the semester in which the I was received unless a different time period has been arranged between the student and instructor. At the end of this period, the I will be changed to an N or F unless the instructor has submitted a change of grade or has agreed to an extension of the incomplete. If an extension is permitted, it is the responsibility of the student to obtain an Extension of Incomplete form, get the instructor’s signature, and submit the form to the registrar before the deadline.

Withdrawals
The permanent registration symbol W (withdrawal) designates official cancellation of a course and is posted by the registrar only on the basis of an official change in registration. The symbol is assigned in all cases of official cancellation only during the first eight weeks of classes; thereafter withdrawal from classes is not permitted.

Sequence Courses
The symbol X is reported in continuing courses for which a grade cannot be determined until the sequence is completed. The instructor will submit a grade for each X when the student has completed the entire sequence.

Grading Options
Courses are graded under one of three systems at UMD: mandatory letter grading, mandatory S-N grading, and optional grading in which a student may select either letter or S-N grading. With optional grading, students make their selection of grading system at the time of registration. Changes from the original selection may be made during the first two weeks of a
semester by following the cancel-add procedure. The following restrictions apply to the various grading options.

- A student seeking a bachelor’s degree must earn a minimum of 90 degree credits in letter-graded courses.
- A student may not elect S-N grading in optional-graded courses that, for that student, fulfill major or minor requirements as determined by the department offering the major or minor.
- No more than 10 credits may be taken S-N during any one semester, with the exception of the semester during which a student seeking teacher licensure is practice teaching.
- No more than 10 credits of S-N graded courses may be applied toward liberal education requirements, and no more than 3 of these credits may be applied to any one of the 10 categories.
- A course taken for credit in certain areas of required high school preparation (two years in a single foreign language, two years of algebra) by a student with preparation equal to or in excess of that specified may be taken S-N only.

**Academic Records**

An official transcript for each student is maintained in the Office of the Registrar. The transcript is a complete record of all academic work attempted at UMD, transferred from other colleges or universities, or earned by examination or other acceptable methods.

Students may obtain official or unofficial copies of their transcripts by submitting a request in writing to UMD Transcripts, 184 Darland Administration Building, 10 University Drive, Duluth, MN 55812. There is a $5 charge for official copies. Unofficial transcripts can be requested from the on-the-spot transcript service at the Campus Center Information Desk. There is no charge for these copies, but students are limited to one copy per visit.

Grades are not automatically mailed to students or their guardians. Grades for a given academic semester are usually available during the first week of the succeeding semester in the form of an audit copy of the transcript. A complete transcript is mailed to students each summer so they can check their records. Grades are also available by calling (218) 726-8088.

**Access to Student 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.) Also, posting lists of examination scores or course grades, or returning test materials to students in ways that make it possible for students to obtain information about other students’ scores or grades, is inappropriate. The policy does permit students to review their educational records and to challenge the contents of those records.

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 Campus Information Desk. Students have the right to review their educational records. The regents’ policy is available for review at the Office of the Registrar.

**Grade Point Average**

A cumulative grade point average (GPA), tabulated by the Office of the Registrar, appears on each transcript. The GPA is determined by dividing the sum of the grade points earned by the sum of the degree credits for which they were earned. Each grade carries the following grade points: A=4.00; A-=3.67; B+=3.33; B=3.00; B-=2.67; C+=2.33; C=2.00; C-=1.67; D+=1.33; D=1.00; F=0.00. Credits associated with the grade F are not applied toward the credit total needed for graduation but are included in GPA calculations. The grade N does not carry credits or grade points. The grade S carries credits but no grade points. The amount and quality of work required for a grade of S may not be less than that required for a C (2.00).

**Graduation Honors**

Baccalaureate degree candidates who have done outstanding work may be awarded special honors upon completion of the senior year, either through graduation with honors, conferral of department honors, or both.

Collegiate honors are designated as *cum laude, magna cum laude, or summa cum laude*. The decision to award graduation honors lies with the college unit in which the student is
enrolled. Each college unit has established criteria to ensure that academic excellence is maintained. No more than 15 percent of the graduating class in each college unit may be nominated, and a student must have a minimum GPA as specified by their college in coursework taken in residence at UMD.

Department honors are designated as “Graduated With Distinction in ____.” The decision to award department honors lies with the student’s major department.

Students should consult their major departments and college units regarding questions and policies dealing with honors.

Excused Absence Policy

Credit Courses
Certain credit courses may have requirements that lead to absences from other credit courses. Information regarding the dates and extent of these absences should be included with registration materials and should be part of the syllabus for the course requiring these absences. This same information should be part of the curriculum proposal for the course.

Activities
There are several official noncredit activities of the University in which required student attendance may lead to absences from credit courses. These may include, but are not limited to, intercollegiate athletics, theatre performances, and University Singers performances. In all cases, these activities must be scheduled before the beginning of the semester and be included with students' registration materials.

Student Responsibilities
If class sessions will be missed because of requirements in other courses or because of official noncredit activities, students must contact their instructors during the first week of classes and make arrangements so that any course requirements unfulfilled due to these absences can be satisfied.

Instructor Responsibilities
In general, requested absences are permitted at the instructor’s discretion. When permitted, the instructor must work with the student to develop a procedure by which unfulfilled course requirements can be satisfied. In some cases, however, the nature of the course may make attendance throughout the semester absolutely necessary. In these cases, the student has the choice of taking the course and missing the activity or withdrawing from the course.

Supervisor Responsibilities
The individual supervising the course or activity leading to absences must give students a schedule of these absences on or before the first day of the semester in which they will occur. The supervisor must also provide to students, in writing and in a timely manner, any changes to this schedule.

Final Examinations
The vice chancellor for academic administration must approve any excused absences from final examinations.

Procedures—Approvals and Exceptions
Credit Courses—An approval request goes through the college curriculum committee to the Office of the Vice Chancellor for Academic Administration.

Activities—The activity supervisor submits the proposed schedule through the proper reporting line to the Office of the Vice Chancellor for Academic Administration.

Appeals
Students—Any student who wishes an exception to this policy or believes the policy is being violated should submit a petition to the Office of the Vice Chancellor for Academic Administration.

Faculty/Staff—Any faculty or staff member who wishes an exception to this policy or believes the policy is being violated should report this to the Office of Vice Chancellor for Academic Administration.

Absence From Class for Religious Observances
The University permits absences from class for participation in religious observances. Students are responsible for informing instructors of absences at the beginning of the semester, meeting with instructors to reschedule any examinations affected by this policy, and obtaining class notes from other students. Instructors are requested to assist students in obtaining course materials and assignments distributed during class sessions.
Commencement Participation

Students may participate in spring commencement if they can demonstrate that they can fulfill all graduation requirements by the end of fall semester following spring commencement. Exceptions to this policy must be approved by the Vice Chancellor for Academic Administration and are granted only for very unusual and compelling reasons.

Student Academic Grievance Policy

A. Scope and Purpose
1. This policy addresses academic grievances only. Academic grievances are complaints brought by students regarding the University’s provision of education and academic services affecting their role as students. Academic grievances must be based on a University rule, policy, or established practice claimed to be violated. (This policy does not limit the University’s right to change rules, polices, or practices.)

2. This policy does not apply to conflicts connected with student employment or actions taken under the Student Conduct Code or complaints alleging violation of the University’s policies of sexual harassment or academic misconduct. Such claims shall be referred to the appropriate office for investigation and review. Any complaint alleging discrimination in the University/student relationship, other than sexual harassment, may be filed either under this policy or with the Office of Equal Opportunity and Affirmative Action, but not both.

3. Students enrolled at any University of Minnesota campus may file academic grievances under this policy.

4. This policy provides an efficient process, allowing for both informal and formal resolutions of conflicts. Resolutions may include student reinstatement or other corrective action for the benefit of the student, but may not include monetary compensation or take disciplinary action against any employee of the University. If, as a result of the outcome of a student grievance, discipline is being considered, a separate investigation will be conducted by the appropriate disciplining member of the administration or his/her designee who will follow the procedures in the relevant contracts, where applicable.

B. Informal Resolution
1. The first step of any resolution should be at the lowest level, between the parties involved or the parties and an appropriate administrator at that lowest level.

2. Grievances involving an instructor’s judgment in assigning a grade based on academic performance may be resolved only through the informal resolution procedures.

C. Formal Resolution
1. Each college unit designates an academic grievance officer (generally the associate or assistant dean) who reviews formal complaints, interviews the parties involved, and recommends a course of action to the dean, who provides a formal resolution. In the case of involved units without an established faculty, the grievance officer will be a member of that staff.

2. There will be a UMD Academic Grievance Committee and a UMD academic grievance officer for grievances arising from actions of college deans or the vice chancellor of student affairs.

In the case of C. 1.: A complaint must be submitted in writing to the appropriate grievance officer, identifying the grievant, the respondent(s), the incident, the rule/policy/established practice claimed to be violated, and a brief statement of the redress sought.

The grievance should be filed in the college unit in which the incident occurred. For graduate students, the appropriate unit is the Graduate School.

3. If any of the parties are not satisfied with the unit grievance officer’s resolution of the grievance, they may appeal to the UMD academic grievance officer located in the office of the Vice Chancellor for Academic Administration. Based on the written appeal and response, this officer will determine whether or not there are sufficient grounds to hold an appeal hearing. The UMD Academic Grievance Committee will not hear a case de novo, but rather will determine whether the parties have been afforded due process. The committee reports its recommendation to the appropriate vice chancellor for review and
action. If the recommendation is not accepted, the vice chancellor provides a written explanation of any nonconcurrency.

4. The decision of the appropriate vice chancellor is final and cannot be appealed.

D. Timeliness
1. All complaints must be filed within 90 calendar days after the incident being grieved occurred. A response to the complaint must be filed within 15 working days.
2. Unit grievance officers shall provide a formal resolution, if required, within 30 working days of the date formal action is requested.
3. Appeals of the unit grievance officer’s actions must be filed within 15 working days.
4. Timeliness may be adjusted if there are compelling reasons for delay offered by any of the parties.

The UMD Academic Grievance Committee (C. 3.) provides a recommendation to the appropriate vice chancellor within 30 working days of receiving an appeal of a unit grievance officer’s action.

Final Examination Policy
UMD policy requires that final examinations be administered at the time and place prescribed in the final examination schedule for all UMD courses offered for undergraduate credit. Exemption from this policy may be granted by the appropriate college dean. Requests for exemption should be initiated by the instructor of record for the course and forwarded through the department to the college dean for action, with an information copy to the registrar. Such requests are considered on a semester-to-semester basis.

Requests for permanent exemption for courses for which regular final examinations are inappropriate, such as independent study or seminar courses, should be initiated by the department responsible and forwarded to the college dean for action, with an information copy to the registrar. Such requests, once granted, remain in effect until modified by action of the department responsible.

Examination Scheduling Procedures
There are two formats for final examinations, regular final examinations and common final examinations. Regular final examinations are scheduled in accordance with the time and days of semester class meetings as indicated in the UMD Class Schedule. Unless otherwise indicated, such examinations will be administered in the regular classroom for each course and section. Common final examinations may be scheduled for courses offered in three or more sections and must be requested by the department responsible for the instruction. The common examination schedule is established by the registrar and is published in advance of the semester final examination period. All students are responsible for knowing the final examination scheduling information contained in the UMD Class Schedule and the UMD common examination schedule. Instructors are responsible for informing students of approved deviations from the published final examination schedules.

Final Examination Conflicts
UMD policy provides that no student may be required to take more than two final examinations on the same day. The regular final examination and the common examination schedules are constructed to minimize conflicts.

Conflicts are resolved according to the following policy. Regular final examinations take priority over common final examinations and both take priority over examinations that have been shifted to a time deviating from the published examination schedule. When three or more regular final examinations fall on the same day for an individual student, the first and last scheduled examinations on that day take priority over others. When one regular final examination conflicts with two or more common final examinations, the first scheduled common final examination on that day takes priority over other common final examinations. When three or more common final examinations fall on the same day, the first and last scheduled examinations on that day take priority over others. When one or more common final examinations are scheduled at the same time, priority is given to the earliest class time as determined by the regular class schedule.
Makeup Examinations

When a student is excused from a final examination because of a conflict, a makeup examination will be scheduled during the final examination period on a day and at a time of mutual convenience to the student and faculty member concerned. If mutual agreement cannot be reached, the faculty member may specify any time during the final examination period that does not create additional conflict with the rest of the student’s scheduled examinations.

Sexual Harassment

Sexual harassment is reprehensible. It subverts the mission of the University and threatens the careers of students, faculty, and staff. It is viewed as a violation of Title VII of the Civil Rights Act of 1964. Sexual harassment is not tolerated at the University of Minnesota. For the purpose of this policy, sexual harassment is defined as follows:

Unwelcome sexual advances, requests for sexual favors, and/or other verbal or physical conduct of a sexual nature constitute sexual harassment when (1) submission to such conduct is made either explicitly or implicitly a term or condition of an individual’s employment or academic advancement, (2) submission to, or rejection of, such conduct by an individual is used as the basis for employment decisions or academic decisions affecting each individual, or (3) such conduct has the purpose or effect of unreasonably interfering with an individual’s work or academic performance or creating an intimidating, hostile, or offensive work or academic environment in any University activity or program.

Consensual romantic and sexual relationships between faculty and student, or between supervisor and employee, while not expressly forbidden, are generally deemed very unwise. Codes of ethics for most professional associations forbid professional-client sexual relationships. In the view of the Senate, the professor-student relationship is one of professional and client. The respect and trust accorded a professor by a student, as well as the power exercised by the professor in giving praise or blame, grades, recommendations for further study and future employment, etc., greatly diminish the student’s actual freedom of choice should sexual favors be included among the professor’s other, legitimate, demands. Therefore, faculty are warned against the possible costs of even an apparently consensual relationship, in regard to the academic efforts of both faculty member and student. A faculty member who enters into a sexual relationship with a student, or a supervisor with an employee, where a professional power differential exists, must realize that, if a charge of sexual harassment is subsequently lodged, it will be exceedingly difficult to prove immunity on grounds of mutual consent.

It is the responsibility of everyone within the University community to uphold the requirements of Title VII and other laws prohibiting sexual harassment and/or sexual violence. The academic and working environment of the University must be kept free of these negative influences. Sexual violence is an extreme form of sexual harassment involving physical violence against an individual. Such incidents may constitute criminal violations and also are a violation of the sexual harassment policy of the University.

Justice requires that the rights and concerns of both complainant and respondent be fully assured. The University shall make every effort to assure and protect these rights and shall undertake no action that threatens or compromises them.

In determining whether alleged conduct constitutes sexual harassment, those entrusted with carrying out this policy look at the record as a whole and at the totality of the circumstances, such as the nature of the sexual advances and the context in which the alleged incidents occurred. A determination of the suitability of a particular action will be made from the facts on a case-by-case basis. For more information regarding this policy or your rights, call the Office of Equal Opportunity director (218/726-6849) or the intake coordinator (218/726-6827).

Smoke-Free Campus Policy

Smoking is prohibited in all facilities of the University of Minnesota Duluth campus except for designated private residence hall rooms.
The University of Minnesota regents adopt regulations for governing the University to provide educational opportunities to its students, transmit and advance knowledge, and provide a wide range of services to both students and the general public. To carry out these responsibilities, the University requires a community free from violence, threats, and intimidation; protective of free inquiry; respectful of the rights of others; open to change; supportive of democratic and lawful procedures; and dedicated to the rational and orderly approach to the resolution of human problems. To safeguard the rights, opportunities, and welfare of students, faculty, staff, and guests of the University community, and to assure protection of the interests of the University as it seeks to carry out its mission on behalf of the citizens of Minnesota, certain minimum standards of conduct become necessary.

In the past, the University had been guided by a Code of Conduct consisting of rules, statement, and policies stemming from many sources. As the structure of the University expanded and in recognition of the need for the clarification and definition of standards of behavior in contemporary society, the Committee on Student Affairs recommended that the University establish and maintain standards of student conduct.

The president was directed to promulgate these standards of conduct on all campuses with appropriate explanation.

This Statement of Standards was adopted by the Board of Regents in 1970. A revision of Section IV, the Conduct Code was approved by the board at its December, 1974, meeting. A revision of the “Procedures for Disciplinary Proceedings—Twin Cities Campus” was approved at the July, 1978, meeting of the board. These revisions were developed through consultation with the Assembly Committee on Student Affairs and are the result of lengthy review by many students, faculty, and staff.

The Policy Statement on Sexual Harassment was approved by the University Senate at its May, 1984, meeting. The policy applies to the entire University and to the conduct of students and employees, including academic staff.

II. Interest of the University Relevant to a Code

Over a period of years, University adjudicative bodies have decided questions of jurisdiction by identifying University interests. These interests provide a substantial foundation for the building of a code.

1. The University has a primary concern with matters which impinge upon academic achievement and integrity.
2. The University has a fundamental concern with conduct which breaches the peace, causes disorder, and substantially interferes with the rights of others.
3. The University has a special interest in behavior which threatens or actions which imperil the physical and mental health and safety of members of the University community.
4. The University has an obligation to protect its property and the property of members of its community from theft, damage, destruction, or misuse.
5. The University has a commitment to enforce its contractual agreements.
6. The University has an obligation to support and be guided by laws of the land.
7. The University has a concern about behavior repugnant to or inconsistent with an educational climate.

III. The Problems of Dual Membership

Students are both members of the University community and citizens of the state. As citizens, students are responsible to the community of which they are a part, and the University neither substitutes for nor interferes with regular legal processes. Students are also responsible for offenses against the academic community. Therefore, an action involving the student in a legal proceeding in a civil or criminal court does not necessarily free the student of responsibility for this conduct in a University proceeding. When a student is charged in both jurisdictions, the University will decide on the
basis of its interest and the interest of the student whether or not to proceed with its internal review simultaneously or defer action.

IV. Conduct Code

The following are defined as disciplinary offenses actionable by the University:

1. **Scholastic Dishonesty**: 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.

2. **Falsification**: willfully providing University offices or officials with false, misleading, or incomplete information; intentionally making a false report of a bomb, fire, natural disaster, or other emergency to a University official or an emergency service agency; misusing, altering, forging, falsifying, or transferring to another person University-issued identification; forging, or altering without proper authorization, official University records or documents or conspiring with or inducing others to forge or alter without proper authorization University records or documents.

3. **Identification and Compliance**: willfully refusing to or falsely identifying one’s self; willfully failing to comply with a proper order or summons when requested by an authorized University official.

4. **University Facilities and Services**: acting to obtain fraudulently (e.g., by deceit, unauthorized procedures, bad checks, misrepresentation) goods, quarters, services, or funds from University departments or student organizations or individuals acting in their behalf; misuse, alteration, or damage of fire-fighting equipment, safety devices, or other emergency equipment or interference in the performance of those specifically charged with carrying out emergency services; wrongful use of University properties or facilities.

5. **Disorderly Conduct on the Campus**: threats to, physical abuse of, or harassment which threatens to or endangers the health, safety, or welfare of a member of the University community; breach of the peace; physically assaulting another; fighting; obstructing or disrupting teaching, research, administrative, and public service functions; obstructing or disrupting disciplinary procedures or authorized University activities; vandalism.

6. **Theft and Property Damage**: theft or embezzlement of, destruction of, damage to, unauthorized possession of, or wrongful sale or gift of property belonging to the University, a member of the University community, or a campus guest.

7. **University Rules**: violating other University, college, department, union, and residence regulations that have been posted or publicized. Provisions contained in University contracts with students shall be deemed “rules” under this code.

8. **Weapons on Campus**: possession of firearms, incendiary devices, explosives, articles, or substances usable as weapons or means of disruption of legitimate campus functions, activities, or assemblies; or using firearms, incendiary devices, explosives, articles, or substances calculated to intimidate, disturb, discomfort, or injure a member of the University community, except in those instances when expressly authorized by the head of a University department whose activities properly require the use or possession of any of the enumerated items.

9. **Disruptive Demonstrations**: intentional participation in a campus demonstration which disrupts the normal operations of the University and infringes on the rights of other members of the University community; leading or inciting others to disrupt scheduled and/or normal activities of any campus building or area; intentional obstruction which unreasonably interferes with freedom of movement, both pedestrian and vehicular, on campus.

10. **Keys**: possession, making, or causing to be made any key to operate locks or locking mechanisms on campus without proper authorization or using or giving to another a key for which there has been no proper authorization.

11. **Violations of Federal or State Laws of Special Relevance to the University**: when the violation of federal or state law, including but not limited to those governing alcoholic beverages, drugs, gambling, sex offenses, indecent conduct, or arson occurs on campus, the offense will also constitute an offense against the University community.
12. **Sound Amplification**: using sound amplification equipment such as a bullhorn on campus or in a campus building without permission of the vice president for student affairs or the vice president's designee, except when such use is authorized for official University purposes.

13. **Disruptive Noise**: making noise or causing noise to be made with objects and instruments that disturbs classes, meetings, office procedures, and other authorized University activities.

14. **Attempt to Injure or Defraud**: to make, forge, print, reproduce, copy, or alter any record, document, writing, or identification used or maintained by the University when done with intent to injure, defraud, or misinform.

15. **Disruption of University Events**: unauthorized entry upon the playing performance area or the spectator areas of any athletic contest, exhibition, or other event.

16. **Persistent Violations**: repeated conduct or action in violation of the above code is relevant in determining an applicant’s or a student’s membership in the University.

**V. Procedures and Sanctions**

If any person is found guilty or pleads guilty to an offense under this code, the sanctions available shall include the following:

1. **Warning and Admonition**: the issuance of an oral or written warning, admonition, or reprimand.

2. **Required Compliance**: carrying out a bona fide University rule as a condition for being admitted or continuing membership in the University; restriction of privileges; restitution; removal from quarters; withholding of diploma and degree for a specified period of time.

3. **Confiscation**: confiscation of goods used or possessed in violation of University regulations; confiscation of falsified identification or identification wrongly used.

4. **Probation**: special status with conditions imposed for a limited time after determination of misconduct.

5. **Suspension or Expulsion**: termination of status in a given course for not more than one calendar year; termination of student status for not more than one calendar year; indefinite termination of student status.

6. **Interim Suspension**: the president may, after evaluating the evidence received, the identification of parties, the safety and well-being of students, faculty, and University property, and, in those cases in which there is an indication that a student’s misconduct will be repeated or continued or where the president believes it is necessary to permit the University to carry on its functions, impose immediate suspension with resultant loss of all student rights and privileges, pending hearing before the appropriate disciplinary committee. The student has a right to a prompt hearing before the president or the president’s designee on the limited questions of identification and whether suspension should remain in effect until the full hearing is completed.

**VI. Repeal of Contradictory Rules**

This student code supersedes the definition of student misconduct published in the “Laws and Regulations Governing the University of Minnesota,” 1931 edition; sections I and II of the regent actions of June 10, 1914; and any other university, college, or department regulations found in contradiction.

**Appeals of Student Discipline**

Any student or student organization charged with violation of a University rule or standard must have the opportunity to receive a fair hearing and access to at least one campus-wide appeal. To safeguard the rights of students and student organizations, each campus must have developed and approved an appeals procedure to govern those cases of individual scholastic, nonscholastic, and student organization misconduct heard in original campus jurisdictions. The procedure must reflect the University’s concern for both substantive and procedural fairness for the accused student or student organization, including both the student’s/student organization’s and institution’s right to resolution of a case within a reasonable period of time. The procedure must specifically include sections stating the

1. grounds for an appeal;
2. procedures for filing an appeal; and
3. nature of an appellate review.
VII. Role and Process Levels for the Conduct Code Coordinator, Student Behavior Judiciary Committee, Student Affairs Committee, and Chancellor

The conduct code coordinator receives referrals or allegations from students, faculty, staff, and guests of the University about alleged violations of the conduct code. The conduct code coordinator collects information, interviews the parties involved, and provides the student, if accused, with a statement of his/her rights. Academic offenses are handled by college offices. In all other cases, the conduct code coordinator attempts an informal/mediated resolution of the case or refers it to the Student Behavior Judiciary Committee. If an attempted informal/mediated resolution is not acceptable or the student charged wishes, the case proceeds to the Student Behavior Judiciary Committee.

Level One

The conduct code coordinator will attempt an informal resolution of the case. This process involves the complainant and the accused in a series of discussions that concludes in an agreement between the parties. Regarding student versus student, the written agreement specifies the conditions under which each party will comply in modifying their behavior toward each other, toward the end of resolving the conflict between them. This agreement also specifies the consequences should either party fail to honor the terms of the agreement. Regarding the University versus student, the student will receive a letter specifying the charges and sanctions imposed.

Should this informal resolution process fail to conclude with a statement agreeable to all parties, none of the proceedings of this process shall be admissible by either party in subsequent steps in the UMD conduct code process. Only the original complaint, the evidence gathered in the investigation of the original complaint, and factual information gathered during the informal process will be admissible in further hearings.

Level Two

The Student Behavior Judiciary Committee is responsible for taking action on cases referred to it by the conduct code coordinator based on alleged violations of this code and for advising the vice chancellor for academic support and student life and the Student Affairs Committee on matters related to student behavior.

Level Three

The Student Affairs Committee of the Campus Assembly is the campus-wide student appeal committee and is also responsible for developing and reviewing policies related to student behavior.

Level Four

The chancellor is the final review authority on matters of student discipline at UMD, acting on appeal recommendations from the Student Affairs Committee/Campus Appeals Body.

VIII. Procedures Implementing the Student Conduct Code

Alleged violations of the code are reported to the conduct code coordinator. Any information pertinent to the complaint is collected and reviewed by the coordinator. The parties involved in the allegation are interviewed. In the event the coordinator issues a complaint, the complainant is the University of Minnesota Duluth.

Any student charged with a violation of the code will receive in writing a statement of the complaint including the range of possible sanctions and will be informed of the opportunity to receive a fundamentally fair hearing. If a hearing is held, the accused students will be granted the following rights:

- To hear all evidence against them; to present their own case including witnesses; to be accompanied by an advisor or legal counsel in a nonparticipatory role; to question adverse testimony; to receive written notice of the hearing committee’s decision; and the opportunity for an appeal if guilt is determined.

- If more than one student is charged with misconduct in a related incident, a single hearing may be held for all of the students so charged.

The Student Behavior Judiciary Committee hearings are closed unless the parties agree to an open hearing. All information about the proceedings and the outcome of closed hearings is private.

IX. Appeals

Dispositions by the Student Behavior Judiciary Committee may be appealed to the UMD Campus Assembly Committee on Student Affairs.
The mission of the School of Business and Economics is to contribute to the intellectual growth and development of individuals in order to enhance their competence in business and management. SBE achieves this mission through teaching, research, and service activities. With a primary focus on teaching, the school offers a high-quality undergraduate program, primarily to students from Minnesota. Additionally, a part-time evening M.B.A. program is offered to regional practitioners. SBE’s secondary focus is on intellectual contributions, primarily through applied scholarship but also through basic research and instructional development. SBE also provides community, professional, and institutional service and outreach, with an emphasis on community service and outreach and their interface with teaching and intellectual contributions.

SBE is organized into four instructional departments: Accounting, Economics, Finance and Management Information Sciences, and Management Studies. Other units within the school include the Center for Economic Education, supported by the economics department, and the Center for Economic Development, which provides a range of research and economic development services for the region and the state. The Center for Economic Development, a joint program of the school, the College of Science and Engineering, and the UMD Natural Resources Research Institute, includes the NRRI Business Group, Bureau of Business and Economic Research, Small Business Development Center, and the Minnesota Technology Regional Office.

The school offers two undergraduate professional degrees: the bachelor of accounting (B.Ac.) and bachelor of business administration (B.B.A.). The school also offers, through the Graduate School, a master of business administration (M.B.A.) degree.

The two baccalaureate degree programs prepare students for careers in accounting, business, management, or administration. In these programs, students acquire business perspectives and foundation knowledge, develop and enhance critical skills, and prepare to assume and maintain responsible positions in organizations. SBE students are encouraged to take at least one year of college-level foreign language.

The Department of Economics offers a major in economics for the bachelor of arts (B.A.) degree conferred by the College of Liberal Arts. The B.A. program is for students who want a liberal education in economics or who plan to pursue graduate work.

The M.B.A. program offered through the Graduate School prepares students for management careers in business, government, and nonprofit organizations. See Graduate School section in this catalog or the Graduate School Catalog for information about this program.

In addition to major programs, the school provides minor programs approved for various degree programs offered by other college units at UMD.

Admission
See Policies and Procedures section in this catalog.

Academic Standing

Good Academic Standing
The B.Ac. and B.B.A. programs require that each student, at the time of graduation, have a 2.00 minimum GPA in all work attempted, including residence and transfer work (overall GPA); all work taken in residence at the University of Minnesota, including work taken through University College (UC) (transcript GPA); and all work in accounting, business, and economics courses, regardless of where or when taken (internal GPA). Students who maintain or exceed this GPA in each of these categories are in good academic standing.
Probation
Any student failing to maintain the required 2.00 average in each of three above areas is considered to be on academic probation. Students on probation are strongly encouraged to talk with their adviser and advisers within the college office to determine the appropriate course of action. If, at the end of a semester on academic probation, the grade-point averages are at or above 2.00, the student will be returned to good academic standing.

Dismissal
If, at the end of a semester on probation, a student fails to attain the minimum GPA required for good academic standing, that student is subject to dismissal. Because some students have trouble adjusting to the standards of a university education, students who have attempted fewer than 20 credits (at UMD or elsewhere) are not subject to dismissal if their overall and transcript GPAs are 1.80 or above. Students whose internal GPA is below 2.00 but whose overall and transcript GPAs are at or above the 2.00 minimum are subject to dismissal only after 60 credits are attempted.

Dismissal decisions are made in the college office following fall and spring final examinations. Dismissed students are notified immediately and their registration for the next semester of day school canceled. Students failing to attain the minimum GPA yet making academic progress may be granted an additional semester of probation at the college’s discretion.

Readmission
Dismissed students must present evidence of improved academic capability to the college to justify their readmission. Petition forms for readmission and information concerning academic standing are available in the SBE Student Affairs Office, 21 School of Business and Economics Building.

General Degree Requirements
Residence Requirement
Degree candidates must complete at least 30 residence credits, defined as those credits taken while officially enrolled in SBE. At least 20 of the last 30 credits must be completed in residence. At least 50 percent of required business, accounting, and upper division economics credits must be taken at UMD.

Admission to Candidacy Requirements
During the second semester of the freshman year (12-20 credits completed), SBE baccalaureate students must apply for candidacy for their degrees. To be eligible for candidacy, students must be in good academic standing (2.00 minimum overall, transcript, and internal GPAs), and have completed all premajor requirements for the B.Ac. or B.B.A. Students who do not qualify for admission to candidacy may not take SBE upper division courses without the permission of the assistant to the dean for student affairs. Students who complete upper division work in accounting, business law, economics, finance and management information sciences, or management studies before being admitted to candidacy may be required to complete additional upper division work.

Graduation Plan
Normally during the second semester of the junior year, but at least two semesters preceding graduation (75-90 credits completed), SBE candidates must file a graduation plan. The plan provides a detailed description of a student’s program as well as assurance that the program meets all degree requirements. Students are responsible for updating the graduation plan as necessary. Students who fail to file a graduation plan cannot register in the school.

Grading
All courses offered in SBE are on either a mandatory A-F or mandatory S-N basis only. However, students in the school have the choice of optional A-F or S-N grading in some courses taken outside the school. Students in the school may not elect optional S-N grading in specific required courses within the lower division program of the school, or in upper division courses outside the school that are used to meet the requirements of a major for the B.B.A. degree. In addition, students should be aware of and comply with general limits on the use of the S-N grading option as stated in Policies and Procedures.

Honors, Scholarships, and Awards
College Honors
The Campus Assembly has established the policy that a maximum of 15 percent of the graduating class can graduate with college honors. In SBE, the top 3 percent of the graduating class (with a GPA of at least 3.80 in
all coursework completed in residence at UMD) will be designated *summa cum laude*; the next 5 percent (with a GPA of at least 3.50 in all coursework completed in residence at UMD) will be designated *magna cum laude*; and the next 7 percent (with a GPA of at least 3.20 in all coursework completed in residence at UMD) will be designated *cum laude*.

Near the beginning of each term, the GPAs necessary to achieve these honors are posted in the SBE Student Affairs Office. The GPAs are established on the basis of the record of the previous year’s graduating class. To be eligible for honors, students must earn at least 45 credits at UMD. For more information, contact the SBE Student Affairs Office.

**Program Honors**

Candidates for the bachelor of accounting and bachelor of business administration degrees are eligible for program honors separate from the college honors described above. Program honors are noted in the commencement catalog and by inclusion of the following notation on the student’s transcript: Graduated With Distinction in Business and Economics.

To be eligible, degree candidates must earn a 3.30 GPA in all SBE upper division courses.

**Dean’s List for Academic Excellence**

Each semester, SBE students are recognized for high academic achievement by being placed on the SBE Dean’s List for Academic Excellence. A memo is placed on the qualifying students’ transcripts indicating this achievement. To be eligible for the SBE Dean’s List:

1. The student must be in residence in the School of Business and Economics, and
2. The student must have earned a 3.50 semester GPA and
   a. have completed all credits attempted in the semester,
   b. have completed a minimum of 12 letter-graded credits in the semester, and
   c. have no grades of “I,” “F,” or “N” for the semester.

**Honorary Societies**

*Omicron Delta Epsilon*—Eligibility requirements for this international honorary society in economics include junior or senior standing, at least 18 credits in economics with a GPA of 3.00 in these courses, and an overall GPA of 3.00.

*Pi Gamma Mu*—Eligibility requirements for this national honorary society in the social sciences include a 3.00 GPA in all social science courses, including accounting, finance and management information sciences, business law, management studies, and economics, and an overall GPA of 3.00.

**Scholarships**

*Allan L. Apter Family Scholarship*—For undergraduate SBE students. Check with the SBE Student Affairs Office for more details.

*Becker C.P.A. Review Scholarship Award*—Full scholarship for C.P.A. review course awarded to an outstanding accounting student.

*Conviser/Duffy C.P.A. Review Scholarship Award*—Full scholarship for C.P.A. review course awarded to an outstanding accounting student.

*Jim Davis Economics Scholarship*—A $500 scholarship awarded to an economics major. Economics faculty make the selection.

*Department of Accounting Scholarship*—A $500 scholarship awarded to an accounting student with minimum accounting and overall GPAs of 3.50.

*Fawzi G. Dimian Alumni Scholarship*—One $1,000 scholarship awarded to an accounting student with minimum accounting and overall GPAs of 3.50.

*Duluth Chapter, Minnesota Society of Certified Public Accountants Accounting Scholarship*—Two $500 scholarships awarded to accounting students who have a 3.00 GPA in accounting courses and an interest in public accounting.

*Duluth Skyline Rotary Club Scholarship*—A $500 scholarship awarded to a full-time junior business administration student with a 3.00 minimum GPA, active involvement in extracurricular activities, leadership potential, and strong oral communication skills. Rotary Club members make the selection.

*Honeywell Scholarship*—A $1,000 scholarship awarded to an accounting student with a 3.20 minimum overall GPA.

*Janet Jasper Accounting Scholarship*—A $1,000 scholarship awarded to an accounting student with minimum accounting GPA of 3.50 and overall GPA of 3.20.

*Larson, Allen, Weishair Scholarship*—A $1,000 scholarship awarded to an accounting student with minimum accounting and overall GPAs of 3.20.
McGladrey and Pullen Accounting Scholarship—A $1,000 scholarship awarded to an accounting student with a 3.20 minimum accounting GPA.

Minnesota Society of C.P.A.s Accounting Scholarship—One $500 scholarship awarded to an accounting junior with minimum accounting and overall GPAs of 3.00 and an interest in public accounting.

SBE Honors Scholarship—At least one $500 honors scholarship awarded annually to a junior accounting, business administration, or economics major who has a 3.20 minimum cumulative GPA and demonstrates strong commitment to serving UMD and the community. At least two semesters at UMD and admission to candidacy (B.Ac. and B.B.A.) or completion of lower and upper division core courses (economics).

Mitchell and Elva Sill Scholarship—Up to twenty $1,000 scholarships awarded annually to full-time accounting and business administration students.

The Charles F. and Selma J. Wuori Memorial Scholarship—One $500 scholarship awarded annually to a junior accounting, business administration, or economics major who has a 3.20 minimum cumulative GPA and demonstrates strong commitment to serving UMD and the community. At least two semesters at UMD and admission to candidacy (B.Ac. and B.B.A.) or completion of lower and upper division core courses (economics).

Awards

Award for Academic Excellence in Business Administration—This honor, which carries with it a plaque and a one-year subscription to the Wall Street Journal, is presented annually to the most academically outstanding B.B.A. graduate.

Business Administration Club Award—Presented to one or more sophomore, junior, or senior members of the Business Administration Club. Business Administration Club members make the selection.

John A. Dettmann Memorial Award—Lake Superior Chapter of the Institute of Management Accountants (IMA)—Awarded annually to accounting juniors for outstanding scholastic achievement in the B.Ac. program. Award includes a student membership in the Institute of Management Accountants.

Economics Department Award for Excellence—Presented annually by the department’s faculty to an economics major who has consistently demonstrated academic excellence. In recognition of this student’s outstanding achievement, the department purchases the student’s textbooks to be used in economics courses for one year.

FMIS Department Awards for Excellence—Presented annually by the department’s faculty to students who have consistently demonstrated academic excellence in their fields of study. One award is given to a finance major, one to an MIS major.

R. S. Hancock Award for Excellence in Marketing—An award to one or more outstanding marketing majors. Selection based on grades and classroom performance in marketing courses.

Management Studies Department Award for Excellence—Presented annually by the department’s faculty to one or more management majors (organizational management or human resource management) or marketing majors who have consistently demonstrated academic excellence.

SBE Book Awards—Ten to fifteen books awarded annually to recognize newly admitted SBE degree candidates who earned exceptionally high grades in their pre-business or pre-accounting programs. Each student receives a free textbook to be used in one fall semester upper division SBE course.

Sielaff Marketing Leadership Award—Award is presented annually by Pi Sigma Epsilon, a marketing, sales management, and selling fraternity to an outstanding upper division marketing student who demonstrates an overall commitment to the field of marketing through academic excellence, extracurricular activities, and career goals.

Special Learning Opportunities

A number of special learning opportunities are available to students in SBE. Internship experiences offer students an opportunity to apply knowledge and skills gained in the classroom to real problems of management and administration through work in sponsoring agencies. Some internships offer a salary and other compensation as well as the opportunity to earn credits through a supervised work experience. Students interested in internship
experiences should contact either their faculty adviser or the director of business internships for more information.

The Center for Economic Education has as its primary mission the sponsorship of programs to increase the general level of economic literacy. The focus of the center’s programs is on pre-service and in-service training for elementary teachers and for business education and social studies teachers at the secondary level.

The University-wide Undergraduate Research Opportunities Program (UROP) provides financial awards to undergraduates for research, scholarly, or creative projects undertaken in partnership with a faculty sponsor. UROP provides the student with the unique educational experience of collaborating with a faculty member on the design and implementation of a project. At the same time, faculty have an opportunity to work closely with students and receive valuable assistance with their own research.

The school’s Center for Economic Development provides special learning opportunities for students through its technical assistance programs that serve the region’s small business community. Often these opportunities are student internships.

The Small Business Institute Program, sponsored jointly by the school's Center for Economic Development and the Small Business Administration, also offers opportunities for students to become involved in applying knowledge and skills to practical problems. Each semester several student teams work directly with a business enterprise on managerial, marketing, or accounting problems.

**Academic Programs**

SBE offers the following degree programs.

- Bachelor of accounting (B.Ac.)
- Bachelor of business administration (B.B.A.). Majors in finance, management, management information systems, and marketing. The management major offers options in human resource management and organizational management.

Majors and minors offered by SBE for degrees conferred by other UMD college units include:

- Major in economics for the B.A. (CLA)
- Minor in accounting for non-SBE students
- Minor in accounting for B.B.A. candidates

- Minor in business administration for non-SBE students
- Minor in economics
- Minor in finance for non-SBE students
- Minor in finance for B.Ac. and B.B.A. candidates
- Minor in management—human resources for non-SBE students
- Minor in management—organizational management for non-SBE students
- Minor in management information systems for non-SBE students
- Minor in management—human resources for B.Ac. and B.B.A. candidates
- Minor in management—organizational management for B.Ac. and B.B.A. candidates
- Minor in management information systems for B.Ac. and B.B.A. candidates
- Minor in marketing for non-SBE students
- Minor in marketing for B.Ac. and B.B.A. candidates

**SBE Freshman Orientation Program**

New high school students entering SBE must participate in SSP 1000—Introduction to College Learning, during their first semester. The purpose of the program is to improve the quality of students’ lower division experience. New advanced standing students are encouraged to enroll in the program but are not required to do so.

**Degree Programs**

**Accounting (Acct)**

*Professors: Ehsan H. Feroz, C. Stevenson Rowley; Associate Professors: Rodger L. Brannan (department head), June F. Li, Alan C. Rolfe; Assistant Professor: Lawrence J. Syck; Instructor: Karen Salmela*

The work of the accountant is firmly established as an indispensable service in the world of business, government, and social institutions. The accounting system is an essential quantitative information system in almost every organization. Professionally trained accountants serve in many areas of private business, in government at all levels, in public and social service institutions, and in the field of public accounting. The growing complexity of American business and multinational firms and the need for new approaches to business and social problems have increased the demand for professional
accountants. Effective operations planning requires that relevant data be collected, analyzed intelligently, and reported coherently. Management needs assistance in directing activities to meet objectives and in adjusting operations to fit new conditions. Providing information for efficient allocation of resources is an important function of accounting in all organizations.

Success as a professional accountant requires motivation, a commitment to service, and skills in communication and analysis. Also important are abilities to work well with others, to think abstractly, and to solve problems systematically. The expanding use of computers in business requires that the accountant be trained to use computer-based accounting and management information systems, to design and implement new systems, and to provide the expertise in internal control and auditing to review and audit both new and existing systems.

The political and economic interdependence of business throughout the world requires the accountant to have a global perspective on business conditions. Whether the scope of the business is domestic or international, this global perspective enables the accountant to gather, interpret, and present meaningful information for business decision makers.

Two types of professional certification are available to accountants in private business. The Certified Management Accountant (C.M.A.) is issued by the Institute of Management Accounting. The Certified Internal Auditor (C.I.A.) certificate is issued by the Institute of Internal Auditors. The B.Ac. degree program serves as basic preparation for the C.M.A. and C.I.A. examinations.

In Minnesota, the Certified Public Accountant (C.P.A.) certificate is issued by the State Board of Accountancy. Completion of the B.Ac. program serves as basic preparation for the C.P.A. examination and qualifies students to take the examination immediately after graduation.

An internship program is available (Acct 3196. Internship in Accounting) that includes opportunities in public and private accounting.

Bachelor of Accounting (B.Ac.)
The bachelor of accounting (B.Ac.) program provides basic conceptual accounting and business knowledge as a foundation for accounting career development. The program includes study in the following areas: financial accounting and accounting theory; cost and management accounting; accounting information and computer systems; financial, operational, and EDP audit; taxation; the application of electronic spreadsheets in various areas of accounting; the functional areas of business, including business law, strategic management, finance, management, management information systems, marketing, international business, and human resource management; and general education, including the areas of the behavioral sciences, the humanities, English, communication, the arts, mathematics, statistics, and the political and legal environment of business and society.

Admission Requirements
During the second semester of the freshman year (12-20 credits completed), SBE baccalaureate students must apply for candidacy for their degrees. To be eligible for candidacy, a student must be in good academic standing (overall, transcript, and internal GPAs must be 2.00 or higher), and have completed all pre-major requirements for the bachelor of accounting or bachelor of business administration degree. Students who do not qualify for admission to candidacy may not take SBE upper division courses without the permission of the assistant to the dean for student affairs. Students who complete upper division work in accounting, business law, economics, finance and management information sciences, or management studies before being admitted to candidacy may be required to complete additional upper division work.

Degree Requirements
Requirements for the B.Ac. in accounting (120 credits) include:

- UMD liberal education requirements
- At least one course each for the international perspective requirement and the cultural diversity requirement must be taken within the liberal education requirements.
- Compliance with the general regulations governing granting of degrees.
- Strict limitations on use of correspondence courses. See SBE Student Affairs.
- No more than 50 percent of the minimum 120 credits required for the B.Ac. degree
may be in accounting, business, or economics courses.

• Students choosing to pursue a double major, or a major and a minor, within the school will likely exceed 120 total degree credits.

Lower Division (60)

Liberal Education Program Requirements (35)

See Policies and Procedures section of this catalog for each category's title, specific guidelines, and a complete list of approved courses, including Comp 1120—College Writing. SBE students are encouraged to take at least one year of college-level foreign language.

Pre-major Requirements

Acct 2001—Principles of Financial Accounting (3)
Acct 2002—Principles of Managerial Accounting (3)
BLaw 2001*—The Legal Environment (3)
Comm 1112*—Public Speaking (3)
or Comm 1222*—Interpersonal Communications (3)
or Foreign language courses (see Student Affairs staff for approved courses)
Econ 1022*—Principles of Economics: Macro (3)
Econ 1023*—Principles of Economics: Micro (3)
Econ 2020—Statistics: Methods and Analysis (5)
FMIS 1201—Introduction to Business Information Systems (3)
Math 1160*—Finite Mathematics and Introduction to Calculus (5)
or Math 1296—Calculus I (5)
Psy 1003*—General Psychology (4)
SSP 1000—Introduction to College Learning (1)
* Courses that may be used to fulfill UMD liberal education program requirements.

Electives

Additional non-SBE courses to bring total to 60 pre-candidacy credits. (Non-SBE statistics courses cannot be used to fulfill elective requirements.)

Upper Division (60)

Communication Skills Requirement (3)

Comp 3121—Advanced Writing: Business

Accounting-Business Law Core (27)

Acct 3101—Intermediate Accounting I (3)
Acct 3102—Intermediate Accounting II (3)
Acct 3110—Computer Applications in Accounting (3)
Acct 3151—Income Tax Accounting (3)
Acct 3201—Cost Accounting I (3)
Acct 3261—Auditing (3)
Accounting electives (two courses) (6)
BLaw 3101—Business Law (3)

SBE Core (24)

FMIS 3141—Business Communications (3)
FMIS 3201—Management Information Systems
or MgtS 3801—Human Resource Management (3)
FMIS 3301—Production and Operations Management (3)
FMIS 3601—Corporation Finance (3)
MgtS 3401—Organizational Behavior and Management (3)
MgtS 3701—Principles of Marketing (3)
MgtS 4481—Strategic Management (3)

Economics elective, select one course:
Econ 3022—Macroeconomic Analysis (3)
Econ 3023—Microeconomic Analysis (3)
Econ 3512—Managerial Economics (3)

Supporting Courses (6)

1. International Requirement—Any course from the list of upper division courses approved for the major or minor in international studies for the B.A. degree (must be outside of SBE if International Accounting is not used as an accounting elective).
2. Upper division non-SBE electives to bring total to 60 credits.

Minor Requirements

The minor in accounting is valuable to students who want to understand the accounting process and its applications in modern society. The minor offers training for entry into positions in government, industry, and social service organizations that require an understanding of accounting but not the depth provided by the B.Ac. degree program.

While completing this minor, no more than 25 percent (30 credits) of total credits required for a degree may be drawn from the courses offered by the SBE or recognized by the school as equivalent transfer courses. Economics courses are excluded from these calculations.

Students must apply for admission to the minor before completing Econ 2020—Statistics: Methods and Analysis or equivalent non-SBE statistics course and are admitted after completing the pre-minor requirements and after earning a minimum of 50 credits.

Admission to the minor is based on the same GPA requirements as admission to candidacy for SBE baccalaureate degrees. Applications are available in 104 School of Business and Economics Building.

Accounting Minor for Non-SBE Students

Pre-Minor Core (15-22)

Acct 2001—Principles of Financial Accounting (3)
Acct 2002—Principles of Managerial Accounting (3)
Econ 1003*—Economics and Society (3)
or Econ 1022*—Principles of Economics: Macro (3)
and Econ 1023*—Principles of Economics: Micro (3)
Econ 2020—Statistics: Methods and Analysis (5)
or equivalent statistics course (3)
FMIS 1201—Introduction to Business Information Systems (3)
or CS 1011*—Introduction to Computers and Software (3)
or CS 1511*—Computer Science I (5)

Required Courses (9)

Acct 3101—Intermediate Accounting I (3)
Acct 3110—Computer Applications in Accounting (3)
SBE 1101—The Business Environment (3)
Electives
Select two courses (6)
Acct 3102—Intermediate Accounting II (3)
Acct 3151—Income Tax Accounting (3)
Acct 3201—Cost Accounting (3)
*Courses that may be used to fulfill UMD liberal education program requirements.

Accounting Minor for B.B.A. Candidates (12)
Required Courses (6)
Acct 3101—Intermediate Accounting I (3)
Acct 3110—Computer Applications in Accounting (3)

Electives
Select two courses (6)
Acct 3102—Intermediate Accounting II (3)
Acct 3151—Income Tax Accounting (3)

Economics (Econ)

Professors: Curt L. Anderson, Wayne A. Jesswein (department head), Richard W. Lichty, Jerrold M. Peterson, Raymond L. Raab, Donald N. Steinnes; Associate Professors: A. Maureen O’Brien (assistant department head and acting head), David A. Vose

B.A.—CLA
Economics is the study of social, business, and individual decision making and the goals, incentives, institutions, and constraints affecting those decisions. The Department of Economics curriculum combines the classical liberal arts and modern quantitative approaches.

The B.A. prepares students for careers in business and government, the study of law, and graduate work in economics, management, public policy, and related fields. Business careers requiring the analytical training of an economist include banking, management, insurance, marketing research, and securities trading. Economists who work for government agencies assess economic conditions in the United States and abroad and predict the economic impact of specific changes in legislation or public policy. Government careers include those in foreign and intelligence service, regulatory agencies, and international trade.

Honors Requirements
The department honors program recognizes majors who demonstrate outstanding academic performance. Department honors are noted in the commencement bulletin and by the following notation on the student’s transcript: Graduated With Distinction in Economics.

To be eligible, degree candidates must earn a 3.20 GPA overall. In addition, candidates must earn a 3.20 GPA in all economics courses.

Degree Requirements
Requirements for the B.A. in economics (120 credits) include:

- UMD liberal education requirements
- Advanced writing requirement: 3xxx composition course (3 credits)
- Major requirements (46 credits)
- Requirements for a minor (or another major) in a discipline outside economics. The department strongly encourages majors to select a discipline that complements their chosen career path or builds on their analytical training. Suggested minors include political science, sociology, a foreign language, computer science, mathematics, and any business related field.

The department faculty welcomes and encourages student interaction with other students and the faculty through activities such as UROP (Undergraduate Research Opportunities Program) projects, ODE (Omicron Delta Epsilon honorary society for economics), and other activities and events.

Lower Division
Econ 1022—Principles of Economics: Macro (3)
Econ 1023—Principles of Economics: Micro (3)
Econ 2020—Statistics: Methods and Analysis (5)

Upper Division
Econ 3022—Macroeconomic Analysis (3)
Econ 3023—Microeconomic Analysis (3)
Econ 3030—Economic Research Methodology
or Econ 4213—Mathematical Economics (3)
Econ 3031—History of Economic Thought
or Econ 3036—Radical Economics (3)
Economics electives at 3xxx or above (15)

Required Courses From Other Programs
Acct 2005—Survey of Accounting (3)
Math 1160—Finite Mathematics and Introduction to Calculus (5)

*Courses that may be used to fulfill UMD liberal education program requirements.

Electives
Electives in economics courses 3xxx or above (15). By petition, one course numbered 3xxx or above related to but outside of economics may be applied toward the major.

Minor Requirements
The economics minor (23 credits) provides a basic overview of economics for students interested in a complementary discipline.

Lower Division
Econ 1022—Principles of Economics: Macro (3)
Econ 1023—Principles of Economics: Micro (3)
Econ 2020—Statistics: Methods and Analysis (5)
Upper Division
Econ 3022—Macroeconomic Analysis
or Econ 3023—Microeconomic Analysis
or Econ 3512—Managerial Economics (3)
Economics electives at 3xxx or above (9)

Finance and Management Information Sciences (FMIS)
Alan Brandyberry, Assistant Professor of Management Information Systems; Woodrow W. Cushing, Assistant Professor of Finance (banking chair); Thomas B. Duff, Professor of Management Information Systems (associate dean and M.B.A. director); John M. Griffith, Assistant Professor of Finance; Duane A. Kaas, Associate Professor of Finance and Management Information Systems (business internship coordinator); R. J. Lieve, Professor of Management Science; Patricia A. Merrier, Professor of Business Communications and Management Information Systems (department head); J. Harold Pardue, Assistant Professor of Management Information Systems; Henry B. Person, Associate Professor of Operations Management; Shee Q. Wong, Professor of Finance

The finance and management information sciences faculty provides academic support for and shares a commitment to excellence in the B.Ac., B.B.A., and M.B.A. degrees. FMIS courses focus on solid preparation for finance careers such as investment portfolio management, banking, and corporate finance and for management careers in fields such as design and implementation of computerized information systems, and production management and control in businesses and public organizations.

Management Studies (MgtS)
Praveen Aggarwal, Assistant Professor of Marketing; Stephen B. Castleberry, Professor of Marketing; Kjell R. Knudsen, Associate Professor of Strategic Management and Administrative Behavior; John W. Newsorn, Professor of Human Resource Management; Jon L. Pierce, Professor of Organization and Management; Linda Rochford, Associate Professor of Marketing (department head); Stephen A. Rubenfeld, Professor of Human Resource Management; Gary Stark, Instructor, Human Resource Management; Rajiv Vaidyanathan, Associate Professor of Marketing

The management studies faculty provides academic support for the B.Ac., B.B.A., and M.B.A. degrees that focus on three domains: human resource management, marketing, and organizational management. The programs and courses view management as a generic process applicable to careers in business, government, and public or social service organizations, and relevant at various levels. Courses stimulate students to integrate environmental factors with internal resources (human, technological, and capital) through an emphasis on strategic plans and programs.

Bachelor of Business Administration (B.B.A.)
This professionally oriented program emphasizes the competencies required for management careers in business, government, public, or social service organizations. The program prepares students for entering careers with management responsibility by providing a breadth and depth of knowledge about organizations, management fundamentals, techniques, processes, and skills, combined with a foundation in the functional areas of accounting, business law, finance, information systems, marketing, operations, and human resource management.

The B.B.A. offers a broad educational experience while preparing students for a variety of technical and management careers. With about one-half of the required coursework from other disciplines, emphasis is on the development of a strong liberal arts education that provides a foundation for the required and elective professional courses. The program's core curriculum focuses on the fundamental administrative and functional skills demanded of leaders in today's public and private organizations. Students are permitted sufficient latitude in choosing electives appropriate to their particular professional objectives in finance, human resource management, organizational management, management information systems, or marketing.

In addition to classroom-based courses, students may participate in internship programs where classroom learning may be applied during professional experience as an employee of a public agency or private business. Students also may participate in management field studies programs, which offer the opportunity to use knowledge and skills to identify, analyze, and solve problems confronting small businesses. Both programs provide practical tests of vocational interests and valuable work experience.
Bachelor of Business Administration
Degree Requirements
Requirements for the B.B.A. (120 credits) include:

- UMD liberal education requirements
- At least one course satisfying the international perspective requirement and the cultural diversity requirement must be taken within the liberal education requirements.
- Compliance with the general regulations governing granting of degrees.
- Strict limitation on use of correspondence courses. See SBE Student Affairs.
- No more than 50 percent of the minimum 120 credits required for the B.B.A. degree may be in accounting, business, or economics courses.
- Students choosing to pursue a double major, or a major and a minor, within the school will likely exceed 120 total degree credits.

**Lower Division (60)**

**Liberal Education Program Requirements (35)**
See Policies and Procedures section in this catalog for each category's title, specific guidelines, and a complete list of approved courses, including Comp 1120—College Writing. SBE students are encouraged to take at least one year of college-level foreign language.

**Pre-major Requirements**

Acct 2001—Principles of Financial Accounting (3)
Acct 2002—Principles of Managerial Accounting (3)
BLaw 2001*—The Legal Environment (3)
Comm 1112*—Public Speaking (3)
or Comm 1222*—Interpersonal Communications (3)
or Foreign language courses (see Student Affairs staff for approved courses)
Econ 1022*—Principles of Economics: Macro (3)
Econ 1023*—Principles of Economics: Micro (3)
Econ 2020—Statistics: Methods and Analysis (5)
FMIS 1201—Introduction to Business Information Systems (3)
Math 1160*—Finite Mathematics and Introduction to Calculus (5)
—or Math 1296—Calculus I (5)
Psy 1003*—General Psychology (4)
SSP 1000—Introduction to College Learning (1)
* Courses that may be used to fulfill UMD liberal education program requirements.

**Electives**

Additional non-SBE courses to bring total to 60 pre-candidacy credits. (Non-SBE statistics courses cannot be used to fulfill elective requirements.)

**Upper Division (60)**

**Communication Skills Requirement (3)**
Comp 3121—Advanced Writing: Business
—or FMIS 3141—Business Communications

**SBE Core (21)**

FMIS 3201—Management Information Systems (3)
FMIS 3301—Production and Operations Management (3)
FMIS 3601—Corporation Finance (3)
MgtS 3401—Organizational Behavior and Management (3)
MgtS 3701—Principles of Marketing (3)
MgtS 3801—Human Resource Management (3)
MgtS 4481—Strategic Management (3)

**Major (21) See Requirements Below**

**Supporting Courses (15)**
(Non-SBE statistics courses cannot be used to fulfill these requirements)

1. Upper division electives in economics
2. International Requirement—Any course from the list of upper division courses approved for the major or minor in international studies for the B.A. degree or Acct 4505—International Accounting or IntB 3201—International Business.
3. Upper division non-SBE electives to bring total to 15 credits

**Finance**
The finance major is designed for students pursuing careers in corporate financial management, investment and portfolio management, and management of financial institutions.

**Group A (9), required:**
FMIS 3612—Managerial Finance (3)
FMIS 3644—Investment Fundamentals (3)
FMIS 3647—Financial Markets and Institutions (3)

**Group B (12), select four courses:**
FMIS 3397—SBE Internship (3)
FMIS 3649—International Finance (3)
FMIS 4611—Portfolio Analysis (3)
FMIS 4613—Corporate Financial Strategies (3)
FMIS 4615—Futures and Options (3)
FMIS 4617—Management of Financial Institutions (3)
FMIS 4619—Analysis of Financial Statements (3)
FMIS 4651—Risk Management and Insurance (3)

**Management—Human Resource Management**
The work of the human resource management (HRM) professional encompasses a broad range of activities affecting the relationship between an organization and its employees—its human resources. HRM involves strategic functions such as organizational planning and human resource policy making, and diverse activities that involve designing and implementing policies and selecting, developing, evaluating, and rewarding a workforce. Typical HRM activities include equal employment opportunity, the study and design of jobs, employee benefit programs, union-management relations, counseling, and the development of work systems that are consistent with the prevailing organizational philosophy.

**Group A (12), select four courses:**
Econ 3821—Labor Economics: Theory and Issues (3)
MgtS 4421—Managing Change (3)
MgtS 4821—Staffing Work Organizations (3)
Management Information Systems

The management information systems (MIS) program prepares students for entry into careers in business computing. The major gives students both the in-depth technical skills needed to design, implement, support, and manage information systems as well as the breadth of knowledge in all business functional areas needed to produce and manage integrative, technology-based solutions to business/organizational problems.

**CS 1511—Computer Science I (5) and CS 1521—Computer Science II (5) are required prior to admission to the MIS major. FMIS 1201 is waived.**

Group A (6), required:
FMIS 3222—System Analysis and Design (3)
FMIS 4225—Advanced Applications Development (3)

Group B (3-4), select one course:
CS 4611—Database Management Systems (4)
FMIS 3421—Database Management and Design (3)

Group C (12-13), select four courses (with at least 6 cr in FMIS courses):
CS 2111—Introduction to Programming in C (3)
CS 2121—Introduction to Programming in Java (3)
CS 3111—Computer Ethics (4)
FMIS 3212—Structured Programming Techniques (3)
FMIS 3224—Telecommunications (3)
FMIS 3226—Expert Systems (3)
FMIS 3228—Electronic Commerce (3)
FMIS 3397—SBE Internship (3)
FMIS 3411—Distributed Computing Principles (3)

Marketing

Marketing is about facilitating exchanges. For an organization to be successful, it must understand the customer and the customer’s needs. An organization seeks to meet these needs in a competitive environment by developing a marketing mix of product/service, price, promotion, and distribution that will satisfy the customer’s and organization’s objectives. Marketing occurs between organizations (business-to-business marketing) between organizations and consumers (consumer marketing), globally (international marketing), between profit and not-for-profit organizations, and even between individuals. Many careers are available in marketing, including marketing research, selling and sales management, advertising, promotion and public relations, and international marketing.

Group A (9), required:
MgtS 3711—Marketing Research (3)
MgtS 4731—Consumer Behavior (3)
MgtS 4781—Marketing Management and Strategy (3)

Group B (12), select four courses:
MgtS 3397—SBE Internship (3)
MgtS 3741—Fundamentals of Selling (3)
MgtS 3781—International Marketing (3)
MgtS 4711—Business-to-Business Marketing (3)
MgtS 4721—Advertising and Marketing Communications (3)
Business Administration Minors for Non-SBE Students (24-36)

Undergraduate Minor Only

This business minor provides supplemental business education for students seeking degrees in programs other than business or accounting.

While completing this minor, no more than 25 percent (30 credits) of total credits required for a degree may be drawn from the courses offered by the SBE or recognized by the school as equivalent transfer courses. Economics courses are excluded from these calculations.

Students must apply for admission to a business minor before completing Econ 2020—Statistics: Methods and Analysis and are admitted after completing pre-minor requirements. Admission to the minor is based on the same GPA requirements as admission to candidacy for SBE baccalaureate degrees. Applications are available in 104 School of Business and Economics Building.

Pre-Minor Core (12-19)

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>or Acct 2005—Survey of Accounting</td>
<td>3</td>
</tr>
<tr>
<td>Econ 1003—Economics and Society</td>
<td>3</td>
</tr>
<tr>
<td>or Econ 1022—Principles of Economics: Macro</td>
<td>(3)</td>
</tr>
<tr>
<td>and Econ 1023—Principles of Economics: Micro</td>
<td>(3)</td>
</tr>
<tr>
<td>Econ 2020—Statistics: Methods and Analysis</td>
<td>(5)</td>
</tr>
<tr>
<td>or equivalent statistics course</td>
<td>(3)</td>
</tr>
<tr>
<td>FMIS 1201—Introduction to Business Information Systems</td>
<td>(3)</td>
</tr>
<tr>
<td>or CS 1011—Introduction to Computers and Software</td>
<td>(3)</td>
</tr>
<tr>
<td>or CS 1511—Computer Science I (5) (required for MIS minors)</td>
<td></td>
</tr>
</tbody>
</table>

Program Minors—select one program

Business Administration

Electives (15)

FMIS 3201—Management Information Systems (3)

FMIS 3301—Production and Operations Management (must meet prerequisite) (3)

FMIS 3601—Corporation Finance (3)

MgtS 3401—Organizational Behavior and Management (3)

MgtS 3701—Principles of Marketing (3)

MgtS 3801—Human Resource Management (3)

Finance

Group A (12), required:

FMIS 3601—Corporation Finance (3)

FMIS 3644—Investment Fundamentals (3)

FMIS 3647—Financial Markets and Institutions (3)

SBE 1101—The Business Environment (3)

Group B (3), electives:

FMIS 3612—Managerial Finance (3)

or FMIS 3649—International Finance (3)

Management—Human Resources

Group A (6), required:

MgtS 3801—Human Resource Management (3)

SBE 1101—The Business Environment (3)

Group B (9), electives:

MgtS 3401—Organizational Behavior and Management (3)

MgtS 4821—Staffing Work Organizations (3)

MgtS 4831—Compensation Systems (3)

MgtS 4841—Training and Development (3)

MgtS 4851—Unions and Collective Bargaining (3)

Management—Organizational Management

Group A (6), required:

MgtS 3401—Organizational Behavior and Management (3)

SBE 1101—The Business Environment (3)

Group B (9), electives:

Micro Organizational Behavior

MgtS 4431—Leadership (3)

MgtS 4471—Interpersonal Relations (3)

Macro Organizational Behavior

MgtS 4411—Organizational Studies (3)

MgtS 4461—Business and Society (3)

Management Information Systems

**CS 1511 is required prior to admission to the program**

Group A (9), required:

FMIS 3201—Management Information Systems (3)

FMIS 3222—Systems Analysis and Design (3)

SBE 1101—The Business Environment (3)

Group B (6-8), electives (at least 3 cr in FMIS courses):

CS 4611—Database Management Systems (4)

or FMIS 3421—Database Management and Design (3)

CS 4711—Computer Security (4)

FMIS 3228—Electronic Commerce (3)

FMIS 3411—Distributed Computing Principles (3)

Marketing

Group A (6), required:

MgtS 3701—Principles of Marketing (3)

SBE 1101—The Business Environment (3)

Group B (9), electives:

MgtS 3711—Marketing Research (3)

MgtS 3741—Fundamentals of Selling (3)

MgtS 3781—International Marketing (3)

MgtS 4711—Business-to-Business Marketing (3)

MgtS 4731—Consumer Behavior (3)

Business Administration Minors for B.Ac./B.B.A. Candidates

B.Ac./B.B.A. candidates may wish to supplement their major coursework by completing a program-specific minor. (The general business administration minor, composed of the SBE core, is not available to SBE students.) Forms for declaring the minor are available in 104 School of Business and
Economics Building and may be submitted with the Application for Candidacy or any time after formal admission to a degree program.

Select one option:

**Finance (12)**

*Required (9):*
- FMIS 3601—Principles of Corporation Finance (3)
- FMIS 3644—Investment Fundamentals (3)
- FMIS 3647—Financial Markets and Institutions (3)

*Electives (3), select one course:*
- FMIS 3612—Managerial Finance (3)
- FMIS 3649—International Finance (3)
- FMIS 4611—Portfolio Analysis (3)
- FMIS 4613—Corporate Financial Strategies (3)
- FMIS 4617—Management of Financial Institutions (3)
- FMIS 4619—Analysis of Financial Statements (3)
- FMIS 4651—Risk Management and Insurance (3)
- FMIS 4995—Special Topics (1-3) (department approval required)

**Management—Human Resources (12)**

*Required Prerequisite:*
- MgtS 3801—Human Resource Management (3)

*Electives (9), select three courses:*
- MgtS 4431—Leadership (3)
- or MgtS 4441—Organizational Studies (3)
- or MgtS 4471—Interpersonal Relations (3)
- MgtS 4821—Staffing Work Organizations (3)
- MgtS 4831—Compensation Systems (3)
- MgtS 4841—Training and Development (3)
- MgtS 4851—Unions and Collective Bargaining (3)
- MgtS 4881—Human Resource Issues and Trends (3)

**Management—Organizational Management (12)**

*Required Prerequisite:*
- MgtS 3401—Organizational Behavior and Management (3)

*Electives (9), select three courses (at least one from each set):*
- Micro Organizational Behavior
  - MgtS 4431—Leadership (3)
  - MgtS 4441—Managerial Decision Making (3)
  - MgtS 4471—Interpersonal Relations (3)
- Macro Organizational Behavior
  - MgtS 4411—Organizational Studies (3)
  - MgtS 4421—Managing Change (3)
  - MgtS 4461—Business and Society (3)
  - MgtS 4472—Entrepreneurship (3)

**Management Information Systems (12)**

**CS 1511 is required prior to admission to the program**

*Required Prerequisites (6):*
- FMIS 3201—Management Information Systems (3)
- FMIS 3222—System Analysis and Design (3)

**Marketing (12)**

*Required Prerequisite:*
- MgtS 3701—Principles of Marketing (3)

*Electives (9), select three courses:*
- MgtS 3711—Marketing Research (3)
- MgtS 3741—Fundamentals of Selling (3)
- MgtS 3781—International Marketing (3)
- MgtS 4711—Business-to-Business Marketing (3)
- MgtS 4721—Advertising and Marketing Communications (3)
- MgtS 4731—Consumer Behavior (3)
- MgtS 4781—Marketing and Management Strategy (must meet prerequisites) (3)
The faculty and administrative officers of the College of Education and Human Service Professions are dedicated to preparing highly qualified leaders in human service professions, including education, social work, allied clinical health, mental health, and selected human service fields. Students are prepared for employment in industry, school and non-school educational settings, community agencies, and government.

Five departments work cooperatively to achieve the purposes of the college in teaching, research, service, and program development. The office of the dean is responsible for programmatic leadership, curricula (including NCATE and Minnesota Board of Teaching-approved teacher education programs), and for recommending graduates for licensure. The departments that have responsibility for degree and licensure programs are Communication Sciences and Disorders; Education, Health, Physical Education & Recreation; Psychology and Mental Health; and Social Work.

Teacher Licensure Programs
The teacher licensure programs have been granted full continuing accreditation by the National Council for Accreditation of Teacher Education and the Minnesota Board of Teaching.

Admission to Upper Division Programs
In addition to the freshman or lower division admission process, students majoring in this college must apply for admission to an upper division program. Admission is contingent on submission of evidence that the student has completed prerequisite courses, earned a satisfactory GPA, taken appropriate tests, made plans for the rest of the academic program, and participated in a personal interview to review these matters. Standards are set by the individual departments, and students should consult their adviser or department office for information.

Most degree programs in this college require a 2.50 or higher minimum GPA for admission and/or graduation.

The college has adopted policies that allow for alternatives to the established admission procedures to encourage the participation of individuals from underrepresented groups and other students as determined by the program faculty.

Academic Standing

Good Academic Standing
Students enrolled in programs within the college are required to maintain a minimum cumulative GPA of 2.00 to be in good academic standing. Eligibility to pursue coursework does not imply eligibility for admission to programs, continued candidacy, or graduation from degree programs that require a 2.50 or higher GPA.

Probation
Students with a cumulative GPA lower than that required for good academic standing are placed on academic probation. Students on academic probation have one semester of day school attendance to attain the overall GPA required to avoid dismissal. Students should consider a lighter load or repeating D or F courses to improve their GPA. Probationary students are strongly encouraged to seek advice from their faculty adviser, peer adviser, or staff in the college’s Student Affairs Office.

Dismissal
Students who fail to attain the required minimum cumulative GPA after the semester of initial probation are subject to dismissal. No student is dismissed before attempting 30 credits. Extenuating circumstances could be taken into consideration at the request of the student before dismissal. Dismissed students are notified immediately.
Readmission After Dismissal
Readmission is not granted before one academic year has passed from the date of dismissal. Readmission is granted when the required minimum cumulative GPA for good academic standing has been attained through University College Duluth or summer school. Students who have been academically dismissed must receive permission from the college office in order to register through University College. Students may not make up grade point deficiencies outside the University of Minnesota. Petition information is available at the CEHSP Student Affairs Office, 115 Bohannon Hall.

Appeal and Petition
A student seeking exception to an academic requirement of the college may petition for an exemption. After consulting with the adviser and others involved, the student should submit a petition to the college's Student Affairs Office, 115 Bohannon Hall.

College Honors
At UMD, a maximum of 15 percent of the graduating class can graduate with college honors. In CEHSP, the top 3 percent of the graduating class is designated summa cum laude, the next 5 percent magna cum laude, and the next 7 percent cum laude. The cumulative GPAs required for the three honors categories are available at the college's Student Affairs Office.

All transfer credits that are counted toward meeting graduation requirements at UMD must be included in calculating the cumulative GPA for honors purposes. Grades in transfer courses cannot qualify a student for honors if the cumulative GPA for UMD credits does not merit honors, and they cannot qualify a student to earn a higher honors classification than that earned on the basis of UMD credits. UMD credits include those earned through day school, extension, and summer session.

Department Honors Programs
Honors programs are available in several departments within the college. Honors program admission requirements and specific honors opportunities vary. See the department head or adviser for further information.

Student Affairs Office
Information about admission, orientation, advising, scholastic standing, change of college, change of major, graduation honors, and grievance and appeal procedures may be obtained from the CEHSP Student Affairs Office, 115 Bohannon Hall (218/726-7156). Applications for Minnesota state licensure and post-baccalaureate contract forms for baccalaureate degree students seeking licensure or certification are also available in this office.

Continuing Education
The college has an office that coordinates University College Duluth (UCD) courses, conferences, and institutes. Both undergraduate- and graduate-level credits may be earned through UCD. In-service educators may apply credits earned through UCD to the M.Ed. program and, with Graduate School approval, to Graduate School programs. For more information, contact Graduate School, 104 DAdB (218/726-6797).

Degrees Offered
Bachelor of Applied Arts (B.A.A.)
This degree program prepares students to teach in secondary education and offers the nonteaching field of exercise science.

Majors
- Teaching communication arts/literature
- Teaching French
- Teaching German
- Teaching social studies
  - Anthropology
  - Economics
  - Geography
  - History
  - Political science
  - Psychology
  - Sociology
- Teaching Spanish

Majors in art education for the B.F.A. degree and in music education for the B.M. degree are available through the School of Fine Arts.

Bachelor of Applied Science (B.A.S.)
This degree program prepares students to teach in elementary and secondary education and offers the nonteaching fields of communication sciences and disorders, psychology, and recreation.
Colleges and Schools

Majors
Communication sciences and disorders
Early childhood studies
Elementary/middle school teacher education
Exercise science
Adult fitness
Athletic training
Exercise science
Health education
Community health
School health
Physical education
Psychology
Recreation
Outdoor education
Recreational sport
Teaching earth sciences
General
Teaching life science
General
Teaching mathematics
Teaching physical sciences
Teaching science (middle school)

Minors
Coaching
Early childhood studies
Health education
Psychology
Recreation—outdoor education
Recreation—recreational sport
Social studies (elementary school)
Teaching communication arts/literature
Teaching earth sciences
Teaching English (elementary/middle school)
Teaching French
Teaching German
Teaching life sciences
Teaching mathematics
Teaching physical sciences
Teaching physics
Teaching science (elementary/middle school)
Teaching Spanish

For other minors available to students receiving a B.A.A. or B.A.S., see School of Business and Economics, School of Fine Arts, College of Liberal Arts, and College of Science and Engineering.

B.A.A. and B.A.S. Requirements—Students pursuing a teaching major must apply to and be accepted by the Department of Education.
Students seeking a K-12 licensure in art, music, foreign languages, or physical education must apply to both the Department of Education and the content area department. B.A.A. and B.A.S. requirements include the following:
• Completion of at least 35 credits in liberal education coursework as prescribed in the Policies and Procedures section of this catalog.

• Completion of one or more majors with a 2.50 minimum GPA in each or as required by individual departments. Students must apply to the department(s) offering the major for acceptance into the program.
• A 2.30 minimum GPA or as required by individual departments in all work attempted in residence at UMD and in the college, including credits transferred from outside UMD.
• Completion of elective courses to total at least 120 credits. The credit requirement is specified individually by each major program. Recommended electives and required supporting courses are described for each major.
• Compliance with general regulations governing granting of degrees. Students should review their degree status in the Office of the Registrar early in their senior year.
• At least 30 credits earned while in residence in the college. Fifteen of the last 30 credits of degree requirements must be earned in residence in the college.

Students seeking two degrees (e.g., a B.A. and B.A.S.) must fulfill the major requirements for both degrees.

If a student elects to complete a minor applicable to teacher licensure for either the B.A.A. or B.A.S., it must be in connection with a teaching major for either of the degrees.

Master of Education (M.Ed.)
Director and Associate Dean: E. Lundstrom
125 Bohannon Hall, (218) 726-7131

The M.Ed. program offers professional development for those in education or human service professions: classroom teachers, educators in specialized areas, and professionals with training responsibilities in health sciences, social services, and community education. In consultation with a faculty committee, candidates plan a program of study to meet core and individual goals and establish a knowledge base that incorporates the college's philosophy of the full integration of reflection, empowerment, diversity, and collaboration.

Degree Requirements—The M.Ed. program requires 30 credits, including 1) demonstrated competencies in human diversity and exceptionality, social responsibility, learning, research, and technology; 2) coursework to achieve professional growth and goals; 3) a field research project and/or paper (4-6 credits); and 4) the following degree
requirements: all degree requirements must be completed within seven years, at least 20 credits must be completed after the candidate is formally admitted to the program, no more than 8 credits may be transferred to the M.Ed. program (these credits must be from accredited programs at the graduate level and approved by the M.Ed. advising committee and the director), coursework taken before admission (including transfer credits) can be included only if recommended by the M.Ed. committee and approved by the director (coursework must have been taken within the last five years and be graduate level), and the program must be recommended by the student's M.Ed. committee and approved by the director and recorded in the M.Ed. office within one semester after admission. Students may complete a concentration and have the notation "(with concentration in ________)" placed on their diplomas and transcripts. A concentration requires at least 15 graduate credits in a specific area (e.g., early childhood studies, environmental education, special education, technology).

**Admission**—Admission is based on the Graduate Record Examination (GRE) General Test or a portfolio that documents professional competence and professional goals, the undergraduate scholastic record, evaluations by supervisors, and availability of courses and faculty. International students must have a TOEFL score of 500 or higher.

**Application**—For an admission application, write to the Director, M.Ed. Program, 125 Bohannon Hall, University of Minnesota Duluth, MN 55812. Submitted applications must include one official transcript of all college work, the completed application, the application fee, and test results or portfolio.

**Application Fee**—A nonrefundable application fee of $30 is required. Checks should be made payable to the University of Minnesota.

**Graduate Record Examination**—The GRE may be taken at UMD. Contact Career Services, 21 Campus Center, University of Minnesota Duluth, MN 55812 for dates and application.

**Portfolio**—Information regarding portfolio preparation and content may be obtained by contacting the M.Ed. program director, 125 Bohannon Hall.

**Graduate School**—The M.A. in counseling psychology is for those interested in obtaining counselor certification for school and agency settings. The M.A. in communication sciences and disorders prepares students for professional licensure or certification in speech-language pathology, audiology, or education of the hearing impaired. A master of social work (M.S.W.) is also available. For more information, see Graduate School.

**Teacher Licensure Requirements**

The teacher licensure requirements are subject to change without notice to accommodate the requirements of licensure and accrediting agencies. These changes may be applied to current students.

Students seeking a teaching license must complete a program approved by the Minnesota Board of Teaching; the college then recommends that an appropriate license be issued. Approved programs are available in the following:

**Majors**
- Early childhood studies
- Elementary/middle school teacher education
- Health education
- Physical education
- Teaching communication arts/literature
- Teaching earth sciences
- Teaching French
- Teaching German
- Teaching life science
- Teaching mathematics
- Teaching physical sciences
- Teaching science (grades 5-9)
- Teaching social studies
- Teaching Spanish

**Teaching License Programs**
- Early childhood/special education
- Emotional disabilities
- English as a second language teaching
- Family education—early childhood
- Family education—parent education
- Learning disabilities
- Speech-language pathologist (graduate only)

**Advanced Licensure Programs**

Requirements for a teaching license at the early childhood, elementary, and secondary levels include completion of

- a B.A.A., B.A.S., B.F.A. in art education, or B.M. in music education, including an NCATE and Minnesota Board of Teaching-approved teaching major.
- an approved program in drug education (Hlth 3202—Drug Education or Hlth 5161—School Health Programs: Early Childhood Through Middle School).
• an approved course in human relations (see requirement listed for each teaching major).
• the Pre-Professional Skills Tests (PPST) (required for initial Minnesota licensure). Students are encouraged to take the PPST during their freshman or sophomore year. They must have taken it before they can be admitted to upper division education courses. Students cannot be recommended for initial licensure until they pass the PPST.

Students must apply to the Department of Education for admission to the above programs. Students in art education, health education, music education, or physical education must also apply to the content area department.

Postbaccalaureate Contracts
Students seeking a teaching license who have already completed a baccalaureate program must apply for a postbaccalaureate student contract evaluation specifying the additional coursework necessary to meet the requirements of the approved teaching licensure program. More information and applications are available from the college’s Student Affairs Office, 115 Bohannon Hall (218/726-7156).

License Application
Teaching license applications may be obtained from the Student Affairs Office, 115 Bohannon Hall (218/726-7156). The completed application, required fees, evidence of passing scores on the PPST, Federal Bureau of Investigation (FBI) background check, fingerprinting, and official transcripts must be submitted before action by the college licensure officer and transmittal to the Minnesota Teacher Personnel Licensing office.

For more information, see program descriptions for the individual teaching majors and special licensure fields. Secondary and K-12 teaching majors should also consult the requirements listed in the Department of Education section.

Degree Programs

Coaching

Health, Physical Education, and Recreation

Minor Only
The coaching minor program prepares graduates to coach in a variety of sites, including schools, public agencies, and youth organizations. The curriculum prepares students to assess, plan, administer, and instruct student athletes.

Requirements
The coaching minor (19 credits) meets or exceeds the National Association for Sport and Physical Education (NASPE) standards for coaching, with emphasis in coaching and administrative theory, psychology, medical and nutritional concerns, risk management, and skill development. Requirements and admission applications can be obtained from the Department of Health, Physical Education, and Recreation (HPER). Postbaccalaureate students seeking a coaching minor should have their transcript evaluated by the HPER department.

Required Courses
CC 3100—Sports Science for Coaches (2) or PEP 3030*-Human Biomechanics (3)
CC 3116—Care and Prevention of Sports Injuries (3)
CC 3150—Coaching Methods (2)
CC 3160—Psychological Aspects of Coaching (2)
CC 3161—Administrative Aspects of Coaching (2)
CC 3997—Coaching Practicum (1)

Specific Coaching Strategies
2 credits from CC 3170 through 3179
Hlth 1470**—Human Nutrition (3)
Hlth 1600—Basic First Aid (2)
*Physical education majors only.
**Courses that may be used to fulfill UMD liberal education program requirements.

Communication Sciences and Disorders (CSD)

Professors: John T. Hatten, Ash M. Hawk; Associate Professors: Faith C. Loven, Mark I. Mizuko (department head), Cindy S. Spillers; Clinic Coordinator: LaVonne Levar

B.A.S.
To meet the many and expanding challenges within the communication disorders field, the Department of Communication Sciences and Disorders offers high quality education and clinical experience at the undergraduate and graduate levels. The undergraduate major
prepares students for admission to professional graduate degree or licensure programs in speech-language pathology, audiology, or education of the hearing impaired. This pre-professional undergraduate program also prepares students to work as clinical aides to communication disorders specialists working in a variety of human service and healthcare settings.

The program includes the study of phonetics, the anatomy and physiology of the speech and hearing mechanisms, the normal development of speech and language, and the nature and treatment of disorders of speech, language, and hearing disorders.

**Admission Requirements**

Students who wish to obtain an undergraduate degree in communication sciences and disorders must be formally admitted to the program. Department and registrar approval of the upper division papers constitutes formal admission to the undergraduate program. To have upper division papers approved, students must have completed at least 54, but not more than 70, semester credits and have a minimum overall GPA of 2.80. Students with 70 credits who have not filed upper division papers will have a hold placed on their records and will not be able to register for classes.

The program allows for alternatives to the established admission procedures on a case-by-case basis.

**Maintenance Standards**

Undergraduates with approved upper division papers who have been formally admitted to the degree program must maintain an overall GPA of at least 2.80. Students whose GPA falls below 2.80 are placed on department academic probation. Students on probation have one semester (including day school, UC, and summer school) to raise their GPA to at least 2.80. If students fail to raise their GPA within one semester, they are dismissed from the program and cannot enroll in further CSD courses. They also cannot complete their undergraduate degree in communication sciences and disorders at UMD. Undergraduates are placed on academic probation only once before being dismissed from the program.

The program allows for alternatives to the established probation procedures on a case-by-case basis.

**Minnesota School Licensure**

Students who wish to obtain Minnesota licensure as a speech-language pathologist for school settings (pre-kindergarten to grade 12) must complete a preparation program that has been approved by the Minnesota Board of Teaching. Interested students should consult with the Department of Communication Sciences and Disorders.

**Professional Certification**

Students interested in professional certification in speech-language pathology or audiology should consult with the Department of Communication Sciences and Disorders. They also should refer to the Graduate School section of this catalog for a description of the master of arts program in communication sciences and disorders.

**Accreditation**

The graduate program is accredited by the Council of Academic Accreditation (CAA) of the American Speech-Language-Hearing Association (ASHA). CAA accreditation is recognized by the U.S. Department of Education and the Council for Higher Education Accreditation.

**Degree Requirements**

The B.A.S. degree program (120 credits) provides students with a foundation in human communication processes and communication disorders. Students must complete:

- Liberal education requirements
- Advanced writing requirement: Comp 3140—Advanced Writing: Human Services or Comp 3150—Advanced Writing: Science or Comp 3160—Advanced Writing: Social Sciences (3 credits)
- Major requirements (82 credits): lower and upper division major requirements (74), approved electives (8)

Students intending to pursue a Minnesota speech-language pathology (SLP) teaching license are advised to choose electives from the Minnesota SLP Teaching License electives on the next page.

**Required Courses**

CSD 1100*—Phonetics (2)
CSD 2230*—Human Communication Disorders (4)
CSD 3100—Normal Aspects of Human Communication (3)
CSD 3103—Anatomy of Speech and Hearing Mechanisms (3)
CSD 3105—Fundamentals of Hearing and Speech Science (5)
CSD 3130—Language Development and Disorders (4)
Colleges and Schools

CSD 3200—Articulation and Phonological Disorders (3)
CSD 3230—Diagnostic and Treatment Methods in Communication Disorders (4)
CSD 4197—Clinical Practicum in Communication Disorders (6)
CSD 4200—Introduction to Fluency Disorders (2)
CSD 4400—Hearing Disorders and Evaluation (3)

Required Courses From Other Programs
Biol 101*—General Biology I (5)
Biol 1761—Human Anatomy (4)
Comm 1112*—Public Speaking
Comm 1222*—Interpersonal Communication (3)
Comp 1120*—College Writing (3)
Hlth 2040—Principles of Human Physiology (4)
Ling 1811*—Introduction to Language (3)
Math 1024*—Introduction to Contemporary Mathematics (3)

Electives (3cr)**
CSD 2001*—American Sign Language Studies I (3)
CSD 2002*—American Sign Language Studies II (3)
CSD 4097—Introduction to Clinical Practicum in Communication Disorders (1)
CSD 5000—Departmental Seminar (1-3)
CSD 5003—American Sign Language Studies III (3)
CSD 5004—American Sign Language Studies IV (3)
CSD 5091—Independent Study (1-3)
CSD 5098—Workshop: (Various Titles to be Assigned) (1-3)
CSD 5400—Rehabilitative Procedures for the Hard of Hearing (3)
or any courses listed under requirements for the Minnesota SLP Teaching License

*Courses that may be used to fulfill UMD liberal education program requirements.

**Students wishing to obtain a Minnesota SLP Teaching License are encouraged to take courses from the following to fulfill the elective requirement:
Educ 1101*—Education in Modern Society (3)
Educ 4500—Professional Issues in Teaching (3)
EdSe 5100—Human Relations in Classrooms (2)
Hlth 3202—Drug Education (2)
SpEd 5433—Foundations in Special Education (4)
SpEd 5435—Parent and Professional Communication and Collaboration in the Special Education Process (4)
The Communication Sciences and Disorders Department has a list of courses offered in other departments and approved for elective credits. Students should contact their adviser for an updated list.

Exit Standards
Senior-level students in good academic standing are required to complete 6 credits of CSD 4197—Clinical Practicum in Communication Disorders. This practicum constitutes a clinical internship in which the students work directly with individuals who have speech, language, or hearing disorders. The internship takes place in the on-campus speech-language-hearing clinic under the close supervision of department faculty who are certified by the American Speech-Language-Hearing Association.

Early Childhood Studies (ECh)

Faculty: Carlson (Educ); Das (PMH); Hatten (CSD); Hazareesingh (Educ); Karp (Educ); Kritzmire (Music); Nierengarten (HPER); Quintero (Educ); Shannon (Educ); Watts (PMH); Wohlhuter (Educ)

B.A.S.
The early childhood studies programs have interdisciplinary curricula that prepare students for work in a variety of settings with children from birth to age eight. Graduates find employment in nursery schools, the primary grades in elementary schools, childcare centers, Head Start programs, home-based programs, parent education, and community education programs. All students complete a common core of courses in child development, parent-child relations, early childhood education, early childhood special education, community resources, and organizational management and supervision.

The early childhood studies major leads to Minnesota licensure in early childhood education (birth to age 8). With the addition of one semester of coursework, students are eligible for licensure in early childhood special education or early childhood parent education, depending on the student's preference.

Student teaching placements in diverse programs in the United States or internationally are available.

Admission Requirements
The number of students admitted to candidacy in the programs each year is based on availability of suitable programs for practicum experience. Candidates are selected on the basis of an overall GPA of at least 2.70, three references, a personal written statement as indicated on the application form, and satisfactory completion of the Pre-Professional Skills Test (PPST). Applications and a booklet describing how to sign up for the PPST are available in 120 Montague Hall. An entrance interview may be requested by the faculty selection committee. Applications, including all supporting documents, are due by 4:00 p.m. on the third Friday of each semester for admission.
the following semester. Students interested in the major are advised to apply during their freshman year. A student transferring from another institution must apply for admission and may be admitted with advanced standing. Decisions regarding transfer of credits are made on an individual basis.

Maintenance Standards
Students who do not maintain satisfactory levels of progress (GPA of 2.70 in all program-required courses and acceptable performance in field experiences) will have their candidacy rescinded.

Student Teaching
Application for student teaching must be made by the first Friday of the semester before student teaching. Applications are available in 120 Montague Hall. All incompletes must be cleared before filing the application. Students must have a 2.70 GPA to be eligible for student teaching.

Exit Criteria
Recommendations for licensure are based on successful completion of all program-related courses, demonstration of satisfactory performance outcomes required by the program, and acceptable performance in field experiences, including student teaching.

Grievance Procedure
Procedures for resolving student grievances are available from the program coordinator.

Personal Liability Insurance
Students must obtain personal liability insurance to protect themselves while working in programs. This usually is obtained most economically by a student membership in Education Minnesota. Applications are available in the department office.

Degree Requirements
Requirements for the B.A.S. in early childhood studies (120 credits) include:

- Liberal education requirements
- Advanced writing requirement: Comp 3140—Advanced Writing: Human Services (3 credits)
- Major requirements (96-97 credits—some courses also fulfill liberal education requirements) satisfy the requirements for early childhood licensure in Minnesota

Four optional areas of specialization (3-13 credits).

Required Courses

**Lower Division (28-29)**

- CS 1011*—Introduction to Computers and Software (3)
- ECh 2010—Introduction to Early Childhood Education: Birth-Age Eight (3)
- Educ 1000—Human Development (3)
- or Psy 2021*—Developmental Psychology (4)
- Educ 1100*—Human Diversity (3)
- Educ 1101*—Education in Modern Society (3)
- Hlth 1470*—Human Nutrition (3)
- Psy 1003*—General Psychology (4)
- Soc 1201*—Sociology of the Family (3)
- SpEd 1357*—Individuals with Disabilities in Society (3)

* Courses that may be used to fulfill UMD liberal education program requirements.

**Upper Division (67)**

**Courses taken before the block courses (6)**

- Art 3806—Early Childhood Art (1)
- Comm 3122—Group Leadership (3)
- Mu 3603—Music for Early Childhood (1)
- PE 3750—Movement Experience for the Young Child (1)

**Block 1 (16)**

- CSD 3130—Language Development and Disorders (4)
- ECh 3010—Programs for Education of Young Children: Birth-Age Eight (4)
- ECh 3050—Observing and Guiding Behavior: Birth-Age Eight (4)
- SpEd 3103—Infant and Toddler with Special Needs (4)

**Block 2 (17)**

- ECh 3020—Literacy, Literature and Mathematics: Birth-Age Eight (5)
- ECh 3030—Inquiry Social Studies and Science Learning: Birth-Age Eight (5)
- ECh 3040—Creative Expression (3)
- SpEd 3105—Young Children with Special Needs: Ages Three-Eight (4)

**Courses to be taken after the block courses (14)**

- Comp 3140—Advanced Composition (3)
- ECh 4009—Early Childhood Administration (2)
- Hlth 5161—School Health Programs: Early Childhood Through Middle School (2)
- Psy 5251—Parenting (3)
- SpEd 5435—Parent Professional Communication (4)

**Student Teaching (14)**

Students must take these two courses concurrently.
- ECh 4600—Student Teaching in Early Childhood/Primary (12)
- ECh 4610—Professional Issues Seminar in Early Childhood Education (2)
Colleges and Schools

Specializations (Optional) (3-13)
Four options: infants and toddlers, field experiences in diverse sites, early childhood special education licensure, and parent educator licensure

Infants and Toddlers:
ECh 2910—Caring for Infants and Toddlers
or ECh 5910—Caring for Infants and Toddlers (3)
ECh 4600—Student Teaching in Early Childhood/Primary (6) (Student Teaching with Infants and Toddlers)

Diverse Field Experience (complete one of the following):
Outside the United States
Educ 3804—Programs for Young Children: Global Perspectives (4)
or Educ 5804—Programs for Young Children: Global Perspectives (4)

Within the United States
ECh 3950—Guided Observations in Diverse Settings, Birth-Age Eight (3-6)
or ECh 5950—Guided Observations in Diverse Settings, Birth-Age Eight (3-6)

Early Childhood Special Education Licensure: Completion of this option along with the early childhood studies major results in recommendation for early childhood special education licensure.
SpEd 3205—Assessment in Early Childhood Special Education (4)
SpEd 5600—Student Teaching (9)

Parent Educator Licensure: Completion of this option along with the early childhood studies major results in recommendation for parent educator licensure.
ECh 4011—Parent Education (4)
Educ 4650—Student Teaching in Parent Education (2)

Exit Standards
Students must successfully complete a student teaching experience and meet other competencies required for Minnesota teacher licensure.

Minor Requirements (33-34)

Lower Division (6-7)
ECh 2010—Introduction to Early Childhood Education: Birth-Age Eight (3)
Educ 1000—Human Development (3)
or Psy 2021*—Developmental Psychology (4)

Upper Division (27)
ECh 3010—Programs for Education of Young Children: Birth-Age Eight (4)
ECh 3020—Literacy, Language, and Mathematics: Birth-Age Eight
or ECh 3030—Inquiry Social Studies and Science Learning: Birth-Age Eight (3)
ECh 3040—Creative Expression (3)
ECh 3050—Observing and Guiding Behavior: Birth-Age Eight (4)

ECh 4600—Student Teaching in Early Childhood/Primary (6)
ECh 4610—Professional Issues Seminar in Early Childhood Education (2)
Psy 5251—Parenting (3)

* Courses that may be used to fulfill UMD liberal education program requirements.

Education (Educ)

Professors: Thomas G. Boman, Helen L. Carlson, Joan M. Karp, David A. McCarthy, Linda Miller-Clear (Engl); Associate Professors: Francis A. Gulbrandsen, Nedra A. Hazaresingh, Clayton E. Keller, June E. Kreutzkampf, Bruce H. Munson, Thomas D. Peacock, Gwen Perun, Elizabeth P. Quinero, Helen Rallis, Mary Kay Rummel, Terrie M. Shannon (department head); Assistant Professors: Manuel T. Barrera III, Kay Wohlhuter; Instructor: Jane E. Dietrich

The department offers programs for the baccalaureate degree or licensure within the general areas of early childhood studies; elementary, middle school, secondary, and K-12 education; and special education. See individual program descriptions for specific admission, retention, and exit requirements.

The Department of Education has adopted the Learner-Sensitive Teacher model, and each program emphasizes the five themes of diversity, collaboration, reflection, empowerment, and technology.

The mission of the department is to prepare teachers, provide a wide range of in-service and graduate programs for school personnel and educators in non-school settings, and provide expertise in instructional methodology and technology. The department also engages in a variety of research and development activities related to teaching and learning and contributes to the liberal education program at UMD.

Fifth-Year Licensure
The College of Education and Human Service Professions (CEHSP) has developed a "Postbaccalaureate Student Contract" process for persons who have completed a baccalaureate degree at UMD or at another institution and who wish to obtain licensure to teach in Minnesota. This process can be used also by persons who already hold a teaching license in one area and wish to add a second license, and by those who wish to upgrade a teaching minor to a teaching major.

Information about this program may be obtained from the Student Affairs Office for CEHSP. Applicants need to provide transcripts for their baccalaureate degrees. A formal assessment of their coursework is carried out.
and a program of studies designed that permits
the applicant to meet the requirements for
Minnesota teacher licensure in the desired area
of teaching.

Postbaccalaureate contract students must
apply for admission or readmission to UMD
and must meet all admission requirements for
the appropriate teacher licensure program.
Upon completion of the requirements identified
on the postbaccalaureate contract, students are
recommended for Minnesota licensure.

Degree Requirements
Degree requirements for the postbaccalaureate
contract vary for each teacher licensure
program. See separate listings of requirements
under each licensure area.

The programs in special education prepare
highly skilled and competent teachers to deliver
quality services to children and youth who have
disabling conditions.

The programs consist of selected core
courses followed by specialization in one of the
following special education fields:
1) Early childhood/special education (EC/SE)
2) Emotional behavioral disorders (EBD)
3) Learning disabilities (LD)
Students may earn their EC/SE license as
a) undergraduate students majoring in early
childhood studies or b) postbaccalaureate
students.

Students interested in an emotional
behavioral disorders or LD license typically earn them as postbaccalaureate students,
although undergraduates who are majoring in a teaching field may also begin work, make
significant progress toward, or even complete these licensure requirements before graduation.

Undergraduates interested in obtaining any special education license at UMD should seek
counseling from the special education faculty as early in their programs as possible.

Admission to Candidacy Requirements
Admission to special education is limited and is
based on the following factors:
• A minimum overall GPA of 2.70 is required
  for consideration of an application.
  (Applicants to EC/SE should also consult
  requirements for early childhood studies.)
• Three letters of reference.
• Interviews with professionals in the field and
  program faculty (optional).
• Quality of written personal statement.

Application packets are available in the
Department of Education. Completed
applications and all supporting documents are
due April 1 for fall semester admission. Check
with the program coordinator for availability of
admission openings at other times.

Applicants who do not meet minimum
requirements are not admitted to candidacy.
Applicants meeting the minimum requirements
but not accepted during an admission period
may be carried over into the pool for
subsequent admission periods and have their
applications reconsidered.

Maintenance Standards
Students who do not maintain satisfactory
levels of progress (GPA of 2.70 in all program-
required courses and acceptable performance in
their field experiences) have their candidacy
rescinded. Courses in which a passing grade of
C+ or lower is received are not counted toward
meeting licensure requirements.

Exit Criteria
To be recommended for licensure, students
must have maintained satisfactory levels of
performance (GPA of 2.70 in all program-
required courses and acceptable performance in
their field experiences), demonstrated
satisfactory performance outcomes required by
the program, and satisfactorily completed their
student teaching practicum.

Personal Liability Insurance
Students must obtain personal liability
insurance to protect them while working in
public school classrooms. This usually is
obtained most economically by student
member in Education-Minnesota.
Applications are available in the department
office.

Grievance Procedure
Students with grievances concerning the
admission, maintenance, or exit processes may
obtain a copy of the grievance procedure from
the program coordinator.

Fifth-Year Licensure—Early Childhood/
Special Education
Persons who hold a baccalaureate degree can
complete this program to obtain Minnesota
censure in early childhood/special education
to provide special education services to children
from birth through age six.
The fifth-year licensure—early childhood/special education program (50 credits) requires 12 credits in special education core courses, 17 credits in early childhood core courses, and 21 credits in early childhood/special education core courses.

**Required Courses**

**Special Education Core (12)**
- SpEd 5205—Assessment in Early Childhood Special Education (4)
- SpEd 5433—Foundations in Special Education (4)
- SpEd 5435—Parent and Professional Communication and Collaboration (4)

**Early Childhood Core (17)**
- ECh 4600—Student Teaching in Early Childhood/Primary (6)
- ECh 4610—Professional Issues Seminar in Early Childhood Education (2)
- ECh 5010—Programs for Education of Young Children: Birth-Age Eight (4)
- ECh 5020—Literacy, Literature, and Mathematics: Birth-Age Eight (5)

**Early Childhood Special Education Core (21)**
- CSD 3130—Language Development and Disorders (4)
- SpEd 5103—Infants and Toddlers with Special Needs (4)
- SpEd 5105—Young Children with Special Needs: Ages Three-Eight (4)
- SpEd 5600—Student Teaching (9)

**Exit Standards**
Students must successfully complete a student teaching experience and meet other competencies required for Minnesota teacher licensure.

**Fifth-Year Licensure—Emotional Behavioral Disorders (EBD)**

The fifth-year licensure—emotional behavioral disorders program (53 credits) requires 12 credits in special education core courses and 25 course credits in the emotional behavioral disorders specialization. In addition, candidates may need up to 16 credits in prerequisite courses in education.

**Prerequisites (16)**
- Students with elementary education backgrounds must complete one course or course components in adolescent growth and development and EdSe 5111—Secondary Curriculum and Administration (2).
- Students with secondary education backgrounds must complete one course or course components in child growth and development and EdSe 5401—Elementary School Curriculum (2).
- ELEd 3325—Language and Literacy (4)
- ELEd 3355—Critical Thinking: Elementary Mathematics (4)
- Instructional technology course (3)
- Multicultural education course (3)

**Emotional Behavioral Disorders Licensure Program**

**Special Education Core (12)**
- SpEd 5204—Special Education Assessment: Mild Disabilities (4)
- SpEd 5433—Foundations in Special Education (4)
- SpEd 5435—Parent and Professional Communication and Collaboration (4)

**Emotional Behavioral Disorders Specialization Courses (25)**
- SpEd 5381—Behavior Management Strategies (4)
- SpEd 5382—Advanced Theory and Practice in Emotional/Behavior Disorders (4)
- SpEd 5452—Academic Interventions for Students with Disabilities (4)
- SpEd 5455—Instructional Strategies and Transitional Planning (4)
- SpEd 5600—Student Teaching (9)

**Exit Standards**
Students must successfully complete a student teaching experience and must meet other competencies required for Minnesota licensure.

**Fifth-Year Licensure—English as a Second Language Teaching**

The fifth-year licensure—English as a second language teaching program (28 credits) is required of students intending to seek teacher licensure in English as a second language (ESL) at the elementary and secondary levels. Students also must complete all other teacher licensure requirements, as well as two years or the equivalent of foreign language study.

**Admission Requirements**
See Admission Requirements description under Teacher Licensure Requirements.

**Required Courses**

- Anth 4628—Language and Culture
- or Educ 5340—Interacting with Diverse Families (3)
- Educ 5350—Literacy for English as a Second Language Learners (5)
- ELEd 4650—Student Teaching in Individual Subjects K-8 (3)
- or EdSe 4600—Student Teaching (3)
- Engl 5811—Introduction to Modern English (4)
- Ling 1811*—Introduction to Language (3)
- Ling 3101—Introduction to Phonology or Ling 3102—Introduction to Syntax (3)
- Ling 3195—Special Topics in Linguistics or Psy 3661—Psychology of Language (3)
- Ling 5802—Applied Linguistics (4)

*Courses that may be used to fulfill UMD liberal education program requirements.*
Language Requirements
Students must successfully complete two years (or the equivalent) of study of a language other than English.

Exit Standards
Students must successfully complete a student teaching experience and meet other competencies required for Minnesota teacher licensure.

Fifth-Year Licensure—Family Education—Early Childhood
Completion of the fifth-year licensure—family education—early childhood program (41 credits) in addition to a degree major in another field satisfies requirements of the Minnesota Board of Teaching for licensure as an early childhood family educator. This licensure prepares students to teach children and to lead parent education groups in the early childhood family education program.

Admission Requirements
Students must apply for admission to the family education—early childhood program and meet the admission requirements of a 2.70 GPA and successful completion of the Pre-Professional Skills Test required for Minnesota licensure.

Required Courses
Comm 3210—Group Communication
 or Psy 3211—Group Dynamics (3)
ECh 3010—Programs for Education of Young Children: Birth-Age Eight (4)
ECh 3020—Literacy, Language, and Mathematics: Birth-Age Eight (5)
ECh 3030—Inquiry Social Studies and Science Learning: Birth-Age Eight (5)
ECh 4011—Parent Education (4)
ECh 4600—Student Teaching Early Childhood/Primary (2)
Educ 1000—Human Development (3)
Educ 1100—Human Diversity (3)
Educ 4650—Student Teaching in Parent Education (3)
Hlth 3202—Drug Education (2)
Psy 2023—Marriages and Families Worldwide (4)
Psy 5251—Parenting (3)
* Courses that may be used to fulfill UMD liberal education program requirements.

Exit Standards
Students must successfully complete a student teaching experience and meet other competencies required for Minnesota licensure.

Fifth-Year Licensure—Family Education—Parent Education
Completion of the fifth-year licensure—family education—parent education program (25 credits) in addition to a degree major in another field satisfies requirements of the Minnesota Board of Teaching for licensure as a parent educator. This licensure prepares students to lead parent education groups in the early childhood family education program.

Admission Requirements
Students must apply for admission to the family education—parent education program and meet the admission requirements of a 2.70 GPA and successful completion of the Pre-Professional Skills Test.

Required Courses
Comm 3210—Group Communication
 or Psy 3211—Group Dynamics (3)
ECh 4011—Parent Education (4)
Educ 1000—Human Development (3)
Educ 1100—Human Diversity (3)
Educ 4650—Student Teaching in Parent Education (3)
Hlth 3202—Drug Education (2)
Psy 2023—Marriages and Families Worldwide (4)
Psy 5251—Parenting (3)
* Courses that may be used to fulfill UMD liberal education program requirements.

Exit Standards
Students must successfully complete a student teaching experience and meet other competencies required for Minnesota licensure.

Fifth-Year Licensure—Learning Disabilities (LD)
The fifth-year licensure—learning disabilities program (53 credits) requires 12 credits in special education core courses and 25 course credits in the LD specialization. In addition, candidates may need up to 16 credits in prerequisite courses in education.

Prerequisite Courses (16)
Students with elementary education backgrounds must complete one course or course components in adolescent growth and development and EdSe 5111—Secondary Curriculum and Administration (2).
Students with secondary education backgrounds must complete one course or course components in child growth and development and EIEd 5401—Elementary School Curriculum (2).
EIEd 3325—Language and Literacy (4)
EIEd 3355—Critical Thinking: Elementary Mathematics (4)
Instructional technology course (3)
Multicultural education course (3)
Learning Disabilities Licensure Program

Special Education Core (12)
SpEd 5204—Special Education Assessment: Mild Disabilities (4)
SpEd 5433—Foundations in Special Education (4)
SpEd 5435—Parent and Professional Communication and Collaboration (4)

L.D. Specialization (25)
SpEd 5351—Learning Disabilities Characteristics and Interventions (4)
SpEd 5381—Behavior Management Strategies (4)
SpEd 5452—Academic Interventions for Students with Disabilities (4)
SpEd 5455—Instructional Strategies and Transitional Planning (4)
SpEd 5600—Student Teaching (9)

Exit Standards
Students must successfully complete a student teaching experience and meet other competencies required for Minnesota teacher licensure.

Elementary/Middle School Teacher Education

Faculty: Hazareesingh, Keller, Munson, Peacock, Perun, Quintero, Rummel, Wohlhuter

B.A.S.
Successful completion of this program qualifies students to apply for state licensure to teach grades K-8 in any Minnesota elementary school. The major also provides a good foundation for programs leading to licensure as a special educator, an elementary principal, or an elementary school counselor or for non-school-related occupations requiring skill in working with children.

An effective elementary school teacher should possess a broad background in liberal and professional education. This professional program focuses on the structure of the various disciplines, the child as learner, the learning environment, diverse learners, teaching strategies in a practicum setting, and a semester of student teaching experience. As part of the program, students are required to complete an approved minor.

Elementary education licensure requirements are established by the state of Minnesota and guided by national standards. Those requirements are changed periodically. To ensure each student has a personalized and current plan of courses to complete, freshman elementary education majors and transfer students should contact their elementary education advisers early in their first semester at UMD.

Admission Requirements
Each student is responsible for obtaining a copy of the most recent elementary/middle school education upper division admissions packet, which is available in the office of the Department of Education. Students should be aware that the admission criteria include, but are not limited to, the following requirements:

- A cumulative overall GPA of at least 2.70 on coursework taken at UMD and elsewhere
- Documentation of at least 60 hours of work with groups of children in a supervised setting
- Three references, including at least one from a person who has observed the applicant working with groups of children
- Passing scores on all parts of the Pre-Professional Skills Test, an exam required for Minnesota teacher licensure
- Completion of required lower division courses

Special Needs
Students who need accommodations because of a disability or a special need should consult their program adviser and the Access Center.

Maintenance Standards
After students are admitted to the elementary education program, they must maintain appropriate performance standards. To continue as an elementary/middle school education major, students must make satisfactory academic progress (grades of C- or better in all required courses in the major and minor) and demonstrate acceptable teaching skills in their field experiences. Faculty review the progress of all elementary/middle school education majors each semester. Students who do not meet program standards may be dropped from the program.

Student Teaching
Application for student teaching must be made by the first Friday of the semester before student teaching. Applications are available in 120 Montague Hall. All incompletes must be cleared before filing the application. Students must have a minimum GPA of at least 2.70 to be eligible for student teaching. Students are responsible for scheduling an interview to document fulfillment of all prerequisites, including completion of all elementary major courses except for Educ 4500 and EIEd 4600, which are taken concurrently.
Assignment to schools for the professional semester is made by the coordinator of field experiences in consultation with administrators and teachers of Duluth and area schools. To ensure adequate student teaching supervision, the number of students accepted each semester is determined by the program faculty. As a result, it may be necessary for some students to accept a second choice of time period in which to complete the professional semester. Student placement is determined by availability of sites and supervisors.

**Exit Standards**

Before being recommended for licensure, students must demonstrate satisfactory performance outcomes required by the program, have grades of C- or better in all required courses in the major and in the minor, and have acceptable ratings from both the classroom and University supervisors for all field experiences, including student teaching performance.

Successful completion of this program indicates a student has completed a nationally accredited and state approved licensure program. The student is qualified to apply for a K-8 teaching license in the state of Minnesota. Students planning to teach in other states should be aware that licensure requirements may vary somewhat from state to state.

**Degree Requirements**

Requirements for the B.A.S. in elementary/middle school education include:

- UMD liberal education program requirement—specific course requirements in some categories, courses indicated by *, as follows:
  - Category 1: Comp 1120*—College Writing (3 credits)
  - Category 2: At least one course
  - Category 3: Comm 1112*—Public Speaking (3 credits) is recommended (elementary/middle school education majors must complete a course in communications in this category)
  - Category 4: At least one course
  - Category 5: At least one course
  - Category 6: At least one course (elementary/middle school education majors must complete a course in geography in this category or in Category 8)
  - Category 7: Educ 1101*—Education in Modern Society (3 credits) is required of elementary/middle school education majors (elementary education students also must complete a course in history)
  - Category 8: Educ 1100*—Human Diversity (3 credits) is required of elementary/middle school education majors
  - Category 9: At least one course (elementary/middle school education majors must complete a course in

- English literature: Engl 1001*—Great American Authors (3 credits), Engl 1101*—Literature Appreciation (3 credits), Engl 1575*—20th-Century Literature (3 credits), or Engl 1907*—Introduction to Literature (3 credits)

- Category 10: Art 1002*—Introduction to Art (3 credits)

- Advanced writing requirement: Comp 3140—Advanced Writing: Human Services (3 credits)

- Major requirements (76 credits)

- Students seeking a K-8 license must complete an approved academic minor (22-32 credits) in order to meet Minnesota teacher licensure requirements. Minors that meet the state licensure requirements are:
  - Teaching social science (elementary school) (26 credits)
  - Teaching English (elementary/middle school) (23 credits)
  - Teaching science (elementary/middle school) (22 credits)
  - Teaching French (32 credits)
  - Teaching German (32 credits)
  - Teaching mathematics (29-30 credits)
  - Teaching Spanish (31 credits)

Requirements for each of the above minors are listed in this college section under their own titles.

**Required Courses**

**Lower Division (13)**

- Educ 1000—Human Development (3)
- EIEd 1010—Introduction to Elementary Education (3)
- Hlth 1600—Basic First Aid (2)

or documented current Red Cross certification

- Math 1141—Mathematics for Elementary Education (4)
- Mu 1601—Music Fundamentals (1)

Depending on their math placement test score, students may be required to complete prerequisite courses in mathematics.

**Upper Division (63)**

**Courses taken before the block courses (16)**

- Art 3810—Art in Elementary Education (2)
- ECh 3006—Early School Years (2)
- Educ 3412—The Computer in Education (4)
- EdSe 5120—Philosophy and Organization of Middle Schools (2)

**Block I—(must all be taken concurrently) (16)**

- EIEd 3113—Learning Environments and Diverse Learning Communities (4)
- EIEd 3325—Language and Literacy (4)
EElEd 3331—Children's Literature and Integrated Creative Arts (4)
EElEd 3355—Critical Thinking: Elementary Mathematics (4)

**Block II—(must all be taken concurrently)** (16)
EElEd 3444—Teaching Science and Environmental Education (4)
EElEd 4345—Instructional Strategies, Assessment, and Management (4)
EElEd 4366—Teaching Social Studies and Environmental Education (4)
SpEd 5310—Adapting for Diverse Learners in General Education Settings (4)

**Block III—(must all be taken concurrently)** (15)
Educ 4500—Professional Issues in Teaching (3)
EElEd 4600—Student Teaching (12)

**Exit Standards**
Students must successfully complete a semester of student teaching experience and must demonstrate other competencies required for Minnesota teacher licensure.

**Exercise Science**

*Health, Physical Education, and Recreation*

**B.A.S.**
The bachelor of applied science (B.A.S.) in exercise science prepares students to move into postgraduate professional programs and occupations in which exercise is a primary or secondary focus. The curriculum offers an opportunity for development of knowledge, skills, abilities, and proficiencies required in such endeavors. Students in this program typically intend to pursue advanced degrees and/or certifications that are required in order to practice professionally in either clinical or nonclinical settings. The curriculum includes (in addition to the UMD liberal education requirements) a core of courses in the basic and applied sciences, the exercise sciences, and related disciplines, and a culminating internship or research experience.

**Admission Requirements**
Refer to CEHSP admission requirements. Students seeking to transfer from outside of UMD or from other UMD academic units must have a minimum GPA of 2.00. All transferring students must meet with the exercise science faculty coordinator before transfer into the major can be approved. Procedural information is available from the CEHSP Student Affairs Office.

**Degree Candidacy**
Students must apply for degree candidacy (upper division) after completing 45 hours of coursework in designated courses and/or liberal education requirements. Courses required to complete degree requirements are determined in consultation with the academic adviser when application for candidacy is made.

**Academic Progress**
A GPA of 2.50 overall and in courses required for the major is required for degree candidacy (upper division) and to graduate. The progress of all students who have accumulated more than 30 hours with less than a 2.50 GPA is reviewed by the Department Scholastic Committee at the end of each semester. Students with a GPA for the semester below the value required to bring their GPA to the graduation standard by the time 120 credits are accumulated are placed on a notification list. Students whose GPA falls below for a second semester are placed on a warning list. Students whose GPA falls below for a third semester may be dismissed from the major, as it is highly unlikely they will meet the standard for graduation from this program. Note that these semesters do not need to be consecutive, as the GPA is cumulative. Each semester the GPA falls below the required value, the more difficult it is to raise the GPA to 2.50 with the remaining program credits.

**Maintenance Standards**
To continue as an exercise science major, students must make satisfactory academic progress; demonstrate acceptable professional performance in their classroom, laboratory, research, and internship experiences; and demonstrate commitment to health-related physical fitness.

**Core Degree Requirements**
Requirements for the B.A.S. in exercise science (120 credits) include:

- UMD liberal education program requirement—courses listed within the major or minor indicated by * may be used to fulfill this requirement
- Advanced writing requirement: Comp 3xxx (3 credits)
- 2.50 GPA both overall and in major courses

**Required Core Courses (all concentrations)**
PE 3470—Sports Nutrition (3)
PEP 3020—Motor Learning (2)
PEP 3030—Human Biomechanics (3)
PEP 3040—Exercise Physiology (3)
PEP 3400—Exercise Testing and Prescription (2)
PEP 4996—Internship (3-12)
or PE 4991—Independent Study (1-4)
Required Courses From Other Programs
Biol 1011*—General Biology I (5)
Chem 1102*—Aspects of Chemistry (4)
Hlth 1470*—Human Nutrition (3)
Hlth 2030—Applied Human Anatomy (4)
Hlth 2040—Principles of Human Physiology (4)
Math 1160*—Finite Mathematics and Introduction to Calculus (5)
Phys 1001*—Introduction to Physics I (5)
Psy 1003*—General Psychology (4)

Note: Students may substitute a higher numbered course with the same designator for this requirement, with approval of their academic adviser. (For example, Chem 1113*—Introduction to General, Organic, and Biological Chemistry I could be substituted for Chem 1102*—Aspects of Chemistry.)

Concentration
Students must select one of the four concentrations described below. Students then choose courses with the PEP or related designators to fulfill the degree credit and content requirements. These courses must be approved in advance by the student’s academic adviser and/or by the exercise science undergraduate program coordinator.

Exit Standards
Students are required to complete an internship (PEP 4996) or senior project (PEP 4991—Independent Study) to meet degree requirements. The nature and amount of the work is dependent on the concentration and is decided in consultation with the academic adviser and/or the exercise science undergraduate program coordinator.

Adult Fitness Concentration
The bachelor of applied science (B.A.S.) in exercise science with a concentration in adult fitness prepares students for professional involvement with clients in clinical, commercial, corporate, and service agency fitness and health programs. The curriculum prepares students to demonstrate the knowledge, skills, and abilities outlined by the American College of Sports Medicine (ACSM) for professionals in clinical and health-related programs. Completion of the degree program does not ensure ACSM certification.

Degree Requirements
• Core degree course requirements
• UMD liberal education and composition requirements
• Final project requirement

Adult Fitness Concentration—Required Courses: Students select, with approval by the academic adviser, a variety of courses with PEP and related designators. These courses, when combined with all other degree and University requirements, must total at least 120 credits. In general, the concentration consists of courses with the PEP, Hlth, and Psy designators.

Athletic Training Concentration
The bachelor of applied science (B.A.S.) in exercise science with a concentration in athletic training prepares students for taking the National Athletic Trainer’s Association (NATA) certification exam and/or for admission to graduate programs in athletic training. The required curriculum includes a liberal education background, a core of basic and applied sciences, athletic training skills and procedures, courses in the exercise science subdisciplines, and an internship in a clinical and/or sport setting. This area of study is primarily for students who intend to pursue certification or advanced degrees in athletic training.

Degree Requirements
• Core degree course requirements
• UMD liberal education and composition requirements
• Final project requirement

Athletic Training Concentration—Required Courses: Students select, with approval by the academic adviser, a variety of courses with PEP and related designators. These courses, when combined with all other degree and University requirements, must total at least 120 credits. In general, this concentration consists of courses with the PEP designator.

Exercise Science Concentration
The bachelor of applied science (B.A.S.) in exercise science with a concentration in exercise science prepares students for admission to graduate programs in exercise science (biomechanics, exercise physiology, sports psychology), the health professions (including medicine, physician assistant, occupational and physical therapy), and clinically applied professions such as athletic training and cardiac rehabilitation. The required curriculum includes a liberal education background, a core of basic and applied sciences, courses in the exercise science subdisciplines, and either a senior project or an internship in a sport, exercise, educational, or public service/workplace setting. This area of study is primarily for students who intend to pursue advanced degrees in an exercise science specialization or to seek admission to a professional program in the health sciences.
Degree Requirements
- Core degree course requirements
- UMD liberal education and composition requirements
- Final project requirement

Exercise Science Concentration—Required Courses: Students select, with approval by the academic adviser, a variety of courses with PEP and related designators. These courses, when combined with all other degree and University requirements, must total at least 120 credits. In general, this concentration consists of courses with the PEP, Anat, Biol, Chem, Engr, Phys, and Phsl designators.

Special Area of Interest Concentration
The bachelor of applied science (B.A.S.) in exercise science with a concentration in a special area of interest prepares students for admission to graduate programs in exercise science, the traditional health professions, and clinically allied professions. Special areas of interest fall outside the approved concentrations in adult fitness, athletic training, and exercise science. They are subject to approval by the department Academic Affairs Committee.

The required curriculum includes a liberal education background, a core of basic and applied sciences, courses in the exercise science subdisciplines, and either a senior project or an internship in a sport, exercise, educational, or public service/workplace setting.

This special area of study is primarily for students who intend to pursue advanced degrees in an exercise science specialization or to seek admission to a professional program in the health sciences that falls outside of the preparation given in the other concentrations.

Degree Requirements
- Core degree course requirements
- UMD liberal education and composition requirements
- Final project requirement

Special Area of Interest Concentration—Required Courses: Students select, with approval by the academic adviser and department academic affairs committee, a variety of courses with PEP and related designators. These courses, when combined with all other degree and University requirements, must total at least 120 credits. In general, this concentration consists of courses with the PEP, Anat, Biol, Chem, Engr, Hlth, Phys, Psy, and Soc designators.

Health, Physical Education, and Recreation (HPER)
Professors: Eugene S. Ley; Associate Professors: John R. Keener, Georgia L. Keeney, Edmond F. Lundstrom, Mark E. Nierengarten (department head); Assistant Professors: Donald T. Collins, Donald P. Roach

The mission of the Department of Health, Physical Education, and Recreation is to promote the health and physical development of people throughout life by providing quality instruction to support the education and professional development of undergraduate students.

The department offers degrees in exercise science, health education, physical education, and recreation. Within these programs are a variety of majors, minors, certifications, and concentrations that give students the knowledge, skill, and attitude to make a valuable contribution in their specific profession. Programs, majors, and certifications are described in alphabetical order in this section of the catalog under these headings: Coaching Minor, Exercise Science (B.A.S.), Health Education (School and Community Options), Physical Education (B.A.S.), and Recreation (B.A.S.). Students should check the admission and graduation requirements for each of the individual programs.

Health Education (Hlth)
Health, Physical Education, and Recreation
B.A.S.

The bachelor of applied science (B.A.S.) in health education prepares graduates to practice in sites such as schools, voluntary health agencies, public health departments, hospitals, corporate work sites, and businesses. Upper division students select an area of concentration in either community health education or school health education. All health educators, regardless of work site, must possess a number of general competencies. The curriculum, therefore, prepares students to assess, plan, implement, deliver, administer, and evaluate health education programs that promote health and prevent disease.
Health Education—Community Health

Admission Requirements
The concentration in community health requires 89-92 credits. All students must apply for admission to upper division after completing the lower division program listed. Students should apply for upper division during the semester in which 45 credits are completed. Students seeking to transfer from other colleges or academic units must have a minimum GPA of 2.00 to transfer into the college. These students should contact the CEHSP Student Affairs Office for procedural information. Students who have completed part or all of an approved program at another institution should contact the faculty coordinator or adviser to find out to what extend their courses meet UMD requirements.

Academic Progress
A GPA of 2.50 overall and in courses required for the major is required for admission to degree candidacy (upper division) and to graduate. The progress of all students who have accumulated more than 30 hours with less than a 2.50 GPA is reviewed by the department scholastic committee at the end of each semester. Students with a GPA for the semester below the value required to bring their GPA to the graduation standard by the time 120 credits are accumulated are placed on a notification list. Students whose GPA falls below for a second semester are placed on a warning list. Students whose GPA falls below for a third semester may be dismissed from the major, as it is highly unlikely they will meet the standard for graduation from this program. Note that these semesters do not need to be consecutive, as the GPA is cumulative. Each semester the GPA falls below the required value, the more difficult it is to raise the GPA to 2.50 with the remaining program credits.

Maintenance Standards
To continue as a health education—community health major, students must make satisfactory academic progress and demonstrate acceptable professional performance in their courses and field experiences.

Degree Requirements
Requirements for the B.A.S. in health education—community health include:

- Major requirements (89-92 credits): Lower and upper division courses (41 credits)—courses are listed in the Class Schedule under Health (Hlth) and Health, Physical Education, and Recreation (HPER), courses required from other programs (27 credits)

The community health concentration (21-24 credits) addresses seven entry-level competencies identified by various national health education organizations: assessing individual and community need for health education; planning effective health education programs; implementing health education programs; evaluating the effectiveness of health education programs; coordinating the provision of health education services; acting as a resource person in health education and community health; and communicating health education needs, concerns, and resources. Students completing this concentration are prepared to take the Certified Health Education Specialist (CHES) exam.

Required Courses
Lower Division (18)
Hlth 1000—Developing Wellness (3)
Hlth 1104—Health Science Terminology (3)
Hlth 1650—CPR (I)
Hlth 1700—Advanced First Aid (3)
Hlth 2030—Applied Human Anatomy (4)
Hlth 2040—Principles of Human Physiology (4)

Upper Division (23)
Hlth 3101—Community Health (3)
Hlth 3115—Consumer Health Education (3)
Hlth 3117—Principles of Sex Education (3)
Hlth 3202—Drug Education (2)
Hlth 3301—Foundations of Health Education (3)
Hlth 3302—Health Education Methods and Materials (3)
HPER 3000—Organization and Administration of Health, Physical Education, and Recreation (3)
HPER 3200—Research and Evaluation in Health and Human Services (3)

Community Health Concentration (21-24)
Hlth 3450—Health Promotion Programming (3)
Hlth 3500—Environmental Health (3)
Hlth 4996—Internship in Health Education (9-12)
Electives from health or other approved areas, numbered 3000 or above (6)

Required Courses From Other Programs (27)
All courses may be used to fulfill UMD liberal education program requirements.
Biol 1001—Biology and Society (4)
Chem 1102—Aspects of Chemistry (3)
Comm 1112—Public Speaking (3)
Educ 1100—Human Diversity (3)
Colleges and Schools

Hlth 1470—Human Nutrition (3)
Psy 1003—General Psychology (4)
Psy 2021—Developmental Psychology (4)
Soc 1101—Introduction to Sociology (3)

Exit Standards
The internship experience introduces undergraduate students to the people and situations they may encounter as a beginning health education professional. Students test classroom theories and techniques and are given responsibilities that help them assess their individual strengths and weaknesses in order to ascertain the most appropriate and desirable entry-level position(s).

The internship experience permits the prospective health educator the opportunity to associate with experienced professional health colleagues in a field situation. The resulting dialogue should enable the future health educator to study firsthand the needs and trends of the field. The internship generally is completed during the senior year after completion of most, if not all, required coursework. The internship may be taken full- or part-time over one or more semesters, to equal 9-12 credits.

Health Education—School Health
Admission Requirements
The concentration in school health requires 100 credits. All students must apply for admission to upper division after completing the lower division program listed. Students should apply for upper division during the semester in which 45 credits are completed. Students seeking to transfer from other colleges or academic units must have a minimum GPA of 2.00 to transfer into the college. These students should contact the CEHSP Student Affairs Office for procedural information.

Academic Progress
A GPA of 2.50 overall and in courses required for the major is required for admission to degree candidacy (upper division) in compliance with NCATE (National Council for Accreditation of Teacher Education) standards and for graduation. The progress of all students who have accumulated more than 30 hours with less than a 2.50 GPA is reviewed by the department scholastic committee at the end of each semester. Students with a GPA for the semester below the value required to bring their GPA to the graduation standard by the time 120 credits are accumulated are placed on a notification list. Students whose GPA falls below for a second semester are placed on a warning list. Students whose GPA falls below for a third semester may be dismissed from the major, as it is highly unlikely they will meet the standard for graduation from this program. Note that these semesters do not need to be consecutive, as the GPA is cumulative. Each semester the GPA falls below the required value, the more difficult it is to raise the GPA to 2.50 with the remaining program credits.

Maintenance Standards
To continue as a health education—school health major, students must make satisfactory academic progress and demonstrate acceptable professional performance in their courses and field experiences.

Personal Liability Insurance
Students must obtain personal liability insurance to protect them while working in public school situations. This usually is obtained most economically by student membership in the Minnesota Education Association. Applications are available in the department office.

Exit Standards
The B.A.S. in health education—school health is offered in conjunction with the Department of Education. Exit standards are published by the Department of Education under Secondary/K-12 Teacher Licensure Requirements.

Degree Requirements
Requirements for the B.A.S. in health education—school health include:

• Liberal education requirements
• Advanced writing requirement: Comp 3140—Advanced Writing: Human Services (3 credits) or other approved advanced composition course
• 2.50 GPA both overall and in major courses
• Major requirements (100 credits):
  • Lower and upper division courses (71 credits)—courses are listed in the Class Schedule under Health (Hlth) and Health, Physical Education, and Recreation (HPER), courses required from other programs (30 credits)

  The school health concentration (29 credits) prepares graduates for teaching at the middle and secondary level (grades 5-12) and meets the Minnesota Board of Teaching licensure requirements as well as program standards of the National Council for Accreditation of Teacher Education (NCATE). Because this concentration is offered in conjunction with the Department of Education, students must meet requirements from the department.
Required Courses

Lower Division (18)
- Hlth 1000—Developing Wellness (3)
- Hlth 1104—Health Science Terminology (3)
- Hlth 1650—CPR (1)
- Hlth 1700—Advanced First Aid (3)
- Hlth 2030—Applied Human Anatomy (4)
- Hlth 2040—Principles of Human Physiology (4)

Upper Division (23)
- Hlth 3101—Community Health (3)
- Hlth 3115—Consumer Health Education (3)
- Hlth 3117—Principles of Sex Education (3)
- Hlth 3202—Drug Education (2)
- Hlth 3301—Foundations of Health Education (3)
- Hlth 3302—Health Education Methods and Materials (3)
- HPER 3000—Organization and Administration of Health, Physical Education, and Recreation (3)
- HPER 3200—Research and Evaluation in Health and Human Services (3)

School Health Education Concentration (29)
- EdSe 3204—General Instructional Methods (3)
- EdSe 3205—Apprenticeship: Middle School (2)
- EdSe 3206—Apprenticeship: Secondary School (2)
- EdSe 4501—Educational Psychology (3)
- EdSe 4600—Student Teaching (12)
- Educ 4381—Teaching American Indian Students (2)
- Educ 4500—Professional Issues in Teaching (3)
- Hlth 5161—School Health Programs: Early Childhood Through Middle School (2)

Required Courses From Other Programs (30)

All courses may be used to fulfill UMD liberal education program requirements.
- Biol 1001—Biology and Society (4)
- Chem 1102—Aspects of Chemistry (3)
- Comm 1112—Public Speaking (3)
- Educ 1100—Human Diversity (3)
- Educ 1101—Education in Modern Society (3)
- Hlth 1470*—Human Nutrition (3)
- Hlth 1650—CPR (1)
- Hlth 1700—Advanced First Aid (3)
- Hlth 2030—Applied Human Anatomy (4)
- Hlth 2040—Principles of Human Physiology (4)
- Psy 1003*—General Psychology (4)
- Psy 2021*—Developmental Psychology (4)

*Courses that may be used to fulfill UMD liberal education program requirements.

Minor Requirements

The minor in health education (44 credits) is for students majoring in other human service professions, interested in learning more about human health and disease prevention, or seeking additional certification for teaching licensure.

Required Courses

Lower Division (26)
- Hlth 1000—Developing Wellness (3)
- Hlth 1470*—Human Nutrition (3)
- Hlth 1650—CPR (1)
- Hlth 1700—Advanced First Aid (3)
- Hlth 2030—Applied Human Anatomy (4)
- Hlth 2040—Principles of Human Physiology (4)
- Psy 1003*—General Psychology (4)
- Psy 2021*—Developmental Psychology (4)

Upper Division (18)
- Hlth 3101—Community Health (3)
- Hlth 3115—Consumer Health Education (3)
- Hlth 3117—Principles of Sex Education (3)
- Hlth 3301—Foundations of Health Education (3)
- Hlth 3302—Health Education Methods and Materials (3)
- HPER 3200—Research and Evaluation in Health and Human Services (3)

Exit Standards

Students must complete a full semester of student teaching (EdSe 4600) in a public school setting at the middle or secondary level.

Students register concurrently for Educ 4500—Professional Issues in Teaching.

Double majors (such as in physical education and health education) are required to student teach in both content areas.

Minor Requirements

The minor in health education (44 credits) is for students majoring in other human service professions, interested in learning more about human health and disease prevention, or seeking additional certification for teaching licensure.

Required Courses

Lower Division (26)
- Hlth 1000—Developing Wellness (3)
- Hlth 1470*—Human Nutrition (3)
- Hlth 1650—CPR (1)
- Hlth 1700—Advanced First Aid (3)
- Hlth 2030—Applied Human Anatomy (4)
- Hlth 2040—Principles of Human Physiology (4)
- Psy 1003*—General Psychology (4)
- Psy 2021*—Developmental Psychology (4)

Upper Division (18)
- Hlth 3101—Community Health (3)
- Hlth 3115—Consumer Health Education (3)
- Hlth 3117—Principles of Sex Education (3)
- Hlth 3301—Foundations of Health Education (3)
- Hlth 3302—Health Education Methods and Materials (3)
- HPER 3200—Research and Evaluation in Health and Human Services (3)

*Courses that may be used to fulfill UMD liberal education program requirements.

Physical Education

Health, Physical Education, and Recreation

Faculty Coordinator: Mark Nierengarten

B.A.S.

The bachelor of applied science (B.A.S.) in physical education is for students preparing for teacher licensure in physical education (K-12). The major meets Minnesota Board of Teaching licensure requirements as well as the program standards of the National Council for the Accreditation of Teacher Education (NCATE) for teaching physical education in grades K-12 in Minnesota.

Academic Progress

A GPA of 2.50 overall and in courses required for the major is required for admission to degree candidacy (upper division) in compliance with NCATE standards and for graduation. The progress of all students who have accumulated more than 30 hours with less than a 2.50 GPA is reviewed by the department scholastic committee at the end of each semester. Students with a GPA for the semester below the value required to bring their GPA to the graduation standard by the time 120 credits are accumulated are placed on a notification

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list. Students whose GPA falls below for a second semester are placed on a warning list. Students whose GPA falls below for a third semester may be dismissed from the major, as it is highly unlikely they will meet the standard for graduation from this program. Note that these semesters do not need to be consecutive, as the GPA is cumulative. Each semester the GPA falls below the required value, the more difficult it is to raise the GPA to 2.50 with the remaining program credits.

**Maintenance Standards**
To continue as a physical education major, students must make satisfactory academic progress, demonstrate acceptable professional performance in their courses and field experiences, and demonstrate commitment to department guidelines for health-related fitness.

**Personal Liability Insurance**
Students are required to obtain personal liability insurance to protect them while they are working in public school situations. Proof of insurance also is required when enrolled in PEP 2071, 3731, and 3970. This usually is obtained most economically by student membership in the Minnesota Education Association. Applications are available in the department office.

**Transfer Students**
Students who have completed part or all of an approved program at another institution should contact the department head to find out to what extent their courses meet UMD requirements.

**Skill Competency**
Students who enroll in Physical Education Professional (PEP) teaching skill courses must demonstrate entrance skill competencies for the course. Descriptions of the entrance skills are available in the physical education office and should be reviewed before enrollment.

**Exit Standards**
The B.A.S. in physical education is offered in conjunction with the Department of Education, which publishes exit standards under “Secondary/K-12 Teacher Licensure Requirements.”

**Degree Requirements**
Requirements for the B.A.S. (130 credits) in physical education include:

- 25 lower division credits within the major, indicated by *, contribute to the University’s liberal education requirement of 35 credits
- Advanced writing requirement: Comp 3140—Advanced Writing: Human Services (3 credits)
- A 2.50 GPA both overall and within major courses
- Major requirements (92):
  - Lower and upper division courses

The department believes that a comprehensive teacher preparation program must develop the knowledge base of prospective teachers. This objective is achieved through exposing students to a properly sequenced physical education teacher preparation program. Courses within the major reflect the guidelines of the National Association for Sports and Physical Education (NASPE) developed for NCATE accreditation. The majority of the courses listed in the program have the prefix PEP, Physical Education Professional. These courses are open only to majors. This allows the faculty to focus on the specific needs and learning objectives of physical education majors.

Teacher preparation programs also must ensure that graduates can demonstrate proficiency in a wide variety of motor skills inherent within the physical education curriculum. Majors must take PEP skill courses. Students who do not have sufficient skill to participate in a PEP skill course will be asked to enroll in a physical education (PE) skill course addressing the same content before enrolling in the PEP course.

Finally, teacher preparation programs must instill in their graduates an ethical set of values regarding the education of atypical learners as well as learners from a broad range of multicultural backgrounds. These values are taught in courses within the major as well as in courses required by the Department of Education. More importantly, these values also are demonstrated by departmental faculty.

**Required Courses**

**Lower Division (32)**
Hlth 1000—Developing Wellness (3)
Hlth 1600—Basic First Aid (2)
Hlth 2030—Applied Human Anatomy (4)
Hlth 2040—Principals of Human Physiology (4)
PE 2240—Lifeguarding Today (1)
PE 2244—Water Safety Instructor (2)
PEP 1000—Teaching Elementary Games and Rhythms (1)
PEP 1002—Teaching Stunts: Tumbling and Apparatus (1)
PEP 1400—Teaching Tennis and Track (1)
PEP 1300—Teaching Ballroom Dance
or PEP 1302—Teaching Folk Dance
or PEP 1304—Teaching Square Dance (1)
PEP 1500—Teaching Cross Country Skiing
or PEP 1504—Teaching Skating (1)
PEP 1600—Teaching Physical Fitness and Weight Training (1)
PEP 1700—Teaching Soccer and Softball (1)
PEP 1710—Teaching Volleyball and Basketball (1)
PEP 2000—Foundations of Physical Education (3)
PEP 2070—Elementary Physical Education Methods and Development (4)
PEP 2071—Clinical Experience: Elementary (1)

Upper Division (28)
CC 3116—Care and Prevention of Sport Injuries (3)
Hith 3202—Drug Education (2)
HPER 3000—Organization and Administration of Health, Physical Education, and Recreation (3)
PEP 3010—Adapted Physical Education (2)
PEP 3020—Motor Learning (2)
PEP 3030—Human Biomechanics (3)
PEP 3040—Exercise Physiology (3)
PEP 3700—Assessment Strategies in School Physical Education (4)
PEP 3730—Secondary Physical Education Methods and Curriculum (4)
PEP 3731—Clinical Experience: Secondary (1)
PEP 3970—Supervised Teaching: College (1)

Required Courses From Other Programs

Lower Division (25)
Biol 1011*—General Biology (5)
Chem 1102*—Aspects of Chemistry (3)
Comp 1120*—College Writing (3)
Educ 1101*—Education and Modern Society (3)
Psy 1003*—General Psychology (4)
Psy 2021*—Developmental Psychology (4)
Soc 1101*—Introduction to Sociology (3)

Upper Division (32)
EdSe 3205—Apprenticeship: Middle School (2)
EdSe 3206—Apprenticeship: Secondary School (2)
EdSe 4100—Human Relations in Classrooms (2)
EdSe 4501—Educational Psychology (3)
EdSe 4600—Student Teaching (6)
EdSe 5120—Philosophy and Organization of Middle Schools (2)
Educ 3412—The Computer in Education (4)
Educ 4381—Teaching American Indian Students (2)
Educ 4500—Professional Issues in Teaching (3)
EllEd 4600—Student Teaching (6)
* Courses that may be used to fulfill UMD liberal education program requirements.

Approved Substitution
Biol 1761—Human Anatomy (4) for Hith 2030—Applied Human Anatomy (4)

Exit Standards
Students must complete a full semester of student teaching in a public school setting. Student teaching is divided equally between elementary (EllEd 4600) and secondary (EdSe 4600) settings. Students register concurrently for Educ 4500—Professional Issues (3) to allow a forum for the discussion of current field practice.

Double majors (such as in physical education and health education) are required to student teach in both content areas.

Psychology (Psy)

Psychology and Mental Health

B.A.S.

Professors: Ajit K. Das, Randall A. Gordon, LeRoy A. McClure, Uwe H. Stuecher; Associate Professors: Helen M. Doane, Aydin Durgumoglu, Eugene E. Grossman (department head), Jane C. Hovland, Robert L. Lloyd, Kristelle E. Miller, Janine Watts, Sandra J. Woolom; Assistant Professors: Kamal S. Gindy, Mark Olson, Donald Streufert; Instructor: Paula Federsen-Randall

The bachelor of applied science (B.A.S.) in psychology provides students with a firm grounding in the methods, history, and content areas of the discipline. Graduates are prepared for graduate study leading to advanced degrees in psychology or for paraprofessional positions requiring some application of research or human service delivery skills. The program core curriculum covers the research methods used in the scientific study of behavior, and surveys theories, findings, and historical applications in a variety of psychology subfields. All students are expected to complete a faculty-supervised independent research project during the design and methodology courses of the core curriculum, applying their methodology training to a topic of their choice. In addition, the core requires some exposure to the natural science, social science, and applied science aspects of the discipline. Students also have the opportunity to focus their study toward either graduate training or paraprofessional positions through their selection of elective courses, independent studies, or field placements in a variety of content areas. Students should consult with faculty advisers to select appropriate elective courses to meet their career goals.

Admission Requirements
Students who wish to pursue the B.A.S. degree in psychology may declare the program as their major at any time providing their cumulative GPA is at least 2.00. Students may declare their
College and Schools

intent to pursue the degree at the CEHSP’s Student Affairs Office. Progress toward completion of degree requirements is continuously tracked by the UMD Registrar’s APAS system.

Honors Requirements
Senior psychology majors with a GPA of at least 3.25 in psychology and 3.00 overall are eligible for departmental honors. Honors work may be completed as an individual honors research project (Psy 3998), as an individual honors application project under the direction of an adviser selected by the student (Psy 3997), by completing an honors seminar (Psy 3985), by completing a successful UROP project, or by receiving a GPA of 3.80 or better in all psychology courses. Eligible students are urged to consult with their adviser or a psychology department faculty member on how they wish to pursue departmental honors before the end of their junior year.

Degree Requirements
Requirements for the B.A.S. (120 credits) in psychology include:

- UMD liberal education program requirement—courses listed within the major or minor indicated by * may be used to fulfill this requirement. However, only courses from outside the Psy prefix may be used. Biol 1001*—Biology and Society (4 credits) must be used to fulfill Category IV.
- Advanced writing requirement: Comp 3xxx (3 credits)
- Major requirements (59 credits):
  - Lower and upper division core (35-39 credits), electives in Psy 3xxx or higher (20-24 credits), 20 credits of Psy 3xxx or higher applied to the B.A.S. must be taken in residence at UMD
  - Elective courses (5 credits)
  - Either a minor program of the student’s choice or 18 additional upper division credits outside the major

Required Courses
Foundation Core (19)
Psy 1003*—General Psychology (4)
Psy 3020—Statistical Methods (4)
Psy 3021—Experimental Design and Methodology (4)
Psy 3022—Applied Methods and Measurement (4)
Psy 3081—History and Systems of Psychology (3)

Natural Science Core—at least one course (4)
Psy 3061—Physiological Psychology (4)
Psy 3611—Learning and Cognition (4)
Psy 3691—Sensation and Perception (4)

Social Science Core—at least three courses (9-12)
Psy 2021*—Developmental Psychology (4)
Psy 2223*—Gender in Society (4)
Psy 3111—Theories of Personality (3)
Psy 3121—Abnormal Psychology (4)
Psy 3201—Social Psychology (3)
Psy 3211—Group Dynamics (3)

Applied Science Core—at least one course (3-4)
Psy 3445—Transpersonal Psychology (3)
Psy 3524—Basic Helping Skills (4)
Psy 3601—Psychology of Personal Development (3)
Psy 3613—Behavior Modification (3)
Psychology Electives—Psy 3xxx or higher (20-24)
* Courses that may be used to fulfill UMD liberal education program requirements.

Exit Standards
Before graduation, all students are required to complete a standardized, objective achievement test of their knowledge of psychology. Test results are treated confidentially by the department and are used to evaluate the effectiveness of the B.A.S. program, not the competencies of the students.

Minor Requirements
The undergraduate minor in psychology provides students with a basic survey of psychological theories and findings and a required emphasis on life span developmental processes. Students must complete 18 credits, including:
Psy 1003*—General Psychology (4)
Psy 2021*—Developmental Psychology (4)
Psy electives 3xxx or higher (10)
At least 8 credits of the minor must be completed in residence at UMD.

Recreation

Health, Physical Education, and Recreation
Faculty Coordinator: Kenneth L. Gilbertson

B.A.S.
The bachelor of applied science (B.A.S.) in recreation prepares students for professional careers in one of two career tracks, or “concentrations.” The first concentration, outdoor education, trains students to work in nonformal outdoor education settings, such as nature centers; city, state, or national parks; and college outdoor programs, or for commercial agencies. The second concentration,
recreational sports programming, provides students with knowledge and skills to work in settings such as city park departments, fitness centers, health clubs, and college recreational sports departments. Core components include program planning and delivery, education methods, physical skills development, management, facilities coordination, evaluation, and principles of recreation. The recreation major is a four-year curriculum including one full semester of field placement in a recreational sport or outdoor educational setting. No minor is required.

This major provides professional training for nontraditional education settings that may not require a teaching license as a prerequisite credential. Refer to the outdoor/environmental education concentration under the teaching biology and teaching earth and space sciences majors for training that includes a teaching licensure.

Admission Requirements
Admission is by application to the Department of Health, Physical Education, and Recreation (HPER). Students are encouraged to apply by the end of their freshman year. Admission to the program requires a 2.50 overall GPA. Enrollment in the senior internship requires an overall GPA of 2.50. The program description includes all requirements for the B.A.S. degree.

Recreation-Outdoor Education
Degree Requirements
Requirements for the B.A.S. in recreation—outdoor education concentration include:
- Liberal education requirements
- Advanced writing requirement: Comp 3140—Advanced Writing: Human Services or Comp 3160—Advanced Writing: Social Sciences (3 credits)
- GPA of 2.50 both overall and in major courses
- Major requirements:
  Lower and upper division courses, including the outdoor education concentration (103 credits), and coursework in education methods, program delivery, evaluation, theories, skills, and principles of recreation management provide the basis for the major

Required Courses
Lower Division Core (25)
Hlth 1620—Wilderness Emergency Care (3)
or Hlth 1700—Advanced First Aid (3)
Hlth 2030—Applied Human Anatomy (4)
Hlth 2040—Principles of Human Physiology (4)
PE 1xxx—Electives (2)
PEP 1xxx—Electives (4)
Rec 1000—Introduction to Recreation (4)
Rec 1203—Outdoor Skills I (2)
Rec 1204—Outdoor Skills II (2)
Upper Division Core (28)
HPER 3100—Risk Management (2)
HPER 3200—Program Evaluation (3)
Rec 3300—Recreation Programming (3)
Rec 3310—Recreation Leadership (2)
Rec 3320—Recreational Sports (3)
Rec 4315—Recreation Management (3)
Rec 4996—Recreation Internship (12)
Outdoor Education Concentration (6)
Rec 3341—Field Interpretive Techniques I (3)
Rec 3342—Field Interpretive Techniques II (3)

Required Courses From Other Programs
Biol 101*—General Biology I (5)
Comm 1112*—Public Speaking (3)
Geog 2306*—Environmental Conservation (3)
Psy 1003*—General Psychology (4)

Outdoor Education Concentration (6)
Educ 4163—Outdoor Education Methods (2)
Psy 3524—Basic Helping Skills (4)

Electives
Approved electives (23):
Biol xxxx—field biology courses
Educ 4601—Wilderness Philosophy (3)
Educ 5165—Theories and Models in Outdoor Education (2)
ES 5001—Environmental Studies Seminar I (4)
Geol 3xxx or 5xxx—field geology courses
HPER 3000—Organization and Administration of Health, Physical Education, and Recreation (3)
PE 3470—Principles of Sports Nutrition (3)
PEP 3020—Motor Learning (2)
Pep 3030—Human Biomechanics (3)
Pep 3040—Physiology of Exercise (3)
Psy 3211—Group Dynamics (3)
Rec 3327—Life Fitness Programs and Events Management (3)
Rec 4991—Independent Study (1-4)
Rec 4992—Readings in Recreation/Leisure (1-4)
Rec 4998—Recreation Seminar (1-3)
* Courses that may be used to fulfill UMD liberal education program requirements.

Exit Standards
Students must complete a full semester (12 credits) of field placement at a pre-approved site. A minimum of 600 contact hours must be completed. Students may complete their internship at a site located locally, nationally, or internationally.
Minor Requirements
Acceptance into the recreation minor—outdoor education concentration (23 credits) requires a minimum GPA of 2.50, plus application to the Department of Health, Physical Education, and Recreation (HPER).

Required Courses
Lower Division Core (12)
Hlth 1620—Wilderness Emergency Care (3)
or
Hlth 1700—Advanced First Aid (3)
PEP 1507—Teaching Outdoor Skills (1)
PEP 1xxx electives (4)
Rec 1000—Introduction to Recreation (4)

Upper Division Core (11)
Rec 3300—Recreation Programming (3)
Rec 4997—Recreation Practicum (2)
HPER 3200—Program Evaluation (3)
Approved upper division Rec electives (4)

Recreational Sports Programming
Degree Requirements
Requirements for the B.A.S. in recreation—recreational sports programming concentration include:
- Liberal education requirements
- Advanced writing requirements: Comp 3140—Advanced Writing: Human Services or Comp 3160—Advanced Writing: Social Sciences (3 credits)
- A GPA of 2.50 both overall and in major courses
- Major requirements (101 credits): Lower and upper division courses including a concentration in recreational sports programming, and coursework in education methods, program delivery, evaluation, theories, skills, and principles of recreation management provide the basis for the major.

Required Courses
Lower Division Core (23)
Hlth 1620—Wilderness Emergency Care (3)
or
Hlth 1700—Advanced First Aid (3)
Hlth 2030—Applied Human Anatomy (4)
Hlth 2040—Principles of Human Physiology (4)
PE 1xxx—Electives (2)
PEP 1xxx electives (4)
Rec 1000—Introduction to Recreation (4)
Rec 1203—Outdoor Skills I (2)

Upper Division Core (30)
HPER 3100—Risk Management (2)
HPER 3200—Program Evaluation (3)
PEP 3020—Motor Learning (2)
PEP 3500—Facilities Management (3)
Rec 3300—Recreation Programming (3)

Exit Standards
Students must complete a full semester (12 credits) of field placement at a pre-approved site. A minimum of 600 contact hours must be completed. Students may complete their internship at a site located locally, nationally or internationally.

Minor Requirements
Acceptance into the recreation minor—recreational sports programming concentration (21-22 credits) requires a minimum GPA of 2.00.

Required Courses
Lower Division Core (11)
Hlth 1620—Wilderness Emergency Care (3)
or
Hlth 1700—Advanced First Aid (3)
PEP 1xxx elective (4)
Rec 1000—Introduction to Recreation (4)

Upper Division Core (11)
Rec 3300—Recreation Programming (3)
Rec 4997—Recreation Practicum (2)
HPER 3200—Program Evaluation (3)
Approved upper division Rec electives (3)
Secondary and K-12 Teacher Education

Students preparing to be licensed to teach in Minnesota secondary schools must complete an approved baccalaureate degree program with one or more majors in a teaching area.

Admission Requirements

Students entering the secondary and K-12 licensure programs are bound by the policies in effect at the time of application to the licensure program. Admission is noncompetitive but based on criteria established by the Department of Education. Admission standards are consistent with Minnesota policies and standards established by the National Council for Accreditation in Teacher Education (NCATE).

To be considered for admission, a student must have a GPA of at least 2.50 overall and in major courses completed at the time of application. Also required is a completed application, passing scores on all sections of the Pre-Professional Skills Test, a current transcript, a personal statement addressing “Why I Want to Be a Teacher,” and a copy of the student’s Academic Progress Audit System (APAS) report. To be considered for student teaching, a student must have maintained a GPA of at least 2.50 overall and in the major and have no grades lower than a C- in courses required for the major. Specific program admission requirements and procedures may be obtained from the Department of Education.

There are alternatives to these established admission procedures to encourage the participation of individuals from underrepresented groups and other students as determined by the department.

Admission to the program is accepted each semester. Applications must be submitted by the end of the third week of the semester before the semester of admission.

Maintenance Standards

To continue as secondary education or K-12 education majors, students must make satisfactory academic progress, demonstrate acceptable professional performance in their field experiences, and demonstrate satisfactory accommodation of any physical or sensory limitations that have been identified in advance as conditions that need to be accommodated to perform the essential elements of the chosen teaching program. Determinations of impairment, accommodation methods, and evaluations are made in consultation among the student, the program adviser, and the Access Center. Students who do not meet these standards may be dropped from the program.

Exit Standards

Before being recommended for licensure, students must demonstrate satisfactory performance outcomes required by the program and have acceptable ratings from both the classroom and University supervisors for student teaching performance.

Personal Liability Insurance

Students must have personal liability insurance to protect them while they are working in public school classrooms. This is usually obtained most economically with a student membership in Education Minnesota. Applications are available in the department office.

Transfer Students

Students who have completed part or all of an approved program at another institution should contact the head of UMD’s Department of Education to find out to what extent their courses meet UMD requirements.

Other Professional Concerns

Forms needed to apply for licensure on completion of an approved program are available in the college’s Student Affairs Office.

Information on obtaining teaching positions is available from the Career Services office in the Campus Center.

Students who already have a baccalaureate degree in a nonteaching major should contact the CEHSP Student Affairs Office for information on obtaining licensure.

Students who desire licensure in special education or other areas should refer to those sections in this catalog.

Other questions about secondary licensure should be directed to the department head.

Secondary and K-12 Teacher Licensure Requirements

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tr>
<td>EdSe 3204</td>
<td>General Instructional Methods</td>
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<tr>
<td>EdSe 3205</td>
<td>Apprenticeship: Middle School</td>
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<td>EdSe 3206</td>
<td>Apprenticeship: Secondary School</td>
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<tr>
<td>EdSe 4100</td>
<td>Human Relations in Classrooms</td>
<td>2</td>
</tr>
<tr>
<td>EdSe 4501</td>
<td>Educational Psychology</td>
<td>3</td>
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<tr>
<td>EdSe 4600</td>
<td>Student Teaching</td>
<td>12</td>
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<tr>
<td>EdSe 5120</td>
<td>Philosophy and Organization of Middle Schools</td>
<td>2</td>
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<tr>
<td>Educ 1101</td>
<td>Education in Modern Society</td>
<td>3</td>
</tr>
<tr>
<td>Educ 3412</td>
<td>Computers in Education</td>
<td>4</td>
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<tr>
<td>Educ 4381</td>
<td>Teaching American Indian Students</td>
<td>2</td>
</tr>
<tr>
<td>Educ 4500</td>
<td>Professional Issues Teaching</td>
<td>3</td>
</tr>
<tr>
<td>Hlth 3202</td>
<td>Drug Education</td>
<td>2</td>
</tr>
</tbody>
</table>
To be permitted to register for student teaching, students must meet the following requirements:

- Grades of C- or better in all courses in the teaching major(s) and minor(s)
- 2.50 GPA both overall and in major courses
- Completion of 85 percent of teaching major courses and 75 percent of teaching minor courses
- Recommendation of special methods instructor(s) and education department head
- Preregistration for student teaching the first week of the preceding semester

Students preparing for secondary school licensure must spend one semester in full-time student teaching in middle and/or senior high school under the supervision of a licensed teacher(s). Students preparing for K-12 licensure must complete part of this assignment in an elementary school. To be recommended for licensure, a minimum of 12 credits must be earned in EdSe 4600. Additional credits may be required for certain major/minor combinations. Student teaching is normally done in the senior year.

See also Teacher Licensure Requirements.

### Social Studies (Elementary School)

#### Minor Only

The social studies (elementary school) minor provides an academic specialty area for those seeking Minnesota teacher licensure for kindergarten through grade six.

#### Requirements (26)

**Anth 1604—Cultural Anthropology (4)**

**Econ 1003—Economics and Society**

**or Econ 1022—Principles of Economics: Macro**

**or Econ 1023—Principles of Economics: Micro (3)**

**Geog 1202—World Regional Geography**

**or Geog 1304—Human Geography (3)**

**Geog 1414—Physical Geography (4)**

**Hist 1304—American Heritage (3)**

**Hist 1305—American Challenges (3)**

**Pol 1011—American Government, Politics (3)**

**Soc 1101—Introduction to Sociology (3)**

### Teaching Communication Arts/Literature

#### B.A.A.

The B.A.A. in teaching communication arts/literature is offered by the Department of Education in conjunction with the Departments of English and Communication. This program is required for students seeking teacher licensure as Minnesota communication arts/literature teachers for grades 5 through 12.

#### Admission Requirements

See admission requirements under Teacher Licensure Requirements.

#### Degree Requirements

Requirements for the B.A.A. in teaching communication arts/literature include:

- Liberal education requirements
- Advanced writing requirement: Comp 3100—Advanced Writing: Language and Literature (3 credits) or Comp 3140—Advanced Writing: Human Services (3 credits) or Engl 3115—Writing Fiction (4 credits) or Engl 3121—Writing Poetry (4 credits) or Engl 5116—Advanced Writing of Fiction (4 credits) or Engl 5122—Advanced Writing of Poetry (4 credits)
- Major requirements (101 credits)

#### Required Courses

**Lower Division (18)**

**Comm 1112*—Public Speaking (3)**

**Comm 1222*—Interpersonal Communication (3)**

**Comm 1500*—Media and Society (3)**

**Educ 1101*—Education in Modern Society (3)**

**Engl 1582*—Introduction to World Literature (3)**

**Ling 1811*—Introduction to Language (3)**

**Upper Division (83)**

**British period course (4)**

**Comm 5725—Teaching Methods in Communication (3)**

**Educ 3412—Computers in Education (4)**

**Educ 4381—Teaching American Indian Students (2)**

**Educ 4500—Professional Issues in Teaching (3)**

**EdSe 3204—General Instructional Methods (3)**

**EdSe 3205—Apprenticeship: Middle School (2)**

**EdSe 3206—Apprenticeship: Secondary School (2)**

**EdSe 4100—Human Relations in Classrooms (2)**

**EdSe 4501—Educational Psychology (3)**

**EdSe 4600—Student Teaching (12)**

**EdSe 5120—Counseling and Organization of Middle Schools (2)**

**EdSe 5215—Teaching Reading and Literature: Grades 5-12 (5)**
### Teaching Earth Sciences

**Adviser:** Boman (Education)

#### B.A.S.

The B.A.S. in teaching earth sciences is offered by the Department of Education in conjunction with the Department of Geology and is for students who plan to teach earth sciences in grades 5 through 12.

#### Admission Requirements

See admission requirements under Teacher Licensure Requirements.

#### Degree Requirements

The Minnesota Board of Teaching currently is revising the science teaching licensure requirements. Please see the Department of Education for revisions in this major.

#### Requirements for the B.A.S. in teaching earth sciences include:

- Liberal education requirements
- Advanced writing requirements: Comp 3140—Advanced Writing: Human Services (3 credits)
- Major requirements (96-97 credits):
  - Lower division coursework (36 credits), upper division coursework (60-61 credits)

#### Required Courses

**Lower Division (36)**

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<tr>
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<th>Course Title</th>
<th>Credits</th>
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<tr>
<td>Ast 1040*</td>
<td>Introductory Astronomy</td>
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<tr>
<td>Biol 1011*</td>
<td>General Biology I</td>
<td>5</td>
</tr>
<tr>
<td>Chem 1151*</td>
<td>General Chemistry I</td>
<td>5</td>
</tr>
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<td>Educ 1101*</td>
<td>Education in Modern Society</td>
<td>3</td>
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<tr>
<td>Geog 1414*</td>
<td>Physical Geography</td>
<td>4</td>
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<tr>
<td>Geol 1110*</td>
<td>Introductory Geology</td>
<td>3</td>
</tr>
<tr>
<td>Geol 2300*</td>
<td>Basic Mineralogy and Petrology</td>
<td>4</td>
</tr>
<tr>
<td>Math 1250*</td>
<td>Precalculus Analysis</td>
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<td>Phys 1001*</td>
<td>Introduction to Physics</td>
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**Upper Division (60-61)**

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<th>Course Title</th>
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<tbody>
<tr>
<td>Educ 3412</td>
<td>The Computer in Education</td>
<td>4</td>
</tr>
<tr>
<td>Educ 4234</td>
<td>Science, Technology, and Society</td>
<td>3</td>
</tr>
<tr>
<td>Educ 4381</td>
<td>Teaching American Indian Students</td>
<td>2</td>
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<tr>
<td>Educ 4500</td>
<td>Professional Issues in Teaching</td>
<td>3</td>
</tr>
<tr>
<td>EdSe 3204</td>
<td>General Instructional Methods</td>
<td>3</td>
</tr>
<tr>
<td>EdSe 3205</td>
<td>Apprenticeship: Middle School</td>
<td>2</td>
</tr>
<tr>
<td>EdSe 3206</td>
<td>Apprenticeship: Secondary School</td>
<td>2</td>
</tr>
<tr>
<td>EdSe 4100</td>
<td>Human Relations in Classrooms</td>
<td>3</td>
</tr>
<tr>
<td>EdSe 4255</td>
<td>Teaching Science: Grades 5-12</td>
<td>3</td>
</tr>
<tr>
<td>EdSe 4501</td>
<td>Educational Psychology</td>
<td>3</td>
</tr>
<tr>
<td>EdSe 4600</td>
<td>Student Teaching</td>
<td>12</td>
</tr>
<tr>
<td>EdSe 5120</td>
<td>Philosophy and Organization of Middle</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Schools</td>
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<tr>
<td>Geog 3401</td>
<td>Weather and Climate</td>
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<tr>
<td>Geol 2210</td>
<td>Geomorphology</td>
<td>3</td>
</tr>
<tr>
<td>Geol 2410</td>
<td>Geology of North America</td>
<td>2</td>
</tr>
<tr>
<td>Geol 2610</td>
<td>Oceanography</td>
<td>3</td>
</tr>
<tr>
<td>Geol 4110</td>
<td>Advanced Earth Science for Teachers</td>
<td>2</td>
</tr>
<tr>
<td>Geol elective 2xxx or above</td>
<td>3-4</td>
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</tr>
<tr>
<td>Hlth 3202</td>
<td>Drug Education</td>
<td>2</td>
</tr>
</tbody>
</table>

* Courses that may be used to fulfill UMD liberal education program requirements.

#### Exit Standards

Students must successfully complete a semester of student teaching and must meet other competencies required for Minnesota teacher licensure.

#### Minor Requirements (49-50)

Effective August 1, 2001, the state of Minnesota will no longer permit secondary teachers to teach in the area of their minor. Teachers must have completed all requirements for a major in order to be licensed to teach in Minnesota at the high school level.
Lower Division
Ast 1040*—Introductory Astronomy (3)
Biol 1011*—General Biology I (5)
Chem 1113*—Introduction to General, Organic, and Biological Chemistry I (5)
Geog 1414*—Physical Geography (4)
Geol 1110*—Introductory Geology (3)
Math 1250*—Precalculus Analysis (4)
Phys 1001*—Introduction to Physics I (5)

Upper Division
Educ 3412—The Computer in Education (4)
Educ 4234—Science, Technology, Society (3)
EdSe 4255—Teaching Secondary Science: Grades 5-12 (3)
Geog 3401—Weather and Climate (4)
Geol 2300—Basic Mineralogy and Petrology (4)
Geol 2410—Geology of North America (2)
or
Geol 2610*—Oceanography (3)

* Courses that may be used to fulfill UMD liberal education program requirements.

Teaching Earth Sciences—Outdoor Education
The B.A.S. in teaching earth sciences is offered by the Department of Education in conjunction with the Department of Geology. This major is for students who plan to teach earth sciences in grades 5-12. Students have the option of also completing the outdoor/environmental education concentration with this major. This concentration prepares students for careers in outdoor education for work in outdoor learning centers, parks, nature preserves, or commercial programs. Students learn to interpret natural and cultural phenomena in the outdoors. This concentration must be taken in conjunction with the teaching biology or teaching earth sciences majors. A student in this concentration must meet the same GPA requirements as for the major. The concentration is noted on the student’s diploma.

Admission Requirements
See admissions requirements under Teacher Licensure Requirements.

Degree Requirements
The Minnesota Board of Teaching currently is revising the science teaching licensure requirements. Please see the Department of Education for revisions in this major.

Requirements for the B.A.S. in teaching earth sciences-outdoor/environmental education include:
- Liberal education requirements
- Advanced writing requirement: Comp 3140—Advanced Writing: Human Services (3 credits)
- Major requirements (130-132 credits):
  - Lower division coursework (36 credits), upper division coursework (60-61 credits), optional outdoor/environmental education concentration coursework (35 credits)

Required Courses
Lower Division (36)
Ast 1040*—Introduction to Astronomy (3)
Biol 1011*—General Biology I (5)
Chem 1151*—General Chemistry I (5)
Educ 1101*—Education in Modern Society (3)
Geog 1414*—Physical Geography (4)
Geol 1110*—Introductory Geology (3)
Geol 2300—Basic Mineralogy and Petrology (4)
Math 1250*—Precalculus Analysis (4)
Phys 1001*—Introduction to Physics I (5)

Upper Division (60-61)
Educ 3412—The Computer in Education (4)
Educ 4234—Science, Technology, Society (3)
Educ 4381—Teaching American Indian Students (2)
Educ 4500—Professional Issues in Teaching (3)
EdSe 3204—General Instructional Methods (3)
EdSe 3205—Apprenticeship: Middle School (2)
EdSe 3206—Apprenticeship: Secondary School (2)
EdSe 4100—Human Relations in Classrooms (2)
EdSe 4255—Teaching Science: Grades 5-12 (3)
EdSe 4501—Educational Psychology (3)
EdSe 4600—Student Teaching (12)
EdSe 5120—Philosophy and Organization of Middle Schools (2)
Geog 3401—Weather and Climate (4)
Geol 2210—Geomorphology (3)
Geol 2410—Geology of North America (2)
Geol 2610*—Oceanography (3)
Geol 4110—Advanced Earth Science for Teachers (2)
Geol elective 2xxx or above (3-4)
Hlth 3202—Drug Education (2)

Required Courses From Other Programs
Requirements (35 credits) for the optional outdoor/environmental education concentration:
Art 1002*—Introduction to Art
or
Art 1600—Photography I (3)
Educ 2605—Introduction to Environmental Education (2)
Educ 4163—Outdoor Education Methods (2)
Educ 4601—Wilderness Philosophy (2)
Educ 5600—Practicum in Education (6)
Geog 2306*—Environmental Conservation (3)
Hlth 1700—Advanced First Aid (3)
or
Hlth 1620—Wilderness Emergency Care (3)
Rec 1201—Outdoor Skills I (2)
Rec 1202—Outdoor Skills II (2)
Three credits (3) from the following six courses:
PE 1500—Cross-Country Skiing (1)
PE 1506—Sailing (1)
Education and Human Service Professions

Teaching French

B.A.A.
The B.A.A. in teaching French is offered through the Department of Education in conjunction with the Department of Foreign Languages and Literatures. This major prepares students for licensure as a French teacher from kindergarten through grade 12.

Admission Requirements
See admission requirements under Teacher Licensure Requirements.

Degree Requirements
Requirements for the B.A.A. in teaching French include:

- Liberal education requirements
- Students are encouraged to take Engl 1907—Introduction to Literature for liberal education credit (Category 9), Psy 2021—Developmental Psychology for liberal education credit (Category 6), and Comm 2929—Intercollegiate Communication for liberal education credit (Category 8). French majors and minors are exempted from the campus-wide requirement for international perspectives courses.
- Advanced writing requirement: Comp 3140—Intro to Advanced Writing: Human Services (3 credits)
- Major requirements (83 credits)

Course requirements as listed below. Study abroad is strongly encouraged. Students also complete a series of education courses in the Department of Education designed to meet the requirements for Minnesota teacher licensure, including a full semester of student teaching. Students must pass the oral proficiency exam, maintain a 3.00 GPA in French courses taken, complete the education courses and Lang 4044, and have the permission of the French faculty and the Department of Education before being placed for their student teaching experience.

The core program in language skills (listening, speaking, reading, writing) is common to all majors and minors in French. Students may be exempted from part or all of the core program requirements if they have previously completed French language coursework. Exemptions are determined by the Department of Foreign Languages and Literatures, based on acceptance of transfer credits and personal interviews. Generally students complete the advanced French
language course (Fr 2301) before enrolling in upper division French courses in literature, culture, and teaching methodology.

**Required Courses**

**Lower Division (23)**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Educ 1101*</td>
<td>Education in Modern Society (3)</td>
</tr>
<tr>
<td>Fr 1101*</td>
<td>Beginning French I (4)</td>
</tr>
<tr>
<td>Fr 1102*</td>
<td>Beginning French II (4)</td>
</tr>
<tr>
<td>Fr 1201*</td>
<td>Intermediate French I (4)</td>
</tr>
<tr>
<td>Fr 1202*</td>
<td>Intermediate French II (4)</td>
</tr>
<tr>
<td>Fr 2301*</td>
<td>Advanced French (4)</td>
</tr>
</tbody>
</table>

**Upper Division (60)**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Educ 3412</td>
<td>The Computer in Education (4)</td>
</tr>
<tr>
<td>Educ 4500</td>
<td>Professional Issues in Teaching (3)</td>
</tr>
<tr>
<td>EdSe 3204</td>
<td>General Instructional Methods (3)</td>
</tr>
<tr>
<td>EdSe 3205</td>
<td>Apprenticeship: Middle School (2)</td>
</tr>
<tr>
<td>or EIEd 3425</td>
<td>Collateral Fields: Field Experiences (2)</td>
</tr>
<tr>
<td>EdSe 3206</td>
<td>Apprenticeship: Secondary School (2)</td>
</tr>
<tr>
<td>EdSe 4100</td>
<td>Human Relations in Classrooms (2)</td>
</tr>
<tr>
<td>EdSe 4600</td>
<td>Student Teaching (12)</td>
</tr>
<tr>
<td>EdSe 5120</td>
<td>Philosophy and Organization of Middle Schools (2)</td>
</tr>
<tr>
<td>EIEd 3113</td>
<td>Learning Environments and Diverse Learning Communities (4)</td>
</tr>
<tr>
<td>Hlth 3202</td>
<td>Drug Education (2)</td>
</tr>
<tr>
<td>Lang 4044</td>
<td>Language Teaching Methods (4)</td>
</tr>
<tr>
<td>Upper division French courses (20), including one culture course taught in French</td>
<td></td>
</tr>
</tbody>
</table>

Some of the upper division French courses may be transferred from another college or earned abroad, but at least two courses must be taken at UMD.

* Courses that may be used to fulfill UMD liberal education program requirements.

**Exit Standards**

Students must successfully complete an oral proficiency exam administered by the Department of Foreign Languages and Literatures.

Students must also successfully complete a semester of student teaching and meet other competencies required for Minnesota teacher licensure.

**Minor Requirements (32)**

Effective August 1, 2001, the state of Minnesota will no longer permit secondary teachers to teach in the area of their minor. Teachers must have completed all requirements for a major in order to be licensed to teach in Minnesota at the high school level.

Students with a major in elementary/ middle school education who complete this minor will be licensed to teach in this area for grades K-8.

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### Teaching German

**B.A.A.**

The B.A.A. in teaching German is offered through the Department of Education in conjunction with the Department of Foreign Languages and Literatures. This major prepares students to teach German from kindergarten through grade 12.

**Admission Requirements**

See admission requirements under Teacher Licensure Requirements.

**Degree Requirements**

Requirements for the B.A.A. in teaching German include:

- Liberal education requirements
- Students are encouraged to take Engl 1907—Introduction to Literature for liberal education credit (Category 9), Psy 2021—Developmental Psychology for liberal education credit (Category 6), and Comm 2929—Intercultural Communication for liberal education credit (Category 8). German majors and minors are exempted from the campus-wide requirement for international perspectives courses.
- Advanced writing requirement: Comp 3140—Advanced Writing: Human Services (3 credits)
- Major requirements (83 credits)

Course requirements as listed below. Study abroad is strongly encouraged. Students also complete a series of education courses in the Department of Education designed to meet the requirements for Minnesota teacher licensure, including a full semester of student teaching. Students must pass the oral proficiency exam, maintain a 3.00 GPA in German courses taken, complete the education courses and Lang 4044, and have the permission of the German faculty and the Department of Education before being placed for their student teaching experience.
The core program in language skills (listening, speaking, reading, writing) is common to all majors and minors in German. Students may be exempted from part or all of the core program requirements if they have previously completed German language coursework. Exemptions are determined by the Department of Foreign Languages and Literatures, based on acceptance of transfer credits and personal interviews. Generally students complete the advanced German language course (Ger 2301) before enrolling in upper division German courses in literature, culture, and teaching methodology.

Required Courses

**Lower Division (23)**
- Educ 1101*—Education in Modern Society (3)
- Ger 1101*—Beginning German I (4)
- Ger 1102*—Beginning German II (4)
- Ger 1201*—Intermediate German I (4)
- Ger 1202*—Intermediate German II (4)
- Ger 2301*—Advanced German (4)

**Upper Division (60)**
- Educ 3412—The Computer in Education (4)
- Educ 4500—Professional Issues in Teaching (3)
- EdSe 3204—General Instructional Methods (3)
- EdSe 3205—Apprenticeship: Middle School (2)
- or 
- EIEd 3425—Collateral Fields: Field Experiences (2)
- EdSe 3206—Apprenticeship: Secondary School (2)
- EdSe 4100—Human Relations in Classrooms (2)
- EdSe 4600—Student Teaching (12)
- EdSe 5120—Philosophy and Organization of Middle Schools (2)
- EIEd 3113—Learning Environments and Diverse Learning Communities (4)
- Hlth 3202—Drug Education (2)
- Lang 4044—Language Teaching Methods (4)

Some of the upper division German courses may be transferred from another college or earned abroad, but at least two courses must be taken at UMD.

* Courses that may be used to fulfill UMD liberal education program requirements.

Exit Standards

Students must successfully complete an oral proficiency exam administered by the Department of Foreign Languages and Literatures.

Students must also successfully complete a semester of student teaching and meet other competencies required for Minnesota teacher licensure.

**Minor Requirements (32)**
Effective August 1, 2001, the state of Minnesota will no longer permit secondary teachers to teach in the area of their minor. Teachers must have completed all requirements for a major in order to be licensed to teach in Minnesota at the high school level.

Students with a major in elementary/middle school education who complete this minor will be licensed to teach in this area from grades K-8.

- Ger 1101*—Beginning German I (4)
- Ger 1102*—Beginning German II (4)
- Ger 1201*—Intermediate German I (4)
- Ger 1202*—Intermediate German II (4)
- Ger 2301*—Advanced German (4)
- Lang 4044—Language Teaching Methods (4)

**Upper division German courses (8)**
A student minoring in teaching German must pass an oral proficiency exam in German, which may be repeated until successful completion is achieved.

* Courses that may be used to fulfill UMD liberal education program requirements.

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**Teaching Life Science**

Adviser: Boman (Education)

**B.A.S.**
The B.A.S. in teaching life science is offered by the Department of Education in conjunction with the Department of Biology. This major is for students who intend to teach biology in grades 5-12.

**Admission Requirements**
See admissions requirements under Teacher Licensure Requirements.

**Degree Requirements**
Requirements for the B.A.S. in teaching life science include:

- Liberal education requirements
- Advanced writing requirement: Comp 3140—Advanced Writing: Human Services (3 credits)
- Major requirements (97-101 credits):
  - Lower division coursework (54-58 credits), upper division coursework (43 credits)

**Required Courses**

**Lower Division (54-58)**
- Biol 1011*—General Biology I (5)
- Biol 1012—General Biology II (5)
- Biol 1761—Human Anatomy
- or 
- Biol 4767—Comparative Anatomy of Vertebrates (4)
- Biol 2101—Cell Biology (3)
- Biol 2201—Genetics (3)
Biol 2801—General Ecology (3)
Biol 2802—Ecology Laboratory (2)
Chem 1113*—Introduction to General, Organic, and Biological Chemistry I (5)
  and Chem 1114—Introduction to General, Organic, and Biological Chemistry II (5)
or Chem 1151*—General Chemistry I (5)
  and Chem 1152—General Chemistry II (5)
  and Chem 2521—Organic Chemistry I (4)
Educ 1101*—Education in Modern Society (3)
Geol 1110*—Introductory Geology (3)
Hlth 2040—Principles of Human Physiology (4)
Math 1250*—Precalculus Analysis (4)
Phys 1001*—Introduction to Physics I (5)

Upper Division (43)
Educ 3412—The Computer in Education (4)
Educ 4234—Science, Technology, and Society (3)
Educ 4381—Teaching American Indian Students (2)
Educ 4500—Professional Issues in Teaching (3)
EdSe 3204—General Instructional Methods (3)
EdSe 3205—Apprenticeship: Middle School (2)
EdSe 3206—Apprenticeship: Secondary School (2)
EdSe 4100—Human Relations in Classrooms (2)
EdSe 4255—Teaching Science: Grades 5-12 (3)
EdSe 4501—Educational Psychology (3)
EdSe 4600—Student Teaching (12)
EdSe 5120—Philosophy and Organization of Middle Schools (2)
Hlth 3202—Drug Education (2)
* Courses that may be used to fulfill UMD liberal education program requirements.

Exit Standards
Students must successfully complete a semester of student teaching and meet other competencies required for Minnesota teacher licensure.

Minor Requirements (52-53)
Effective August 1, 2001, the state of Minnesota will no longer permit secondary teachers to teach in the area of their minor. Teachers must have completed all requirements for a major in order to be licensed to teach in Minnesota at the high school level.

Required Courses
Lower Division
Biol 1011*—General Biology I (5)
Biol 1012—General Biology II (5)
Biol 2201—Genetics (3)
Biol 2801—General Ecology (3)
Chem 1113*—Introduction to General, Organic, and Biological Chemistry I (5)
Geol 1110*—Introductory Geology (3)
Geol 2300—Basic Mineralogy and Petrology (4)
Geol 2410—Geology of North America (2)
or Geol 2610*—Oceanography (3)
Math 1250*—Precalculus Analysis (4)
Phys 1001*—Introduction to Physics I (5)

Upper Division
Biol—Electives 3xxx or above (3)
Educ 3412—The Computer in Education (4)
Educ 4234—Science, Technology, and Society (3)
EdSe 4255—Teaching Science: Grades 5-12 (3)
* Courses that may be used to fulfill UMD liberal education program requirements.

Teaching Life Science-Outdoor Education
This concentration prepares students for careers in outdoor education for work in outdoor learning centers, parks, nature preserves, or commercial programs. Students learn to interpret natural and cultural phenomena in the outdoors. This concentration must be taken in conjunction with the teaching biology or teaching earth sciences majors. A student in this concentration must meet the same GPA requirements as for the major. The concentration is noted on the student’s diploma.

Admission Requirements
See admissions requirements under Teacher Licensure Requirements.

Degree Requirements
Requirements for the B.A.S. in teaching life science-outdoor education include:
• Liberal education requirements
• Advanced writing requirement: Comp 3140—Advanced Writing: Human Services (3 credits)
• Major requirements (132-136 credits):
  Lower division coursework (54-58 credits),
  upper division coursework (43 credits),
  required courses for optional outdoor/environmental education concentration (35 credits)

Required Courses
Lower Division (54-58)
Biol 1011*—General Biology I (5)
Biol 1012—General Biology II (5)
Biol 2101—Cell Biology (3)
Biol 2201—Genetics (3)
Biol 1761—Human Anatomy
or Biol 4767—Comparative Anatomy of Vertebrates (4)
Biol 2801—General Ecology (3)
Biol 2802—Ecology Laboratory (2)
Chem 1113*—Introduction to General, Organic, and Biological Chemistry I
   and Chem 1114—Introduction to General, Organic, and Biological Chemistry II (10)
or
   Chem 1151*—General Chemistry I
   and Chem 1152—General Chemistry II (10)
   and Chem 2521—Organic Chemistry I (4)
Educ 1101*—Education in Modern Society (3)
Geol 1110*—Introductory Geology (3)
Hlth 1250*—Precalculus Analysis (4)
Phys 1001*—Introduction to Physics I (5)

Upper Division (43)
Educ 3412—The Computer in Education (4)
Educ 4234—Science, Technology, and Society (3)
Educ 4500—Issues in Global Ecology (3)
EdSe 3204—General Instructional Methods (3)
EdSe 3205—Apprenticeship: Middle School (2)
EdSe 3206—Apprenticeship: Secondary School (2)
EdSe 4010—Human Relations in Classrooms (2)
EdSe 4255—Teaching Science: Grades 5-12 (3)
EdSe 4501—Educational Psychology (3)
EdSe 4600—Student Teaching (12)
EdSe 5120—Philosophy and Organization of Middle Schools (2)
Hlth 3202—Drug Education (2)

* Courses that may be used to fulfill UMD liberal education program requirements.

Electives
Requirements (35 credits) for the outdoor education concentration:
Art 1002*—Introduction to Art
   or
   Art 1600—Photography I (3)
Educ 2605—Introduction to Environmental Education (2)
Educ 4163—Outdoor Education Methods (2)
Educ 4601—Wilderness Philosophy (2)
Educ 5600—Practicum in Education (6)
Geog 2306*—Environmental Conservation (3)
Hlth 1620—Wilderness Emergency Care (3)
or
   Hlth 1700—Advanced First Aid (3)
Rec 1201—Outdoor Skills I (2)
Rec 1202—Outdoor Skills II (2)

Three credits (3) from the following six courses:
PE 1500—Cross-Country Skiing (1)
PE 1506—Sailing (1)
PE 1507—Flatwater Kayaking (1)
PE 1508—Flatwater Canoeing (1)
PE 1512—Fishing Skills (1)
PE 2240—Lifeguarding Today (1)

Seven credits (7) from the following: **
Biol 2803*—Issues in Global Ecology (3)
Biol 3603—Plant Taxonomy (3)
Biol 4701—Invertebrate Biology (4)
Biol 4731—Entomology (3)
Biol 4761—Ichthyology (4)
Biol 4763—Ornithology (3)
Biol 5833—Stream Ecology (4)
Biol 5861—Lake Ecology (3)

* Courses that may be used to fulfill UMD liberal education program requirements.

** For teaching biology majors, these 7 credits may also satisfy a portion of the electives for the major field requirement.

Exit Standards
Students must successfully complete a student teaching experience and meet other competencies required for Minnesota teacher licensure.

Teaching Mathematics

Faculty Coordinator: Pagnucco

B.A.S.
The B.A.S. in teaching mathematics is offered by the Department of Education in conjunction with the Department of Mathematics and Statistics. This major is for students who plan to teach mathematics in grades 5-12.

Admission Requirements
See admission requirements under Teacher Licensure Requirements.

Degree Requirements
Requirements for the B.A.S. in teaching mathematics include:
- Liberal education requirements
- Advanced writing requirement: Comp 3140—Advanced Writing: Human Services
   or Comp 3150—Advanced Writing: Science (3 credits)
- Major requirements (97 credits):
  Lower division coursework (18 credits), upper division coursework (79 credits)

Required Courses
Lower Division (18)
CS 1511*—Computer Science I (5)
Educ 1101*—Education in Modern Society (3)
Math 1296*—Calculus I (5)
Math 1297—Calculus II (5)

Upper Division (79)
Educ 3412—The Computer in Education (4)
Educ 4381—Teaching American Indian Students (2)
Educ 4500—Issues in Global Ecology (3)
EdSe 3204—General Instructional Methods (3)
EdSe 3205—Apprenticeship: Middle School (2)
EdSe 3206—Apprenticeship: Secondary School (2)
EdSe 4010—Human Relations in Classrooms (2)
EdSe 4222—Teaching Mathematics: Grades 5-12 (4)
EdSe 4501—Educational Psychology (3)
EdSe 4600—Student Teaching (12)
EdSe 5120—Philosophy and Organization of Middle Schools (2)
Hlth 3202—Drug Education (2)
Math 3110—Foundations of Mathematics and Geometry (5)
Math 3280—Differential Equations with Linear Algebra (4)
Math 3299—Intermediate Analysis (3)
Math 3355—Discrete Mathematics (4)
Math 3941—Undergraduate Colloquium (1)
Math 5371—Abstract Algebra I (3)
Stat 3611—Introduction to Probability and Statistics (4)
Electives at the 3xxx-4xxx level (13)
* Courses that may be used to fulfill UMD liberal education program requirements.

Exit Standards
Students must successfully complete a semester of student teaching and meet other competencies required for Minnesota teacher licensure.

Minor Requirements (24-26)
Effective August 1, 2001, the state of Minnesota will no longer permit secondary teachers to teach in the area of their minor. Teachers must have completed all requirements for a major in order to be licensed to teach in Minnesota at the high school level.

Students with a major in elementary/middle school education who complete this minor are licensed to teach in this area for grades K-8.

Required Courses
Lower Division
Math 1160*—Finite Mathematics and Introduction to Calculus (5)
and Math 1250—Precalculus Analysis (4)
or Math 1296*—Calculus I (5)
and Stat 3611—Introduction to Probability and Statistics (4)
Stat 1411—Introduction to Statistics (3)

Upper Division
EdSe 4222—Teaching Mathematics: Grades 5-12 (4)
or other mathematics methods course approved by adviser
Math 3110—Foundations of Mathematics and Geometry (5)
Math 3280—Differential Equations with Linear Algebra (4)
* Courses that may be used to fulfill UMD liberal education program requirements.

Teaching Physical Sciences

Adviser: Boman (Education)

B.A.S.
The B.A.S. in teaching physical sciences is offered by the Department of Education in conjunction with the Departments of Chemistry and Physics. This major prepares students to teach physical sciences, chemistry, and physics in grades 5 through 12.

Admission Requirements
See admissions requirements under Teacher Licensure Requirements.

Degree Requirements
The Minnesota Board of Teaching currently is revising the science teaching licensure requirements. Please see the Department of Education for revisions in this major.

Requirements for the B.A.S. in teaching physical sciences include:
- Liberal education requirements
- Advanced writing requirement: Comp 3140—Advanced Writing: Human Services (3 credits)
- Major requirements (91-92 credits):
  - Lower division coursework (38 credits),
  - upper division coursework (53-54 credits)

Required Courses
Lower Division (38)
Chem 1151*—General Chemistry I (5)
Chem 1152—General Chemistry II (5)
Educ 1101*—Education in Modern Society (3)
Math 1296*—Calculus I (5)
Phys 1201*—Mechanics (4)
Phys 1202—Heat and Electricity (4)
Phys 1203—Magnetism, Waves, and Optics (4)
Chem 2222—Quantitative Analysis (4)
Chem 2521—Organic Chemistry I (4)

Upper Division (53-54)
Educ 3412—The Computer in Education (4)
Educ 4234—Science, Technology, and Society (3)
Educ 4381—Teaching American Indian Students (2)
Educ 4500—Professional Issues in Teaching (3)
EdSe 3204—General Instructional Methods (3)
EdSe 3205—Apprenticeship: Middle School (2)
EdSe 3206—Apprenticeship: Secondary School (2)
EdSe 4100—Human Relations in Classrooms (2)
EdSe 4255—Teaching Science: Grades 5-12 (3)
EdSe 4501—Educational Psychology (3)
EdSe 4600—Student Teaching (12)
EdSe 5120—Philosophy and Organization of Middle Schools (2)
Hlth 3202—Drug Education (2)
Phys 2021—Relativity and Quantum Physics (4)
Phys 2031—Quantum Physics Laboratory (1)
Select two (5-6) from:
- Engr 2026—Dynamics (3)
- Phys 2001—Oscillations (2)
- Phys 3061—Instrumentation (3)
- Phys 5061—Experimental Methods (3)

* Courses that may be used to fulfill UMD liberal education program requirements.

Exit Standards
Students must successfully complete a semester of student teaching and meet other competencies required for Minnesota teacher licensure.

Minor Requirements (28)
Effective August 1, 2001, the state of Minnesota will no longer permit secondary teachers to teach in the area of their minor. Teachers must have completed all requirements for a major in order to be licensed to teach in Minnesota at the high school level.

Required Courses
- **Lower Division**
  - Chem 1151*—General Chemistry I (5)
  - or Chem 1161*—Honors Course: General Chemistry I (5)
  - Chem 2222—Quantitative Analysis (4)
  - Chem 2521—Organic Chemistry I (4)

- **Upper Division**
  - Educ 3412—The Computer in Education (4)
  - Educ 4234—Science, Technology, and Society (3)
  - EdSe 4255—Teaching Science: Grades 5-12 (3)

See also teaching physics minor

* Courses that may be used to fulfill UMD liberal education program requirements.

Teaching Physics

Minor Only
Effective August 1, 2001, the state of Minnesota will no longer permit secondary teachers to teach in the area of their minor. Teachers must have completed all requirements for a major in order to be licensed to teach in Minnesota at the high school level.

Required Courses
The teaching physics minor requires 22 credits of lower division coursework and 13-14 credits of upper division coursework, for a total of 35-36 credits.

Required Courses
- **Lower Division (22)**
  - Math 1296*—Calculus I (5)
  - Phys 1201*—Mechanics (4)
  - Phys 1202—Heat and Electricity (4)
  - Phys 1203—Magnetism, Waves, and Optics (4)
  - Phys 2021—Relativity and Quantum Physics (4)
  - Phys 2031—Quantum Physics Laboratory (1)

- **Upper Division (13-14)**
  - Educ 3412—The Computer in Education (4)
  - Educ 4234—Science, Technology, and Society (3)
  - EdSe 4255—Teaching Science: Grades 5-12 (3)
  - Phys 3099—Physics Tutoring or Phys 5090—Physics Seminar (1)

One from next four:
- Engr 2026—Dynamics (3)
- Phys 2001—Oscillations (2)
- Phys 3061—Experimental Methods (3)

* Courses that may be used to fulfill UMD liberal education program requirements.

Teaching Science (Middle School)

B.A.S.
The B.A.S. in teaching science (middle school) is offered by the Department of Education in conjunction with the Departments of Biology, Chemistry, Geology, and Physics. This major (97-98 credits) is for students who intend to teach general science in grades 5-9.

Admission Requirements
See admissions requirements under Teacher Licensure Requirements.

Degree Requirements
The Minnesota Board of Teaching currently is revising the science teaching licensure requirements. Please see the Department of Education for revisions in this major.

Requirements for the B.A.S. in teaching science (middle school) include:
- Liberal education requirements
- Advanced writing requirement: Comp 3140—Advanced Writing: Human Services (3 credits)
- Major requirements (98-99 credits):
  - Lower division coursework (47-48 credits),
  - upper division coursework (51 credits)
### Required Courses

**Lower Division (47-48)**

- Ast 1040*—Introductory Astronomy (3)
- Biol 1761—Human Anatomy
- or Biol 4767—Comparative Anatomy of Vertebrates
- or Hlth 2040—Principles of Human Physiology (4)
- Biol 1011*—General Biology I (5)
- Biol 1012—General Biology II (5)
- Chem 1113*—Introduction to General, Organic, and Biological Chemistry I (5)
- Chem 1114—Introduction to General, Organic, and Biological Chemistry II (5)
- Educ 1101*—Education in Modern Society (3)
- Geol 1110*—Introductory Geology (3)
- Math 1160*—Finite Mathematics and Introduction to Calculus (5)
- or Math 1250*—Precalculus Analysis (4)
- Phys 1001*—Introduction to Physics I (5)
- Phys 1002—Introduction to Physics II (5)

**Upper Division (51)**

- Educ 3412—The Computer in Education (4)
- Educ 4234—Science, Technology, and Society (3)
- Educ 4381—Teaching American Indian Students (2)
- Educ 4500—Professional Issues in Teaching (3)
- EdSe 3204—General Instructional Methods (3)
- EdSe 3205—Apprenticeship: Middle School (2)
- EdSe 3206—Apprenticeship: Secondary School (2)
- EdSe 4100—Human Relations in Classrooms (2)
- EdSe 4255—Teaching Science: Grades 5-12 (3)
- EdSe 4501—Educational Psychology (3)
- EdSe 4600—Student Teaching (12)
- EdSe 5120—Philosophy and Organization of Middle Schools (2)
- Geol 2311—Mineralogy and Petrology I (4)
- Geol 2312—Mineralogy and Petrology II (4)
- Hlth 3202—Drug Education (2)

* Courses that may be used to fulfill UMD liberal education program requirements.

### Exit Standards

Students must successfully complete a semester of student teaching and must meet other competencies required for Minnesota teacher licensure.

### Teaching Science

**(Elementary/Middle School)**

#### Minor Only

The teaching science minor provides an academic specialty area for those seeking Minnesota teacher licensure for kindergarten through grade eight. Students with a major in elementary/middle school education who complete this minor will be licensed to teach in this area at that level.

#### Requirements (22)

At least one of the following sequences (6-10):

- Biol 1011-1112—General Biology I-II
- or Chem 1113-1114—Introduction to General, Organic, Biological Chemistry
- or Chem 1151-1152—General Chemistry I-II (10)
- Geol 1110—Introductory Geology (3)
- or Ast 1040—Introduction to Astronomy (3)
- or Geol 2610—Oceanography (3)

### Teaching Social Studies

**B.A.A.**

The B.A.A. in teaching social studies prepares students to teach in grades 5 through 12. Social studies is an interdisciplinary major that requires lower division coursework in each of seven areas: anthropology, economics, geography, history, political science, psychology, and sociology. Students then select one of these areas in which to complete an upper division concentration. Students complete additional coursework in education. Minnesota issues a broad area social studies teaching license, rather than a license to teach in a specific area such as history or geography.
Admission Requirements
See admission requirements under Teacher Licensure Requirements.

Degree Requirements
Requirements for the B.A.A. in teaching social studies include:

- Liberal education requirements
- Advanced writing requirement: Comp 3140—Advanced Writing: Human Services (3 credits)
- Major requirements (100 credits):
  Lower division courses in each of the seven social studies areas (35-36 credits, some courses also fulfill liberal education requirements), upper division courses in an area of concentration (18 credits), other education and social studies courses (51-52 credits).

Required Courses
Social Studies Lower Division (33)
  Anth 1602—Prehistoric Cultures or Anth 1604—Cultural Anthropology (4)
  Econ 1003—Economics and Society or Econ 1022—Principles of Economics: Macro (3)
  Geog 1202—World Regional Geography or Geog 1304—Human Geography (3)
  Geog 1414—Physical Geography (4)
  Hist 1207—Dawn of Modern Europe or Hist 1208—Europe in the Modern Age (3)
  Hist 1304—American Heritage or Hist 1305—American Challenges (3)
  Pol 1011—American Government and Politics (3)
  Pol 1050—International Relations or Pol 1500—Introduction to Comparative Politics (3)
  Psy 1003—General Psychology (4)
  Soc 1101—Introduction to Sociology (3)

Social Studies Upper Division
Non-Western History (3-4)
Select one course:
  Amln 2115—Chippewa History and Culture (3)
  Hist 3462—History of Modern Japan (3)
  Hist 3463—History of Modern China (3)
  Hist 3515—Modern Africa (3)
  Hist 3516—Society and Culture in 20th-Century Africa (3)
  Pol 3520—Chinese Government and Politics (4)
  Pol 3560—Latin American Government and Politics (4)
  Pol 3570—The Third World and Development (3)
  Span 2540a—Latino Literatures and Cultures (3)

Social Studies Concentration (18)
Select one of the seven social science fields and complete the 18-credit concentration as specified for each field below.

Required Education Courses
  Educ 1101*—Education in Modern Society (3)
  Educ 3412—The Computer in Education (4)
  Educ 4234—Science, Technology, and Society (3)
  Educ 4381—Teaching American Indian Students (2)
  Educ 4500—Professional Issues in Teaching (3)
  EdSe 3204—General Instructional Methods (3)
  EdSe 3205—Apprenticeship: Middle School (2)
  EdSe 3206—Apprenticeship: Secondary School (2)
  EdSe 4100—Human Relations in Classrooms (2)
  EdSe 4501—Educational Psychology (3)
  EdSe 4244—Teaching Social Studies: Grades 5-12 (3)
  EdSe 4600—Student Teaching (12)
  EdSe 5120—Philosophy and Organization of Middle Schools (2)
  Hlth 3202—Drug Education (2)

Anthropology Concentration (18)
   Anth 4651—The Development of Anthropological Theory (4)
   Soc 3151—Research Methods and Analysis (3)
   Electives in 3xxx or 4xxx Anth courses (11)

Economics Concentration (18)
   Econ 1022*—Principles of Economics: Macro (3)
   Econ 1023*—Principles of Economics: Micro (3)
   Electives in 3xxx, 4xxx, or 5xxx courses (12)

Geography Concentration (17-18)
   Geog 3401—Weather and Climate (4)
   Geog 3702—Geography of United States and Canada (3)
   Electives in 3xxx or 4xxx or 5xxx courses (12)

History Concentration (18)
Choose from the following (no more than 8 cr in any one group):

Group I: American History
   Hist 2357*—Women in American History (3)
   Hist 3361—The American City (3)
   Hist 3365—American Society and Culture (3)
   Hist 3367—Civil Rights Movement: Recent America (3)
   Hist 3384—American Foreign Relations I (3)
   Hist 3385—American Foreign Relations II (3)

Group II: European History
   Hist 2265*—Russia in the 20th Century (3)
   Hist 3239—Europe in the Age of Renaissance and Reformation: 1348-1648 (3)
   Hist 3241—Europe in Revolution: 1789-1948 (3)
   Hist 3242—Europe in Ascendance: 1848-1914 (3)
   Hist 3243—Europe in Crisis in the 20th Century (3)
   Hist 3256—Making of Modern Britain (3)
   HmCl 3021—The Age of the Heroes: Homer and His World (3)
   HmCl 3031—Roman Republic (3)
HmCI 3041—Roman Empire (3)
HmCI 3055—Ancient Near East (3)
HmCI 3151—Ancient Egyptian Culture (3)
HmCI 3333—From Homer to Alexander in Archaic and Classical Greece (3)

**Group III: Asian History or Other Non-U.S., Non-European History**

Hist 3461—History of Tradition of East Asia to 1800 (3)
Hist 3462—History of Modern Japan (3)
Hist 3463—History of Modern China (3)
Hist 3491—History of Modern Asia (3)
Hist 3510—History of Pre-Colonial Africa (3)
Hist 3515—Modern Africa (3)
Hist 3516—Society and Culture in 20th-Century Africa (3)
*This course may not be counted toward the upper division Non-Western History category if it is counted toward the history concentration.*

**Political Science Concentration (18)**

Choose from the following (no more than 8 credits in any one group):

**Category I: American Politics**

Pol 3001—Introduction to American Public Policy (3)
Pol 3020—State Government (3)
Pol 3030—Urban Government and Politics (3)
Pol 3040—Women and Politics (3)
Pol 3070—Civit Liberties (3)
Pol 3080—Environment and Politics (3)
Pol 3130—Judicial Process (3)
Pol 3140—American Political Parties and Elections (3)
Pol 3150—American Constitutional Law I (4)
Pol 3151—American Constitutional Law II (4)
Pol 3170—Political Interest Groups and Individuals (3)
Pol 3221—Introduction to Public Administration (3)
Pol 3310—Public Opinion and Propaganda (3)

**Category II: International Politics**

Pol 3400—Contemporary Issues in World Politics (4)
Pol 3402—American and Foreign Defense Policy (3)
Pol 3415—International Law (4)
Pol 3426—Politics of International Organizations (4)
Pol 3460—International Political Economy (4)

**Category III: Comparative Politics**

Pol 3510—Russian and Soviet Politics and Government (4)
Pol 3517—Western European Political Systems (4)
Pol 3520—Chinese Government and Politics (4)
Pol 3570—Third World and Development (3)

**Category IV: Political Theory**

Pol 3610—Political Economy: Introduction (4)
Pol 3625—Democratic Theory (4)
Pol 3640—Theory and Practice of Nonviolence (4)
Pol 3651—History of Western Political Thought I (4)
Pol 3652—History of Western Political Thought II (4)
Pol 5610—Contemporary Political Theory (3)

**Psychology Concentration (18)**

Psy 2021*—Developmental Psychology (4)
Psy 2223*—Gender in Society (4)
Psy 3021—Experimental Design and Methodology (4)
Psy 3111—Theories of Personality (3)
Psy 3121—Abnormal Psychology (4)
Psy 3201—Social Psychology (3)
Psy 3211—Group Dynamics (3)
Psy 3215—Topics in Human Sexuality (3)
Psy 3371—Child and Adolescent Psychology (3)
Psy 3611—Learning and Cognition (3)

**Sociology Concentration (18)**

Soc 2111—Sociological Theory (3)
Soc 3151—Research Methods and Analysis (3)
Soc 3701—Social Psychology (3)
Soc 3831—Organization and Society
or Soc 3821—Sociology of Community (3)
Soc 3901—Social Change/Social Policy (3)
Elective at 3xxx or 4xxx level (3)
* Courses that may be used to fulfill UMD liberal education program requirements.

**Exit Standards**

Students must successfully complete a student teaching experience and meet other competencies required for Minnesota licensure.

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**Teaching Spanish**

**B.A.A.**

The B.A.A. in teaching Spanish is offered through the Department of Education in conjunction with the Department of Foreign Languages and Literatures. This major prepares students to teach Spanish from kindergarten through grade 12.

**Admission Requirements**

See admission requirements under Teacher Licensure Requirements.

**Degree Requirements**

Requirements for the B.A.A. in teaching Spanish include:

- Liberal education requirements. Students also are encouraged to take Engl 1907—Introduction to Literature for liberal education credit (Category 9), Psy 2021—Developmental Psychology for liberal education credit (Category 6), and Comm 2929—Intercultural Communication for liberal education credit (Category 8). Spanish majors and minors are exempted from the campus-wide requirement for international perspectives courses.

- Advanced writing requirement: Comp 3140—Advanced Writing: Human Services (3 credits)

Requirements for the major (83 credits) include:

Course requirements as listed below. Study abroad is strongly encouraged.
Students also complete a series of education courses in the Department of Education designed to meet the requirements for Minnesota teacher licensure, including a full semester of student teaching experience. Students must pass the oral proficiency exam, maintain a 3.00 GPA in Spanish courses taken, complete the education courses and Lang 4044, and have the permission of the Spanish faculty and the Department of Education before being placed for their student teaching experience.

The core program in language skills (listening, speaking, reading, writing) is common to all majors and minors in Spanish. Students may be exempted from part or all of the core program requirements if they have previously completed Spanish language coursework. Exemptions are determined by the Department of Foreign Languages and Literatures, based on acceptance of transfer credits and personal interviews. Generally students complete the advanced Spanish language course (Span 2301) before enrolling in upper division Spanish courses in literature, culture, and teaching methodology.

Required Courses

Lower Division (23)
- EDUC 1101*—Education in Modern Society (3)
- Span 1101*—Beginning Spanish I (4)
- Span 1102*—Beginning Spanish II (4)
- Span 1201*—Intermediate Spanish I (4)
- Span 1202*—Intermediate Spanish II (4)
- Span 2301*—Advanced Spanish (4)

Upper Division (60)
- EDUC 3412—The Computer in Education (4)
- EDUC 4500—Professional Issues in Teaching (3)
- EdSe 3204—General Instructional Methods (3)
- EdSe 3205—Apprenticeship: Middle School (2)
- or ELED 3425—Collateral Fields: Field Experiences (2)
- EdSe 3206—Apprenticeship: Secondary School (2)
- EdSe 4100—Human Relations in Classrooms (2)
- EdSe 4600—Student Teaching (12)
- EdSe 5120—Philosophy and Organization of Middle Schools (2)
- ELED 3113—Learning Environments and Diverse Learning Communities (4)
- HTH 3202—Drug Education (2)
- Lang 4044—Language Teaching Methods (4)

Upper division Spanish courses (20), including one culture course taught in Spanish and
- Span 3042—Hispanic American Civilization and Culture
- or Span 3044—Spanish Civilization and Culture (4)

Some of the upper division Spanish courses may be transferred from another college or earned abroad, but at least two courses must be taken at UMD.

* Courses that may be used to fulfill UMD liberal education program requirements.

Exit Standards

Students must successfully complete an oral proficiency exam administered by the Department of Foreign Languages and Literatures.

Students must also successfully complete a semester of student teaching and meet other competencies required for Minnesota teacher licensure.

Minor Requirements (31)

Effective August 1, 2001, the state of Minnesota will no longer permit secondary teachers to teach in the area of their minor. Teachers must have completed all requirements for a major in order to be licensed to teach in Minnesota at the high school level.

Students with a major in elementary/middle school education who complete this minor will be licensed to teach in this area from grades K-8.

Lang 4044—Language Teaching Methods (4)
- Span 1101*—Beginning Spanish I (4)
- Span 1102*—Beginning Spanish II (4)
- Span 1201*—Intermediate Spanish I (4)
- Span 1202*—Intermediate Spanish II (4)
- Span 2301*—Advanced Spanish (4)

Upper division Spanish courses (7)

Students must complete the oral proficiency exam in Spanish, which may be repeated until successful completion is achieved.

* Courses that may be used to fulfill UMD liberal education program requirements.
The School of Fine Arts—composed of the departments of art, music, and theatre; the Tweed Museum of Art; Glensheen; and the Marshall Performing Arts Center—plays a leading role in fostering the arts and serving as a cultural and artistic center for the campus and northern Minnesota. The school provides a comprehensive education for students in the visual and performing arts, including majors in art and music education, and opportunities for those whose study in other disciplines is complemented by the fine arts curriculum. The school also offers selected graduate programs in art and music.

The faculty and staff of the departments of art, music, and theatre recognize the importance of exceptional instruction, scholarship, performance, research, and outreach. Their dedication to excellence is sustained within a balance of traditional academic experiences, exposure to new technologies and processes, and continuing performance/exhibition opportunities for students and faculty. The Tweed Museum of Art and Glensheen historic estate are both campus-wide learning laboratories and significant educational resources with important connections to the community.

All units within the School of Fine Arts are committed to demanding standards of performance in the classroom and in artistic endeavors. Through individualized preprofessional arts training in areas of specialization combined with broad-based liberal arts study, the school attracts students who possess both strong artistic and academic potential. The school has an ongoing commitment to assisting students in identifying postgraduate professional opportunities and making professional transitions, and continuing an active involvement in international exchanges in the arts. The school awards bachelor of fine arts (B.F.A.) and bachelor of music (B.M.) degrees.

Academic Programs

Art
- General studio art major (B.F.A.)
- Art minor
  - Art—pregraduate (B.F.A.) with art and technology and studio art emphases
  - Art education major (B.F.A.) with K-12 emphasis
  - Art history major (B.F.A.)
  - Art history minor
  - Graphic design major (B.F.A.)
  - Photography minor
  - Art major (B.A.—CLA)

Music
- Jazz studies major (B.M.)
- Jazz studies minor
- Music education major (B.M.) with instrumental K-12 and vocal K-12 emphases
- Performance major (B.M.) with band or orchestral instruments, keyboard, musical theatre, and vocal emphases
- Piano pedagogy major (B.M.)
- Theory-composition major (B.M.)
- Music major (B.A.—CLA)
- Music minor

Theatre
- Theatre major (B.F.A.) with acting, composite, design/technical, and musical theatre emphases
- Theatre minor
- Dance minor
- Theatre major (B.A.—CLA)

For other minors available to students receiving a B.A. degree, see School of Business and Economics, College of Education and Human Service Professions, College of Liberal Arts, and College of Science and Engineering.

Graduate Programs

An M.F.A. in art with an emphasis in graphic design is available. In addition, an M.M. in music education is available to students desiring advanced professional study. See Graduate School for more information.

Office of Student Affairs

For information and advice on academic matters (e.g., academic standing; admissions; advisement; academic programs; change of major, college, or adviser; grievance and appeal procedures; undergraduate research), contact the SFA Office of Student Affairs, 212 Humanities Building. Forms and petitions are also available in this office.
SFA also offers a peer advisement program that supplements faculty advising. Peer advisers are art, music, and theatre undergraduates. They answer questions and provide assistance with forms, procedures, and class schedules. For more information, contact the SFA Office of Student Affairs.

For information about music theory tutoring, contact the Department of Music, 231 Humanities Building.

**Admission**

See Policies and Procedures for additional criteria and procedures for admission or readmission to the school.

Admission into SFA does not necessarily mean admission into a specific degree program. Upon receiving the letter of admission to UMD, students should go to their department office and talk with a faculty adviser to learn the requirements for specific majors. All prospective music majors must audition for acceptance into a degree program and complete an entrance interview and placement examinations in written theory and aural and keyboard skills.

**Residence Requirements**

SFA degree candidates must complete at least 30 credits in residence in SFA. Residence credits are those taken while officially enrolled in SFA.

**Academic Standing**

**Good Academic Standing**

SFA students must maintain a minimum GPA to be in good academic standing. For students who have attempted 31 or more credits (at UMD or elsewhere), the minimum overall GPA required is 2.00. Because some students have difficulty adjusting to the standards of a university education, students who have attempted fewer than 31 credits (at UMD or elsewhere) must maintain a minimum overall GPA of 1.80 to remain in good academic standing.

For graduation, a 2.50 GPA in the major is required for the B.F.A. and B.M. degrees. In addition, a 2.80 GPA in the major is required for the B.F.A. art—pregraduate major.

**Probation**

Students with an overall GPA lower than that required for good academic standing are placed on academic probation. Students who have attempted 31 or more credits are returned to good academic standing status the semester after attaining a 2.00 minimum GPA. Students who have attempted fewer than 31 credits are returned to good academic standing status the semester after attaining a 1.80 minimum GPA.

**Dismissal**

Students who fail to attain the required minimum overall GPA for good academic standing after one semester of probation are subject to dismissal. Dismissal decisions are made in the college unit following final examinations. Dismissed students are notified immediately and their day school registration for the next semester is canceled. At the college's discretion, students may be granted an additional semester of probation if they are making progress.

**Readmission**

Dismissed students must present evidence of improved academic capability to justify their readmission. Petition forms for readmission and information concerning academic standing are available in the SFA Office of Student Affairs, 212 Humanities Building.

**Student Grievance Policy**

SFA students may file an official grievance if they are having a problem with a class or instructor within the school. The procedures for filing this grievance are available in the SFA Office of Student Affairs, 212 Humanities Building.

**College Honors**

At UMD, a maximum of 15 percent of the graduating class can graduate with college honors. In SFA, the top 3 percent of the graduating class is designated summa cum laude, the next 5 percent magna cum laude, and the next 7 percent cum laude.

At the beginning of each year, GPAs necessary to achieve these honors are posted in the Office of Student Affairs, 212 Humanities Building. The GPAs are based on the previous spring semester graduating class. In addition, those receiving honors must have a coefficient of course completion of at least 90 percent. To be eligible for honors, students must earn at least 30 credits at UMD. For more information, contact the Office of Student Affairs, 212 Humanities Building.
Dean's List of Academic Excellence

Each semester, SFA students are recognized for high academic achievement by being placed on the SFA Dean's List of Academic Excellence. A memo is placed on their transcript indicating this achievement. To be eligible for this honor, students must have a 3.50 minimum GPA and 12 graded credits. Incompletes, Ns, and Fs disqualify a student from eligibility.

Students who have been on the Dean's List of Academic Excellence for four or more semesters are given special recognition by the school at the time of graduation.

Department Honors

Art Honors are awarded to graduating art majors for exceptional achievement. Candidates, nominated by art department faculty, receive honors for distinguished achievement demonstrated in part by the senior student exhibition or a senior presentation or project.

Music Honors are awarded to graduating music majors for exceptional achievement. Candidates, nominated by music department faculty, receive honors for distinguished achievement in musical performance, composition, or demonstrated ability as a music teacher.

Theatre Honors are awarded to graduating theatre majors for exceptional achievement. Candidates, nominated by theatre department faculty, receive honors for distinguished contributions in acting, musical theatre, design/technical theatre, or general theatre involvement.

Scholarships and Awards

The following scholarships and awards are available to students in SFA. Contact the appropriate department for additional information.

Billy Barnard Jazz Scholarship—Awarded to jazz studies students pursuing improvisational jazz studies. Students must show promise of or be currently contributing to the improvisational jazz community.

Patricia L. Benson Memorial Scholarship—$50 scholarship designated for a voice/opera student based on potential as well as financial need.

Bernstein Jazz Scholarship—One or more awards given annually based on musicianship and potential in the area of jazz performance. Must be a music major in good standing—trumpet first preference, brass next, then any qualifying music major.

Lois Casmir Birk Memorial Scholarship—$600 scholarship awarded to a theatre major who has demonstrated or shows promise of outstanding achievement in any aspect of theatre.

Cheng-Khee Chee Art Scholarship—Amount and number of recipients vary each year; awarded to students who demonstrate or show promise of demonstrating outstanding achievement, with special consideration to students working in watermedia.

Frank P. Comella Memorial Scholarship—Awarded to an undergraduate or graduate student who has demonstrated a firm commitment to pursue a degree in music education. Based on financial need.

Raymond W. Darland Art Scholarships—Ten or more renewable $150-$1,250 scholarships from an Alice Tweed Tuohy Foundation endowment awarded to art majors who have maintained high GPAs in all University as well as department work; summer session scholarships may also be awarded. Selected from student applications.

Mark Farley Memorial Scholarship—Awarded to a student who best exemplifies the following attributes: outstanding artistic musicianship, dedication and commitment to career in music, intelligence and academic aptitude, service to the department, and admirable personal qualities. A GPA of 3.00 with preference given to trumpet major, brass player, performer on any other instrument, in that order. Financial need considered.

Ronald R. Gauger Memorial Scholarship—Awarded to an undergraduate pursuing a degree with a keyboard emphasis. Based on need and potential.

Charles Gendein, Sadie Gendein, and Esther Gendein Latts Memorial Scholarship Fund—Applications made to the Department of Music scholarship chair stating desire to pursue a degree in music and outlining career goals. Awards made to an undergraduate who attended a Minnesota high school, maintained a minimum GPA of 3.00, and enrolled as a full-time music major. Based on need and potential.
Isaac and Rose Gershgol Scholarships—Awarded to undergraduates in fine arts who have financial need and who are outstanding students and performers. Selection based on department recommendations. Art, music, and theatre students eligible. Contact the SFA Office of the Dean, 212 Humanities Building, for information.

Earl W. Jenson Scholarship—$600 scholarship awarded to a theatre major who has made an outstanding contribution in the area of design and technical theatre.

Gregg Johnson Scholarships—Awarded to music majors on the basis of academic achievement, performance or creative ability, service to the music department, and financial need. Selected through auditions.

Howard W. Lyons Art Scholarships—Scholarships awarded to deserving art majors who have maintained high GPAs in all University as well as department work. Selected from student applications.

Marshall Center Awards for Excellence in Theatre or Dance—$600-$1,800 scholarships awarded to current or prospective theatre majors who have made outstanding contributions in theatre or dance and demonstrate exceptional potential for artistic achievement.

Matinee Musicale Scholarships—Scholarships awarded to music majors on the basis of talent and performance ability.

Deborah Mitchell and John Schissel Memorial Summer Session Art Scholarships—Summer session scholarships awarded to deserving art majors.

Music Department Achievement Awards—Awarded to music majors on the basis of academic achievement, performance or creative ability, service to the music department, and financial need. Selected through auditions.

Edith M. Nelson Art Scholarship—Awarded to art majors on the basis of merit, with priority given to those working in ceramics.

Omnibus Music Scholarships—Awarded to music majors to assist in the continuation of study at the graduate or undergraduate level.

Oreck Foundation Music Scholarships—Awarded to music majors on the basis of academic achievement, performance or creative ability, service to the music department, and financial need. Selected through auditions.

Olive Anna Tezla School of Fine Arts Scholarship—Awarded annually to one art, music, or theatre student for excellent scholarship/creative activity or outstanding contributions to an area of art, music, or theatre, or demonstrated leadership in the school. Contact the SFA Office of the Dean, 212 Humanities Building, for information.

UMD Opera Theatre Scholarship—One or more awards presented annually to students who demonstrate the highest achievement in all aspects of operatic craft.

Ann Uppgren Awards—$600 scholarship awarded to a theatre major who has made outstanding contributions in theatre and demonstrates potential for artistic achievement.

WADSO Scholarships—Awarded to incoming freshmen and currently enrolled music majors who play instruments of the symphony orchestra. Selected through auditions.

Erin Wright Memorial Scholarship—$600 scholarship awarded to a theatre major who demonstrates potential in theatre and dance.

Bachelor of Fine Arts (B.F.A.)
Curricula for this degree are for students pursuing programs of intensive study to prepare for professional careers in the arts. Majors offered for the B.F.A. include art majors in general studio; art—pregraduate with emphases in art and technology and studio art; graphic design; art history; art education with an emphasis in K-12; and theatre with emphases in acting, composite, design/technical, and musical theatre.

Bachelor of Music (B.M.)
Curricula for this degree are for students pursuing programs of intensive study to prepare for professional careers in music. Majors offered for the B.M. include music education with emphases in instrumental music K-12 and vocal music K-12; performance in band or orchestral instruments, keyboard, musical theatre, and vocal; piano pedagogy; theory-composition; and jazz studies.
Multiple Majors and/or Degrees

Students with a baccalaureate degree from another institution may earn a degree with a different major in SFA by completing all degree requirements for that new major, including 30 SFA residence credits.

Students may earn different degrees and/or majors concurrently while enrolled in SFA. If both majors are approved for the B.F.A., at least 120 credits are required. If both majors are approved for the B.M., at least 130 credits are required.

Departmental approval is necessary to be admitted to more than one B.M. degree.

Students may complete an additional major not offered by SFA by fulfilling the requirements of the second major in another college. Students receive only one degree offered by SFA but the second major is listed on their transcript.

If students wish to earn degrees from SFA and another UMD college or school, all degree requirements must be met in SFA as well as in the other college or school. The two degrees are awarded at the time of graduation. Note: Other UMD colleges and schools may have the same residence requirements as SFA. In this case, students may wish to change colleges or petition one of the schools to have the residence-credit requirement waived. Students should consult their faculty advisers and the SFA Office of Student Affairs, 212 Humanities Building, before pursuing two degrees.

B.F.A. Requirements

- Lower division liberal education program, specified in Policies and Procedures.
- Two courses distributed across two study fields outside student’s discipline from the following (Art and ArtH count as one study field).
  - Art 1001—Art Today (3) (Category 9)
  - Art 1002—Introduction to Art (3) (Category 10)
  - ArtH 1303—History of World Art I (3) (Category 9)
  - ArtH 1304—History of World Art II (3) (Category 9)
  - FA 1300—Creating Across Disciplines (3)
  - Mu 1001—Introduction to Music (3) (Category 9)
  - Th 1001—Introduction to Theatre Arts (3) (Category 9)
  - Th 1111—Acting Fundamentals I (3) (Category 10)
  - One music ensemble (3) (Category 10)
  - One theatre practicum (3) (Category 10)
- A 2.00 minimum GPA (C) in all work attempted in residence and overall. Transfer credits must carry minimum grades of C.
- Completion of an approved major with a 2.50 minimum GPA in the major (the art-pregraduate major requires a 2.80 GPA). Department listings in this catalog should be consulted for possible additional or substitute requirements. Major requirements may involve completion of courses in related fields outside the major.
- Electives to total at least 120 degree credits. See specific majors for the exact number of credits. Elective credits other than those required in the major may be taken from any UMD academic unit.
- Compliance with general regulations governing granting of degrees. Each student is responsible for completing all requirements for the degree.

B.M. Requirements

- Lower division liberal education program, specified in Policies and Procedures.
- Students enrolled in the performance (musical theatre, vocal, keyboard, band or orchestral instruments), jazz studies, piano pedagogy, and theory-composition programs must complete two courses distributed across two study fields from the following (Art and ArtH count as one study field). Students enrolled in music education must complete one course from the following; however, it is recommended that music education majors complete two courses distributed across two study fields.
  - Art 1001—Art Today (3) (Category 9)
  - Art 1002—Introduction to Art (3) (Category 10)
  - ArtH 1303—History of World Art I (3) (Category 9)
  - ArtH 1304—History of World Art II (3) (Category 9)
  - FA 1300—Creating Across Disciplines (3)
  - Th 1001—Introduction to Theatre Arts (3) (Category 9)
  - Th 1111—Acting Fundamentals I (3) (Category 10)
  - One theatre practicum (3) (Category 10)
- A 2.00 minimum GPA (C) in all work attempted in residence and overall. Transfer credits must carry minimum grades of C.
- Completion of an approved major in one area (performance, theory-composition, jazz studies, piano pedagogy, or music education) with a 2.50 minimum GPA in the major.
• Electives to total at least 130 degree credits. See specific majors for the exact number of credits. Elective credits other than those required in the major may be taken from any UMD academic unit.

• Compliance with general regulations governing granting of degrees. Each student is responsible for completing all requirements for the degree.

Degree Programs
Art (Art)

Professors: Gloria DeFilipps Brush (department head), Leif Brush, Thomas F. Hedin, James C. Klueg, Dean R. Lettenstrom; Associate Professors: James H. Brugger, Alyce B. Coker, Janice D. Kmetz, Robert A. Repinski, Robyn S. Roslak, Harry E. Watts; Assistant Professors: Kenneth Fitzgerald, Stephen Hilyard, Catherine Ishino; Instructor: Alison Aune-Hinkel

The Department of Art offers a broad range of courses in studio art, art history and theory, and art education. Major or minor programs may be selected by students interested in artistic or scholarly development or in liberal education or by those planning a career in arts administration, teaching, graphic design, or museum work.

Much of the Tweed Museum of Art’s program is related to the interests and needs of art students. Loan exhibitions and the permanent collection are available for study. All art majors, except those in art history, must present an exhibition of their own art work in the museum during their senior year.

Studio Art—General
B.F.A.

Studio art majors have as their priority the development of a strong personal creative direction in one or more of the studio areas offered within the department. Art history and seminar courses provide the foundation for this course of study, and students are encouraged to pursue related internship opportunities.

Degree Requirements
Requirements for the B.F.A. in studio art—general include:

• UMD liberal education requirements
• Advanced writing requirement: Comp 3110—Advanced Writing: Arts and Letters or Comp 5220—Document Design and Graphics (3 credits)
• Major requirements (73 credits)
• Electives to bring total to 120 credits

Required Courses

<table>
<thead>
<tr>
<th>Studio (25)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Art 1010—Drawing I (3)</td>
</tr>
<tr>
<td>Art 1011—2-D Design (3)</td>
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<tr>
<td>Art 1012—3-D Design or Art 1014—3-D Digital Design (3)</td>
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<tr>
<td>Art 1013—2-D Digital Design (3)</td>
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<tr>
<td>Art 2900*—Visual Literacy (3)</td>
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<tr>
<td>Art 3700—Drawing II (3)</td>
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<td>Art 4700—Drawing III (3)</td>
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<tr>
<td>Art 4812—Art Seminar (3)</td>
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<tr>
<td>Art 4899—Senior Exhibit (1)</td>
</tr>
</tbody>
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Select six (18) from:

| Art 1100—Painting I (3) |
| Art 1200—Sculpture I (3) |
| Art 1300—Printmaking I: Intaglio, Relief or Art 1301—Printmaking I: Litho, Screen (3) |
| Art 1400—Ceramics I (3) |
| Art 1500—Jewelry and Metals I (3) |
| Art 1510—Weaving and Fibers I (3) |
| Art 1600—Photography I (3) |
| Art 3016—2-D Digital Studio I (3) |
| Art 3030—Art in Technologies I (3) |

Art Electives (6)

Studio Electives (12)

Art History (9)

| Arth 1303*—History of World Art I (3) |
| Arth 1304*—History of World Art II (3) |
| Arth 2305*—Classical Themes in Art History (3) |

Art History Elective (3)

Final Project

Seniors prepare and present a solo or joint exhibition in the Tweed Museum of Art and enroll in Art 4812—Art Seminar (3).

Art Minor Requirements (27)

| Art (12) |
| Art 1002*—Introduction to Art (3) |
| Art 1010—Drawing I (3) |
| Art 1011—2-D Design or Art 1013—2-D Digital Design (3) |
| Art 1012—3-D Design or Art 1014—3-D Digital Design (3) |

Art History (3)

| Arth 1303*—History of World Art I or Arth 1304*—History of World Art II (3) |

Studio Electives (12)—select from painting, sculpture, printmaking, ceramics, jewelry and metals, weaving and fibers, photography, digital studio, drawing, art in technologies

* Courses that may be used to fulfill UMD liberal education program requirements.
Art—Pregraduate
B.F.A.

Pregraduate art majors have as their priority the development of a strong personal creative direction in one or more of the studio areas offered within the department. Art history and seminar courses provide the foundation for this course of study. This program specifically serves students who aspire to graduate-level fine arts study by enabling them to prepare a concentrated body of work in one or more areas.

The studio art emphasis allows students to focus on a particular area of interest within the visual arts and to produce an extensive body of work. Students accepted into this emphasis use the more traditional art materials/media, but may elect some digitally based coursework.

The art and technology emphasis allows a student to concentrate on a particular area of interest within the visual arts to produce an extensive body of work that is digitally based. Students accepted into this emphasis focus on new technologies and electronic/digitally based media, but may elect some courses involving more traditional media.

Admission Requirements
Students wishing to transfer into the pregraduate art major should begin their application for candidacy process before the sixth week of the semester preceding the term the transfer is to take effect. Students must have completed a minimum of 18 credits in art department studio courses to be eligible to apply. If a student has transfer credits in art from another institution, a minimum of 9 art department studio credits at UMD should be taken before applying. Students are admitted into the program through portfolio review. Additional information on applying is available in the art department office.

Degree Requirements
Requirements for the B.F.A. in studio art—pregraduate (120 credits) include:
- UMD liberal education requirements
- Advanced writing requirement: Comp 3110—Advanced Writing: Arts and Letters or Comp 5220—Document Design and Graphics (3 credits)
- Major requirements (85 credits)
- Electives with consent of adviser to bring total to 120 credits

Pregraduate Core
Required Courses (22)
Art 1010—Drawing I (3)
Art 1011—2-D Design (3)
Art 1013—2-D Digital Design (3)
Art 2900*—Visual Literacy (3)
Art 4812—Art Seminar (3)
Art 4899—Senior Exhibit (1)
ArtH 1303*—History of World Art I (3)
ArtH 1304*—History of World Art II (3)

Studio Art Emphasis
Required Courses (6)
Art 1001—Art Today (3)
Art 1012—3-D Design or Art 1014 3-D Digital Design (3)
Studio Required Electives (36)
Select from painting, drawing, sculpture, printmaking, ceramics, jewelry and metals, weaving and fibers, photography, 2-D digital studio, art in technologies

Required Art History Course (3)
ArtH 2390—American Art of the 20th Century or ArtH 3370—European Art, 1900-1945 (3)

Art History Elective (3)
Art Electives (12)
Other Electives (3)
FA courses (or others with department head approval) to bring total to 120

Art and Technology Emphasis
Required Courses (30)
Art 1014—3-D Digital Design (3)
Art 1600—Photography I (3)
Art 2905—Graphic Tech I (3)
Art 2911—Graphic Design I (3)
Art 3016—2-D Digital Studio I (3)
Art 3030—Art in Technologies I (3)
Art 5016—2-D Digital Studio II (3)
Art 5030—Art in Technologies II (3)
Art 5795—Intermedia Studio Problems (3)
Art 5907—Motion Graphics I (3)
ArtH 2390*—American Art of the 20th Century or ArtH 3370—European Art, 1900-1945 or ArtH 4901—History of Graphic Design (3)
FA 1300—Creating Across Disciplines or FA 5300—Creating Across Disciplines (3)
Related electives with department head approval

Studio Required Electives (9)
Select from painting, drawing, sculpture, printmaking, ceramics, jewelry and metals, weaving and fibers, photography

Additional Art Electives (18)
Select from above required studio areas and graphic design course sequence (with instructor approval)
Art 5016—2-D Digital Studio II (3)
Art 5030—Art in Technologies II (3)
Art 5795—Intermedia Studio Problems (3)
Art 5908—Motion Graphics II (3)
Art 5909—Interactive Design (3)
**Required Electives (6)**
Related electives (with adviser approval) to bring total to 120

**Final Project**
Seniors prepare and present a solo or joint exhibition in the Tweed Museum of Art and enroll in Art 4812—Art Seminar.

**Art Education—K-12**

**B.F.A.**
The B.F.A. program in art education—K-12 is for students who wish to receive licensure to teach art through the State of Minnesota; it is offered in cooperation with the College of Education and Human Services Professions.

The program prepares art teachers for kindergarten through the twelfth grade and provides a foundation in a variety of studio areas, art history, and art education methods. In addition to completing art courses, each student must gain admission to the licensure program and complete the education courses required by the State Department of Education and Board of Teaching. A minimum GPA of 2.50 overall and in courses required for the major is required to be considered for admission to the licensure program, in addition to other requirements. To be considered for student teaching, a student must have maintained a minimum GPA of 2.50 overall and in the major and have no grades lower than a C- in major content courses. For complete information, see the CEHSP section on the Secondary Teacher Education Program.

Field experiences are an important part of the program and include arranged teaching in the area elementary grades and in public and private agencies, observation and participation in area secondary schools, and a full semester of supervised student teaching.

**Degree Requirements**
Requirements for the B.F.A. in art education—K-12 include:
- UMD liberal education requirements
- Advanced writing requirement: Comp 3110—Advanced Writing: Arts and Letter or Comp 3140—Advanced Writing: Human Services or Comp 5220—Document Design and Graphics (3 credits)
- Major requirements (99-100 credits)

**Required Courses**

**Art Required (19)**
Art 1010—Drawing I (3)
Art 1011—2-D Design (3)
Art 1012—3-D Design
or Art 1014—3-D Digital Design (3)

Art 1013—2-D Digital Design (3)
Art 3700—Drawing II (3)
Art 4812—Art Seminar (3)
Art 4899—Senior Exhibition (1)

**Studio Areas (15) (select five)**
Art 1100—Painting I (3)
Art 1200—Sculpture I (3)
Art 1300—Printmaking I—Intaglio, Relief
or Art 1301—Printmaking I—Litho, Screen (3)
Art 1400—Ceramics I (3)
Art 1500—Jewelry and Metals I (3)
Art 1510—Weaving and Fibers I (3)
Art 1600—Photography I (3)
Art 3016—2D Digital Studio I (3)
Art 3030—Art in Technologies I (3)
Art 4700—Drawing III (3)

**Studio Electives at 3xxx or 4xxx level (9)**
Choose from three of the studio areas above

**Art Education (9)**
Art 3800—Community Involvement Through Art (1)
Art 3810—Art in Elementary Education (2)
Art 3811—Art Education Elementary-Level Experience (2)
Art 3815—Art in Secondary Education (4)

**Art History (6)**
ArtH 1303*—History of World Art I (3)
ArtH 1304*—History of World Art II (3)

**Art History Electives (3)**

**Required Courses From Other Programs**

**Education Plan I (38-39)**
Educ 1000—Human Development (3)
Educ 1101*—Education in Modern Society (3)
Educ 3481—Teaching American Indian Students (2)
Educ 4500—Professional Issues in Teaching (3)
EdSe 3604—Instructional Methods (3)
EdSe 3605—Apprenticeship: Middle School (2)
EdSe 3606—Apprenticeship: Secondary School (2)
EdSe 4100—Human Relations in Classrooms (2)
EdSe 4501—Educational Psychology (3)
EdSe 4600—Student Teaching (6)
EdSe 4601—Student Teaching Seminar (1)
ElEd 4520—Student Teaching in Individual Subjects—K-8 (6)
Hlth 3202—Drug Education (2)

* Courses that may be used to fulfill UMD liberal education program requirements.

**Final Project**
Art education majors conclude their study with one semester of intensive student teaching activities.
Art History
B.F.A.
The B.F.A. program in art history offers introductory and advanced-level courses from pre-history to the present. The visual arts are studied in relation to cultural values and beliefs as well as to the unique perceptions of individual artists. Students are encouraged to develop their own ideas about art and art history through research papers and projects.

The program offers liberal education and upper division credits. Students may elect to major or minor in the field. Art history often attracts students from other departments, who bring their own interests and insights to bear on the study of art. Research-related art museum internships are available.

Degree Requirements
Requirements for the B.F.A. in art history include:
- UMD liberal education requirements
- Advanced writing requirement: Comp 3110—Advanced Writing: Arts and Letters or Comp 5220—Document Design (3 credits)
- Major requirements (69 credits)
- Electives to bring total to 120 credits

Required Courses
Art 1002*—Introduction to Art (3)
Art 1010—Drawing I (3)
Art 1011—2-D Design or Art 1012—3-D Design or Art 1013—2-D Digital Design (3)
ArtH 1303*—History of World Art I (3)
ArtH 1304*—History of World Art II (3)
ArtH 2305*—Classical Themes in Art History (3)
ArtH 2390*—American Art of the 20th Century (3)
ArtH 3320—Ancient Art (3)
ArtH 3330—Renaissance Painting and Sculpture (3)
ArtH 3331—European Architecture, 1400-1800 (3)
ArtH 3340—Baroque and Rococo Art (3)
ArtH 3360—European Art in an Age of Revolution (3)
ArtH 3361—European Art: Impressionism and Post-Impressionism (3)
ArtH 3370—European Art from 1900 to 1945 (3)
ArtH 3380—Art of the United States: Colonial to Impressionism (3)

Foreign language (12)
Approved electives (12)
* Courses that may be used to fulfill UMD liberal education program requirements.

Electives
Major includes 12 credits in related areas selected in consultation with an adviser.

Language Requirements
The program requires 12 credits in a foreign language.

Final Project
All art history majors are required to write a research paper on a subject of their choice. This paper may be one written previously for independent study in art history or for an art history class. It must be revised in consultation with the faculty member for whom it was originally written, who reads and approves the final version. The final paper is kept on file in the art department.

The student may begin or revise the paper after completing most of the art history courses required for the major. The paper must be completed before the last semester of residency and approved by an art history faculty member before graduation.

Minor Requirements (21 cr)
Required (9)
ArtH 1303*—History of World Art I (3)
ArtH 1304*—History of World Art II (3)
ArtH 2305*—Classical Themes in Art History (3)

Art history electives (12) at 3xxx
* Courses that may be used to fulfill UMD liberal education program requirements.

Graphic Design
B.F.A.
Graphic design as a practice comprises a range of visual communication centering on the use of type and image. Graphic design is often assumed to be a commercial activity that promotes products and services for sale, but it also includes the design of information, publications, and aspects of film and video. Increasingly the practice also includes the planning and implementation of interactive media. The discipline traditionally concentrated on training for the practice of graphic design, but now encompasses both training and the study and analysis of graphic design and its role in modern culture. Increasingly graphic design is practiced as a fine arts activity without reference to clients and commerce.

The graphic design program at UMD takes advantage of its position in a school of fine arts in a university setting. Even though the B.F.A. is a professional degree requiring more credits in the major than does the B.A., a broad education is still the goal. Program organizers believe that a narrow vocational approach encourages neither well-rounded citizens nor, ultimately, good designers. Nonetheless, a professional degree implies preparation for
employment, and 6 credits of “real world” classes, including internships and a graphic design services course, where students act as a design firm for campus organizations, assure that all graduates have experience practicing the profession. Students must also complete a final project that receives public exposure.

**Degree Requirements**
Requirements for the B.F.A. in graphic design include:
- UMD liberal education requirements
- Advanced writing requirement: Comp 3110—Advanced Writing: Arts and Letters (3 credits)
- Major requirements (82 credits):
  - 70 credits in graphic design and studio,
  - 12 credits in art history

**Required Courses**

**Graphic Design (37)**
- Art 1010—Drawing I (3)
- Art 1011—2-D Design (3)
- Art 1012—3-D Design
  - or Art 1014—3-D Digital Design (3)
- Art 1013—2-D Digital Design (3)
- Art 2900*—Visual Literacy (3)
- Art 2905—Graphic Techniques I (3)
- Art 2911—Graphic Design I (3)
- Art 3922—Graphic Design II (3)
- Art 3933—Graphic Design III (3)
- Art 4812—Art Seminar (3)
- Art 4905—Graphic Techniques II (3)
- Art 4999—Senior Project in Graphic Design (1)
- Art 5907—Motion Graphics I (3)

*Select six (6) credits from:*
- Art 4904—Technical Topics (1-3)
- Art 4915—Papers and Printing (1-3)
- Art 5902—Graphic Design Theory and Criticism (3)
- Art 5908—Motion Graphics II (3)
- Art 5909—Interactive Design (3)
- Art 5916—Type Lab (1-3)
- Art 5926—Publications Design (3)
- Art 5991—Independent Study in Graphic Design (1-3)
- Art 5999—Special Projects in Design (1-3)
- Art studio elective (3)
- Art history elective (3)

*Select six (6) credits from:*
- Art 4972—Graphic Design Services (3-6)
- Art 4976—Publication Services (3)
- Art 4997—Graphic Design Internship (3-6)

**Studio—select five courses (15)**
- Art 1100—Painting I (3)
- Art 1200—Sculpture I (3)
- Art 1300—Printmaking I: Intaglio, Relief
  - or Art 1301—Printmaking I: Litho, Screen (3)
- Art 1400—Ceramics I (3)
- Art 1500—Jewelry and Metals I (3)
- Art 1510—Weaving and Fibers I (3)
- Art 1600—Photography I (3)
- Art 3016—2-D Digital Studio I (3)
- Art 3030—Art in Technologies I (3)
- Art 3700—Drawing II (3)

*Studio electives at 3xxx or 4xxx from two of the five areas selected above (6)*

**Art History (9)**
- ArtH 2305*—Classical Themes in Art History (3)
- ArtH 2390*—American Art of the 20th Century (3)
- ArtH 4901—History of Graphic Design (3)

**Art History Elective (3)**
- *Courses that may be used to fulfill UMD liberal education program requirements.*

**Final Project**
Students must submit a final project, which is a show of the student’s work in the Tweed Museum of Art or another significant project with public exposure.

**Photography Minor Only**
This minor provides experience with both traditional silver-based photographic processes and digital manipulation from photographic sources. Students learn the principles of design and composition and are introduced to theories of visual communication, particularly within the art and design context.

**Requirements (27)**
- Art 1002*—Intro to Art (3)
- Art 1013—2-D Digital Design (3)
- Art 1600—Photography I (3)
- Art 2900*—Visual Literacy (3)
- Art 3016—2-D Digital Studio I (3)
- Art 3600—Photography II (6)
- Art 4600—Photography III (6)

*Note: Art department majors are not required to take Art 1002 if they take an additional 3 credits of Art 4600.*
- *Courses that may be used to fulfill UMD liberal education program requirements.*

**B.A. — CLA Art**
The B.A. in art program provides study in art with an emphasis on liberal education.

**Degree Requirements**
Requirements for the B.A. in art (120 credits) include:
- UMD liberal education requirements
- Advanced writing requirement: Comp 3110—Advanced Writing: Arts and Letters
  - or Comp 5220—Document Design and Graphics (3 credits)
- Major requirements (58 credits)
- Minor requirements
**Required Courses**

Art 1002*-Introduction to Art (3)
Art 1010—Drawing I (3)
Art 1011—2-D Design
or  Art 1013—2-D Digital Design (3)
Art 1012—3-D Design (3)
Art 2900*-Visual Literacy (3)
Art 3700—Drawing II (3)
Art 4812—Art Seminar (3)
Art 4899—Senior Exhibit (1)

**Studio Electives (18)**

Four from the following plus the additional electives:

- Art 1100—Painting I (3)
- Art 1200—Sculpture I (3)
- Art 1300—Printmaking I: Intaglio, Relief
or  Art 1301—Printmaking I: Litho, Screen (3)
- Art 1400—Ceramics I (3)
- Art 1500—Jewelry and Metals I (3)
- Art 1510—Weaving and Fibers I (3)
- Art 1600—Photography I (3)
- Art 3016—2-D Digital Studio I (3)
- Art 3030—Art in Technologies I (3)

Additional studio electives at 3xxx or 4xxx from two of the four areas selected above (6)

- ArtH 1303*-History of World Art I (3)
- ArtH 1304*-History of World Art II (3)
- ArtH 2305*—Classical Themes in Art History (3)

* Courses that may be used to fulfill UMD liberal education program requirements.

**Required Courses From Other Programs**

See general requirements of the College of Liberal Arts for all B.A. majors.

**Language Requirements**

See general College of Liberal Arts requirements for B.A. majors.

**Final Project**

Seniors prepare and present a solo or joint exhibition in the Tweed Museum of Art and enroll in Art 4812—Art Seminar.

**Fine Arts (FA)**

Courses in the fine arts acquaint students with the interdisciplinary aspects of art, dance, museum studies, music, and theatre, as well as their relationships with other academic disciplines.

**Music (Mu)**

Professors: Ann Anderson, Judith Kitzmire (department head), Thomas Wegren, Stanley Wold; Associate Professors: Wm. Robert Bucker, Mark Whitlock; Assistant Professors: Daniel Lipori, Christopher Oberholtzer, Justin Rubin, Paul Sahuc, David Schmalenberger, Ramon Vasquez

The Department of Music provides historical, theoretical, pedagogical, and creative experiences in music, preparing students for professional careers as teachers, performers, conductors, and composers. The department offers the Bachelor of Music (B.M.) degree in jazz studies, music education, performance (voice, instruments, musical theatre), piano pedagogy, and theory-composition. Also available are the Bachelor of Arts (B.A.) degree in music for students wishing to combine music with traditional liberal arts studies, and two undergraduate minors: in jazz studies and in music. Graduate study leading to the Master of Music (M.M.) degree in music (with emphasis in music education) is also offered.

**Admission Requirements**

All students must perform an audition on the major instrument and successfully complete entrance examinations in theory/aural/keyboard skills and an interview in the major field. Students electing a performance degree must pass a performance review at the end of the first semester to receive full acceptance into the degree program. Ongoing assessment takes place by way of juries, written examinations, and recitals.

**Jazz Studies**

**B.M.**

**Degree Requirements**

Requirements for the B.M. in jazz studies include:

- UMD liberal education requirements
- Advanced writing requirement: Comp 3110—Advanced Writing: Arts and Letters (3 credits)
- Major requirements:
  - Course requirements (61 credits), core music courses (26 credits), electives (12 credits)

**Required Courses**

**Music Core (26)**

- Mu 0100—Recital Hour (0) (taken concurrently with applied instruction each semester)
- Mu 1101—Music Theory I (3)
- Mu 1102—Music Theory II (3)
- Mu 1901—Music Technology I (1)
- Mu 1902—Music Technology II (1)
- Mu 2101—Music Theory III (3)
Mu 2102—Music Theory IV (3)
Mu 2701—Fundamentals of Conducting (1)
Mu 2801—Improvisation (1)
Mu 3101—Form and Analysis (2)
Mu 3201—Music History I (4)
Mu 3202—Music History II (4)

**Major Course Requirements (61)**

Ensembles (6) (1.5 cr each semester, lower division, including one combo)
Applied instruction at lxxx (4)
Applied instruction at 4xxx (4)
Applied instruction secondary instrument (4)

Ensembles (6) (1.5 cr each semester, upper division, including one combo)
Mu 1005*—Jazz Studies (3)
Mu 1421—Piano Class (2)
Mu 2005*—African Roots of American Music (3)
Mu 2802—Introduction to Jazz Improvisation (1)
Mu 3801—Jazz Improvisation III (I)
Mu 3802—Jazz Improvisation IV (I)
Mu 3805—Jazz Writing I (2)
Mu 3806—Jazz Writing II (2)
Mu 4101—Instrumental Arranging (3)
Mu 4801—Evolution and Analysis of Jazz Styles (2)
Mu 4803—Jazz Literature and Pedagogy (3)
Mu 4805—MIDI Applications (3)
Mu 4807—Music Industry (2)

* Courses that may be used to fulfill UMD liberal education program requirements.

**Music Education—Instrumental K-12 Emphasis**

**B.M.**

The B.M. in music education—instrumental K-12 is for students planning to teach classroom and instrumental music.

**Degree Requirements**

Requirements for the B.M. in music education—instrumental K-12 include:

- UMD liberal education requirements
- Advanced writing requirement: Comp 3110—Advanced Writing: Arts and Letters (3 credits)
- Major requirements:
  - Course requirements (78 credits), core music courses (26 credits), elective (1)

**Required Courses**

**Music Core (26)**

Mu 0100—Recital Hour (0) (taken concurrently with applied instruction each semester)
Mu 1101—Music Theory I (3)
Mu 1102—Music Theory II (3)
Mu 1901—Music Technology I (1)
Mu 1902—Music Technology II (1)
Mu 2101—Music Theory III (3)
Mu 2102—Music Theory IV (3)
Mu 2701—Fundamentals of Conducting (1)
Mu 2801—Improvisation (1)
Mu 2802—Introduction to Jazz Improvisation (1)
Mu 3101—Form and Analysis (2)
Mu 3201—Music History I (4)
Mu 3202—Music History II (4)
Mu 3801—Jazz Improvisation I
Mu 3802—Jazz Improvisation II
Mu 3805—Jazz Writing I (2)
Mu 3806—Jazz Writing II (2)
Mu 4101—Instrumental Arranging (3)
Mu 4801—Evolution and Analysis of Jazz Styles (2)
Mu 4803—Jazz Literature and Pedagogy (3)
Mu 4805—MIDI Applications (3)
Mu 4807—Music Industry (2)

* Courses that may be used to fulfill UMD liberal education program requirements.

**Minor Requirements (27-28)**

Applied instruction, principal instrument, at lxxx (4)
Mu 0100—Recital Hour (0) (taken concurrently with applied instruction)
Mu 1005*—Jazz Studies (3)
Mu 1101—Music Theory I (3)
Mu 1102—Music Theory II (3)
Mu 1505*—Jazz Ensemble (1) each semester
or Mu 1541—Chamber Music (2) (.5 cr each semester)
Mu 2802—Introduction to Jazz Improvisation (1)
Mu 3801—Jazz Improvisation (1)
Mu 4505—Jazz Ensemble (1) each semester
or Mu 4541—Chamber Music (2) (.5 cr each semester)
Mu 4803—Jazz Literature and Pedagogy (3)

Mu 4805—MIDI Applications (3)
Mu 4807—Music Industry (2)

**Major Course Requirements (78)**

Applied instruction at lxxx (4)
Applied instruction at 4xxx (3)
Mu 1005*—Jazz Studies
or Mu 2001*—Ethnic and Folk Music of the World
or Mu 2005*—African Roots of American Music (3)
Mu 1421—Piano Class (2)
or pass basic piano proficiency exam
Mu 1441—Vocal Techniques (1)
Mu 1442—Percussion Techniques (1)
Mu 1491—Group Instruction in Applied Music (1) (Guitar)
Mu 2443—Woodwind Techniques I (1)
Mu 2444—Woodwind Techniques II (1)
Mu 2445—String Techniques I (1)
Mu 2446—String Techniques II (1)
Mu 2447—Brass Techniques I (1)
Mu 2448—Brass Techniques II (1)
Mu 3605—Teaching Classroom Music (4)
Mu 3607—Instrumental Music Methods (3)
Colleges and Schools

Mu 3705—Instrumental Conducting I (1)
Mu 3706—Instrumental Conducting II (1)
Mu 4101—Instrumental Arranging (3)

Ensembles, one each semester (4)
Mu 1501*—Concert Band
or  Mu 1502*—Symphonic Wind Ensemble
or  Mu 1503*—Symphony Orchestra (1)

Ensembles, one each semester (3)
Mu 4501—Concert Band
or  Mu 4502—Symphonic Wind Ensemble
or  Mu 4503—Symphony Orchestra (1)

Additional Ensembles (1) from
Mu 1504*—Chamber Orchestra (1)
or  Mu 1505*—Jazz Ensemble (1)
or  Mu 4504—Chamber Orchestra (1)
or  Mu 4505—Jazz Ensemble (1)
or  Mu 4541—Chamber Ensemble (0.5)

Proficiency exams: basic piano, advanced proficiency in major instrument, aural skills

Art 1001*—Art Today
or  Art 1002*—Introduction to Art
or  ArtH 1303*—History of World Art I
or  ArtH 1304—History of World Art II
or  Th 1001*—Introduction to Theatre Arts
or  Th 1111*—Acting Fundamentals (3)

Educ 1101*—Education in Modern Society (3)
Educ 4381—Teaching American Indian Students (2)
Educ 4500—Professional Issues in Teaching (3)
EdSe 3205—Apprenticeship: Middle School
or  EdSe 3206—Apprenticeship: Secondary School (2)
EdSe 4501—Educational Psychology (3)
EdSe 4600—Student Teaching (6)
EdSe 4601—Student Teaching Seminar (1)
EdSe 5100—Human Relations in Classrooms (2)
ElEd 3425—Collateral Fields: Field Experience (2)
ElEd 4650—Student Teaching in Individual Subjects—K-8 (5)

Hlth 3202—Drug Education (2)
SpEd 1357*—Individuals with Disabilities in Society (3)

Electives (1)
* Courses that may be used to fulfill UMD liberal education program requirements.

Music Education—Vocal K-12 Emphasis

B.M.
The B.M. in music education—vocal K-12 is for students planning to teach classroom and vocal music.

Degree Requirements
Requirements for the B.M. in music education—vocal K-12 include:
- UMD liberal education requirements
- Advanced writing requirement: Comp 3110—Advanced Writing: Arts and Letters (3 credits)

- Major requirements:
  Course requirements (77 credits), core music courses (26 credits), electives (2 credits)

Required Courses
Music Core (26)
Mu 0100—Recital Hour (0) (taken concurrently with applied instruction each semester)
Mu 1101—Music Theory I (3)
Mu 1102—Music Theory II (3)
Mu 1901—Music Technology I (1)
Mu 1902—Music Technology II (1)
Mu 2101—Music Theory III (3)
Mu 2102—Music Theory IV (3)
Mu 2701—Fundamentals of Conducting (1)
Mu 2801—Improvisation (1)
Mu 3101—Form and Analysis (2)
Mu 3201—Music History I (4)
Mu 3202—Music History II (4)

Major Course Requirements (77)
Mu 1421—Piano class (2)
Applied Instruction (select one) (11)
Voice, principal instrument:
  Mu 1311—Voice (4)
  Mu 1322—Piano (4)
  Mu 4311—Voice (3)
Keyboard, principal instrument:
  Mu 1312—Voice (4)
  Mu 1321—Piano (4)
  Mu 4321—Piano (3)

Instrumental, principal instrument:
  Principal instrument, at lxxx (4)
  Principal instrument, at 4xxx (3)
  Mu 1312—Voice (2)
  Mu 1322—Piano (2)
Mu 1005*—Jazz Studies
or  Mu 2001*—Ethnic and Folk Music of the World
or  Mu 2005*—African Roots of American Music (3)
Mu 1411—Diction: Italian and English (1)
Mu 1441—Vocal Techniques (1)
Mu 1442—Perussion Techniques (1)
Mu 1491—Group Instruction in Applied Music (1) (Guitar)
Mu 3605—Teaching Classroom Music (4)
Mu 3701—Choral Conducting and Methods I (3)
Mu 3702—Choral Conducting and Methods II (3)

Ensembles, one each semester (4)
Mu 1510*—Concert Chorale
or  Mu 1511*—University Singers (1)

Ensembles, one each semester (3)
Mu 4510—Concert Chorale
or  Mu 4511—University Singers (1)

Additional ensembles, one each semester except student teaching semester (3)
Mu 4512—Chamber Singers
or  Mu 4513—Jazz Choir
or  Mu 3510—Opera Studio (1)
Proficiency exams: advanced piano, advanced voice, fretted instrument, aural skills
Art 1001*-Art Today
or Art 1002*-Introduction to Art
or ArtH 1303*-History of World Art I
or ArtH 1304*-History of World Art II
or TH 1001*-Introduction to Theatre Arts
or Th 1111*-Acting Fundamentals I (3)
Educ 1101*-Education in Modern Society (3)
Educ 4381—Teaching the American Indian Students (2)
EdSe 3205—Apprenticeship: Middle School
or EdSe 3206—Apprenticeship: Secondary School (2)
EdSe 4501—Educational Psychology (3)
EdSe 5100—Human Relations in Classrooms (2)
EjEd 3425—Collateral Fields: Field Experience (2)
Hlth 3202—Drug Education (2)
Student Teaching
EjEd 4650—Student Teaching in Individual Subjects—K-8 (5)
EdSe 4600—Student Teaching (6)
EdSe 4601—Student Teaching Seminar (1)
Educ 4500—Professional Issues in Teaching (3)
SpEd 1357*-Individuals with Disabilities in Society (3)
For information about admission to the teacher licensure program, see College of Education and Human Service Professions.
Electives (2)
* Courses that may be used to fulfill UMD liberal education program requirements.

Performance—Band or Orchestral Instruments Emphasis
B.M.

Degree Requirements
Requirements for the B.M. in performance—band or orchestral instruments include:

• UMD liberal education requirements
• Advanced writing requirement: Comp 3110—Advanced Writing: Arts and Letters (3 credits)
• Major requirements:
  Course requirements (62 credits), core music courses (26 credits), electives (11 credits)

Required Courses
Music Core (26)
Mu 0100—Recital Hour (0) (taken concurrently with applied instruction each semester)
Mu 1101—Music Theory I (3)
Mu 1102—Music Theory II (3)
Mu 1901—Music Technology I (1)
Mu 1902—Music Technology II (1)
Mu 2101—Music Theory III (3)
Mu 2102—Music Theory IV (3)
Mu 2701—Fundamentals of Conducting (1)
Mu 2801—Improvisation (1)
Mu 3101—Form and Analysis (2)
Mu 3201—Music History I (4)
Mu 3202—Music History II (4)

Major Course Requirements (62)
Applied instruction at lxxx (10)
Applied instruction at 4xxx (12)
Applied instruction secondary instrument (4)
Mu 1005*-Jazz Studies
or Mu 2001*-Ethnic and Folk Music of the World
or Mu 2005*-African Roots of American Music (3)
Mu 1421—Piano Class (2)
Ensembles, one each semester (4)
Mu 1501*-Concert Band
or Mu 1502*-Symphonic Wind Ensemble
or Mu 1503*-Symphony Orchestra
or Mu 1504*-Chamber Orchestra (1)
Mu 1541—Chamber Music (.5 cr each semester) (2)
Mu 2802—Introduction to Jazz Improvisation (1)
Mu 3300—Recital (1)
Mu 3705—Instrumental Conducting I (1)
Mu 3706—Instrumental Conducting II (1)
Mu 3995—Independent Study (solo literature) (2)
Mu 4101—Instrumental Arranging (3)
Mu 4103—Contrapuntal Techniques (2)
Ensembles, one each semester (4)
Mu 4501—Concert Band
or Mu 4502—Symphonic Wind Ensemble
or Mu 4503—Symphony Orchestra
or Mu 4504—Chamber Orchestra (1)
Mu 4541—Chamber Music (.5 cr each semester) (2)
Mu 4601—Applied Music Teaching (1 cr each semester) (2)
Proficiency exams: basic piano, advanced proficiency in major instrument aural skills
Art 1001*-Art Today
or Art 1002*-Introduction to Art
or ArtH 1303*-History of World Art I
or ArtH 1304*-History of World Art II (3)
Th 1001*-Introduction to Theatre Arts
or Th 1111*-Acting Fundamentals (3)
Electives (11)
* Courses that may be used to fulfill UMD liberal education program requirements.

Performance—Keyboard Emphasis
B.M.

Degree Requirements
Requirements for the B.M. in performance-keyboard include:

• UMD liberal education requirements
• Advanced writing requirement: Comp 3110—Advanced Writing: Arts and Letters (3 credits)
• Major requirements:
  Course requirements (63 credits), core music courses (26 credits), electives (10 credits)
Colleges and Schools

Required Courses

Music Core (26)
Mu 0100—Recital Hour (0) (taken concurrently with applied instruction each semester)
Mu 1101—Music Theory I (3)
Mu 1102—Music Theory II (3)
Mu 1901—Music Technology I (1)
Mu 1902—Music Technology II (1)
Mu 2101—Music Theory III (3)
Mu 2102—Music Theory IV (3)
Mu 2701—Fundamentals of Conducting (1)
Mu 2801—Improvisation (1)
Mu 3101—Form and Analysis (2)
Mu 3201—Music History I (4)
Mu 3202—Music History II (4)

Major Course Requirements (63)
Applied Instruction
Mu 1321—Applied Voice (7) (1 cr 1st semester; 2 cr each semester thereafter)
Mu 4311—Applied Voice (8)
Mu 1322—Applied Piano (2)

Ensembles, one each semester (4)
Mu 1501*—Concert Band
or Mu 1502*—Symphonic Wind Ensemble
or Mu 1503*—Symphony Orchestra
or Mu 1510*—Concert Chorale
or Mu 1511*—University Singers
or Mu 1512*—Chamber Singers
or Mu 1513—Jazz Choir

Ensembles, one each semester (4)
Mu 4501—Concert Band
or Mu 4502—Symphonic Wind Ensemble
or Mu 4503—Symphony Orchestra
or Mu 4510—Concert Chorale
or Mu 4511—University Singers
or Mu 4512—Chamber Singers
or Mu 4513—Jazz Choir

Proficiency exams: advanced piano, aural skills
Art 1001*—Art Today
or Art 1002*—Introduction to Art
or ArtH 1303*—History of World Art I
or ArtH 1304*—History of World Art II (3)

Electives (10)
* Courses that may be used to fulfill UMD liberal education program requirements.

Performance—Musical Theatre Emphasis

B.M.

Degree Requirements
Requirements for the B.M. in performance—musical theatre include:
- UMD liberal education requirements
- Advanced writing requirement: Comp 3110—Advanced Writing Arts and Letters (3 credits)
- Major requirements:
  - Course requirements (67-69 credits), core music courses (26 credits), electives (4-6 credits)

Required Courses

Music Core (26)
Mu 0100—Recital Hour (0) (taken concurrently with applied instruction each semester)
Mu 1101—Music Theory I (3)
Mu 1102—Music Theory II (3)
Mu 1901—Music Technology I (1)
Mu 1902—Music Technology II (1)
Mu 2101—Music Theory III (3)
Mu 2102—Music Theory IV (3)
Mu 2701—Fundamentals of Conducting (1)
Mu 2801—Improvisation (1)
Mu 3101—Form and Analysis (2)
Mu 3201—Music History I (4)
Mu 3202—Music History II (4)

Major Course Requirements (67-69)
Mu 1311—Applied Voice (7) (1 cr 1st semester; 2 cr each semester thereafter)
Mu 4311—Applied Voice (8)
Mu 1322—Applied Piano (2)
Mu 1411—Diction: Italian and English (1)
Mu 1412—Diction: German
or Mu 1413—Diction: French (1)
Mu 1421—Piano Class (2)
Mu 3211—Art Song Literature (2)
Mu 3212—Opera Literature (2)
Mu 3300—Recital (1)
Mu 3510—Opera Studio (2) (required fall semester, last two years)
Mu 3511—Performance Practicum (1)
Mu 4601—Applied Music Teaching (I)
Th 1001*—Introduction to Theatre Arts
or Th 1111*—Acting Fundamentals (3)
Ensembles, one each semester (4)
Mu 1510*—Concert Chorale
or Mu 1511*—University Singers
or Mu 1512*—Chamber Singers
or Mu 1513*—Jazz Singers (1)
Ensembles, one each semester (4)
Mu 4510—Concert Chorale
or Mu 4511—University Singers
or Mu 4512—Chamber Singers
or Mu 4513—Jazz Singers (1)

Proficiency exams: basic piano, advanced proficiency (voice) aural skills
Th 1001*—Introduction to Theatre Arts
or Th 1071*—Music Theatre History (3)
Th 1099—Production Practicum I (1)
Th 1111*—Acting Fundamentals I (3)
Th 1112—Acting I (3)
Th 1118—Voice and Movement for the Actor (3)
Th 2114—Acting: Musical Theatre (3)

Select two of the following (6-8):
Th 1301—Stagecraft (4)
Th 1451—Stage Makeup (3)
Th 1501—Stage Lighting I (4)
Th 3441—Costume Design I (3)

Select one Dance option (4):
DN 1111*—Jazz Dance Technique I (2)
and DN 3211—Jazz Dance Technique II (2)
or DN 1121—Tap Dance Technique I (2)
and DN 3221—Tap Dance Technique II (2)
or DN 1131*—Ballet Technique I (2)
and DN 3231—Ballet Technique II (2)

Electives (4-6)
* Courses that may be used to fulfill UMD liberal education program requirements.

Performance—Vocal Emphasis
B.M.

Degree Requirements
Requirements for the B.M. in performance-vocal emphasis include:

- UMD liberal education requirements
- Advanced writing requirement: Comp 3110—Advanced Writing: Arts and Letters (3 credits)
- Major requirements:
  - Course requirements (77 credits), core music courses (26 credits), electives (8 credits)

Required Courses

Music Core (26)
Mu 0100—Recital Hour (0) (taken concurrently with applied instruction each semester)
Mu 1101—Music Theory I (3)
Mu 1102—Music Theory II (3)
Mu 1901—Music Technology I (1)
Mu 1902—Music Technology II (1)
Mu 2101—Music Theory III (3)
Mu 2102—Music Theory IV (3)
Mu 2701—Fundamentals of Conducting (1)
Mu 2801—Improvisation (1)
Mu 3101—Form and Analysis (2)
Mu 3201—Music History I (4)
Mu 3202—Music History II (4)

Major Course Requirements (77)
Mu 1311—Voice (10) (1 cr first semester; 3 cr each semester thereafter)
Mu 4311—Voice (12)
Mu 1005*—Jazz Studies
or Mu 2001*—Ethnic and Folk Music of the World
or Mu 2005*—African Roots of American Music (3)
Mu 1322—Piano (2)
Mu 1411—Diction: Italian and English (1)
Mu 1412—Diction: German (1)
Mu 1413—Diction: French (1)
Mu 1421—Piano Class (2)
Mu 1441—Vocal Techniques (1)
Mu 2802—Introduction to Jazz Improvisation (I)
Mu 3211—Art Song Literature (2)
Mu 3212—Opera Literature (2)
Mu 3300—Recital (1)
Mu 3510—Opera Studio (4)
Mu 3701—Choral Conducting and Methods I (3)
Mu 4103—Counterpointal Techniques (2)
Mu 4601—Applied Music Teaching (1)
Mu 4807—Music Industry (2)

Ensembles, one each semester (4)
Mu 1510*—Concert Chorale
or Mu 1511*—University Singers (1)
Ensembles, one each semester (4)
Mu 4510—Concert Chorale
or Mu 4511—University Singers (1)
Additional Ensembles (4)
Proficiency exams: basic piano, advanced proficiency in major instrument, aural skills
Art 1001*—Art Today
or Art 1002*—Introduction to Art
or ArtH 1303*—History of World Art I
or ArtH 1304*—History of World Art II (3)
Th 1001*—Introduction to Theatre Arts
or Th 1111*—Acting Fundamentals (3)

Two (8) from:
Fr 1101*—Beginning French I (4)
Fr 1102*—Beginning French II (4)
Fr 1201*—Intermediate French I (4)
Fr 1202*—Intermediate French II (4)
Ger 1101*—Beginning German I (4)
Ger 1102*—Beginning German II (4)
Ger 1201*—Intermediate German I (4)
Ger 1202*—Intermediate German II (4)

Electives (8)
* Courses that may be used to fulfill UMD liberal education program requirements.
Piano Pedagogy
B.M.

Degree Requirements
Requirements for the B.M. in piano pedagogy include:
• UMD liberal education requirements
• Advanced writing requirement: Comp 3110—Advanced Writing: Arts and Letters (3 credits)
• Major requirements:
  Course requirements (62 credits), core music courses (26 credits), electives (11 credits)

Required Courses
Music Core (26)
Mu 0100—Recital Hour (0) (taken concurrently with applied instruction each semester)
Mu 1101—Music Theory I (3)
Mu 1102—Music Theory II (3)
Mu 1901—Music Technology I (1)
Mu 1902—Music Technology II (1)
Mu 2101—Music Theory III (3)
Mu 2102—Music Theory IV (3)
Mu 2701—Fundamentals of Conducting (1)
Mu 2801—Improvisation (1)
Mu 3101—Form and Analysis (2)
Mu 3201—Music History I (4)
Mu 3202—Music History II (4)

Major Course Requirements (62)
Applied instruction (lxxx)
Mu 1321—Piano (8) (2 cr each semester)
Mu 4321—Piano (8) (2 cr each semester)
Mu 1005*—Jazz Studies
or Mu 2001*—Ethnic and Folk Music of the World
or Mu 2005—African Roots of American Music (3)
Mu 2802—Introduction to Jazz Improvisation (1)
Mu 3300—Recital (1)
Mu 3603—Music for Early Childhood (1)
Mu 3625—Art of Accompanying (2) (1 cr each semester)
Mu 4103—Contrapuntal Techniques (2)
Mu 4201—Piano Literature (3)
Mu 4621—Piano Pedagogy I, Practicum (3)
Mu 4622—Piano Pedagogy II, Practicum (3)
Mu 4623—Piano Techniques and Styles (3)
Mu 4805—MIDI Applications (2)
Mu 4807—Music Industry (2)
Mu 4997—Internship in Music (4) (2 cr each semester)

Ensembles, one each semester (4)
Mu 1501*—Concert Band
or Mu 1502*—Symphonic Wind Ensemble
or Mu 1503*—Symphony Orchestra
or Mu 1505*—Jazz Ensemble
or Mu 1510*—Concert Chorale
or Mu 1511*—University Singers (1)

Additional Ensemble (1)
Mu 1512*—Chamber Singers (1)
or Mu 1513*—Jazz Choir (1)
or Mu 1541—Chamber Music (0.5)
or Mu 3510—Opera Studio (1)

Electives (11)
* Courses that may be used to fulfill UMD Liberal education program requirements.

Theory and Composition
B.M.

Degree Requirements
Requirements for the B.M. in theory and composition include:
• UMD liberal education requirements
• Advanced Writing requirement: Comp 3110—Advanced Writing: Arts and Letters (3 credits)
• Major requirements:
  Course requirements (62-63 credits), core music courses (26 credits), electives (10-11 credits)

Required Courses
Music Core Requirements (26)
Mu 0100—Recital Hour (0) (taken concurrently with applied instruction each semester)
Mu 1101—Music Theory I (3)
Mu 1102—Music Theory II (3)
Mu 1901—Music Technology I (1)
Mu 1902—Music Technology II (1)
Mu 2101—Music Theory III (3)
Mu 2102—Music Theory IV (3)
Mu 3101—Form and Analysis (2)
Mu 3201—Music History I (4)
Mu 3202—Music History II (4)
Mu 4321—Piano (8) (2 cr each semester)
Mu 4510—Concert Band
or Mu 4502—Symphonic Wind Ensemble
or Mu 4503—Symphony Orchestra
or Mu 4505—Jazz Ensemble
or Mu 4510—Concert Chorale
or Mu 4511—University Singers (1)

Additional Ensemble (1)
Mu 1512*—Chamber Singers (1)
or Mu 1513*—Jazz Choir (1)
or Mu 1541—Chamber Music (0.5)
or Mu 3510—Opera Studio (1)

Proficiency exam: advanced piano, aural skills
Art 1001*—Art Today
or Art 1002*—Introduction to Art
or ArtH 1303*—History of World Art I
or ArtH 1304*—History of World Art II (3)
Th 1001*—Introduction to Theatre Arts
or Th 1111*—Acting Fundamentals (3)

Ensembles, one each semester (4)
Mu 4501—Concert Band
or Mu 4502—Symphonic Wind Ensemble
or Mu 4503—Symphony Orchestra
or Mu 4505—Jazz Ensemble
or Mu 4510—Concert Chorale
or Mu 4511—University Singers (1)

Additional Ensemble (1)
Mu 1512*—Chamber Singers (1)
or Mu 1513*—Jazz Choir (1)
or Mu 1541—Chamber Music (0.5)
or Mu 3510—Opera Studio (1)

Proficiency exam: advanced piano, aural skills
Art 1001*—Art Today
or Art 1002*—Introduction to Art
or ArtH 1303*—History of World Art I
or ArtH 1304*—History of World Art II (3)
Th 1001*—Introduction to Theatre Arts
or Th 1111*—Acting Fundamentals (3)

Electives (11)
* Courses that may be used to fulfill UMD Liberal education program requirements.
Major Requirements (62-63)
Applied instruction, principal instrument at 1xxx (4)
Applied instruction, principal instrument at 4xxx (4)
Applied instruction, secondary instrument (2) (for non-keyboard major: piano)

Mu 1005*—Jazz Studies
or Mu 2001*—Ethnic and Folk Music of the World
or Mu 2005*—African Roots of American Music (3)
Mu 1421—Piano Class (2)
Mu 1441—Vocal Techniques (1)
Mu 1442—Percussion Techniques (1)
Mu 2105—Composition I (4) (2 cr each semester)
Mu 2443—Woodwind Techniques I
or Mu 2444—Woodwind Techniques II (1)
Mu 2445—String Techniques I
or Mu 2446—String Techniques II (1)
Mu 2447—Brass Techniques I
or Mu 2448—Brass Techniques II (1)
Mu 3105—Composition II (4) (2 cr each semester)
Mu 3300—Recital (1)
Mu 3701—Choral Conducting and Methods I (3)
or Mu 3705—Instrumental Conducting I (1)
and Mu 3706—Instrumental Conducting II (1)

Ensembles, one each semester (4)
Mu 1501*—Concert Band
or Mu 1502*—Symphonic Wind Ensemble
or 1503*—Symphony Orchestra
or 1510*—Concert Chorale
or Mu 1511*—University Singers (1)

Ensembles, one each semester (4)
Mu 4501—Concert Band
or Mu 4502—Symphonic Wind Ensemble
or Mu 4503—Symphony Orchestra
or Mu 4510—Concert Chorale
or Mu 4511—University Singers (1)
Mu 3805—Jazz Writing I (2)
Mu 4101—Instrumental Arranging (3)
Mu 4103—Contrapuntal Techniques (2)
Mu 4105—Composition III (4) (2 cr each semester)
Mu 4807—Music Industry (2)
Mu 4997—Internship (music tutoring) (1)
Mu 5995—Independent Study (project in theory) (3)
Proficiency exams: basic piano, advanced proficiency in major instrument, aural skills

Art 1001*—Art Today
or Art 1002*—Introduction to Art
or ArtH 1303*—History of World Art I
or ArtH 1304*—History of World Art II (3)
Th 1001*—Introduction to Theatre Arts
or Th 1111*—Acting Fundamentals (3)

Electives (10-11)
* Courses that may be used to fulfill UMD liberal education program requirements.

Music
B.A.—CLA

Degree Requirements
Requirements for the B.A. in music include:

- UMD liberal education requirements
- Advanced writing requirement: Comp 3xxx (3)
- Major requirements (45 credits)
- Minor requirements (26 credits)

Required Courses
Music Major (45)
Applied instruction, principal instrument, at 1xxx (4)
Applied instruction, principal instrument, at 4xxx (2)
Mu 0100—Recital Hour (0) (to be taken concurrently with applied instruction)
Mu 1101—Music Theory I (3)
Mu 1102—Music Theory II (3)
Mu 1901—Music Technology I (1)
Mu 1902—Music Technology II (1)
Mu 2101—Music Theory III (3)
Mu 2102—Music Theory IV (3)
Mu 3201—Music History I (4)
Mu 3202—Music History II (4)
Ensembles at 1xxx, one course each semester (4)
Ensembles at 4xxx, one course each semester (4)
Music electives at 2xxx and above (9)
Additional B.A. degree requirements are noted under College of Liberal Arts.

Minor Requirements
Required (26)
Applied instruction, principal instrument, at 1xxx (4)
Mu 1101—Music Theory I (3)
Mu 1102—Music Theory II (3)
Mu 1901—Music Technology I (1)
Mu 3201—Music History I (4)
Mu 3202—Music History II (4)
Select one from:
Mu 1005*—Jazz Studies
or Mu 2001*—Ethnic and Folk Music of the World
or Mu 2003*—Survey of American Music
or Mu 2005*—African Roots of American Music (3)
Ensembles (4)
* Courses that may be used to fulfill UMD liberal education program requirements.
Theatre (Th)

Professor: Kathryn A. Martin; Associate Professors: Ann Bergeron, Jon Berry, Patricia Dennis (department head), Mark Harvey, Thomas Isbell, Cathryn Ufema, Arden Weaver; Assistant Professor: William Payne

The Department of Theatre, housed in the Marshall Performing Arts Center, has three objectives: to teach, produce, and sponsor theatre. The department provides academic and professional training in the arts of the theatre: acting, singing, directing, critical evaluation, dance, scenic design, lighting, sound, costume, properties, stage management, theatre history and theory, and theatre management.

The cocurricular producing arm of the department, UMD Theatre, provides practical experience for University students while enhancing the cultural life of the University and the communities it serves. Auditions for all theatre productions are open to any student currently enrolled at UMD. Productions range from classical to contemporary, comedy to tragedy, musical theatre to experimental. Modern, jazz, tap, and classical dance are offered in academics as well as in the production season.

The department sponsors performances and residencies by a variety of theatre artists. Recent visitors have included world-class performing artists, directors, choreographers, designers, and dance companies.

Admission Requirements
Students majoring in theatre for the B.F.A. are admitted as provisional candidates for the degree when they enter the University. At the end of the first year in residence, students are required to interview/audition for admission to full candidacy. The presentation should reflect the student’s area of emphasis: acting, musical theatre, design/technical theatre, or composite. Majors are also expected to participate in some aspect of UMD Theatre production during each semester of their residence at UMD. A minimum of 2.50 is required in the major for graduation. Department requirements and procedures are detailed in the Department of Theatre B.F.A. Handbook, provided to all B.F.A. majors.

Required Core (43)
Th 0901—B.F.A. Qualifying Presentation (0)
Th 1112—Acting I (3)
Th 1299—Theatre Marketing/Management Practicum (2)
Th 1301—Stagecraft (4)
Th 1401—Costume Construction I (4)
Th 1451—Stage Makeup (3)
Th 1501—Stage Lighting I (4)
Th 1699—Running Crew Practicum (2)
Th 1801—Elements of Theatre (3)
Th 3201—Stage Direction (3)
Th 3331—Scenic Design I (3)
Th 3441—Costume Design I (3)
Th 3801—Drama Titles (1)
Th 4801—History of the Theatre I (4)
Th 4802—History of the Theatre II (4)

Theatre—Acting Emphasis
B.F.A.
The B.F.A. in theatre—acting is for students seeking professional training or an intensive course of study with an acting emphasis.

Degree Requirements
Requirements for the B.F.A. in theatre—acting include:

- UMD liberal education requirements
- Advanced writing requirement: Comp 3110—Advanced Writing: Arts and Letters (3 credits)
- Major requirements (76 credits): Core B.F.A. theatre requirements (43 credits), acting emphasis (33 credits)
- Free electives (6 credits)

Required Courses
Acting Emphasis (33)
Th 1116—Audition Techniques (3)
Th 1118—Voice and Movement for the Actor (3)
Th 2112—Acting II: American Realism (3)
Th 2113—Acting III: Classical Styles (3)
Th 2118—Speech for the Actor (3)
Th 2119—Stage Dialects (3)
Th 3151—Stage Combat/Circus (3)
Th 3171—Acting IV: Character/Masks (3)
Th 4151—Acting V: Senior Studio (3)
Th 4171—Acting VI: Acting for the Camera (3)
Th 4851—Drama and Performance Theory (3)

Theatre—Composite Emphasis
B.F.A.
The B.F.A. in theatre—composite is for students seeking professional training or an intensive course of study with a composite emphasis.

Degree Requirements
Requirements for the B.F.A. in theatre—composite include:

- UMD liberal education requirements
- Advanced writing requirement: Comp 3110—Advanced Writing: Arts and Letters (3 credits)
• Major requirements (76 credits):
  Core B.F.A. theatre requirements (43 credits), composite emphasis (33 credits)
• Free electives (6 credits)

**Required Courses**

**Composite Emphasis (33)**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Th 1099—Production Practicum</td>
<td>1</td>
</tr>
<tr>
<td>Th 3699—Production Management</td>
<td>2</td>
</tr>
</tbody>
</table>

Theatre Electives (18) — Theatre courses that support a theatre emphasis unavailable within the parameters of the acting, musical theatre, or design/technical emphases and approved by the composite adviser and the theatre faculty. At least 10 credits must be in upper division courses.

Electives (12) — Courses outside the department that clearly support the student’s declared composite emphasis and are approved by the composite adviser and theatre faculty.

**Theatre—Design/Technical Emphasis B.F.A.**

The B.F.A. in theatre—design/technical is for students seeking professional training or an intensive course of study with a design/technical emphasis.

**Degree Requirements**

Requirements for the B.F.A. in theatre—design/technical include:

• UMD liberal education requirements
• Advanced writing requirement: Comp 3110—Advanced Writing: Arts and Letters (3 credits)
• Major requirements (73 credits):
  Core B.F.A. theatre requirements (43 credits), design/technical emphasis (30 credits)
• Free electives (9 credits)

**Required Courses**

**Design/Technical Emphasis (30)**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Th 1351—Stage Rendering Techniques</td>
<td>3</td>
</tr>
<tr>
<td>Th 4331—Scenic Design II</td>
<td>3</td>
</tr>
<tr>
<td>Th 4351—Portfolio Preparation and Presentation</td>
<td>3</td>
</tr>
<tr>
<td>Th 4441—Costume Design II</td>
<td>3</td>
</tr>
<tr>
<td>Th 4501—Stage Lighting II</td>
<td>3</td>
</tr>
<tr>
<td>Th 4851—Drama and Performance Theory</td>
<td>3</td>
</tr>
</tbody>
</table>

**Repeating (3)**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Th 4399—Theatre: Special Projects</td>
<td>1-2</td>
</tr>
</tbody>
</table>

**Three (9) from:**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Th 1551—Sound Design</td>
<td>3</td>
</tr>
<tr>
<td>Th 3351—Theatrical Drafting</td>
<td>3</td>
</tr>
<tr>
<td>Th 3355—Computer-Aided Theatrical Design</td>
<td>3</td>
</tr>
<tr>
<td>Th 3371—Scene Painting</td>
<td>3</td>
</tr>
<tr>
<td>Th 3381—Theatre Design: Period Styles</td>
<td>3</td>
</tr>
<tr>
<td>Th 3401—Costume Construction II</td>
<td>3</td>
</tr>
</tbody>
</table>

**Theatre—Musical Theatre Emphasis B.F.A.**

The B.F.A. in theatre—musical theatre is for students seeking professional training or an intensive course of study with a musical theatre emphasis.

**Degree Requirements**

Requirements for the B.F.A. in theatre—musical theatre include:

• UMD liberal education requirements
• Advanced writing requirement: Comp 3110—Advanced Writing: Arts and Letters (3 credits)
• Major requirements (87 credits):
  Core B.F.A. theatre requirements (43 credits), musical theatre emphasis (44 credits)

**Required Courses**

**Musical Theatre Emphasis (44)**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Th 1071—Musical Theatre History</td>
<td>3</td>
</tr>
<tr>
<td>Th 1114—Musical Theatre: Theory/Sight-Singing</td>
<td>3 **</td>
</tr>
<tr>
<td>Th 1116—Audition Techniques</td>
<td>3</td>
</tr>
<tr>
<td>Th 1118—Voice and Movement for the Actor</td>
<td>3</td>
</tr>
<tr>
<td>Th 2112—Acting II: American Realism</td>
<td>3</td>
</tr>
<tr>
<td>Th 2113—Acting III: Classical Styles</td>
<td>3</td>
</tr>
<tr>
<td>Th 2114—Acting: Musical Theatre</td>
<td>3</td>
</tr>
<tr>
<td>Th 2118—Speech for the Actor</td>
<td>3</td>
</tr>
<tr>
<td>Th 3151—Stage Combat/Circus</td>
<td>3</td>
</tr>
<tr>
<td>Th 4151—Acting V: Senior Studio</td>
<td>3</td>
</tr>
<tr>
<td>DN 3211—Jazz Dance Technique II</td>
<td>2</td>
</tr>
<tr>
<td>DN 3221—Tap Dance Technique II</td>
<td>2</td>
</tr>
<tr>
<td>DN 3231—Ballet Technique II</td>
<td>2</td>
</tr>
<tr>
<td>DN 4116—Musical Theatre Audition Techniques</td>
<td>3</td>
</tr>
<tr>
<td>Mu 1312—Voice</td>
<td>1 **</td>
</tr>
<tr>
<td>Mu 1322—Piano</td>
<td>1 **</td>
</tr>
<tr>
<td>Mu 3510—Opera Studio</td>
<td>1</td>
</tr>
</tbody>
</table>

**Repeating (2)**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mu 1510—Concert Chorale</td>
<td>1</td>
</tr>
</tbody>
</table>

* Courses that may be used to fulfill UMD liberal education program requirements.
** May audition for exemption.

**Theatre Minor Requirements (24-25)**

This minor is for students who want to pursue an interest in theatre that will complement their major program.

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Th 1001—Introduction to Theatre Arts</td>
<td>3</td>
</tr>
<tr>
<td>Th 1111—Acting Fundamentals I</td>
<td>3</td>
</tr>
<tr>
<td>Th 1301—Stagecraft</td>
<td>4</td>
</tr>
<tr>
<td>Th 1401—Costume Construction</td>
<td>4</td>
</tr>
<tr>
<td>Th 1501—Stage Lighting I</td>
<td>4</td>
</tr>
</tbody>
</table>

**One from:**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Th 3201—Stage Direction</td>
<td>3</td>
</tr>
<tr>
<td>Th 3331—Scene Design</td>
<td>3</td>
</tr>
<tr>
<td>Th 3441—Costume Design</td>
<td>3</td>
</tr>
</tbody>
</table>
One from:
Th 4801—History of the Theatre I (4)
Th 4802—History of the Theatre II (4)
Th 4851—Dramatic and Performance Theory (3)

* Courses that may be used to fulfill UMD liberal education program requirements.

Dance (DN)
Adviser: Bergeron (Th)

Undergraduate Minor Only
The Department of Theatre is the home department of the dance minor. Technique courses are offered in ballet, modern, jazz, and tap dance and are complemented with courses in dance appreciation, dance history, and dance composition. Annual dance concerts give students opportunities for choreography and performance. This minor provides technical training in and an in-depth appreciation of dance as a performance and social art form.

Requirements (26)
DN 1001*—Introduction to the World of Dance (3)
DN 1101*—Modern Dance Technique I (2)
DN 1111*—Jazz Dance Technique I (2)
DN 1121—Tap Dance Technique I (2)
DN 1131*—Ballet Technique I (2)
DN 3401—Dance Composition (3)
DN 3611—Dance History (3)

Select (6) from:
DN 3201—Modern Dance Technique II (2)
DN 3211—Jazz Dance Technique II (2)
DN 3221—Tap Dance Technique II (2)
DN 3231—Ballet Technique II (2)
Repeating (2)
Th 1199*—Performance Practicum (1)

Select one from:
PE 1300—Ballroom Dance
or PE 1302—Folk Dance
or PE 1304—Square Dance (1)

* Courses that may be used to fulfill UMD liberal education program requirements.

Theatre
B.A.—CLA
The B.A. in theatre offers broad, liberal arts study in theatre arts complemented by courses from across the University curriculum. The courses required within the major afford the student a strong core of theatre knowledge and experience. Students are urged to broaden their study by selecting a minor or second major (in literature, culture, language, the social sciences, or the arts as appropriate to their career goals) in consultation with the academic adviser.

Degree Requirements
Requirements for the B.A. in theatre include:
• UMD liberal education requirements
• Advanced writing requirement: Comp 3110—Advanced Writing: Arts and Letters (3 credits)
• Major requirements (53 credits)
• Minor requirements

Required Courses
Th 1111*—Acting Fundamentals I (3)
Th 1299—Theatre Marketing/Management Practicum (2)
Th 1301—Stagecraft (4)
Th 1401—Costume Construction I (4)
Th 1451—Stage Makeup (3)
Th 1501—Stage Lighting I (4)
Th 1699—Running Crew Practicum (2)
Th 1801—Elements of Theatre (3)
Th 3099—Production Practicum II (2)
Th 3111—Acting Fundamentals II (3)
Th 3201—Stage Direction (3)
Th 3331—Scenic Design I (3)
Th 3441—Costume Design I (3)
Th 3699—Production Management (2)
Th 3801—Drama Titles (1)
Th 4801—History of the Theatre I (4)
Th 4802—History of the Theatre II (4)
Th 4851—Dramatic and Performance Theory (3)
College of Liberal Arts (CLA)

Dean: Linda Krug
109 Cina Hall, (218) 726-8981

Associate Dean: John Hamlin
104 Cina Hall, (218) 726-6387

The College of Liberal Arts emphasizes the foundations of knowledge and techniques of analysis and expression essential for lifelong learning. Critical thinking, imagination, curiosity, and healthy doubt tempered by wisdom, tolerance, and a sense of humor are attributes of the truly educated individual. The college is dedicated to accomplishing diversity through greater representation of minorities and women in the faculty, staff, and student population as well as through the integration of materials relating to cultural diversity in the curriculum.

The college faculty is committed to the advancement of knowledge through scholarly research and other creative activities. Faculty are encouraged to develop interdisciplinary teaching agendas thus providing students with rich and varied instructional opportunities. The college’s vitality is maintained through the faculty’s commitment to their own research and teaching and dedication to University and community service.

Students are provided the opportunity to develop competence in a particular field of knowledge by learning its principles, history, and perspectives. Skills in written composition and oral communication through public speaking and persuasion are the backbone of the curriculum. Opportunities are provided for study in a wide variety of disciplines in the humanities and social sciences. The CLA offers programs leading to the bachelor of arts degree.

Admission

See Policies and Procedures.

College Honors

At UMD, a maximum of 15 percent of the graduating class can graduate with college honors. In CLA, the top 3 percent of the graduating class is designated summa cum laude, the next 5 percent magna cum laude, and the next 7 percent cum laude.

At the beginning of each year, GPAs necessary to achieve these honors are posted in the CLA Student Affairs Office. The GPAs are based on the previous spring semester graduating class. In addition, those receiving honors must have a coefficient of course completion of at least 90 percent. The GPA and coefficient of completion are calculated for UMD coursework as well as for total undergraduate work, including that completed at other institutions. To be eligible for honors, students must earn at least 30 credits at UMD.

For more information, contact the CLA Student Affairs Office, 111 Cina Hall.

Dean’s List of Academic Excellence

Each semester, CLA students are recognized for high academic achievement by being placed on the CLA Dean’s List of Academic Excellence. A memo is placed on their transcript indicating this achievement. To be eligible for this honor, students must have a 3.50 minimum GPA and 12 graded credits. Incompletes, N’s, and F’s disqualify a student from eligibility.

Department Honors

Honors are awarded to graduates who have successfully fulfilled the additional requirements of the special honors program in the department offering their major programs. For information, see American studies, communication, English, history, philosophy, political science, sociology-anthropology, and Spanish.
Baccalaureate Degrees

CLA offers the bachelor of arts (B.A.) degree involving traditional liberal arts studies.

Majors
American Indian studies
  Chippewa language
  Social studies
Anthropology
Art (SFA)
Biology (CSE)
Chemistry (CSE)
Communication
Criminology
Economics (SBE)
English
  English for the workplace
  Liberal arts
  Pregraduate studies
Environmental studies
Geography
Geology (CSE)
History
Interdisciplinary studies
International studies
Mathematics (CSE)
Music (SFA)
Philosophy
  General
  Applied ethics
Physics (CSE)
Political science
  General
  Public policy
Sociology
Spanish
Theatre (SFA)
Urban and regional studies
Women's studies

Minors
American Indian studies
American studies
Anthropology
Communication
English
Environmental studies
French
Geography
German
History
Humanities
Interdisciplinary studies
International studies
Linguistics
Philosophy
Political science
Professional writing and communication
Sociology
Spanish
Women's studies

For other minors available to students receiving a B.A., see School of Business and Economics, School of Fine Arts, College of Education and Human Service Professions, and College of Science and Engineering.

B.A. Requirements
• Completion of at least 120 degree credits, including liberal education, a major, and a second field of study (either a minor or another major).
• Completion of at least 30 degree credits at UMD.
• Completion of at least 20 of the last 30 credits earned before graduation at UMD.
• A 2.00 overall University GPA in all work attempted. (Transfer grades and credits outside the University are not calculated into the University GPA; however, transfer credits are counted as degree credits.) A 2.00 minimum GPA in the major(s) and minor(s).
• Successful completion of 75 percent of all work attempted.
• Comp 3xxx course or equivalent (3)
• Completion of liberal education program requirements (see Policies and Procedures for a list of approved liberal education courses and requirements on course and grading option selection).
• Completion of an approved major for the B.A. and an approved minor or second major.

For students completing two or more majors:
• Students pursuing two degrees (e.g., a B.A. and a B.S.) must declare both degrees before graduation. This is effective fall 1997 for currently matriculated students and is not retroactive.

Academic Standing

Good Academic Standing
CLA students who have attempted 30 or more credits (including credits outside the University and credits by examination) must have a 2.00 minimum overall University GPA to be in good academic standing. Credits outside the University are not calculated into the University GPA. Students who have attempted 20 or fewer credits (at UMD or elsewhere) must have a 1.80 minimum overall GPA to be in good academic standing.
Probation

Students with a cumulative GPA lower than that required for good academic standing are placed on academic probation. Once on academic probation, students have one semester of day school attendance to attain the required cumulative GPA and avoid dismissal. No credit load restrictions are imposed on students on academic probation. However, they should consider the possibility that a higher GPA might be more easily attained by carrying a lighter load and/or repeating courses in which a D or F was received. Students on probation are strongly encouraged to talk with their adviser.

Dismissal

If a student has been on probation for one semester in day school, the student is subject to dismissal. The dean decides either to dismiss or to allow another semester of registration. Dismissed students are notified immediately and their day school registration for the next semester, financial aid, and on-campus housing contract are canceled.

Readmission

Students who have been academically dismissed must present evidence of improved academic capability to the college to justify readmission. Petitions for readmission are considered at any time. However, readmission is not normally considered before one year has passed from the date of dismissal, unless circumstances clearly support a decision for early readmission. Readmission is granted whenever deficiencies are made up through University College Duluth or summer school. Petition forms and information about academic standing are available in the CLA Student Affairs Office. Students who withdraw voluntarily from school with a GPA below that required for good academic standing are subject to CLA's guidelines for probation, dismissal, and readmission.

Student Affairs Office

For information and advice on academic matters (such as scholastic standing; admission; advising; academic programs; change of major, college, or adviser; grievance and appeal procedures), contact the CLA Student Affairs Office, 111 Cina Hall. Forms and petitions are also available in this office.

Preprofessional Programs

The college offers programs and special advising services for students who plan to enter professional schools in law (see Department of Political Science). In addition, some students who plan to attend medical school major in a CLA program (see also Pre-Medicine in the College of Science and Engineering).

Variations in curriculum may be arranged upon agreement between the student, preprofessional adviser, and the office of admissions of the pertinent professional school. Students are encouraged to avoid narrow specialization during their undergraduate years.

Degree Programs

American Indian Studies (Amln)

Professors: Robert E. Powless (department head), John Red Horse; Assistant Professor: Mark J. Gonzalez; Instructors: David Niib Aubid, James D. Robinson, Jr.

This program promotes Indian awareness by examining ways in which traditional tribal culture has been maintained, altered, and expressed in present-day Indian life and affairs. The program has been developed by Indian faculty and students and members of the local Indian community. It serves Indian and non-Indian students by broadening their knowledge of traditional and modern Indian history and culture. It is hoped that this promotes, for the Indian student, a positive Indian identity and pride in ancestry.

Honors Requirements

Students must have a 3.75 GPA and earn an A in Amln 3921.

American Indian Studies—Option A B.A.

Degree Requirements

Requirements for the B.A. in American Indian studies (Chippewa language emphasis) (120 credits) include:

- UMD liberal education requirements
- Advanced writing requirement: Comp 3160—Advanced Writing: Social Sciences (3 credits) is recommended
- Major requirements (42 credits)
- Minor requirements (27 credits)
### Colleges and Schools

#### Required Courses

**Lower Division (21)**

- Amln 1103*—Beginning Chippewa I (3)
- Amln 1104*—Beginning Chippewa II (3)
- Amln 1106*—American Indian Prose, Poetry, and Oratory (3)
- Amln 1120*—American Indians in the 20th Century (3)
- Amln 2105*—Survey of North American Indian Arts (3)
- Amln 2115—Chippewa History and Culture (3)

**Upper Division (21)**

At least 7 credits from:

- Amln 2520—Tribal Law and Government (3)
- Amln 3106*—Indian-White Relations (3)
- Amln 3300—Projects in American Indian Studies (3)
- Amln 3333—Introduction to Federal Indian Law (3)
- Amln 3410—Fur Trade in Canada and the United States (3)
- Amln 3750—American Indian Psychology (3)
- Amln 3905—Special Topics (3)
- Amln 4970—Tribal Economic Development and Management (3)
- Amln 4990—Directed Research (1-3)
- Amln 5910—Projects in American Indian Studies (1-2)
- Amln 3333—Introduction to Federal Indian Law (3)
- Amln 3410—Fur Trade in Canada and the United States (3)
- Amln 3750—American Indian Psychology (3)
- Amln 4630—American Indians and the Media (3)
- Amln 4970—Tribal Economic Development and Management (3)
- Amln 4990—Directed Research (1-3)
- Amln 5910—Projects in American Indian Studies (1-2)
- Amln 3333—Introduction to Federal Indian Law (3)
- Amln 3750—American Indian Psychology (3)
- Amln 4630—American Indians and the Media (3)
- Amln 4970—Tribal Economic Development and Management (3)
- Amln 4990—Directed Research (1-3)
- Amln 5910—Projects in American Indian Studies (1-2)
- Amln 3333—Introduction to Federal Indian Law (3)

At least 3 credits from:

- Amln 3260—American Indian Novel (3)
- Amln 3301—Advanced Chippewa (3)
- Amln 4302—Independent Study of the Chippewa Language (3)
- Amln 4630—American Indians and the Media (3)
- Amln 4905—Legal Aspects of Federal Indian Policy for Human Services (3)

At least 3 credits from:

- Anth 3614—Peasant Societies and Cultures (3)
- Anth 3616—Cultures of Arctic North America (3)
- Anth 4621—Myth and Sacred Symbols (3)
- Geog 3113—Geography of American Indians in the United States and Canada (3)
- WS 2101*—Women, Race, and Class (3)

* Courses that may be used to fulfill UMD liberal education program requirements.

#### Minor Requirements (27)

**Lower Division (12)**

- Amln 1106*—American Indian Prose, Poetry, and Oratory (3)
- Amln 1120*—American Indians in the 20th Century (3)
- Amln 2105*—Survey of North American Indian Arts (3)
- Amln 2115—Chippewa History and Culture (3)

**Upper Division (15)**

- Amln 3106*—Indian-White Relations (3)
- Amln 3300—Projects in American Indian Studies (3)
- Amln 3410—Fur Trade in Canada and the United States (3)
- Amln 4970—Tribal Economic Development and Management (3)
- Amln 4990—Directed Research (1-3)
- Amln 5910—Projects in American Indian Studies (1-2)
- Amln 3333—Introduction to Federal Indian Law (3)

**Electives (6) from:**

- Amln 1103*—Beginning Chippewa (3)
- Amln 2520—Tribal Law and Government (3)
- Amln 3260—American Indian Novel (3)
- Amln 3333—Introduction to Federal Indian Law (3)
- Amln 3750—American Indian Psychology (3)
- Amln 4630—American Indians and the Media (3)
- Amln 4970—Tribal Economic Development and Management (3)
- Anth 3614—Peasant Societies and Cultures (3)
- Anth 3616—Cultures of Arctic North America (3)
- Anth 4621—Myth and Sacred Symbols (3)
- Geog 3113—Geography of American Indians in the United States and Canada (3)
- WS 2101*—Women, Race, and Class (3)

* Courses that may be used to fulfill UMD liberal education program requirements.

### American Indian Studies—Option B

#### B.A.

**Degree Requirements**

Requirements for the B.A. in American Indian studies (social studies emphasis) (120 credits) include:

- UMD liberal education requirements
- Advanced writing requirement: Comp 3160—Advanced Writing: Social Sciences (3 credits) is recommended
- Major requirements (42 credits)
- Minor requirements (27 credits)

#### Required Courses

**Lower Division (21)**

- Amln 1103*—Beginning Chippewa (3)
- Amln 1106*—American Indian Prose, Poetry, and Oratory (3)
- Amln 1120*—American Indians in the 20th Century (3)
- Amln 2105*—Survey of North American Indian Arts (3)
- Amln 2115—Chippewa History and Culture (3)
- Amln 3300—Projects in American Indian Studies (2)
- Anth 1604*—Cultural Anthropology (3)

**Upper Division (21)**

At least 7 credits from:

- Amln 2520—Tribal Law and Government (3)
- Amln 3106*—Indian-White Relations (3)
- Amln 3300—Projects in American Indian Studies (3)
- Amln 3750—American Indian Psychology (3)
- Amln 4630—American Indians and the Media (3)
- Amln 4970—Tribal Economic Development and Management (3)
- Anth 3614—Peasant Societies and Cultures (3)
- Anth 3616—Cultures of Arctic North America (3)
- Anth 4621—Myth and Sacred Symbols (3)
- Geog 3113—Geography of American Indians in the United States and Canada (3)
- WS 2101*—Women, Race, and Class (3)

* Courses that may be used to fulfill UMD liberal education program requirements.

#### Language Requirements

All majors take Amln 1103; Chippewa language emphasis students earn further language credits as specified.

#### Final Project Internship

Amln 3997 provides hands-on experience for students and gives something back to the Indian community. Extra credits must be taken in junior or senior year.
Amln 3106 — American Indian Prose, Poetry, and Oratory (3)
Amln 3120 — American Indians in the 20th Century (3)
Amln 3205 — Survey of North American Indian Arts (3)
Amln 3206 — Chippewa History and Culture (3)

Upper Division (15)
Amln 3300 — Projects in American Indian Studies (3)
Amln 3410 — Fur Trade in Canada and the United States (3)

Electives (6) from:
Amln 1103 — Beginning Chippewa (3)
Amln 2520 — Tribal Law and Government (3)
Amln 3260 — American Indian Novel (3)
Amln 3333 — Introduction to Federal Indian Law (3)
Amln 3750 — American Indian Psychology (3)
Amln 4630 — American Indians and the Media (3)
Amln 4970 — Tribal Economic Development and Management (3)

Amln 3410 — Fur Trade in Canada and United States (3)
Amln 3750 — American Indian Psychology (3)
Amln 3905 — Special Topics (3)
Amln 4970 — Tribal Economic Development and Management (3)
Amln 4990 — Directed Research (1-3)

At least 3 credits from:
Amln 3260 — American Indian Novel (3)
Amln 3301 — Advanced Chippewa (3)
Amln 4302 — Independent Study of the Chippewa Language (3)
Amln 4630 — American Indians and the Media (3)
Amln 5905 — Legal Aspects of Federal Indian Policy for Human Services (3)

At least 3 credits from:
Anth 3614 — Peasant Societies and Cultures (3)
Anth 3615 — Cultures of Arctic North America (3)
Anth 4621 — Myth and Sacred Symbols (3)
Geog 3113 — Geography of American Indians in the United States and Canada (3)
WS 2101 — Women, Race, and Class (3)

* Courses that may be used to fulfill UMD liberal education program requirements.

Language Requirements
All majors take Amln 1103; Chippewa language emphasis students earn further language credits as specified.

Final Project Internship
Amln 3997 provides hands-on experience for students and gives something back to the Indian community. Extra credits must be taken in junior or senior year.

Minor Requirements (27)
Lower Division (12)
Amln 1106 — American Indian Prose, Poetry, and Oratory (3)
Amln 1120 — American Indians in the 20th Century (3)
Amln 2105 — Survey of North American Indian Arts (3)
Amln 2115 — Chippewa History and Culture (3)

Upper Division (15)
Amln 3106 — Indian-White Relations (3)
Amln 3300 — Projects in American Indian Studies (3)
Amln 3410 — Fur Trade in Canada and the United States (3)

Electives (6) from:
Amln 1103 — Beginning Chippewa (3)
Amln 2520 — Tribal Law and Government (3)
Amln 3260 — American Indian Novel (3)
Amln 3333 — Introduction to Federal Indian Law (3)
Amln 3750 — American Indian Psychology (3)
Amln 4630 — American Indians and the Media (3)
Amln 4970 — Tribal Economic Development and Management (3)

Amln 3616 — Cultures of Arctic North America (3)
Anth 4621 — Myth and Sacred Symbols (3)
Geog 3113 — Geography of American Indians in the United States and Canada (3)
WS 2101 — Women, Race, and Class (3)

* Courses that may be used to fulfill UMD liberal education program requirements.

American Studies (AmS)
Department of Sociology-Anthropology
Director: T. Bacig (Soc-Anth); Advisers: Adams (Engl), Evans (Phil), Maiolo (Engl), Storch (Hist)

Undergraduate Minor Only
American studies links a variety of disciplines to create an integrated course of study focusing on the distinctive American heritage. Courses explore the American experience from historical, literary, intellectual, social, and cultural perspectives.

A minor is offered to students with diverse career goals who desire a more comprehensive understanding of American culture than that provided by companion disciplines.

Students may follow an American studies track through the interdisciplinary studies program to earn a B.A. major in interdisciplinary studies (see Interdisciplinary Studies).

Requirements (24)
Three courses (9-10) from:
Amln 1120 — American Indians in the 20th Century (3)
AmS 1031 — Landscapes, Environments, and U.S. Culture (3)
AmS 1041 — Frontier Heritage in Canada and the United States (4)

Electives (14-15) from:
Amln 3106 — Indian-White Relations (3)
AmS 5091 — Directed Study (1-4)
Anth 3615 — Cultures of Arctic North America (3)
Anth 3618 — Ancient Middle America (3)
Anth 3624 — Archaeology of North America (3)
Anth 3632 — Latin American Cultures (3)
Engl 3563 — American Literature I
or Engl 3564 — American Literature II (3)
Engl 4292 — Literature into Film (4)
Engl 5572 — American Renaissance (4)
Engl 5573 — American Realism: Naturalism (4)
Engl 5577 — Major American Authors (4)
Engl 5581 — American Novel I
or Engl 5582 — American Novel II (4)
Hist 1305 — American Challenges (3)
Hist 2357 — Women in American History (3)
Hist 3365 — American Society and Culture (3)
**Anthropology (Anth)**

**Department of Sociology-Anthropology**

Advisers: Belote, Kemp, Linn, Roufs, Smith

**B.A.**

Anthropology is concerned with the study of diverse peoples and cultures with a central focus on what it means to be human. This understanding is developed using an integrative and comparative approach that examines the role of culture in human society. Areas of knowledge include:

- specific ethnographic areas such as Central and South America, the Arctic, India, and Africa along with specific subfields of anthropology: archaeology, linguistics, and physical and applied anthropology.
- political, social, and environmental issues within the context of international and intranational diversity.
- major historical and contemporary theoretical perspectives.

To illustrate how anthropological knowledge is obtained, qualitative methodology is emphasized, including knowledge of the uses and limitations of standard methods, a strong ethical component concerning the study of humans, and the relationship between theory and method in qualitative fieldwork.

**Honors Requirements**

The department honors program recognizes majors who demonstrate outstanding academic performance, provides special educational opportunities for such students, and encourages the development of specialty areas within the major. Honors students participate in independent research, working closely with a faculty member. Qualified majors apply to the honors program any time after they have completed Anth 4651 but before the end of the sixth week of the first semester of their senior year.

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**Degree Requirements**

Requirements for the B.A. in anthropology (120 credits) include:

- UMD liberal education requirements
- Advanced writing requirement: Comp 3xxx (3 credits)
- Major requirements (39 credits): including Four required courses (15 credits), electives (24 credits minimum)
- Minor requirements

**Required Courses**

**Lower Division (8)**

- Anth 1602*-Prehistoric Cultures (4)
- Anth 1604*-Cultural Anthropology (4)

**Upper Division (7)**

- Anth 4651-The Development of Anthropological Theory and Method (4)
- Anth 4653—Senior Seminar (3)

**Electives (24)**

- 9 credits from at least three 3xxx anthropology courses
- 9 credits from at least three 4xxx anthropology courses
- 6 upper division credits in anthropology or other department-approved courses in fields such as American Indian studies, American studies, cultural geography, linguistics, sociology, and humanities and classics

* Courses that may be used to fulfill UMD liberal education program requirements.

**Final Project**

Anth 4653 is a capstone course that provides anthropology majors with an overview of current anthropological knowledge and develops their research skills.

**Minor Requirements (23)**

**Lower Division (8)**

- Anth 1602*-Prehistoric Cultures (4)
- Anth 1604*-Cultural Anthropology (4)

**Electives (15)**

- 6 credits from at least two 3xxx anthropology courses
- 6 credits from at least two 4xxx anthropology courses
- 3 upper division credits in anthropology or other department-approved courses in fields such as American Indian studies, American studies, cultural geography, linguistics, sociology, and humanities and classics

* Courses that may be used to fulfill UMD liberal education program requirements.

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**Archaeology**

See Sociology-Anthropology
Communication (Comm)

Professors: Jackson R. Huntley, Michael J. Sunnafrank; Associate Professors: Virginia T. Katz, Linda T. Krug, Elizabeth J. Nelson (department head), Gerald L. Pepper, Deborah S. Peterson-Perlman

B.A.

This program emphasizes the breadth and diversity of the communication field. Required and elective courses are drawn from the areas of interpersonal communication/social groups, rhetoric/persuasion/media, and public speaking.

Admission Requirements

To be accepted into the communication major, students declare a pre-communication major and complete Comm 1000*—Human Communication Theory (3) and Comm 1112*—Public Speaking (3) with grades of C or above. An application is required for students who choose to retake either of these courses; the department will accept the grade in the first retake only. In addition, students must have attended UMD for one semester and have a 2.50 overall GPA at the time of acceptance.

When pre-communication majors complete Comm 1000 and Comm 1112 with grades of C or above plus 15 credits of communication electives, but have not attained a 2.50 overall GPA, they will be eligible for a communication minor but not allowed to pursue the communication major.

Honors Requirements

Candidates must be communication majors with a 3.30 GPA in all communication courses and 3.00 overall. Students write an honors-quality paper sponsored by a communication faculty member and approved by two additional communication faculty. Candidates apply before the end of the first four weeks of their senior year. Contact the department chair or academic adviser for more information.

Degree Requirements

Requirements for the B.A. in communication (120 credits) include:

- UMD liberal education requirements
- Advanced writing requirement: Comp 3xxx (3 credits)
- Major requirements (38 credits)
- Minor requirements (21 credits)

Required Courses

Required Courses (11)

Comm 1000—Human Communication Theory (3)
Comm 1112—Public Speaking (3)
Comm 3115—Persuasion and Argumentation in Public Speaking (4)
or Comm 3116—Professional Communication (4)
Comm 4000—Communication Portfolio (1) (students may not register for this course until they have been accepted into the major)

Electives (27)

Interpersonal Communication/Social Groups—Three (9-12) from:
Comm 1222*—Interpersonal Communication (3)
Comm 2929*—Intercultural Communication (3)
Comm 3200—Interpersonal Communication Theory (3)
Comm 3205—Relationship Communication (3)
Comm 3210—Group Communication (4)
Comm 3215—Conflict Management (3)
Comm 4200—Communication in Organizations (4)

Rhetoric/Persuasion/Media—Three (9-12) from:
Comm 1500*—Media and Society (3)
Comm 2101*—Foundations of Mass Communication (3)
Comm 2505—Analysis of Public Discourse (3)
Comm 3500—Principles of Persuasion (3)
Comm 3505—Media Communications (3)
Comm 4500—History of Rhetoric (3)
Comm 4505—Media Theory and Research (4)

Other electives—Courses listed below may be used to reach total required elective credits.
Comm 3300—Teaching Assistantship in Communication (1-3)
Comm 3390—Special Topics in Communication: (Various Titles to Be Assigned) (3)
Comm 4390—Seminar: Communication (3)
Comm 4391—Independent Study (1-3)
Comm 4397—Internship in Communication (1-8)
Comm 5300—Teaching Methods in Communication (3)
Comm 5390—Workshop: (Various Titles to Be Assigned) (1-3)

* Courses that may be used to fulfill UMD liberal education program requirements.

Minor Requirements (21)

To be accepted into the communication minor, students declare a pre-communication minor and complete Comm 1000*—Human Communication Theory (3) and Comm 1112*—Public Speaking (3) with grades of C or above. If students choose to retake either of these courses, the department will accept the grade in the first retake only.

Once accepted into the minor, students choose 15 credits (9 of which must be upper division) from among courses listed in interpersonal communication/social groups, rhetoric/persuasion/media, and other areas.
Composition (Comp)

Professors: Michael D. Linn, Kathryn L. Riley; Associate Professors: Thomas J. Farrell, Eleanor M. Hoffman, Kenneth C. Risdon (department head); Assistant Professors: Paul Cannan, Jill Jenson, Kathleen M. Maurer

The Department of Composition is committed to teaching, research, and service in the areas of writing, rhetoric, and linguistics. The department’s primary responsibility is to provide instruction in and encourage the development of student competence in writing. Composition faculty also teach in the areas of linguistics, English, humanities, and related fields in the liberal arts. Courses in the department develop students’ written communication skills. In addition to the required freshman composition courses, upper division writing courses are offered in the areas of business, language and literature, arts and letters, human services, social science, engineering, science, organizational writing, and document design and graphics. Students are required to complete these specialized courses during their junior or senior year. The department offers writing internships and independent study courses at the undergraduate and graduate levels along with graduate seminars in the teaching of writing and in topics relevant to written discourse. An individualized major through the Interdisciplinary Studies Program may be developed.

The UMD composition requirements are described in the Liberal Education Program section of this catalog.

Professional Writing and Communication

Minor Only

This interdisciplinary minor, offered jointly by the Departments of Composition and Communication, allows students to develop extensive oral and written communication skills particularly relevant to professional situations. It emphasizes the development of varied writing and speaking techniques, understanding persuasive argument, and document and speech design and delivery.

Requirements (27-30)

Lower Division (6)
Comm 1112*-Public Speaking (3)
Ling 1811*-Introduction to Language (3)

Upper Division (21-24)
Composition (9)
Comp 5220—Document Design and Graphics (3)

Courses (6) from two of the following groups:

Group A
Comp 3100—Advanced Writing: Language and Literature
or Comp 3110—Advanced Writing: Arts and Letters (3)

Group B
Comp 3121—Advanced Writing in Business and Organizations (3)

Group C
Comp 3130—Advanced Writing: Engineering
or Comp 3150—Advanced Writing: Science
or Comp 3160—Advanced Writing: Social Sciences (3)

Communication (8)
Comm 3115—Advanced Public Speaking (4)
Comm 3116—Professional Communication (4)

Internship (1-3)
Comp 5197—Internship in Writing (1-3)

Electives (3)
Any interpersonal communication/social groups
or rhetoric/persuasion/media course (see communication B.A. program requirements)
or Comm 3505—Media Communications (3)
or Comm 4200—Communication in Organizations (4)
* Courses that may be used to fulfill UMD liberal education program requirements.

Composition Requirements

Comp 1120—College Writing (3 credits) or its equivalent must be completed during the first two semesters of attendance at UMD as part of the UMD liberal education program or Minnesota Transfer Curriculum. UMD also requires all students to take one upper division composition course. This requirement is clarified under each program’s description.

Entering freshmen who score a 3 or above on either of the Educational Testing Service Advanced Placement examinations in English: Literature and Composition or Language and Composition are granted 3 credits for Comp 1120 after completing the word processing component of Comp 1120 or passing the Comp 1100 test-out. Credit for Comp 1120 is also granted for a score of 6 or 7 on the International Baccalaureate examination. Students may complete the word processing component of Comp 1120 by either taking Comp 1100 or passing the Comp 1100 test-out. Students scoring a 32 or above on the ACT are exempt from Comp 1120.

Examination for Credit—Students who have earned transfer credit in composition without the required Comp 1120 word processing component may complete the requirement either by successfully completing Comp 1100 for credit or by earning credit by examination for Comp 1100.
The Department of Composition offers the Comp 1100 and Comp 1120 tests once each semester (excluding summer sessions).

For more information, contact the Department of Composition.

Criminology (Crim)

Department of Sociology-Anthropology

**Advisers:** Arthur, Fleischman (Criminology Coordinator), Franz, Grana, Hamlin, Laundergan, Wilson

**B.A.**

Criminology is the study of crime and criminal behavior. The criminology program focuses on crime as a social phenomenon and the causes of criminal behavior. The major provides an overview of institutions, issues and causes of crime, and social control; it also offers a strong foundation in liberal arts, a basic knowledge of behavioral sciences, and a strong professional growth potential for those pursuing a career in criminology or the criminal justice system. Many criminology majors enter law, law enforcement, corrections, and other social service careers or graduate school.

**Admission Requirements**

To be accepted into the criminology major, students declare a pre-criminology major and complete Soc 1101, Soc 1301, Soc 2001, and Soc 2306 with grades of C or above. If a student chooses to retake any of the four courses, the department will accept the grade in the first retake only. In addition, students must have a 2.50 overall GPA, including transfer credits, at the time of application to the major.

**Honors Requirements**

The department honors program recognizes majors who demonstrate outstanding academic performance, provides special educational opportunities for such students, and encourages the development of specialty areas within the major. Honors students participate in independent research, working closely with a faculty member. Qualified majors apply to the honors program any time after they have completed Soc 3151-3152 but before the end of the sixth week of the first semester of their senior year.

**Degree Requirements**

Requirements for the B.A. in criminology (120 credits) include:

- Major requirements (47 credits):
  - Eight required courses, one inequality in society course, four courses reflecting student career interests (e.g., corrections, law enforcement), two nonsociology courses (6 credits minimum) complementing the student's focus in the major
- Minor requirements

**Note:** Students majoring in both criminology and sociology complete 36 unduplicated credits beyond the total required for one of these majors (e.g., if a criminology major is completed for 47 credits, a student also majoring in sociology takes 36 additional credits beyond those counted toward the criminology major).

**Required Courses**

Soc 1101*—Introduction to Sociology (3)
Soc 1301*—Introduction to Criminology (3)
Soc 2001—Sociological Perspective (3)
Soc 2306—Deviance (3)
Soc 3151—Research Methods and Analysis (3)
Soc 3152—Applied Research (3)
Soc 4587—Internship Preparation (1)
Soc 4597—Internship (7)**

**One course (3) from:**
Soc 3326—Justice, Women, and Race (3)
Soc 3945—Social Stratification (3)
Soc 4947—Sociology of Women (3)
Soc 4949—Race and Ethnic Relations (3)

**Four electives (12) from:**
Soc 3395—Special Topics in Criminology (3)
Soc 3322—Law and Society (3)
Soc 3324—Sociology of Criminal Law (3)
Soc 3328—Delinquency/Juvenile Justice (3)
Soc 3342—Law Enforcement Administration (3)
Soc 3344—Law Enforcement and Society (3)
Soc 3361—Correctional Continuum (3)
Soc 3363—Correctional Agency Administration (3)
Soc 4382—Victimology (3)
Soc 4395—Special Topics in Criminology (3)
Soc 4911—Alcoholism and Other Addictions (3)
Soc 4925—Sociology of Rape (3)
Soc 4935—Conflict and Violence (3)

With department approval:
Soc 4598—Workshop: (Various Titles to Be Assigned) (3)

**Maximum of 7 credits of Soc 4597 may be applied to the major**

**Required Courses From Other Programs**

Two courses (6 minimum) from:
Amln 2520—Tribal Law and Government (3)
Amln 3106*—Indian-White Relations (3)
Amln 3333—Introduction to Federal Indian Law (3)
Phil 3231—Law and Punishment (4)
Pol 3150—American Constitutional Law I (4)
Pol 3151—American Constitutional Law II (4)
Psy 2021*—Developmental Psychology (4)
Psy 3121—Abnormal Psychology (4)
Psy 3371—Child and Adolescent Psychology (3)
Psy 5121—Psychology Over the Life Span (3)
Psy 5123—Psychology of Addictive Behavior (3)
WS 3350—Women and the Law (3)
or courses approved by the department

* Courses that may be used to fulfill UMD liberal education program requirements.

Final Project
Soc 4587 and Soc 4597 are required. Students intern in a setting related to their career interests at one of the more than 100 internship sites located in Minnesota and Wisconsin. Students typically intern during their senior year or the summer following their senior year.

English (Engl)

Professors: Klaus P. Jankofsky, Joseph C. Maiolo, Linda Miller-Cleary; Associate Professors: Stephen J. Adams, Katherine L. Basham, Carol A. Bock, Martin F. Bock, Roger C. Lips; Assistant Professor: Paul D. Cannan; Instructor: Krista S. Twu

The English program develops students' knowledge and appreciation of the literary arts within the English, Irish, and American traditions. Depending on career goals, majors should choose one of three tracks: liberal arts, English for the workplace, or pre-graduate studies.

Honors Requirements
Candidates must have a 3.20 overall GPA and 3.40 in the major. An honors paper or creative writing project must be completed in a 5xxx course or through independent study. Completed projects and papers must be approved by a sponsoring faculty member and the department honors committee. Students who wish to qualify for honors must contact the department at least one semester before graduation.

English—English for the Workplace B.A.
The English for the workplace track enhances career opportunities in fields such as business, writing, publishing, and government service. Students may major or minor in programs leading to the B.A. or the B.A.A. teaching degree (see College of Education and Human Service Professions).

Degree Requirements
Requirements for the B.A. in English—English for the workplace (120 credits) include:

- UMD liberal education requirements
- Advanced writing requirement—courses listed within the major requirements
- Completion of English for the workplace track (52-53 credits)

Required Courses (52-53)

English Cluster (23)
Engl 1582*—Introduction to World Literatures (3)
Engl 2581*—Women Writers (3)
Engl 3501—British Literature I
or Engl 3502—British Literature II (4)
Engl 3563—American Literature I
or Engl 3564—American Literature II (4)
Engl 3906—Methods of Literary Study (4), Engl 4909—Senior Portfolio (1)

British/American Periods (4) (select one):
Engl 5523—Middle English Language and Literature (4)
Engl 5533—Studies in English Literature Before 1800 (4)
Engl 5541—Restoration and 18th-Century Literature (4)
Engl 5561—English Romanticism (4)
Engl 5562—Victorian Literature (4)
Engl 5566—Irish Literary Revival (4)
Engl 5571—Colonial and Revolutionary American Authors (4)
Engl 5572—American Renaissance (4)
Engl 5573—American Realism: Naturalism (4)

Communication and Composition Cluster (12-13)
Comm 1112*—Public Speaking (3)
Comp 5220—Document Design and Graphics (3)

Communication elective (3-4) (select one):
Comm 2929—Intercultural Communication (4)
Comm 3215—Conflict Management (3)
Comm 3505—Media Communications (3)
Comm 4200—Communication in Organizations (4)
Comm 4505—Media Theory and Research (4)

Composition elective (3) (select one):
Comp 3121—Advanced Writing in Business and Organizations (3)
Comp 3140—Advanced Writing: Human Services (3)
Comp 3150—Advanced Writing: Science (3)
Comp 3160—Advanced Writing: Social Sciences (3)

Business and Economic Cluster (11)
Econ 1022*—Principles of Economics: Macro
or Econ 1023*—Principles of Economics: Micro (3)
Econ 2020—Statistics: Methods and Analysis (5)
CS 1011*—Introduction to Computers and Software
or FMIS 1201—Introduction to Business Information Systems (3)
Culture Cluster (6) (choose courses with different designators)

- Amin 2115—Chippewa History and Culture (3)
- AmIn 4630—American Indians and the Media (3)
- Anth 4621—Myth and Sacred Symbols (3)
- Anth 4623—Anthropology and Contemporary Human Problems (3)
- Ger 2402—Germany Today (3)
- HmCl 3241—Women and Men in Popular Culture (3)
- Phil 1008*-Critical Thinking (3)
- Span 2540*-Latino Literatures and Cultures (3)
- WS 2101—Women, Race, and Class (3)
- WS 3150—Women-Identified Culture (3)

*Courses that may be used to fulfill UMD liberal education program requirements.

Final Project
Completion of Engl 4909 and submission of final portfolio. Contact the department for deadline information.

English—Liberal Arts

B.A.

The liberal arts track offers a traditional combination of survey, genre, major figure, and linguistic courses focusing on the study of literature as a humanities discipline. Students may major or minor in programs leading to the B.A. or the B.A.A. teaching degree (see College of Education and Human Service Professions).

Degree Requirements
Requirements for the B.A. in English—liberal arts (120 credits) include:
- UMD liberal education requirements
- Advanced writing requirement—courses listed within the major requirements
- Completion of liberal arts track (36-37 credits)
- Minor requirements

Required Courses (36-37)

Core (21)
- Engl 3501—British Literature I (4)
- Engl 3502—British Literature II (4)
- Engl 3563—American Literature I (4)
- Engl 3564—American Literature II (4)
- Engl 3906—Methods of Literary Study (4)
- Engl 4909—Senior Portfolio (1)

Electives (15-16) (one course from each of four categories)

American Period
- Engl 5571—Colonial and Revolutionary American Authors (4)
- Engl 5572—American Renaissance (4)
- Engl 5573—American Realism, Naturalism (4)

British Period
- Engl 5523—Middle English Language and Literature (4)
- Engl 5533—Studies in English Literature Before 1800 (4)
- Engl 5541—Restoration and 18th-Century Literature (4)
- Engl 5561—English Romanticism (4)
- Engl 5562—Victorian Literature (4)
- Engl 5566—Irish Literary Revival (4)

Genre
- Engl 3411—The Modern Short Story (4)
- Engl 4375—Drama (4)
- Engl 5375—Modern Poetry (4)
- Engl 5471—The Novella (4)
- Engl 5581—American Novel I (4)
- Engl 5582—American Novel II (4)
- Engl 5585—British Novel I (4)
- Engl 5586—British Novel II (4)

Major Figure
- Engl 3223*-Shakespeare (3)
- Engl 5222—Shakespeare (4)
- Engl 5312—Chaucer (4)
- Engl 5331—Milton (4)
- Engl 5577—Major American Authors (4)

Linguistics
- Engl 5811—Introduction to Modern English (4)
- Engl 5821—History of the English Language (4)
- Ling 5802—Applied Linguistics (4)

*Courses that may be used to fulfill UMD liberal education program requirements.

Final Project
Completion of Engl 4909 and submission of final portfolio. Contact the department for deadline information.

English—Pre-Graduate Studies

B.A.

The pre-graduate studies track prepares students for graduate study in English and American literature, linguistics, and related fields. Students may major or minor in programs leading to the B.A. or the B.A.A. teaching degree (see College of Education and Human Service Professions).

Degree Requirements
Requirements for the B.A. in English—pre-graduate studies (120 credits) include:
- UMD liberal education requirements
- Advanced writing requirement—courses listed within the major requirements
- Completion of pre-graduate studies track (45 credits)
- Minor requirements
Required Courses

Core (25)
- Engl 3501—British Literature I (4)
- Engl 3502—British Literature II (4)
- Engl 3563—American Literature I (4)
- Engl 3564—American Literature II (4)
- Engl 3906—Methods of Literary Study (4)
- Engl 4909—Senior Portfolio (1)
- Engl 5222—Shakespeare (4)

Electives (20) (one course from each category)

American Period
- Engl 5571—Colonial and Revolutionary American Authors (4)
- Engl 5572—American Renaissance (4)
- Engl 5573—American Realism, Naturalism (4)

British Period
- Engl 5523—Middle English Language and Literature (4)
- Engl 5533—Studies in English Literature Before 1800 (4)
- Engl 5541—Restoration and 18th-Century Literature (4)
- Engl 5561—English Romanticism (4)
- Engl 5562—Victorian Literature (4)
- Engl 5566—Irish Literary Revival (4)

Genre
- Engl 3411—The Modern Short Story (4)
- Engl 4375—Drama (4)
- Engl 5375—Modern Poetry (4)
- Engl 5471—The Novella (4)
- Engl 5581—American Novel I (4)
- Engl 5582—American Novel II (4)
- Engl 5585—British Novel I (4)
- Engl 5586—British Novel II (4)

Major Figure
- Engl 5312—Chaucer (4)
- Engl 5331—Milton (4)
- Engl 5577—Major American Authors (4)

Linguistics
- Engl 5811—Introduction to Modern English (4)
- Engl 5821—History of the English Language (4)
- Ling 5802—Applied Linguistics (4)

* Courses that may be used to fulfill UMD liberal education program requirements.

Final Project
Completion of Engl 4909 and submission of final portfolio. Contact the department for deadline information.

Minor Requirements (21)

Lower Division (6)
- Two courses from:
  - Engl 1575*—20th-Century Literature (3)
  - Engl 1582*—Introduction to World Literatures (3)
  - Engl 1907*—Introduction to Literature (3)

Upper Division (15)
- Engl 3223—Shakespeare (3)
- Two courses from:
  - Engl 3501—British Literature I (4)
  - Engl 3502—British Literature II (4)
  - Engl 3563—American Literature I (4)
  - Engl 3564—American Literature II (4)
  - English elective 3xxx or above (4)

Environmental Studies (ES)

Department of Philosophy
Coordinators: E. Browning Cole (Phil), Howard Mooers (Geol)

B.A.
This program provides a sound interdisciplinary foundation in the natural sciences, social sciences, and humanities, producing graduates who understand and think creatively about the complex issues of our natural, naturalized, and artificial environments. The curriculum encourages cross-disciplinary thinking and problem solving by introducing ethical reflection on questions of culture, resources, and the environment and the use of literature and the arts to illuminate ways in which humans have imbued nature with meanings and significance. Coursework develops skills in scientific methodology, research, writing, creative thinking, and policymaking.

The major provides a basis for professional careers as well as graduate study in many related environmental fields, while the minor provides students with a general understanding of issues related to their natural environments.

Honors Requirements
Candidates must be environmental studies majors with a 3.00 overall GPA and 3.30 in the major. Students must complete an honors project involving a written report, work of art, or other substantial contribution to the field. The project is supervised by a faculty member and approved by one of the program codirectors. In some cases the project may develop out of the environmental studies internship. Students must notify one of the codirectors of their intent to participate in the honors program by the end of the first week of the semester of graduation and the completed project must be approved by the faculty adviser and one of the codirectors at least 30 days before the end of the term. The project is presented orally or by exhibition.
Degree Requirements
Requirements for the B.A. in environmental studies (120 credits) include:
• UMD liberal education requirements
• Advanced writing requirement: Comp 3xxx (3 credits)
• Major requirements (59-61 credits)
• Minor requirements

Required Courses

Lower Division (34)
ES 1001—Introductory Seminar (2)

Upper Division (14)
ES 3001—Outdoor Experience (1)
ES 5001—Environmental Studies Seminar I (4)
ES 5050—Environmental Studies Internship (2)

Required Courses From Other Programs

Lower Division
AmS 1030—Landscapes, Environments, and U.S. Culture (3)
Anth 1604*—Cultural Anthropology (4)
Biol 1011*—General Biology I (5)
Biol 1012—General Biology II (5)
Econ 1003*—Economics and Society
or Econ 1022*—Principles of Economics: Macro
or Econ 1023*—Principles of Economics: Micro (3)
Geol 1110*—Introductory Geology
or Geol 2306*—Environmental Conservation (3)
Geol 1130*—Introduction to Environmental Science (3)
Phil 1003*—Ethics and Society (3)
Pol 1200*—Introduction to Public Policy (3)

Upper Division
Biol 2803*—Issues in Global Ecology (3)
Phil 3325—Environmental Ethics (4)

Electives

Upper Division (11-13) (four courses, at least one from each group)

Ecological Theory and Practice
Biol 2801—General Ecology (3)
Biol 2802—Ecology Laboratory (2)
Geog 3362—Geographical Aspects of Outdoor Recreation (3)
Geol 2350—Earth’s Resources (3)
Rec 3341—Field Interpretive Techniques I (3)
Rec 3342—Field Interpretive Techniques II (3)
Soc 4860—Environmental Sociology (3)

Specific Areas of Interest
Anth 3614—Peasant Societies and Cultures (3)
Anth 3628—Women in Cross-Cultural Perspective
Anth 3632—Latin American Cultures (3)
Anth 4631—Human Ecology (3)
Educ 4601—Wilderness Philosophy (3)
Hist 3361—The American City (3)
WS 2101*—Women, Race, and Class (3)
WS 3600—Ecofeminist Theories and Practices (3)

Resource Policy
AmIn 3333—Introduction to Federal Indian Law (3)
AmIn 3410—Fur Trade in Canada and United States (3)
Econ 4721—Natural Resources and Energy Economics (3)
Econ 4777—Environmental Economics (3)
Geog 3382—U.S. and Canadian Public Lands and Public Land Policy (3)
Geog 3461—Geography of Global Resources (4)
Phil 3242*—Values and Technology (3)
Pol 3080—Environment and Politics (3)
* Courses that may be used to fulfill UMD liberal education program requirements.

Final Project
All majors complete ES 5001, usually during their senior year. It encourages critical discussion, research, and literature review of multidisciplinary environmental issues and requires completion of an individual or group report.

Majors also complete ES 5050. This practical experience in some field of environmental work is supervised by both a faculty and work-site adviser. The internship may be completed during the summer or academic year, as dictated by work-site requirements.

Minor Requirements (34-35)

Lower Division (18)
Biol 1011*—General Biology I (5)
Biol 1012—General Biology II (5)
ES 1001—Introductory Seminar (2)
Geol 1110*—Introductory Geology
or Geol 1130*—Introduction to Environmental Science (3)
Phil 1003*—Ethics and Society (3)
Pol 1200*—Introduction to Public Policy (3)

Upper Division (10)
Biol 2803*—Issues in Global Ecology (3)
Geol 2350*—Earth Resources (3)
Phil 3325—Environmental Ethics (4)
Electives (6-7)
Any two courses from upper division electives for the major
* Courses that may be used to fulfill UMD liberal education program requirements.

Foreign Languages and Literatures

Professors: Richard A. Seybolt, Eileen M. Zeitz; Associate Professors: Jonathan B. Conant (department head), Yolande J. Jenny, Milan Kovacovic

The department offers majors and minors for the B.A. and B.A.A. degrees in French, German, and Spanish. Instruction in Russian and other languages is offered when feasible. Instruction in Swedish is offered when feasible through the Study in Sweden Program.
Colleges and Schools

French (Fr)

Department of Foreign Languages and Literatures

Undergraduate Minor Only

The French minor complements any liberal arts degree. French has been the language of a major world culture for centuries and is the traditional language of the arts and philosophy. As global commerce and communication become the norm, French—with English, one of the two official languages of the European Community—provides a solid basis for careers in business, law, human services, and diplomacy.

Requirements (12-32)

Students with previous language study may be exempt from some core requirements and should consult the department about placement.

Core (0-20)

- Fr 1101*—Beginning French I (4)
- Fr 1102*—Beginning French II (4)
- Fr 1201*—Intermediate French I (4)
- Fr 1202*—Intermediate French II (4)
- Fr 2301*—Advanced French (4)

Upper Division (12)

Selected from French courses beyond Fr 2301

*Courses that may be used to fulfill UMD liberal education program requirements.

Geography (Geog)

Professor: Lawrence M. Knopp, Jr. (department head); Associate Professor: Scott M. Freundschuh; Assistant Professors: Pat Farrell, Gordon L. Levine, Tongxin Zhu

B.A.

This program provides students with a strong liberal arts degree that combines the human, physical, and technical aspects of the discipline. It trains students for employment in careers requiring knowledge of geography or the use of geographic techniques, and prepares them for graduate study. Geography offers career opportunities in environmental assessment, public and private sector planning, travel and tourism, cartographic analysis, business and industrial research, locational analysis, community activism, and a variety of other activities requiring geographic expertise.

Geography courses are also included in other programs, including urban and regional studies, environmental studies, international studies, and education.

Degree Requirements

Requirements for the B.A. in geography (120 credits) include:

- UMD liberal education requirements
- Advanced writing requirement: Comp 3xxx (3 credits)
- Major requirements (40 credits):
  - 13 lower division credits, 27 upper division credits, senior research project
- Minor requirements

It is recommended, but not required, that majors complete:

- CS 1131—Introduction to Programming in FORTRAN
- CS 1135—Introduction to Programming in FORTRAN 77
- CS 1511—Computer Science I
- CS 1521—Computer Science II
- Geol 1110—Introductory Geology
- Geol 2210—Geomorphology
- Geol 2410—Geology of North America
- Soc 3151—Research Methods and Analysis
  - and Soc 3152—Applied Research
  - or Stat 1411—Introduction to Statistics
  - and Stat 3611—Introduction to Probability and Statistics

Prospective majors are encouraged to consult their adviser as early as possible to plan their programs and select supporting courses from related fields.

Required Courses

Lower Division (13)

- Geog 1304*—Human Geography (3)
- Geog 1414*—Physical Geography (4)
- Geog 2552*—Introduction to Maps and Cartographic Methods (3)
  - and Geog 1202*—World Regional Geography (3)
  - or Geog 2306*—Environmental Conservation (3)
  - or Geog 2313*—Economic Geography (3)

Upper Division (27)

- Geog 3532—Map Design (4)
- Geog 5612—Field Techniques (4)
- Geog 5803—Geographic Thought (3)
- Geog 5999—Senior Project in Geography (3)

Electives (13) selected in consultation with an adviser, chosen from at least two of the following concentrations.

- Cultural/Historical: Geog 3104, 3113, 3143
- Economic/Political: Geog 3333, 3342, 3352, 3362, 3382, 4393, 4394
- Environmental/Physical: Geog 3401, 3422, 3461, 5431, 5441
- Spatial/Analytical: Geog 4563, 5543, 5571
- Regional: Geog 3702, 3707, 3712, 3732, 3742, 3752, 3762, 3767

*Courses that may be used to fulfill UMD liberal education program requirements.
**Electives**
None, except those approved by the department faculty on a case-by-case basis.

**Language Requirements**
Foreign language study is recommended, but not required, for all geography students, especially those interested in cultural geography or considering graduate study.

**Final Project**
Majors complete a senior research project, Geog 5999, developing ideas generated in courses such as Geog 5612 and Geog 5803 and carried out with the guidance of a faculty member. Students present their projects orally at a department seminar.

**Minor Requirements (20)**

*Lower Division (10)*
Geog 1304*-Human Geography (3)
Geog 1414*-Physical Geography (4)
Geog 2552*-Introduction to Maps and Cartographic Methods (3)
Electives (10) (no more than three of these credits may be 1xxx or 2xxx)

*Courses that may be used to fulfill UMD liberal education program requirements.*

**German (Ger)**

*Department of Foreign Languages and Literature*

*Undergraduate Minor Only*
The German minor complements any liberal arts degree. German has been the language of a major world culture for centuries and is the traditional language of science, medicine, and philosophy. As global commerce and communication become the norm, German provides a solid basis for careers in business, law, human services, and diplomacy.

**Requirements (12-32)**
Students with previous language study may be exempt from some core requirements and should consult the department about placement.

*Core (0-20)*
Ger 1101*-Beginning German I (4)
Ger 1102*-Beginning German II (4)
Ger 1201*-Intermediate German I (4)
Ger 1202*-Intermediate German II (4)
Ger 2301*-Advanced German (4)

*Upper Division (12)*
Selected from German courses beyond Ger 2301

*Courses that may be used to fulfill UMD liberal education program requirements.*

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**College of Liberal Arts**

**History (Hist)**

*College of Liberal Arts*

*Professor: Neil T. Storch; Associate Professor: Alexis E. Pogorelskin (department head); Assistant Professors: Anna Marie Roo and Nkasa T. Yelengi*

**B.A.**
The study of history is vital to a liberal arts education because it provides a holistic approach to knowledge; it broadens students' understanding of commonality and diversity, the development of cultures, and the drama of the human experience.

History touches on the whole range of the human heritage. While focusing on the past, it also helps students understand the present and provides a strong foundation for the future. It prepares students for careers that demand analytical and communication skills, critical thinking, and cultural breadth. These careers include law, business, journalism, teaching, government, and the ministry.

This program introduces students to major world cultures and provides experience in the critical use of historical literature and other source materials. It offers concentrations in ancient and medieval, Africa/East Asia/Latin America, the Western heritage, the United States, and the modern world.

**Honors Requirements**
A 3.30 GPA in all history courses and department approval of an honors-quality paper are required. The paper, which may be written in conjunction with a 2xxx, 3xxx, or 5xxx course, is evaluated by two department faculty members. Contact the department head or academic adviser for more information.

**Degree Requirements**
Requirements for the B.A. in history (120 credits) include:

- UMD liberal education requirements
- Advanced writing requirement: Comp 3100—Advanced Writing: Language and Literature or Comp 3110—Advanced Writing: Arts and Letters or Comp 3160—Advanced Writing: Social Sciences (3 credits)
- Major requirements (38-40 credits)
- Minor requirements (21-22 credits)
Colleges and Schools

Required Courses

Lower Division (12-13)

Four from:
- Hist 1207*-Dawn of Modern Europe (3)
- Hist 1208*-Europe in the Modern Age (3)
- Hist 1304*-American Heritage (3)
- Hist 1305*-American Challenges (3)
- HmCI 1004*-From Classical Antiquity to Medieval Culture (4)

Upper Division (26-27)

History and other designated electives at 2xxx or above. Students also complete at least one 5xxx course in which individual research and a paper are required. At least 6 credits must be completed in three of the following categories and at least 3 credits must come from one of the remaining categories for a total of 21 credits.

Ancient and Medieval: HmCI 3007, 3021, 3031, 3041, 3055, 3151, 3161, 3333, Hist 3263
- Africa/East Asia/Latin America: Hist 2515*, 3462, 3463, 3491, 3515, 3516, 3601, Pol 3520, 3560
- Western Heritage: Hist 2245*, 3239, 3241, 3242, 3256, 3257
- United States: Hist 2357*, 3316, 3317, 3361, 3365, 3367
- Modern World: Hist 2265*, 3243, 3264, 3275, 3384, 3385, 3591

Hist 3095—Special Topics may be assigned a category in consultation with the instructor.
- Hist 5905—History Seminar
- Hist 5094—Directed Research (4)
- Hist 3505—Colloquium for Majors (1-2)

Electives

HmCI 1004*-From Classical Antiquity to Medieval Culture (4)
- HmCI 3007—The Late Rome and Medieval Worlds (3)
- HmCI 3021—The Age of the Heroes: Homer and His World (3)
- HmCI 3031—The Roman Republic (3)
- HmCI 3041—The Roman Empire (3)
- HmCI 3055—The Ancient Near East (3)
- HmCI 3151—Ancient Egyptian Culture (3)
- HmCI 3161—Egyptian Literature and Language (3)
- HmCI 3333—From Homer to Alexander: Archaic and Classical Greece (3)

Pol 3520—Chinese Government and Politics (4)
- Pol 3560—Latin American Governments and Politics (4)

* Courses that may be used to fulfill UMD liberal education program requirements.

Language Requirements

Foreign language study is recommended, especially for students considering graduate study.

Seminar Requirement

Hist 5905 is a capstone course. As an alternative, students may complete Hist 5094, which also requires a research paper.

Colloquium Requirement

Majors attend a series of colloquia, Hist 3505, in their senior year. These colloquia showcase research by both students and faculty focusing on problems of methodology in the discipline. Participation is S-N. Students making a presentation earn 2 credits.

Internship Option

In consultation with the department’s internship adviser, students may participate in a learning experience, Hist 3097, either on or off campus that introduces them to practical applications or other methodological issues of history as a discipline.

Minor Requirements (21-22)

Lower Division (9-10)

Any three from:
- Hist 1207*-Dawn of Modern Europe (3)
- Hist 1208*-Europe in the Modern Age (3)
- Hist 1304*-American Heritage (3)
- Hist 1305*-American Challenges (3)
- HmCI 1004*-From Classical Antiquity to Medieval Culture (4)

Upper Division (12)

History and other designated electives at 2xxx or above. At least 6 credits must be completed in each of two of the following: ancient and medieval, Africa/East Asia/Latin America, the Western heritage, the United States, the modern world (see above for acceptable courses in these categories).

* Courses that may be used to fulfill UMD liberal education program requirements.

Humanities

Department of Sociology- Anthropology

Director: Bacig; Advisers: Cole (Phil), Marchese (Soc/Anth)

Minor Only

The humanities minor acquaints students with a variety of expressions of the human mind and spirit as they appear in the arts, literary sources, and historical documents; helps them develop skills for analyzing such human expressions; and provides them with experiences in interdisciplinary inquiry and using various expressive arts to investigate some of the basic concerns of humankind.

Students may follow either a classical heritage track or a contemporary humanities track to earn a B.A. major in interdisciplinary studies (see Interdisciplinary Studies).
Requirements (20)

Lower Division (8-14)
HmCl 1004*—From Classical Antiquity to Medieval Culture (4)
HmCl 1005*—From Renaissance to Revolutions (4)
Other 1xxx-2xxx humanities and classics courses (6 maximum)

Upper Division (6-12)
HmCl 3099—Project in the Humanities (2)
Other 3xxx-5xxx humanities and classics courses (4-10)

* Courses that may be used to fulfill UMD liberal education program requirements.

Interdisciplinary Studies (IS)

Department of Sociology-Anthropology
Director: L. Krug; Advisers: T. Bacig, E. Browning Cole (Phil), R. Marchese, N. Peterson

B.A.

This program is for students whose educational objectives can best be met by integrating courses from three or more departments.

In addition to the individually designed major, students may follow structured tracks within the major. These tracks provide suggested frameworks for study in selected interdisciplinary areas; they do not replace or preclude the option of the individually designed major and all major requirements apply.

American studies track—Creates an integrated major that focuses on the distinctive American heritage. Courses explore the American experience from historical, literary, intellectual, social, and cultural perspectives.

Classical heritage track—Creates an integrated major that explores the classical heritage from ancient times through the Medieval and Renaissance eras and considers the impact of this heritage in the modern world. The program emphasizes a period of time when diverse cultures and civilizations had a profound effect on the peoples of the Mediterranean basin.

Contemporary humanities track—Creates an integrated major that focuses on the development and experience of contemporary culture. Courses explore contemporary culture from recent historical, literary, intellectual, social, and cultural perspectives.

Admission Requirements

This major is unique because it is individually designed; students work with faculty advisers to create a field of study involving courses from several departments. It may encompass the natural sciences, social sciences, humanities, fine arts, technical and professional fields, or a combination of these.

The program admission application should be thought through carefully (contact the program director for referral to specific faculty who can consult on students' proposed programs). It consists of a list of courses for the major and a statement of purpose that explains the student's rationale for the proposed program. Upon approval by the Interdisciplinary Studies Committee, it becomes an individualized program. A current transcript must be submitted with the application.

Note: Unlike many UMD majors, interdisciplinary studies is available only by formal application and committee approval. Students should not apply for a change of adviser until their program has been approved.

Degree Requirements

Requirements for the B.A. in interdisciplinary studies (120 credits) include:

- UMD liberal education requirements
- Advanced writing requirement: The appropriate 3xxx advanced writing course selected by the Interdisciplinary Studies Committee (3 credits)
- Major requirements (40-60 credits): 40 upper-division credits (minimum) in three or more departments, including the senior project and seminar (interested students should obtain a descriptive brochure and application from the department)
- No minor requirements
- Before completing 70 credits, majors submit a statement of their educational objectives and a list of proposed courses to the Committee on Interdisciplinary Studies for approval.

Required Courses

Upper Division
IS 3001—Interdisciplinary Methods Seminar (3)
IS 3699—Senior Project (1-10)
Other approved courses (36-47)
American Studies Track

Lower Division (18)

Three courses (9-10) from:
Amln 1120*—American Indians in the 20th Century (3)
AmS 1031*—Landscapes, Environments, and U.S. Culture (3)
AmS 1041*—Frontier Heritage in Canada and the United States (4)
AmS 1061*—American Immigrant Heritage (3)

Remaining courses (8-9) from:
Amln 1106*—American Indian Prose, Poetry, and Oratory (3)
Amln 2105*—Survey of Northern American Indian Arts (3)
Anth 1604*—Cultural Anthropology (4)
Comm 2101*—Foundations of Mass Communication (3)
FA 2510—History of American Architecture: 1600 to Present (3)
Hist 1304*—American Heritage (3)
Hist 1305*—American Challenges (3)
Mu 1005*—Jazz Studies (3)
Mu 2003*—Survey of American Music (3)
Pol 1011*—American Government and Politics (3)
Span 1201*—Intermediate Spanish I (4)
Span 1202*—Intermediate Spanish II (4)
SW 1619*—Race, Class, and Gender (3)
WS 1000*—Introduction to Women's Studies (3)
WS 2101*—Women, Race, and Class (3)

Upper Division (40 minimum)

IS 3001—Interdisciplinary Methods Seminar (3)
IS 3099—Senior Project (1-10)

Remaining courses should be selected from a minimum of two of the following categories. Directed study and special topics courses may be applied to any appropriate category. In addition, students may select other courses, as approved by their adviser.

Category I: Historical
Amln 3106*—Indian-White Relations (3)
Amln 3410—Fur Trade in Canada and the United States (3)
Anth 3618—Ancient Middle America (3)
Anth 3624—Archaeology of North America (3)
Geog 3104—Historical Geography: United States (4)
Hist 3365—America Society and Culture (3)

Category II: Literary and Cultural
Amin 4630—American Indians and the Media (3)
ArtH 3380—History of World Art I (3)
Engl 1535—King Arthur in History, Literature, and Art (3)
Fr 1201*—Intermediate French I (4)
Fr 1202*—Intermediate French II (4)
Ger 1201*—Intermediate German I (4)
Ger 1202*—Intermediate German II (4)
HmCI 1022—The Bible as Literature (3)
Span 1201*—Intermediate Spanish I (4)
Span 1202*—Intermediate Spanish II (4)

Category III: Social Issues
Anth 3616—Cultures of Arctic North America (3)
Geog 3113—Geography of American Indians in the United States and Canada (3)
Geog 3143—Ethnic Geography of American Immigrants (3)
Geog 3702—Geography of the United States and Canada (3)
Hist 3367—Civil Rights Movements: Recent America (3)
Phil 3305—19th- and 20th-Century Philosophy (4)
Pol 3140—American Political Parties and Elections (3)
Pol 3402—American and Foreign Defense Policy (3)
Soc 3862—Technology and Society (3)
Soc 4947—Sociology of Women (3)
Soc 4949—Race and Ethnic Relations (3)

Additional Course
AmS 5091—Directed Study (1-4)

* Courses that may be used to fulfill UMD liberal education program requirements.

Classical Heritage Track

Lower Division (18)

HmCI 1004*—From Classical Antiquity to Medieval Culture (4)
HmCI 1005*—From Renaissance to Revolutions (4)
HmCI 1021*—Classical Mythology (3)

Remaining courses (7) should be selected from (language study is recommended for those wishing to pursue graduate study in history, humanities, classics, and Medieval and Renaissance civilization)

Anth 1602*—Prehistoric Cultures (4)
Anth 1612*—Introduction to Archaeology (4)
Art 1002*—Introduction to Art (3)
ArtH 1303*—History of World Art I (3)
ArtH 1304*—History of World Art II (3)
Engl 1535*—King Arthur in History, Literature, and Art (3)
Fr 1201*—Intermediate French I (4)
Fr 1202*—Intermediate French II (4)
Ger 1201*—Intermediate German I (4)
Ger 1202*—Intermediate German II (4)
HmCI 1022—The Bible as Literature (3)
Span 1201*—Intermediate Spanish I (4)
Span 1202*—Intermediate Spanish II (4)

Upper Division (40 minimum)

IS 3001—Interdisciplinary Methods Seminar (3)
IS 3099—Senior Project (1-10)

Remaining courses should be selected from a minimum of two of the following categories. Directed study and special topics courses may be applied to any appropriate category. In addition, students may select other courses, as approved by their adviser.

Category I: Historical and Cultural
HmCI 3021-The Age of Heroes: Homer and His World (3)
HmCI 3031—The Roman Republic (3)
HmCI 3041—The Roman Empire (3)
College of Liberal Arts

HmCI 3055—The Ancient Near East (3)
HmCI 3151—Ancient Egyptian Culture (3)
HmCI 3333—From Homer to Alexander: Archaic and Classical Greece (3)

Philosophical and Literary (Ancient)
HmCI 3022—Historical Jesus (3)
HmCI 3028—Gender and Culture in the Classical World (4)
Phil 3301—Greek Philosophy (4)

Category II: Historical and Cultural (Medieval)
HmCI 3007—The Late Rome and Medieval Worlds (3)
HmCI 5033—Medieval Literature in Its Cultural Context (4)

Philosophical and Literary (Medieval)
Engl 5312—Chaucer (4)
Engl 5523—Middle English Language and Literature (4)

Category III: Historical and Cultural (Renaissance)
ArtH 4491—Directed Study in 19th- and 20th-Century European Art (1-3)
ArtH 5391—Directed Study in Renaissance and Baroque Art (1-3)
Engl 3223—Shakespeare (3)
Hist 3239—Europe in the Age of Renaissance and Reformation: 1348-1648 (3)
Span 4025—Cervantes (4)

Additional Courses
HmCI 3095—Special Topics in Humanities (1-5)
HmCI 3591—Independent Study (1-4)
HmCI 5591—Independent Study (1-4)
* Courses that may be used to fulfill UMD liberal education program requirements.

Contemporary Humanities Track

Lower Division (18)
Two courses (6-7) from:
AmS 1031*—Landslapes, Environments, and U.S. Culture (3)
AmS 1061*—American Immigrant Heritage (3)
Comm 2101*—Foundations of Mass Communication (3)
HmCI 1005*—Renaissance to Revolutions (4)

Remaining courses (11-12) from:
AmIn 1106*—American Indian Prose, Poetry, and Oratory (3)
AmIn 1120*—American Indians in the 20th Century (3)
AmIn 2105*—Survey of North American Indian Arts (3)
AmS 1041*—Frontier Heritage in Canada and the United States (4)
Anth 1604*—Cultural Anthropology (4)
Comm 2621—Analysis of Public Discourse (3)
Engl 1575*—20th-Century Literature (3)
FA 2510—History of American Architecture: 1600 to Present (3)
HmCI 1023*—Folklore (3)
Mu 1005*—Jazz Studies (3)
Mu 2001*—Ethnic and Folk Music of the World (3)
Phil 1003*—Ethics and Society (3)
Phil 1007*—Philosophy and World Religions (3)
Th 1001*—Introduction to Theatre Arts (3)
WS 1000*—Introduction to Women's Studies (3)

Upper Division (40 minimum)
IS 3001—Interdisciplinary Methods Seminar (3)
IS 3099—Senior Project (1-10)

Remaining courses should be selected from a minimum of two of the following categories. Directed study and special topics courses may be applied to any appropriate category. In addition, students may select other courses, as approved by their adviser.

Category I: Literary and Artistic Culture
AmIn 3260—American Indian Novel (3)
Engl 4292—Literature Into Film (4)
Engl 5577—Major American Authors (4)
HmCI 3022—Historical Jesus (3)
WS 3200—Women's Autobiographies (3)

Category II: Media and Popular Culture
AmIn 4630—American Indians and the Media (3)
HmCI 3035—The Music and Lives of the Beatles (3)
HmCI 3221—Science Fiction (3)
HmCI 3231—Utopian Images (3)
HmCI 3271—Popular Culture in the 1960s (3)

Category III: Cultural Issues
Anth 3628—Women in Cross-Cultural Perspective (3)
Anth 4616—Culture and Personality (3)
Anth 4621—Myth and Sacred Symbols (3)
Anth 4628—Language and Culture (3)
Comm 3205—Relationship Communication (3)
Hist 3367—Civil Rights Movement: Recent America (3)
HmCI 3051—Science and Civilization (3)
Phil 3242—Values and Technology (3)
Phil 5245—Aesthetics (3)
Soc 3701—Social Psychology (3)
Soc 4860—Environmental Sociology (3)
Soc 4947—Sociology of Women (3)
Span 3042—Hispanic American Civilization and Culture (4)

Additional Courses
HmCI 3095—Special Topics in Humanities (1-5)
HmCI 3591—Independent Study (1-4)
HmCI 5591—Independent Study (1-4)
* Courses that may be used to fulfill UMD liberal education program requirements.

Final Project
IS 3001—Interdisciplinary Methods Seminar prepares students for their senior project by training them to conduct library research, consult their adviser, and write a project proposal.

IS 3099—Senior Project usually results in an academic paper of 15-30 pages with a full bibliography (2-4 credits). However, the project may be an internship, portfolio, exhibit, tour, or...
field study (up to 10 credits). Additional credits are recommended only for projects that take students off campus for a substantial part of an academic term.

The project includes a bibliography of relevant library resources showing general knowledge of the topic and a written paper, report, journal, or analysis of how the program has affected one’s personal and intellectual development. A copy of the project must be filed with the program director.

International Studies (IntS)

Department of Political Science

Director: Paul Sharp (Pol); Steering Committee: Sharon Kemp (Soc-Anth), Gordon Levine (Geog), Tineke Ritmeester (WS), Bradley Thayer (Pol), Eileen Zeitz (Span)

B.A.

This interdisciplinary program provides students with a broad background in contemporary international affairs and the skills necessary to participate effectively in the global community. The program incorporates courses and faculty from more than fourteen different departments and programs. Majors and minors are encouraged to incorporate a study abroad experience into their programs.

Degree Requirements

Requirements for the B.A. in international studies (120 credits) include:

• UMD liberal education requirements
• Advanced writing requirement: Comp 3xxx (3 credits)
• Major requirements (42-60 credits, depending on foreign language proficiency level when entering the program)
• Minor requirements

Required Courses

Anth 1604*—Cultural Anthropology (4)
Geog 1202*—World Regional Geography (3)
Geog 1304*—Human Geography (3)
Hist 1208*—Europe in the Modern Age (3)
IntS 4100—Seminar in International Studies (4)
Pol 1050*—International Relations (3)

Electives (18-24)

Within the 18-24 credits, three electives from at least two of the following categories.

The International Economy

Econ 3410—International Economics and Finance (3)
FMIS 3649—International Finance (3)
Geog 3461—Geography of Global Resources (3)

MgtS 3781—International Marketing (3)
Pol 3460—International Political Economy (4)

International Relations

Hist 3385—American Foreign Relations II (3)
Pol 3402—American Foreign and Defense Policy (3)
Pol 3415—International Law (4)
Pol 3426—Politics of International Organization (4)
Pol 3451—Theories of International Relations (4)

Social Change and Development

Anth 3614—Peasant Societies and Cultures (3)
Anth 4641—International Development: Women and Population (3)
Geog 3143—Ethnic Geography of American Immigration (3)
Pol 3570—Third World and Development (3)
Soc 3945—Social Stratification (3)

Comparative Approaches and Perspectives

Anth 3628—Women in Cross-Cultural Perspective (3)
Comm 2929*—Intercultural Communication (4)
WS 3000—International Perspectives on Feminism (3)
WS 3400—Women and Film (3)

Within the 18-24 credits, three electives from two of the following regional fields.

Western European Nations

Engl 3501—British Literature I (4)
Engl 3502—British Literature II (4)
Engl 5566—Irish Literary Revival (4)
Engl 5586—British Novel II (4)
Fr 2315*—French Cinema (4)
Fr 4422—20th-Century Novel (4)
Geog 3762—Geography of Europe (3)
Geog 3767—Geography of Scandinavia, Finland, and Iceland (3)
Ger 2402*—Germany Today (3)
Ger 3403—German Poetry and Theater (4)
Ger 4404—Contemporary Germany (4)
Hist 3243—Europe in Crisis in the 20th Century (3)
Hist 3257—Modern France (3)
Pol 3517—Western European Political Systems (4)
Span 3044—Spanish Civilization and Culture (4)
Span 4026—20th-Century Spain and Beyond (4)

Soviet Union and Successor States

Engl 3511—European and Russian Literature (4)
Geog 3752—Geography of Russia and Other Commonwealth Republics (3)
Hist 2265*—Russia in the 20th Century (3)
Hist 3264—History of Russia II (3)
Hist 3275—Russian Culture (3)
Pol 3510—Russian and Soviet Politics and Government (4)

Spanish Americas

Anth 3632—Latin American Cultures (3)
Geog 3712—Geography of Latin America (4)
Pol 3560—Latin American Governments and Politics (4)
Span 3042—Hispanic American Civilization and Culture (4)
Electives (12-16 credits in courses from the electives list)
Foreign language study is strongly recommended.

* Courses that may be used to fulfill UMD liberal education program requirements.

Language (Lang)
See Department of Foreign Languages and Literatures.

Linguistics (Ling)

Department of Foreign Languages and Literatures
Faculty: Conant (Ger) (coordinator), Hatten (CSD), Katz (Comm), Kovacovic (Fr), Linn (Comp), Riley (Comp)

Undergraduate Minor Only
This interdisciplinary minor develops the student’s systematic understanding of the nature of language. It has numerous career applications, including professional writing, human relations, and the law. Linguistics has many subfields and can overlap with anthropology, communication, communication sciences and disorders, education, English, foreign languages, philosophy, psychology, and sociology. A B.A. in English with an emphasis in linguistics (see English) and a designated minor for the M.A. in English are also offered.

Requirements
Required for the minor are 20 credits in core and related courses (listed below), of which a minimum of 14 credits must be earned from the list of core courses. Ling 1811, an overview of linguistics, should be the first course taken.

Core Courses
Anth 4628—Language and Culture (3)
CSD 1100—Phonetics (2)
Engl 5811—Introduction to Modern English (4)
Engl 5821—History of the English Language (4)
Ling 1811*—Introduction to Language (3)
Ling 3101—Introduction to Phonology (3)
Ling 3102—Introduction to Syntax (3)
Ling 3195—Special Topics in Linguistics (3)
Ling 3591—Independent Study in Linguistics (1-3)
Ling 5195—Special Topics in Linguistics (3)
Ling 5802—Applied Linguistics (4)
Ling 5852—Practicum in Teaching Linguistics (3)
Psyc 3661—Psychology of Language (3)

Related Courses
Amln 1103*—Beginning Chippewa I (3)
Amln 1104*—Beginning Chippewa II (3)
CSD 3130—Language Development and Disorders (4)
Phil 3651—Advanced Logic (4)

* Courses that may be used to fulfill UMD liberal education program requirements.
Colleges and Schools

Literature (Lit)
See Departments of American Indian Studies, English, and Foreign Languages and Literatures.

Philosophy (Phil)

Professors: James H. Fetzer, Gerald F. Gaus (Pol), David J. Mayo; Associate Professors: David J. Cole, Eve Browning Cole, Robert H. Evans; Assistant Professor: Richard Hudelson

B.A.
This program familiarizes students with the history of philosophy and helps them develop problem-solving skills using critical thinking. Beginning courses provide a comprehensive introduction to the methods and procedures of analytical reasoning by examining issues concerning the nature of knowledge and reality, the existence of freedom, logic, and the character of right and wrong. Advanced courses focus on special historical periods (e.g., Greek philosophy, early modern philosophy) and specific problem areas (e.g., philosophy of religion, medical ethics, philosophy of language).

Principles that emerge from the study of philosophy concern the nature of reasoning as it applies to all areas of investigation within the humanities, natural sciences, and social sciences. As a result, studying philosophy enhances all majors and minors.

Honors Requirements
Candidates must be philosophy majors with a 3.30 GPA in the major. Students complete Phil 5991 and write a substantial paper or significantly rewrite a paper submitted for another philosophy course. Students must notify the department head of their intent to participate in the honors program by the end of the first week of the semester of graduation and the paper must be approved by a faculty member at least 30 days before the end of the term. The paper is presented orally in a department colloquium with a manuscript submitted at least one week before presentation. Contact the department head for more information.

Degree Requirements
Requirements for the B.A. in philosophy (120 credits) include:
- UMD liberal education requirements
- Advanced writing requirement: Comp 3xxx (3 credits)
- Major requirements (33-34 credits)
- Minor requirements

Required Courses
Lower Division (6-7)
Phil 1001*—Problems of Philosophy (3)
Phil 1018*—Logic (4)
or Phil 3651—Advanced Logic (3)

Upper Division (27)
Phil 3301—Greek Philosophy (4)
Phil 3303—The Birth of Modern Philosophy (4)
Phil 3305—19th- and 20th-Century Philosophy (3)
Phil 3900—Colloquium for Majors (1)
Phil 4900—Seminar in Philosophy (3)
Four philosophy electives (at least three at 2xxx or above) (12)

* Courses that may be used to fulfill UMD liberal education program requirements.

Final Project
Students attend 12 department colloquia (Phil 3900); contact the department secretary for details.

Philosophy—Applied Ethics

B.A.
This program familiarizes students with major ethical theories and their current applications in a number of fields and work situations. Beginning courses provide a framework for ethical thinking and decision making in general from a variety of theoretical orientations, along with introductory applications to current social problems. Advanced courses apply this thinking to complex issues generated within specific fields such as medicine, technology, and the environment. Students choose upper division electives from other disciplines to shape the major to their specific interests and post-baccalaureate plans.

Principles that emerge from the study of applied ethics can complement a variety of other majors and minors, as well as enhance students' moral education and theoretical literacy for handling ethical problems that may emerge in a variety of careers.

Degree Requirements
Requirements for the B.A. in philosophy—applied ethics (120 credits) include:
- UMD liberal education requirements
- Advanced writing requirement: Comp 3xxx (3 credits)
- Major requirements (43-45 credits)
- Minor requirements

Required Courses
Lower Division (9)
Phil 1001*—Problems of Philosophy (3)
Phil 1003*—Ethics and Society (3)
Phil 1008—Critical Thinking (3)
Upper Division Core (17)
Phil 3231—Theories of Law and Punishment (4)
Phil 3281—Ethical Theory (4)
Phil 3291—Current Social and Political Philosophy (4)
Phil 3900—Colloquium for Majors (ethics topics) (1)
Phil 4900—Seminar in Philosophy (ethics topic alternate years) (4)

Upper Division Application Areas (11)
Phil 3222—Medical Ethics (4)
Phil 3241—Values and Technology (3)
Phil 3225—Environmental Ethics (4)

Electives (6-8)
Two electives from other programs in application areas subject to advisor approval.

* Courses that may be used to fulfill UMD liberal education program requirements.

Minor Requirements
The philosophy minor (16 credits) acquaints students with major figures and problems in our philosophical heritage and helps them develop critical thinking skills.

6 lower division philosophy credits
10 upper division philosophy credits

Political Science (Pol)

Professors: Gerald Gaus, Paul Sharp (department head);
Associate Professors: Elizabeth Bartlett, Stephen Chilton,
Craig Grau; Assistant Professors: John Kress, Bradley Thayer

B.A.
This program prepares students for careers in government and business, the study of law, and graduate study in political science, domestic and international public policy, and related fields. It offers general liberal education coursework, specialized coursework for students majoring in other disciplines, and a related field for graduate students. Political science courses apply to the majors in urban and regional studies, international studies, women’s studies, criminology, and social studies teaching; the minors in international studies, women’s studies, and social science (elementary) teaching; and the bachelor of accounting and bachelor of business administration degrees.

Honors Requirements
The department honors program offers exceptional majors further opportunities to pursue academic excellence. Admission to the program requires a 3.00 GPA in the major. Students must complete Pol 3910 with a minimum grade of B+ in their junior year, write an honors-quality paper in Pol 4190, 4191 (4 credits), or 4192 in their senior year, and have a 3.10 GPA in the major at graduation.

Graduation with honors requires a total of 40 credit hours of political science courses. Contact the department head for more information.

Degree Requirements
Requirements for the B.A. in political science (120 credits) include:
- UMD liberal education requirements
- Advanced writing requirement: Comp 3xxx (3 credits)
- Major requirements (39 credits)
- Minor requirements

Students have considerable flexibility in designing their major to ensure it meets personal and professional interests and needs. Up to 8 credits can be taken from the list of approved courses outside the department. Students should consult their department adviser to define the focus and coverage of their program and select courses in other disciplines, including second majors and minors. Students are encouraged to acquire collateral skills in areas such as statistics, computer applications, and foreign languages. At least 8 political science credits must be taken at UMD. Students interested in graduate study should begin planning for it in their junior year; many programs expect proficiency in statistical analysis and/or a foreign language.

Required Courses
Pol 4190—Senior Seminar
or Pol 4192—Senior Seminar in Policy Studies (4)

Four courses (12-13) from:
- Pol 1011*—American Government and Politics (3)
- Pol 1050*—International Relations (3)
- Pol 1200*—Introduction to Public Policy (3)
- Pol 1500*—Introduction to Comparative Politics (3)
- Pol 1610*—Politics and Society (3)
- Pol 2700—Methodology and Analysis (4)

Electives
(22-23) from the following (one of the remaining introductory courses may also be used), including up to 8 credits from the list of approved courses outside the department:
Pol 1195—Special Topics: (Various Titles to be Assigned) (1-4)
Pol 3001—American Public Policy (3)
Pol 3003—Public Choice: Markets Versus Governments (4)
Pol 3004—The Political Theory of the Welfare State (4)
Pol 3020—State Government (3)
Pol 3030—Urban Government and Politics (3)
Pol 3040—Women and Politics (3)
Pol 3070—Civil Liberties (3)
Pol 3080—Environment and Politics (3)
Pol 3097—Government Internship (1-6)**
Colleges and Schools

Pol 3109—Intern Teaching in Political Science (1-2)
Pol 3120—Congress and the Presidency (4)
Pol 3130—The Judicial Process (3)
Pol 3140—American Political Parties and Elections (3)
Pol 3150—American Constitutional Law I (4)
Pol 3151—American Constitutional Law II (4)
Pol 3170—Political Interest Individuals and Groups (3)
Pol 3195—Special Topics: (Various Titles to be Assigned) (1-4)
Pol 3197—Nongovernmental Internship (1-6)**
Pol 3221—Public Administration (3)
Pol 3297—Public Policy Internship (1-6)
Pol 3310—Public Opinion and Propaganda (3)
Pol 3400—Contemporary Issues in World Politics (4)
Pol 3402—American and Foreign Defense Policy (3)
Pol 3415—International Law (4)
Pol 3426—Politics of International Organizations (4)
Pol 3451—Theories of International Relations (4)
Pol 3460—International Political Economy (4)
Pol 3510—Russian and Soviet Politics and Government (4)
Pol 3517—Western European Political Systems (4)
Pol 3520—Chinese Government and Politics (4)
Pol 3550—Politics of Contemporary Southern Africa (2)
Pol 3560—Latin American Governments and Politics (4)
Pol 3570—Third World and Development (3)
Pol 3600—Political Concepts (4)
Pol 3610—Political Economy: An Introduction (4)
Pol 3640—Theory and Practice of Nonviolence (4)
Pol 3651—History of Western Political Thought I (4)
Pol 3652—History of Western Political Thought II (4)
Pol 3711—The Washington Semester: Introductory Seminar (4)
Pol 3712—The Washington Semester: Advanced Seminar (4)
Pol 3794—The Washington Semester: Research (4)
Pol 3797—The Washington Semester: Internship (4)
Pol 3910—Honors Seminar: Landmarks in Political Science (4)
Pol 4191—Independent Study (1-4)
Pol 4192—Senior Seminar in Policy Studies (4)
Pol 4195—Special Topics: (Various Titles to be Assigned) (1-4)
Pol 4198—Workshop: (Various Titles to be Assigned) (1-4)
Pol 4610—Contemporary Political Theory (3)
* Courses that may be used to fulfill UMD liberal education program requirements.
** May be repeated for up to eight credits with no more than four credits counting toward the major

Electives

Up to 8 credits from:
Amln 2520—Tribal Law and Government (3)
Amln 3333—Introduction to Federal Indian Law (3)
BLaw 2001—The Legal Environment (3)
Comm 3612—Political Communication (3)
Econ 2020—Statistics: Methods and Analysis (5)
Econ 3036—Radical Economics (3)

Pol 3197—Nongovernmental Internship (1-6)**
Pol 3297—Public Policy Internship (1-6)
Pol 3310—Public Opinion and Propaganda (3)
Pol 3400—Contemporary Issues in World Politics (4)
Pol 3402—American and Foreign Defense Policy (3)
Pol 3415—International Law (4)
Pol 3426—Politics of International Organizations (4)
Pol 3451—Theories of International Relations (4)
Pol 3460—International Political Economy (4)
Pol 3510—Russian and Soviet Politics and Government (4)
Pol 3517—Western European Political Systems (4)
Pol 3520—Chinese Government and Politics (4)
Pol 3550—Politics of Contemporary Southern Africa (2)
Pol 3560—Latin American Governments and Politics (4)
Pol 3570—Third World and Development (3)
Pol 3600—Political Concepts (4)
Pol 3610—Political Economy: An Introduction (4)
Pol 3640—Theory and Practice of Nonviolence (4)
Pol 3651—History of Western Political Thought I (4)
Pol 3652—History of Western Political Thought II (4)
Pol 3711—The Washington Semester: Introductory Seminar (4)
Pol 3712—The Washington Semester: Advanced Seminar (4)
Pol 3794—The Washington Semester: Research (4)
Pol 3797—The Washington Semester: Internship (4)
Pol 3910—Honors Seminar: Landmarks in Political Science (4)
Pol 4191—Independent Study (1-4)
Pol 4192—Senior Seminar in Policy Studies (4)
Pol 4195—Special Topics: (Various Titles to be Assigned) (1-4)
Pol 4198—Workshop: (Various Titles to be Assigned) (1-4)
Pol 4610—Contemporary Political Theory (3)
* Courses that may be used to fulfill UMD liberal education program requirements.
** May be substituted for Pol 2700

Pre-Law

Because entrance requirements differ among law schools, prospective law students should obtain information from the law schools they expect to apply to as early as possible. Students should be aware that successful completion of the Law School Admission Test (LSAT) is required for admission to most law schools. The Department of Political Science and the Career Services office maintain files on law schools and provide LSAT materials to students. They also hold informational meetings during the year with representatives of law schools.

Admission to law school requires a bachelor of arts (B.A.) degree or its equivalent. Well-balanced bachelor of science and bachelor of business administration programs are accepted as the equivalent of the B.A. degree by most law schools.

Because law schools do not recommend any particular major, pre-law students may find a variety of majors useful, including economics, history, political science, philosophy, humanities, English, sociology, psychology,
mathematics, physical sciences, anthropology, geography, journalism, communication, modern languages, international studies, and women's studies.

Each student's education should be as broad as possible. Electives should be chosen in areas outside the major field to develop and demonstrate multiple competencies in varying subject areas and methods. Double majors are increasingly recommended, particularly where they complement substantive knowledge with analytical skills.

Law schools attach special importance to training that helps students express themselves in the English language forcefully, effectively, and accurately. Whatever the specialty, a professional career in law requires the communication of ideas and information through words. Success in law school, as well as in subsequent professional practice, depends to a great extent on the capacity for effective writing and speaking. Therefore, students are encouraged to take courses that require considerable reading, writing, and independent thinking, and they should develop through coursework or activities their capacity for expressing themselves orally. Knowledge of the principles of accounting is also helpful.

**Minor Requirements**
The minor (20 credits) can be designed specifically to supplement major programs in related disciplines or more broadly develop the political awareness, background, and critical faculties requisite to responsible citizenship. Twelve credits must be 3xxx or above. At least 8 political science credits must be taken at UMD. Up to 4 credits may be from the list of approved courses outside the department (see political science major).

**Political Science—Public Policy Concentration B.A.**
The public policy concentration offers political science majors the option of focusing on the study and analysis of policy decisions as applied to a wide variety of issues confronting our society. Students examine the institutions and processes involved in policy making, together with the conceptual tools and models used for analyzing policy outcomes. Students then design their own elective track around a core course on a key policy area.

The concentration introduces students to the contexts of policy making in the United States and abroad and the ways in which policy may be studied, before students specialize in a particular area of policy. It provides the practical skills required to play a role in policy making and helps develop the habits of thought and civic values essential to effective democratic citizenship. It also prepares students for graduate-level study.

**Degree Requirements**
Requirements for the B.A. in political science—public policy concentration (120 credits) include:
- UMD liberal education requirements
- Advanced writing requirement: Comp 3xxx (3 credits)
- Major requirements (44-50 credits)

**Required Courses**

*Introductory Courses (15-17)*
- Pol 1011—American Government (3)
- Pol 1200—Introduction to Public Policy (3)
- Pol 1610—Politics and Society or Phil 1003—Ethics and Society (3)
- Econ 1022—Principles of Economics: Macro or Econ 1023—Principles of Economics: Micro (3)

*One course from the following:*
- Econ 2020—Statistics: Methods and Analysis (5)
- Pol 1050—International Relations (3)
- Pol 1500—Introduction to Comparative Politics (3)
- Pol 2700—Methodology and Analysis (4)

*Advanced Courses (17)*
- Pol 3001—American Public Policy (3)
- Pol 3003—Public Choice: Markets Versus Governments (4)
- Pol 3221—Public Administration (3)
- Pol 3297—Public Policy Internship (3)
- Pol 5192—Senior Policy Seminar (4)

*Policy Areas (12-16)*
- Students take four courses from one of the policy areas below. The core course listed with each area is required. Students choose the other three courses in consultation with their adviser and by approval of the concentration supervisor. Students may petition to create their own policy area from available courses, in consultation with their adviser and by approval of the concentration supervisor.

**Track One: Public Sector Policy**
- Pol 3004 The Political Theory of the Welfare State (4) plus three other approved courses

**Track Two: Environmental Policy**
- Pol 3080 Environment and Politics (3) plus three other approved courses

**Track Three: International Policy**
- Pol 3402 American Foreign and Defense Policy (3) plus three other approved courses
Track Four: Private Sector Policy
Pol 3610 Political Economy: An Introduction (3) plus three other approved courses

Track Five: Law and Policy
Pol 3150 American Constitutional Law I (4) plus three other approved courses

* Courses that may be used to fulfill UMD liberal education program requirements.

Russian (Russ)
See Department of Foreign Languages and Literatures.

Sociology
Department of Sociology-Anthropology

Professors: John A. Arthur, Thomas D. Bacig, Linda S. Belote, William A. Fleischman, J. Clark Laundergan, Michael D. Linn (Comp), Ronald T. Marchese, Timothy G. Roufs, David M. Smith; Associate Professors: Robert E. Franz (department head), Sheryl J. Grana, John E. Hamlin; Assistant Professors: Sharon F. Kemp, Janelle L. Wilson

B.A.
Sociology focuses on the relationships between social structure and the dynamics of establishing, maintaining, and changing patterns of human social behavior. The program is built around a theoretical-methodological core with courses integrated to develop students' conceptual and research competence. These courses focus on social psychology, social organization, social change, and criminology. The major provides a background for careers in human services and business and preparation for related graduate and professional school study.

Admission Requirements
To be accepted into the sociology major, students declare a pre-sociology major and complete Soc 1101, Soc 2001, and Soc 2111 with grades of C or above. If a student chooses to retake any of the three courses, the department will accept the grade in the first retake only. In addition, students must have a 2.50 overall GPA, including transfer credits, at the time of application to the major.

Honors Requirements
The department honors program recognizes majors who demonstrate outstanding academic performance, provides special educational opportunities for such students, and encourages the development of specialty areas within the major. Honors students participate in independent research, working closely with a faculty member. Qualified majors apply to the honors program any time after they have completed Soc 3151-3152 but before the end of the sixth week of the first semester of their senior year.

Degree Requirements
Requirements for the B.A. in sociology (120 credits) include:
- UMD liberal education requirements
- Advanced writing requirement: Comp 3xxx (3 credits)
- Major requirements (44 credits)
- Minor requirements

Note: Students majoring in both sociology and criminology complete 36 unduplicated credits beyond the total required for one of these majors (e.g., if a sociology major is completed for 44 credits, a student also majoring in criminology takes 36 additional credits beyond those counted toward the sociology major).

Required Courses
Soc 1101*—Introduction to Sociology (3)
Soc 2001—Sociological Perspective (3)
Soc 2111—Sociological Theory (3)
Soc 3151—Research Methods and Analysis (3)
Soc 3152—Applied Research (3)
Soc 4587—Internship Preparation (1)
Soc 4597—Internship (7)**

One course (3) from:
Soc 3326—Justice, Women, and Race (3)
Soc 3945—Social Stratification (3)
Soc 4947—Sociology of Women (3)
Soc 4949—Race and Ethnic Relations (3)
Four sociology electives (12)

* Courses that may be used to fulfill UMD liberal education program requirements.
** Maximum of 7 credits of Soc 4597 may be applied to the major

Required Courses From Other Programs
Two nonsociology courses (6 credits minimum) selected in consultation with the adviser and approved by the department.

Final Project
Soc 4587 and Soc 4597 are required. Students intern in a setting related to their career interests at one of the more than 100 internship sites located in Minnesota and Wisconsin. Students typically intern during their senior year or the summer following their senior year.

Minor Requirements (24)

The following with grades of C or above:
Soc 1101—Introduction to Sociology (3)
Soc 2001—Sociological Perspective (3)
Soc 2111—Sociological Theory (3)
Upper-division electives (15) (one course may be in anthropology with adviser approval)

Students majoring in criminology and minoring in sociology must have 15 non-overlapping credits.

Spanish

Department of Foreign Languages and Literatures

B.A.

In this program, students gain a better understanding of varied cultures and their cultural manifestations and a broader world perspective; studying Spanish is also important as it becomes the second language of the United States. This major emphasizes communication skills, language proficiency, and the study of language, literature, and culture as they pertain to Spain, Spanish America, and the U.S. Latino population. It prepares students for graduate or professional school programs such as law, or for work in government or with agencies and businesses having international ties. It provides students with a traditional liberal education.

Honors Requirements

Students who complete an honors project during their senior year and earn a 3.30 GPA in the major receive department honors and receive a degree with distinction. This honor is noted on the transcript.

Degree Requirements

Requirements for the B.A. in Spanish (120 credits) include:

• UMD liberal education requirements
• Students are encouraged to take Engl 1907—Introduction to Literature and Comm 2929—Intercultural Communication for liberal education credit (Categories 9 and 8, respectively), and Ling 1811—Introduction to Language (Category 2). Spanish majors and minors are exempt from the international perspectives requirement.
• Advanced writing requirement: Comp 3100—Advanced Writing: Language and Literature (3)
• Major requirements (23-43 credits)
• Minor or second major requirements
• Oral proficiency exam

The core program in language skills (listening, speaking, reading, writing) is common to all Spanish majors and minors. Students with previous language study may be exempt from some core requirements and should consult the department about placement. Students usually complete the advanced Spanish language course before other upper division courses that emphasize literature and culture. Study abroad is encouraged for all students.

Required Courses (23-43)

Students may be exempt from part or all of the core requirements if they have previously completed studies in Spanish at the high school or college level.

Core (0-20)

Span 1101*—Beginning Spanish I (4)
Span 1102*—Beginning Spanish II (4)
Span 1201*—Intermediate Spanish I (4)
Span 1202*—Intermediate Spanish II (4)
Span 2301*—Advanced Spanish (4)

Upper Division (23)

Selected from Spanish courses beyond Span 2301; with adviser approval, one of these courses (3-4 credits) may be taken in another department or program if it relates to the Spanish major, such as:

Anth 3618—Ancient Middle America (3)
Anth 3632—Latin American Culture (3)
Engl 3563—American Literature I (4)
Geog 3712—Geography of Latin America (4)
Hist 3601—Colonial Latin America from Columbus to Bolivar 1492-1830 (3)
IntS 3197—International Internship (6)
Phil 2001—Existential Literature (3)
Pol 3560—Latin American Governments and Politics (4)

* Courses that may be used to fulfill UMD liberal education program requirements.

Minor Requirements (11-32)

Core (0-20)

Upper Division (11-12)

Selected from Spanish courses beyond Span 2301

Swedish (Swed)

See Department of Foreign Languages and Literatures.
Urban and Regional Studies

Department of Geography
Coordinator: Knopp (Geog); Advisers: Das (Psy), Fleischman (Soc), Jesswein (Econ), Laundergan (Soc), Levine (Geog), Lichty (Econ), Rubenfeld (MgtS), Syck (Acct), Trolander (Hist)

B.A.
This program incorporates resources from many departments and prepares students for careers in planning, public administration, policy analysis, community activism, and related fields. Students gain insight into the complexities of life in urban areas as well as their adjacent regions in North America and throughout the world. The program also prepares students for graduate study in planning, public administration, and the social sciences.

Degree Requirements
Requirements for the B.A. in urban and regional studies (120 credits) include:

• UMD liberal education requirements
• Advanced writing requirement: Comp 3xxx (3 credits)
• Major requirements (57 credits):
  25 lower-division credits in urban and regional studies, sociology, political science, geography, economics, and women's studies,
  21 upper-division credits in sociology, history, political science, and geography,
  8 credits minimum in one of three cores,
  3 credits minimum in an urban and regional studies internship
• Minor requirements

Required Courses
URS 1001—Introduction and Orientation to Urban and Regional Studies (3)
URS 3097—Internship in Urban and Regional Studies (3 minimum)

Required Courses From Other Programs
Lower Division
Econ 1022*—Principles of Economics: Macro (3)
Econ 1023*—Principles of Economics: Micro (3)
Geog 1304*—Human Geography (3)
Geog 1414*—Physical Geography (4)
Pol 1011*—American Government and Politics (3)
Soc 1101*—Introduction to Sociology (3)
WS 2101*—Women, Race, and Class (3)

Upper Division
Geog 3333—Urban Geography (3)
Geog 3352—Urban and Regional Planning (3)
Hist 3361—The American City (3)
Pol 3030—Urban Government and Politics (3)
Soc 3151—Research Methods and Analysis (3)
Soc 3152—Applied Research (3)
Soc 3821—Sociology of Community (3)

8 credits minimum from one of the following cores:

Public Policy and Administration (12)
Econ 4570—Public Finance (3)
Econ 4935—Urban/Regional Economics (3)
MgtS 3801—Human Resource Management (3)
Pol 3221—Introduction to Public Administration (3)

Spatial Analysis and Planning (11)
Geog 2552*—Introduction to Maps and Cartographic Methods (3)
Geog 3532—Map Design and Graphic Methods (5)
Geog 4563—Introduction to Geographic Information Systems (3)

Urban Society and Culture (12)
Geog 4394—Feminist Geographies (3)
Soc 4387—Minorities, Crime, and Justice (3)
Soc 4715—Popular Culture (3)
Soc 4949—Race and Ethnic Relations (3)

* Courses that may be used to fulfill UMD liberal education program requirements.

Electives
None, except those approved by the student’s adviser and the program director on a case-by-case basis.

Language Requirements
Foreign language study is recommended, but not required, for all majors, especially those interested in cultural aspects of urban and regional studies, planning and policy analysis, or public administration, or those considering graduate study.

Final Project
Majors complete at least 3 credits in URS 3001. Internships are arranged in cooperation with community-based organizations and institutions and must be approved in advance by the student’s adviser and the program director. Evidence of successful completion of the internship, usually in the form of weekly reports from the student and a letter or memo from a supervisor at the cooperating agency, is required.
Women's Studies (WS)

Professor: Judith A. Trolander; Associate Professors: Beth Bartlett (department head), Tineke Ritmeester; Assistant Professor: Njoki Kamau; Advisory Board: Belote (Soc), Farrell (Geog), Fuller (Lib), Grana (Soc), Hunter (WS/Comp), Kemp (Soc), Knopp (Geog), Kramer (SW), McClure (Psy), Pelayo-Woodward (Equity Programs), Shepard (SW), Trolander (WS)

B.A.

This interdisciplinary program emphasizes women's intellectual, artistic, and creative endeavors; demonstrates the significance of gender distinctions; and explores how dynamics of race, ethnicity, economics, class, gender, and sexuality influence women's knowledge of the world. The diversity of women's experiences is considered from multiple perspectives, including international, historical, ethnic, cross-cultural, and nonheterosexual. Students come to understand institutional oppression and violence against women as well as women's resistance and activism. Coursework develops students' ability to analyze issues from feminist perspectives, stimulates critical thinking, strengthens writing skills, broadens perspectives, provides a basis for graduate study in this or other fields, and fulfills personal needs for self-understanding and multicultural as well as international awareness.

A women's studies background is useful in law, social work, nonprofit organizations, international nongovernment organizations, the arts, education, health professions, government agencies, business, journalism, as well as self-employment.

Degree Requirements

Requirements for the B.A. in women's studies (120 credits) include:

- UMD liberal education requirements
- Advanced writing requirement: Comp 3xxx (3 credits) to be completed before taking WS 4000
- Major requirements (45 credits)
- Minor requirements

Prospective majors are encouraged to consult the department as early as possible to plan a focus appropriate to educational and career goals.

Required Courses

Core (18)

Hist 2357*—Women in American History (3)
WS 1000*—Introduction to Women's Studies (3)
WS 2000—Feminist Inquiry (3)
WS 2101*—Women, Race, and Class (3)

WS 3000—International Perspectives on Feminism (3)
WS 4000—Seminar (3)

Electives (18 minimum) from:

- WS 3150—Women-Identified Culture (3)
- WS 3200—Women's Autobiographies (3)
- WS 3300—Women, Religion, and Spirituality (3)
- WS 3350—Women and the Law (3)
- WS 3400—Women and Film (3)
- WS 3595—Special Topics (3)
- WS 3600—Ecofeminist Theories and Practices (3)
- WS 3891—Independent Study (1-3)
- WS 3897—Internship (1-9)
- WS 4050—Feminist Theory (4)
- WS 5595—Special Topics (3)
- WS 5991—Independent Study (1-3)

* Courses that may be used to fulfill UMD liberal education program requirements.

Required Courses From Other Programs

Non-women's studies electives (9) selected in consultation with adviser

Minor Requirements (21)

Required (6)

WS 1000—Introduction to Women's Studies (3)
WS 2000—Feminist Inquiry (3)

Electives (15)

Women's studies core and/or electives (9)
Non-women's studies electives (6)
Dean: Richard J. Ziegler, 117 School of Medicine Building, (218) 726-7572

Associate Dean for Admissions and Student Affairs: Lillian A. Repesh, 173 School of Medicine Building, (218) 726-8511, (218) 726-8872

Assistant Dean for Clinical Affairs: Byron J. Crouse, 143 School of Medicine Building, (218) 726-7917

Assistant Dean for Education and Curriculum: Richard Hoffman, 111 School of Medicine Building, (218) 726-7581

Assistant Dean for Research: George J. Trachte, 131 School of Medicine Building, (218) 726-8975

Director of Alumni Relations and Preceptorship Program: James G. Boulger, 234 School of Medicine Building, (218) 726-8892

Director of Animal Services: Larry D. Anderson, (218) 726-7931

Interim Director of Center of American Indian and Minority Health: Joceyln Dorscher; Associate to the Dean: Gerald L. Hill, 182 School of Medicine Building, (218) 726-7235

Director of Chemical Toxicology Research Center: Joseph R. Prohaska, 252 School of Medicine Building, (218) 726-7502

The School of Medicine offers the first two years of the four-year medical school curriculum. It covers basic medical and clinical science studies with principal emphasis on the training of family physicians. Students who successfully complete the program at UMD will automatically transfer on a noncompetitive basis to complete the last two years of their M.D. requirements at the University of Minnesota Medical School in Minneapolis.

The specific goals of the School of Medicine, Duluth are to:

- increase the proportion of well-trained physicians who will enter family practice;
- increase the number of physicians who will most likely enter practice in rural and nonurban areas of the state;
- provide excellent academic training for medical, graduate, and undergraduate students in the basic and clinical sciences;
- conduct and promote research programs for the advancement of knowledge in the health sciences and for service to the state.

To achieve these goals, many family practitioners, as well as other primary care physicians, are used as instructors and preceptors throughout the two years of study. These role models illustrate, both through their instruction and example, the delivery of general and family medical care in urban, small community, and rural settings. The preceptorship program in family medicine is specifically designed to meet these goals and to augment the supply of family physicians in the northern regions of Minnesota.

Coursework taught by School of Medicine faculty at the undergraduate and graduate levels is listed by department in Course Descriptions.

For information on the school’s policies, admission procedures, and course offerings to medical students, consult the School of Medicine, Duluth Catalog.

Anatomy and Cell Biology (Anat)

Professor: Arlen R. Severson (department head); Associate Professors: Stephen W. Downing, Donna J. Forbes, Lillian A. Repesh; Assistant Professor: Jon M. Holy; Sr. Research Associate: Richard L. Leino

Behavioral Sciences (BhSc)

Professor: Frederic W. Hafferty; Associate Professors: James G. Boulger, Gary L. Davis (department head), Barbara Elliott, Richard G. Hoffman; Assistant Professor: Mustafa N. al’Abi

Biochemistry and Molecular Biology (MdBc)

Professors: Paul M. Anderson, Lester R. Drewes (department head), Joseph R. Prohaska (director, Chemical Toxicology Research Center), Kendall B. Wallace; Associate Professor: Thomas E. Huntley; Assistant Professor: Annette L. Boman; Adjunct Assistant Professor: Subhash C. Basak

Family Medicine (FMed)

Professor: Barbara Elliott; Associate Professors: James G. Boulger, Byron J. Crouse (department head); Assistant Professors: Mustafa N. al’Abi, Joceyln Dorscher; Clinical Professor: James L. Anderson; Clinical Associate Professor: Daniel P. Benzie; Clinical Assistant Professors: Jeff Adams, Bruce Dahlman, Thomas W. Day, David Hutchinson, Gerald Konrad, Glenn Nordhn, Roger K. Waage
Medical and Molecular Physiology (Phsl)

*Professor Emeritus:* Lloyd Beck; *Professor:* Lois J. Heller;  
*Associate Professors:* Edwin W. Haller, David E. Mohrman, Edward K. Stauffer, Lorentz E. Wittmers, Jr. (acting department head); *Assistant Professor:* Janet L. Fitzakerley

Medical Microbiology and Immunology (MicB)

*Professor:* Richard J. Ziegler; *Associate Professors:* Alice Adams, Omelan A. Lukasewycz; *Assistant Professors:* Benjamin L. Clarke, Louise B. Hawley

Medicine (Med)

Interdisciplinary course offerings taught by School of Medicine faculty.

Pathology and Laboratory Medicine (Path)

*Professors:* Arthur C. Aufderheide, Patrick C. J. Ward (department head); *Assistant Professor:* M. Kent Froberg

Pharmacology (Phcl)

*Professors:* Richard M. Eisenberg (department head), Jean F. Regal, George J. Trachte; *Associate Professor:* Edward T. Knych; *Assistant Professor:* Janet L. Fitzakerley
College of Science and Engineering (CSE)

Dean: Sabra S. Anderson, 140 Engineering Building, (218) 726-6397
Associate Dean: Timothy B. Holst, 140 Engineering Building, (218) 726-7585

The College of Science and Engineering has a fourfold mission: help each student develop a foundation for a career by learning the substance and methods of an academic discipline; participate fully in the liberal education mission of the campus; foster significant scholarly research; and serve the well-being of the community, state, and region. The college offers students a broad range of curricula covering the natural sciences, mathematical sciences, engineering, and technology.

Each student is provided the opportunity to develop competence in a special field of knowledge by learning its principles and perspectives, mastering its methods, and acquiring much of its accumulated knowledge.

In addition to offering formal coursework, the college is committed to providing students with opportunities to learn through participation in research, honors programs, individual study, and special seminars. Such programs, which emphasize undergraduate education, are enhanced and complemented by high quality graduate programs. These graduate programs form an integral component of our commitment to scholarship.

Several departments also offer master's degrees through the Graduate School.

Admission

The college has no specific secondary school preparation requirements for admission beyond the preparation standards of the University of Minnesota. However, secondary school students contemplating a baccalaureate degree in a physical or biological science, mathematics, computer science, or engineering are strongly urged to complete a college preparatory program that includes four years (grades 9-12) each of English, mathematics, and science.

Some programs (chemical engineering, electrical and computer engineering, industrial engineering) have specific college-level course requirements and minimum GPAs that must be satisfied before students can be admitted into the upper division (junior and senior level) program.

For general admission information, see Policies and Procedures.

College Honors

At UMD, a maximum of 15 percent of the graduating class can graduate with college honors. In CSE, the top 3 percent of the graduating class is designated *summa cum laude*, the next 5 percent *magna cum laude*, and the next 7 percent *cum laude*.

At the beginning of each year, GPAs necessary to achieve these honors are posted in the Student Affairs Office, 140 Engineering Building. The GPAs are based on the previous spring semester graduating class. In addition, students receiving honors must have a coefficient of course completion of at least 90 percent. To be eligible for honors, students must earn at least 30 credits at UMD. For more information, contact the Office of the Associate Dean, 140 Engineering Building.

Honors Programs

The objective of the CSE honors programs is to offer superior ability, highly motivated students a greater challenge than is available through the traditional curriculum. Honors opportunities provide for closer student-faculty relationships, emphasize writing and speaking skills, and offer active learning in the disciplinary and interdisciplinary components.

In the lower division, honors opportunities include seminars and special sections of lecture and lab courses. Students may participate in these by invitation or by consent of the instructor.

Honors opportunities in the upper division are available for students majoring in biology, chemical engineering, chemistry, computer science, geology, mathematics, or physics through the department honors programs.
Candidates are selected on the basis of coursework completed and potential for independent work. A research project is required for department honors.

More information about department honors is available through the departments.

**Baccalaureate Degrees**

CSE offers the bachelor of science (B.S.), bachelor of science in chemical engineering (B.S.Ch.E.), bachelor of science in electrical and computer engineering (B.S.E.C.E.), and bachelor of science in industrial engineering (B.S.I.E.) degrees.

**B.S. Majors**

- Biochemistry/molecular biology
- Biology
- Chemistry
- Computer science
- Geology
- Information systems and technology
- Mathematics
  - Applied mathematics
  - Computational mathematics
  - Double major
  - Statistics
  - Traditional mathematics
- Physics
- Applied physics

**Minors**

- Aerospace studies
- Biology
- Chemistry
- Computer science
- Computer science, applied
- Electrical and computer engineering
- Environmental engineering
- Geological sciences
- Information systems and technology
- Mathematics
- Mathematics, applied
- Physics

For other minors available to students receiving a B.S., see School of Business and Economics, School of Fine Arts, College of Education and Human Service Professions, and College of Liberal Arts.

**B.S. Requirements**

- Completion of at least 120 degree credits (some programs require more than 120 degree credits; see program descriptions).
- Completion of at least 30 degree credits at UMD.
- Completion of at least 20 of the last 30 credits earned before graduation at UMD.

- A 2.00 minimum GPA in all work attempted at UMD; a 2.00 minimum GPA in all work, including transfer credits; and successful completion (excluding failing grades, nonpassing grades, and withdrawals) of 75 percent of all work attempted.
- Completion of UMD liberal education requirements. See Policies and Procedures.
- Completion of a major for the B.S. and a minor or second major in a different program. Required for graduation is a 2.00 minimum GPA in the major, including supporting courses, and a 2.00 minimum GPA in the minor, including supporting courses. If there are multiple majors and/or minors, this requirement holds for each major and minor, calculated separately.

**For students completing two or more majors:**

- A minor is not required.
- If the majors are for different degrees (e.g., a B.S. and a B.A.), the majors must be in different programs (e.g., a student may not receive a B.S. in chemistry and a B.A. in chemistry) and students must complete requirements for both degrees.
- Compliance with general regulations governing granting of degrees.

**B.S.Ch.E. Requirements**

- Completion of at least 130 degree credits.
- Completion of at least 30 degree credits at UMD.
- Completion of at least 20 of the last 30 credits earned before graduation at UMD.
- A 2.00 minimum GPA in all work attempted at UMD; a 2.00 minimum GPA in all work, including transfer credits; and successful completion (excluding failing grades, nonpassing grades, and withdrawals) of 75 percent of all work attempted.
- Completion of UMD liberal education requirements. See Policies and Procedures. Students must take two courses with different course designators from Category 9 and no courses from Category 10 as part of their liberal education program.
- Completion of the chemical engineering major. Admission to the upper division program of the chemical engineering major is competitive and on a space-available basis. Application for admission to upper division must be filed with the department upon completion of lower division requirements.
- A 2.00 minimum GPA in all courses taken in the chemical engineering major, including required courses in related fields. This GPA requirement applies to all courses in the major taken at UMD calculated separately.
and also to all courses in the major when transfer credits are included.

- Compliance with general regulations governing granting of degrees.

**B.S.E.C.E. Requirements**

- Completion of at least 131 degree credits.
- Completion of at least 30 degree credits at UMD.
- Completion of at least 20 of the last 30 credits earned before graduation at UMD.
- A 2.00 minimum GPA in all work attempted at UMD; a 2.00 minimum GPA in all work, including transfer credits; and successful completion (excluding failing grades, nonpassing grades, and withdrawals) of 75 percent of all work attempted.
- Completion of UMD liberal education requirements. See Policies and Procedures.

**Master of Industrial Safety (M.I.S.)**

**Professor:** B. J. DeRubeis, Director (218) 726-8117; Associate Professor: Hamid F. Fard; Assistant Professor: Dale Krageschmidt

The M.I.S. program prepares qualified personnel for industrial safety or industrial hygiene supervisory and management positions in business, government, and industry. The coursework includes analysis of occupational safety and health problems, accompanying problem-solving and decision-making techniques, and the application of established principles and practices of accident prevention, control, and reduction in occupational settings.

**Admission Requirements**

Applicants must have a baccalaureate degree from an accredited college or university, preferably with a major in technology, engineering, science, or another appropriate field. Baccalaureate degree holders with different majors who have relevant backgrounds or qualifications are also considered. A general chemistry course with laboratory and a first aid course must be completed before admission. If other deficiencies exist, candidates may be accepted into the program contingent upon successful completion of courses designed to correct them. All applicants must take the Graduate Record Examination (GRE) General Test and have an official report of the results sent to the master of industrial safety program office as part of their application for admission. Because this test is given at limited times and places during the year, applicants are advised to register early for
the examination. Applicants must furnish official transcripts showing that they have completed their baccalaureate degree before they will be admitted or allowed to enroll in any M.I.S. courses. Students may apply for admission during their last semester of undergraduate work, but they will not be formally admitted or allowed to begin M.I.S. coursework until the baccalaureate degree is completed.

**Application Procedure**

Admission is restricted to fall semester entry and is limited to thirty students. A completed admission application should be submitted by April 1 of the year of anticipated entrance. Because enrollment is limited, applicants applying after April 1 may not get into the program. Information and applications are available from the master of industrial safety program office, 229 Voss-Kovach Hall. The admission decision is based on an evaluation by the applicant screening committee of the undergraduate scholastic record, past work experience, GRE results, and letters of recommendation. International students must present a TOEFL score of 500 or above. Applicants are responsible for obtaining information on all admission deadlines and requirements and for submitting all required admission materials before the first day of fall semester classes or they will be denied admission and must reapply to the program the following year.

**Degree Requirements**

Requirements for the Master of Industrial Safety include: 1) 36 course credits in either the industrial safety or industrial hygiene option and maintenance of an overall minimum GPA of 3.00; 2) a minimum of two semesters for the residence requirement; 3) an additional 3-credit industrial internship with a Plan B type project, which must be fulfilled within six months following completion of coursework, unless a formal extension is requested and granted.

**Required Courses**

**Core (30)**

- Safe 6001—OSHA and Other Regulatory Standards (3)
- Safe 6011—System Safety and Loss Control Techniques (3)
- Safe 6012—Risk Management and Workers’ Compensation (2)
- Safe 6021—Physical Hazard Control (3)
- Safe 6101—Principles of Industrial Hygiene (3)
- Safe 6111—Industrial Noise and Ventilation Control (3)
- Safe 6301—Occupational Biomechanics and Work Physiology (2)
- Safe 6302—Occupational Ergonomics and Injury Management (3)
- Safe 6401—Environmental Safety and Legal Implications (2)
- Safe 6801—Conference Leading and Team Dynamics (2)
- Safe 6811—Behavioral Aspects of Safety (2)
- Safe 6821—Organization and Administration of Safety Programs (2)

**Industrial Safety Option (9)**

- Safe 6051—Construction Safety (2)
- Safe 6201—Fire Prevention and Emergency Preparedness (2)
- Safe 6211—Transportation Safety (2)
- Safe 6997—Internship in Industrial Safety (3)

**Industrial Hygiene Option (9)**

- Safe 6102—Advanced Industrial Hygiene and Health Physics (2)
- Safe 6112—Advanced Industrial Noise and Ventilation Control (2)
- Safe 6121—Epidemiology and Industrial Toxicology (2)
- Safe 6997—Internship in Industrial Safety (3)

**Final Project**

Upon completing program coursework on campus, students are required to complete a cooperative internship in an industrial, governmental, or other organization that has an established safety program or is implementing one. Students are required to complete a Plan B type project for the firm.

**Grading System**

The M.I.S. program uses two grading systems, mandatory A-B-C-D-F and S-N. The course syllabus identifies the grading system used for each course. The temporary grade I (incomplete) is assigned only when a student has made an agreement with the instructor to complete the requirements for a course before the time the instructor submits final grades for a semester. The I remains in effect for nine weeks after the beginning of the next semester during which the student is in attendance, unless a different time period has been arranged between the student and instructor. At the end of this period, the I is changed to an N or F unless the instructor has submitted a change of grade or has agreed to an extension of the incomplete. If an extension is permitted, it is the responsibility of the student to get an Extension of Incomplete form, the instructor’s signature, and submit the form to the program office before the deadline. A student with an excessive number of incompletes may be denied further registration until some of them have been removed.
Colleges and Schools

The program discourages retaking courses to improve grades. Permission from the course instructor and the major adviser is required to retake courses. If a course is retaken, all registrations for it remain on the student's record.

Academic Standing

Good Academic Standing
CSE requires that its students maintain a minimum cumulative GPA to be in good academic standing. For students who have attempted 20 or more credits, this minimum cumulative GPA is 2.00. Because some students have difficulty adjusting to the standards of a university education, students who have attempted fewer than 20 credits (at UMD or elsewhere) must maintain a minimum cumulative GPA of 1.80 to remain in good academic standing.

Probation
Students with a cumulative GPA lower than that required for good academic standing are placed on academic probation. If at the end of a semester on academic probation the cumulative GPA is at or above 2.00, the student will be returned to good academic standing.

Dismissal
If, after a semester of probation, a student fails to attain the required minimum cumulative GPA for good academic standing, the student is subject to dismissal. Dismissal decisions are made in the college office following fall and spring semester final exams. Dismissed students are notified immediately and their registration for the next semester of day school canceled. Students failing to attain the minimum GPA, yet making academic progress, may be granted an additional semester of probation at the discretion of the college.

Readmission
Students who have been academically dismissed from CSE must present evidence of improved academic capability to the college to justify readmission. Petition forms for readmission, and information concerning academic standing, are available in the CSE Student Affairs Office, 140 Engineering Building.

Student Affairs Office

Information on academic matters, including academic standing; admission; advising; academic programs; change of major, college, or adviser; grievance and appeals procedures; honors programs; undergraduate research; student clubs; and tutoring is available in the CSE Student Affairs Office, 140 Engineering Building.

Preprofessional Programs

The college offers programs and special advising services for students who plan to enter professional schools. These programs offer preparation in preprofessional coursework as well as a broad background in mathematics, biological and physical sciences, humanities, and social science.

Some professional requirements can be fulfilled in one or two years; others take four years with the completion of a baccalaureate degree. In any case, students are encouraged to avoid narrow specialization during their undergraduate years.

The basic programs are described below. Variations in a curriculum may be arranged upon agreement among the student, preprofessional adviser, and office of admissions of the pertinent professional school. Students are encouraged to see their advisers regularly to obtain current curriculum information, learn of visits by representatives of various professional schools, and receive help with course planning. UMD also offers preparatory courses for other health sciences professions.

Pre-Dentistry

Adviser: Holmstrand (Biol)

The University’s School of Dentistry requires at least three years of college, including:

- Biol 1011—General Biology I (5)
- Biol 1012—General Biology II (5)
- Chem 1151—General Chemistry I (5)
- Chem 1152—General Chemistry II (5)
- Chem 2521—Organic Chemistry I (4)
- Chem 2522—Organic Chemistry II (4-5)
- Chem 3322—Biochemistry (3)
- Comm 1112—Public Speaking (3)
- Comp 1120—College Writing (3)
Comp 3150—Advanced Writing: Science (3)
Math 1250—Precalculus Analysis (3)
Phys 1001—Introduction to Physics I (5)
Phys 1002—Introduction to Physics II (5)
Psy 1003—General Psychology (4)
E lectives especially recommended are Acct 2005; Art 1002, 1009, 1012; Biol 1761, 2101, 2201, 4501, 4765, 4767, 5361, 5765; Chem 2222; Econ 1023; and Psy 2021, 3371.

It is also strongly recommended that students complete additional credits to achieve as broad and liberal an education as possible. About 80 percent of successful dental school candidates have a baccalaureate degree. Applicants to dental school must apply before December 1 for entry the following fall. The American Dental Association Admissions Test (DAT) must be taken before the student’s application will be considered. The computerized DAT can be taken at any time, but students must first apply through the Dental Admission Testing Program.

Pre-Engineering

Advisors: See individual engineering departments or contact CSE Student Affairs, (218) 726-7585, for referral.

Students who are undecided on the specific engineering program they would like to pursue may ask to be declared pre-engineering students. They should select a specific engineering program during their freshman year from either the Accreditation Board for Engineering and Technology (ABET)-accredited chemical engineering, electrical and computer engineering, or industrial engineering programs at UMD, or one of the preparatory engineering programs, such as pre-aerospace engineering, pre-civil engineering, or pre-mechanical engineering. Students selecting one of the preparatory programs may transfer to the Institute of Technology (IT) on the Minneapolis campus or other baccalaureate degree-granting institutions at the end of their sophomore year to complete their studies in those engineering fields.

Students are encouraged to make a selection as early as possible because only mathematics, physics, and college writing courses are common in the first year. There are other required courses, such as chemistry, computer programming, economics, and engineering graphics, that differ between engineering programs even in the first year. After selecting a specified field, students are assigned advisers with the appropriate background who can advise them to take the proper courses. Students should choose a field of engineering before the beginning of their sophomore year.

Recommended Courses for First Two Years for Students Who Wish to Transfer to IT or Another University

The course recommendations below have been designed to closely match the lower division programs (i.e., the first two years) at the University’s Institute of Technology (IT). Students who wish to transfer to another engineering school can, with the aid of their engineering adviser, plan a program fulfilling the basic requirements of the first two years. Programs in engineering specialties at other schools normally do not differ markedly from those listed below; they usually concentrate on mathematics and the basic sciences.

Pre-Aerospace Engineering
Chem 1151—General Chemistry I (5)
Comp 1120—College Writing (3)
CS 1131—FORTRAN (3)
Engr 2015—Statics (2)
Engr 2016—Mechanics of Materials (3)
Engr 2026—Dynamics (3)
Math 1296—Calculus I (5)
Math 1297—Calculus II (5)
Math 3298—Calculus III (5)
Math 3280—Differential Equations and Linear Algebra (4)
Phys 1201—Mechanics (4)
Phys 1202—Heat and Electricity (4)
Phys 2021—Relativity and Quantum Physics (4)

Liberal education courses that complete Minnesota Transfer Curriculum or meet requirements of transfer institution

Pre-Civil Engineering
Chem 1151—General Chemistry I (5)
Chem 1152—General Chemistry II (5)
Comp 1120—College Writing (3)
Engr 2015—Statics (2)
Engr 2016—Mechanics of Materials (3)
Engr 2026—Dynamics (3)
Geol 1110—Introductory Geology (3)
Math 1296—Calculus I (5)
Math 1297—Calculus II (5)
Math 3298—Calculus III (5)
Math 3280—Differential Equations and Linear Algebra (4)
Phys 1201—Mechanics (4)
Phys 1202—Heat and Electricity (4)
Stat 3611—Introduction to Probability and Statistics (4)

Liberal education courses that complete Minnesota Transfer Curriculum or meet requirements of transfer institution

Pre-Mechanical Engineering
Chem 1151—General Chemistry I (5)
Comp 1120—College Writing (3)
CS 1511—Computer Science I (5)
Engr 2015—Statics (2)
Colleges and Schools

Engr 2016—Mechanics of Materials (3)
Engr 2026—Dynamics (3)
IE 1105—Introduction to Engineering Design (3)
IE 1205—Introduction to Manufacturing Engineering (3)
Math 1296—Calculus I (5)
Math 1297—Calculus II (5)
Math 3298—Calculus III (5)
Math 3280—Differential Equations and Linear Algebra (4)
Phys 1201—Mechanics (4)
Phys 1202—Heat and Electricity (4)
Liberal education courses that complete Minnesota Transfer Curriculum or meet requirements of transfer institution

Other Engineering Specialties
Consult CSE Student Affairs Office, 140 Engineering Building.

Junior-Level Admission
UMD and transfer students must apply for admission at the end of their sophomore year to the upper division of the engineering program in which they are interested. A minimum cumulative GPA, determined by the department, is required in the lower division courses of the chosen engineering program. Students from other colleges wishing to transfer into UMD engineering programs should have completed the equivalent lower division courses with the required cumulative GPA. The completed application is evaluated on the basis of GPA, curriculum completed, and space availability. Students transferring from the Minnesota state community college system should refer to the list of equivalent lower division courses for their college. This list is available from CSE or the community college engineering adviser.

Courses in which a D has been earned at an institution other than the University cannot be used to meet the specified course requirements of the engineering degrees except when the D is earned in a sequence course and a C or better is earned in the following course.

Students in the joint admission program are admitted to CSE as juniors if they meet admission requirements (see Joint Admission Program in Engineering). They must complete a UMD Application for Undergraduate Admission and pay the application fee. UMD engineering students seeking admission to IT engineering programs on the Minneapolis campus must complete the change of college form for transfer to IT.

Pre-Fisheries and Wildlife Management
Adviser: Contact the Department of Biology

This curriculum provides two years of study that fulfill many of the basic requirements for professional study in fisheries and wildlife management. UMD courses below are required for the fisheries and wildlife management degree and have equivalents in the Department of Fisheries and Wildlife, College of Natural Resources on the St. Paul campus. Students planning to attend the 3 1/2-week summer program at the Lake Itasca Forestry and Biological Station following their freshman or sophomore year must have a 2.00 minimum GPA, completed 40 credits, and completed Biol 1011-1012 with minimum grades of C. For more information, consult the College of Natural Resources section of the Twin Cities Undergraduate Catalog.

Biol 1011—General Biology I (5)
Biol 1012—General Biology II (5)
Biol 2201—Genetics (3)
Chem 1151—General Chemistry I (5)
Chem 1152—General Chemistry II (5)
Comm 1112—Public Speaking (3)
Comp 1120—College Writing (3)
Math 1296—Calculus I (5)
Math 1297—Calculus II (5)
or Math 1160—Finite Mathematics and Introduction to Calculus (5)
Phys 1001—Introduction to Physics I (5)
Phys 1002—Introduction to Physics II (5)
Stat 2411—Statistical Methods (3)

Pre-Medicine
Advisers: Carlson, Firling, Hedman, Hicks, Karim, Magnuson, Poe, Siders, Thompson, Tsai (Chem)

Students admitted to medical school must complete four-year degrees before they begin medical studies. There is no prescribed pre-medical major—any recognized college major is acceptable. Admission requirements vary, however, and students should plan their academic programs with the assistance of a pre-medicine adviser. Students also should check the admission requirements of the medical schools in which they are interested. The following courses are prerequisites for admission to many medical schools.
Biol 1011—General Biology I (5)
Biol 1012—General Biology II (5)
Chem 1151—General Chemistry I (5)
Chem 1152—General Chemistry II (5)
Chem 2521—Organic Chemistry I (4)
Chem 2522—Organic Chemistry II (4-5)
Chem 3322—Biochemistry (3)
Chem 3324—Biochemistry Laboratory (1)
Comp 1120—College Writing (3)
Comp 3150—Advanced Writing: Science (3)
Math 1296—Calculus I (5)
Math 1297—Calculus II (5) (for Phys 1201-1204)
Phys 1001—Introduction to Physics I (5)
Phys 1002—Introduction to Physics II (5)
or
Phys 1201—Mechanics (4)
and Phys 1204—Electricity, Magnetism, and Optics (5)

Additional recommended or required courses may include cell biology, genetics, humanities, literature, microbiology, quantitative analysis, and social sciences.

The Medical College Admission Test (MCAT) should be taken in the spring of the junior year or, at the latest, in the summer before the senior year. Students are advised to apply to medical school as early as possible after June 15 of the year preceding anticipated fall entrance. Most application deadlines are between October 1 and November 15.

Current information about admission requirements for all American medical schools can be found in Medical School Admission Requirements. Complete information on admission requirements for the three Minnesota medical schools is in the Handbook on Pre-Medical Studies, available from any pre-medicine adviser or the college’s Student Affairs Office, 140 Engineering Building.

Pre-Pharmacy
Adviser: Caple, Harriss (Chem)

Students wishing to enter the four-year doctor of pharmacy (Pharm.D.) program in the College of Pharmacy on the Minneapolis campus may complete their pre-pharmacy work on the Duluth campus. Students who have successfully completed the prerequisites below are considered for admission to the program.

Biol 1011—General Biology I (5)
Biol 1012—General Biology II (5)
Biol 2101—Cell Biology (3)
Biol 1761—Human Anatomy (4)
Biol 4501—General Microbiology (4)
Chem 1151—General Chemistry I (5)
Chem 1152—General Chemistry II (5)
Chem 2521—Organic Chemistry I (4)
Chem 2522—Organic Chemistry II (5)
Comm 1112—Public Speaking (3)
Comp 1120—College Writing (3)
Comp 3150—Advanced Writing: Science (3)
Econ 1023—Principles of Economics: Microeconomics (3)
Math 1296—Calculus I (5)
Math 1297—Calculus II (5)
Phys 1001—Introduction to Physics I (5)
Phys 1002—Introduction to Physics II (5)

Two courses dealing with human behavior in society (e.g., psychology, sociology, anthropology)

College of Science and Engineering

Pre-Optometry
Adviser: Firling (Biol)

Admission requirements for optometry colleges vary considerably. The following program satisfies pre-optometry requirements for most of these colleges. It is suggested that students begin application procedures during their third year of college study. Applicants are selected on a competitive basis and academic work is weighed heavily. Taking courses pass-fail is discouraged. In addition to GPA, admission is based on Optometry College Admission Test (OCAT) scores, letters of recommendation, volunteer or work experience in optometry, interview evaluations, and other supporting documents.
Pre-Veterinary Medicine

Adviser: Karim (Biol)

The pre-veterinary program at UMD is part of the preparation for entry into the College of Veterinary Medicine on the St. Paul campus. Students may apply for entry after their third year at UMD. Required courses must be completed A-F.

Students should apply for admission to the veterinary college no later than November 1 for entry the following fall (about one year before desired entry). The Graduate Record Examination (GRE) is also required for admission. Write to the Office of the Registrar—St. Paul, University of Minnesota, 130 Coffey Hall, 1420 Eckles Avenue, St. Paul, MN 55108.

A recommended pre-veterinary program appears below for those who wish to enter veterinary college after their third year.

Biol 1011—General Biology I (5)
Biol 1012—General Biology II (5)
Biol 2101—Cell Biology (3)
Biol 2201—Genetics (3)
Biol 4501—General Microbiology (4)
Chem 1151—General Chemistry I (5)
Chem 1152—General Chemistry II (5)
Chem 2521—Organic Chemistry I (4)
Chem 2522—Organic Chemistry II (4-5)
Chem 3322—Biochemistry (3)
Comp 1120—College Writing (3)
Comp 3150—Advanced Writing: Science (3)
Math 1250—Precalculus Analysis (4)
Phys 1001—Introduction to Physics I (5)
Phys 1002—Introduction to Physics II (5)
Arts and humanities electives
History and social sciences electives

Additional recommended electives include courses in business management, communications, economics, public speaking, and statistics.

Note: Students who choose to complete a degree at UMD before transferring to a veterinary college may do so within the usual four-year enrollment if they carefully select electives to fulfill pre-veterinary requirements and the requirements of their major departments. Additional biology, chemistry, or mathematics coursework, for example, can lead to majors in these areas.

Degree Programs

Aerospace Studies (Air)

Professor: Lt. Col. Carol Wolosz (department head);
Assistant Professor: John Hedenberg

Any student may enroll in aerospace studies courses. Active-duty Air Force officers provide a curriculum that gives students insight into the mission, organization, and operation of the U.S. Air Force. Students study Air Force history, leadership, management, professionalism, and U.S. foreign policy and its relationship to defense policy. Applying organizational leadership and management skills is the backbone of this professional development program. AFROTC prepares college students for Air Force leadership positions as they earn their academic degrees. Scholarships are available on a competitive basis. High school seniors and college students can compete for two-, three-, and four-year scholarships that cover all tuition, fees, book expenses, and a monthly stipend. Non-AFROTC-scholarship two-year participants receive a monthly stipend and may qualify for a $3,450 per year tuition incentive. All aerospace studies courses must be taken A-F.

Requirements

The following courses are required for both the two- and four-year commissioning programs (for more information about the commissioning programs, see Education, Service, and Research Centers):

Core Program—Professional Officer Course (12)
(required of all candidates for commissions)
Air 3101-3102—Air Force Leadership and Management (6)
Air 4101—U.S. Security Policy Process (3)
Air 4102—Preparation for Active Duty (3)
Leadership Lab—A 1.25 hour per week laboratory provides introductory and advanced hands-on leadership and management experience (P-F).

Pilot and navigator candidates are encouraged to take Air 2200—Introduction to Aviation (3).

Minor Only

The aerospace studies minor (27-28 credits) provides preparation in areas studied by most officers early in their service careers. The minor increases future officers' performance potential in two areas in which all officers must eventually develop competence: communication skills and international affairs.
Requirements

**Lower Division (9)**
- Air 1101—The Air Force Today (1)
- Air 1102—The Air Force Today (1)
- Air 2101—The Air Force Way (1)
- Air 2102—The Air Force Way (1)
- Course requiring mathematical reasoning (2)
- Comm 1112*-Public Speaking
  or Comm 1222*-Interpersonal Communication (3)

**Upper Division (18-19)**
- Air 3101—Air Force Leadership and Management (3)
- Air 3102—Air Force Leadership and Management (3)
- Air 4101—U.S. Security Policy Process (3)
- Air 4102—Preparation for Active Duty (3)
- Advanced or technical writing course (3)

One of the following or an approved substitute:
- Air 2200—Introduction to Aviation (3)
- Air 3400—Project Management (3)
- Hist 3384—American Foreign Relations I (3)
- Pol 3400—Contemporary Issues in World Politics (4)
- Pol 3402—American Foreign and Defense Policy (3)
- Pol 3415—International Law (4)

* Courses that may be used to fulfill UMD liberal education program requirements.

Honors Requirements

The chemistry department honors program helps outstanding biochemistry and molecular biology majors develop into competent, independent research workers, encourages student interest in the discipline, and aids students in their transition to scientists. Qualified majors may apply after the first semester of their sophomore year. Participants choose a research adviser and complete three semesters of effort on a jointly developed project. Written reports and an oral presentation of the research are also required.

Degree Requirements

Requirements for the B.S. degree in biochemistry and molecular biology (120 credits) include:
- UMD liberal education requirements
- Advanced writing requirement—noted under the major requirements for “Year 3” (3 credits)
- Major requirements (82 credits)

Required Courses

**Year 1**
- Biol 1011*-General Biology I (5)
- Chem 1151*-General Chemistry I
  or Chem 1161*-Honors Course: General Chemistry I (5)
- Chem 1152-General Chemistry II
  or Chem 1162—Honors Course: General Chemistry II (5)
- Math 1296*-Calculus I (5)
- Math 1297-Calculus II (5)

**Year 2**
- Biol 2201—Genetics (3)
- Chem 2222—Quantitative Analysis (4)
- Chem 2521—Organic Chemistry I (4)
- Chem 2522—Organic Chemistry II (4)
- Phys 1201*-Mechanics (4)
- Phys 1204—Electricity, Magnetism, and Optics (5)

**Year 3**
- Biol 2101—Cell Biology (3)
- Chem 4341—Biochemistry and Molecular Biology I (4)
- Chem 4363—Biochemistry Laboratory (2)
- Chem 4632—Physical Chemistry (5)
- Comp 31xx—Advanced Writing (3)

**Year 4**
- Chem 3184—Undergraduate Seminar (2)
- Chem 4242—Instrumental Analysis (2)
- Chem 4342—Biochemistry and Molecular Biology II (4)
- Chem 4364—Molecular Biology Laboratory (2)
- Chem 4434—Inorganic Chemistry (4)

* Courses that may be used to fulfill UMD liberal education program requirements.

Astronomy (Ast)

See Course Descriptions.

Biochemistry and Molecular Biology

Department of Chemistry


B.S.

Biochemistry and molecular biology is the study of life at the molecular level. This field is both a life science and a chemical science, exploring the chemistry of living organisms and the molecular basis for the processes that occur in living cells. The Department of Chemistry provides classroom and laboratory learning opportunities and research experience across the discipline to meet the needs of students in liberal arts and preprofessional programs as well as of students who wish to pursue careers in the field.
Biology (Biol)

Professors: Conrad E. Firling, Stephen C. Hedman, M. Reza-Ul Karim, Andrew R. K. Jemer, Gerald J. Niemi, John J. Pastor, Melbourne C. Whiteside; Associate Professors: Randall E. Hicks, Linda L. Holmstran, David J. Schimpf; Assistant Professors: Arun Goyal, Qinjin Liu, Merry Jo Oursler

The Department of Biology provides instruction and research experience for undergraduate and graduate students as part of a liberal education, preparation for graduate school, or a sound basis for professional training in the biological and health sciences.

B.A.—CLA

The B.A. degree is for students completing a liberal arts degree in biology.

Degree Requirements

Requirements for the B.A. in biology (120 credits) include:

- UMD liberal education requirements
- Advanced writing requirement: Comp 3150—Advanced Writing: Science (3 credits)
- Major requirements (59-70 credits): 24 core biology credits, which include coursework in general biology, genetics, cell biology, ecology, evolution, and seminar; 17-28 credits of supporting courses in mathematics, statistics, and chemistry; 18 credits of biology electives at the 2xxx level or above to provide flexibility in pursuing personal interests or career preparation
- Minor requirements

Required Courses

Biol 1011*—General Biology I (5)  
Biol 1012—General Biology II (5)  
Biol 2101—Cell Biology (3)  
Biol 2201—Genetics (3)  
Biol 2801—General Ecology (3)  
Biol 2802—Ecology Laboratory (2)  
Biol 3997—Seminar I (0.5)  
Biol 3998—Seminar II (0.5)  
Biol 4801—Evolution (2)

Biol electives at 2xxx or above (18), must include a minimum of two laboratory courses or courses with a laboratory component

Required Courses From Other Programs

Chem 1113*—Introduction to General, Organic, and Biological Chemistry I (5)  
and Chem 1114—Introduction to General, Organic, and Biological Chemistry II (5)  
or Chem 1151*—General Chemistry I (5)  
and Chem 1152—General Chemistry II (5)  
and Chem 2521—Organic Chemistry I (4)  
and Chem 2522—Organic Chemistry II (4-5)  
or Chem 1161*—Honors Course: General Chemistry I (5)  
and Chem 1162—Honors Course: General Chemistry II (5)  
and Chem 2521—Organic Chemistry I (4)  
and Chem 2522—Organic Chemistry (4-5)  
Math 1250*—Precalculus Analysis (4)  
and Stat 1411*—Introduction to Statistics (3)  
or Math 1290*—Calculus for Modeling (5)  
and Stat 2411*—Statistical Methods (3)  
or Math 1296*—Calculus I (5)  
and Stat 2411*—Statistical Methods (3)  
or Stat 3611—Introduction to Probability and Statistics (4)

Electives

Two of the following may be applied toward biology elective credits noted above:

MicB 5545—Immunobiology (3)  
Phsl 5601—Physiology of Organ Systems I (3)  
Phsl 5602—Physiology of Organ Systems II (2)  
* Courses that may be used to fulfill UMD liberal education program requirements.

B.S.

Degree Requirements

Requirements for the B.S. in biology (120 credits) include:

- UMD liberal education requirements
- Advanced writing requirement: Comp 3150—Advanced Writing: Science (3 credits)
- Major requirements (77-81 credits): 24 core biology credits, which include general biology, cell biology, genetics, ecology, evolution, and seminar; supporting coursework in mathematics, chemistry, and physics; 18 credits of biology electives at 2xxx level or higher

Required Courses

Biol 1011*—General Biology I (5)  
Biol 1012—General Biology II (5)  
Biol 2101—Cell Biology (3)  
Biol 2201—Genetics (3)  
Biol 2801—General Ecology (3)  
Biol 2802—Ecology Laboratory (2)  
Biol 3997—Seminar I (0.5)  
Biol 3998—Seminar II (0.5)  
Biol 4801—Evolution (2)

Biol electives at 2xxx or above (18), must include a minimum of two laboratory courses or courses with a laboratory component

Required Courses From Other Programs

Chem 1113*—Introduction to General, Organic, and Biological Chemistry I (5)  
and Chem 1114—Introduction to General, Organic, and Biological Chemistry II (5)  
or Chem 1151*—General Chemistry I (5)  
and Chem 1152—General Chemistry II (5)  
and Chem 2521—Organic Chemistry I (4)  
and Chem 2522—Organic Chemistry II (4-5)  
or Chem 1161*—Honors Course: General Chemistry I (5)  
and Chem 1162—Honors Course: General Chemistry II (5)  
and Chem 2521—Organic Chemistry I (4)  
and Chem 2522—Organic Chemistry (4-5)  
Math 1250*—Precalculus Analysis (4)  
and Stat 1411*—Introduction to Statistics (3)  
or Math 1290*—Calculus for Modeling (5)  
and Stat 2411*—Statistical Methods (3)  
or Math 1296*—Calculus I (5)  
and Stat 2411*—Statistical Methods (3)  
or Stat 3611—Introduction to Probability and Statistics (4)
Required Courses From Other Programs
Chem 1151*—General Chemistry I (5)
and Chem 1152—General Chemistry II (5)
or Chem 1161*—Honors Course: General Chemistry I (5)
and Chem 1162—Honors Course: General Chemistry II (5)
Chem 2521—Organic Chemistry I (4)
Chem 2522—Organic Chemistry II (4-5)
Math 1296*—Calculus I (5)
and Math 1297—Calculus II (5)
or Math 1296*—Calculus I (5)
and Stat 2411*—Statistical Methods (3)
or Stat 3611—Introduction to Probability and Statistics (4)
or Math 1290—Calculus for Modeling (5)
and Stat 2411—Statistical Methods (3)
or Stat 3611—Introduction to Probability and Statistics (4)
* Courses that may be used to fulfill UMD liberal education program requirements.

Electives
Two of the following may be applied to biology elective credits noted above:
MicB 5545—Immunobiology (3)
Phsl 5601—Physiology of Organ Systems I (3)
Phsl 5602—Physiology of Organ Systems II (2)

Minor Requirements (44-55)
Biol 1011*—General Biology I (5)
Biol 1012—General Biology II (5)
Biol 2101—Cell Biology (3)
Biol 2201—Genetics (3)
Biol 2801—General Ecology (3)
Biol 4801—Evolution (2)
Biol electives at 2xxx or above (6) (may include two of the following: MicB 5545, Phsl 5601, Phsl 5602)
Chem 1113*—Introduction to General, Organic, and Biological Chemistry I (5)
and Chem 1114—Introduction to General, Organic, and Biological Chemistry II (5)
or Chem 1151*—General Chemistry I (5)
and Chem 1152—General Chemistry II (5)
and Chem 2521—Organic Chemistry I (4)
and Chem 2522—Organic Chemistry II (4-5)
or Chem 1161*—Honors Course: General Chemistry I (5)
and Chem 1162—Honors Course: General Chemistry II (5)
and Chem 2521—Organic Chemistry I (4)
and Chem 2522—Organic Chemistry II (4-5)
Math 1250*—Precalculus Analysis (4)
and Stat 1411*—Introduction to Statistics (3)
or Math 1290*—Calculus for Modeling (5)
and Stat 2411*—Statistical Methods (3)
or Stat 3611—Introduction to Probability and Statistics (4)
or Math 1296*—Calculus I (5)
and Stat 2411*—Statistical Methods (3)
or Stat 3611—Introduction to Probability and Statistics (4)

Cell Biology

Department of Biology
Professors: Conrad E. Firling, Stephen C. Hedman, M. Reza-Ul Karim, Andrew R. Klemer, Gerald J. Niemi, John J. Pastor, Melbourne C. Whiteside; Associate Professors: Randall E. Hicks, Linda L. Holmstrand, David J. Schimpf; Assistant Professors: Arun Goyal, Qin Qin Liu, Merry Jo Oursler

B.S.
Cell biology is one of the most rapidly growing areas of modern biology. The cell biology major prepares students for graduate school and careers in cell biology, genetics, developmental biology, physiology, immunology, and biotechnology. The major is also appropriate for students considering entry into professional schools of medicine, dentistry, pharmacy, and veterinary medicine. The program is administered by the Department of Biology and involves faculty in both the College of Science and Engineering and the UMD School of Medicine.

Degree Requirements
The B.S. in cell biology allows students to satisfy requirements for a chemistry minor by completing the courses listed in the major.

Degree requirements include (120 credits):
• UMD liberal education requirements
• Advanced writing requirement: Comp 3150—Advanced Writing: Science (3 credits)
• Major requirements (84-90 credits)

Required Courses
Biol 1011*—General Biology I (5)
Biol 1012—General Biology II (5)
Biol 2101—Cell Biology (3)
Biol 2201—Genetics (3)
Biol 2801—General Ecology (3)
Biol 4801—Evolution (2)
Biol electives at 2xxx or above (6) (may include two of the following: MicB 5545, Phsl 5601, Phsl 5602)
Chem 1113*—Introduction to General, Organic, and Biological Chemistry I (5)
and Chem 1114—Introduction to General, Organic, and Biological Chemistry II (5)
or Chem 1151*—General Chemistry I (5)
and Chem 1152—General Chemistry II (5)
and Chem 2521—Organic Chemistry I (4)
and Chem 2522—Organic Chemistry II (4-5)
or Chem 1161*—Honors Course: General Chemistry I (5)
and Chem 1162—Honors Course: General Chemistry II (5)
and Chem 2521—Organic Chemistry I (4)
and Chem 2522—Organic Chemistry II (4-5)
Math 1250*—Precalculus Analysis (4)
and Stat 1411*—Introduction to Statistics (3)
Biol 5601—Plant Physiology (2)
and Biol 5602—Plant Physiology Laboratory (2)
or Phsl 5601—Physiology of Organ Systems I (3)
and Phsl 5602—Physiology of Organ Systems II (2)

Minimum of 6 credits—select at least one course with laboratory or a laboratory course, not selected above:
Biol 2801—General Ecology (3)
Biol 3990—Topics in Biology (program approved) (1-5)
Biol 3994—Undergraduate Research (1-3)
Biol 5121—Plant Biochemistry and Molecular Biology (4)
Biol 5133—Mechanisms of Cell Communication (4)
Biol 5199—Frontiers in Cell Biology (1)
Biol 5331—Plant Development (2)
Biol 5332—Plant Development Laboratory (2)
Biol 5361—Developmental Biology (4)
Biol 5511—Virology (3)
Biol 5513—Experimental Immunology (4)
Biol 5601—Plant Physiology (2)
Biol 5602—Plant Physiology Laboratory (2)
Biol 5765—Histology (4)
Biol 5801—Microbial Ecology (2)
Biol 5802—Microbial Ecology Laboratory (2)
Biol 5990—Topics in Biology (program approved) (1-5)
MicB 5545—Immunobiology (3)
Phsl 5601—Physiology of Organ Systems I (3)
Phsl 5602—Physiology of Organ Systems II (2)

Required Courses From Other Programs
Chem 1151—General Chemistry I (5)
and Chem 1152—General Chemistry II (5)
or Chem 1161—Honors Course: General Chemistry I (5)
and Chem 1162—Honors Course: General Chemistry II (5)
Chem 2222—Quantitative Analysis (4)
and Chem 2521—Organic Chemistry I (4)
and Chem 2522—Organic Chemistry II (4-5)
Chem 3322—Biochemistry (3)
and Chem 3324—Biochemistry Laboratory (1)
or Chem 4341—Biochemistry and Molecular Biology I (4)
and Chem 4363—Biochemistry Laboratory (2)
Math 1296—Calculus I (5)
and Math 1297—Calculus II (5)
or Math 1296—Calculus I (5)
and Stat 2411—Statistical Methods (3)
or Stat 2411—Statistical Methods (3)
or Stat 2411—Statistical Methods (3)
or Stat 3611—Introduction to Probability and Statistics (4)
or Math 1290—Calculus for Modeling (5)
and Stat 2411—Statistical Methods (3)
or Stat 3611—Introduction to Probability and Statistics (4)
Phys 1001—Introduction to Physics I (5)
and Phys 1002—Introduction to Physics II (5)
or Phys 1201—Mechanics (4)
and Phys 1204—Electricity, Magnetism, and Optics (5)

* Courses that may be used to fulfill UMD liberal education program requirements.

Chemical Engineering (ChE)

Professor: Dianne Dorland (department head); Associate Professor: Richard A. Davis; Assistant Professors: Keith Lodge, Steven Sterberg

B.S.Ch.E.

This four-year baccalaureate (B.S.Ch.E.) degree program emphasizes the development of the student's ability to analyze and design chemical processing systems. By the end of the program, the student must demonstrate the ability to solve engineering problems, a sensitivity to the social and environmental impacts of the engineering profession, and the ability to maintain a high level of competency.

Chemical engineering graduates are qualified for employment in diverse industries, ranging from those that manufacture inorganic chemicals, petrochemicals, plastics, synthetic fibers, paper and pulp, and pharmaceuticals to those that process hazardous and nuclear wastes. Graduates are qualified for assignments that include plant operations, process development, process control, project engineering, or sales, and frequently pursue engineering management later in their careers. They are also well qualified to continue with professional or graduate education.

The chemical engineering curriculum is based on fundamental sciences such as physics, chemistry, and mathematics; engineering sciences such as statics and deformable body mechanics of materials; traditional chemical engineering sciences such as material and energy balance, transport phenomena, and thermodynamics; and chemical engineering design courses, with a capstone plant design course during the senior year. The program emphasizes hazardous waste processing engineering, communication skills, safety, ethics, and the use of computers. Students have a unique opportunity to become involved in research, through either the Undergraduate Research Opportunities Program or the department honors program.

Admission Requirements

Students may declare a chemical engineering major as freshmen or sophomores. Students must complete the lower division level before applying to the upper division level (junior and senior years) of the program. Admission is competitive and applicants are admitted on a space-available basis, determined by the cumulative GPA in composition, physics, mathematics, engineering statics, and chemistry.
through Chem 2521. Transfer students and students who have been granted joint admission in engineering with the Minnesota State Community College System should refer to the Pre-Engineering section. Students must complete the upper division courses to complete the degree.

**Honors Requirements**
To graduate with department honors, students must have a minimum 3.50 GPA and be nominated by the chemical engineering faculty.

**Degree Requirements**
Requirements for the B.S.Ch.E. in chemical engineering (130 credits) include:

- UMD liberal education requirements
- Advanced writing requirement: Comp 3130—Advanced Writing: Engineering (3 credits)
- Completion of the lower division level before applying to the upper division level (junior and senior years) of the program.

**Required Courses**

**Lower Division (12)**
- ChE 1011*—Introduction to Chemical Engineering (3)
- ChE 2011—Design of Engineering Experiments (3)
- ChE 2111—Material and Energy Balances (3)
- ChE 2121—Chemical Engineering Thermodynamics (3)

**Upper Division (36)**
- ChE 3111—Fluid Mechanics (3)
- ChE 3112—Heat and Mass Transfer (3)
- ChE 3211—Chemical Engineering Laboratory I (2)
- ChE 3212—Properties of Engineering Materials (3)
- ChE 4111—Separations (3)
- ChE 4211—Chemical Engineering Laboratory II (2)
- ChE 4301—Chemical Reaction Engineering (3)
- ChE 4401—Process Control (3)
- ChE 4501—Chemical Engineering Design I (4)
- ChE 4502—Chemical Engineering Design II (4)
- Two ChE electives at 4xxx or 5xxx (6)

**Required Courses From Other Programs**

**Lower Division (56)**
- Comp 1120*—College Writing (3)
- Chem 1151*—General Chemistry I
- or Chem 1161*—Honors General Chemistry I (5)
- Chem 1152—General Chemistry II
- or Chem 1162—Honors General Chemistry II (5)
- Chem 2222—Quantitative Analysis (4)
- Chem 2521—Organic Chemistry I (4)
- CS 1135*—Introduction to Programming in FORTRAN 77 (2)
- Engr 2015—Statics (2)
- Math 1296*—Calculus I (5)
- Math 1297—Calculus II (5)
- Math 3280—Differential Equations with Linear Algebra (4)
- Phys 1201*—Mechanics (4)
- Phys 1202—Heat and Electricity (4)
- Liberal education electives** (9)

**Upper Division (23)**
- Advanced chemistry elective, such as Chem 2522—Organic Chemistry II (4)
- or Chem 4642—Physical Chemistry II (4)
- Chem 4641—Physical Chemistry I (4)
- Engr 2016—Mechanics of Materials (3)
- Engr 3201—Electrical Power (3)
- Liberal education electives** (6)

Advanced liberal education elective—any 2xxx course or above in the humanities, social sciences, or behavioral sciences for which the student has already completed a category 6, 7, 8, or 9 prerequisite course (3)

* Courses that may be used to fulfill UMD liberal education program requirements.

** Liberal education electives: one course each from categories 6, 7, and 8; two courses from category 9.

**Chemistry (Chem)**


Chemistry is a body of knowledge that helps explain the physical world and its processes. Chemists study substances: their composition, structures, properties, and reactions. The Department of Chemistry provides classroom and laboratory learning opportunities and research experience across the discipline to meet the needs of students in liberal arts and preprofessional programs as well as of students who wish to pursue careers in the field.

**Honors Requirements**
The chemistry department honors program helps outstanding chemistry majors develop into competent, independent research workers, encourages student interest in the discipline, and aids students in their transition to scientists. Qualified majors may apply after the first semester of their sophomore year. Participants choose a research adviser and complete three semesters of effort on a jointly developed project. Written reports and an oral presentation of the research are also required.
B.A.—CLA

Degree Requirements
Requirements for the B.A. degree in chemistry (120 credits) include:
- UMD liberal education requirements
- Advanced writing requirement—listed under the major requirements for “Year 3” (3 credits)
- Major requirements (54 credits)
- Minor requirements

Required Courses

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<tr>
<th>Year 1</th>
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<tbody>
<tr>
<td>Chem 1151*—General Chemistry I</td>
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<tr>
<td>or Chem 1161*—Honors Course: General Chemistry I (5)</td>
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<tr>
<td>Chem 1152—General Chemistry II</td>
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<tr>
<td>or Chem 1162—Honors Course: General Chemistry II (5)</td>
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<tr>
<td>Math 1296*—Calculus I (5)</td>
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<td>Math 1297—Calculus II (5)</td>
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<thead>
<tr>
<th>Year 2</th>
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<tbody>
<tr>
<td>Chem 2222—Quantitative Analysis (4)</td>
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<tr>
<td>Chem 2521—Organic Chemistry I (4)</td>
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<tr>
<td>Chem 2522—Organic Chemistry II (5)</td>
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<tr>
<td>CS 1135*—Introduction to Programming in FORTRAN 77 (2)</td>
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<tr>
<td>Math 3280—Differential Equations with Linear Algebra (4)</td>
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<tr>
<td>Phys 1201*—Mechanics (4)</td>
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<tr>
<td>Phys 1204—Electricity, Magnetism, and Optics (5)</td>
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<tr>
<th>Year 3</th>
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<tbody>
<tr>
<td>Chem 3322—Biochemistry (3)</td>
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<tr>
<td>Chem 3324—Biochemistry Laboratory (1)</td>
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<tr>
<td>Chem 4434—Inorganic Chemistry (4)</td>
</tr>
<tr>
<td>Chem 4632—Physical Chemistry (5)</td>
</tr>
<tr>
<td>Comp 31xx—Advanced writing (3 credits)</td>
</tr>
</tbody>
</table>
* Courses that may be used to fulfill UMD liberal education program requirements.

B.S.

Students earning a B.S. degree who wish to have their program certified by the American Chemical Society must take advanced courses that include additional hours of laboratory work.

Degree Requirements
Requirements for the B.S. degree (120 credits) in chemistry include:
- UMD liberal education requirements
- Advanced writing requirement—noted under the major requirements for “Year 3” (3 credits)
- Major requirements (71 credits)

Required Courses

<table>
<thead>
<tr>
<th>Year 1</th>
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<tbody>
<tr>
<td>Chem 1151*—General Chemistry I</td>
</tr>
<tr>
<td>or Chem 1161*—Honors Course: General Chemistry I (5)</td>
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<tr>
<td>Chem 1152—General Chemistry II</td>
</tr>
<tr>
<td>or Chem 1162—Honors Course: General Chemistry II (5)</td>
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<tr>
<td>Math 1296*—Calculus I (5)</td>
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<tr>
<td>Math 1297—Calculus II (5)</td>
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<tr>
<th>Year 2</th>
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<tbody>
<tr>
<td>Chem 2222—Quantitative Analysis (4)</td>
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<tr>
<td>Chem 2521—Organic Chemistry I (4)</td>
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<tr>
<td>Chem 2522—Organic Chemistry II (5)</td>
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<tr>
<td>CS 1135*—Introduction to Programming in FORTRAN 77 (2)</td>
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<td>Phys 1201*—Mechanics (4)</td>
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<tr>
<td>Phys 1204—Electricity, Magnetism, and Optics (5)</td>
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<tr>
<th>Year 3</th>
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<tbody>
<tr>
<td>Chem 3322—Biochemistry (3)</td>
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<tr>
<td>Chem 3324—Biochemistry Laboratory (1)</td>
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<tr>
<td>Chem 4242—Instrumental Analysis (4)</td>
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<tr>
<td>Chem 4641—Physical Chemistry I (4)</td>
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<tr>
<td>Chem 4642—Physical Chemistry II (4)</td>
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<tr>
<td>Comp 31XX—Advanced writing (3 credits)</td>
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<tr>
<th>Year 4</th>
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</thead>
<tbody>
<tr>
<td>Chem 3184—Undergraduate Seminar (2)</td>
</tr>
<tr>
<td>Chem 4434—Inorganic Chemistry (5)</td>
</tr>
</tbody>
</table>

* Courses that may be used to fulfill UMD liberal education program requirements.

Minor Requirements (26)
Chem 1151*—General Chemistry I |
| or Chem 1161*—Honors Course: General Chemistry I (5) |
| Chem 1152—General Chemistry II |
| or Chem 1162—Honors Course: General Chemistry II (5) |
| Chem 2222—Quantitative Analysis (4) |
| Chem 2521—Organic Chemistry I (4) |
| Chem 2522—Organic Chemistry II (4) |
| College-level math course (4) |

* Courses that may be used to fulfill UMD liberal education program requirements.
Computer Science (CS)

Professors: Donald B. Crouch (department head); Associate Professors: Timothy R. Colburn, Carolyn J. Crouch, Linda L. Deneen, Douglas J. Dunham, Gary M. Shute; Assistant Professors: Maria Sosonkina Driver, Richard F. Maclin, C. Hudson Turner

B.S.

Computer science is a discipline that involves understanding the design of computers and computational processes, and ranges from the theoretical study of algorithms to the design and implementation of software at the systems and applications levels.

The B.S. degree in computer science is a four-year accredited program that provides a solid base of fundamental knowledge in the following areas: design and implementation of computer software systems, fundamental principles of computer hardware operation, and theoretical computer science. In addition, students are expected to develop outstanding programming skills. The program provides the necessary foundational studies for students seeking careers in the computing industry or preparing for graduate study in computer science. This program is accredited by the Computer Science Accreditation Commission of the Computing Sciences Accreditation Board.

Admission Requirements

Same as admission criteria for the College of Science and Engineering.

Honors Requirements

Program candidates submit an application to the department honors committee. Participants must maintain a 3.00 cumulative GPA and a 3.30 GPA in the major and complete an honors research project supervised by a faculty member, presenting the results of this research at a colloquium; credit for the project can be earned in CS 4994—Honors Project. Students must also attend 10 computer science research colloquia.

Degree Requirements

Requirements for the B.S. in computer science (120 credits) include:

- UMD liberal education requirements
- Advanced writing requirement: Comp 3130—Advanced Writing: Engineering or Comp 3150—Advanced Writing: Science (3 credits)
- The computer science segment of the program contains a broad-based core of fundamental material required of all students (18 credits). In addition, 24 credits of advanced computer science courses, with at least 12 of these chosen from courses that provide depth in the discipline, are included in the major requirements.
- Mathematics and science are particularly important for the study of computer science. The curriculum includes 18 credits of mathematics/statistics courses and 12-14 credits of science courses, including a 2-semester science sequence.
- To broaden students' backgrounds, the major includes courses chosen from communication, composition, the humanities, the social sciences, and the arts.
- An ethics course is included, as well as a fundamental course in digital system design chosen from electrical and computer engineering.
- A minor or a second major in another department is required.

Required Courses

Core

CS 1511*—Computer Science I
or CS 1581*—Honors: Computer Science I (5)
CS 1521—Computer Science II (5)
CS 2511—Software Development (4)
CS 2521—Computer Organization (4)

Advanced Courses—six courses, including at least three breadth courses (24)

1. Breadth

CS 4511—Automata, Computability, and Formal Languages (4)
CS 4521—Advanced Data Structures and Algorithms (4)
CS 4531—Software Engineering (4)
CS 4611—Database Management Systems (4)
CS 5541—Artificial Intelligence (4)
CS 5551—User Interface Design (4)
CS 5621—Computer Architecture (4)
CS 5631—Operating Systems (4)
CS 5641—Compiler Design (4)
CS 5651—Computer Networks (4)

2. Electives

CS 4711—Computer Security (4)
CS 4811—Systems Software (4)
CS 5721—Computer Graphics (4)
CS 5731—Information and Text Processing (4)
CS 5741—Object-Oriented Design (4)
CS 5751—Machine Learning (4)

Required Courses From Other Programs

Comp 1120*—College Writing (3)
Comm 1112*—Public Speaking (3)
ECE 1315—Digital System Design (4)
Math 1296*—Calculus I (5)
Math 1297—Calculus II (5)
Math 3355—Discrete Mathematics (4)
Phil 3242—Values and Technology (3)
Stat 3611—Introduction to Probability and Statistics (4)
One of the following science sequences:
Biol 1011—General Biology I
    and Biol 1012—General Biology II (10)
or
Chem 1151—General Chemistry I
    and Chem 1152—General Chemistry II (10)
or
Chem 1161—Honors Course: General Chemistry I
    and Chem 1162—Honors Course: General Chemistry II (10)
or
Geol 1110—Introductory Geology (3)
    and Geol 2210—Geomorphology (3)
    and Geol 2300—Basic Mineralogy and Petrology (4)
or
Phys 1201—Mechanics (4)
    and Phys 1202—Heat and Electricity (4)
    or Phys 1204—Electricity, Magnetism, and Optics (5)
Additional approved courses from physics, chemistry, biology, astronomy, and geology (4)**

Electives in the humanities, social sciences, and arts (18)**
* Courses that may be used to fulfill UMD liberal education program requirements.
** A complete list of eligible courses is available from the department.

Minor Requirements
The computer science minor requires 31 credits:
CS 1511—Computer Science I
    or
CS 1581—Honors: Computer Science (5)
CS 1521—Computer Science II (5)
CS 2511—Software Development (4)
Electives in CS courses at 4xxx or above, ECE 3341, ECE 4305 (12)
Math 1296—Calculus I—(5)
* Courses that may be used to fulfill UMD liberal education program requirements.

Computer Science—Applied
Minor Only
The applied computer science minor (29-34 credits) provides a thorough introduction to the use of computers as tools and complements studies in other disciplines.

Requirements (29)
Two of the following courses (5-10):
CS 1111—Introduction to Programming in Pascal (3)
CS 1121—Introduction to Programming in Visual BASIC (3)
CS 1131—Introduction to Programming in FORTRAN (3)
    or
CS 1135—Introduction to Programming in FORTRAN 77 (2)
CS 1211—Introduction to Programming in C (3)
    or
CS 1511—Computer Science I (5)
CS 1581—Honors: Computer Science (5)
CS 2111—Introduction to Programming in C++ (3)
CS 1521—Computer Science II (5)
Electives in CS courses at 25xx or above (16)
Approved electives from computer science or other departments with a significant computing component (8)**
* Courses that may be used to fulfill UMD liberal education program requirements.
** A complete list of eligible courses is available from the department.

Electrical and Computer Engineering (ECE)

Professors: Stanley Burns (department head), Nazmi Shehadeh, Marian Stachowicz; Associate Professors: Christopher Carroll, Taek Mu Kwon, Jian-Shiou Yang; Assistant Professors: Mohammed Hasan, Bassam Shaer

B.S.
The electrical and computer engineering B.S.E.C.E. program combines traditional electrical engineering topics with current computer design and analysis topics. The program is concerned with the theory, design, and application of electrical phenomena and digital computers, including electronic circuits, signal analysis, system design, and computer architecture. The department displays strengths in such diverse areas as electronics, signal processing, electromagnetics, digital computer systems, communications, and controls. Individual faculty members specialize in areas such as VLSI design, microprocessor systems, image processing, robust control, solid state devices, neural networks, and fuzzy logic. The program balances theoretical and practical experience in electrical and computer engineering through analysis, synthesis, and experimentation, using facilities that include eight major instructional laboratories and three research laboratories.

Honors Requirements
To receive department honors upon graduating, students must finish the program with an overall GPA of at least 3.50, satisfactorily complete a research project under the guidance of a faculty member, and convey the results in an oral and written presentation to the department.

Degree Requirements
Requirements for the B.S.E.C.E. in electrical and computer engineering (131 credits) include:
- UMD liberal education requirements
  (35 credits; 37 credits for ECE majors)—courses listed within the major or minor indicated by * may be used to fulfill this requirement
• Advanced writing requirement: Comp 3130—Advanced Writing: Engineering (3 credits)
• 6 technical elective credits to achieve breadth and depth in the major
• Enough required math, science, engineering science, engineering design, and composition credits to meet or exceed accreditation requirements

**Required Courses**

ECE 1001—Introduction to ECE (2)
ECE 1315—Digital System Design (4)
ECE 2006—Electrical Circuit Analysis (4)
ECE 2111—Linear Systems and Signal Analysis (4)
ECE 2212—Electronics I (4)
ECE 2325—Microcomputer System Design (4)
ECE 3151—Control Systems (3)
ECE 3235—Electronics II (4)
ECE 3341—Digital Computer Circuits (4)
ECE 3445—Electromagnetic Fields (3)
ECE 3611—Introduction to Solid State Semiconductors (3)
ECE 4305—Computer Architecture (4)
ECE 4899—Senior Project I (1)
ECE 4999—Senior Project II (3)
ECE technical electives (6)

**Required Courses From Other Programs**

Chem 2172*—General Chemistry (4)
Comp 1120*—College Writing (3)
Comp 3130—Advanced Writing: Engineering (3)
CS 1511*—Computer Science I (5)
CS 1521—Computer Science II (5)
CS 2511—Software Development (4)
CS 5631—Operating Systems (4)
Econ 1023*—Principles of Economics: Micro (3)
IE 2105—Material Science (3)
or Engr 2015—Statics (2)
and Engr 2026—Dynamics (3)
or Engr 2015—Statics (2)
and ChE 3111—Fluid Mechanics (3)
Math 1296*—Calculus I (5)
Math 1297—Calculus II (5)
Math 3280—Differential Equations with Linear Algebra (4)
Math 3298—Calculus III (4)
Phys 1201*—Mechanics (4)
Phys 1204—Electricity, Magnetism, and Optics (5)
Stat 3611—Introduction to Probability and Statistics (4)

**Liberal education electives (13)**

Liberal education elective choices (plus Econ 1023) must include the following:
• At least one course from category 7
• At least one course from category 8
• At least two courses from category 9 with different prefixes
• At least one course emphasizing international perspective

• At least one course emphasizing cultural diversity
• At least 16 credits in categories 6 through 9
• At least one course numbered 2000 or higher and one 1xxx course with the same prefix, both from categories 6 through 9 (or any course that specifies as a prerequisite any course in categories 6 through 9)

*Courses that may be used to fulfill UMD liberal education program requirements.

**Final Project**

Electrical and computer engineering students must complete a capstone design project integrating the knowledge from their academic career. This project, completed individually or in a small group, must involve the design of hardware or software to meet specifications agreed upon by the student and the faculty project adviser.

**Minor Requirements (38)**

ECE 1315—Digital System Design (4)
ECE 2006—Electrical Circuit Analysis (4)
ECE 2111—Linear Systems and Signal Analysis (4)
ECE 2212—Electronics I (4)
ECE 2325—Microcomputer System Design (4)**
Math 1296*—Calculus I (5)
Math 1297—Calculus II (5)
Math 3280—Differential Equations with Linear Algebra (4)
Phys 1201*—Mechanics (4)

*Courses that may be used to fulfill UMD liberal education program requirements.

**For computer science majors:** CS 2521—Computer Organization (4) may be substituted for ECE 2325—Microcomputer System Design (4)

**Engineering**

*College of Science and Engineering*

See Chemical Engineering, Electrical and Computer Engineering, Environmental Engineering, Industrial Engineering, or Pre-Engineering Program.

**Environmental Engineering**

*Department of Chemical Engineering*

**Minor Only**

The environmental engineering minor develops a student's ability to understand and address environmental concerns. Coursework provides broad-based science and engineering knowledge suited to pollution prevention and waste management. The minor enhances degrees in science or other engineering fields.
**Requirements (48)**

**Lower Division (42)**

- **ChE 1011**—Introduction to Chemical Engineering
- **ChE 2001**—Introduction to Environmental Engineering (3)
- **ChE 2011**—Design of Engineering Experiments
- **Stat 2411**—Statistical Methods (3)
- **ChE 2111**—Material and Energy Balances (3)
- **Chem 1151**—General Chemistry I (5)
  
  * and **Chem 1152**—General Chemistry II (5)
  
  * or **Chem 1161**—Honors Course: General Chemistry I (5)
  
  * and **Chem 1162**—Honors Course: General Chemistry II (5)
- **ChE 2222**—Quantitative Analysis (4)
- **Engr 2015**—Statics (2)
- **Geo! 1110**—Introductory Geology (3)
- **Math 1296**—Calculus I (5)
  
  * or **Math 1250**—Precalculus Analysis (4)
- **Phys 1201**—Mechanics (4)

**Upper Division (3)**

- **ChE 4612**—Hazardous Waste Processing Engineering (3)
- **Geo! electives 3xxx or higher** (3-7)
- **Geological Sciences (Geol)**
  
  **Professors:** James A. Grant, Timothy B. Holst, Thomas C. Johnson, Charles L. Matsch, Ronald L. Morton, Richard W. Ojakangas, George R. Rapp, Jr.; **Associate Professors:** Erik T. Brown, Howard D. Mooers, Penelope Morton (department head), Nigel J. Wattrus

The Department of Geological Sciences offers three undergraduate programs: a B.S. program providing training for a career as a professional geologist, which usually requires graduate study; a B.A. liberal arts program; and a program for those interested in teaching earth sciences (see Earth Sciences).

**Admission Requirements**

Students must have a minimum GPA of 2.00.

**Honors Requirements**

Students must maintain a GPA of 3.00 or higher, participate in the CSE honors program, and conduct independent research under the supervision of a geological sciences faculty member or other member of the scientific community approved by the department honors coordinator.

**B.A.—CLA**

**Degree Requirements**

Requirements for the B.A. in geological sciences (120 credits) include:

- UMD liberal education requirements
- Completion of an advanced writing requirement: Comp 3150—Advanced Writing: Science (3 credits)
- Major requirements (51-53 credits)
- Minor requirements

**Required Courses**

- **Geo! 1110**—Introductory Geology (3)
- **Geo! 2100**—Geological Computer Applications (1)
- **Geo! 2210**—Geomorphology (3)
- **Geo! 2311**—Mineralogy and Petrology I (4)
  
  * and **Geo! 2312**—Mineralogy and Petrology II (4)
  
  * or **Geo! 2300**—Basic Mineralogy and Petrology (4)
- **Geo! 2315**—Mineral Resource Geology (2)
- **Geo! 3110**—Environmental Geology (2)
- **Geo! 3410**—Stratigraphy-Sedimentation (3)
- **Geo! 3520**—Structural Geology (4)
- **Geo! 3530**—Field and Computer Methods (3)
- **Geo! 4500**—Field Geology (6)
- **Geo! electives 3xxx or higher** (3-7)

**Required Courses From Other Programs**

- **Chem 1113**—Introduction to General, Organic, and Biological Chemistry I (5)
  
  * and **Chem 1114**—Introduction to General, Organic, and Biological Chemistry II (5)
  
  * or **Chem 1151**—General Chemistry I (5)
  
  * and **Chem 1152**—General Chemistry II (5)
  
  * or **Chem 1161**—Honors Course: General Chemistry I (5)
  
  * and **Chem 1162**—Honors Course: General Chemistry II (5)
- **Math 1250**—Precalculus Analysis (4)
  
  * or **Math 1296**—Calculus I (5)
  
  * or **Stat 2411**—Statistical Methods (3)

* Courses that may be used to fulfill UMD liberal education program requirements.

**B.S.**

**Degree Requirements**

Requirements for the B.S. in geological sciences (120 credits) include:

- UMD liberal education requirements
- Advanced writing requirement: Comp 3150—Advanced Writing: Science (3 credits)
- Major requirements (76 credits)

**Required Courses**

- **Geo! 1110**—Introductory Geology (3)
- **Geo! 2100**—Geological Computer Applications (1)
- **Geo! 2210**—Geomorphology (3)
- **Geo! 2311**—Mineralogy and Petrology I (4)
College of Science and Engineering

Geol 2312—Mineralogy and Petrology II (4)
Geol 2315—Mineral Resource Geology (2)
Geol 3110—Environmental Geology (2)
Geol 3410—Stratigraphy-Sedimentation (3)
Geol 3520—Structural Geology (4)
Geol 3530—Field and Computer Methods (3)
Geol 3710—Introduction to Geochemistry (3)
Geol 4500—Field Geology (6)
Geo! 4810—Global Geophysics (3)
Geol electives, upper division (9)

Required Courses From Other Programs
Chem 1151*—General Chemistry I
or Chem 1161*—Honors Course: General Chemistry I (5)
Chem 1152—General Chemistry II
or Chem 1162—Honors Course: General Chemistry II (5)
Math 1290*—Calculus for Modeling I
or Math 1296*—Calculus I (5)
Phys 1201*—Mechanics (4)
Phys 1202—Heat and Electricity (4)
Stat 2411*—Statistical Methods (3)
* Courses that may be used to fulfill UMD liberal education program requirements.

Minor Requirements (20)
The geological sciences minor enhances the student’s understanding of and familiarity with earth materials and processes, and provides valuable background for many environmental careers and applications.

Geol 1110*—Introductory Geology (3)
Geol 2300—Basic Mineralogy and Petrology (4)
Geol 2410—Geology of North America (2)
Geol electives 2xxx or above (11)
* Courses that may be used to fulfill UMD liberal education program requirements.

Industrial Engineering (IE)

Professors: Bernard J. DeRubeis, Mark A. Fusilso, Thys B. Johnson (NRRI), L. Alden Kendall, Richard R. Lindeke;
Associate Professors: Hamid Fard, Lester W. Garber, David A. Wyrick (department head); Assistant Professors: Dale A. Kragescheid, Ryan G. Rosandich, John C. Voss

B.S.I.E.
The industrial engineering B.S.I.E. program integrates topics from manufacturing, management, and traditional design. Industrial engineers are proficient in the design, improvement, and management of complex systems of people, materials, equipment, and energy. They study and adapt product designs and the associated plant facilities to optimize production. In the process, they consider economic, technical, and human factors. The curriculum rounds out the learning experience by providing skills in the mathematical and physical sciences, economics, composition, and humanities and social sciences.

The industrial engineering program is accredited by the Accreditation Board for Engineering and Technology (ABET). The program emphasizes manufacturing engineering and engineering management. Students have an opportunity to learn about engineering in the global community. This option requires a senior year exchange with the Department of Materials and Manufacturing Engineering at Luleå University of Technology in Sweden.

Admission Requirements
Admission to the program is competitive and on a space-available basis. A minimum overall GPA of 2.00 is required on all program courses taken at the time an application to the program is submitted. An application may be submitted when the student has completed the following courses:
Math 1296—Calculus I (5)
Math 1297—Calculus II (5)
Math 3280—Differential Equations with Linear Algebra (4)
Phys 1201—Mechanics (4)
Phys 1202—Heat and Electricity (4)
Engr 2015—Statics (2)
IE 1105—Introduction to Engineering Design (3)
IE 1205—Introduction to Manufacturing Engineering (3)
The department will use a summary of the grades on the above courses as another criteria for accepting students into the B.S. program.

Degree Requirements
Requirements for the B.S.I.E. in industrial engineering (132 credits) include:
• UMD liberal education program requirement—courses listed within the major or minor indicated by * may be used to fulfill this requirement. Students must take two courses with different designators from category 9, and no courses from category 10, as part of this requirement.
• Completion of at least 30 degree credits at UMD
• Completion at UMD of at least 20 of the last 30 credits earned before graduation
• A minimum GPA of 2.00 (C) overall (including transfer credits) and in all major work attempted at UMD, and successful completion (with grades of A-D, or P) of all required courses and of 75 percent of all work attempted
• Completion of the composition requirement...
**Colleges and Schools**

- Completion of the major program. A minimum GPA of 2.00 in all courses taken in the major, including required courses in related fields, is required for graduation.
- Completion of 65 credits in upper division courses (at 3xxx or above)
- Students should file an Academic Progress Audit System (APAS) report by the time they have completed 60 credits, or they may not be permitted to register.

**Required Courses**

IE 1105—Introduction to Engineering Design (3)  
IE 1205—Introduction to Manufacturing Engineering (3)  
IE 2105—Introduction to Material Science for Engineers (3)  
IE 3105—Human Factors (4)  
IE 3115—Operations Research (4)  
IE 3125—Engineering Economic Analysis (3)  
IE 3135—Manufacturing Processes I (4)  
IE 3205—Project Management (3)  
IE 3245—Manufacturing Processes II (4)  
IE 3255—Statistical Quality Control (3)  
IE 3265—Production and Operations Management (4)  
IE 4115—Facility Planning and Simulation (4)  
IE 4135—Automation and Robotics (3)  
IE 4145—CAD/CAM (4)  
IE 4175—Machine Design (3)  
IE 4235—Manufacturing Systems Integration (4)  
IE 4255—Design of Industrial Systems (3)

**Required Courses From Other Programs**

Chem 1151*—General Chemistry I (5)  
Comp 1120*—College Writing (3)  
Comp 3130—Advanced Writing: Engineering**  
or Comp 3150—Advanced Writing: Science (3)**  
CS 1511*—Computer Science I (5)  
Econ 1022*—Principles of Economics: Macro  
or Econ 1023*—Principles of Economics: Micro (3)  
Engr 2015—Statics (2)  
Engr 2016—Mechanics of Materials (3)  
Engr 2026—Dynamics (3)  
Engr 3201—Electrical Power (3)  
Math 1296*—Calculus I (5)  
Math 1297—Calculus II (5)  
Math 3280—Differential Equations with Linear Algebra (4)  
Phys 1201*—Mechanics (4)  
Phys 1202—Heat and Electricity (4)  
Stat 3611 Introduction to Probability and Statistics (4)  
One course each from liberal education categories 7 and 8; two courses from category 9 (12)  
Advanced (3xxx level or greater) humanities/social science approved elective (3)  
Approved technical elective (2)

* Courses that may be used to fulfill UMD liberal education program requirements.  
** Fulfills the advanced composition requirement.

**Final Project**

Students are required to complete a final team design project in the capstone design course IE 4255—Design of Industrial Systems. Completion of the junior year curriculum is a prerequisite for this course. The course requires publication of a final report and a formal presentation to the project sponsors. Students taking the senior year at Luleå University of Technology must take its equivalent capstone design course.

**Information Systems and Technology**

**Computer Science**

**B.S.**

The B.S. in information systems and technology prepares a student for graduate school and careers in information systems, and provides a basis for continued career growth. This is a multidisciplinary program that emphasizes the study of systems development methodology and technology for our rapidly changing information society. Professionals in this area must be capable of designing and developing information systems that utilize the latest in computer technology. They must possess good communication skills, both oral and written, and also be aware of the societal and ethical implications of the systems they develop. The goal is to develop project leaders and information resource managers who can address organizational needs with technical solutions. Graduates of this program are prepared for positions in the design and development of information systems as project managers, information systems center specialists, network administrators, and database managers. This major also is appropriate for students considering information systems graduate programs or MBA professional programs.

**Degree Requirements**

Requirements for the B.S. in information systems and technology (120 credits) include:

- UMD liberal education requirements
- Advanced writing requirement: Comp 3150—Advanced Writing: Science (3 credits)
- The computer science segment of the program consists of a core of fundamental material required of all students (17 credits). In addition, 32 credits of advanced computer science courses are required for the major.
Mathematics courses are particularly important for the study of information systems and technology. The curriculum includes 9 credits in mathematics/statistics, 6 credits in advanced FMIS courses, and 6 credits in economics and accounting.

A minor or second major in another department is required.

Required Courses

*Core (17)*
- CS 1121*-Introduction Programming in Visual BASIC (3)
- CS 1211*-Introduction to Programming in C (3)
- CS 1311—Fundamentals of Information Systems (4)
- CS 2111—Introduction to Programming in C++ (3)
- CS 2311—Data, File, and Object Structures (4)

*Note:* CS 151*-Computer Science I (5) and CS 1521—Computer Science II (5) may be taken in lieu of CS 1211 (3), CS 2111 (3), and CS 2311 (4).

*Advanced Courses (38)*
- CS 3011—Information Technology and Hardware (4)
- CS 3111—Computer Ethics (4)
- CS 3211—Introduction to Interactive Multimedia Technology (4)
- CS 3211—Introduction to Database Management Systems (4)
- CS 3221—Operating Systems Practicum (4)
- CS 4311—Human-Computer Interaction (4)
- CS 4411—Data Communications and Network Technology (4)
- CS 4711—Computer Security (4)
- FMIS 3201—Management Information Systems (3)
- FMIS 3222—Systems Analysis and Design (3)

*Required Courses From Other Programs*

*Additional Requirements (21)*
- Acct 2005*-Survey of Accounting (3)
- Comm 1112*-Public Speaking (3)
- Comp 1120*-College Writing (3)
- Comp 3150—Advanced Writing: Science (3)
- Econ 1003*-Economics and Society (3)
- Stat 3611—Introduction to Probability and Statistics (4)
- Math 1296*-Calculus I (5)
- Math 1297—Calculus II (5)
- Math 3280—Differential Equations with Linear Algebra (4)
- or Math 3320—Introduction to Linear Algebra (3)
- Math 3298—Calculus III (4)
- Math 3299—Intermediate Analysis (3)
- Math 3355—Discrete Mathematics (4)
- Math 3941—Undergraduate Colloquium (1)
- Math 5326—Linear Algebra I (3)
- Math 5371—Abstract Algebra I (3)
- Stat 3611—Introduction to Probability and Statistics (4)

*Minor Requirements (32)*
- CS 1211*-Introduction to Programming in C (3)
- CS 1311—Fundamentals of Information Systems (4)
- CS 2111—Introduction to Programming in C++ (3)
- CS 2311—Data, File and Object Structures (4)
- CS 3011—Information Technology and Hardware (4)
- CS 3121—Introduction to Interactive Multimedia Technology (4)
- CS 4411—Data Communications and Network Technology (4)
- FMIS 3201—Management Information Systems (3)
- FMIS 3222—Systems Analysis and Design (3)

Courses that may be used to fulfill UMD liberal education program requirements.

*Note:* CS 151*-Computer Science I (5) and CS 1521—Computer Science II (5) may be taken in lieu of CS 1211 (3), CS 2111 (3), and CS 2311 (4).

Mathematics (Math and Stat)

*Department of Mathematics and Statistics*

*Professors:* Sabra S. Anderson, Joseph A. Gallian, Richard F. Green, Barry R. James, Ronald R. Regal, Harlan W. Stech (department head); *Associate Professors:* Duane E. Anderson, John R. Greene, Kang L. James, Clinton J. Kolaski, Kathryn E. Lenz, Zhuangyi Liu, Robert L. McFarland, James L. Nelson, Bruce B. Peckham, James W. Rowell, Steven A. Trogdon

*B.A.—CLA*

This major prepares students for careers in business, industry, and government and for graduate school. A working knowledge of FORTRAN is required for some of the higher-level numerical courses.

*Degree Requirements*

Requirements for the B.A. in mathematics (120 credits) include:

- *UMD liberal education requirements*
- *Advanced writing requirement: Comp 3130—Advanced Writing: Engineering or Comp 3150—Advanced Writing: Science (3 credits)*
- *Major requirements (45-51 credits)*

*Required Courses*
- Math 1296*-Calculus I (5)
- Math 1297—Calculus II (5)
- Math 3280—Differential Equations with Linear Algebra (4)
- or Math 3320—Introduction to Linear Algebra (3)
- Math 3298—Calculus III (4)
- Math 3299—Intermediate Analysis (3)
- Math 3355—Discrete Mathematics (4)
- Math 3941—Undergraduate Colloquium (1)
- Math 5326—Linear Algebra I (3)
- Math 5371—Abstract Algebra I (3)
- Stat 3611—Introduction to Probability and Statistics (4)

*One of the following options (7-12 cr):*

1. Math 5201—Real Variables (4) and Math 5372—Abstract Algebra II (3)
2. Math 5201—Real Variables (4) and two 5xxx courses approved by the Department of Mathematics and Statistics (6-8)
3. Math 5372—Abstract Algebra II (3) and two 5xxx courses approved by the Department of Mathematics and Statistics (6-8)
Colleges and Schools

Required Courses From Other Programs
One CS course above 1010 (3)
* Courses that may be used to fulfill UMD liberal education program requirements.

Mathematics—Applied Mathematics
B.S.—CSE
This major prepares students for careers in business, industry, and government and for graduate school. A working knowledge of FORTRAN is required for some of the higher-level numerical courses.

Degree Requirements
Requirements for the B.S. in mathematics—applied mathematics (120 credits) include:
• UMD liberal education requirements
• Advanced writing requirement: Comp 3130—Advanced Writing: Engineering or Comp 3150—Advanced Writing: Science (3 credits)
• Major requirements (51-54 credits)

Required Courses
Math 1296*—Calculus I (5)
Math 1297—Calculus II (5)
Math 3280—Differential Equations with Linear Algebra (4)
Math 3298—Calculus III (4)
Math 3299—Intermediate Analysis (3)
Math 3941—Undergraduate Colloquium (1)
Math 5326—Linear Algebra I (3)
Stat 3611—Introduction to Probability and Statistics (4)

One of the following (2-3):
Math 3097—Internship (2)
Math 5270—Modeling with Dynamical Systems (3)
Math 5900—Team Modeling Project (3)
Math 5991—Independent Study (2)
Math or Stat course above 3000 for UROP participants (2)

At least one course from each of the following groups (10-14)—students who take CS 1521 select three courses; others select four courses:

Group 1
Math 4230—Applied Mathematics: Complex Variables (3)
Math 4240—Applied Mathematics: Operational Mathematics (3)
Math 4820—Applied Mathematics: Numerical Methods (3)

Group 2
Math 5220—Optimization and Control (3)
Math 5260—Dynamical Systems (3)
Math 5280—Partial Differential Equations (3)
Math 5810—Linear Programming (3)

Group 3
Math 5830—Numerical Analysis: Approximation and Quadrature (4)
Math 5840—Numerical Analysis: Systems and Optimization (4)
Math 5850—Numerical Differential Equations (4)

Required Courses From Other Programs
CS 1511—Computer Science I (5)

One of the following (3-5):
CS 1121*—Introduction to Programming in Visual BASIC (3)
CS 1131*—Introduction to Programming in FORTRAN (3)
CS 1211*—Introduction to Programming in C (3)
CS 1521—Computer Science II (5)
CS 2111—Introduction to Programming in C++ (3)
CS 2121*—Introduction to Programming in Java (3)
* Courses that may be used to fulfill UMD liberal education program requirements.

Minor Requirements (21)
Math 1296*—Calculus I (5)
Math 1297—Calculus II (5)
Math 3280—Differential Equations with Linear Algebra (4)
Math 3298—Calculus III (4)
Math 3355—Discrete Mathematics (4)
Math 4230—Applied Mathematics: Complex Variables (3)
Math 4240—Applied Mathematics: Operational Methods (3)
Math 4820—Applied Mathematics: Numerical Methods (3)
Math 5810—Linear Programming (3)
Math 5830—Numerical Analysis: Approximation and Quadrature (4)
Math 5840—Numerical Analysis: Systems and Optimization (4)
Math 5850—Numerical Differential Equations (4)
Stat 3611—Introduction to Probability and Statistics (4)
The student's program of study must include at least one course 4xxx or 5xxx course selected from the above electives or an additional approved 4xxx or 5xxx course outside of Math or Stat containing strong mathematical content.

* Courses that may be used to fulfill UMD liberal education program requirements.

Mathematics—Computational Mathematics
B.S.—CSE
This major prepares students for careers in business, industry, and government and for graduate school. A working knowledge of FORTRAN is required for some of the higher-level numerical courses.

Degree Requirements
Requirements for the B.S. in mathematics—computational mathematics (120 credits) include:
• UMD liberal education requirements
• Advanced writing requirement: Comp 3130—Advanced Writing: Engineering or Comp 3150—Advanced Writing: Science (3 credits)
• Major requirements (57-60 credits)
Required Courses
Math 1296*—Calculus I (5)
Math 1297—Calculus II (5)
Math 3280—Differential Equations with Linear Algebra (4)
Math 3298—Calculus III
or Math 3355—Discrete Mathematics (4)
Math 3941—Undergraduate Colloquium (1)
Math 5326—Linear Algebra I (3)
Stat 3611—Introduction to Probability and Statistics (4)
Two of the following (6-8):
Math 4820—Applied Mathematics: Numerical Methods (3)
Math 5810—Linear Programming (3)
Math 5830—Numerical Analysis: Approximation and Quadrature (4)
Math 5840—Numerical Analysis: Systems and Optimization (4)
Math 5850—Numerical Differential Equations (4)

Mathematics--Double Major
B.S.—CSE
This major prepares students for careers in business, industry, and government and for graduate school. A working knowledge of FORTRAN is required for some of the higher-level numerical courses.

Degree Requirements
Requirements for the B.S. in mathematics—double major (120 credits) include:
• UMD liberal education requirements
• Advanced writing requirement: Comp 31xx—Advanced writing course (3 credits)
• Major requirements (48 credits)

An individualized program may be designed for students who have received a degree or are working on a degree from outside the Department of Mathematics and Statistics.

Required Courses
Math 1296*—Calculus I (5)
Math 1297—Calculus II (5)
Math 3280—Differential Equations with Linear Algebra (4)
Math courses above 3280 and/or Stat courses above 3000 (23); substitution courses from other programs must contain substantial mathematical or statistical content and be approved by the Department of Mathematics and Statistics in consultation with the participating department.

Substitution Option 1—Substitute up to 10 credits for up to 10 credits: 4xxx and/or 5xxx courses. Selected courses cannot be used for any major or minor outside the Department of Mathematics and Statistics.

Substitution Option 2—Usually substitute up to 20 credits for up to 10 credits: 4xxx and/or 5xxx courses. The substitution rate is higher because the credits apply to two majors/minors.

Math and/or Stat courses above 5xx (8)
* Courses that may be used to fulfill UMD liberal education program requirements.

Required Courses From Other Programs
One CS course above 1010 (3)

Mathematics—Statistics
Advisers: R. Green, B. James, K. James, R. Regal

B.S.—CSE
The science of statistics is concerned with generating and analyzing data. The mathematics and statistics major trains students in theoretical, applied, and computational statistics used in a wide variety of disciplines. Advisers have information on the national actuarial examinations.
Degree Requirements
Requirements for the B.S. in mathematics—statistics (120 credits) include:

- UMD liberal education requirements
- Advanced writing requirements: Comp 3100—Advanced Writing: Language and Literature or Comp 3110—Advanced Writing: Arts and Letters or Comp 3121—Advanced Writing in Business and Organizations or Comp 3130—Advanced Writing: Engineering or Comp 3140—Advanced Writing: Human Services or Comp 3150—Advanced Writing: Science or Comp 3160—Advanced Writing: Social Sciences (3 credits)
- Major requirements (48-50 credits)

Required Courses
Math 1296*—Calculus I (5)
Math 1297—Calculus II (5)
Math 3280—Differential Equations with Linear Algebra (4)
or Math 3320—Introduction to Linear Algebra (3)
Math 3298—Calculus III (4)
Math 3299—Intermediate Analysis (3)
Math 3355—Discrete Mathematics (4)
Math 3941—Undergraduate Colloquium (1)
Math 5326—Linear Algebra I (3)
Math 5371—Abstract Algebra I (3)
Stat 3611—Introduction to Probability and Statistics (4)

One of the following (7-12):
1. Math 5201—Real Variables (4)
   and Math 5372—Abstract Algebra II (3)
2. Math 5201—Real Variables (4)
   and two 5xxx courses approved by the Department of Mathematics and Statistics (6-8)
3. Math 5372—Abstract Algebra II (3)
   and two 5xxx courses approved by the Department of Mathematics and Statistics (6-8)

Required Courses From Other Programs
One CS course above 1010 (3)

* Courses that may be used to fulfill UMD liberal education program requirements.

Minor Requirements (22)
Math 1296*—Calculus I (5)
Math 1297—Calculus II (5)
Math 3280—Differential Equations with Linear Algebra (4)
or Math 3320—Introduction to Linear Algebra (3)
Math and/or Stat courses above 3099, with not more than one credit from Math 3120—Mathematics Tutorial Project and with at least one course above 4000, to bring the total to 22 credits (8-9)

* Courses that may be used to fulfill UMD liberal education program requirements.

Mathematics—Traditional Mathematics

B.S.—CSE
This major prepares students for careers in business, industry, and government and for graduate school. A working knowledge of FORTRAN is required for some of the higher-level numerical courses.

Degree Requirements
Requirements for the B.S. in mathematics—traditional mathematics (120 credits) include:

- UMD liberal education requirements
- Advanced writing requirements: Comp 3130—Advanced Writing: Engineering or Comp 3150—Advanced Writing: Science (3 credits)
- Major requirements (45-51 credits)

Required Courses
Math 1296*—Calculus I (5)
Math 1297—Calculus II (5)
Math 3280—Differential Equations with Linear Algebra (4)
or Math 3320—Introduction to Linear Algebra (3)
Math 3298—Calculus III (4)
Math 3299—Intermediate Analysis (3)
Math 3355—Discrete Mathematics (4)
Math 3941—Undergraduate Colloquium (1)
Math 5326—Linear Algebra I (3)
Math 5371—Abstract Algebra I (3)
Stat 3611—Introduction to Probability and Statistics (4)

One of the following (7-12):
1. Math 5201—Real Variables (4)
   and Math 5372—Abstract Algebra II (3)
2. Math 5201—Real Variables (4)
   and two 5xxx courses approved by the Department of Mathematics and Statistics (6-8)
3. Math 5372—Abstract Algebra II (3)
   and two 5xxx courses approved by the Department of Mathematics and Statistics (6-8)

Required Courses From Other Programs
One CS course above 1010 (3)

* Courses that may be used to fulfill UMD liberal education program requirements.

Minor Requirements (22)
Math 1296*—Calculus I (5)
Math 1297—Calculus II (5)
Math 3280—Differential Equations with Linear Algebra (4)
or Math 3320—Introduction to Linear Algebra (3)
Math and/or Stat courses above 3099, with not more than one credit from Math 3120—Mathematics Tutorial Project and with at least one course above 4000, to bring the total to 22 credits (8-9)

* Courses that may be used to fulfill UMD liberal education program requirements.

Physical Science

Teaching Physical Science Major (B.A.S.)
See College of Education and Human Service Professions for program description.
Physics (Phys)

Professors: John R. Hiller (department head), Thomas F. Jordan, Michael Sydor; Associate Professors: Bo R. Casserberg, John L. Kroening; Assistant Professors: Jonathan Maps, Elise A. Ralph, Meng Zhou

The Department of Physics offers two B.S. degrees, which provide professional preparation in pure and applied physics, and a liberal arts degree (B.A.). Students participate in research, which is focused primarily on theoretical physics, instrumentation, experimental solid state physics, and physical limnology. The department also offers courses required for such professional and pre-professional programs as engineering and medicine.

Honors Requirements
To graduate with honors, students must participate in the department honors program, complete a research project, and maintain a GPA above 3.00. They are also expected to attend department colloquia. Interested students should contact the physics honors program coordinator.

B.A.—CLA
The B.A. in physics is a liberal arts degree that allows considerable freedom in the planning of upper level courses and can easily be combined with other majors and interests. The physics courses emphasize conceptual foundations, problem-solving skills, and experimental techniques.

Degree Requirements
Requirements for the B.A. in physics (120 credits) include:

- UMD liberal education requirements
- Advanced writing requirement: Comp 3150 (3 credits)
- Major requirements (52 credits): 32-credit core required for all physics majors and minors, 8 credits in mathematics in addition to required core, 12 credits of physics and limnology electives
- A minor or a second major in a different program

Required Courses
Core
Phys 1201*—Mechanics (4)
Phys 1202—Heat and Electricity (4)**
Phys 1203—Magnetism, Waves, and Optics (4)**
Phys 2001—Oscillations (2)
Phys 2021—Relativity and Quantum Physics (4)
Phys 2031—Quantum Physics Laboratory (1)

Electives (12)
Phys 3061—Instrumentation (3)
Phys 4001—Classical Mechanics (4)
Phys 4011—Electromagnetic Theory (4)
Phys 4021—Quantum Physics II (4)
Phys 4031—Thermal and Statistical Physics (4)
Phys 5041—Optics (3)
Phys 5051—Computational Physics (4)
Phys 5061—Experimental Methods (3)
Phys 5062—Advanced Laboratory (2)
Phys 5531—Introduction to Solid State Physics (3)
Phys 5541—Fluid Dynamics (3)

Required Courses From Other Programs
Core
CS 1131*—Introduction to Programming in FORTRAN (3)
Math 1296*—Calculus I (5)
Math 1297—Calculus II (5)

Additional Courses
Math 3280—Differential Equations with Linear Algebra (4)
Math 3298—Calculus III (4)
* Courses that may be used to fulfill UMD liberal education program requirements.
** Phys 1204—Electricity, Magnetism, and Optics (5) and Phys 1205—Waves and Heat (3) may be substituted for the pair Phys 1202 and 1203

Electives
May be used toward 12 credits in electives:
Lim 5601—Limnology I: Physics and Chemistry (4)

Minor Requirements
This minor program (35 credits) provides an introduction to classical and quantum physics.

Core (32)
CS 1131*—Introduction to Programming in FORTRAN (3)
Math 1296*—Calculus I (5)
Math 1297—Calculus II (5)
Phys 1201*—Mechanics (4)
Phys 1202—Heat and Electricity (4)**
Phys 1203—Magnetism, Waves, and Optics (4)**
Phys 2001—Oscillations (2)
Phys 2021—Relativity and Quantum Physics (4)
Phys 2031—Quantum Physics Laboratory (1)

Additional Courses
Phys electives at 3xxx or above (3)
* Courses that may be used to fulfill UMD liberal education program requirements.
** Phys 1204—Electricity, Magnetism, and Optics (5) and Phys 1205—Waves and Heat (3) may be substituted for the pair Phys 1202 and 1203
B.S.
The B.S. in physics is primarily for students planning to work toward an advanced degree in physics or a related area. The physics courses emphasize conceptual foundations, problem-solving skills, and experimental techniques.

Degree Requirements
Requirements for the B.S. in physics (120 credits) include:

- UMD liberal education requirements
- Advanced writing requirement: Comp 3150 (3 credits)
- Major requirements (68 credits):
  32-credit core required for all physics majors and minors; 12 credits in mathematics and chemistry in addition to required core; 24 credits in advanced physics courses in the fundamental areas of mechanics, quantum physics, electromagnetism, statistical physics, and experimental methods; two semesters (1 credit each) of a seminar course to train students for oral presentation of work in physics
- A minor or a second major in a different program

Required Courses

Core
Phys 1201*—Mechanics (4)
Phys 1202—Heat and Electricity (4)**
Phys 1203—Magnetism, Waves, and Optics (4)**
Phys 2001—Oscillations (2)
Phys 2021—Relativity and Quantum Physics (4)
Phys 2031—Quantum Physics Laboratory (1)

Additional Courses (24)
Phys 3061—Instrumentation (3)
Phys 4001—Classical Mechanics (4)
Phys 4011—Electromagnetic Theory (4)
Phys 4021—Quantum Physics II (4)
Phys 4031—Thermal and Statistical Physics (4)
Phys 5061—Experimental Methods (3)
Phys 5090—Physics Seminar (2)

Required Courses From Other Programs

Core
CS 1131*—Introduction to Programming in FORTRAN (3)
Math 1296*—Calculus I (5)
Math 1297—Calculus II (5)

Additional Courses
Chem 2172*—General Chemistry (4)
Math 3280—Differential Equations with Linear Algebra (4)
Math 3298—Calculus III (4)

* Courses that may be used to fulfill UMD liberal education program requirements.
** Phys 1204—Electricity, Magnetism, and Optics (5) and Phys 1205—Waves and Heat (3) may be substituted for the pair Phys 1202 and Phys 1203

Final Project
No final projects, internships, or seminars are required, except as part of Phys 5090—Physics Seminar.

Minor Requirements
This minor program (35 credits) provides an introduction to classical and quantum physics.

Core (32)
CS 1131*—Introduction to Programming in FORTRAN (3)
Math 1296*—Calculus I (5)
Math 1297—Calculus II (5)

Additional Courses
Phys electives at 3xxx or above (3)

** Phys 1204—Electricity, Magnetism, and Optics (5) and Phys 1205—Waves and Heat (3), may be substituted for the pair Phys 1202 and Phys 1203

Applied Physics

B.S.
The B.S. in applied physics is primarily for students planning to work in industry. The physics courses emphasize conceptual foundations, problem-solving skills, and experimental and computational techniques.

Degree Requirements
The requirements for the B.S. in applied physics (120 credits) include:

- UMD liberal education requirements
- Advanced writing requirement: Comp 3150 (3 credits)
- Major requirements (76 credits):
  32-credit core required for all physics majors and minors; 15 credits in chemistry, computer science, and mathematics in addition to required core; 10 credits in computational and experimental methods; 17 credits in electives chosen from advanced physics courses and courses in other technical areas, such as limnology and engineering; two semesters (1 credit each) of a seminar to train students in oral presentation of work in physics
- A minor or a second major in a different program
### Required Courses

#### Core
- Phys 1201*—Mechanics (4)
- Phys 1202—Heat and Electricity (4)**
- Phys 1203—Magnetism, Waves and Optics (4)**
- Phys 2001—Oscillations (2)
- Phys 2021—Relativity and Quantum Physics (4)
- Phys 2031—Quantum Physics Laboratory (1)
** Phys 1204—Electricity, Magnetism, and Optics (5) and Phys 1205—Waves and Heat (3) may be substituted for the pair Phys 1202 and Phys 1203.

#### Additional Courses (12)
- Phys 3061—Instrumentation (3)
- Phys 5051—Computational Physics (4)
- Phys 5061—Experimental Methods (3)
- Phys 5090—Physics Seminar (2)

#### Electives (8)
- Phys 4001—Classical Mechanics (4)
- Phys 4011—Electromagnetic Theory (4)
- Phys 4021—Quantum Physics II (4)
- Phys 4031—Thermal and Statistical Physics (4)

#### Technical Electives (9)
- Phys 5041—Optics (3)
- Phys 5062—Advanced Laboratory (2)
- Phys 5531—Introduction to Solid State Physics (3)
- Phys 5541—Fluid Dynamics (3)

### Required Courses From Other Programs

#### Core
- CS 1131*—Introduction to Programming in FORTRAN (3)
- Math 1296*—Calculus I (5)
- Math 1297—Calculus II (5)

#### Additional Courses
- Chem 2172*—General Chemistry (4)
- CS 1211*—Introduction to Programming in C (3)
- Math 3280—Differential Equations with Linear Algebra (4)
- Math 3298—Calculus III (4)
* Courses that may be used to fulfill UMD liberal education program requirements.

#### Electives
- May be used toward 9 credits in technical electives:
  - An approved set of Engr courses
  - Lim 5601—Limnology I: Physics and Chemistry (4)

### Final Project

No final projects, internships, or seminars required, except as part of Phys 5090—Physics Seminar.

### Minor Requirements

An applied physics minor is not available, but see the B.S. and B.A. degrees for a description of the physics minor.

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### Teaching Physics Minor

See College of Education and Human Service Professions for program description.

### Statistics (Math and Stat)

#### Department of Mathematics and Statistics

**Advisers:** R. Green, B. James, K. James, R. Regal

The science of statistics is concerned with generating and analyzing data. The mathematics and statistics major trains students in theoretical, applied, and computational statistics used in a variety of disciplines. See Mathematics for a description of the mathematics—statistics B.S. major.
Graduate School

UMD offers the master of fine arts in art (emphasis in graphic design); master of arts in communication sciences and disorders, counseling psychology (emphasizes in community counseling, college counseling, and school counseling), and English; master of science in applied and computational mathematics, biology, chemistry, computer science, geology, and physics; master of business administration; master of liberal studies; master of music; and master of social work.

All-University M.S./Ph.D. programs in toxicology and water resources science are offered jointly with the Twin Cities campus. In addition, several graduate programs operate at UMD under the aegis of graduate programs on the Twin Cities campus. Cooperative programs offered at both the master's and doctoral levels include biochemistry, microbiology, pharmacology, and physiology.

Admission

Any student with a U.S. bachelor's degree or a comparable foreign degree from a recognized college or university may apply to the Graduate School dean for admission. Applicants with the necessary background for their chosen major field, an excellent scholastic record from an approved college or university, and appropriate professional qualifications may be admitted for graduate work on recommendation of the graduate faculty in the proposed major field and approval of the Graduate School dean. The Graduate School operational standard for admission is an undergraduate grade point average (GPA) of 3.00. Individual programs may require a higher GPA. Applicants should consult the program to which they are applying for more specific information about admission standards.

University of Minnesota undergraduates who have no more than 7 semester credits or two courses to complete for the bachelor's degree (including both distribution and total credit requirements), if they are admitted, may register in the Graduate School to begin a graduate program while simultaneously completing their baccalaureate work. Before registering in the Graduate School, students must have the minimum number of credits required for their undergraduate degree.

Graduate School faculty and staff encourage applications from persons of color or other groups that have been underrepresented in the student body.

Application Fee

For each program, the Graduate School application fee is $50 for U.S. applicants and $55 for foreign applicants. This fee is subject to change. The most detailed and up-to-date information about the fee is included in the instructions that accompany the Graduate School Application for Admission.

Transcripts

Two copies of official transcripts of all previous academic study must be submitted. Also, during the program of study, students often need a complete set of official credentials covering previous college and university training. Applicants, therefore, are urged to request three sets of official credentials when preparing their application for admission: one to be submitted with the application, one for permanent filing in the Graduate School office, and the other for personal use.

International Applicants

International applicants must submit complete credentials. Details on the types of transcripts required are given in the Graduate School Application for Admission instructions.

GMAT

Business administration applicants must take the Graduate Management Admission Test (GMAT) and request that an official report of the results be sent to the Graduate School from the Educational Testing Service as part of the admission application. Because this test is given at limited times and places during the year, applicants are advised to register early for the examination. For more information, contact the Educational Testing Service, Box 6000, Princeton, NJ 08541-6000. Under certain circumstances, alternatives to the GMAT can be used; contact the business administration program for more information.
GRE

Students who submit undergraduate narrative transcripts or transcripts containing pass-no credit (S-N), credit, or other ungraded notations for a substantial number of courses taken during the junior and senior years, or whose transcripts do not show a substantial number of letter grades during these years, must submit the results of the Graduate Record Examination (GRE) General Test and, if available, a Subject Test appropriate to the proposed major in the Graduate School.

The GRE General Test is required of all applicants for programs in applied and computational mathematics, biology, computer science, counseling psychology, English, and geology. International applicants who are applying for assistantships from any science program not listed here are also strongly urged to submit general test scores in support of their application. Arrangements to take these tests can be made through the Educational Testing Service, Box 6000, Princeton, NJ 08541-6000 USA.

TOEFL

The operational standard for admission to the Graduate School is a score of at least 550 on the Test of English as a Foreign Language (TOEFL) (or 213 on a computer-based test taken after June 1998). Individual programs may have higher requirements. This examination is required of all international applicants whose native language is not English and who have not lived in the United States for at least one year while completing at least 18 semester credits. This requirement will not be waived. Test scores must be less than two years old. For more information, write to TOEFL, Box 899, Princeton, NJ 08541-6151 USA. If desired, the Michigan English Language Assessment Battery (MELAB) is an alternative to the TOEFL; a minimum score of 80 is required. Information about the MELAB is available by writing to the English Language Institute, Testing and Certification, 3020 North University Building, University of Michigan, Ann Arbor, MI 48109-1057 USA.

Additional Information

The Graduate School and individual programs within it reserve the right to request additional information when they believe it is necessary.

Application Procedure

Requests for application materials must be sent to the Graduate School, 431 Darland Administration Building, University of Minnesota Duluth, MN 55812. Requests should specify the applicant’s proposed major field, degree objective, and desired date of entry. Requests can also be entered at <www.d.umn.edu/grad/> on the World Wide Web.

Applicants are encouraged to apply for admission well in advance of the term in which they wish to enter the Graduate School (but no more than one year in advance of the proposed entry date). The Graduate School application, complete with all required materials, must be submitted by the following deadlines.

- Fall semester: July 15
- Spring semester: November 1
- Summer session: May 1

Deadlines that occur on a holiday or weekend will be extended through the next regular workday. Many major fields have established deadlines earlier than those listed above and also require additional application and supporting materials. It is the applicant's responsibility to obtain information on those deadlines and requirements from the specific program descriptions in this catalog and from the director of graduate studies in the proposed major field.

Professional Development

Applicants who wish to enroll in a field in the Graduate School but are not interested in a graduate degree may apply for admission for professional development courses. These applicants must complete the usual application materials and meet existing deadlines and admission standards. Because some major fields restrict admission to those planning on pursuing an advanced degree, applicants are advised to consult with the director of graduate studies in their proposed major field before completing application materials.

Visiting Graduate Students

Students who have registered within the previous two years in a graduate degree program at another recognized U.S. graduate school and wish to enroll for a summer session or a single semester in the Graduate School of the University of Minnesota to earn credits to apply toward their degree program may be
admitted as visiting graduate students. Visiting graduate status may not be granted for more than one semester or one summer term. Students seeking visiting graduate status should request and complete the Visiting Application available from the UMD Graduate School office, 431 Darland Administration Building. This form must be approved by the Graduate School before registering for classes.

**Academic Staff**

University of Minnesota staff holding academic appointments above the rank of instructor or research fellow are normally not permitted to complete a graduate degree at the University. Those who wish to register for courses and transfer them elsewhere may apply for admission for professional development courses.

**Readmission, Change of Major or Degree Objective**

Admitted students who have not registered in the Graduate School at least once a year must request readmission before registering for classes, submitting petitions, filing for graduation, scheduling examinations, or submitting a degree program/thesis. If readmitted, the student must also register for at least one credit in the Graduate School. Students admitted to the Graduate School who fail to register for classes within one year of their admission date are also required to reapply for admission. Students who have completed a degree or certification program and who wish to take additional work in the Graduate School must apply for readmission. Students currently enrolled who wish to change their major field or degree objective from that originally approved by the Graduate School must complete and submit a Change of Status form. Readmission or Change of Status forms may be obtained from the UMD Graduate School office, 431 Darland Administration Building. A minimum of six weeks before the desired date of enrollment is typically required to process these requests.

**Change of Campus**

Students enrolled in the Graduate School on one campus who wish to complete their studies on another campus should complete and submit a Change of Status form.

**Registration**

New graduate students must obtain directions for registration at the UMD Graduate School office. Graduate fees are listed in the General Information section of this catalog.

**Registration Requirements**

The University requires that graduate students holding appointments as teaching or research assistants or administrative fellows must register for at least 6 A-F or S-N credits in the Graduate School each term that an appointment is held. This does not apply to summer terms. Exceptions to this can be done via petition to the program’s director of graduate studies. To be exempt from FICA withholding, a graduate assistant must register for 3 or more credits. Audit registration by itself is not acceptable for maintaining an assistantship. Medical fellows must also register each term an appointment is held, including summer terms.

Students receiving other types of financial aid from the University or other agencies, international students with certain types of visas, and students wishing to use various University services and facilities may have to meet specific registration requirements of other agencies or University units. These students are responsible for securing information about such requirements from the appropriate offices.

Active graduate students need not register for the sole purpose of taking final written or oral examinations for the master’s degree or specialist certificate or for taking the preliminary written or oral examinations for the doctorate.

Master’s degree candidates are not required to register for any specific number of semesters.

**Types of Registration**

The two kinds of registration used by graduate students at UMD are:

*For Coursework*—The maximum number of credits for which a graduate student may register in a single semester during the academic year is 18; in a single summer session, 11. Exceptions are granted by the Graduate School office only under unusual circumstances.

*Thesis Credit*—Regardless of their initial dates of entry to the Graduate School, all students enrolled in a Plan A master’s program must register for at least 10 master’s thesis credits (8777), and all students enrolled in a doctoral program must register for at least 24 doctoral
thesis credits (8888). Doctoral thesis credits can only be taken after the semester in which the preliminary examination is passed.

**Doctoral Pre-Thesis Credits (8666)**
These credits are available for doctoral students who have not yet passed their preliminary oral examination but who need to be registered in the Graduate School to meet requirements of agencies or departments outside the Graduate School (e.g., loan agencies). Doctoral pre-thesis credits are not graded. *Note: Registration for doctoral pre-thesis credits cannot be used to meet any Graduate School degree requirements.*

**Registration Holds**
Registration holds may be placed on student records when students fail to file official degree programs and/or thesis proposals or when they accumulate an excessive number of incompletes. Students who fail to meet Graduate School or major field standards for scholarly achievement may also have a hold placed on their registration.

**International Students**
International students are normally required to maintain registration in the Graduate School to satisfy the rules of the Immigration and Naturalization Service (INS). Students should, therefore, plan their programs carefully to meet this requirement. The Graduate School is required to notify the INS office when an international student fails to maintain registration.

**Official Transcripts**
Official transcripts of Graduate School students are available at UMD’s Campus Center Information Desk except for students who registered in the Graduate School summer session II, 1972 or earlier. Official records of these students are maintained in the Office of the Registrar, University of Minnesota, 200 Fraser Hall, 106 Pleasant Street S.E., Minneapolis, MN 55455.

**Changes in Registration**
All registration changes require an adviser's signature. During fall and spring semesters, Friday of the second week of the semester is the last day to add a course or change sections of a course, change grading option (including to or from auditor status), or cancel a course without a W (indicating withdrawal) appearing on the transcript. During the summer term, the deadline for such changes is the fifth day of instruction.

Students may cancel courses through Friday of the eighth week of the semester; canceling courses after the eighth week requires the approval of the adviser, instructor, and UMD Graduate School office. During the summer term, students may cancel a course through the last day of instruction with the adviser's signature.

Students cannot change their registration after the last day of instruction of a semester or register for previous semesters.

**Rate Structure**
Students registering for 1 through 5 credits (part time) do so on a per-credit basis. Students registering for 6 through 14 credits do so on a flat-rate basis. Registration for credits beyond 14 credits is on a per-credit basis.

Students from North Dakota, South Dakota, Wisconsin, and Manitoba may wish to take advantage of tuition reciprocity. Because tuition procedures differ, contact the UMD Office of Admissions for specific information.

**Transfer of Credits**
Master's degree students are required by the Graduate School to complete at least 60 percent of the course credits (excluding thesis credits if any) for their official degree programs as registered Graduate School students. With the approval of the adviser and director of graduate studies of the major field (and the director of graduate studies in the minor field if the courses are to be applied to a designated minor) and the Graduate School, the transfer of up to 40 percent of the degree coursework from other recognized graduate schools, or from adult special and University College status at the University of Minnesota, in any desired combination, is permitted. Individual graduate programs may, at their option, specify a lower percentage of coursework for transfer.

The work to be transferred must be postbaccalaureate graduate level that was taken for graduate credit and taught by faculty authorized to teach graduate courses. University College courses must bear the special UC transcript entry verifying that they were completed for graduate credit. Credits transferred from other institutions must appear on official graduate school transcripts of the institutions. Credit for courses completed through independent (correspondence) study, completed through extension or special categories at other institutions, or taken before the awarding of the baccalaureate, cannot be transferred.
Any transfer course which will be used to satisfy degree requirements must be included on the proposed degree program. If the course has been completed by the time the degree program is approved, the transfer process is automatic. If the transfer course has not been completed by the time the degree program is approved, the course is not automatically transferred. To complete this transfer an appropriate petition must be submitted and approved. More information regarding this process can be obtained from the UMD Graduate School office, 431 Darland Administration Building.

In the case of a transfer from a non-U.S. institution, credits must have been earned in a program comparable to a graduate degree program at a regionally accredited U.S. institution.

Financial Aid
Fellowships and scholarships are available through the Graduate School. For more information, contact the director of graduate studies in the particular program or the UMD Graduate School office.

Assistantships (teaching and research) are normally granted through the individual departments and information can be obtained by writing to the director of graduate studies for the particular program. Graduate assistants on a 25 percent or greater appointment will receive free health and medical insurance coverage.

Some residence counseling positions may be available. For information, write to the Housing Office, 149 Lake Superior Hall, University of Minnesota Duluth, MN 55812.

Inquiries regarding loan funds, living accommodations, employment, and placement should be addressed to the Vice Chancellor for Academic Support and Student Life, 297 Darland Administration Building, University of Minnesota Duluth, MN 55812.

Two Degrees
Students may have a maximum of 8 semester credits in common between two Plan A master's degrees, two Plan B master's degrees, or a Plan A and Plan B master's degree.

Master's Degree Requirements
The master's degree is offered under two plans: Plan A (involving a thesis) and Plan B (involving additional coursework and/or special projects in place of a thesis). Plan B is the only plan available at Duluth for majors in art, business administration, communication sciences and disorders, counseling psychology, English, liberal studies, music, and social work. Applied and computational mathematics, biology, chemistry, computer science, geology, and physics majors may select either Plan A or Plan B.

Time Requirement
The maximum time allowed by the Graduate School for completion of the master's degree is seven years. The seven-year period begins with the oldest work included on the official degree program, including any transfer work applied. The graduate faculty in a specific program may set more stringent time requirements.

Grading System
The Graduate School uses two grading systems, A-B-C-D-F (with pluses and minuses) and S-N. Except in courses in which grading has been restricted to one system or the other, students have the option of choosing the system under which they will be graded. Students must declare a grading system choice as part of their initial registration. Changes in grading options must be made by the end of the second week of class (end of the first week during summer sessions). For information about courses in which grading is restricted, students should consult the department offering the course. Instructors must explain to students the achievement level necessary to earn an S grade for a course.

Course instructors may, at their discretion, set a time limit for removal of incomplete grades. In general, it is recommended that incomplete grades be removed within one calendar year. A student with an excessive number of incompletes may be denied further registration until some of them have been removed.

The Graduate School discourages retaking courses to improve grades. Permission of the course instructor and the major adviser is required to do so. If a course is retaken, all registrations for it remain on the student's record.
Minimum Grade Requirements
The minimum GPA required by the Graduate School for courses included on the official program for any master's degree is 2.80 (on a 4.00 scale). 5xxx and 8xxx courses with grades of A, B, C (including C-), and S may be applied to a Graduate School degree program. Under some circumstances and with approval of the student's major field, 4xxx, 6xxx, and 7xxx courses may also be applied to a Graduate School degree. Grades of A, B, C, and S are acceptable, but grades of S are not calculated in the GPA. At least two thirds of the course credits taken in the Graduate School (excluding thesis credits) and included in any degree program must be taken A-F.

Individual major fields may set higher grade requirements, and students should be familiar with special requirements in their major field.

Transfer of Plan
A student transfers from one plan for the master’s degree to the other by submitting to the Graduate School a revised program form signed by the adviser, director of graduate studies for the major, and director of graduate studies for the minor if a minor is declared.

Plan A: Master's Degree With Thesis
Major and Related Field(s) or Minor—Students must complete an approved program of coursework consisting of at least 14 semester credits in the major field, at least 6 semester credits in one or more related fields outside the major, and at least 10 thesis credits (8777).

Students who wish to complete a designated minor (certified on the transcript; related fields option is not) must complete at least 6 semester credits in a single field. A designated minor must be approved by the director of graduate studies in the minor field.

In cases where the student takes coursework beyond the minimum requirements, both the adviser and the Graduate School may demand comparable standards of performance for all work taken.

Admission to the Graduate School requires the specification of a major field. Any proposal for a subsequent change in major necessitates a formal request to the Graduate School.

Official Degree Program—After completing 10 credits and ordinarily not later than the second semester of registration (the second year for longer programs), students must file an official degree program with the Graduate School. This requirement may vary with the program. The program form is available in the UMD Graduate School office. Students list all coursework, completed and proposed, that will be offered to fulfill degree requirements, including transfer work. If a foreign language is required, it is specified. If the degree is being completed under Plan A, students should also include the proposed thesis title. The members of a student's final examining committee (who are the thesis reviewers for Plan A) are appointed by the Graduate School dean on recommendation of the faculty in the major field at the time the student's official degree program is approved. A degree program approved by the Graduate School must be on file before reviewers report, examination, or graduation forms can be released to the student.

Program Changes—Once approved, the program must be followed to meet graduation requirements. Alterations in the program, including committee changes, must be requested in advance by means of a Graduate School petition form.

Language Requirement—See the appropriate major field under Program Statements below to determine the language requirement, if any, for that field. The Graduate School monitors the fulfillment of the language requirement when a major field specifies one. Information about how the student must demonstrate proficiency and the conditions under which proficiency will be recorded on the official transcript is available from the UMD Graduate School office.

Master's Thesis—The thesis title is submitted for approval as part of the information provided on the student's official degree program form available from the UMD Graduate School office. The thesis title must be approved by the adviser. The thesis must be on a topic related to the major, be written in acceptable English, demonstrate the student's ability to work independently, and display the student's power of independent thought both in perceiving problems and in making satisfactory progress toward their solution. Familiarity with the bibliography of the special field and correct citation of authorities are expected.

Three unbound copies of the thesis must be provided and a $10 fee paid. Two copies are for the University library in Minneapolis, and one is for the Duluth campus library. The student's adviser(s) must sign all three unbound copies of the thesis to confirm that they are complete and satisfactory in all respects and that all revisions required by the final examining committee have been made.
The copies must be on 20-pound linen stock of 75 percent rag content. The original and two copies must contain all illustrative material. If photographs are included, all three copies must contain original photographs (i.e., no photocopies). Ample margins should be left for binding purposes. The body of the thesis should be double spaced, but footnotes may be single spaced. Photocopy methods of reproduction will be accepted (except photographs), provided that 20-pound rag content bond is used and adequate contrast and clarity is provided.

Thesis Registration—Students are required to file the title of their thesis with the Graduate School before taking their oral examinations. They may obtain forms for this purpose in the UMD Graduate School office.

The thesis is examined by a committee of not less than three members, appointed by the Graduate School dean upon recommendation of the adviser and the director of graduate studies. The examining committee will include at least two representatives of the major field and one representative of the related or minor field. This committee must be unanimous in certifying that the thesis is ready for defense, and a record of this action must be filed in the UMD Graduate School office on the appropriate form before the candidate may be admitted to the final written or oral examination.

The thesis may include materials that students have published while University of Minnesota graduate students, provided the research was carried out under the direction of the graduate faculty and approved by the adviser for incorporation into the thesis. The adviser should notify the Graduate School in writing of the intent to publish part of the thesis materials, but Graduate School approval is not required.

If the thesis is accepted, the candidate should immediately begin to have it prepared in its final form and should submit the Application for Degree before the first working day of the month the candidate plans to graduate. Application for Degree forms must be obtained from the UMD Graduate School office. Two unbound copies of the thesis, including the original, must be submitted to the UMD Graduate School office by the last working day of the month of proposed graduation.

Final Examinations—Candidates for the master’s degree, Plan A, must pass a final oral examination; a final written examination may also be required at the discretion of the graduate faculty in the major field. If both a written and an oral examination are specified, the written examination must precede the oral examination.

The final examination covers the major and minor or related fields and may include other related work. This examination is coordinated by the chair of the student’s examining committee. A majority vote of the committee, all members present and voting, is required for a pass. Results are reported to the Graduate School on a Final Examination Report that is issued to the student when the form certifying the thesis is ready for defense is submitted. In case of failure, unanimous consent of the examining committee is required to retake the examination, providing the reexamination is conducted by the original committee.

Reports—Forms are provided for signed reports concerning the thesis and the final written or oral examinations. All reports must be filed in the UMD Graduate School office by the published deadline.

Plan B: Master’s Degree Without Thesis

The requirements for this plan follow Plan A in matters of admission and language requirements. Unless otherwise specified by the program, a Plan B student must pass either a final written examination or a final oral examination, or both, at the discretion of the graduate faculty in the major field. Plan B differs from Plan A in substituting for the thesis a heavier course requirement and/or special projects. For professional purposes, the master’s degree program under Plan B is less a test of research interest and more adapted to individuals who will profit by a broader range of knowledge in their fields. Whether taken for professional or personal purposes, the requirements for Plan B are meant to test interests and intellectual abilities for a different purpose, but not on a different level, from that of Plan A.

Under Plan B, students must complete an approved program of coursework consisting of at least 30 semester credits. At least 14 of these credits must be in the major field, at least 5 credits must be in one or more related fields outside the major, and the remaining credits may be in either the major or related fields. Normally a majority of the program credits are in the major field. These are minimum credit requirements; some major fields require additional work.
After completing 10 credits and ordinarily not later than the second semester of registration (the second year for longer programs), students must file an official degree program with the Graduate School. This requirement may vary with the program. The program form is available in the UMD Graduate School office. Students list all coursework, completed and proposed, that will be offered to fulfill degree requirements, including transfer work. If a foreign language is required, it is specified. The members of a student’s final examining committee are appointed by the Graduate School dean on recommendation of the faculty in the major field at the time the student’s official degree program is approved. A degree program approved by the Graduate School must be on file before reviewers report, examination, or graduation forms can be released to the student.

Students who wish to complete a designated minor (certified on the transcript; related fields option is not) must complete at least 6 semester credits in a single field. A designated minor must be approved by the director of graduate studies in the minor field.

If Plan B projects are required, these should take a combined minimum of 120 hours of effort on the part of the student. This requirement may be satisfied through papers written in conjunction with regular courses, papers written in specially designed courses, presentation of a studio show (art), or other appropriate methods. Students should consult individual programs concerning the project’s requirement. If one Plan B project is required, it must be in the major; additional projects may be in related field(s).

In cases where the student takes coursework beyond the minimum requirements, both the adviser and the Graduate School may demand comparable standards of performance for all work taken and, in evaluating and approving the minimum program submitted, will reject the minimum degree program if the GPA for the total number of courses taken falls below 2.80 and may terminate candidacy.

Under this plan, the candidate is examined by a committee of not less than three members, two from the major field and one from a related field or minor, appointed by the Graduate School dean upon recommendation of the adviser and the director of graduate studies. The adviser is expected to contact the UMD Graduate School office before the student’s final examination for the degree to obtain an Examination Report Form for use by the student’s committee. The student makes available to the examining committee for its review the projects prepared to fulfill the required 120 hours of effort, within an adequate period of time to allow for evaluation before the examination(s). A majority vote of the committee, all members present and voting, is required to pass. The vote is reported to the Graduate School on a form the student must obtain from the UMD Graduate School office before taking the examination. In case of failure, unanimous consent of the examining committee is required to retake the master’s final examination, providing the reexamination is conducted by the original committee.

**Termination of Graduate Student Status**

When performance is unsatisfactory in terms of grades or normal progress standards, as established and promulgated by the graduate faculty in the major field, graduate student status may be terminated. All guidelines stated in this catalog represent minimal requirements, and each program is free to set more specific terms by which progress will be measured for purposes of continuation. Notice of termination will be in writing.

**Attendance at Commencement**

Subject to satisfying participation requirements, attendance at commencement is voluntary. However, all candidates are individually recognized at the ceremony and must inform the Graduate School whether or not they will attend. The policy governing commencement ceremony participation is attached to the Application for Degree.

**Sexual Harassment**

See Policies and Procedures for information on sexual harassment.

**Program Statements**

A synopsis of information concerning each major and minor field follows. Further details are available from the directors of graduate studies. Courses in each area are listed in Course Descriptions under the appropriate department headings.
General information concerning graduate work on the Duluth campus may be obtained from the Graduate School office. The University of Minnesota Graduate School Catalog may be requested by writing to the Graduate School, University of Minnesota, 316 Johnston Hall, 101 Pleasant Street S.E., Minneapolis, MN 55455. The zip code of the recipient is required for mailing catalogs.

**Degree Programs**

**Applied and Computational Mathematics**

**M.S.**

**Plan A and Plan B**

Associate Professor John R. Greene
Director of Graduate Studies

This program is for those wishing to pursue careers that use applied mathematics and statistics in science, industry, business, and teaching, and for those wishing to go on for Ph.D. degrees in mathematics or statistics. It emphasizes the use of modern modeling techniques and computational methods, with areas of concentration available in continuous and probability/statistics and discrete mathematics. The faculty is drawn largely from the Department of Mathematics and Statistics, but includes members from the Departments of Computer Science, Electrical and Computer Engineering, and Chemical Engineering.

**Admission Requirements**

Applicants should have completed an undergraduate degree in mathematics or statistics. However, a student with a degree in another major, and with a substantial background in mathematics or statistics (e.g., computer science or engineering), may also qualify; students lacking certain prerequisites may make up deficiencies concurrently with graduate work.

GRE General Test scores are required. Students whose native language is not English must submit their TOEFL scores.

**Degree Requirements**

The M.S. is offered under both Plan A (with thesis) and Plan B (without thesis). All students must complete at least 33 credits, of which at least 17 must be from approved mathematics or statistics courses or seminars (including a graduate seminar and two of the three core courses) and 6 must be from a minor or related field (statistics is a related field). Plan A also requires 10 thesis credits; Plan B requires a 2-credit project and an additional 8 credits from approved graduate-level mathematics, statistics, or related-field courses. There is an 8-credit limit on 4xxx credits that may be applied to the degree.

**Language Requirements**—None.

**Final Exam**—The final exams are written and oral.

**Minor Requirements for Students Majoring in Other Fields**—A master’s minor requires 6 credits in approved Math or Stat courses.

**Art—Graphic Design**

**M.F.A.**

**Plan B**

Associate Professor Robyn Rosiak
Director of Graduate Studies

Graphic design is the manipulation of type and image for communication. Traditionally, this has meant design for the print medium, but the same skill and understanding go into design for video, computer-based presentations, and an ever-widening range of applications. The Department of Art strongly believes that, even though many graphic design M.F.A. graduates choose to practice rather than teach, the M.F.A. is a primary prerequisite for teaching at the university level, and M.F.A. programs therefore have a responsibility to prepare students for academic as well as aesthetic rigor. Consequently, although the M.F.A. is largely a studio degree, the program includes a strong analytical and intellectual component.

The department also believes that such rigor is ultimately the best approach for training graphic design practitioners as well. The field is rapidly changing, and only by being versed in the traditional capacities of the area, the skills and knowledge of related fields, and the skills of critical thought can future designers hope to lead rather than merely react to changes.

**Admission Requirements**

Applicants should have an interest in art-making and the cultural and historical importance of art, and have a B.A., B.S., or B.F.A. in art. Individuals with undergraduate degrees in other disciplines who have completed a substantial number of art courses also may be considered for admission. Deficiencies in undergraduate preparation may be made up concurrently with graduate work.
Applicants must have a minimum undergraduate GPA of 3.00. Those whose native language is not English must have a TOEFL score of at least 213 or a MELAB score of 80. The GRE is not required.

A portfolio of at least 20 slides of design work (or work submitted on videotape or disk), a letter of intent, a sample of the applicant's writing (written in or translated into English), and three letters of recommendation are required as part of the application.

**Degree Requirements**
The M.F.A. program requires at least two years in residence and 60 credits. The program may be completed on a part-time basis by first taking all requirements other than the Art 8901—Graduate Seminar/Art 8980—Graduate Studio series and Art 8990—M.F.A. Creative Thesis. The 8901/8980 series must be taken within a two-year period. A final project and minimum 15-page supporting paper are required. Although a gallery exhibition is typical, the project may take forms such as a book, video, Web site, or interactive project.

**Language Requirements**—None.

**Final Exam**—An oral exam based on the project and supporting paper is required.

**Minor Requirements for Students Majoring in Other Fields**—Not applicable.

**Biochemistry**
See Cooperative Programs.

**Biology**

**M.S.**

**Plan A and Plan B**

Associate Professor David J. Schimpf
Director of Graduate Studies

The program offers study toward the M.S. under either Plan A or Plan B. Plan A students must select an area of concentration from among botany, cellular and physiological biology, environmental biology, or zoology.

**Admission Requirements**

Introductory biology and at least 16 additional semester credits of approved coursework in biology; a sequence in inorganic chemistry; a sequence in organic chemistry; differential and integral calculus; and a sequence in general or introductory physics (or approved alternative courses in physical or analytical sciences).

Students with deficiencies may be admitted with the provision that equivalent coursework or approved substitutions be completed during the first year of graduate study.

As part of their application materials, applicants must also submit recent GRE General Test scores.

Prior coursework and/or GRE scores are used to ascertain proficiency in the areas of general biology, genetics, cell biology, and ecology. Such proficiency is considered in the admission decision.

**Degree Requirements**

Plan A students must complete at least 14 course credits in the major, including at least 10 credits in courses approved for the selected area of concentration and Biol 8099—The Biological Practitioner; at least 6 credits of approved coursework in one or more related fields or a minor; and at least 10 thesis credits. Plan B students must complete Biol 8099—The Biological Practitioner, at least 13 other course credits in the major, at least 6 credits of approved coursework in one or more related fields or a minor, and at least 10 credits of other approved coursework. Plan A requires a thesis; Plan B requires one to three Plan B projects.

**Language Requirements**—None.

**Final Exam**—Students must present a department seminar and pass a final oral exam.

**Minor Requirements for Students Majoring in Other Fields**—Any course that may be used as credit for the major may be used as credit toward the minor.

**Business Administration**

**M.B.A.**

**Plan B, Coursework Only**

Professor Thomas B. Duff
Director of Graduate Studies

The M.B.A. program is designed and offered to meet the needs of residents of northeastern Minnesota and northwestern Wisconsin who are currently employed full time, pursuing professional managerial careers, and seeking general management education at the graduate level part-time. To meet the needs of these practitioners, the M.B.A. core courses and electives are offered in the evening, with most courses meeting one evening per week. Full-time enrollment is possible, however, and a relatively small number of domestic and international students enroll full time.
Admission Requirements
Applicants must have a bachelor's degree from an accredited college or university; completed prerequisite or foundation courses in accounting, economics, finance, production/operations, marketing, organizational management, and human resource management or be able to demonstrate knowledge and proficiency in each of these areas; and have an acceptable score on the GMAT or GRE, passed the Certified Professional Accountant (CPA) examination, or completed a graduate degree from an accredited college or university. In addition, international students must have an acceptable score on the TOEFL.

The bachelor's degree may be in any field; however, students who have had little or no undergraduate or other education in business administration must complete prerequisite or foundation courses in the areas identified above. These courses must be completed before admission to the M.B.A. program and no graduate credit or credit toward M.B.A. program requirements is granted for prerequisite courses.

Degree Requirements
The M.B.A. requires 32 credits. All students must complete six core and three support area courses, which provide exposure to financial reporting, analysis, and markets; the domestic and global environments of business and organizations; the creation and distribution of goods and services; and human behavior in organizations. Also required is a capstone strategic management course and at least 2 credits of cross-functional experience selected from special topics, workshops, projects, or field study. Students then choose one of two options for completing an additional 6 credits of elective coursework: coursework only or field research (Plan B).

Language Requirements—None.
Final Exam—For Plan B, students meet with their faculty committee for a final review of their completed project. For coursework only, no final exam is required.
Minor Requirements for Students Majoring in Other Fields—Not applicable.

Chemistry
M.S.
Plan A and Plan B
Professor Donald P. Poe
Director of Graduate Studies

The M.S. program offers a broad-based education in chemistry that is well-suited to students going on to Ph.D. programs, careers in industry, or professional schools. Both Plan A (with thesis) and Plan B (without thesis) are available. For Plan A, emphases include analytical, biological, inorganic, organic, and physical chemistry. The faculty include members from the Department of Chemistry in the College of Science and Engineering and from the Department of Biochemistry and Molecular Biology in the School of Medicine.

Admission Requirements
Applicants must have completed an undergraduate chemistry major, including a junior-senior level course in inorganic chemistry, one year of physical chemistry, mathematics through calculus, and one year of college physics, preferably taught using calculus. Students lacking some of these prerequisites may make up deficiencies concurrently with graduate work.

Degree Requirements
All students must complete 30 credits, including at least 14 credits in the major (including four core courses) and 6 credits in a related field or minor. Plan A students must also register for 10 thesis credits; Plan B students must complete an additional 10 course credits and prepare three papers. Attendance and presentation at the chemistry seminar are required. Individual programs are designed to best serve the interests of the student. 4xxx courses must be approved by the director of graduate studies.

Language Requirements—None.
Final Exam—The final exam is oral.
Minor Requirements for Students Majoring in Other Fields—A master's minor requires at least 6 credits in chemistry courses. Individual programs must be approved by the director of graduate studies in chemistry.
Communication Sciences and Disorders

M.A.
Plan B
Associate Professor Faith C. Loven
Director of Graduate Studies

The graduate program in communication sciences and disorders effectively combines academic and clinical endeavors to prepare students to become speech-language pathologists. The program places a major emphasis on the development of clinical skills, although students have the opportunity to engage in a wide variety of academic and research activities as well. The curriculum, which is based on five semesters of study, is accredited by the Council of Academic Accreditation (CAA) and is accredited in speech-language pathology by the American Speech-Language Hearing Association (ASHA).

Admission Requirements
Applicants must have a bachelor's degree in communication sciences and disorders. Three letters of recommendation evaluating the applicant's scholarship and clinical skill are required. At least two letters should be from academic faculty familiar with the applicant. A personal statement of the applicant's short- and long-term goals is also required.

Degree Requirements
The M.S. is offered under Plan B only. At least 42 credits are required, including 30 credits of required CSD courses, 2 credits of Plan B project (CSD 8099), 4 credits of internship, and at least 6 credits of approved courses from related fields. All Plan B projects must be pre-approved by the student's examining committee, which also must give final approval.

Language Requirements—None.

Final Exam—The final exams are written and oral.

Minor Requirements for Students Majoring in Other Fields—Not applicable.

Computer Science

M.S.
Plan A and Plan B
Professor Carolyn J. Crouch
Director of Graduate Studies

Computer science is a discipline that involves understanding the design of computers and computational processes. The discipline ranges from the theoretical study of algorithms to the design and implementation of software at the systems and applications levels.

The M.S. is a two-year program that provides the necessary foundational studies for graduates planning to pursue either a Ph.D. in computer science or a career as a computer scientist in business or industry.

Admission Requirements
The program is for students with undergraduate degrees in computer science or computer engineering. These students should be able to enroll immediately in 8xxx computer science courses. Students with other backgrounds may be considered if they have completed the following courses or their equivalents: CS 1511-1521—Computer Science I-II; CS 2511—Software Development; CS 2521—Computer Organization; CS 4511—Automata, Computability, and Algorithms; CS 4521—Advanced Data Structures and Algorithms; CS 5621—Architecture; and CS 5631—Operating Systems. The appropriate math prerequisites, namely Math 1296-1297—Calculus I-II, and Statistics 3611—Probability and Statistics, are also required. Students who fail to meet these requirements may be admitted provisionally and must complete specified courses before proceeding with their graduate work. The GRE General Test is required; the TOEFL is also required of international students.

Degree Requirements
The M.S. is offered under Plan A (thesis) and Plan B (non-thesis). At least 33 credits are required, including 16 credits from 8xxx courses in computer science, 1 credit of CS 8993—Seminar, and 6 credits from a specified set of courses outside of computer science (minor or related field). Plan A also requires 10 thesis credits; Plan B requires at least 10 credits in additional computer science courses, 5xxx or above. All courses are chosen in consultation with the student's adviser, subject to approval by the director of graduate studies.
Language Requirements—None.
Final Exam—Students present a departmental colloquium, followed by an oral exam.
Minor Requirements for Students Majoring in Other Fields—At least 6 credits in computer science is required for a master’s minor.

Master of Education (M.Ed.)
For information about the master of education (M.Ed.) degree program, see College of Education and Human Service Professions in the Colleges and Schools section of this catalog, or write to the program director, 125 Bohannon Hall.

Counseling Psychology

M.A.
Plan B
Associate Professor Jane Hovland
Director of Graduate Studies

The M.A. in counseling psychology is based on a developmental philosophy that encourages academic learning and personal growth. The overall emphasis is on the promotion of healthy psychological functioning and the prevention of psychological disturbances. A core curriculum provides theoretical frameworks and practice in counseling skills from which students can develop their unique strategies and pursue specialty training.

Three emphases for specialty training are offered: community counseling, college counseling, and school counseling. The community and school counseling emphases are accredited by the Council for Accreditation of Counseling and Related Educational Programs (CACREP); the college counseling emphasis will be included in the next accreditation review. Students select an emphasis during their second semester.

Community counseling students may elect coursework that provides a foundation for pursuing licensure as a psychological practitioner in the State of Minnesota or as a licensed professional counselor in many other states. The college counseling emphasis offers preparation for student support and development in colleges and universities. The school counseling emphasis allows for specialization in grades K-8 or 5-12. Experiential requirements for Minnesota professional school counselor licensure can be met through completion of a supervised one-year school counseling residency after completing this program or through holding a valid Minnesota teaching license and having one year of teaching experience at the level of licensure desired.

Admission Requirements
A minimum undergraduate GPA of 3.00 and 6 semester credits in psychology or education, including an undergraduate inferential statistics course, are required. Applicants must submit scores from the GRE General Test with minimum scores of 350 on the verbal and quantitative sections; scores of 500 on both sections are preferred. A written statement providing evidence of social service or teaching experience and three recommendation forms are required. Applications should be submitted by March 15 for consideration for admission the following fall semester. Applications submitted after March 15 are considered only if space is available.

Degree Requirements
The M.A. requires 50 credits, including 31 counseling core credits, 13 professional emphasis credits, and 6 credits in a minor or related field. Counseling core credits include a 4-credit Plan B research paper (Psy 5061, 5062—Research Problems I, II) with an oral exam; professional emphasis credits include a semester practicum (2 credits) and a nine-month internship (23 hours per week, 6 credits). Core credits must include Psy 5051, 5052, 5061, 5062, 5121, 5501, 5502, 5601, 5603, 5611, 5651. Professional emphasis credits are as follows: community counseling—Psy 5125, 8001, 8101, 8197, 8297; college counseling—Psy 8003, 8101, 8397, 8497, 3-credit elective; school counseling—Psy 5201, 8005, 8101, 8597 or 8797, 8697 or 8897. A comprehensive examination is required after completing one year of full-time study.

Students pursuing licensure in Minnesota as psychological practitioners or professional school counselors must complete specified courses, which can be completed as major or related field requirements. Students should consult with the program for current specified courses, as requirements are determined by state agencies and may change.

Students must also complete a national counselor exam, such as the National Counselor Examination for Licensure and Certification (NCE), before graduation.

Language Requirements—None.
Final Exam—A final oral exam on the Plan B paper is required. Students must also take a national counselor exam.
Minor Requirements for Students Majoring in Other Fields—A master’s minor requires 8 credits of psychology and is structured to include a research component, counseling orientation, and an elective. Interested students should contact the director of graduate studies in counseling psychology.

English

M.A.

Plan B

Associate Professor Carol Bock
Director of Graduate Studies

The M.A. program offers courses in English, Irish, and American literature, creative writing, linguistics, composition and rhetorical theory, and English education. Students work closely with faculty in developing their own program of study through coursework, independent readings, and related research projects. The program has two master’s emphases: a literary studies emphasis for concentrated study of literature and preparation for the Ph.D. in English, and an interdisciplinary English studies emphasis for those who wish to teach English at the community-college level.

Admission Requirements

Students applying to either of these programs must submit GRE General Test scores, two writing samples such as course papers, and three letters of recommendation. International applicants must submit TOEFL scores of at least 600. Entering students should have completed 30 credits in English (these may include credits in literature, language, and advanced composition), including 28 upper division credits.

Applicants must have completed or complete as graduate students upper division courses in Chaucer, Shakespeare, Milton, and the English language or English linguistics. Certain course prerequisites may be taken concurrently with graduate work and may be applied toward degree requirements.

Degree Requirements

Literary Studies Emphasis (Plan B)
Requires at least 30 credits, including at least 24 credits in the major, 6-8 credits in a related field, and three Plan B projects.

English Studies Emphasis (Plan B)
Requires at least 31 credits, including at least 25 credits in the major, distributed in literature, linguistics, and composition/rhetoric; 6-8 credits in a related field; and three Plan B projects.

Language Requirements—The literary studies emphasis requires a reading knowledge of Latin, Greek, French, German, Italian, Spanish, Russian, or another approved language.

The English studies emphasis requires certification in a foreign language or completion of 6 course credits beyond the 31 required credits. Certification is gained by demonstrating a reading knowledge of a foreign language appropriate to the candidate’s area of study and approved by the English graduate committee. Candidates whose professional objectives are best served by completing the additional 6 credits select courses from literature and literary analysis, linguistics, composition/rhetoric, or courses closely related to the field of concentration.

Final Exam—The final exams are written and oral.

Students must submit Plan B papers (normally three) or projects totaling 120 hours of effort before taking the exam. The projects normally are completed in connection with courses in English or in a related field. A completed project must be approved by a graduate faculty member.

Minor Requirements for Students Majoring in Other Fields—At least 8 credits in English, composition, and/or linguistics is required for a master’s minor.

Geology

M.S.

Plan A and Plan B

Professor James Grant
Director of Graduate Studies

The M.S. program in geology encompasses areas of interest in hard-rock geology (igneous, metamorphic, and sedimentary petrology; economic geology; and Precambrian geology), Quaternary geology, hydrogeology, geoarchaeology, and physical and chemical limnology. Several of these areas are strengthened by collaboration with the Large Lakes Observatory, the Natural Resources Research Institute, and the Geoarchaeology Laboratory.
Admission Requirements
Applicants must have completed an undergraduate major in geology, geophysics, or related earth science with one year each of college mathematics (including calculus), chemistry, and physics. A full-time geological field course of at least five weeks is also required, as are GRE General Test scores.

Degree Requirements
The M.S. is offered under Plan A (thesis) and Plan B (non-thesis). Courses are selected with approval of the student’s adviser and the director of graduate studies; also, no more than 25 percent of the courses may be at the 4xxx level except by their approval. For both plans, a written candidacy exam during the second semester of residency is required.

Plan A requires 30 credits, including 14 course credits in the major, 6 course credits in a minor or related field (which may be taken within geology if they are in an area different from the student’s principal area), and 10 thesis credits. All courses must be at the 4xxx or 5xxx level. Plan B requires 30 credits in approved courses, including three Plan B papers.

Language Requirements—None.
Final Exam—The final exam is oral.

Minor Requirements for Students Majoring in Other Fields—A master’s minor requires at least 6 credits and is decided in consultation with the student’s adviser and the director of graduate studies in geology.

Master of Industrial Safety (M.I.S.)
For information about the master of industrial safety (M.I.S.) degree program, see College of Science and Engineering in the Colleges and Schools section of this catalog, or write to the program director, 229 Voss-Kovach Hall.

Interdisciplinary Archaeological Studies
See Cooperative Programs.

Liberal Studies

M.L.S.
Plan B
Professor James Fetzer
Director of Graduate Studies

The interdisciplinary M.L.S. is a community outreach program that provides citizens with the opportunity to return to higher education to broaden their intellectual horizons without having to focus on specific professional goals. Students choose to write one to three papers exploring in depth an interdisciplinary topic.

Admission Requirement
Applicants must have a bachelor’s degree from a recognized college or university.

The application should include a thoughtfully composed letter stating, in narrative form, reasons for wishing to pursue the M.L.S. and describing education and career experiences. This letter should be addressed to the director of graduate studies in the UMD Graduate School office.

Degree Requirements
The M.L.S. is offered under Plan B only. Students must complete at least 4 credits of IS 8001—Introduction to Liberal Studies, 4 credits of IS 8501—Seminars: Ethics and the Human Condition, 9 additional credits in humanities/classics or interdisciplinary studies courses, and 15 elective credits from any disciplines. One to three Plan B papers are required.

Language Requirements—None.
Final Exam—The final exam is oral.

Minor Requirements for Students Majoring in Other Fields—Not applicable.

Linguistics
Freestanding Minor
Professor Michael D. Linn

Linguistics, offered interdepartmentally and through the Department of Interdisciplinary Programs, may be elected by graduate students as a related field, or with approval of the director of graduate studies of the major, as a designated minor.

Degree Requirements
The minor in linguistics requires at least 12 credits selected from Engl 5811—Introduction to Modern English (4 credits), Engl 5821—History of the English Language
Colleges and Schools

(4 credits), Ling 5802—Applied Linguistics (4 credits), Ling 5852—Practicum in Teaching Linguistics (3 credits), and Ling 8500—Graduate Seminar (3 credits).

Microbiology
See Cooperative Programs.

Music

M.M. With Emphasis in Music Education
Plan B
Professor Judith Kritzmiere
Director of Graduate Studies

The M.M. program offers the practicing music teacher an opportunity to acquire advanced understanding and skills in music education theory and practice. Through required and elective courses in music, education, and music education, a course of study is designed to meet the interests and objectives of the student.

Admission Requirements
Applicants must have an undergraduate degree in music and have applied to the University of Minnesota Graduate School. In addition, the following must be submitted for review by the Music Graduate Committee: 1) Department of Music Graduate Study Application; 2) sample of professional writing (a three- to five-page paper addressing current issues in music education); 3) two letters of reference from professional colleagues and/or supervisors describing the candidate's potential for success in the graduate music program; and 4) an entrance performance audition on the major instrument or a videotape of classroom teaching or conducting.

Applicants may request additional information at 218/726-8208 or from the director of graduate studies, at jkritzmi@d.umn.edu.

Degree Requirements
The M.M. (Plan B) requires 30 credits, including 14 credits in music education and education (including Mu 8222—Music Bibliography and Research [3 cr] and Mu 8601—Foundations of Music Education [3 cr]); 8 credits in music—literature, performance, ensembles, history, and theory; 6 credits for the Plan B paper; and 2 elective credits.

Language Requirements—None.

Final Exam—A final oral exam on the Plan B paper is required.

Minor Requirements for Students Majoring in Other Fields—Not applicable.

Pharmacology
See Cooperative Programs.

Physics

M.S.
Plan A and Plan B
Associate Professor Bo R. Casserberg
Director of Graduate Studies

The M.S. program provides a grounding in the fundamentals of physics, combined with significant research involvement. The primary areas of research are computational physics, quantum theory and relativity, experimental work in condensed-matter physics, and observational and theoretical work in physical limnology.

Admission Requirement
An undergraduate degree in physics or the equivalent is required.

Degree Requirements
The M.S. is offered under both Plan A and Plan B. All students take 14 credits in a common core of courses (including Phys 5501, 5511, 5521, and 5522 and 2 credits in 5090) and 6 credits in a minor or related fields. Plan A also requires 10 thesis credits; Plan B requires one or more projects requiring at least 120 hours work total, preparation of a written report for each project, and 10 additional course credits in physics. These courses may include 4xxx courses, if appropriate and if approved for graduate credit; for distinctly interdisciplinary programs, the courses may be outside physics. In all cases, the overall plan of study and selection of elective courses must form a coherent program and be approved by the director of graduate studies.

Language Requirements—None.

Final Exam—The final exam is oral.

Minor Requirements for Students Majoring in Other Fields—A master's minor requires 6 credits, of which no more than 1 credit can be from Phys 5090.
Physiology
See Cooperative Programs.

Social Work

M.S.W.
Plan B
Professor Joyce Kramer
Director of Graduate Studies

The M.S.W. program offers a concentration in advanced generalist practice. The curriculum prepares students to practice at the direct service, program, and community levels of intervention. Graduates undertake a variety of professional social work functions, including counselor, community organizer, case manager, educator, and administrator. The curriculum has a special focus on services to American Indians and their communities. The M.S.W. program is accredited by the Council on Social Work Education.

Admission Requirements
1) A bachelor's degree from a regionally accredited college or university. The bachelor's degree should include a solid background in the liberal arts, as evidenced on the transcript by courses in the arts, humanities, and behavioral and social sciences. Applicants should be knowledgeable about diverse cultures, social problems, social conditions, and the social, psychological, and biological determinants of human behavior. Applicants with undergraduate degree majors in social work or a related field or discipline are given preference over applicants with other majors.
2) Completion of at least 18 semester credits in two or more social science disciplines, such as sociology, psychology, economics, anthropology, or political science.
3) Strong academic preparation as demonstrated by undergraduate GPA.
4) Demonstrated interest in becoming a social worker. Preference is given to applicants with professional experience in human service settings, particularly when this experience involves working with underrepresented and protected classes.

Enrollment Prerequisites—Admitted applicants must complete a college-level biology course with content on human anatomical and physiological development and a college-level statistics course. The biology course must be completed before registering for the first research course. Interested persons can apply and be admitted before completing the enrollment prerequisites. Advanced Standing—Applicants with a bachelor of social work degree from a program accredited by the Council on Social Work Education may apply for admission to the advanced standing program. All other applicants are ineligible for this program.

Degree Requirements
A total of 51 graduate credits is required (34 credits for students admitted with advanced standing), with a minimum of 41 credits in social work courses (28 credits for advanced standing students) and at least 2 credits from a related discipline. The 51-credit program requires two field placements in human service agencies; the advanced standing program requires one field placement. A minimum GPA of 3.00 for courses included on the degree program is required. A Plan B project is also required. A level of personal and professional competence considered satisfactory for entrance into the profession of social work, as indicated by course and field placement evaluations, is required. Students graduating from a B.S.W. program accredited by the Council on Social Work Education are eligible for the advanced standing program.

Language Requirements—None.

Final Exam—The final exam is oral, except for students who are over 250 miles from Duluth. They may complete an oral or written exam using distance technology.

Minor Requirements for Students Majoring in Other Fields—Not applicable.

Toxicology

M.S.
Plan A and Plan B

Ph.D.

Professor Kendall Wallace
Associate Director of Graduate Studies

This University-wide program provides comprehensive training in the broad scope of toxicology. Toxicology, the science of poisons, is devoted to identifying and quantifying potential noxious agents in our environment. Although most chemical agents at sufficiently large doses may be toxic, not all present a significant risk to human health or to environmental organisms or ecosystems.
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Accordingly, the essence of the science of toxicology is defining the fine line which distinguishes a risk from a residue. To accomplish this requires scientific expertise in such areas as analytical and environmental chemistry, biology, and mathematics. Advanced courses and research are also available in such subdisciplines as human health risk assessment; epidemiology; environmental chemistry and engineering; ecotoxicology; food additives and nutritional toxicology; biochemical and physiological mechanisms; histopathology; diagnostic and analytical toxicology; drug metabolism; chemical carcinogenesis; behavioral toxicology; and the toxicity of noxious agents to various organ systems (e.g., nervous, heart, liver, kidneys).

Admission Requirements
Applicants must have a bachelor’s degree or its foreign equivalent from a recognized college or university. At least a full year each of biology, organic chemistry, and physics as well as mathematics through calculus is expected. GRE General Test scores are required; international students must also submit TOEFL scores.

M.S.
Plan A and Plan B

Degree Requirements
The M.S. is offered under Plan A and Plan B. Plan A requires 22 course credits and 10 thesis credits; Plan B requires 30 course credits. A core curriculum of 8 credits in toxicology (Txcl 8012, 8013, and 8100) is required for both plans. Additional courses are arranged on an individual basis.

Language Requirements—None.
Final Exam—The final exam is oral.

Ph.D.

Degree Requirements
The Ph.D. requires core courses in physiology (4 credits), biochemistry (6 credits), statistics (2 credits), and toxicology (10 credits). Students must also complete 12 credits in a minor or supporting program and 24 thesis credits. Because the program spans the Duluth and Twin Cities campuses, the required courses differ on each campus.

Additional advanced courses in toxicology or related fields may be specified by the adviser. Students must complete and defend an original research project.

Language Requirements—None.

Minor Requirements for Students Majoring in Other Fields—A minor is available at the doctoral level and requires 12 credits: 8 credits of core courses and 4 credits of advanced toxicology courses.

Water Resources Science

M.S.
Plan A and Plan B

Ph.D.

Associate Professor Howard Mooers
Associate Director of Graduate Studies

This interdisciplinary program produces scientists with strong technical skills in disciplines relevant to water resources science and promotes a broad understanding of 1) the hydrologic cycle and associated ecosystems, 2) the interconnectedness of the sciences involved in managing aquatic resources, and 3) the interplay between the biophysical sciences and social sciences in developing and implementing public policies related to water.

The program involves the Twin Cities campus Departments of Anthropology; Applied Economics; Biosystems and Agricultural Engineering; Civil Engineering; Ecology, Evolution, and Behavior; Entomology; Environmental and Occupational Health; Fisheries and Wildlife; Forest Resources; Geography; Horticultural Science; Geology and Geophysics; Landscape Architecture; Plant Biology; and Soil, Water, and Climate; and the Humphrey Institute of Public Affairs. It also involves the Duluth campus Departments of Biology, Chemical Engineering, Chemistry, Economics, Geography, and Physics.

Admission Requirements
Applicants must have a B.S. in a physical or biological science or engineering with a 3.00 minimum GPA, and normally will have taken at least two courses each in calculus, chemistry, and physics and one course in biological sciences. Students who do not have a master’s degree in a related subject are admitted to the M.S. program first even if their long-term goal is a Ph.D. The GRE General Test is recommended for all applicants.
M.S.
Plan A and Plan B

Degree Requirements
Students may choose Plan A, which requires a thesis, or Plan B, which requires additional coursework and a major project. Both plans incorporate courses offered on the Twin Cities and Duluth campuses.

Students must complete five courses in four core areas (hydrology; environmental/water chemistry; limnology; water resources policy, law, and administration) and at least three electives (in emphasis areas such as aquatic biology, hydrologic science, watershed management, and water quality engineering). One elective must be from an approved list of technical courses dealing with water quality science/management; two electives must be in the student's focus area within aquatic science. Related field credits should be in courses outside of aquatic science.

If a student has had none of the core courses in previous studies, at least 28 course credits (plus 10 thesis credits) is required for Plan A and at least 30 credits is required for Plan B (up to 3 credits of independent study may be used for the Plan B project). If a student has met some core course requirements, the minimum number of credits for Plan A may be reduced proportionately, but never to less than the Graduate School minimum of 20 course credits.

Language Requirements—None.
Final Exam—The final exam is oral.

Minor Requirements for Students Majoring in Other Fields—A master's minor requires 10 credits, including WRS 5101 (3 credits), WRS 8100 (1 credit), a core course from one of the program’s emphasis areas, and an elective within that field of specialization. In aquatic biology and limnology, the core course is EEB 4601; in hydrological science, watershed management, and water engineering, the core course is in hydrology.

Ph.D.

Coursework is tailored to student interests, and many areas of specialization are possible. Core courses are offered on both the Twin Cities and Duluth campuses or are available in both regions through interactive video.

Degree Requirements
Students complete coursework equivalent to that of an M.S. in water resources science, with additional coursework in an area of specialization. There are no specific credit requirements in the major, but Ph.D. programs normally include at least 40 course credits beyond the B.S. level, including relevant coursework taken for a master's degree and a required minimum of 12 credits in a minor or supporting program.

Language Requirements—None.

Minor Requirements for Students Majoring in Other Fields—Doctoral students must complete 14 credits, including WRS 5101 (3 credits), WRS 8100 (1 credit), a core course from one of the program’s emphasis areas, and two electives within one field of specialization. In aquatic biology and limnology, the core course is EEB 4601; in hydrological science, watershed management, and water engineering, the core course is in hydrology.

Cooperative Programs
Biochemistry

M.S.
Plan A

Ph.D.

Professor Lester R. Drewes, ldrewes@d.umn.edu
Associate Director of Graduate Studies

UMD Department of Biochemistry and Molecular Biology faculty participate fully in the University's biochemistry, molecular biology and biophysics graduate program <www.d.umn.edu/medweb/biochem/>. Students are subject to the same entrance and degree requirements as all other University biochemistry graduate students. All requirements for the M.S. can be completed on the Duluth campus. Up to two semesters of coursework on the Twin Cities campus may be required for Ph.D. students, depending on their needs and interests. Postdoctoral students are welcome and find favorable opportunities for continued research. Teaching and research assistantships are available to some students through the department as a form of financial aid.
Interdisciplinary Archaeological Studies

M.A. and M.S.
Plan A and Plan B
Regents’ Professor George R. Rapp, Jr.
Associate Director of Graduate Studies

This program is offered cooperatively with the graduate program in interdisciplinary archaeological studies on the Twin Cities campus. Students combine archaeology with a related field such as geology, ecology, geography, ethnobotany, or ancient history. UMD faculty supervise interdisciplinary archaeology students; the Archaeometry Laboratory is the program’s UMD home department.

Microbiology

M.S.
Plan A

Ph.D.

This program is associated with the graduate program in microbiology on the Twin Cities campus. Preparative coursework is offered primarily on the Twin Cities campus and can be completed in one year. Thesis research is conducted in molecular genetics, bacteriology, virology, mycology, or immunology.

Pharmacology

M.S.
Plan A

Ph.D.

Professor Jean F. Rega
Associate Director of Graduate Studies

This program is associated with the graduate program in pharmacology on the Twin Cities campus. All requirements for the M.S. can be completed on the Duluth campus. Up to two semesters of coursework on the Twin Cities campus may be required for Ph.D. students. Courses and research provide opportunities for training in biochemical and physiological pharmacology, immunopharmacology, and toxicology. All students complete coursework in biochemistry, physiology, and statistics as well as the major courses in pharmacology. In general, applicants should be well grounded in chemical and biological sciences and mathematics. Applicants must submit GRE General Test scores. Financial aid in the form of research assistantships is available through the department. When applying, students should specify that they are applying for the M.S. or Ph.D. program at UMD. Applications and information may be obtained from the Associate Director of Graduate Studies, Department of Pharmacology, University of Minnesota Duluth, MN 55812.

Physiology

M.S.
Plan A

Ph.D.

Associate Professor Edwin W. Haller
Associate Director of Graduate Studies

This program is part of the cellular and integrative physiology graduate program on the Twin Cities campus. Students may complete their M.S. studies on the Duluth campus. Students may enter and complete their doctoral studies on the Duluth campus with graduate faculty in the Department of Medical and Molecular Physiology; however, doctoral degree requirements require at least two semesters on the Twin Cities campus or at an internationally recognized institution that strengthens students’ training program. Students can pursue studies in muscle, cardiovascular, respiratory, cellular, and endocrine physiology as well as membrane transport, neuroscience, and temperature regulation. For more information, see <www.d.umn.edu/medweb/PhysGrad.html> on the Web.
Course Descriptions

Non-Degree Credit Courses

These courses have content normally available in a standard secondary school curriculum and the credits cannot be used for a UMD degree. They are designated with the following statement in parentheses after the course number and title: “cannot apply cr toward degree.” The courses carry credit and students must pay normal tuition for them. When appropriate, the credits may be used in determining financial aid. In some instances, the credits also may be used in determining intercollegiate athletic eligibility. Students should contact the Department of Intercollegiate Athletics regarding the effect of non-degree credit courses on athletic eligibility. Non-degree credits are not included in the total UMD credits earned, GPA, or in determining student classification. Non-degree credit courses in this catalog are Math 1002—Euclidean Geometry, Math 1004—Intermediate Algebra, and SSP 1003—Basic Mathematics and Introductory Algebra.

Course Numbers

Semester courses have four-digit numbers as follows:
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. 4xxx courses may be counted for a Graduate School degree if the course is taught by a member of the graduate faculty and has been approved for graduate credit.
5xxx Courses primarily for graduate students; undergraduate students in their third or fourth year may enroll in such courses.
6xxx Courses for post-baccalaureate students in professional degree programs.
7xxx Courses for post-baccalaureate students in professional degree programs.
6xxx and 7xxx courses are to be used primarily for post-baccalaureate professional programs that are not offered through the Graduate School.
8xxx Courses for graduate students.

Prerequisites

QP—The quarter prerequisite is intended to show what is required, particularly in terms of quarter courses, before taking the course.
SP—The semester prerequisite is intended to show what is required, particularly in terms of semester courses, before taking the course.

If no prerequisites are listed, there are none, except for the class standing requirement indicated by the course number. When no department designation precedes the course number listed as a prerequisite, that course is in the same department as the course being offered. Likewise, a prerequisite reading “6 cr” means 6 credits in courses offered by the same department.

Symbols

§...Credit will not be granted if credit has been received for the course listed after this symbol.
¶...Concurrent registration is allowed in the course listed after this symbol.
#...Consent of instructor is required before registration.
...Consent of the department of offering the course is required for registration.
...Consent of the department of 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.
Accounting (Acct)

School of Business and Economics

Acct 2001. Principles of Financial Accounting. (3 cr; QP–30 cr or Q; SP–20 cr or Q; A-F only)

Acct 2002. Principles of Managerial Accounting. (3 cr; QP–1511, 1512 or Q; SP–2001 or Q; A-F only)
Information accumulation, analysis, and use for managerial decisions. Cost-volume-profit relationships; short- and long-term decisions; standards and budgets; segment and managerial performance evaluation.

Acct 2005. Survey of Accounting. (3 cr; OP–Not open to SBE students or Acct minors; SP–Not open to SBE students or non-SBE students minoring in Acct; A-F only)

Acct 3096. Volunteer Income Tax Assistance. (1 cr [max 2 cr]; QP–40 cr; cr not available as Acct elective; SP–27 cr; A-F only; cr not available as Acct elective; S-N only)
Introduction to preparation of federal and Minnesota state tax returns for low-income individuals. Preparation of actual tax returns as a volunteer, supervised by faculty.

Acct 3101. Intermediate Accounting I. (3 cr; QP–SBE candidate or Acct minor; SP–SBE candidate or non-SBE students minoring in Acct or Q; A-F only)

Acct 3102. Intermediate Accounting II. (3 cr; QP–3501, 3502, SBE candidate or Acct minor or Q; SP–3101, SBE candidate or non-SBE students minoring in Acct or Q; A-F only)
Long-term liabilities, stockholders’ equity, earnings per share, revenue recognition, and tax allocation. Investments, pensions, leases, accounting changes and error analysis, financial statement analysis, and disclosures in financial statements.

Acct 3110. Computer Applications in Accounting. (3 cr; QP–SBE candidate or Acct minor; SP–SBE candidate or SBE students minoring in Acct or Q; A-F only)

Acct 3151. Income Tax Accounting. (3 cr; QP–1512, SBE candidate or Acct minor or Q; SP–2002, SBE candidate or non-SBE students minoring in Acct or Q; A-F only)
Principles involved in determining taxable net income and computation of federal and state income taxes. Individual and corporation taxes emphasized.

Acct 3191. Independent Study. (1-3 cr; QP–BAC candidate with 120 cr or Q; SP–BAC candidate with 80 cr or Q; cr not available as Acct elective; S-N only)
For students wishing to do special work in an accounting area that extends beyond, or in greater depth than, regular course offerings.

Acct 3196. Internship in Accounting. (3-6 cr [max 6 cr]; QP–3503; SP–3102, BAC candidate or Q; max 3 cr may be applied to Acct electives; S-N only)
Participation in a professional work experience working full time for at least twelve weeks during any semester or summer.

Acct 3201. Cost Accounting I. (3 cr; QP–3102, SBE candidate or Acct minor or Q; SP–3110, SBE candidate or non-SBE students minoring in Acct or Q; A-F only)
Determining manufacturing costs, e.g., in a job order or process manufacturing environment. Cost-volume-profit relationships, activity-based accounting, standard costing techniques.

Acct 3261. Auditing. (3 cr; QP–3503, SBE candidate with 120 cr or Acct minor with 90 cr or Q; SP–3102, SBE candidate or Q; A-F only)
Theory and procedures in audit process.

Acct 4152. Advanced Income Taxation. (3 cr; QP–3544, SBE candidate or Acct minor with 120 cr; SP–3151, SBE candidate or Q; A-F only)
Emphasis on decision making and tax planning. Analysis of federal and state taxes relating to partnerships, corporations, and associations; corporate distributions and reorganizations; trust and foundations; estate, gift, and inheritance taxes.

Acct 4201. Cost Accounting II. (3 cr; QP–3507, SBE candidate or Acct minor or grad student or Q; SP–3201, SBE candidate or Q; A-F only)
Sophisticated use of cost information derived from accounting systems for effective management decision making, budgeting cost analysis and control, and performance evaluation. Relevant costs, cost behavior determination, cost allocation, transfer pricing, product profitability, and performance measurement.

Acct 4261. Advanced Auditing. (3 cr; QP–3546, SBE candidate with 120 cr or Acct minor with 90 cr or grad student or Q; SP–3261, SBE candidate or Q; A-F only)
Topics including, but not limited to, statistical sampling, EDP auditing, internal auditing.

Acct 4501. Advanced Accounting. (3 cr; QP–3503, SBE candidate with 120 cr or Acct minor with 90 cr or Q; SP–3102, SBE candidate or Q; A-F only)
Topics including consolidated financial statements, partnership, and fiduciary accounting.

Acct 4505. International Accounting. (3 cr; QP–3503, SBE candidate or Acct minor or grad student or Q; SP–3102, SBE candidate or Q; A-F only)
International comparative analysis, accounting measurement, and reporting issues unique to multinational business transactions and multinational enterprises; international financial markets; foreign exchange accounting; international audit environment; international taxation and transfer pricing; harmonization of worldwide accounting.

Acct 4510. Fund and Not-For-Profit Accounting. (3 cr; QP–1512, 90 cr or Q; SP–2002 or SBE candidate or Q; A-F only)
Accounting concepts and processes applied to government, hospital, education, charity, and other not-for-profit entities.

Acct 4551. Seminar in Accounting Theory. (3 cr; QP–3503, SBE candidate or Acct minor with 120 cr or grad student or Q; SP–3102, SBE candidate with 80 cr or Q; A-F only)
Critical examination of accounting theories and a detailed study of alternative accounting models. Library research and case analysis.
Course Descriptions

Aerospace Studies (Air)

College of Science and Engineering

Air 1101. The Foundations of the U.S. Air Force. (1 cr; A-F only)
Two-part survey of U.S. Air Force as public-service organization. Role of military in U.S. society; military history; officership; professionalism; core values; career opportunities; customs/courtesies; communication skills.

Air 1102. The Foundations of the U.S. Air Force. (1 cr; A-F only)
Two-part survey of U.S. Air Force as public-service organization. Role of military in U.S. society; military history; officership; professionalism; core values; career opportunities; customs/courtesies; communication skills.

Air 1591. Leadership Practicum. (1-4 cr [max 4 cr]; A-F only)
Leadership techniques and their practical application in structured realistic situations.

Air 2101. The Evolution of U.S. Air Force Air and Space Power. (1 cr; A-F only)
Air Force heritage; development/deployment of air power, a primary element of U.S. national security; leadership and quality principles; ethics and values. Leadership development based on student participation in group problem solving. Oral/written communication development.

Air 2102. The Evolution of U.S. Air Force Air and Space Power. (1 cr; A-F only)
Air Force heritage; development/deployment of air power, a primary element of U.S. national security; leadership and quality principles; ethics and values. Leadership development based on student participation in group problem solving. Oral/written communication development.

Air 2200. Introduction to Aviation. (3 cr; A-F only)
Weather; Federal Aviation Administration regulations; dead-reckoning navigation; radio navigation; related topics required to complete FAA private pilot's license written examination. Open to any student interested in U.S. aviation or the private pilot's examination.

Air 3101. Air Force Leadership Studies. (3 cr; A-F only)
Comprehensive study of leadership/quality management fundamentals, professional knowledge, organizational doctrine and ethics, and communication skills required of today's Air Force officer. Leadership/management case studies.

Air 3102. Air Force Leadership Studies. (3 cr; A-F only)
Comprehensive study of leadership/quality management fundamentals, professional knowledge, organizational doctrine and ethics, and communication skills required of today's Air Force officer. Leadership/management case studies.

Air 3400. Project Management. (3 cr; SP-Econ 2020 or Pol 2700 or Psy 2023 or Soc 3151 or Stat 1411 or Stat 2411 or Stat 3611 or #; A-F only)
Concepts and elements of project/risk management within a systems approach to accomplish resource-, schedule-, and performance-constrained projects. Use and limitations of current computer software. Open to any student interested in management of cross-functional project teams.

Air 3591. Leadership Practicum. (1-4 cr [max 4 cr]; A-F only)
Practical application of leadership and management in structured realistic situations.

Air 4101. National Security Affairs. (3 cr; SP-Cannot apply cr to Graduate School program; A-F only)
Advanced leadership development; national security processes, regional studies, doctrine, the military as a profession, civilian control of the military.

Air 4102. Preparation for Active Duty. (3 cr; SP-Cannot apply cr to Graduate School program; A-F only)
Advanced leadership development; advanced leadership ethics, doctrine, the military as a profession, officership, military justice.

American Indian Studies (Amin)

College of Liberal Arts

Amin 1103. Beginning Chippewa I. (3 cr; A-F only)
Speaking and comprehension of basic Chippewa speech patterns. Development of rudimentary reading knowledge.

Amin 1104. Beginning Chippewa II. (3 cr; SP-1103 or #; A-F only)
Speaking and comprehension of basic Chippewa speech patterns. Development of rudimentary reading knowledge.

Amin 1106. American Indian Prose, Poetry, and Oratory. (3 cr; A-F only)
Survey of transcribed/translated American Indian oratory, post-1900 prose, and contemporary poetry by Indian writers/speakers. Works used to facilitate understanding of major themes in American Indian life.

Amin 1120. American Indians in the 20th Century. (3 cr; A-F only)
Topical review of Indian-white contacts, antiquity to present. Historical analysis of the people and their cultures.

Amin 2105. Survey of American Indian Arts. (3 cr; A-F only)
Traditional arts of American Indians and the cultures that produced them; techniques, motifs, and aesthetics of Indian textiles and utilitarian and ceremonial arts.

Amin 2115. Chippewa History and Culture. (3 cr; A-F only)
Anishinaabe, Ojibway, and Chippewa. Origins and lifestyle; relationship between traditional and contemporary times. Emphasis on Minnesota.

Amin 2203. Intermediate Chippewa I. (3 cr; SP-1104 or #; A-F only)
Speaking basic Chippewa sentences and paragraphs at fluent level so listener can understand speaking pattern context. Ability to write and read Chippewa language proficiently.

Amin 2204. Intermediate Chippewa II. (3 cr; SP-2203 or #; A-F only)
Speaking basic Chippewa sentences and paragraphs at fluent level so listener can understand speaking pattern context. Ability to write and read Chippewa language proficiently.
Amln 2520. Tribal Law and Government. (3 cr; SP—Intro soc sci course, 1120, 3106 or #; A-F only)
Review of American Indian law and analysis of modern tribal government.

Amln 3106. Indian-White Relations. (3 cr; SP—1120 or #; A-F only)
Ten to twelve significant events and their ramifications for contemporary Indian affairs. Variety of options for fulfilling course requirements.

Amln 3260. American Indian Novel. (3 cr; SP—1120 or #; A-F only)
Approximately four novels by American Indian authors are read with an explication of the novels and the milieu that produced them.

Amln 3300. Projects in American Indian Studies. (1-5 cr [max 10 cr]; SP—1120; A-F only)
Directed reading, research, or involvement in social action culminating in a paper.

Amln 3301. Advanced Chippewa. (3 cr; SP—2204 or #; A-F only)
Taught entirely in Chippewa language. Fluent Chippewa speaking, writing, reading, and conversations to increase oral and comprehension abilities.

Amln 3333. Introduction to Federal Indian Law. (3 cr; SP—1120 or #; A-F only)
Legal concepts, cases, and issues surrounding American Indian federal law (e.g., treaties).

Amln 3410. Fur Trade in Canada and the United States. (3 cr; SP—1120 or #; A-F only)
Historical review and analysis of Canadian and U.S. Indians in the fur trade.

Amln 3570. American Indian Psychology. (3 cr; SP—Soc sci course, 1120, 3106 or #; A-F only)
Reviews major theories of personality development and motivational psychology applicable to American Indian issues. Attributes of culturally appropriate developmental models are advanced through cross-cultural examination of general traits, perspectives, norms, and values. Relevant techniques of counseling.

Amln 3905. Special Topics: (Various Titles to be Assigned). (3 cr [max 12 cr]; SP—Intro soc sci course or 1120 or #; A-F only)
Study of topics not included in regular curriculum. Topic announced before course offered.

Amln 3997. Internship in American Indian Studies. (4-8 cr; SP—Amln major; may not be taken final semester of sr yr; may be taken in 1 or 2 semesters; A-F only)
Supervised lab experience in American Indian agency or project or with significant Indian clientele. Advance, concurrent, and follow-up written and oral presentations.

Amln 4302. Independent Study of the Chippewa Language. (1-6 cr [max 12 cr]; SP—1103 or #; cannot apply cr to Graduate School program; A-F only)
Individual opportunity to devise and/or be involved in programs to increase fluency.

Amln 4630. American Indians and the Media. (3 cr; SP—1120 or #; cannot apply cr to Graduate School program; A-F only)
Examination of images of American Indians in media such as literature, movies, TV, toys, music, and sports as they have contributed to and continue to perpetuate stereotypic and distorted images.

Amln 4970. Tribal Economic Development and Management. (3 cr; SP—1120 or #; cannot apply cr to Graduate School program; A-F only)
Management concepts and theories; tribal environment and its contemporary economic and governmental development; tribal managerial techniques.

Amln 4990. Directed Research. (1-6 cr [max 12 cr]; SP—#; max 8 cr may be applied to Graduate School program; A-F only)
Qualified seniors and graduate students may register for work on tutorial basis.

Amln 5905. Legal Aspects of Federal Indian Policy for Human Services. (3 cr; SP—1120, upper div soc sci course or #)

Amln 5910. Topics in American Indian Studies: (Various Titles to be Assigned). (3 cr [max 12 cr]; SP—Intro soc sci course or 1120 or #; max 6 cr may be applied to Graduate School program; A-F only)
Focus on areas of particular relevancy to both Indian and non-Indian people in this region. Faculty-student-community consultation determines topic selection for a given semester.
Course Descriptions

Anatomy and Cell Biology (Anat)

School of Medicine

Anat 3100. Practical Human Anatomy. (2 cr; SP-#) Lectures present gross structure of human body by regions: head/neck, thorax, abdomen, pelvis, limbs. For nurse/nurse practitioners, physician's assistants, emergency medical workers, and pre-medicine, physical education, athletic training, and coaching students. Selected study of predissected human specimens optional.

Anat 5133. Developmental, Cell, and Tissue Biology. (5 cr; SP—Upper div undergrad or grad student; A-F only) In-depth study of cytology, embryological origins, development, structure, and functions of basic tissues of the human body.

Anat 5521. Human Gross Anatomy. (7 cr; SP—#; A-F only) Regional dissection of human body supplemented with normal topographic and radiographic anatomy of the body, basic clinical science correlation, and demonstrations of anatomy through use of fresh autopsy specimens.

Anat 5522. Microscopic Anatomy. (5 cr; SP—#; A-F only) Introduction to microscopic structure and the cytochemical and functional aspects of cells, tissues, and organs. Emphasis on basic concepts of microscopic anatomy and identification of specific cells, tissues, and organs.

Anat 5533. Human Neuroanatomy. (4 cr; SP—#; A-F only) Structure of central nervous system, with correlation of structure, function, and clinical relevance. Consideration of special senses.

Anthropology (Anth)

College of Liberal Arts

Anth 1602. Prehistoric Cultures. (4 cr; A-F only) Origin and development of extinct and living human beings, including growth and differentiation of cultures from their beginnings to earliest stages of ancient civilizations.

Anth 1604. Cultural Anthropology. (4 cr; A-F only) Introduction to representative cultures of the world and to concepts and methods of cultural anthropology, focusing on range of variation and degree of uniformity in human behavior and in cultural adaptations.

Anth 1612. Introduction to Archaeology. (4 cr; A-F only) Basic principles of archaeology with examples of their application to world prehistory.

Anth 3614. Peasant Societies and Cultures. (3 cr; QP—1604, 40 cr or #; SP—1604, 30 cr or #; A-F only) Comparative study of peasant societies; their role in traditional urban nation-states, and their place in contemporary economic development and cultural change.

Anth 3616. Cultures of Arctic North America. (3 cr; QP—1604, 40 cr or #; SP—1604, 30 cr or #; A-F only) Ethnographic account of traditional and contemporary cultures of Eskimos and Indians in northern North America. Processes of cultural change that have produced the contemporary situations in this area.

Anth 3618. Ancient Middle America. (3 cr; QP—1604, 40 cr or #; SP—1604, 30 cr or #; A-F only) Survey of the Aztecs, Maya, and their predecessors.

Anth 3622. Prehistoric Archaeology: Old World. (3 cr; QP—40 cr or #; SP—30 cr or #; A-F only) Archaeological survey of Europe, Africa, and Asia.

Anth 3624. Archaeology of North America. (3 cr; QP—40 cr or #; SP—30 cr or #; A-F only) Archaeological survey of major cultural areas of North America north of Mexico.

Anth 3628. Women in Cross-Cultural Perspective. (3 cr; QP—1604, 40 cr or #; SP—1604, 30 cr or #; A-F only) Worldwide survey of the structure of gender systems, focusing on women's lives in selected, primarily non-Western, cultures; how gender relations are impacted by colonialism, industrialism, and economic development.

Anth 3631. Cross-Cultural Adaptation. (1 cr; QP—Exper living in another culture, #; SP—Exper living in another culture, #; A-F only) Cultural adaptation, cultural shock, and problems of reentry for anthropological fieldworkers, students in study-abroad programs, and business students returning from internships or study in other cultures.

Anth 3632. Latin American Cultures. (3 cr; QP—1604, 40 cr or #; SP—1604, 30 cr or #; A-F only) Survey of social, political, economic, and religious organization of contemporary national and native cultures of Mexico, Central America, and South America.

Anth 3634. Cultures of Africa. (3 cr; QP—1604, 40 cr or #; SP—1604, 30 cr or #; A-F only) Ethnographic survey of human societies of sub-Saharan Africa focusing on precolonial life ways, the response to colonization, and post-imperial transformations and problems. Balanced emphasis on regional variability and pan-Africanism.

Anth 3636. Anthropology of India. (3 cr; QP—1604, 40 cr or #; SP—1604, 30 cr or #; A-F only) Peoples and cultures of India with focus on village life within historical context of regional differences; importance of caste, kinship, and religion to unity and diversity of modern-day India and challenges it faces.

Anth 3695. Special Topics in Anthropology: (Various Titles to be Assigned). (1-4 cr [max 8 cr]; QP—1604, 40 cr or #; SP—1604, 30 cr or #; A-F only) Seminar on contemporary topics in selected branches of anthropology.

Anth 4616. Culture and Personality. (3 cr; QP—1604, 70 cr or grad student or #; SP—1604, 60 cr or grad student or #; A-F only) Role of culture in forming of personality; problems of individual adjustment to demands of culture. Psychological and sociopsychological approaches to culture.

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Anth 4621. Myth and Sacred Symbols. (3 cr; QP-1604, 70 cr or grad student or #; SP-1604, 60 cr or grad student or #; A-F only)
Interpretation of myths and sacred symbols found in beliefs and rituals of selected traditional cultures.

Anth 4623. Anthropology and Contemporary Human Problems. (3 cr; QP-1604, 70 cr or grad student or #; SP-1604, 60 cr or grad student or #; A-F only)
Cultural roots of such interrelated contemporary human problems as over-population, food production and distribution, health and nutrition, social and ecological disorders. Review of alternative solutions to such problems as suggested by anthropological study and analyses.

Anth 4628. Language and Culture. (3 cr; QP-70 cr or grad student or #; SP-1604, 60 cr or grad student or #; A-F only)
Relationship between language and culture studied through comparative cases from diverse areas of the world.

Anth 4631. Human Ecology. (3 cr; QP-1604, 70 cr or grad student or #; SP-1604, 60 cr or grad student or #; A-F only)
In-depth study of some of the methods and concepts concerning the interrelations of certain human populations with their environments in diverse natural, cultural, historical, and evolutionary settings.

Anth 4641. International Development: Women and Population. (3 cr; QP-1604 or Soc 1100, Soc 1500, 70 cr or #; SP-1604, 60 cr or #; A-F only)
Impact of macrostructural and microstructural components of population and development on women's lives, with reference to women in Asia, Africa, and Latin America. Challenges facing women as sociocultural, political, and economic development occurs. Approached from demographic and culturally specific perspective.

Anth 4651. Development of Anthropological Theory and Method. (4 cr; QP-1604, 70 cr or grad student or #; SP-1604, 90 cr or grad student or #; cannot apply cr to Graduate School program; A-F only)
Theoretical perspectives from mid-19th century to the present; examines method, interrelationship of method and theory, and implications for practice of anthropology.

Anth 4653. Senior Seminar. (3 cr; SP-1604, 90 cr or grad student or #; cannot apply cr to Graduate School program; A-F only)
Contemporary topics in selected branches of anthropology. Active participation in group research project to develop and enhance anthropological research skills.

Anth 4654. Biological Anthropology. (3 cr; QP-#; SP-1604 or grad student or #; A-F only)
The human skeleton as source of information about individual variations, population structure, and human evolution. Study of human remains from archaeological sites, morphology, paleopathology, and relevant statistical methods. Lectures and labs emphasize acquiring practical experiences in analysis and interpretation.

Anth 4691. Independent Study in Anthropology. (1-5 cr [max 10 cr]; QP-55 cr; Comp 31xx, #; SP-60 cr or #; cannot apply cr to Graduate School program; A-F only)
Directed reading and research leading to presentation of paper.

Anth 4695. Special Topics in Anthropology: (Various Titles to be Assigned). (1-5 cr [max 10 cr]; QP-1604, 40 cr or #; SP-1604, 60 cr or #; A-F only)
Seminar on contemporary topics in selected branches of anthropology.

Anth 4696. Field Research in Archaeology. (1-10 cr [max 10 cr]; QP-1602 or 1612, #; SP-1602 or 1612, #; cannot apply cr to Graduate School program; A-F only)
Archaeological field excavation, survey, and research in historic and prehistoric sites.

Anth 4699. Honors Project. (1 cr; QP-5626, Soc 1500, Soc 3500, Soc 3520, 120 cr; approval by dept honors program director; SP-1604, 60 cr or #; cannot apply cr to Graduate School program; A-F only)
Advanced individual project in any area of anthropology; must demonstrate sound theoretical and research foundations; written report.

Art (Art)

School of Fine Arts

Art 1001. Art Today. (3 cr; A-F only)
Introductory survey of influence of art and roles of artists in varied sociocultural contexts, emphasizing recent art and its historical sources.

Art 1002. Introduction to Art. (3 cr; SP-Not for art majors except those in art history; A-F only)
Studio course with strong lecture component for those with little or no creative experience in art, introducing various materials, techniques, and concepts. Studio work, lectures, class discussions, viewing artworks, and outside reading.

Art 1009. Fundamentals of Drawing. (3 cr; SP-Not for art majors or minors; A-F only)
Stimulation of visual and conceptual skills through dynamics of drawing as well as lectures/presentations and group discussions.

Art 1010. Drawing I. (3 cr; QP-11002 or art or art ed major or #; SP-11002 or art or art ed major or #; A-F only)
Introduction to the drawing experience and problems concerned with translation of three-dimensional visual experience into two-dimensional form.

Art 1011. 2-D Design. (3 cr; SP-1002 or art or art ed major or #; A-F only)
Introduction to two-dimensional design through study of design elements and principles (including principles of visual organization) and their application in various media.

Art 1012. 3-D Design. (3 cr; SP-1002 or art or art ed major or #; A-F only)
Introduction to basic concepts and materials of three-dimensional form and space.

Art 1013. 2-D Digital Design. (3 cr; SP-1002 or art or art ed major or #; A-F only)
Two-dimensional studio and graphic design concepts using the computer as a creative tool.

Art 1014. 3-D Digital Design. (3 cr; SP-1013 or #; A-F only)
Introduction to concepts and materials of three-dimensional form and space using digital visualization.

Art 1100. Painting I. (3 cr; QP-11002 or art or art ed major, 1010 or 1011 or 1013) or #; SP-1002 or 1009 or 1010 or #; A-F only)
Color and pigment theory, basic concepts and explorations in technology and imagery. Painting traditions and contemporary directions.
Course Descriptions

Art 1111. Freshman Seminar: Art and Design in the Communications Culture. (3 cr; SP—Fewer than 30 cr; A-F only)
Theory and practice focusing on dynamics of visual communication. Interpretation and analysis of symbols, formal structures, and context.

Art 1125. Watercolor I. (3 cr; QP—1010, 1011 or 1013 or #; SP—1002 or 1010 or #; A-F only)
Basic concepts and techniques.

Art 1200. Sculpture I. (3 cr; QP—1002 or art or art ed major, 1010, 1012 or #; SP—1002 or art or art ed major, 1012 or #; A-F only)
Sculptural materials, methods, and concepts, with problems relating to form, time, and space; experience with various sculptural forms and media, emphasizing creative expression.

Art 1300. Printmaking I: Intaglio, Relief. (3 cr; QP—1002 or art or art ed major, 1010, 1011 or #; SP—1002 or 1011 or #; A-F only)
Introduction to methods and materials used in zinc plate etching and relief printing from wood and linoleum. Technical, aesthetic, and contextual considerations encountered in production of meaningful artwork. Theoretical, legal, critical, and historical aspects of printmaking.

Art 1301. Printmaking I: Litho, Screen. (3 cr [max 6 cr]; QP—1002 or art or art ed major, 1010, 1011 or #; SP—1002 or 1011 or #; A-F only)
Introduction to methods and materials used in lithographic printmaking from stones and plates and water-based screenprinting. Technical, aesthetic, and contextual considerations encountered in production of meaningful artwork. Theoretical, legal, critical, and historical aspects of printmaking.

Art 1400. Ceramics I. (3 cr; QP—1002 or art or art ed major, 1010, 1012 or #; SP—1002 or art or art ed major, 1010, 1012 or #; A-F only)
Handbuilding methods, surface enhancement, and conceptual support for pottery and/or ceramic sculpture.

Art 1405. Fundamentals of Ceramics. (3 cr; QP—Not for art majors or minors; SP—Not for art majors or minors)
Basic handbuilding and glazing of earthenware ceramics.

Art 1500. Jewelry and Metals I. (3 cr; QP—1002 or art or art ed major, 1011 or 1013 or #; SP—1002 or 1011 or 1013 or #; A-F only)
Basic jewelry design, fabrication, and surface enhancement techniques.

Art 1510. Weaving and Fibers I. (3 cr; QP—1002 or art or art ed major, 1011 or 1013, 1012 or #; SP—1002 or 1011 or 1013 or #; A-F only)
Contemporary weaving and fibers.

Art 1600. Photography I. (3 cr; QP—1002 or art or art ed major or #; SP—1002 or art or art ed major or #; A-F only)
Introduction to primarily silver-based photographic concepts, materials, history, and darkroom practice, in a creative context.

Art 1605. Fundamentals of Photography. (3 cr; QP—Not for art majors or minors; SP—Not for art majors or minors; A-F only)
Basic photographic principles and primarily silver-based techniques through studio/lecture experiences.

Art 2814. Creating Across Cultures. (3 cr; A-F only)
Underrepresented visual arts of cultural groups within U.S. society.

Art 2900. Visual Literacy. (3 cr; A-F only)
Various forms of visual expression—art, commercial imagery, typography, architecture, graffiti, etc.—as rhetoric. Introduction to variety of theories and/or modes of criticism, and consideration of their value for explanation of visual expression.

Art 2905. Graphic Techniques I. (3 cr; QP—1011 or 1013 or #; SP—1011 or 1013 or #; A-F only)
Fundamentals of graphic reproduction; application of digital programs used in preparing work for reproduction.

Art 2911. Graphic Design I. (3 cr; QP—3040, 3052, 3053 or #; SP—1010, 1011 or 1013, 2905 or #; A-F only)
Introduction to theory and practice of graphic design. Meaning and aesthetics of image juxtaposition; juxtaposition of type and image.

Art 3016. 2-D Digital Studio I. (3 cr [max 6 cr]; QP—1002 or art or art ed major, 1013 or #; SP—1002 or art or art ed major, 1013 or #; A-F only)
Computer as a fine arts medium. Development of a serial approach to visual imagery.

Art 3030. Art in Technologies I. (3 cr [max 6 cr]; QP—1013 or 1014 or #; SP—1013 or 1014 or #; A-F only)
Interdisciplinary, collaborative investigations linking traditional to emerging electronically-based art technologies.

Art 3095. Topics in Art: (Various Titles to be Assigned). (1-3 cr [max 12 cr]; QP—#; SP—#; A-F only)
Intensive study of special topics in visual arts. Topic announced before course offered.

Art 3100. Painting II. (3 cr [max 9 cr]; QP—3103 or #; SP—Art 1100 or #; repeatable to 9 cr with #; A-F only)
Painting in specialized interest area, using student/instructor-generated semester goals outline.

Art 3125. Watercolor II. (3 cr [max 6 cr]; QP—1125 or #; SP—1125 or #; A-F only)
Advanced concepts and techniques.

Art 3200. Sculpture II. (3 cr [max 6 cr]; QP—3201 or #; SP—1200 or #; A-F only)
Sculptural materials, methods, and concepts, with problems relating to form, time, and space; experience with various sculptural forms and media, emphasizing creative expression.

Art 3300. Printmaking II. (3 cr [max 6 cr]; QP—3301 or #; SP—1300 or #; A-F only)
Continued exploration of processes explored in either or both of the introductory courses. Increased technical challenges combined with refinement of image and concept. Some photographic and mixed-media processes; increased experience in editing and critical review.

Art 3400. Ceramics II. (3 cr [max 6 cr]; QP—3401 or #; SP—1400 or #; A-F only)
Advanced handbuilding and surface enhancement techniques; development of a stylistically consistent body of work.

Art 3405. Ceramics. (3 cr [max 6 cr]; SP—1405 or #; not for art majors or minors)
Handbuilding, glazing, and firing of earthenware ceramics.
Art 3500. Jewelry and Metals II. (3 cr [max 6 cr]; QP-3501 or #; SP-1500 or #; A-F only) Application of jewelry techniques and design.

Art 3511. Weaving and Fibers II. (3 cr [max 6 cr]; QP-3511; SP-1510 or #; A-F only) Weaving and related techniques in fibers and fabrics.

Art 3600. Photography II. (3 cr [max 6 cr]; QP-1600 or 1605 or 3601; SP-1600 or 1605; A-F only) Experience with varied digital and silver-based photographic processes and concepts in a creative context.

Art 3700. Drawing II. (3 cr [max 6 cr]; QP-3713 or 3715; SP-1010 or #; A-F only) Individually supervised projects supporting involvement in other studio areas.

Art 3800. Community Involvement Through Art. (1-3 cr [max 3 cr]; SP- #; 1 cr for each 45 hrs of fieldwork; A-F only) For students interested in working with public and private social agencies through an art program.

Art 3806. Early Childhood Art. (1 cr; QP- Art or art ed major or admission to early childhood studies program or #; SP-Art or art ed major or admission to early childhood studies program or #; A-F only) Aspects of preschool art development, including studio expenses.

Art 3810. Art in Elementary Education. (2 cr; QP-1002 or art or art ed major or admission to elem ed program or #; SP-1002 or art or art ed major or admission to elem ed program or #; A-F only) Instructional problems; growth and development of artistic expression in children. Studio experience relating to elementary art curriculum.

Art 3811. Art Education Elementary-Level Experience. (2 cr; QP- Art or art ed major or #; SP-3810, art or art ed major or #; A-F only) Experience in curriculum development and teaching methods for art educators.

Art 3815. Art in Secondary Education. (4 cr; QP- Art or art ed major or minor or #; SP-Art or art ed major or minor or #; A-F only) Nature and objectives of art programs in secondary school; content and methods. Development of secondary art curriculum.

Art 3895. Problems in Art Education. (1-3 cr; QP- Art major or minor; SP-Art major or minor; A-F only) Individual supervised study for advanced art education students. Applied research in art education.

Art 3922. Graphic Design II. (3 cr; QP-3058 or #; SP-2911 or #; A-F only) Continuation of theory and practice of graphic design. Introduction to professional practices. Materials meaning, aesthetics, and practical use.

Art 3933. Graphic Design III. (3 cr; QP-3059 or #; SP-3922 or #; A-F only) Continuation of theory and practice of graphic design. Graphic design as an organizational and informative medium and as a purely aesthetic pursuit.

Art 4100. Painting III. (3 cr [max 6 cr]; QP-5150 or #; SP-3100 or #; cannot apply cr to Graduate School program; A-F only) Advanced individually supervised projects using both traditional and contemporary painting media and techniques.

Art 4191. Individual Study in Painting. (1-3 cr [max 8 cr]; QP-4 qtrs painting, Δ; SP-2 sem painting, #; cannot apply cr to Graduate School program; A-F only) Instruction tailored to individual’s needs outside of traditional class structure.

Art 4200. Sculpture III. (3 cr [max 6 cr]; QP-5250 or #; SP-3200 or #; cannot apply cr to Graduate School program; A-F only) Sculpture in area of specialized interest.

Art 4291. Individual Study in Sculpture. (1-3 cr [max 8 cr]; QP-4 qtrs sculpture, Δ; SP-2 sem sculpture, #; cannot apply cr to Graduate School program; A-F only) Further exploration of print processes. Emphasis on refinement of technical skills as well as development of concepts and imagery. Experimentation in nontraditional, collaborative, and cross-disciplinary approaches. Increased experience in editing and alternative formats combined with a comprehensive critical review.

Art 4391. Individual Study in Printmaking. (1-3 cr [max 8 cr]; QP-4 qtrs printmaking, Δ; SP-2 sem printmaking, Δ; A-F only) Graduate students complete a project by contract with instructor, supported by a research paper.

Art 4400. Ceramics III. (3 cr [max 6 cr]; QP-5452 or #; SP-3400 or #; cannot apply cr to Graduate School program; A-F only) Technical and conceptual refinement of advanced body of ceramic work.

Art 4491. Individual Study in Ceramics. (1-3 cr [max 8 cr]; QP-4 qtrs ceramics, Δ; SP-2 sem ceramics, Δ; A-F only) Directed study in specific areas.

Art 4511. Weaving and Fibers III. (3 cr [max 6 cr]; QP-3511 or #; SP-3511 or #; cannot apply cr to Graduate School program; A-F only) On- or off-loom studio projects for advanced student.

Art 4581. Individual Study in Fibers. (1-3 cr [max 8 cr]; QP-4 qtrs fibers, Δ; SP-2 sem fibers, #; cannot apply cr to Graduate School program; A-F only) Fibers and weaving.

Art 4600. Photography III. (3 cr [max 9 cr]; QP-5650 or #; SP-3600 or #; A-F only) Digital or silver-based photography in area of special interest. Graduate students complete a photographic project by contract with instructor, supported by a research paper.

Art 4691. Individual Study in Photography. (1-3 cr [max 8 cr]; QP-4 qtrs photography, Δ; SP-2 sem photography, Δ; A-F only) Graduate students complete a project by contract with instructor, supported by a research paper.

Art 4700. Drawing III. (3 cr [max 6 cr]; QP-5750 or #; SP-3700 or #; A-F only) Individually supervised projects supporting involvement in other studio areas. Graduate students produce a technically and conceptually sophisticated portfolio of drawing, supported by a research paper.

Art 4702. Honors Studio. (3 cr; QP- #; cannot apply cr to Graduate School program; SP-4; cannot apply cr to Graduate School program; A-F only) Directed, but largely independent, creative inquiry for students of exceptional ability.
Art 4791. Individual Study in Drawing. (1-3 cr [max 8 cr]; QP-4 qtrs drawing; SP-2 sem drawing; A-F only) Graduate students complete a project in drawing by contract with instructor, supported by a research paper.

Art 4812. Art Seminar. (3 cr; QP-Sr or #; cannot apply cr to Graduate School program; SP-Sr or #; cannot apply cr to Graduate School program; A-F only) Current visual arts issues investigated through directed study, lectures, assigned readings, and preparation of student presentations.

Art 4891. Honors Art Education Research. (3 cr; QP-#; cannot apply cr to Graduate School program; SP-#; cannot apply cr to Graduate School program; A-F only) Directed, but largely independent, research in an area of art education for students of exceptional ability.

Art 4892. Independent International Study. (1-6 cr [max 9 cr]; QP-1-6 cr with Δ; may apply up to 6 cr to Graduate School program; sr standing advisable; SP-Δ cannot apply cr to Graduate School program; sr standing advisable; A-F only) Travel and research in international museums, schools, arts organizations, and art centers. Requires advanced planning. Credit allowed depends on nature and scope of project.

Art 4897. Graphic Design Internship. (3 cr; QP-Sr graphic design major or #; SP-Sr graphic design major; A-F only) Preparatory to Graduate School program; A-F only)

Art 4997. Graphic Design Internship. (3 cr; QP-Sr graphic design major or #; SP-Sr graphic design major; A-F only)

Art 4999. Senior Project in Graphic Design. (1 cr [max 3 cr]; SP-Sr graphic design major or #; A-F only) Preparation of senior show/project.

Art 5016. 2-D Digital Studio II. (3 cr [max 6 cr]; QP-3016 or #; SP-3016 or #; A-F only) Directed study emphasizing 2-D media.

Art 5030. Art in Technologies II. (3 cr [max 6 cr]; QP-1013, 1014, 3016 or #; SP-3030 or #; A-F only) Directed interdisciplinary, collaborative investigations linking traditional to emerging electronically-based art technologies.

Art 5091. Individual Study in Electronic Arts. (1-3 cr [max 8 cr]; QP-1014 or 3016 or FA 1200 or FA 5200 or #; SP-1014 or 3016 or #; cannot apply cr to Graduate School program; A-F only) Individually supervised projects in electronic arts media.

Art 5795. Intermedia Studio Problems. (1-3 cr [max 9 cr]; QP-3 qtrs in each area with Δ; SP-2 sem in each area with Δ; A-F only) Directed study emphasizing intermedia concerns.

Art 5902. Graphic Design Theory and Criticism. (3 cr; QP-Arth 3310 or #; SP-Arth 5901 or grad student or #; A-F only) Introductory course.

Art 5907. Motion Graphics I. (3 cr; QP-3058, 3053 or #; SP-2911 or grad student or #; A-F only) Introduces aesthetics, mechanics, and meaning of motion graphics.

Art 5908. Motion Graphics II. (3 cr; QP-3054; SP-5907 or #; A-F only) Continuation of aesthetics, mechanics, and meaning of motion graphics.

Art 5909. Interactive Design. (3 cr; QP-3054 or #; SP-5907 or #; A-F only) Interactivity in graphic design, concentrating on computer-based interactive presentations.

Art 5916. Type Lab. (1 cr [max 3 cr]; QP-3053 or #; SP-3922 or #; A-F only) Type as an artistic medium. Introduction to letterpress printing.

Art 5926. Publications Design. (3 cr; QP-3059, 3062 or #; SP-3933 or #; A-F only) Design and structure of publications for print, especially magazines. Typographic structures: grids and proportion systems.

Art 5991. Independent Study in Graphic Design. (1-3 cr [max 8 cr]; QP-4 qtrs graphic design; D; SP-2 sem graphic design; D; A-F only)

Art 5997. Art Museum Internship. (3 cr [max 6 cr]; SP-1001, 6 er art hist; 1 cr for each 45 hrs of work; A-F only) Supervised practicum in art museum operation.

Art 5999. Special Projects in Design. (1 cr [max 3 cr]; QP-3059, 3062 or #; SP-3933 or #; A-F only) Topics in graphic design practice.

Art 8333. FTE: Master's. (1 cr; SP-Master's student, adviser and DGS consent)

Art 8901. Graduate Seminar. (3 cr [max 12 cr]; SP-fi8980; A-F only) Critique of student work and discussion of readings. Faculty presentations on design history, criticism, theory, and analysis.
Art 8903. Art Teaching Practicum. (1 cr [max 4 cr]; SP—Grad tchg asst or #: A-F only)
Theory of and experience in teaching college-level art.

Art 8980. Graduate Studio. (3 cr [max 12 cr]; SP—#8901; A-F only)
Graphic design studio work based on directed problems and topics for critique in concurrent graduate seminar.

Art 8990. M.F.A. Creative Thesis. (3 cr [max 6 cr]; SP—#: A-F only)
In consultation with adviser, completion of major project as culmination of M.F.A. studies.

Art History (ArtH)

School of Fine Arts

ArtH 1303. History of World Art I. (3 cr; A-F only)
Development of world art and architecture from prehistory through Middle Ages.

ArtH 1304. History of World Art II. (3 cr; A-F only)
Development of world art and architecture from Renaissance to present.

ArtH 2305. Classical Themes in Art History. (3 cr; A-F only)
Genres of painting and related subjects in Western art, 1400-1800.

ArtH 2390. American Art of the 20th Century. (3 cr; A-F only)
American art from Armory Show of 1913 to present examined in social and historical contexts.

ArtH 3091. Honors Research in Art History. (1-3 cr; SP—#: A-F only)
Directed research in an art history area for students of exceptional ability. Students must be invited by art history faculty to register for this course.

ArtH 3320. Ancient Art. (3 cr; A-F only)
Art and architecture of Minoans, Mycenaens, Greeks, and Romans.

ArtH 3330. Renaissance Painting and Sculpture. (3 cr; A-F only)
Developments in Europe, 1300-1600.

ArtH 3331. European Architecture, 1400-1800. (3 cr; A-F only)
Developments during Renaissance and Baroque periods.

ArtH 3340. Baroque and Rococo Art. (3 cr; A-F only)
Developments in European painting and sculpture during 17th and 18th centuries.

ArtH 3360. European Art in an Age of Revolution. (3 cr; A-F only)
European art from French Revolution through pan-European revolutions of 1848, examined in social and historical contexts.

ArtH 3361. European Art: Impressionism and Post-Impressionism. (3 cr; A-F only)
European art from mid-19th century through 1900, including late Realism, Impressionism, pan-European Symbolism and Art Nouveau, examined in social and historical contexts.

ArtH 3370. European Art, 1900-1945. (3 cr; A-F only)
Includes Cubism, Futurism, Dada, de Stijl, German Expressionism, New Objectivity, Surrealism, art of Bauhaus, and art of National Socialists, examined in social and historical contexts.

ArtH 3380. Art of the United States: Colonial to Impressionist. (3 cr; A-F only)
U.S. art from colonial period through 1900, examined in social and historical contexts.

ArtH 3395. Topics in Art History: (Various Titles to be Assigned). (1-3 cr [max 6 cr]; A-F only)
Title announced before course is offered.

ArtH 4491. Directed Study in 19th- and 20th-Century European Art. (1-3 cr [max 9 cr]; SP—Grad student or #: max 6 cr for undergrads; A-F only)
Independent research in an area of the student’s interest; fundamental knowledge of period or subject required. Graduate students complete a substantial research paper on a topic chosen in consultation with instructor.

ArtH 4901. History of Graphic Design. (3 cr; QP—1906 or #: SP—#370 or grad student or #: A-F only)
Introduction, from origins of written communication to present. Graduate students write several research papers and produce a design artifact related to a historical topic of their choice.

Ast 1040. Introductory Astronomy. (3 cr; A-F only)
Survey of present knowledge of solar system, interstellar space, stars, galaxies, and universe. Historical development of astronomy as a science. (3 hrs lect)

Ast 2040. The Solar System. (3 cr; QP—1040, Math 1210 or Math 1250 or #: SP—1040, Math 1250 or #: A-F only)
Survey of terrestrial and Jovian planets and their satellites; asteroids, comets, interplanetary debris; examination of lunar rocks and meteorite samples when available; origin and evolution of solar system. (3 hrs lect)

Behavioral Science (BhSc)

School of Medicine

BhSc 5491. Problems in Medical Behavioral Sciences. (1-6 cr; SP—Med or upper div or grad student; #: can apply max 6 cr to Graduate School program; A-F only)
Independent study on a tutorial, seminar, or lecture basis. Investigative work, lecture material, and/or appropriate reading and discussions designed according to interest and capabilities of individual student.

BhSc 5591. Studies in Medical Behavioral Sciences. (2 cr; SP—Regis med student; #: P-N only)
Series of electives on topics in general medical behavioral science, typically including social psychology of deviance, alternatives in health care delivery, family dynamics, and others.
**Course Descriptions**

**Biochemistry and Molecular Biology (MdBc)**

**School of Medicine**

**MdBc 5501. Neurobiochemistry.** (2 cr; QP–Chem 3311 or Chem 5337; SP–Chem 3322 or Chem 4342 or #; A-F only) Current concepts on anatomical and compositional properties of brain; membranes and transport; neurotransmission; receptors and signal transduction mechanisms; energy, carbohydrate, protein, lipid, and nucleic acid metabolism; development and diseases of the central nervous system.

**MdBc 8151. Biochemistry Seminar.** (1 cr [max 4 cr]; SP–Biochem or Chem grad student or #; S-N only) Current topics in biochemistry.

**MdBc 8294. Current Research Techniques.** (1-3 cr [max 4 cr]; SP–Biochem or Chem grad student or #; S-N only) Research projects in biochemistry, each carried out in research lab of a faculty member.

**MdBc 8333. FTE: Master’s.** (1 cr; SP–Master’s student, adviser and DGS consent)

**MdBc 8444. FTE: Doctoral.** (1 cr; SP–Doctoral student, adviser and DGS consent)

**MdBc 8666. Doctoral Pre-Thesis Credits.** (1-18 cr; SP–Max 18 cr per semester or summer; doctoral student who has not passed prelim oral)

**MdBc 8777. Thesis Credits: Master’s.** (1-18 cr; SP–Max 18 cr per semester or summer; 10 cr total required [Plan A only])

**MdBc 8888. Thesis Credits: Doctoral.** (1-18 cr; SP–Max 18 cr per semester or summer; 24 cr required)

**Biology (Biol)**

**College of Science and Engineering**

**Biol 1001. Biology and Society.** (4 cr; A-F only) Contemporary issues in biology. For nonmajors. (3 hrs lect, 2 hrs lab)

**Biol 1011. General Biology I.** (5 cr; SP–1 yr high school chem or 1 sem college chem; A-F only) Fundamental concepts of biology, including chemical basis of life, cell structure and function, energy transformations, photosynthesis, cellular respiration, genetics, molecular biology, DNA technology, development, origin of life, and evolution. (4 hrs lect, 2.5 hrs lab)

**Biol 1012. General Biology II.** (5 cr; SP–1011; A-F only) Fundamental concepts of biology, including classification and diversity of life, anatomy, physiology, and development of procaryotes, protistans, fungi, animals, and plants; behavior; population, community, and ecosystem ecology. (4 hrs lect, 2.5 hrs lab)

**Biol 1097. Freshman Seminar: Topics (Various Titles to be Assigned).** (3 cr; SP–Fewer than 30 cr; A-F only) Fundamental concepts of a specific area within the biological sciences.

**Biol 1761. Human Anatomy.** (4 cr; SP–1 yr high school biol or 1011; A-F only) Gross and microscopic structure of body from functional standpoint using charts, models, skeletons; cat and sheep organ dissection demonstrates mammalian anatomy. Not for biology majors/minors; primarily for students in nursing, allied health professions, preprofessional programs, communication disorders, physical education. (2 hrs lect, 4 hrs lab)

**Biol 2101. Cell Biology.** (3 cr; SP–1012, 4 cr organic chem or #; A-F only) Structure and function of procaryotic and eucaryotic cells, including cell surface, membranes, organelles, cytoskeleton, cell growth, cell physiology, and experimental methods used in cell studies. (3 hrs lect)

**Biol 2201. Genetics.** (3 cr; SP–1012, Math 1004; A-F only) Basic principles of Mendelian inheritance, molecular genetics, chromosomal aberrations, and population genetics. (3 hrs lect)

**Biol 2763. Biology of Women.** (2 cr; QP–1102 or 1111; SP–1001 or 1011; A-F only) Fundamental principles of biology unique to women. Evolution of sex and gender; sex determination, differentiation, and development; sexual brain differences; anatomy and physiology; menstruation; oogenesis; ovulation; fertilization; pregnancy and birthing; birth control; menopause; aging; cancer; and nutrition. (2 hrs lect)

**Biol 2801. General Ecology.** (3 cr; SP–1012 or #; A-F only) Relationships between life and environment for individuals, populations, communities, and ecosystems; surveys of environmental factors and biomes. May be taken without lab 2802. (3 hrs lect)

**Biol 2802. Ecology Laboratory.** (2 cr; SP–2801 or #; A-F only) Experience in methods of measuring environmental factors, interpreting data. (4 hrs lab)

**Biol 2803. Issues in Global Ecology.** (3 cr; QP–1102 or 1110 or 1111 or #; SP–1001 or 1012 or #; A-F only) Holistic approach to current status and future prospects of Earth's life support systems.

**Biol 3601. Plant Diversity.** (3 cr; SP–1012; A-F only) Evolutionary survey of plants, focusing on diversity of life histories and patterns of organization. Fossil and extant groups, including algae and nonvascular and vascular land plants. (2 hrs lect, 2 hrs lab, field trip)

**Biol 3602. Plant Taxonomy.** (3 cr; SP–1012; A-F only) Introduction to taxonomy of vascular plants, emphasizing seed plants; representative families; terminology; literature; use of keys. (2 hrs lect, 2 hrs lab)

**Biol 3701. Animal Diversity.** (4 cr; SP–1012; A-F only) Survey of major animal phyla, focusing on phylogeny, anatomy, physiology, and ontogeny. (2 hrs lect, 4 hrs lab)

**Biol 3990. Topics in Biology.** (1-5 cr [max 5 cr]; SP–1012 or #) Topic announced before course offered.

**Biol 3993. Laboratory Teaching Experience.** (1-2 cr [max 2 cr]; SP–Biol or cell biol major, 90 cr incl 25 cr Biol; #; max 2 cr may be applied toward Biol or cell biol major; S-N only) Participation in teaching biology lab courses: help set up labs, participate in teaching of labs, and share in instruction of review labs.

**Biol 3994. Undergraduate Research.** (1-3 cr [max 6 cr]; SP–1012, Jr, #; max 4 cr may be applied toward Biol or cell biol major or Biol minor as upper div elective; S-N only) Advanced independent work in special fields.
Biol 3996. Internship in Biology. (1-2 cr [max 2 cr]; SP-1012, Jr; max 1 cr may be applied toward biol or cell biology major; S-N only)
Credit given for professional work experience outside an academic department. Requires prior department approval and coordination with faculty sponsor.

Biol 3997. Seminar I. (0.5 cr; SP-3997, Jr or Sr; S-N only)
Students attend and evaluate department seminars. (1.5 hrs seminar)

Biol 3998. Seminar II. (0.5 cr; SP-3997, Jr or Sr; S-N only)
Experience in oral presentation of student-initiated field, lab, or library research findings.

Biol 4501. General Microbiology. (4 cr; SP-2101 or #; A-F only)
Morphology of microorganisms; growth; environmental and physiological types; physical and chemical control; taxonomy; viruses; genetics of bacteria; practical applications, including medical, water, soil, and food microbiology. (2 hrs lect, 4 hrs lab)

Biol 4701. Invertebrate Biology. (3 cr; SP-1012 or #; A-F only)
Survey of major invertebrate phyla, emphasizing classification, phylogeny, morphology, physiology, and ecological relationships. Lab includes dissection of selected invertebrates, and collection and identification of local species. (2 hrs lect, 3 hrs lab, field)

Biol 4731. Entomology. (3 cr; SP-1012 or #; A-F only)
Structure, life history, ecology, classification, evolution, principles of control, and significance of insects in our society. Field collections. (2 hrs lect, 3 hrs lab and field)

Biol 4761. Ichthyology. (3 cr; SP-2801 or #; A-F only)
Physiologic, taxonomic, ecologic, economic, and behavioral aspects of fishes. Lab emphasis on fishes of Great Lakes region, including field conducted independent study. (2 hrs lect, 3 hrs lab, field)

Biol 4763. Ornithology. (3 cr; SP-1110 or 1112, 1113 or #; SP-2801 or #; A-F only)
Lab and field identification of birds, their migration and habitats; biological, taxonomic, and economic considerations. (2 hrs lect, 8 hrs lab and field for 7 weeks)

Biol 4765. Vertebrate Embryology. (3 cr; SP-2101 or #; A-F only)
Comparative morphogenesis of vertebrate embryo, including reproductive cycles, gametogenesis, fertilization, cleavage, gastrulation, embryonic adaptations, and detailed consideration of mammalian organogenesis. Lab study of developmental anatomy of frog, chick, and pig embryo. (2 hr lect, 4 hrs lab)

Biol 4767. Comparative Anatomy of Vertebrates. (4 cr; SP-1012; A-F only)
Review; emphasizes phylogeny. (2 hrs lect, 4 hrs lab)

Biol 4801. Evolution. (2 cr; SP-2201 or #; A-F only)
Origin, history, opposition, and evidence supporting evolutionary ideas. Basic concepts: origin of life, phylogeny, biological history, mechanisms of evolutionary change, population genetics, speciation, tempo of evolution, macroevolution, extinction, biogeography, evolution of social systems, altruism. (2 hrs lect)

Biol 4891. Animal Behavior. (2 cr; SP-2801 or #; A-F only)
Known behavior of various vertebrate and invertebrate phyla, emphasizing adaptive significance and the genetics and ontogeny of behavioral patterns. Mating, aggressive, nutritive, and nurturing behavior and relation to ecology of animal populations. (2 hrs lect)

Biol 4892. Animal Behavior Laboratory. (1 cr; SP-2801, 4891 or 4891 or #; A-F only)
Lab exercises and student projects to examine and demonstrate principles of animal behavior.

Biol 5121. Plant Biochemistry and Molecular Biology. (4 cr; SP-2101, Chem 3322 or Chem 4341 or #; A-F only)
Biochemistry unique to photosynthetic organisms; photosynthetic electron transport respiration, nitrogen fixation, carbon dioxide fixation, lipid metabolism, carbon partitioning, cell walls, and biosynthesis of plant hormones. Recent advances in plant molecular biology. (1 hr lect, 9 hrs lab)

Biol 5133. Mechanisms of Cell Communication. (4 cr; SP-2101; A-F only)
Molecular and cellular mechanisms of cell-cell and cell-matrix interactions. Signal transduction mechanisms. (2 hrs lect, 4 hrs lab)

Biol 5199. Frontiers in Cell Biology. (1 cr; SP-2101, 2201, cell biol major, 90 cr; S-N only)
Analysis and discussion of current literature. (1 hr lect)

Biol 5231. Molecular Biology. (3 cr; SP-2101, 2201 or #; A-F only)
Contemporary topics dealing with molecular biology and genetics of procaryotic and eucaryotic organisms. (3 hrs lect)

Biol 5232. Molecular Biology Laboratory. (2 cr; SP-5231 or 45231 or #; A-F only)
Regulation of gene expression in prokaryote and eukaryote explored through use of recombinant DNA technologies. (6 hrs lab)

Biol 5331. Plant Development. (2 cr; SP-2101, 2201, 3601 or #; A-F only)
Basic cellular events of plant development: cell division, cell-to-cell interaction, cell polarity, and cell death. Genetic control and environmental regulation of plant cells and their development. (2 hrs lect)

Biol 5332. Plant Development Laboratory. (2 cr; SP-5331 or 45331; A-F only)
Laboratory study of basic cellular events during plant development: advanced computer image analysis, cell and tissue measurement, in situ cell labeling, plant labeling, plant culture, sample isolation, and data analysis. Research paper required. (4 hrs lab)

Biol 5361. Developmental Biology. (4 cr; SP-2101, 2201 or #; A-F only)
Molecular and cellular mechanisms of development, emphasizing animal systems, including cell cycle, gametogenesis, fertilization, morphogenetic movements, cytodifferentiation, cell interactions, pattern formation, gene expression, organogenesis, metamorphosis, regeneration, and aging. (2 hrs lect, 6 hrs lab)

Biol 5511. Virology. (3 cr; SP-4501; A-F only)
Viruses and hosts; effects of viral infections on cells; expression of viral genome in procaryotic and eucaryotic cells; epidemiology and pathogenesis of viruses, including emerging ones; viral evolution. (2 hrs lect, 2 hrs lab)
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Biol 5513. Experimental Immunology. (4 cr; SP-4501 or #; A-F only)
Principles and practices of basic and advanced immunological lab techniques. (2 hrs lect, 6 hrs lab)

Biol 5601. Plant Physiology. (2 cr; SP-2101 or #; A-F only)
Study of plant functions, emphasizing higher plants. Biochemical and physical aspects of plants: growth, nutrition, metabolism, and relationship to light, water, and other environmental factors. Research paper required of graduate students. (2 hrs lect)

Biol 5602. Plant Physiology Laboratory. (2 cr; SP-5601 or $5601; A-F only)
Experimental basis for interpretation of certain physiological phenomena in plants; research problems, methods, and techniques. Research problem required of graduate students. (6 hrs lab)

Biol 5765. Histology. (4 cr; SP-2101; A-F only)
Mammalian tissues, organs, systems studied at light and electron microscopic levels. Cellular elements (epithelium, peripheral blood, connective tissues, mineralized tissue and joints, muscle, nerve, cardiovascular, myeloid); organs; systems (lymphoid, respiratory, urinary, integumentary, digestive, endocrine, reproductive). (3 hrs lect, 3 hrs lab)

Biol 5801. Microbial Ecology. (2 cr; SP-2101, 2801 or 4501 or #; A-F only)
Microorganisms in natural environments: diversity, distribution, energetics, and growth of heterotrophic and autotrophic microbes in oxic and anoxic habitats. Roles of microbial populations and communities in biogeochemical cycling, ecosystem functioning, landscapes, and industrial, agricultural, and environmental applications. (2 hrs lect)

Biol 5802. Microbial Ecology Laboratory. (2 cr; SP-5801 or $5801 or #; A-F only)
Lab and field-oriented exercises that teach concepts about microbial populations and their communities, energetics, food webs, biogeochemistry, and biodiversity while providing an introduction to research methods. Students master advanced microscopic, culturing, spectroscopic, molecular, radioisotopic, and computational techniques. (4 hrs lab)

Biol 5803. Water Pollution Biology. (3 cr; SP-5861 or #; A-F only)
Systems approach to responses of aquatic organisms, communities, and ecosystems to pollutants and human use. Case studies of stressed aquatic ecosystems. (2 hrs lect, 3 hrs lab)

Biol 5807. Mathematical Ecology. (3 cr; SP-2801, Math 1290 or Math 1297; A-F only)
Development and use of mathematical models to describe ecological patterns and processes. (2 hrs lect, 2 hrs lab)

Biol 5811. Plant Autecology. (3 cr; SP-2801; A-F only)
Survey of environmental factors and responses to these by an individual plant; ecological life histories; biotic interactions; intraspecific variation; use of instrumentation; emphasis on seed plants. (2 hrs lect, 2 hrs lab)

Biol 5831. Plant Population and Community Ecology. (4 cr; SP-2801; A-F only)
Structure and dynamics of plant populations and plant communities in relation to environment; emphasis on seed plants. (2 hrs lect, 4 hrs lab)

Biol 5833. Stream Ecology. (4 cr; SP-2801 or #; A-F only)
Studies of stream communities and ecosystems as influenced by biological interactions and physical factors. Emphasis on North Shore streams. (2 hrs lect, 6 hrs lab and field)

Biol 5861. Lake Ecology. (3 cr; SP-2801 or #; A-F only)
Ecology of lakes and reservoirs. (3 hrs lect)

Biol 5862. Advanced Lake Ecology. (3 cr; SP-5861 or $5861; A-F only)
Lake and laboratory approaches to evaluation of ecosystem health and experimental aquatic ecology. (1 hr lect, 4 hrs lab)

Biol 5863. Ecosystems Ecology. (3 cr; SP-2801 or #; A-F only)
Survey of terrestrial and aquatic ecosystems, emphasizing current literature on ecosystem processes. (3 hrs lect)

Biol 5864. Ecosystems Ecology Laboratory. (1 cr; SP-5863 or $5863, 2802; A-F only)
Lab and field investigations of ecosystem processes. (3 hrs lab)

Biol 5865. Conservation Biology. (2 cr; SP-2801; A-F only)
Introduction to science of species, habitat, and ecosystem conservation and management. (4 hrs lect, for 7 wks)

Biol 5990. Topics in Biology. (1-5 cr [max 10 cr]; SP-1012, #; A-F only)
Topic announced before course offered.

Biol 8099. The Biological Practitioner. (1 cr; SP-Grad student in biol or related field; #; S-N only)
Research ethics and professional communication.

Biol 8139. Seminar in Cell Biology. (1 cr [max 10 cr]; QP-3245; SP-2101, grad student in biol or related field; #; S-N only)
Analysis of current literature.

Biol 8333. FTE: Master’s. (1 cr; SP-Master’s student, adviser and DGS consent)

Biol 8777. Thesis Credits: Master’s. (1-18 cr; SP-Max 18 cr per semester or summer; 10 cr total required [Plan A only])

Biol 8899. Seminar in Ecology. (1 cr [max 10 cr]; QP-3775; SP-2801, grad student in biol or related field; #; S-N only)
In-depth analyses of topics in ecology.

Biol 8993. Graduate Seminar. (1 cr [max 10 cr]; SP-Grad student in biol or related field; #; S-N only)
Reports on recent development in biology and on research projects in the department.

Biol 8994. Graduate Research. (1-4 cr [max 10 cr]; SP-Grad student in biol or related field; #; S-N only)
Directed research or study on an advanced topic.

Business Law (BLaw)

School of Business and Economics

BLaw 2001. The Legal Environment. (3 cr; QP-30 cr; SP-20 cr; A-F only)
Introduction to U.S. legal system and its impact on modern business operations. Ethical, economic, social, and political perspectives of the legal environment. Constitutional law, administrative regulation, torts and products liability, contracts, business organizations, employment/labor law.
Chemical Engineering

(ChE)

College of Science and Engineering

ChE 1011. Introduction to Chemical Engineering. (3 cr; QP—High school chem, high school algebra; SP—High school chem, high school algebra; A-F only)
Differences between natural sciences and chemical engineering. Continuous processing concept and waste disposal. Hazardous waste; engineering economy, including value of money and rate of return. Chemical engineering equipment and flow sheets. Process paths based on economics. Species allocation and separation.

ChE 2001. Introduction to Environmental Engineering. (3 cr; QP—High school chem, high school algebra; SP—High school chem, high school algebra; A-F only)
Comprehensive survey of environmental engineering. Fundamental science and engineering principles as basis for analyzing environmental issues. Federal laws on air pollution, wastewater discharge, and hazardous waste. Wastewater treatment, air pollution control, waste minimization, resource recovery, and recycling.

ChE 2011. Design of Engineering Experiments. (3 cr; QP—Math 1297; SP—Math 1297; A-F only)
Basic theories of experimental design, data analysis, and statistical process control, emphasizing their application to chemical engineering practice.

ChE 2111. Material and Energy Balances. (3 cr; QP—Chem 1112 or Chem 1132H; SP—Chem 1151 or Chem 1161)
Elementary principles of chemical processes, emphasizing material and energy balances.

ChE 2121. Chemical Engineering Thermodynamics. (3 cr; QP—3110, Math 1297; SP—2111, Math 1297; A-F only)
Application of thermodynamic principles to chemical engineering, emphasizing pressure-volume-temperature relationships, thermodynamic laws, thermochemistry, chemical equilibrium, and phase relationships.

ChE 3111. Fluid Mechanics. (3 cr; QP—Engr 3015, Math 3380; SP—Engr 2015, Math 3280; A-F only)
Mass and energy balances, Bernoulli’s equation, momentum balance, laminar and turbulent flow, boundary layer theory, pumps, compressors, and turbines.

ChE 3112. Heat and Mass Transfer. (3 cr; QP—3210; SP—3111; A-F only)
Theory and practice of heat and mass transfer. Fundamentals of diffusion, conduction, convection, and radiation with application to design of heat and mass transfer equipment and systems.

ChE 3211. Chemical Engineering Laboratory I. (2 cr; QP—3210; SP—3111; A-F only)

ChE 3231. Properties of Engineering Materials. (3 cr; SP—2121, Chem 2521, Chem 4641; A-F only)
Thermodynamic, mechanical, and kinetic properties of materials: structure and bonding in metals, alloys, corrosion, crystals, semiconductors, polymers, colloids, ceramics, interfaces, and composites.

ChE 3791. Independent Study. (1-3 cr [max 3 cr]; QP—BChE candidate, Δ; SP—BSChE candidate, Δ)
Directed individual study arranged with instructor and head of department before registration.

ChE 3894. Chemical Engineering Research. (1-3 cr [max 6 cr]; QP—BChE candidate, Δ; SP—BSChE candidate, Δ)
Experience in a selected research area. Student must present a satisfactory written report and oral presentation. Course may also be used for portion of a research proposal.

ChE 3951. Cooperative Education. (1-6 cr [max 20 cr]; QP—BChE candidate, Δ; SP—BSChE candidate, Δ)
Practical work experience with an employer closely associated with student’s academic area. Arranged by mutual agreement among student, department, and employer. Formal written report of work completed must be submitted to department at end of experience.

ChE 3994. Honors Chemical Engineering Research. (1-3 cr [max 6 cr]; QP—BChE candidate, Δ; SP—BSChE candidate, Δ; A-F only)
Experience in selected area of research in chemical engineering for honors students. Student must present a satisfactory written report and oral presentation. Course may also be used for preparation of research proposal for a department honors program.

ChE 4111. Separations. (3 cr; SP—3112; cannot apply cr to Graduate School program; A-F only)
Application of principles of mass transfer. Design of distillation, gas absorption, liquid extraction, drying, leaching, and membrane separation processes.

ChE 4211. Chemical Engineering Laboratory II. (2 cr; QP—3230, grade of C or better in 3411, BChE candidate or #; SP—3211; cannot apply cr to Graduate School program; A-F only)
Experiments illustrating mass transfer, simultaneous mass and heat transfer, and other separation principles. Technical report writing.

ChE 4301. Chemical Reaction Engineering. (3 cr; QP—3110, Chem 5622, Math 3380, BChE candidate; SP—3112; cannot apply cr to Graduate School program; A-F only)
Theory of rates of chemical reactions. Application of rate data to design of batch, tubular, continuous stirred-tank, and catalytic-chemical reactors.
Course Descriptions

Chem 4401. Process Control. (3 cr; QP—3110, 3230, Math 3380, BChE candidate; SP—2121, 3112, 4301, Math 3280; cannot apply cr to Graduate School program; A-F only)
Dynamic behavior of open-ended-loop system.
Design of automatic controller, emphasizing chemical process systems.

Chem 4501. Chemical Engineering Design I. (4 cr; QP—3110, 3230, 3601, 3611, 3621, 3631, 5535, BChE candidate; SP—2121, 3231, 4111, 4211, 4301; cannot apply cr to Graduate School program; A-F only)
Preliminary design of chemical processing or hazardous waste treatment plant. Use of engineering economics and calculation of rate return and hazardous waste management as applied to chemical plants. Market survey, flow sheet preparation, material and energy balances.

Chem 4502. Chemical Engineering Design II. (4 cr; QP—3701; SP—4501; cannot apply cr to Graduate School program; A-F only)
Continuation of Chem 4501. Equipment design, instrumentation, process control, hazardous waste management plan, plant safety, economic feasibility, and institute analysis for process chosen.

Chem 4601. Biochemical Engineering. (3 cr; SP—4301, #; A-F only)
Application of chemical engineering principles to design and operation of industrial microbial processes, emphasizing enzyme and micrombial growth kinetics.

Chem 4611. Advanced Wastewater Treatment. (3 cr; SP—2111, Chem 2521)

Chem 4612. Hazardous Waste Processing Engineering. (3 cr; QP—Chem 3513 or Chem 3542, Chem 5621, Phys 1109 or Phys 1109H; SP—2111, Chem 2521; A-F only)

Chem 5895. Special Topics: (Various Titles to be Assigned). (1-4 cr (max 10 cr); QP—#; SP—#; cr cannot be applied to a Graduate School program)
Study of current and special topics not available in regular department curriculum. May involve specialties of department or visiting faculty.

Chemistry (Chem)

College of Science and Engineering

Chem 1102. Aspects of Chemistry. (3-4 cr; SP—$1113, $1151, $1161, $2172; A-F only)
Topics in general, organic, and biological chemistry. Study of chemical principles, their application, and their impact on daily life. Independent unit in contrast to Chem 1113, 1151, or 1161; 4 credit option with lab.

Chem 1113. Introduction to General, Organic, and Biological Chemistry I. (5 cr; SP—$1151, $1161, $2172; for students terminating study of chem with a max of 10 cr; A-F only)
Chemical principles and their applications: atomic and molecular structure, solutions, acids, bases, salts, equilibria; physical and chemical properties of organic compounds, organic chemistry of living systems; carbohydrates, lipids, proteins, enzymes, nucleic acids, and metabolic pathways.

Chem 1114. Introduction to General, Organic, and Biological Chemistry II. (5 cr; QP—1105, 1106; SP—$2521, $3322; 1113; A-F only)
Chemical principles and their applications: atomic and molecular structure, solutions, acids, bases, salts, equilibria; physical and chemical properties of organic compounds, organic chemistry of living systems; carbohydrates, lipids, proteins, enzymes, nucleic acids, and metabolic pathways.

Chem 1151. General Chemistry I. (5 cr; QP—High school chem, high school algebra or ∆; SP—$1113, $1161, $2172; high school chem, high school algebra; A-F only)
Fundamental principles exemplified by study of elements, compounds, and their reactions.

Chem 1152. General Chemistry II. (5 cr; QP—1110; SP—$1114, $1162, $2172; 1151; A-F only)
Fundamental principles exemplified by study of elements, compounds, and their reactions.

Chem 1161. Honors Course: General Chemistry I. (5 cr; QP—High school chem, high school algebra or ∆; primarily for chem majors and others selected for aptitude and interest; SP—$1113, $1151, $2172; high school chem, ∆; A-F only)
Fundamental principles exemplified by study of elements, compounds, and their reactions.

Chem 1162. Honors Course: General Chemistry II. (5 cr; QP—1113; SP—$1114, $1152, $2172; 1161; A-F only)
Fundamental principles exemplified by study of elements, compounds, and their reactions.

Chem 1191. Independent Study. (1-2 cr (max 4 cr); QP—∆; SP—∆; A-F only)
For students wishing to do special work in areas useful to individual programs and objectives when such are not available in regular course offerings.

Chem 2095. Special Topics in Chemistry: (Various Titles to be Assigned). (4 cr; SP—10 cr college chem or #; A-F only)
Selected topics that fall outside currently offered courses. Topic announced before course offered.

Chem 2107. Introductory Environmental Chemistry. (3 cr; QP—11112 or 1132H; SP—1152 or 1162; A-F only)
Introduction to air and water chemistry. Sources and reactions of C, N, O, P, S, and trace metals. Pollution and waste disposal. Field trips to local labs.

Chem 2172. General Chemistry. (4 cr; QP—Phys 1108, ECE or IE Phys or Applied Phys major with 42 cr; SP—$1113, $1151, $1161; Math 1290 or Math 1296; A-F only)
Fundamental principles exemplified by study of elements, compounds, and their reactions.

Chem 2222. Quantitative Analysis. (4 cr; QP—1112 or 1132H; SP—1152 or 1162; A-F only)
Theory and practice in analytical techniques; introduces gravimetric, volumetric, and spectrophotometric methods.

Chem 2521. Organic Chemistry I. (4 cr; QP—11112 or 1132H; SP—1152 or 1162; A-F only)
Structure and bonding, stereochemistry, functional group reactions.
Chem 2522. Organic Chemistry II. (4-5 cr; QP-3512; SP-2521; A-F only)
Functional group reactions, bioorganic chemistry.

Chem 3184. Undergraduate Seminar. (1 cr [max 2 cr]; QP-BS chem or biochem/molecular biol majors; SP-BS chem or biochem/molecular biol majors; S-N only)
Practice in preparation and oral presentation of reports on articles from literature or on senior research. (2 hrs per wk for 2 sems)

Chem 3194. Undergraduate Research. (1-3 cr [max 6 cr]; QP-ΔA SP-ΔA S-N only)
Experience in a selected area of research.

Chem 3322. Biochemistry. (3 cr; QP-3513 or #; SP-2522; A-F only)
Survey of biochemistry, emphasizing enzyme catalysis, cellular energetics, and major metabolic processes.

Chem 3324. Biochemistry Laboratory. (1 cr; QP-3311; SP-3322 or 8322; A-F only)
Identification and analysis of biological molecules with emphasis on macro-molecules, polysaccharides, proteins, and nucleic acids (RNA, DNA).

Chem 4242. Instrumental Analysis. (2-4 cr; QP-3210, 5611 or 5622; SP-2222, 4623 or 4642; BS chem majors should take for 4 cr with lab; A-F only)
Theory and applications of instrumental methods of chemical analysis, including electrochemistry, spectroscopy, and separations.

Chem 4341. Biochemistry and Molecular Biology I. (4 cr; QP-3513 or 3542, Math 1296; physical chem recommended; SP-2522, Math 1296; physical chem recommended; A-F only)
Introduction to properties of biochemically important compounds and their interactions in living systems, emphasizing bioenergetics, enzyme mechanisms, major metabolic pathways, and metabolic regulation.

Chem 4342. Biochemistry and Molecular Biology II. (4 cr; QP-Biol 3154, 5337; SP-4341, Math 1296; physical chem recommended; A-F only)
Introduction to properties of biochemically important compounds and their interactions in living systems, emphasizing bioenergetics, enzyme mechanisms, major metabolic pathways, and metabolic regulation.

Chem 4363. Biochemistry Laboratory. (2 cr; QP-3210, 5337; SP-2222, 4342 or 4342 with #; A-F only)
Applications of biochemistry and molecular biology techniques.

Chem 4364. Molecular Biology Laboratory. (2 cr; QP-5338, 5361 or #; SP-4342, 4363; A-F only)
Applications of biochemistry and molecular biology techniques.

Chem 4434. Inorganic Chemistry. (4-5 cr; QP-5610 or 5620; SP-4632 or 4641; BS chem majors must take for 5 cr with lab; A-F only)

Chem 4632. Physical Chemistry. (4-5 cr; QP-3513 or #, Math 1297, Phys 1109 or 11109H; SP-2522 or #, Math 1297, Phys 1204; S cr includes lab; A-F only)
Properties of gases, liquids, and solutions; thermodynamics and equilibria; electrochemistry; chemical kinetics; quantum mechanics; spectroscopy.

Chem 4641. Physical Chemistry I. (4 cr; QP-2 yrs chem, Math 3298, Math 3320, Phys 1109 or Phys 1109H; SP-2 yrs chem, Math 3280, Phys 1204; A-F only)
Quantitative treatment of physical principles and theories in chemistry, including topics in quantum mechanics, spectroscopy, and thermodynamics.

Chem 4642. Physical Chemistry II. (4 cr; QP-2 yrs chem, Math 3298, Math 3320, [Phys 1109 or Phys 1109H]; SP-4641; A-F only)
Quantitative treatment of physical principles and theories in chemistry, including topics in thermodynamics, equilibrium, and kinetics.

Chem 5350. Research Topics for High School Chemistry Teachers. (2-4 cr [max 8 cr]; QP-Ed MA or EdM student, Δ; SP-Ed MA or MEd student, Δ)
Experimental work and philosophy associated with a selected research topic.

Chem 5714. Applications of Spectroscopy. (3 cr; QP-Grad student or #; SP-5774; A-F only)
Application of spectroscopic techniques to structure elucidation, including NMR, FTIR, MS, UV-Vis, X-ray, EPR spectroscopy.

Chem 5725. Intermediate Analytical Chemistry. (3 cr; QP-5230 or #; SP-4242 or #; A-F only)
Augmentation to basic coursework in wet and instrumental analytical chemistry, including statistical and chemometric methods for experimental design and data analysis, electronics and computers in chemical instrumentation, and selected techniques of instrumental analysis such as mass spectrometry, inductively coupled optical emission spectroscopy, and analytical gas chromatography.

Chem 5754. Synthesis. (3 cr; QP-Grad student or #; SP-5774; A-F only)
Inorganic, organic, organometallic synthesis.

Chem 5764. Thermodynamics and Kinetics. (3 cr; QP-Grad student or #; SP-Grad student or #; A-F only)
Basic classical and statistical thermodynamics, phenomenological kinetics, elementary reaction rate theory, and the relationship between thermodynamics and kinetics.

Chem 5774. Structure and Bonding. (4 cr; QP-Grad student or #; SP-Grad student or #; A-F only)
Group theory to support its application to spectroscopy, bonding, reactions. Theoretical models to support MO theory.

Chem 8184. Seminar. (1 cr [max 1 cr]; SP-Grad chem major or #; S-N only)
Practice in preparation and oral presentation of reports on articles from the literature or on graduate research.

Chem 8224. Advanced Analytical Chemistry. (4 cr; SP-Grad chem major or #; A-F only)
Advanced treatment of selected methods in analytical chemistry.

Chem 8324. Advanced Biochemistry and Molecular Biology. (4 cr; QP-5337 or equiv; SP-4342 or equiv; A-F only)
Applications of biochemistry and molecular biology techniques.

Chem 8333. FTE: Master's. (1 cr; SP-Master's student, adviser and DGS consent)

Chem 8424. Advanced Inorganic Chemistry. (4 cr; QP-5720; SP-5774; A-F only)
Discussion of structure, reactions, and bonding in inorganic and organometallic compounds in terms of valence bond, molecular orbital, and ligand field theories.
Course Descriptions

Chem 8444. FTE: Doctoral. (1 cr; SP—Doctoral student, adviser and DGS consent)

Chem 8524. Advanced Organic Chemistry. (4 cr; QP—5730, 5750; SP—5754, 5764; A-F only)
Advanced treatment of synthetic methods and reaction mechanisms in organic chemistry.

Chem 8624. Advanced Physical Chemistry. (4 cr; QP—5720, grad student or #; SP—5714, 5764, 5774; A-F only)
Advanced topics selected from quantum and computational chemistry, reaction kinetics and dynamics, statistical mechanics, and thermodynamics.

Chem 8666. Doctoral Pre-Thesis Credits. (1-18 cr; SP—Max 18 cr per semester or summer; doctoral student who has not passed prelim oral)

Chem 8750. Selected Topics in Chemistry. (1-4 cr [max 8 cr])
Topics not available in standard curriculum.

Chem 8777. Thesis Credits: Master's. (1-18 cr; SP—Max 18 cr per semester or summer; 10 cr total required [Plan A only])

Chem 8888. Thesis Credits: Doctoral. (1-18 cr; SP—Max 18 cr per semester or summer; 24 cr required)

Coaching Certification (CC)

College of Education and Human Service Professions

CC 3100. Sports Science for Coaches. (2 cr; QP—Coaching minor or #; not open to PE majors; SP—Coaching minor or #; not open to PE majors; A-F only)
Applied musculoskeletal anatomy and linear, angular, and curvilinear physics as bases for enhanced athletic performance.

CC 3116. Care and Prevention of Sport Injuries. (3 cr; QP—Coaching minor or #; not open to PE majors; SP—Coaching minor or #; not open to PE majors; A-F only)
Sport training programs; reconditioning and preconditioning regimens.

CC 3150. Coaching Methods. (2 cr; QP—Coaching minor or #; SP—Coaching minor or #; A-F only)
Study and application of educational methods in an athletic setting. Skill development, learning styles, biological considerations, practice development, conditioning for sport, and skill analysis.

CC 3160. Psychological Aspects of Coaching. (2 cr; QP—Coaching minor or #; SP—Coaching minor or #; A-F only)
Introduction to coaching field: its educational value and the psychological and sociological dimensions of high-level performance.

CC 3161. Administrative Aspects of Coaching. (2 cr; QP—Coaching minor or #; SP—Coaching minor or #; A-F only)
State and federal governing organizations, budgeting, scheduling, insurance, contest administration, and public relations procedures.

CC 3170. Coaching and Officiating Football. (2 cr; QP—Coaching minor or #; SP—Coaching minor or #; A-F only)
Systems of offense and defense, strategy, and methods of organizing practices and working with team members.

CC 3171. Coaching and Officiating Basketball. (2 cr; QP—Coaching minor or #; SP—Coaching minor or #; A-F only)
Fundamentals, styles of offense and defense, training suggestions.

CC 3172. Coaching and Officiating Volleyball. (2 cr; QP—Coaching minor or #; SP—Coaching minor or #; A-F only)
Coaching and officiating offenses and defenses; conditioning programs; coaching and officiating philosophies.

CC 3173. Coaching and Officiating Baseball. (2 cr; QP—Coaching minor or #; SP—Coaching minor or #; A-F only)
Fundamentals, practice sessions, training techniques, and offensive and defensive strategies.

CC 3174. Coaching and Officiating Soccer. (2 cr; QP—Coaching minor or #; SP—Coaching minor or #; A-F only)
Fundamental skills, systems of offense and defense, strategy and rules of the game, methods of organizing practices.

CC 3175. Coaching and Officiating Ice Hockey. (2 cr; QP—Coaching minor or #; SP—Coaching minor or #; A-F only)
Theory of coaching and teaching athletics. Review of literature on the competitive swimming and diving field, coaching and officiating philosophy, techniques, and methods.

CC 3176. Coaching and Officiating Swimming. (2 cr; QP—Coaching minor or #; SP—Coaching minor or #; A-F only)
Fundamental skills, systems of offense and defense, strategy and rules of the game, methods of organizing practices.

CC 3177. Coaching and Officiating Tennis. (2 cr; QP—Coaching minor or #; SP—Coaching minor or #; A-F only)
Strategies, fundamentals, psychology of tennis, attack and defensive patterns.

CC 3178. Coaching and Officiating Track and Field. (2 cr; QP—Coaching minor or #; SP—Coaching minor or #; A-F only)
Fundamentals, mechanical analysis of events, training techniques and strategies.

CC 3179. Coaching and Officiating Softball. (2 cr; QP—Coaching minor or #; SP—Coaching minor or #; A-F only)
Fundamentals, practice sessions, training techniques, and offensive and defensive strategies.

CC 3991. Independent Study. (2 cr; QP—Coaching minor or #; SP—Coaching minor or #; A-F only)
A coaching methods experience. Directed individual study must be arranged with coaching coordinator before registration.

CC 3997. Coaching Practicum. (1 cr; SP—15 cr in coaching minor; SP—15 cr in coaching minor; #; S-N only)
Supervised coaching experience in a school or agency setting.

Communication (Comm)

College of Liberal Arts

Comm 1000. Human Communication Theory. (3 cr; A-F only)
Introduction to fundamental concepts, models, and theories of human communication. Issues concerning verbal and nonverbal symbolic processes, language and meaning, and the relationship between communication and understanding. Communication processes and problems in various contexts.

Comm 1112. Public Speaking. (3 cr; A-F only)
Application of the theoretical bases of rhetoric to the public speaking situation.
Comm 1222. Interpersonal Communication. (3 cr; A-F only)
Analysis of the role communication plays in interpersonal relationships.

Comm 1500. Media and Society. (3 cr; A-F only)
Manipulative influence of contemporary media on American society. Examples drawn from campaigns, commercial advertising, and editorials.

Comm 2101. Foundations of Mass Communication. (3 cr; A-F only)
Theories, research, regulation, and ethical concerns surrounding contemporary mass media. Identifies U.S. media’s role within the international marketplace. Survey of contemporary media content, industry structures, technology, and delivery systems.

Comm 2621. Analysis of Public Discourse. (3 cr; SP-1112; A-F only)
Guided investigation of public discourse within selected periods. Topics vary.

Comm 2929. Intercultural Communication. (4 cr; A-F only)
Understanding variations among international cultures regarding communication practices. Potential difficulties in intercultural communication; effective means of engaging in intercultural communication.

Comm 3115. Persuasion and Argumentation in Public Speaking. (4 cr; SP-1112; A-F only)
Advanced theories. Developing persuasive strategies, carefully managing logical and argumentational structures within the speech, and fostering critical thinking tools in creation, analysis, and evaluation of persuasive speech.

Comm 3116. Professional Communication. (4 cr; SP-1112; A-F only)
Theory and practice of communication skills related to the workplace. Skill development in presentational speaking and vocational interviewing.

Comm 3200. Interpersonal Communication Theory. (3 cr; SP-1000 or 1222; A-F only)
Role of communication in developing, maintaining, and changing personal relationships.

Comm 3205. Relationship Communication. (3 cr; SP-1000 or 1222; A-F only)
Study of advanced interpersonal communication skills in context of family and gender issues.

Comm 3210. Group Communication. (4 cr; SP-30 cr or #; A-F only)
Small group approaches to problem management. Useful for anyone intending to participate in decision-making groups.

Comm 3215. Conflict Management. (3 cr; SP-30 cr or #; A-F only)
Application of interpersonal conflict management theory and skills to small group, organizational, and community conflicts.

Comm 3300. Teaching Assistantship in Communication. (1-3 cr [max 6 cr]; SP-60 cr, comm major or minor; #; max 3 cr may be applied to comm major or minor; S-N only)
Practical experience in teaching beginning courses in the department. Students serve as intern teachers assisting the instructor in administration of the course. Application deadline is one week before beginning of registration for following semester.

Comm 3390. Special Topics in Communication: (Various Titles to be Assigned). (3 cr [max 6 cr]; A-F only)
Topics not included in regular curriculum. Topic announced before course offered.

Comm 3500. Principles of Persuasion. (3 cr; SP-Soc sci course or #; A-F only)
Social scientific theory and research on communication techniques used to influence attitudes, perceptions, and behaviors of others. Research evidence regarding persuasion processes and effects on individuals and society.

Comm 3505. Media Communications. (3 cr; SP-Comp 1120; A-F only)
Journalistic and public relations writing techniques: fact gathering; selection and editing of news-editorial content of newspapers, magazines, television, and radio; reporting and editing court and municipal and county agency news; and practical application of public relations principles.

Comm 4000. Communication Portfolio. (1 cr; SP-5r comm major; cannot apply cr to Graduate School program; S-N only)
Compilation by senior communication major of portfolio of representative academic work, internship/employment/faculty evaluations, and/or other such materials as student and faculty adviser deem necessary.

Comm 4200. Communication in Organizations. (4 cr; SP-60 cr or #; A-F only)
Relationship between communication and organization design. Emphasis on development and impact of organization culture. Communication issues, including power, networks, gender, race, and decision making. Explores qualitative and field research.

Comm 4390. Seminar. (3 cr [max 9 cr]; SP-60 cr; max 6 cr may be applied to Graduate School program; A-F only)
Directed study and preparation of papers on subjects of current interest. Subjects announced before registration.

Comm 4391. Independent Study. (1-3 cr [max 6 cr]; SP-60 cr, 3.30 GPA in comm major or minor; #; max 3 cr may be applied to comm major or minor; A-F only)
Directed readings and projects in communication, communication media, or communication education. Application deadline is one week before beginning of registration for following semester.

Comm 4397. Internship in Communication. (1-8 cr [max 8 cr]; SP-79 cr, comm major or minor, 2.50 GPA in major or minor; max 3 cr may be applied to comm major or minor; cannot apply cr to Graduate School program; S-N only)
Students work in pre-approved program with a public agency, private organization, or other service agency; work must be in specific area of communication. Application deadline is one week before beginning of registration for following semester.

Comm 4500. History of Rhetoric. (3 cr; SP-1112 or #; cannot apply cr to Graduate School program; A-F only)
Development of rhetorical thought as expressed by representative writers.

Comm 4505. Media Theory and Research. (4 cr; SP-1500 or 2101, 60 cr or #; cannot apply cr to Graduate School program; A-F only)
Theoretical concepts and research perspectives currently used to understand intricacies of a mediated society. Introduction and application of basic research methods to study questions concerning impact of media on society and individuals.
Course Descriptions

Comm 5095. Special Graduate Topics in Communication. (3 cr; max 36 cr; SP–Grad student; #; A–F only)
Theory and research on various topics in communication.

Comm 5300. Teaching Methods in Communication. (3 cr; SP–79 cr or grad student or #; S–N only)
Issues in teaching communication theory and skills; suggested methods and materials of instruction. Public speaking, interpersonal communication, effective listening, media literacy, and group communication.

Comm 5390. Workshop; (Various Titles to be Assigned). (1-3 cr; max 6 cr; SP–Jr or sr or #; S–N only)
Intensive study of various aspects of communication.

Communication Sciences and Disorders (CSD)

College of Education and Human Service Professions

CSD 1100. Phonetics. (2 cr)
Study and practice of International Phonetic Alphabet. English and non-English speech sounds as they occur separately and in connected speech. Variations in speech production as related to regional and/or class distinctions.

Application of basic vocabulary in American Sign Language and the fingerspelling alphabet. Introduction to various sign systems and their use by the deaf community.

CSD 2002. American Sign Language Studies II. (3 cr; OP–5730, 5735 or #; SP–2001 or #)
Expansion of vocabulary base in American Sign Language. Comparative linguistic study of various sign systems, their use by the deaf community. In-depth study of principles of American Sign Language as used receptively and expressively in communication with deaf individuals.

CSD 2230. Human Communication Disorders. (4 cr)
Receptive and expressive human communication disorders. Importance of communication to human behavior; influence that communication disorders exert on broad spectrum of human activities. Professional roles and responsibilities of speech-language pathologists and audiologists. Observation.

CSD 3100. Normal Aspects of Human Communication. (3 cr; OP–3111, CSD major or #; SP–2230, CSD major or #; A–F only)
Introduction to normal processes and development of language, articulation, fluency, voice, and auditory behaviors. Some outside observation required.

CSD 3103. Anatomy of Speech and Hearing Mechanisms. (3 cr; OP–CSD major or #; SP–CSD major or #; A–F only)
Anatomy and physiology as they relate to hearing and speech processes including respiration, phonation, and articulation.

CSD 3105. Fundamentals of Hearing and Speech Science. (5 cr; OP–3111, CSD major or #; SP–3103, CSD major or #; A–F only)
Basic principles and research methods underlying current theories of psychoacoustics, physiological and acoustic phonetics, and speech perception. Lab.

CSD 3130. Language Development and Disorders. (4 cr; OP–CSD major or #; SP–CSD major or #; A–F only)

CSD 3200. Articulation and Phonological Disorders. (3 cr; OP–1990, 3111, 3211; SP–1100, 2230, 3100; CSD major or #; A–F only)
Differential diagnosis, assessment, and treatment considerations for articulation and phonological disorders. Outside observation required.

CSD 3230. Diagnostic and Treatment Methods in Communication Disorders. (2 cr; max 4 cr; OP–3111, CSD major or #; SP–2230, 3100, 3130; CSD major or #; A–F only)
Introduction to clinical assessment and treatment principles and procedures in communication disorders. Basic skills necessary for functioning in a clinical setting. Students must take the course fall semester (2 credits) and repeat it spring semester (2 credits) in the same academic year.

CSD 4097. Introduction to Clinical Practicum in Communication Disorders. (1 cr; OP–CSD major, C grade or better in 3906, 25 hours clinical observation; SP–CSD major, C grade or better in 3230, 25 hrs clinical observation; A–F only)
Introductory experience of clinical practicum with speech, language, and/or hearing impaired persons in an on-campus clinic under supervision of an ASHA-certified speech-language pathologist. (1 hr seminar per week)

CSD 4197. Clinical Practicum in Communication Disorders. (3 cr; max 6 cr; OP–CSD major, C grade or better in 3906, 25 hours clinical observation; SP–3230, CSD major, C grade or better in 3230, 25 hours clinical observation or #; A–F only)
Beginning experience of clinical practicum with speech, language, and/or hearing impaired persons in an on-campus clinic under supervision of an ASHA-certified speech-language pathologist. (1 hr seminar per week)

CSD 4200. Introduction to Fluency Disorders. (2 cr; OP–3111, 3211; SP–2230, 3100, CSD major or #; A–F only)
Etiology, characteristics, and development of stuttering and other fluency disorders.

CSD 4400. Hearing Disorders and Evaluation. (3 cr; OP–3211, CSD major or #; SP–3105, CSD major or #; A–F only)
Characteristics, development, and etiologies of typical auditory pathologies. Overview of basic hearing assessment and diagnostic techniques. Clinical observation required.

CSD 5000. Departmental Seminar. (1-3 cr; max 6 cr; OP–CSD major or #; SP–CSD major or #)
Recent developments in speech, language, and hearing; reports on current faculty/student research projects within department.

CSD 5003. American Sign Language Studies III. (3 cr; OP–5740 or #; SP–2002 or #; cannot apply cr to Graduate School program)
Intermediate-level study of grammatical and linguistic features of ASL; focus on understanding deaf culture and fluency in expressive and receptive skills.

CSD 5004. American Sign Language Studies IV. (3 cr; OP–5735, 5760 or #; SP–5003 or #; cannot apply cr to Graduate School program)
Advanced-level study of grammatical and linguistic features of ASL; understanding deaf culture and fluency in expressive and receptive skills.
CSD 5091. Independent Study. (1-3 cr [max 6 cr]; QP-Sr or grad student in CSD or SpEd; A; SP-Sr or grad student in CSD or SpEd; A) Directed study, readings, and/or projects of student interest in communication disorders.

CSD 5098. Workshop: (Various Titles to be Assigned). (1-3 cr [max 6 cr]) Opportunities for speech-language pathologists, audiologists, other related professionals, and students to concentrate study on a specific topic presented in a workshop format.

CSD 5200. Dysphagia. (3 cr; QP-3211 or equiv; CSD grad student or #; SP-3103 or equiv; CSD major or #) Anatomy and physiology of normal and disordered deglutition. Etiology, diagnosis, and management of swallowing disorders, including head and neck cancer.

CSD 5230. Assistive Technology. (4 cr; QP-Sr or #; SP-CSD major #; offered summer only) Assistive technology approaches and devices designed to improve communication skills of persons who do not speak or whose speech is not intelligible. Hands-on experience adapting computers into communication aids and operating computers with alternate access methods.

CSD 5300. Language Disorders in Children and Adolescents. (4 cr; QP-Sr or grad student in CSD or #; SP-Sr or grad student in CSD or #; A-F only) Advanced study of language disorders in individuals aged birth to 21 years. Etiology, diagnosis, and clinical techniques and study of relevant research. Relationship of language disorder to personal adjustment and academic success.

CSD 5400. Rehabilitative Procedures for the Hard of Hearing. (3 cr; QP-3711, CSD major or #; SP-4400 or equiv, CSD major or #; A-F only) Theories, principles, and methods regarding current approaches to aural rehabilitation of hard-of-hearing children and adults.

CSD 8097. Internship: Communication Disorders. (1-3 cr; [max 4 cr]; QP-25 hrs clinical observation, CSD grad student or #; SP-25 hrs supervised clinical observation, CSD grad student or #; A-F only) Supervised clinical practicum in on-campus clinic and/or an approved professional setting under supervision of an ASHA-certified speech-language pathologist. (1 hr seminar per week)

CSD 8099. Projects in Communication Disorders. (2 cr; QP-CSD grad student or #; SP-CSD grad student or #; A-F only) Plan B project or individual research under faculty supervision.

CSD 8197. Externship: Communication Disorders. (4 cr; QP-25 hrs clinical observation, CSD grad student or #; SP-25 hrs supervised clinical observation, CSD grad student or #; A-F only) Full-time professional clinical experience in an approved professional setting under supervision of an ASHA-certified speech-language pathologist.

CSD 8200. Voice Disorders. (4 cr; QP-CSD grad student or #; SP-CSD grad student or #) Theoretical and practical study of voice and voice disturbances in children and adults. Ventilator dependence and alaryngeal considerations.

CSD 8205. Advanced Fluency Disorders. (3 cr; QP-3510 or equiv; SP-4200 or equiv; CSD grad student or #) Differential diagnosis, assessment, and treatment considerations for developmental stuttering and other fluency disorders.

CSD 8230. Neurogenic Language Disorders. (3 cr; QP-3211 or equiv; CSD grad student or #; SP-3103 or equiv, CSD grad student or #) Advanced study of diagnosis, treatment, and research of acquired language disorders resulting from neurological impairment: aphasia, right brain damage, dementia, and traumatic head injury.

CSD 8231. Neurogenic Speech Disorders. (3 cr; QP-3211 or equiv; CSD grad student or #; SP-3103 or equiv, CSD grad student or #) Advanced study of neuroanatomical bases for motor speech disorders: diagnostic and therapeutic procedures used in speech disorders related to central and peripheral nervous system damage.

CSD 8235. Counseling Applications in Communication Disorders. (2 cr; QP-CSD grad student or #; SP-CSD grad student or #) Applications of interviewing and counseling theories and behaviors to field of speech-language pathology.

CSD 8297. Audiology Practicum. (1-2 cr [max 4 cr]; QP-8305, 5600, CSD grad student or #; SP-5400, 8400, CSD grad student or #; cannot apply more than 2 cr to Graduate School program; S-N only) Clinical assessment and rehabilitative experiences in an on-campus clinic under supervision of an ASHA-certified audiologist.

CSD 8333. FTE: Master's. (1 cr; SP-Master's student, adviser and DGS consent)

CSD 8400. Clinical Methods: Audiology. (1 cr; QP-3711, 3811, CSD grad student or #; SP-4400 or equiv, 5400, CSD grad student or #; offered intersession only; A-F only) Review of principles and practices underlying clinical assessment of auditory integrity; theoretical and practical approaches to fitting appropriate amplification systems.

CSD 8402. Clinical Seminar in Audiology. (2 cr; QP-5600, CSD grad student or #; SP-5400, CSD grad student or #) Study and discussion of current trends in rehabilitation of hard-of-hearing individuals through directed readings.

Composition (Comp)

College of Liberal Arts

Comp 1100. Word Processing for Writing. (0.5 cr; QP-cannot apply credit to Engl major or minor; S-N only) Basic computer literacy in word processing and Computer-Aided Instruction (CAI). Completes the computer component of freshman composition for students with transfer credit for composition that does not include the computer component of the course.

Comp 1120. College Writing. (3 cr; SP-Students speaking English as a second language must have TOEFL score of 550; A-F only) Instruction and practice in writing argumentative prose for academic situations with integrated word processing lab.
Course Descriptions

Comp 3100. Advanced Writing: Language and Literature. (3 cr; QP–1120, 90 cr; upper div papers filed; SP–1120, 60 cr; A-F only)
Writing critical essays and analyses using oral, published, and archival materials on liberal arts topics.

Comp 3110. Advanced Writing: Arts and Letters. (3 cr; QP–1120, 90 cr; upper div papers filed; SP–1120, 60 cr; A-F only)
Writing practice.

Comp 3121. Advanced Writing: Business and Organizations. (3 cr; QP–§3120; 1120, 90 cr; upper div papers filed; SP–1120, 60 cr; A-F only)
Study of and practice in the main forms of business and organizational writing: letters, memos, proposals, and reports.

Comp 3130. Advanced Writing: Engineering. (3 cr; QP–1110 or 1120, 90 cr; upper div papers filed; SP–1120, 60 cr; A-F only)
Writing practice.

Comp 3140. Advanced Writing: Human Services. (3 cr; QP–1110 or 1120, 90 cr; upper div papers filed; SP–1120, 60 cr; A-F only)
Writing practice.

Comp 3150. Advanced Writing: Science. (3 cr; QP–1110 or 1120, 90 cr; upper div papers filed; SP–1120, 60 cr; A-F only)
Writing practice.

Comp 3160. Advanced Writing: Social Sciences. (3 cr; QP–1110 or 1120, 90 cr; upper div papers filed; SP–1120, 60 cr; A-F only)
Writing practice.

Comp 3595. Special Topics: (Various Titles to be Assigned). (1-3 cr [max 6 cr]; SP–1120, 30 cr; A-F only)
General composition topics not included in regular curriculum. Topic announced before course offered.

Comp 5197. Internship in Writing. (1-3 cr [max 3 cr]; QP–5115; SP–#; A-F only)
Practical writing experience arranged by student with a media organization, business, or government agency.

Comp 5220. Document Design and Graphics. (3 cr [max 6 cr]; QP–Max 4 cr may be applied to Graduate School program; SP–1120, 60 cr; max 3 cr may be applied to Graduate School program; A-F only)
Principles and practice of using computer programs to design, create, and print documents that effectively integrate verbal and graphic texts.

Comp 5591. Independent Study. (1-3 cr [max 6 cr]; QP–#; max 6 cr may be applied to Graduate School program; SP–#; max 3 cr may be applied to Graduate School program; A-F only)
Students choose projects with their instructor.

Comp 5595. Special Topics: (Various Titles to be Assigned). (1-3 cr [max 6 cr]; SP–60 cr; A-F only)
Intensive study of rhetoric or composition topics not focused on in regular upper-division composition courses or related offerings. Topic announced before course offered.

Comp 8500. Graduate Seminar. (3–6 cr [max 6 cr]; A-F only)
Varying topics appropriate to study of composition, English, language, and rhetoric.

Comp 8902. Teaching College Composition. (3 cr; QP–#; required for tcgh assts in comp and Engl depts; SP–#; required for tcgh assts in comp and Engl depts; A-F only)
Methods, materials, and objectives of college composition, including practice in writing, teaching writing, and evaluating writing.

Comp 8910. Practicum in Teaching Composition. (3 cr; SP–#; A-F only)
Teaching, tutoring, and assisting in composition courses; experience in preparation of materials, microteaching, and grading student work.

Comp 8994. Directed Research in Composition. (1-3 cr [max 3 cr]; SP–8902; #; A-F only)
Controlled research in methods, materials, and theories (both linguistic and rhetorical) used in composition classes, sometimes involving experiments with composition students in secondary schools and colleges.

Computer Science (CS)

College of Science and Engineering

CS 1011. Introduction to Computers and Software. (3 cr; QP–1 yr high school algebra, Comp 1100 or Comp 1120 or #; SP–1 yr high school algebra, Comp 1100 or Comp 1120 or #; A-F only)
Introduction to computing systems. Survey of widely used software: operating systems, database systems, spreadsheets, graphics, programming languages. Brief introduction to computer hardware organization, microprocessors, networks.

CS 1111. Introduction to Programming in Pascal. (3 cr; QP–1 yr high school algebra or #; SP–§1511, §1581; 1 yr high school algebra or #; A-F only)
Basic concepts such as assignment, selection, repetition, modularity with procedures. For students with no prior programming experience.

CS 1121. Introduction to Programming in Visual BASIC. (3 cr; QP–1 yr high school algebra or #; SP–1 yr high school algebra or #; A-F only)
Event-driven Windows programming, data types, operators, objects and properties, menus, procedures, control structures, and database file processing. Applications of computers in instruction. For students with no prior programming experience.

CS 1131. Introduction to Programming in FORTRAN. (3 cr; QP–3 1/2 yrs high school algebra or Math 1250 or #; SP–§1135; 3 1/2 yrs high school algebra or Math 1250 or #; A-F only)
Study of FORTRAN 90 and its application in science and engineering. Basic syntax and data types, input and output, subprograms, control structures (if, select case, do, while, for), arrays, structured data, pointers, recursion, and vector operations.

CS 1135. Introduction to Programming in FORTRAN 77. (2 cr; QP–3 1/2 yrs high school algebra or Math 1250 or #; SP–§1131; 3 1/2 yrs high school algebra or Math 1250 or #; A-F only)
Study of FORTRAN 77 and its application in science and engineering. Basic syntax and data types, input and output, subprograms, control structures (if, for), and arrays.
Computer Science

CS 1211. Introduction to Programming in C. (3 cr; QP-3 yrs high school math, 1 qtr college programming or #; SP-51521; 3 yrs high school math, 1 sem college programming or #; A-F only)
For programmers experienced in another programming language.

CS 1311. Fundamentals of Information Systems. (4 cr; A-F only)
Introduction to systems theory, quality, decision making, and organizational role of information systems.

CS 1511. Computer Science I. (5 cr; QP-3 1/2 yrs high school math or #; SP-91581; 3 1/2 yrs high school math or #; A-F only)
Introduction to structured programming; use of subprograms, inter-module communication. Control structures, structured data. Elementary search and sort algorithms and their complexity. Recursion for problem solving. Introduction to data abstraction.

CS 1521. Computer Science II. (5 cr; QP-1622; SP-1511; A-F only)
Procedural and data abstraction. Elementary abstract data types, including stacks and queues, and their applications. Intermediate abstract data types, including trees, heaps, hash tables, and their applications. External methods.

CS 1581. Honors: Computer Science. (5 cr; QP-3 1/2 yrs high school math; #; SP-51511; 3 1/2 yrs high school math, #; A-F only)
Same as CS 1511, but in greater depth and with more challenging assignments. For high-ability students.

CS 2111. Introduction to Programming in C++. (3 cr; QP-1 yr high school or college computer programming in C or 1623 or 3104 or #; SP-1 yr high school or college computer programming in C or 1211 or 1521 or #; A-F only)
For programmers experienced in C programming language.

CS 2121. Introduction to Programming in Java. (3 cr; QP-3 yrs high school math, programming course or #; SP-3 yrs high school math, programming course or #; A-F only)
Design and implementation of applets and applications using Java programming language, including exception handling, abstract window toolkit, file system interface, network interface, and threads.

CS 2311. Data, File, and Object Structures. (4 cr; QP-1421; SP-2111 or #; A-F only)
Object-oriented and procedural software engineering methodologies in data definition and measurement, and in abstract data type construction; their use in developing screen editors, reports, and other information systems applications using data structures and file structures.

CS 2511. Software Development. (4 cr; QP-1623 or #; SP-1521 or #)
Techniques for creation and management of large-scale software. Experience with group implementation and design of software. Modularity, reusability, data abstraction, and algorithm analysis. Includes large-scale group project.

CS 2521. Computer Organization. (4 cr; QP-1623 or #; SP-1521 or #)
Internal representation of programs and data. Computer organization and introduction to computer architecture.


CS 2991. Independent Study. (1-4 cr [max 8 cr]; QP-#; SP-#)
Directed study of special interest topics not available in standard curriculum. Must be arranged with instructor before registration. May include readings, research, or special projects.

CS 3011. Information Technology and Hardware. (4 cr; SP-1311, 2311; A-F only)
Principles and application of telecommunication and computer systems hardware and software presented through lecture, installation, configuration, and operations experiences.

CS 3111. Computer Ethics. (4 cr; QP-1 qtr college programming, jr or #; SP-1 sem college programming, jr or #; A-F only)
Ethical issues faced by computing professionals, including those related to property rights, privacy, crime, liability, database security, and network access and communication.

CS 3121. Introduction to Interactive Multimedia Technology. (4 cr; QP-1 qtr college programming, jr or #; SP-1 sem college programming, jr or #; A-F only)
Systems topics. Fundamentals of multimedia computing and theoretical understanding of multimedia technologies; digitizing and manipulating images, voice, and video materials, including authoring a multimedia package. Includes a large-scale project.

CS 3131. Introduction to Computer Graphics. (4 cr; QP-1 qtr college programming, jr, Math 1160 or Math 1297 or Math 3320 or #; SP-1 sem college programming, jr, Math 1160 or Math 1297 or Math 3320 or #; A-F only)
Computer graphics and data structures and algorithms useful for presenting data visually on a computer. Graphical display techniques, user interfaces, and use of software applications supporting data visualization.

CS 3211. Introduction to Database Management Systems. (4 cr; QP-1 qtr college programming, jr or #; SP-1 sem college programming, jr or #; A-F only)
Design and use of database management systems. Basic data models, logical and physical data structures, comparisons of models, logical data design, and database usage. Issues such as data independence, integrity, privacy, security, and role of database administrator.

CS 3221. Operating Systems Practicum. (4 cr; QP-1 qtr college programming, jr or #; SP-1 sem college programming, jr or #; A-F only)
Hands-on introduction to operating systems and tools. Operating systems such as UNIX and X Windows and Windows 95. Program development tools. Local/remote area networks.

CS 3996. Internship in Computer Science. (1-3 cr; QP-Comp sci jr, #; SP-Comp sci jr, #; S-N only)
Practical, independent project in commercial or industrial setting. Department approval required before beginning project.

CS 4311. Human-Computer Interaction. (4 cr; SP-2111, 3121 or #; A-F only)
Design and evaluation of user interfaces for information systems. User models; task analysis; dialogue analysis and design; tradeoffs among alternative technologies; system models; evaluation techniques, help and documentation issues.
Course Descriptions

CS 4411. Communications and Network Technology. (4 cr; SP-3011, 3221 or #; A-F only)
In-depth experience of telecommunications fundamentals, including voice-video-data for LAN, MANN, and WAN, including the switched network systems. Data communication and telecommunication models and standards, concepts, and standard organizations. Installation, configuration, systems integration, and management of the technologies.

CS 4511. Automata, Computability, and Formal Languages. (4 cr; QP-3710 or #; SP-2511, Math 3355 or #; A-F only)

CS 4521. Advanced Data Structures and Algorithms. (4 cr; QP-1623, 3710 or #; SP-2511, Math 3355 or #; A-F only)
Common abstract data types such as lists, maps, sets, trees, tries, heaps, priority queues, graphs definitions. Time and space analysis of related algorithms such as sorting, hashing, graph search, shortest paths, strongly-connected components, order statistics, string compression, search.

CS 4531. Software Engineering. (4 cr; QP-3620, 3710 or #; SP-2511 or #; A-F only)
Formal methods of software design and development. Recognition of conditions for production of high quality software. Organization and management of software development projects. Introduction to design methodologies.

CS 4611. Database Management Systems. (4 cr; QP-3620 or #; SP-2511, 2521 or #; A-F only)
Database management fundamentals: relational, hierarchical, and network data models. Implementation topics, including file organization, query processing, concurrency control, recovery, integrity, and view implementation.

CS 4711. Computer Security. (4 cr; QP-3610, 3710 or #; SP-2511 or #; A-F only)

CS 4811. Systems Software. (4 cr; QP-3610, 1623 or #; SP-2511, 2521 or #; A-F only)
Design and implementation of basic systems software, including assemblers, macroprocessors, linkers/loaders, and compilers, utilizing a software engineering approach.

CS 4991. Independent Study. (1-4 cr [max 8 cr]; QP-#; SP-#; A-F only)
Directed study of special interest topics not available in standard curriculum. Must be arranged with instructor before registration. May include readings, research, or special projects.

CS 4994. Honors Project. (2-3 cr; QP-Consent of comp sci honors prog committee; SP-Consent of comp sci honors prog committee; A-F only)
Required for students who wish to participate in the computer science honors program. Students must complete a research project under supervision of a faculty adviser.

CS 4995. Special Topics: (Various Titles to be Assigned). (1-4 cr [max 8 cr]; QP-#; SP-#; A-F only)
Study of selected topic announced in Class Schedule.

CS 5541. Artificial Intelligence. (4 cr; QP-1623, 3610, 3710 or #; SP-2511, Math 3355 or #; A-F only)
Introduction to principles and programming methods of AI. Advanced Lisp programming. Knowledge representation methods, state space search strategies, and use of logic for problem solving. Applications chosen from among expert systems, planning, natural language understanding, and uncertainty reasoning.

CS 5551. User Interface Design. (4 cr; QP-1623, 3610, 3710 or #; SP-2511 or #; A-F only)
Introduction to major topics: handling input data, menus, user feedback, command-line systems, window systems, interface management systems, use of color, help systems, error handling and avoidance, and design for users with disabilities.

CS 5621. Computer Architecture. (4 cr; QP-3620 or #; SP-2511 or #; A-F only)
Computer organization from a software point of view. Relations among CPU organization, assembly language, and operating systems. System organization, including memory, I/O, and peripherals. Introduction to pipelining and CPU design. Alternative CPU organizations.

CS 5631. Operating Systems. (4 cr; QP-3620 or #; SP-2511, 2521 or #; A-F only)
Operating system as resource manager. Processor management and scheduling, deadlocks, concurrency, memory management, performance evaluation, and their application in modern operating systems. Introduction to networking and distributed systems.

CS 5641. Compiler Design. (4 cr; QP-3620 or #; SP-2511, 2521 or #; A-F only)

CS 5651. Computer Networks. (4 cr; QP-3620 or #; SP-2511, 2521 or #; A-F only)
Introduction to computer networking and associated software protocols. ISO reference model from software point of view, and commonly used protocols, such as TCP/IP. Design of computer networking software.

CS 5721. Computer Graphics. (4 cr; QP-3610, Math 3320 or #; SP-2511, Math 3320 or #; A-F only)
Computer graphics hardware and software, including displays, hardcopy devices, graphics packages, transformations, projections, scan conversion and clipping, 3-dimensional viewing, hierarchical object modeling, and rendering.

CS 5731. Information and Text Processing. (4 cr; QP-1623, 3710 or #; SP-2511 or #; A-F only)

CS 5741. Object-Oriented Design. (4 cr; QP-5529 or #; SP-4531 or #; A-F only)
Overview of software design and design methods, focusing on object-oriented design. Software implementation issues, emphasizing object-oriented
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<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Prerequisites</th>
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</thead>
<tbody>
<tr>
<td>CS 5751</td>
<td>Machine Learning. (4 cr; QP-5776 or # or CS grad student; SP-2511 or Stat 1411 or Stat 2411 or #; A-F only)</td>
<td>4</td>
<td>Introduction to primary approaches to machine learning. Methods selected from decision trees, neural networks, statistical learning, genetic algorithms, and reinforcement learning. Theoretical concepts associated with learning, such as inductive bias and Occam's razor.</td>
</tr>
<tr>
<td>CS 5994</td>
<td>Advanced Topics in Computer Science: (Various Titles to be Assigned). (4 cr; QP-5766 or # or CS grad student; SP-4511 or # or CS grad student; A-F only)</td>
<td>4</td>
<td>Research-oriented study of topics of current academic or industrial interest, such as parallel algorithms, VLSI design, computational geometry, logic programming languages, program correctness, information retrieval systems, and decision support systems.</td>
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<tr>
<td>CS 8333</td>
<td>FTE: Master's. (1 cr; SP-Master's student, adviser and DGS consent)</td>
<td>1</td>
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<tr>
<td>CS 8511</td>
<td>Advanced Theory of Computation. (4 cr; QP-5766 or # or CS grad student; SP-4511 or # or CS grad student)</td>
<td>4</td>
<td>Deterministic Turing machines and class P, nondeterministic computation and class NP, relationship between P and NP, polynomial transformations, and NP-completeness. Solutions and approximation algorithms for NP-complete problems. Cook's Theorem, halting problem, Church's thesis, polynomial hierarchy.</td>
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<tr>
<td>CS 8621</td>
<td>Advanced Computer Architecture. (4 cr; QP-5510 or # or CS grad student; SP-5621 or # or CS grad student; A-F only)</td>
<td>4</td>
<td>Hardwired and microprogrammed controllers. Memory devices and memory subsystem organization, including virtual memories and caches. Computer networks. Pipelined, vectorized, and parallel computer systems. Algorithmically specialized functional units.</td>
</tr>
<tr>
<td>CS 8631</td>
<td>Advanced Systems Programming. (4 cr; QP-5520, 5746 or # or CS grad student; SP-5631, 5641 or # or CS grad student; A-F only)</td>
<td>4</td>
<td>Overview of systems programs with emphasis on unifying themes common to major application areas, such as compiler construction, operating systems, and networks. Advanced study of practical aspects of one of these systems, including a substantive software development project.</td>
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<tr>
<td>CS 8721</td>
<td>Advanced Computer Graphics. (4 cr; QP-5736 or # or CS grad student; SP-5721 or # or CS grad student; A-F only)</td>
<td>4</td>
<td>Currently available computer graphics techniques. Curve and surface representation, solid modeling, visible surface determination, rendering, and illumination techniques. Advanced algorithms for scan-conversion, clipping, and anti-aliasing.</td>
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<tr>
<td>CS 8731</td>
<td>Information Retrieval. (4 cr; QP-5798 or # or CS grad student; SP-5731 or # or CS grad student)</td>
<td>4</td>
<td>Methods, major models, and theoretical issues in automatic processing and retrieval of text. Statistical and syntactic approaches in automatic text transformation. Very large database issues (data mining and fusion). Internet applications, knowledge-based processing. Hypertext and multimedia approaches.</td>
</tr>
<tr>
<td>CS 8751</td>
<td>Artificial Intelligence and Machine Learning. (4 cr; QP-5776 or # or CS grad student; SP-5751 or # or CS grad student; A-F only)</td>
<td>4</td>
<td>Overview of advanced artificial intelligence topics such as machine learning, knowledge representation, machine vision, natural language processing, search, logic and deduction, problem solving, planning, and robotics. Significant software project required.</td>
</tr>
<tr>
<td>CS 8777</td>
<td>Thesis Credits: Master's. (1-18 cr; SP-Max 18 cr per semester or summer; 10 cr total required [Plan A only])</td>
<td>1-18</td>
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<tr>
<td>CS 8993</td>
<td>Seminar. (1 cr [max 3 cr]; QP-# or CS grad student; SP-# or CS grad student; A-F only)</td>
<td>1</td>
<td>Presentation and discussion of articles in literature and/or of current research in department.</td>
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<tr>
<td>CS 8995</td>
<td>Special Topics: (Various Titles to be Assigned). (1-4 cr [max 8 cr]; QP-# or CS grad student; #; SP-CS grad student; #; A-F only)</td>
<td>1-4</td>
<td>Topics not available in standard curriculum. Topic announced in Class Schedule.</td>
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</table>

**Dance (DN)**

**School of Fine Arts**

DN 1001. Introduction to the World of Dance. (3 cr; A-F only)  
Appreciation of dance as an art and entertainment form using aesthetic, sociocultural, historical, and genre studies. Video and concert viewing, readings on choreographers and dancers, critiques, and lab experiences.

DN 1101. Modern Dance Technique I. (2 cr [max 12 cr]; A-F only)  
Beginning work, emphasizing modern dance as a performing art form.

DN 1111. Jazz Dance Technique I. (2 cr [max 8 cr]; QP-# for wrt and spr qtrs; SP-# for spr sem; A-F only)  
Beginning work, emphasizing jazz dance as a performing art form. Full semester enrollment encouraged.

DN 1121. Tap Dance Technique I. (2 cr [max 4 cr]; QP-6 cr of 1101 or 1111; #; SP-4 cr of 1101 or 1111; #; A-F only)  
Beginning work, emphasizing tap dance as a performing art form.

DN 1131. Ballet Technique I. (2 cr [max 12 cr]; A-F only)  
Beginning work, emphasizing ballet as a performing art form. Full semester enrollment encouraged.

DN 3201. Modern Dance Technique II. (2 cr [max 12 cr]; QP-#; SP-#; A-F only)  
Intermediate work, emphasizing modern dance as a performing art form.

DN 3211. Jazz Dance Technique II. (2 cr [max 12 cr]; QP-#; SP-#; A-F only)  
Intermediate work, emphasizing modern dance as a performing art form.

DN 3221. Tap Dance Technique II. (2 cr [max 4 cr]; QP-1121 or #; SP-1121 or #; A-F only)  
Intermediate work, emphasizing tap dance as a performing art form. Tap dance composition and development of improvisational skills.

DN 3231. Ballet Technique II. (2 cr [max 12 cr]; QP-#; SP-#; A-F only)  
Intermediate work, emphasizing ballet as a performing art form.
Course Descriptions

DN 3401. Dance Composition. (3 cr; QP–3201, 3231 or 3211, #; SP–3201, 3231 or 3211, #; A-F only)
Study and development of dance choreography through creative experiences.

DN 3611. Dance History. (3 cr; QP–1500 or #; SP–1001 or #; A-F only)
Religious, social, political, and artistic forces that have contributed to development of dance in Western civilization, emphasizing Romantic era through present.

DN 3991. Independent Study in Dance. (1-3 cr [max 6 cr]; QP–#; undergrads may not take more than 6 cr in 3171 and 5171 combined; SP–#; undergrads may not take more than 6 cr in 3991 and 5991 combined; A-F only)
Directed readings and projects arranged between student and faculty mentor.

DN 4116. Musical Theatre Audition Techniques. (3 cr; QP–#; SP–#; cannot apply cr to Graduate School program; A-F only)
Advanced dance, song, acting, and marketing capstone course for professionally oriented musical theatre student.

DN 5991. Independent Study in Dance. (1-3 cr [max 6 cr]; QP–#; undergrads may not take more than 6 cr in 3171 and 5171 combined; SP–#; undergrads may not take more than 6 cr in 3991 and 5991 combined; cannot apply cr to Graduate School program; A-F only)
Advanced directed readings and projects arranged between student and faculty mentor.

DN 5997. Internship in Professional Dance. (1-12 cr [max 12 cr]; QP–#; 1 cr for each 30 hrs of work, can apply max 6 cr to Graduate School program; SP–#; 1 cr for each 45 hrs of work, cannot apply cr to Graduate School program; A-F only)
Internship with a cooperating professional, commercial, or regional dance company.

Early Childhood Studies (ECh)

College of Education and Human Service Professions

ECh 2010. Introduction to Early Childhood Education: Birth-Age Eight. (3 cr; SP–CS 1011)
Historical, contemporary, and future scenarios in education for children from birth to age eight; personal and professional goals; use of technology for information gathering and record keeping.

ECh 2910. Caring for Infants and Toddlers. (3 cr; SP–2010 or #)
Current research in development in infants and toddlers; creation of culturally and developmentally appropriate environments for infants and toddlers and their families; observational tools related to infants and toddlers.

ECh 3006. Early School Years. (2 cr; SP–EEEd 1010)
Theoretical, historical, and cultural influences that impact early childhood education. Environments, methods, and materials that facilitate development. Collaborating with families and communities.

ECh 3010. Programs for Education of Young Children: Birth-Age Eight. (4 cr; SP–ECh major; A-F only)
Historical and theoretical models for education of young children from birth through age eight. Methods for facilitating development and collaborating with families and communities. Use of technology with young children. Practicum.
ECh 4993. Special Area Project. (1-4 cr; SP-#; cannot apply cr to Graduate School program; A-F only) Independent project for advanced students to substantially further their theoretical knowledge base or professional competencies in early childhood, birth through age eight.

ECh 5010. Programs for Education of Young Children: Birth-Age Eight. (4 cr; SP-ECh major; A-F only) Historical and theoretical models for education of young children from birth through age eight. Methods for facilitating development and collaborating with families and communities. Use of technology with young children. Practicum.

ECh 5020. Literacy, Language, and Mathematics: Birth-Age Eight. (5 cr; SP-ECh major, §3010, §3030, §SpEd 3103) Research and developing curriculum for emerging language, literacy, and mathematics for young children from birth through age eight. Use of technology to enhance curriculum. Practicum.

ECh 5030. Inquiry Social Studies and Science Learning: Birth-Age Eight. (5 cr; SP-2010, 3010, §3020, §4011, §SpEd 3105) Exploratory, socially sensitive environments for children from birth through age eight; inquiry, physical knowledge, social processes in children’s play; planning, implementing, evaluating, culturally, developmentally appropriate science and social studies learning experiences; integrated, thematic curricula; use of technology to enhance learning. Practicum.

ECh 5040. Creative Expression. (3 cr; SP-Cannot apply cr to Graduate School program) Developing curriculum for creative expression involving aesthetic and physical development.


ECh 5107. Issues in the Education of Younger Learners. (6 cr; SP-60 cr.; #; cannot apply cr to Graduate School program; offered summer only; A-F only) Societal effects on education and care of younger learners; efficacy research; multicultural and anti-bias curricula; integration of children with special needs; curriculum, systems, technology, and evaluation models.

ECh 5910. Caring for Infants and Toddlers. (3 cr; SP-Cannot apply cr to Graduate School program) Current research in brain development in infants and toddlers; creation of culturally and developmentally appropriate environments for infants and toddlers and their families; observational tools related to infants and toddlers.

ECh 5950. Guided Observations in Diverse Settings: Birth-Age Eight. (1-6 cr; SP-ECh major) Observing interaction and environment with children from birth through age eight and their families in diverse settings.

ECh 5991. Independent Study. (1-6 cr [max 6 cr]; SP-#; cannot apply cr to Graduate School program; A-F only) Directed independent study, readings, and/or projects of student interest.

ECh 5993. Special Area Project. (1-4 cr; SP-Cannot apply cr to Graduate School program; A-F only) Independent project for advanced students to substantially further their theoretical knowledge base or professional competencies.

ECh 7600. Seminar I: Professional and Portfolio Development for Study of Children and Families. (2 cr; SP-Offered summer only; A-F only) Professional ethics and philosophy of interdisciplinary programs for children and families; preparation of professional portfolio.

ECh 7602. Seminar II: A Case Approach to Dichotomies of Theory and Practice. (3-6 cr; SP-MEd student or #; offered summer only; A-F only) Advocacy, conflict resolution, resource systems, cultural differences, special needs, collaboration among families and agencies. Preventing and solving problems and implementing solutions.

ECh 7603. Seminar III: Participatory Leadership—Challenges and Rewards. (4 cr; SP-MEd student or #; offered summer only; A-F only) Participatory leadership models in different settings, including educational, community, global, and cultural. Analyzes useful aspects of models highlighting interpersonal communication. Students collaboratively design a participatory leadership development program and an evaluation component.

ECh 7605. Field Observation. (2 cr; SP-MEd student or #; A-F only) Field observation in a program serving children and families; examination of systems issues; reflective seminar.

**Economics (Econ)**

**School of Business and Economics**

**Econ 1003. Economics and Society.** (3 cr; QP-Cr not allowed toward econ major or minor or BAc or BBA degree; SP-Cannot apply cr to Econ major or minor or BAc or BBA majors) General description of U.S. economy and analysis of contemporary economic problems. Introduction to major economic issues and problems of the day, providing a simple framework used by economists for analysis. Offered in both classroom and alternative formats.

**Econ 1014. Freshman Seminar: Economics of Income Inequality and Poverty.** (4 cr; SP-Fewer than 30 cr; A-F only) Nature and consequences of income and inequality and poverty globally and within the United States.

**Econ 1022. Principles of Economics: Macro.** (3 cr; A-F only) Analyzing overall performance of an economic system. National income accounting and theory, unemployment, inflation, fiscal policy, money, monetary policy, economic growth, international trade, non-U.S. economies, and real-world application of these concepts.

**Econ 1023. Principles of Economics: Micro.** (3 cr; A-F only) Analyzing free enterprise system through study of product and resource markets. Supply and demand, utility, production and cost, market structure, resource use, market failures, regulatory role of government, and real-world application of these concepts.
Econ 1040. Personal Financial Management. (3 cr; A-F only)
Practical applications of concepts and techniques in managing personal finances.

Econ 1042. Freshman Seminar: The Great Depression and Macroeconomic Thought. (4 cr; SP–Fewer than 30 cr; A-F only)
Development of macroeconomic thought from the historical perspective of the Great Depression, 1929-41. During this time macroeconomic theory went through a profound revolution that laid the economic foundation for contemporary society.

Econ 2020. Statistics: Methods and Analysis. (5 cr; SP–24 cr; A-F only)
Statistical analysis of business and economic data; emphasizes problem solving and computer-based methods. Data analysis presentation, probability and sampling distributions, estimation, hypothesis testing, survey and experimental design, analysis of variance, qualitative data analysis, regression. Case studies.

Econ 3022. Macroeconomic Analysis. (3 cr; QP–1004, 1005, Math 1160; SP–1022, 1023, Math 1160; A-F only)
Determinants of national income, employment, and price levels with particular attention to aggregate demand and aggregate supply, and monetary and fiscal policy.

Econ 3023. Microeconomic Analysis. (3 cr; QP–1004, 1005, Math 1160; SP–1022, 1023, Math 1160; A-F only)
Behavior of households as consuming units and suppliers of resources; analysis of decision making by firms under various market conditions.

Econ 3030. Economic Research Methodology. (3 cr; QP–1004, 1005, 1203, 1204, Math 1160; SP–1022, 1023, 2020, Math 1160; A-F only)
Techniques used in modeling and estimating economic relationships; emphasis on computer methods and research applications/case studies involving real data. Model building, multiple regression, logistic regression, residual and influence analysis, time in regression analysis. Research report.

Econ 3031. History of Economic Thought. (3 cr; QP–1002 or [1004, 1005]; SP–1003 or [1022, 1023]; A-F only)
Development of economic ideas, principles, and systems of analysis from early times to present, emphasizing personalities and historical events surrounding development of economic thought.

Econ 3036. Radical Economics. (3 cr; QP–1002 or [1004, 1005]; SP–1003 or [1022, 1023]; A-F only)
Radical Marxist critique of traditional economic models and of methodology used in developing and applying these models. Alternatives to market system. Analysis of current economic issues from radical's perspective.

Econ 3311. Money and Banking. (3 cr; QP–1005; SP–1022; A-F only)
Role of financial institutions and markets, emphasis on Federal Reserve System and its control of commercial banking system, monetary theory and policy, and international economics.

Econ 3410. International Economics and Finance. (3 cr; QP–1004, 1005; SP–1022, 1023; A-F only)

Econ 3512. Managerial Economics. (3 cr; QP–1004, 1203, 1204; SP–1023, 2020; A-F only)
Application of economic theory to management decision making and policy formulation within the firm. Demand analysis, production and cost analysis, price analysis, capital budgeting, and price analysis.

Econ 3595. Special Topics: (Various Titles to be Assigned). (1-3 cr; QP–[1002 or 1004, 1005]) or #; SP–[1003 or 1022, 1023]) or #; A-F only)
Topics announced in Class Schedule.

Econ 3613. The Economics of Antitrust and Regulation. (3 cr; QP–1004; SP–1023; A-F only)
Alternatives open to a free-enterprise economy when economic goals have not been satisfactorily achieved by the private sector. Public regulation and antitrust legislation and enforcement examined as a means of social control when unacceptable market failures exist.

Econ 3821. Labor Economics: Theory and Issues. (3 cr; QP–1004; SP–1023; A-F only)
Labor markets from theoretical and institutional perspectives, including wage theories, labor supply, labor demand and employment, human capital investments, and occupational choice.

Econ 3920. Consumer Economics. (3 cr; QP–[1004, 1005]) or #; SP–[1022, 1023] or #; A-F only)
Role of household demand for various types of consumer goods and services. Introduction to absolute, relative, and lifetime income hypothesis of consumption demand theory. Development of consumer demand under perfect and imperfect information about product quality.

Econ 4040. Tools: Applications of Economic Analysis. (3 cr; QP–1204, 5333; SP–3030 or equiv; A-F only)
Development and application of tools of economic research and analysis; emphasis on critical thinking using computer-based statistical methods. Econometrics (theory and practice), applied research techniques, economic forecasting, and time series analysis. Research report.

Econ 4213. Mathematical Economics. (3 cr; QP–1004, 1005, Math 1160; SP–1022, 1023, Math 1160; A-F only)
Application of fundamentals of differential and integral calculus and linear algebra to static, comparative static, and dynamic topics in microeconomics and macroeconomics.

Econ 4315. Monetary Theory and Policy. (3 cr; QP–3105; SP–3022; A-F only)
Development of monetary theory and implications of theory for Federal Reserve System's control of money supply and financial institutions, money market strategy, and monetary policy, including goals, targets, and indicators.

Econ 4397. Half-Time Internship. (3 cr [max 6 cr]; QP–[Econ major, 3104, 3105] or #; SP–54497; [Econ major, 3022, 3023] or #; A-F only)
Following written approval of proposal, student engages in supervised program of half-time work experience in public agency, private business, or other organization. Advance, concurrent, and follow-up written and oral presentations required.

Econ 4497. Full-Time Internship. (6 cr; QP–[Econ major, 3104, 3105] or #; SP–54397; [Econ major, 3022, 3023] or #; A-F only)
Following written approval of proposal, student engages in supervised program of full-time work experience in public agency, private business, or other organization. Advance, concurrent, and follow-up written and oral presentations required.
Econ 4570. Public Finance. (3 cr; QP−1004, 1005; SP−1022, 1023; A-F only)
Theory and practice of determining governmental expenditures and revenues, including consideration of public goods, welfare economics, raising of revenues, debt policy, and economic stabilization.

Econ 4610. Industrial Organization. (3 cr; QP−3104 or 3411; SP−3023 or 3512; A-F only)
Industrial structure and firm’s trade practices. Methodology links observed market behavior with microeconomic models. Strategic behavior of firms analyzed by integrating areas of production, finance, and marketing. Public policies evaluated in terms of their efficiency and equity.

Econ 4721. Natural Resource and Energy Economics. (3 cr; QP−1004; SP−1023; A-F only)
Microeconomic analysis of natural resource and energy markets. Role of these resources in production processes and waste generation, use and pricing of nonrenewable and renewable resources over time, resource availability, sustainable development, and ecological economics.

Econ 4777. Environmental Economics. (3 cr; QP−1004; SP−1023; A-F only)
Microeconomic analysis of environmental quality as an economic good. Pollution control, benefit-cost analysis, valuation methodologies and their application to air and water quality, hazardous waste management, preservation, and global pollutants.

Econ 4935. Urban/Regional Economics. (3 cr; QP−1002 or 1004, 1005; SP−1003 or 1022, 1023; A-F only)
Allocation of unevenly distributed and imperfectly mobile resources. Alternative theories relating to urban and regional growth processes. Analysis of intraregional structures as contributors to growth process. Selected economic problems unique to urban communities.

Econ 4991. Independent Study. (1-6 cr; max 6 cr; QP−Δ; SP−[Econ major; 12 cr of 3xxx and above Econ] or #; A-F only)
For students wishing to do special work in areas useful to individual programs and objectives and not available in regular course offerings.

Econ 5012. Economic Education. (1-3 cr; QP−Δ; SP−Δ; A-F only)
Basic economic concepts, curriculum and course design, materials, teaching strategies and methodologies, and research relevant to teaching economics at the K-12 level.

Education (Educ)

College of Education and Human Service Professions

Educ 1000. Human Development. (3 cr; A-F only)
Patterns and theories of development from conception through late adulthood emphasizing early childhood through adolescence; analysis of individual, family, and environmental factors which affect development over the life span.

Educ 1100. Human Diversity. (3 cr; A-F only)

Educ 1101. Education in Modern Society. (3 cr; A-F only)
Survey of educational institutions and practices used in different sectors of society. Historical and philosophical foundations of American education.

Educ 1111. Developing Critical Thinking Skills. (3 cr; A-F only)
Experiences in learning concepts through discovery, induction, and critical reasoning by use of real materials and real situations. Problem-solving approaches and techniques.

Educ 1201. Managing Planet Earth. (3 cr; A-F only)
Environmental education; exploration of key concepts and principles that govern how nature works; potential solutions to environmental and resource problems.

Educ 1313. Freshman Seminar: Values and Education. (3 cr; SP−Fewer than 30 cr; A-F only)
Values and their expression in and effects on educational policies and practices. Philosophical, historical, and comparative approaches and issues involving conflicts of values.

Educ 1450. Freshman Seminar: Childhood Studies—Local, National, Global. (3 cr; SP−Fewer than 30 cr; A-F only)
Problems and issues facing contemporary children from perspectives of anthropological sociological, legal, educational, and medical knowledge. Cross-cultural variations in experiences and status of children.

Educ 2605. Introduction to Environmental Education. (2 cr [max 2 cr])
Overview of history, foundations, and processes of environmental education. Emphasis on lesson planning and instructional strategies.

Educ 3412. The Computer in Education. (1-4 cr [max 6 cr]; A-F only)
Introduction to computer use in instructional settings. PC and Mac platforms. Develops basic skills using software commonly used by educators. Teaching strategies using computer-based instruction.

Educ 3804. Programs for Young Children: Global Perspectives. (4 cr; SP−ECH 3010, ECH 3020, ECH 3030 or #)
Cross-cultural perspectives on elementary education and early childhood education. Intercultural communication in different cultures; teaching and administrative behavior and differing educational structures in various foreign countries.

Educ 4163. Outdoor Education Methods. (2 cr; SP−Rec 3342 or #; cannot apply cr to Graduate School program; A-F only)
Methods and theoretical basis for teaching outdoor education. Emphasis on application at outdoor sites. Weekend experience at a regional nature center required.

Educ 4223. Advanced Course: Mathematics Teaching. (2 cr; SP−Cannot apply cr to Graduate School program; A-F only)
Methods, materials, curriculum development; preparation and evaluation of tests and other assessments of learning; application of principles of teaching and learning mathematics.

Educ 4225. Mathematics Education: Current Trends. (2 cr; SP−Cannot apply cr to Graduate School program; A-F only)
Review of research and current literature; trends and experimental approaches to teaching mathematics; criteria for program development and evaluation.
Course Descriptions

Educ 4233. Secondary School Curriculum. (2 cr; SP—Cannot apply cr to Graduate School program; A-F only)
Design and organization of curriculum with special consideration of issues, approaches, research, and recommendations for high school programs; effectiveness of selected curricular designs.

Educ 4234. Science, Technology, and Society. (3 cr; SP—Cannot apply cr to Graduate School program; A-F only)
Nontechnical study of historical and cultural impact of natural science and technology on the earth and its inhabitants.

Educ 4235. Energy Education for Teachers. (2-3 cr; SP—Cannot apply cr to Graduate School program)
Energy and energy-related problems; resources and field experiences to prepare teachers to implement energy-related learning experiences into K-12 curriculum.

Educ 4381. Teaching American Indian Students. (2 cr; SP—10 cr Educ cannot apply cr to Graduate School program; A-F only)
Survey of contemporary Indian education; evaluation of one’s attitudes toward Indian students; direct interaction with Indian parents and students; development of culturally sensitive teaching plans regarding Indians.

Educ 4500. Professional Issues in Teaching. (3 cr; SP—Admission to Educ or CSD program, sr, Δ cannot apply cr to Graduate School program; A-F only)
Issues related to professional status and activity of teachers, historical and philosophical foundations of education, communication, job seeking skills, and current national and state study group results.

Educ 4601. Wilderness Philosophy. (2 cr; SP—#; cannot apply cr to Graduate School program; offered summer only)
People and social forces that have influenced land-use related to designated wilderness; philosophical and historical basis for wilderness management.

Educ 4650. Student Teaching in Parent Education. (1-3 cr; QP—FamL 5620, FamL 5325; SP—Admission to parent ed program; #; cannot apply cr to Graduate School program; S-N only)
Application of knowledge, understandings, and skills related to working with adult learners in parent education or early childhood/family education programs.

Educ 4991. Independent Study. (1-3 cr [max 6 cr]; SP—#; cannot apply cr to Graduate School program; A-F only)
Directed independent study, readings, and/or projects of interest to education students.

Educ 4993. Special Area Project. (1-4 cr; SP—#; cannot apply cr to Graduate School program; A-F only)
Independent project for advanced students to substantially further their theoretical knowledge base or professional competencies.

Educ 5001. Mentor Clinical Supervision Model. (1 cr; SP—Tchg exper or Δ; cannot apply cr to Graduate School program; A-F only)
Overview of clinical supervision model, including cycles of supervision, development of observation and assessment skills; analysis of case studies in supervision.

Educ 5002. Observation and Assessment Skills for Supervision. (1 cr; SP—Tchg exper or #; cannot apply cr to Graduate School program; A-F only)
Overview of observation and assessment tools used in clinical supervision; experience in using tools; facilitation of professional development in teachers.

Educ 5128. Urban Education. (3 cr; SP—Cannot apply cr to Graduate School program)
Combines on-site experience in an urban educational setting with reading and reflection. Develops knowledge, skills, attitudes, motivation, and commitment to work individually and collectively with poor children in urban schools.

Educ 5132. Motivational Strategies for Teachers. (2 cr; SP—Cannot apply cr to Graduate School program; A-F only)
Description and analysis of design, impact, and outcome of effective and unusual motivational strategies employed in education, business, and industry. Opportunities to adapt procedures to fit unique characteristics of participants’ clients and institutional settings.

Educ 5146. The Future and Education. (2 cr; SP—Cannot apply cr to Graduate School program)
Effects of technological and social changes on education; the future-conscious educational program.

Educ 5164. Environmental Education In-Service Training. (1-10 cr [max 10 cr]; SP—#; cannot apply cr to Graduate School program; A-F only)
Environmental education methods, materials, and curricula for educators wishing to enhance their environmental education training.

Educ 5165. Theories and Models in Outdoor Education. (2 cr; SP—#; cannot apply cr to Graduate School program; A-F only)
Overview of theoretical foundations of outdoor education. Definitions of terms related to outdoor education, historical antecedents, future adventure education, social and psychological benefits of outdoor education.

Educ 5167. Research and Issues in Outdoor Education. (2 cr; SP—#; cannot apply cr to Graduate School program; A-F only)
Research literature and related issues pertaining to outdoor education, including research design and methods. Application of research to specific issues.

Educ 5222. Supervision of Secondary Instruction. (2 cr; SP—Cannot apply cr to Graduate School program; A-F only)
Review of research on supervision of instruction; application of principles to improvement of instruction in secondary schools.

Educ 5236. Environmental Education for Teachers. (1-3 cr [max 3 cr]; SP—#; cannot apply cr to Graduate School program; A-F only)
Combines environmental study with field experiences to prepare pre-service and in-service teachers for implementation of environmental learning experiences in the school curriculum, grades K-12, all subject areas.

Educ 5340. Interacting With Diverse Families. (3 cr; SP—90 cr or Δ; A-F only)
Issues relating to working with and advocating for families from diverse backgrounds and/or with diverse needs. Emphasis on linguistically diverse families, immigrant families, families headed by single parents, families with members with a disability, families headed by lesbian/gay parents.

Educ 5350. Literacy for ESL Learners. (3-5 cr; SP—#; cannot apply cr to Graduate School program; A-F only)
Rationale and specific techniques for teaching of reading to non-English speaking or reading students.
Educ 5381. Teaching American Indian Students. (2 cr; SP–Cannot apply cr to Graduate School program; A–F only)
Survey of contemporary Indian education; evaluation of one’s attitudes toward Indian students; direct interaction with Indian parents and students; development of culturally sensitive teaching plans regarding Indians.

Educ 5401. Creative and Intellectually Gifted Children. (2 cr; SP–Cannot apply cr to Graduate School program; A–F only)
Identification, characteristics, and service needs of creative and intellectually gifted children; various programs to meet needs.

Educ 5412. The Computer in Education. (1–4 cr [max 6 cr]; SP–Cannot apply cr to Graduate School program; A–F only)
Introduction to computer use in instructional settings. PC and Mac platforms. Develops basic skills using software commonly used by educators. Teaching strategies using computer-assisted instruction.

Educ 5413. Teaching With Technology. (4 cr; SP–3412 or 5412, 90 cr or grad or adult spec student or #; A–F only)
Develops basic computer and educational technology skills focusing on using microcomputers for communications.

Educ 5414. Using Technology for the Administrative Tasks of Teaching. (4 cr; SP–3412 or 5412, 5413 or #; A–F only)
Develops basic computer and educational technology skills focusing on using microcomputers for administrative tasks of teaching.

Educ 5415. Advanced Educational Media Production. (4 cr; SP–3412 or 5412, 5413, 5414 or #; A–F only)
Current issues and trends regarding computers, media, and related technologies. Specific themes and/or content varies.

Educ 5421. Research Methods in Education. (2 cr; SP–5421; admission to MEd or #; cannot apply cr to Graduate School program; A–F only)
Planning, design, implementation, analysis of data, evaluation, and reporting associated with classroom research and research within school systems.

Educ 5422. Qualitative and Quantitative Research Methods in Education. (3 cr; SP–Grad student or #; cannot apply cr to Graduate School program; offered summer only; A–F only)
Qualitative and quantitative field research in educational settings; methodology, philosophical and ethical perspectives, and practice.

Educ 5555. Environmental Education for Practicing Educators. (2 cr; SP–Cannot apply cr to Graduate School program; A–F only)
Provides information base for informed decision making about environmental issues. Develops knowledge, skills, attitudes, motivation, and commitment to work individually and collectively toward sustaining a healthy world environment.

Educ 5560. Current Research and Issues in Science Education. (2–3 cr [max 6 cr]; SP–; offered summer only; A–F only)
Examines science education research literature. Trends in research and teaching.

Educ 5570. Exemplary Models for Science Education. (2–3 cr [max 6 cr]; SP–; offered summer only; A–F only)
Emphasis on hands-on and/or integrated curriculum models.

Educ 5600. Practicum in Education. (1–12 cr [max 12 cr]; SP–#; cannot apply cr to Graduate School program; S–N only)
Arranged opportunity for persons interested in gaining practical experience in a nontraditional educational program under direction and supervision of faculty. Location, type of experience, duration of experience, and assessment are determined in consultation with faculty supervisor.

Educ 5650. Families in Crisis. (3 cr; SP–Cannot apply cr to Graduate School program; A–F only)
Examines impact of various crises on family members. Analysis of coping strategies, reorganization of family roles, and survey of community resources for assistance in crisis situations.

Educ 5666. Creating Social Studies Curriculum Materials. (3 cr; SP–Cannot apply cr to Graduate School program)
Using historic sites and related materials to create curriculum materials; implementing and evaluating living history learning experiences in classrooms.

Educ 5784. Multicultural Literature for Children and Adolescents. (3 cr; SP–Cannot apply cr to Graduate School program; A–F only)
Current literature.

Educ 5804. Programs for Young Children: Global Perspectives. (4 cr; SP–ECh 3010, ECh 3020, ECh 3030 or #)
Cross-cultural perspectives on elementary education and early childhood education. Intercultural communication in different cultures; teaching and administrative behavior and differing educational structures in various foreign countries.

Educ 5823. Teacher as Researcher. (1–4 cr; SP–Tchg exper or #; A–F only)
For practicing teachers who ask questions about their classrooms, seek answers from literature reviews and classroom research, and interpret and use the results.

Educ 5850. Classroom Learning Applications. (2 cr; SP–Admission to MEd or #; A–F only)

Educ 5991. Independent Study. (1–4 cr [max 8 cr]; OP–#; SP–#; cannot apply cr to Graduate School program; A–F only)
Directed independent study, readings, and/or projects of interest to students in education.

Educ 5993. Special Area Project. (1–4 cr; SP–Cannot apply cr to Graduate School program; A–F only)
Independent project for advanced students to substantially further their theoretical knowledge base or professional competencies.

Educ 5994. Current Issues in Education. (1–4 cr; SP–Tchg exper or #; cannot apply cr to Graduate School program; A–F only)
Issues such as school reform and educational innovations.

Educ 5995. Topics in Education: (Various Titles to be Assigned). (1–4 cr [max 4 cr]; SP–Cannot apply cr to Graduate School program; A–F only)
Topics selected from education to meet needs and interests of different groups of students. Topics vary. Specific course content announced in Class Schedule.
Course Descriptions

Education and Human Service Professions (EHS)

College of Education and Human Service Professions

EHS 5000. Human Service Systems. (4 cr; SP—Course in human dev or ed psy or multicultural ed or spec ed, grad student or #; cannot apply cr to Graduate School program; A-F only)


EHS 5050. Applied Human Development. (2-4 cr; SP—#; cannot apply cr to Graduate School program; A-F only)

Independent study incorporating a life span approach to understanding human development and using this approach to better understand aspects of one’s personal and professional life. Reading, viewing videotapes, listening to audiotapes, and completing assignments through independent learning contract.

EHS 5595. Topics in Education and Human Service Professions. (1-4 cr; SP—Course in human dev or ed psy or multicultural ed or spec ed, grad student or #; may be repeated under different topics for 12 cr max; cannot apply cr to Graduate School program; A-F only)

Topics announced in Class Schedule.

EHS 5990. Research Project. (1-12 cr; SP—Cannot apply cr to Graduate School program; A-F only)

Faculty-supervised research project required for M.Ed.

Education, Secondary (EdSe)

College of Education and Human Service Professions

EdSe 3204. General Instructional Methods. (3 cr; SP—Admission to sec ed program; A-F only)

Effective teaching, teaching for diversity, teaching through multiple intelligences, Minnesota graduation rules, writing objectives and lesson plans, using instructional media and technology, various teaching strategies, methods of assessing student learning, classroom management.

EdSe 3205. Apprenticeship: Middle School. (2 cr; SP—Admission to sec ed program, §3204; A-F only)

Thirty hours of experience in a middle school, including observing, teaching, tutoring, working with individual students and small groups. Focuses on classroom management, multicultural education, and students with special needs.

EdSe 3206. Apprenticeship: Secondary School. (2 cr; SP—Admission to sec ed program, §3204; A-F only)

Thirty hours of experience in a high school, including observing, teaching, tutoring, working with individual students and small groups. Focuses on classroom management, multicultural education, and students with special needs.

EdSe 4100. Human Relations in Classrooms. (2 cr; SP—Admission to sec ed program; cannot apply cr to Graduate School program; A-F only)

Examination of cultural differences; planning instruction to accommodate individual differences in race, gender, ethnic background, cultural background, and physical and mental development; needs of persons with disabilities; humanizing classroom and classroom management procedures.

EdSe 4222. Teaching Mathematics: Grades 5-12. (4 cr; SP—Admission to sec ed program, 3204 or #; cannot apply cr to Graduate School program; A-F only)

Standards for secondary mathematics as they apply to learning, teaching, curriculum, and integration of technologies in mathematics grades 5-12; emphasis on use of problematic approach to mathematical sense-making.

EdSe 4244. Teaching Social Studies: Grades 5-12. (3 cr; SP—Admission to sec ed program, 3204 or #; cannot apply cr to Graduate School program; A-F only)

History and philosophy of social studies education; social studies objectives; curriculum design; instructional planning and use of resources; evaluation procedures.

EdSe 4255. Teaching Science: Grades 5-12. (3 cr; SP—Admission to sec ed program, 3204 or #; cannot apply cr to Graduate School program; A-F only)

Historical development of science education. Goals and purposes of science education in secondary schools; methods and materials; evaluation procedures; current trends.

EdSe 4501. Educational Psychology. (3 cr; SP—Admission to sec ed program; cannot apply cr to Graduate School program; A-F only)

Principles of psychology applied to teaching; examination of adolescent growth and development; classroom management.

EdSe 4600. Student Teaching. (6-12 cr [max 12 cr]; SP—4501,5100, appropriate methods course, #; cannot apply cr to Graduate School program; S-N only)

Supervised practicum in secondary or middle school under direction of licensed teacher. Demonstration of subject matter, teaching competence, and potential for future improvement.

EdSe 4991. Independent Study. (1-6 cr [max 6 cr]; SP—#; cannot apply cr to Graduate School program; A-F only)

Directed independent study, readings, or projects of interest to education students.

EdSe 4993. Special Area Project. (1-4 cr; SP—#; cannot apply cr to Graduate School program; A-F only)

Independent project for advanced students to substantially further their theoretical knowledge base or professional competencies.

EdSe 5111. Secondary Curriculum and Administration. (2 cr; SP—#; A-F only)

Supervised study and field work to acquire understanding of organization and administration of secondary school curriculum, current practices, and current issues.

EdSe 5120. Philosophy and Organization of Middle Schools. (2 cr; SP—120 cr or #; A-F only)

Philosophies and organization and structure of middle schools. Assessment of benefits, drawbacks, and rationale.
Teaching procedures, objectives, and materials; emphasis on teaching of reading in various subject-matter fields, practicum experience.

**EdSe 5215. Teaching Reading and Literature: Grades 5-12.** (5 cr; SP–9 cr ed; A-F only)

Directed independent study, readings, and/or projects of interest to education students or practicing teachers.

**EdSe 5993. Special Area Project.** (1-4 cr [max 4 cr]; SP–Cannot apply cr to Graduate School program; A-F only)

Independent project for advanced students to substantially further their theoretical knowledge base or professional competencies.

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**Educational Administration (EdAd)**

**College of Education and Human Service Professions**

**EdAd 5910. Professional Competency Assessment.** (2 cr; SP–EdAd lic prog or #; cannot apply cr to Graduate School program; A-F only)

Required competencies of educational administration professionals seeking licensure or advanced educational degrees. Competency areas of diversity, creativity, technology, leadership, resource management, and assessment/regulations. Professional portfolios used to illustrate competencies.

**EdAd 5911. Leadership and Personal Growth.** (4 cr; SP–EdAd lic prog or #; cannot apply cr to Graduate School program; A-F only)

K-12 administrative competencies: school leadership, judgment skills, oral and nonverbal communications, written expression, philosophical and cultural values. Superintendent competencies: leadership and district culture, and values and ethics of leadership.

**EdAd 5912. Supervision of Teachers and School Staff.** (4 cr; SP–EdAd lic prog or #; cannot apply cr to Graduate School program; A-F only)


**EdAd 5913. Communication and Community Relations in Education.** (4 cr; SP–EdAd lic prog or #; cannot apply cr to Graduate School program; A-F only)

K-12 administrative competencies: policy and political influences, media and public relations. Superintendent competencies: communication and community relations.

**EdAd 5914. Creation/Implementation and Interpretation of Rules and Regulations.** (4 cr; SP–EdAd lic prog or #; cannot apply cr to Graduate School program; A-F only)

K-12 administrative competencies: legal and regulatory applications. Superintendent competencies: policy and governance.

**EdAd 5915. Resource Management in Education.** (4 cr; SP–EdAd lic prog or #; cannot apply cr to Graduate School program; A-F only)

K-12 administrative competencies: information collection, problem analysis, organizational oversight, implementation skills, and human, fiscal, and time resource allocation. Superintendent competencies: organizational management and human resource management.

**EdAd 5916. Instructional Design and Management and Assessment of Learning.** (4 cr; SP–EdAd lic prog or #; cannot apply cr to Graduate School program; A-F only)

K-12 administrative competencies: instruction and the learning environment, curriculum design, student guidance and development, and measurement and evaluation. Superintendent competencies: curriculum planning and development and instructional management.

**EdAd 6991. Independent Study.** (1-4 cr [max 6 cr]; SP–A-F only)

Directed independent study, readings, and/or projects of interest to students who want to learn about educational administration.

**EdAd 6997. Internship in Educational Administration.**

(1-4 cr [max 6 cr]; SP–A-F only)

For persons preparing for licensure as an elementary, middle school, or secondary school principal; preparing for licensure as a superintendent; or exploring an interest in educational administration.

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**Electrical and Computer Engineering (ECE)**

**College of Science and Engineering**

(1-6 cr [max 6 cr]; SP–Cannot apply cr to Graduate School program; A-F only)

K-12 administrative competencies: policy and political influences, media and public relations. Superintendent competencies: leadership and district culture, and values and ethics of leadership.

**ECE 2111. Linear Systems and Signal Analysis.** (4 cr; SP–A-F only)

Signal and system modeling concepts, system analysis in time domain, Fourier series and Fourier transform. Discrete time domain signals and systems, Z transform, analysis and design of digital filters, discrete Fourier transform, FFT applications. (3 hrs lect, 3 hrs lab)
Course Descriptions

ECE 2212. Electronics I. (4 cr; QP-3006; SP-2006; A-F only)
Diodes, BJTs, FETs, ideal operational amplifiers, DC analysis, small signal models, and analysis; single-stage circuits design; power amplifiers. (3 hrs lect, 3 hrs lab)

ECE 2325. Microcomputer System Design. (4 cr; QP-1315; SP-1315; A-F only)

ECE 3151. Control Systems. (3 cr; QP-3011; SP-2111; A-F only)

ECE 3235. Electronics II. (4 cr; QP-3021; SP-2212; A-F only)
Multistage circuits, frequency analysis, non-ideal operational amplifiers, feedback and stability, oscillators, filters. (3 hrs lect, 3 hrs lab)

ECE 3341. Digital Computer Circuits. (4 cr; QP-3325; SP-2325; A-F only)
Digital logic family characteristics. Medium Scale Integration (MSI) components and applications. Programmable Logic Devices (PLDs). Alternative clocking techniques. Computer arithmetic circuits and memory design. Fundamental mode asynchronous finite-state machine design. (3 hrs lect, 3 hrs lab)

ECE 3445. Electromagnetic Fields. (3 cr; QP-Math 3350, Math 3380, Phys 1109 or Phys 1109H; SP-Math 3280, Math 3298, Phys 1201; A-F only)
Fundamentals of electromagnetic analysis. Electrostatic and magnetostatic fields. Introductory numerical analysis of electromagnetic fields. Time-varying fields and potentials. Maxwell’s equations and their applications. (3 hrs lect)

ECE 3611. Introduction to Solid-State Semiconductors. (3 cr; QP-Phys 1109 or Phys 1109H; SP-Phys 1204; A-F only)
Fundamentals of solid-state semiconductors and devices. Quantum mechanical concepts and atomic states, solid-state structure, band structure, semiconductor statistics, and transport. (3 hrs lect)

ECE 4151. Digital Control System Design. (3 cr; QP-3012; SP-3151, 3341; A-F only)
Digital control system characteristics: transient and steady-state responses, frequency response, stability; design by transform techniques, controllability, and observability; design using state-space methods. (3 hrs lect)

ECE 4246. Advanced Analog Circuits. (3 cr; QP-3055; SP-3235; A-F only)
Application of linear integrated circuits to data acquisition problems; transducer interfacing, linear and non-linear preprocessing, phase-locked loops, and high performance quantization and recovery (A/D, D/A conversion). (3 hrs lect)

ECE 4305. Computer Architecture. (4 cr; QP-3340; SP-3341; A-F only)

ECE 4311. Design of Very Large-Scale Integrated Circuits. (3 cr; QP-3035 or 3340 or #; SP-3235, 3341 or #; A-F only)
Philosophy of and techniques for designing VLSI circuits in CMOS technology. Full- and semi-custom design techniques. Digital, analog, and hybrid CMOS circuits and systems. Substantial design project required. (3 hrs lect)

ECE 4315. Multiprocessor-Based System Design. (3 cr; QP-3325, ECS 5520; SP-4305, ECS 5631; A-F only)
Parallelism, interconnection networks, shared memory architecture, principles of scalable performance, vector computers, multiprocessors, multicomputers, dataflow architectures, and supercomputers. (3 hrs lect)

ECE 4321. Computer Networks. (3 cr; QP-3503, Stat 3562; SP-3341, Stat 3611; A-F only)
Network classification and services. Protocol and communication architectures. Hardware components: multiplexers, concentrators, bridges, routers, access servers. (3 hrs lect)

ECE 4477. Antennas and Transmission Lines. (3 cr; SP-3445; A-F only)
Introduction to free space and guided electromagnetic wave propagation; analysis and design of antennas and transmission lines. (3 hrs lect)

ECE 4501. Power Systems. (4 cr; QP-3006; SP-2006; cannot apply cr to Graduate School program; A-F only)

ECE 4741. Digital Signal Processing. (3 cr; QP-3012; SP-2111; A-F only)
Discrete signal processing, digital filtering, A/D conversion, two-dimensional signal processing restoration, enhancement, and reconstruction. (3 hrs lect)

ECE 4765. Modern Communication. (4 cr; QP-3011, 3035 or CP-E 3035; SP-2111, 3235; A-F only)
Design and analysis of modern communication systems; evaluation of analog and digital modulation techniques. (3 hrs lect, 3 hrs lab)

ECE 4781. Telecommunications. (3 cr; QP-3445; SP-3445; cannot apply cr to Graduate School program; A-F only)
Topics in switching theory, transmission, networking, traffic engineering, and associated engineering programs and solutions. (3 hrs lect)

ECE 4801. Introduction to Artificial Neural Networks. (3 cr; QP-1622, Math 3380, Stat 3562 or #; SP-CS 1521, Math 3280, Stat 3611 or #; A-F only)

ECE 4813. Tools and Methods of Design Automation. (3 cr; QP-3340; SP-3341; A-F only)
Methods and techniques for designing electronic systems based on top-down strategy. High-level synthesis techniques and tools. Automated design of large, digital electronic systems. Design project using electronic design automation tools available in department. (3 hrs lect)
ECE 4831. Fuzzy Set Theory and Its Application. (3 cr; QP–CS 1623, Math 3320; SP–CS 1521, Math 3280; A-F only) Concepts and techniques for dealing with complex phenomena that do not lend themselves to analysis by classical methods, based on probability theory and bivalent logic. (3 hrs lect)

ECE 4899. Senior Project I. (1 cr; QP–3340; SP–64951; 3341, BSEE candidate; #; cannot apply cr to Graduate School program; A-F only) Selection and completion of project approved and supervised by faculty.

ECE 4951. Design Workshop. (4 cr; QP–Comp 3130; SP–64999, 54999; Comp 3130, BSEE candidate, 100 cr or #; cannot apply cr to Graduate School program; A-F only) Study of a selected topic; its application to a design project, completed individually or in a small group. Focuses on a different method each semester offered. Completion satisfies requirement for a senior design project.

ECE 4991. Independent Study. (1-3 cr; SP–#; does not qualify as ECE technical elective; cannot apply cr to Graduate School program; A-F only) Special projects not available in regular curriculum. Independent investigation, research studies, or survey of selected projects or problems.

ECE 4995. Selected Advanced Topics or Seminar. (1-3 cr [max 3 cr]; SP–#; A-F only) Current problems and research. Discussions, selected reading, and/or invited speakers.

ECE 4999. Senior Project II. (3 cr; QP–3970; SP–64951; 4899, BSEE candidate; #; cannot apply cr to Graduate School program; A-F only) Students present senior project results in formal report after making refinements. Complete documentation of results in professional manner required. ECE 4899 and ECE 4999 must be completed within one year for credit.

Elementary Education (EIEd)

College of Education and Human Service Professions

EIEd 1010. Introduction to Elementary Education. (3 cr; A-F only) The elementary teaching profession; personal goals, teaching-learning environment, learner sensitive model, and career opportunities. Experiences which help students gain accurate knowledge of their field.

EIEd 3113. Learning Environments and Diverse Learning Communities. (4 cr; SP–EIEd 3113, 3331, 3335, Educ 3412, Hlth 5161, PE 3126, EIEd candidate; A-F only) Teaching and learning models as a basis for structuring learning environments for children. Curriculum and instructional strategies; action research; parent involvement. Sociocultural and historical backgrounds, issues, unique learner needs of students, with emphasis on American Indian students.

EIEd 3325. Language and Literacy. (4 cr; SP–EIEd 3113, 3331, 3335, Educ 3412, Hlth 5161, PE 3126, EIEd or ECh candidate; A-F only) Development and instruction in children’s literature-based reading, writing, and oral language in elementary schools. Methods, materials, and research findings related to teaching of integrated language arts.

EIEd 3331. Children’s Literature and Integrated Creative Arts. (4 cr; SP–EIEd 3113, 33325, 33355, Educ 3412, Hlth 5161, PE 3126, EIEd or ECh candidate; A-F only) Purposes of reading; bases for selecting and evaluating reading materials; integrated creative arts: literature, music, drama, and visual arts for elementary classrooms, including those with special needs students.


EIEd 3425. Collateral Fields: Field Experiences. (1-3 cr [max 6 cr]; SP–#; A-F only) Experience working with kindergarten, elementary, or middle school teacher and children. Work supervised by education advisor and/or faculty member from academic department or collateral field, in cooperation with elementary or middle school principal.

EIEd 4344. Teaching Science and Environmental Education. (4 cr; SP–EIEd 3113, 4344, 4366, 5310, EIEd candidate or #; cannot apply cr to Graduate School program; A-F only) Curriculum standards and research-based pedagogy. Practicum.

EIEd 4345. Instructional Strategies, Assessment, and Management. (4 cr; SP–EIEd 3113, 4344, 4366, 5310, EIEd candidate or #; A-F only) Formal and informal assessment strategies to ensure and evaluate continuous intellectual, social, and physical development of students while managing and supporting a positive classroom environment. Includes field experience.

EIEd 4366. Teaching Social Studies and Environmental Education. (4 cr; SP–EIEd candidate, 4344, 4366, 5310; cannot apply cr to Graduate School program; A-F only) Content and organization of social studies; planning instruction for diverse students; understanding and improving the learning situation; effective use of materials in environmental education. Practicum.

EIEd 4600. Student Teaching. (6-12 cr; SP–Sr, EIEd candidate, #; cannot apply cr to Graduate School program; SN only) Planning, implementing, and evaluating an elementary curriculum. Assessing learning needs and collaborating with specialists to individualize methods and materials.

EIEd 4650. Student Teaching in Individual Subjects—K-8. (1-6 cr [max 7 cr]; SP–A; cannot apply cr to Graduate School program; S-N only) Student teaching in, e.g., art, music, physical education, science. Demonstrating subject matter competence, instructional strategies, and management skills; self-evaluation.

EIEd 4991. Independent Study. (1-6 cr [max 6 cr]; SP–A; cannot apply cr to Graduate School program; A-F only) Directed independent study, reading, and/or projects in elementary or middle school education of interest to student.

EIEd 4993. Special Area Project. (1-4 cr; SP–#; cannot apply cr to Graduate School program; A-F only) Independent project for advanced students to substantially further their theoretical knowledge base or professional competencies.
Course Descriptions

EEl 5401. Elementary School Curriculum. (2 cr; SP--; cannot apply cr to Graduate School program; A-F only)
Curriculum practices, issues, and trends in elementary schools; survey of research studies related to all areas of instruction; approaches to school reform; analysis of representative programs.

EEl 5595. Professional Teaching Experience in a Kindergarten Classroom. (4 cr; SP-Sr, kindergarten EEl candidate, A; cannot apply cr to Graduate School program; S-N only)
Planning, implementing, and evaluating a kindergarten curriculum. Assessing learning needs and collaborating with specialists to individualize methods and materials.

EEl 5993. Special Area Project. (1-4 cr; SP--; cannot apply cr to Graduate School program; A-F only)
Independent project for advanced students to substantially further their theoretical knowledge base or professional competencies.

Engineering (Engr)

College of Science and Engineering

Engr 2015. Statics. (2 cr; QP-Math 1297 or %Math 1297, Phys 1107; SP-Math 1297, Phys 1201)

Introductory treatment of stress and strain at a point. Stress-strain relation in two dimensions. Axial loading, torsion, shear and bending moment diagrams, bending stresses, deflection of determinate and indeterminate beams, instability.

Engr 2026. Dynamics. (3 cr; QP-3015, %Math 3380; SP-2015, Math 3280)

Engr 3201. Electrical Power. (3 cr; QP-Phys 1109, Math 3380 or equiv; SP-Math 3280, Phys 1201)

English (Engl)

College of Liberal Arts

Engl 1001. Great American Authors. (3 cr; A-F only)
Introduction to American authors important for their artistic mastery and/or significant role in American literary history.

Engl 1101. Literature Appreciation. (3 cr; QP--1906, $1907; primarily for nonmajors but also for potential majors and creative writers; SP-$1907; primarily for nonmajors but also for potential majors and creative writers; A-F only)
Developing critical reading skills in fiction, poetry, and drama.

Engl 1507. Time and Place. (3 cr; A-F only)
Close reading of selected works about experience of time and place.

Engl 1535. King Arthur in History, Literature, and Art. (3 cr; A-F only)
Survey of historical accounts, and literary and artistic treatments of King Arthur in Latin, French, and German sources of the Middle Ages and in selected works in modern Arthurian literature.

Engl 1575. 20th-Century Literature. (3 cr; Primarily for nonmajors; A-F only)
Readings primarily in American, British, and Irish literature.

Engl 1582. Introduction to World Literatures. (3 cr; A-F only)
Sampling of literary works mainly from Middle East, Africa, Far East, and South America.

Engl 1585. Tales of Terror. (3 cr; A-F only)
Gothic masterpieces chiefly from English and American literature, with emphasis on sociological and psychological implications of the genre.

Engl 1801. Freshman Seminar: American Gothic. (3 cr; SP-Fewer than 30 cr; A-F only)
The Gothic tradition in American literature, from colonial days to the present, with special attention to psychological and cultural implications. Visual arts, film, and theories of terror, horror, the uncanny, and the grotesque.

Engl 1802. Freshman Seminar: Asian Culture. (3 cr; SP-Fewer than 30 cr; A-F only)
Chinese and Japanese cultures, including Confucianism, Taoism, Buddhism, Shintoism; arts such as calligraphy, printing, poetry, garden design, and music; and some political history.

Engl 1803. Freshman Seminar: Unseen Reality. (3 cr; SP-Fewer than 30 cr; A-F only)
Concepts of "the ideal" and "the real" as developed by writers with differing perspectives in a variety of literary forms, including fiction, nonfiction, and poetry.

Engl 1907. Introduction to Literature. (3 cr; QP--1906; primarily for nonmajors; SP-Primarily for nonmajors; A-F only)
Literary modes and methods of literary study and interpretation.

Engl 2571. Contemporary Literature. (3 cr; A-F only)
Readings in American and British literature since 1945. Emphases, authors, and titles vary.

Engl 2581. Women Writers. (3 cr; QP--45 cr or #; SP-30 cr or #; A-F only)
Feminist reading of selected plays, poetry, prose (including critical works) written by women writers.

Engl 3115. Writing Fiction. (4 cr; max 8 cr; QP--Comp 1110 or Comp 1120 or #; SP--Comp 1120 or #; A-F only)
Writing of original fiction, with emphasis on the short story; structure and techniques learned from critical reading and classroom analysis.

Engl 3121. Writing Poetry. (4 cr; A-F only)
Writing of poetry, with emphasis on techniques learned through critical reading and classroom analysis.

Engl 3223. Shakespeare. (3 cr; A-F only)
Introduction to Shakespeare. Selected plays from the histories, comedies, tragedies, and dramatic romances.
Aspects of drama, such as structure, language, characterization, theme, and dramatic conventions examined in study of individual plays.

Engl 3411. The Modern Short Story. (4 cr; A-F only) Study of the genre, emphasizing close reading and interpretation of the elements of short fiction in selected works.

Engl 3501. British Literature I. (4 cr; SP-Engl major or minor; A-F only) Chronological study of English literature from beginnings to late-18th century, emphasizing major works, authors, and important literary forms, styles, themes, and movements.

Engl 3502. British Literature II. (4 cr; SP-Engl major or minor; A-F only) Chronological study of English literature from late-18th to late-20th century, emphasizing major works, authors, and important literary forms, styles, themes, and movements.

Engl 3511. European and Russian Literature. (4 cr) Reading of European and/or Russian literature in translation. Period, topic, and nationality vary with instructor.

Engl 3563. American Literature I. (4 cr; A-F only) Historical survey of important authors, movements, conventions, genres, and themes: origins to Civil War.

Engl 3564. American Literature II. (4 cr; A-F only) Historical survey of important authors, movements, conventions, genres, and themes: Civil War to present.

Engl 3906. Methods of Literary Study. (4 cr; QP-61906; Comp 1120, Engl major or #; SP-Comp 1120, Engl major or #; A-F only) Introduction to interpretive and scholarly methods.

Engl 4292. Literature Into Film. (4 cr; SP-30 cr or #; cannot apply cr to Graduate School program) Comparative study of novels and their film adaptations.

Engl 4375. Drama. (4 cr; A-F only) Selected playwrights, plays, types, traditions, or periods; relevant theoretical and critical writings. Authors and topics vary.

Engl 4909. Senior Portfolio. (1 cr; SP-Engl major, sr; A-F only) Required portfolio and research project undertaken for senior seminar.

Engl 5116. Advanced Writing of Fiction. (4 cr [max 8 cr]; QP-#; SP-#; A-F only) Writing of original fiction beyond the beginning stages; some experience required.

Engl 5122. Advanced Writing of Poetry. (4 cr [max 8 cr]; QP-3121 or #; SP-3121 or #; A-F only) Study of poetics and poetry, with emphasis on student poems.

Engl 5222. Shakespeare. (4 cr; SP-6 cr literature; A-F only) Concentrated study of selected plays, with attention to Shakespearean criticism and scholarship. Recommended as the second course in Shakespeare.

Engl 5312. Chaucer. (4 cr; SP-6 cr literature; A-F only) Introduction to Middle English. Reading and analysis of Chaucer's works, primarily Canterbury Tales and Troilus and Criseyde.

Engl 5331. Milton. (4 cr; QP-8 cr literature; SP-6 cr literature; A-F only) Minor poems, Areopagitica, Paradise Lost, and Samson Agonistes.

Engl 5375. Modern Poetry. (4 cr; QP-8 cr literature; SP-6 cr literature; A-F only) Study of modern poetry written in English.

Engl 5471. The Novella. (4 cr; SP-6 cr literature; A-F only) In-depth study of selected masterworks of the form.

Engl 5523. Middle English Language and Literature. (4 cr; QP-8 cr literature; SP-6 cr literature; A-F only) Introduction to and reading of Middle English; reading, discussion, and criticism of selections from alliterative poetry, metrical romances, saints' legends, the mystics. Langland, Gower, Lydgate, Malory.

Engl 5533. Studies in English Literature Before 1800. (4 cr; SP-6 cr literature; A-F only) Intensive study of a theme, literary school or circle, or literary genre in historical and cultural context. Topics vary.

Engl 5541. Restoration and 18th-Century Literature. (4 cr; SP-6 cr literature; A-F only) Studies of controversies and cultural change evident in English literature, 1660-1800. Such authors as Dryden, Behn, Pope, Fielding, Johnson.

Engl 5561. English Romanticism. (4 cr; QP-8 cr literature; SP-6 cr literature; A-F only) The Romantic movement in England as reflected in the works of such writers as Wordsworth, Coleridge, Mary Shelley, Keats, Percy Shelley, and Anne Radcliffe.

Engl 5562. Victorian Literature. (4 cr; QP-8 cr literature; SP-6 cr literature; A-F only) Cultural and social concerns of Victorian England as reflected in the works of such writers as Tennyson, Arnold, Christina and D.G. Rossetti, Robert and Elizabeth Barrett Browning, and Samuel Butler.

Engl 5566. Irish Literary Revival. (4 cr; QP-8 cr literature; SP-6 cr literature; A-F only) Anglo-Irish literature in its sociohistorical context. Such authors as Yeats, Synge, Gregory, Joyce, and O’Casey.

Engl 5571. Colonial and Revolutionary American Authors. (4 cr; SP-6 cr literature; A-F only) Major authors of 17th and 18th centuries representing not only the literary artistry of those periods but also the religious and political prose that shaped the emerging republic.

Engl 5572. American Renaissance. (4 cr; SP-6 cr literature; A-F only) American Romanticism and the flowering of American literature from early 19th century to the Civil War (authors and topics vary; e.g., Thoreau, Fuller, Hawthorne, Dickinson, Whitman).

Engl 5573. American Realism, Naturalism. (4 cr; SP-6 cr literature; A-F only) Literary realism and its outgrowths in America (naturalism, impressionism, regionalism) from the Civil War through the early 20th century (authors and topics vary; e.g., Twain, Howells, Chopin, James, Wharton).

Engl 5577. Major American Authors. (4 cr [max 8 cr]; SP-6 cr literature; A-F only) Concentrated study in one to three authors, who are announced before course is offered.
THE BRITISH NOVEL IN ITS SOCIAL, INTELLECTUAL, AND AESTHETIC CONTEXTS. Authors and topics vary.

THE AMERICAN NOVEL, ORIGINS THROUGH 1920; CULTURAL, INTELLECTUAL, AND AESTHETIC CONTEXTS. Authors and topics vary.

ENGL 5581. AMERICAN NOVEL I. (4 cr; SP–6 cr literature or #; A-F only)
The American novel, origins through 1920; cultural, intellectual, and aesthetic contexts. Authors and topics vary.

ENGL 5582. AMERICAN NOVEL II. (4 cr; SP–6 cr literature; A-F only)
The American novel, 1920 to present; cultural, intellectual, and aesthetic contexts. Authors and topics vary.

ENGL 5585. BRITISH NOVEL I. (4 cr; SP–6 cr literature; A-F only)
The British novel in its social, intellectual, and aesthetic contexts, origins to 1872. Authors and topics vary.

ENGL 5586. BRITISH NOVEL II. (4 cr; SP–6 cr literature; A-F only)
The British novel in its social, intellectual, and aesthetic contexts, 1872 to present. Authors and topics vary.

ENGL 5591. INDEPENDENT STUDY. (1-5 cr; OP-6 cr literature; A-F only)
6 cr may be applied to Graduate School program; A-F only)
Topics not included in regular English curriculum. Topic and credits announced before course offered.

ENGL 5595. SPECIAL TOPICS: (VARIOUS TITLES TO BE ASSIGNED). (1-5 cr; OP-Max 6 cr; A-F only)
Topics not included in regular English curriculum. Topic and credits announced before course offered.

ENGL 5811. INTRODUCTION TO MODERN ENGLISH. (4 cr; A-F only)
Modern theories of English grammar.

ENGL 5821. HISTORY OF THE ENGLISH LANGUAGE. (4 cr; A-F only)
History of sounds, word stock, and structures of English language from earliest records to present.

ENGL 5902. TEACHING LANGUAGE, COGNITION, AND WRITING. (4 cr; OP–Max 6 cr; A-F only)
Theory and practice of teaching composition; for prospective teachers grade five to community college level.

ENGL 5922. TEACHING LANGUAGE AND COMMUNICATION. (4 cr; OP–Max 6 cr; A-F only)
Theory and applications in teaching reading, writing, speaking, listening, and media, grades 5-12.

ENGL 8111. SEMINAR: MEDIEVAL AND RENAISSANCE STUDIES. (4 cr; A-F only)
Advanced study of literature and literary culture. Historical, cultural, and literary contexts; methodology; relevant scholarship and criticism.

ENGL 8141. SEMINAR: 19TH-CENTURY BRITISH LITERATURE. (4 cr; A-F only)
Advanced study of Romantic and Victorian literature and literary culture. Historical, cultural, and literary contexts; methodology; relevant scholarship and criticism.

ENGL 8175. SEMINAR: MODERNISM. (4 cr; A-F only)
Advanced intensive study of selected modern writers. Historical, cultural, and literary contexts; methodology; relevant scholarship and criticism.

ENGL 8191. SEMINAR: AMERICAN LITERATURE. (4 cr; A-F only)
Intensive study of selected authors and topics announced ahead of time; historical, cultural, and literary contexts; methodology; relevant scholarship and criticism.

ENGL 8333. FTE: MASTER'S. (1 cr; SP–Master's student, adviser and DGS consent)

ENGL 8444. FTE: DOCTORAL. (1 cr; SP–Doctoral student, adviser and DGS consent)

ENGL 8666. DOCTORAL PRE-THESIS CREDITS. (1-18 cr; SP–Max 18 cr per semester or summer; doctoral student who has not passed prelim oral)

ENGL 8888. THESIS CREDITS: DOCTORAL. (1-18 cr; SP–Max 18 cr per semester or summer; 24 cr required)

ENGL 8906. INTRODUCTION TO CRITICAL THEORY. (4 cr; A-F only)
Core course required for all English M.A. (Plan B) students. Seminar in critical theory and methods of literary research.

ENGL 8931. PRACTICUM IN TEACHING LITERATURE. (4 cr; SP–6 cr literature; SP–8 cr grad-level literature or #; A-F only)
Teaching in sophomore literature courses; experience preparing supplementary materials, consulting with students, and assisting instructors in grading student work.

ENVIRONMENTAL STUDIES (ES)

COLLEGE OF LIBERAL ARTS

ES 1001. INTRODUCTORY SEMINAR. (2 cr; A-F only)
Introduction to the complexities of multidisciplinary environmental issues through research and literature review with emphasis on development of critical thinking skills.

ES 3001. OUTDOOR EXPERIENCE. (1 cr; SP–1001, 60 cr, ES major/minor or #; A-F only)
Lecture and field-based course incorporating outdoor recreational programs, environmental education, and field-based research in science into a comprehensive understanding of multidisciplinary nature of environmental issues.

ES 3050. SPECIAL TOPICS IN ENVIRONMENTAL STUDIES. (2-4 cr; OP-6 cr; ES major/minor or #; A-F only)
In-depth examination of one or more problems or topics in this interdisciplinary field.

ES 4001. INDEPENDENT STUDY. (1-3 cr; SP–60 cr or #; cannot apply cr to Graduate School program)
Directed readings and projects for students who wish to do advanced work on topics not normally covered in other courses.

ES 5001. ENVIRONMENTAL STUDIES SEMINAR. (4 cr; OP–ES major, 90 cr; not for grad cr; SP–ES major, 90 cr; not for grad cr; A-F only)
Critical discussion, research, and literature review of multidisciplinary environmental issues.

ES 5050. ENVIRONMENTAL STUDIES INTERNSHIP. (2-4 cr; SP–Cannot apply cr to Graduate School program; A-F only)
Practical experience in some field of environmental work, under direction of a faculty adviser and a work-site adviser.
Family Medicine (FMed)  

School of Medicine  
FMED 5591. Independent Study. (1-8 cr | max 12 cr; QP-Δ; SP-Δ)  
Intensive, independent study project of student's interest in medical research, interdisciplinary fellowship, preceptorship in rural health care delivery, or another medical area approved by Department of Family Medicine.  

FMED 7100. Clinical Family Medicine. (13 cr | max 117 cr; SP-Δ; cannot apply cr to Graduate School program; P-N only)  
Supervised care of patients of all ages emphasizing continuous, primary, preventive, acute, and chronic care in all general diagnostic categories.

Finance and Management Information Sciences (FMIS)  

School of Business and Economics  
FMIS 1201. Introduction to Business Information Systems. (3 cr; A-F only)  
Computer concepts; use of command-driven and graphics-user interface operating systems; graphics; word processing, spreadsheet, WWW publishing, and database management applications.  

FMIS 3141. Business Communications. (3 cr; QP-Comp 1110, SBE candidate or Econ major or Acct or Bus Adm minor with 60 cr or Q; SP-SBE candidate or Econ major or Q; A-F only)  
Principles of business communication and their application to oral, written, and nonverbal communication.  

FMIS 3201. Management Information Systems. (3 cr; SP-SBE candidate or Engr major or approved non-SBE student minoring in Bus Adm or MIS or CS or Q; A-F only)  
Conceptual foundations, structure, development, and implementation of information systems for social organizations. Emphasis on computer-based systems and their behavioral and societal implications for management.  

FMIS 3212. Structured Programming Techniques. (3 cr; SP-SBE candidate or Econ major or approved non-SBE student minoring in Bus Adm or MIS or CS or Q; A-F only)  
Introduction to programming for business applications using structured problem-solving techniques and programming methodologies. Focus on sequential file processing, data validation, internal table manipulation, and sorting.  

FMIS 3222. Systems Analysis and Design. (3 cr; SP-SBE candidate or approved non-SBE student minoring in MIS or Q; A-F only)  
Analysis phase of systems development life cycle. Emphasizes feasibility study, requirements analysis, and system specification. Detailed study of current physical and logical systems models and specification.  

FMIS 3224. Telecommunications. (3 cr; SP-SBE candidate or Q; A-F only)  

FMIS 3226. Expert Systems. (3 cr; SP-SBE candidate or Q; A-F only)  
In-depth examination of design and use of expert systems in a business environment. Applications, architectures, knowledge representation, inferencing strategies, and development tools and techniques.  

FMIS 3228. Electronic Commerce. (3 cr; SP-SBE candidate or approved non-SBE MIS minor or Q; A-F only)  
Overview of impact of Electronic Commerce (EC) on business, principles and practices of Internet-based EC, business and IT strategies, and future developments. Survey of EC applications, business models, and information technologies underlying these applications.  

FMIS 3301. Production and Operations Management. (3 cr; SP-SBE candidate or approved non-SBE student minoring in Bus Adm or MIS or CS or Q; A-F only)  
Introductory survey of production and operations as a functional area of management, including operations strategy, process design, forecasting, resource allocation, inventory management, scheduling, quality management, and project management. Computer applications of quantitative techniques to support operations decision making.  

FMIS 3397. SBE Internship. (3 cr; SP-SBE candidate, consent of internship director; S-N only)  
Work-integrated learning program providing practical experiences within students' majors. Students participate in an approved program within cooperating businesses, government agencies, or civic organizations. Requires minimum 300 hours work experience, assigned written reports, and performance evaluations.  

FMIS 3411. Distributed Computing Principles. (3 cr; SP-SBE candidate or approved non-SBE student minoring in Bus Adm or MIS or CS or Q; A-F only)  
Structured techniques concerning data communication principles, networks, distributed databases, associated hardware and software, typical applications, and management considerations.  

FMIS 3421. Database Management and Design. (3 cr; SP-SBE candidate or approved non-SBE student minoring in MIS or Q; A-F only)  
Concepts and structures relating to design, implementation, and administration of database management systems. Emphasis on relational databases and development of integrated applications.  

FMIS 3601. Corporate Finance. (3 cr; SP-SBE candidate or approved non-SBE student minoring in Bus Adm or Finance or Q)  
Fundamental concepts of managerial financial decision making. Time value of money, valuation, risk and return, financial statement analysis, short-run financial management, capital budgeting, cost of capital, long-term financing, and corporate taxation.
Course Descriptions

FMIS 3612. Managerial Finance. (3 cr; QP–3611, SBE candidate or Acct or Bus Adm minor with 90 cr; SP–3601, SBE candidate or approved non-SBE student minoring in Finance or Q; A-F only)
Intermediate conceptual and analytical applications in capital budgeting, funds flow, cost of capital, debt management, equity financing, mergers and acquisitions, business reorganizations, international financial management.

FMIS 3644. Investment Fundamentals. (3 cr; QP–3611, SBE candidate or Acct or Bus Adm minor with 90 credits or Q; SP–3601, SBE candidate or approved non-SBE student minoring in Finance or Q; A-F only)
Comprehensive introduction to nature, problems, and process of evaluating particular securities and portfolio construction. Survey of basic principles of security analysis, analytical techniques, and investment policy for individual and institutional investors. Introduction to computer-assisted investment analysis.

FMIS 3647. Financial Markets and Institutions. (3 cr; QP–3611, SBE candidate or Acct or Bus Adm minor with 90 cr; SP–3601, SBE candidate or approved non-SBE student minoring in Finance or Q; A-F only)
Analysis of money and capital markets, savings-investment process, and financial institutions. Role of Federal Reserve and Treasury in finance market development; supply and demand for loanable funds; level and structure of interest rates. Asset/liability management.

FMIS 3649. International Finance. (3 cr; QP–3611, SBE candidate or Econ major or Acct or Bus Adm or Econ minor with 90 cr or Q; SP–3601, SBE candidate or approved non-SBE student minoring in Finance or Q; A-F only)
Comprehensive framework and analysis for financial management of international firm. International financial markets, exchange rates and international firms, elements of international investments, financing decisions, and strategy formulation.

FMIS 3980. Special Topics: (Various Titles to be Assigned). (1-3 cr; max 8 cr; QP–SBE candidate or Acct or Bus Adm or Econ minor or Q; SP–SBE candidate or Q; A-F only)
Specific finance or information systems problems, issues, and approaches.

FMIS 3991. Independent Study. (3 cr; QP–§3971; A-F only)
For students wishing to do special work in finance or information sciences that extends beyond, or in greater depth than, regular course offerings.

FMIS 4225. Advanced Applications Development. (3 cr; QP–SBE candidate with 120 cr or grad student or Q; SP–3421, CS 1521 or CS 1521, SBE candidate or Q; A-F only)
Development of advanced microcomputer-based applications using modern development environments (languages). Emphasis on systems development and integration, interface design, and data access strategies.

FMIS 4611. Portfolio Analysis. (3 cr; QP–3644 or #3644, SBE candidate with 120 cr or grad student or Q; SP–3644 or #3644, SBE candidate or grad student or Q; A-F only)
Principles for investment selection under conditions of uncertainty, along Markowitz-Tobin-Sharpe lines; implications of model for capital markets and price behavior in efficient markets; empirical evidence on capital market performance; computer-assisted techniques for portfolio analysis.

FMIS 4613. Corporate Financial Strategies. (3 cr; QP–3612 or #3612, SBE candidate with 120 cr or grad student or Q; SP–3612 or #3612, SBE candidate and grad student or Q, offered alt yrs; A-F only)
Application of financial theory and analytical techniques to financial problem solving using case study methods.

FMIS 4615. Futures and Options. (3 cr; QP–3644 or #3644, SBE candidate with 120 cr or grad student or Q; SP–3644 or #3644, SBE candidate with 60 cr or grad student or Q; A-F only)
Nature and functions of derivative security markets such as options, futures, options on futures, swaps, and financial engineering. Emphasizes their use as tools for risk reduction, portfolio management, and speculative medium for aggressive investor.

FMIS 4617. Management of Financial Institutions. (3 cr; QP–3647 or #3647, SBE candidate with 120 cr or grad student or Q; offered alt yrs; SP–3647 or #3647, SBE candidate or grad student or Q; offered alt yrs; A-F only)
Techniques for managing commercial banks and other financial institutions through asset/liability management.

FMIS 4619. Analysis of Financial Statements. (3 cr; QP–3611, SBE candidate with 120 cr or grad student or Q; SP–3601, SBE candidate or grad student or Q; A-F only)
Analysis and interpretation of financial statements. Presentation of analytical techniques, including trend, comparative, and ratio analysis. Use of computer-assisted analysis.

FMIS 4651. Risk Management and Insurance. (3 cr; QP–3611, SBE candidate with 90 cr or grad student; SP–3601, SBE candidate or grad student; offered alt yrs; A-F only)
Introduction to risk analysis and management from perspective of individuals and firms in society. Applied use of risk transfer and control techniques, insurance contact construction, and determination of premiums.

FMIS 4995. Special Topics: (Various Titles to be Assigned). (3 cr; QP–SBE candidate or Acct or Bus Adm or Econ minor with 90 cr or Q; SP–SBE candidate or grad student or Q; A-F only)
Specific contemporary finance and information science problems, issues, and approaches.

Fine Arts (FA)

School of Fine Arts

FA 1100. Freshman Seminar: Producing/Presenting Art. (3 cr; SP–Fewer than 30 cr; A-F only)
Through direct experience and discourse, students study the multiple venues in which art is presented, exhibited, and perceived. Issues in aesthetic philosophy and arts criticism.

FA 1101. Freshman Seminar: Creating Art. (3 cr; SP–Fewer than 30 cr; A-F only)
Multiplicity of ways that art is created and the situation in which such work arises, including aesthetic philosophy and creative work.

FA 1300. Creating Across Disciplines. (3 cr)
Investigation of interdisciplinary creative possibilities offered by artists working with computers, sound, visual arts, theatre, dance, and music, culminating in individual or collaborative public performance.

FA 2100. Museums and Society. (3 cr; A-F only)
Study of museum audiences, including identification and fulfillment of their needs.
FA 2510. History of American Architecture: 1600 to Present. (3 cr; QP—Musm 1010; SP—2100 or #) Architecture from colonial period to present, emphasizing cultural, art historical, and social aspects.

FA 2595. Topics in Fine Arts: (Various Titles to be Assigned). (1-3 cr [max 9 cr]) Selected studies with interdisciplinary or multidisciplinary focus.

FA 3100. Management and Operation of Cultural Properties. (3 cr; QP—Musm 1001; SP—2100 or #; A-F only) Study of day-to-day management and operation of cultural properties, focusing on administrative, financial, and service aspects; philosophical and technical problems associated with exhibition, care, and interpretation of museum collections.

FA 3700. English Architecture. (1-3 cr; A-F only) Architecture and building seen in their art historical, cultural, and social contexts.

FA 3710. Shakespeare's Dramatic Art. (1-3 cr; A-F only) Social, intellectual, and dramatic context of Shakespeare’s plays and his handling of comedy, history, tragedy, and romance.

FA 5300. Creating Across Disciplines. (3 cr [max 9 cr]; QP—Max 6 cr to MA or MEd program; SP—Cannot apply cr to Graduate School program) Advanced work in interdisciplinary and interactive or collaborative projects, performances, or installations, drawing upon concepts and processes from various art disciplines.

French (Fr)

College of Liberal Arts

Fr 1101. Beginning French I. (4 cr; A-F only) Conversation and communicative course for students with little or no previous study of French. Emphasis on oral and aural skills; some grammar. Taught in French and English.

Fr 1102. Beginning French II. (4 cr; QP—1301 or equiv or #; SP—1-2 yrs high school Fr or 1101 or #; A-F only) Conversation and communicative course for students with previous study of French. Emphasis on oral and aural skills; some grammar. Taught in French and English.

Fr 1201. Intermediate French I. (4 cr; QP—1303 or equiv or #; SP—3-4 yrs high school Fr or 1102 or #; A-F only) Consolidation and enrichment of previously acquired abilities in speaking and understanding French, set within introduction to written French and survey of contemporary culture of French-speaking societies. Emphasis on oral, aural, and reading skills; vocabulary building; some writing. Taught in French.

Fr 1202. Intermediate French II. (4 cr; QP—1502 or equiv or #; SP—4 yrs high school Fr or 1201 or #; A-F only) Consolidation and enrichment of previously acquired abilities in speaking and understanding French, set within introduction to written French and survey of contemporary culture of French-speaking societies. Emphasis on oral, aural, and reading skills; vocabulary building; some writing. Taught in French.

Fr 2301. Advanced French. (4 cr; QP—1503 or equiv or #; SP—5 yrs high school Fr or 1202 or #; A-F only) Development of French literacy within a culturally authentic contemporary context. Emphasis on practical writing and formal oral and aural communication skills; vocabulary building; enhancement of reading skills; review of key grammar. Taught in French.

Fr 2315. French Cinema. (4 cr; A-F only) Images of human diversity in French cinema. Films with English subtitles; class discussion in English.

Fr 3006. Language Study Abroad. (1-5 cr [max 10 cr]; QP—A; SP—A) For students pursuing formal study of French, beyond the beginning and intermediate levels, in a French-speaking country, under the auspices of another college or university or by individual agreement.

Fr 3400. Culture and Civilization Study Abroad. (1-10 cr [max 20 cr]; QP—A; SP—A) For students pursuing formal study of French culture and civilization, beyond the beginning and intermediate levels, in a French-speaking country, under the auspices of another college or university or by individual agreement.

Fr 3591. Independent Study. (1-4 cr [max 8 cr]; QP—3001 or equiv, C or better in advanced Fr language sequence or #; SP—2301 with C or better; #; A-F only) Students develop and carry out reading and research programs in consultation with the instructor.

Fr 4422. 20th-Century Novel. (4 cr; QP—3001 or equiv, C or better in advanced Fr language sequence or #; SP—2301 or equiv with C or better or #; cannot apply cr to Graduate School program; A-F only) Representative novels.

Fr 4472. French Classical Literature. (4 cr; QP—3001 or equiv, C or better in advanced Fr language sequence or #; SP—2301 or equiv with C or better or #; cannot apply cr to Graduate School program; A-F only) Representative works of 17th-century French prose, poetry, and theatre. Taught in French.

Fr 4482. Voltaire and Rousseau in English. (4 cr; QP—3001 or equiv, C or better in advanced Fr language sequence or #; SP—2301 or equiv with C or better or #; cannot apply cr to Graduate School program; A-F only) Representative works.

Fr 4492. 19th-Century Novel. (4 cr; QP—3001 or equiv, C or better in advanced Fr language sequence or #; SP—2301 with C or better or #; cannot apply cr to Graduate School program; A-F only) Novels by writers such as Hugo, Balzac, Stendhal, Flaubert, Zola, and Maupassant. Taught in French.

Geography (Geog)

College of Liberal Arts

Geog 1202. World Regional Geography. (3 cr; A-F only) Geography of human groups in diverse settings. Emphasis on cultural diversity, regional development, and human and environmental forces shaping regional patterns and processes. Geographic analysis of selected regions and countries.
Course Descriptions

Geog 1304. Human Geography. (3 cr; A-F only)

Geog 1414. Physical Geography. (4 cr; A-F only)
Earth-sun relations, maps and globes, and major factors of the natural environment, including water resources, landforms, weather and climate, natural vegetation, and soils. (3 hrs lect, 2 hrs lab)

Geog 2306. Environmental Conservation. (3 cr; A-F only)
Integrated study of physical, economic, social, and political aspects of natural resource management. Emphasis on identifying environmental problems and evaluating alternatives for resolution, including planning, regulation, market incentives, and mitigation activities.

Geog 2313. Economic Geography. (3 cr; A-F only)
Contemporary geographic pattern analysis of production, distribution, and consumption of goods and services. Development of geographic theories and models that attempt to explain spatial variations of economic activities such as agriculture, manufacturing, and trades and services.

Geog 2552. Introduction to Maps and Cartographic Methods. (3 cr; A-F only)
Defines maps and map-like images. Maps as communication tools. Scale, projections, cartographic generalization and symbolization. Compares spatial data models and types of spatial (geographic) data. How classification and symbolization methods determine representation of spatial data.

Geog 3104. Historical Geography: United States. (4 cr; QP-40 cr incl 4 cr Geog or #; SP-25 cr incl 3 cr Geog or #; A-F only)
Geographic conditions influential in development and settlement of the United States.

Geog 3113. Geography of American Indians in the United States and Canada. (3 cr; QP-40 cr incl 4 cr Geog or #; SP-25 cr incl 3 cr Geog or #; A-F only)
Regional shifts in location and spatial organization of American Indians pre- and post-European contact. Comparative analysis of U.S. and Canadian groups.

Geog 3143. Ethnic Geography of American Immigration. (3 cr; QP-40 cr incl 8 cr Geog or #; SP-25 cr incl 6 cr Geog or #; A-F only)
Geographic survey of origins and distribution of European immigration in the United States; theories relating to migration and location of immigrants; transplanted systems of cultural ecology and the American environment; ethnicity as a geographic expression. Local and regional case studies.

Geog 3333. Urban Geography. (3 cr; QP-40 cr incl 4 cr Geog or #; SP-25 cr incl 3 cr Geog or #; A-F only)
Urbanization as a geographic process. Perspectives on the origins of cities, patterns of urban development, and contemporary urban problems.

Geog 3342. Geography of Transportation. (4 cr; QP-8 cr Geog incl 1312, 40 cr or #; SP-6 cr Geog incl 2313, 25 cr or #; A-F only)
Analysis of the distribution and pattern of various transportation modes; examination of geographic aspects of transport systems at empirical and theoretical levels.

Geog 3352. Urban and Regional Planning. (3 cr; QP-40 cr incl 8 cr Geog or #; SP-25 cr incl 6 cr Geog or #; A-F only)
Planning principles, process, and practice. History and trends in planning; development of comprehensive plans; implementation process in urban and regional planning.

Geog 3362. Geographic Aspects of Outdoor Recreation. (3 cr; QP-40 cr incl 4 cr Geog or #; SP-25 cr incl 3 cr Geog or #; A-F only)
Geographic survey of U.S. outdoor recreation sites; theories relating to location; outdoor recreation as a cultural expression of land use. Local and regional case studies of northern Minnesota.

Geog 3382. U.S. and Canadian Public Lands and Public Land Policy. (3 cr; QP-40 cr incl 4 cr Geog or #; SP-25 cr incl 3 cr Geog or #; A-F only)
Comparison of public land systems in the United States and Canada, including philosophies and attitudes toward public land; patterns of land use; current stresses on public lands.

Geog 3401. Weather and Climate. (3 cr; QP-1403 or 1413, 40 cr or #; SP-1414, 25 cr or #; A-F only)
Atmospheric composition, structure, and motion; precipitation processes, air masses, fronts, cyclonic storms, and general weather patterns. Global distribution and classification of climates.

Geog 3422. Natural Hazards. (4 cr; QP-1403 or 1413, 40 cr or #; SP-1414, 25 cr or #; A-F only)
Geography of natural hazards. Human-physical environment interrelationships under extreme geophysical conditions; causes, characteristics, and consequences of natural hazards such as earthquakes, tornadoes, hurricanes, floods, and drought; human adjustment to these events.

Geog 3451. The Geography of Soils. (4 cr; A-F only)
Soil formation processes in various environments, emphasizing soil as a resource that reflects human-environment interaction. (3 hrs lect, 1 hr lab)

Geog 3461. Geography of Global Resources. (3 cr; QP-40 cr or #; SP-25 cr or #; A-F only)
Spatial distribution and uses of global natural resources addressed through models of resource management, focusing on energy, non-fuel minerals, population, food, and technology. Theoretical approach and political perspective applied to trade, international economic development, and environmental issues.

Geog 3481. Urban Habitat: The Physical Geography of the City. (3 cr; A-F only)
Effects of urbanization on aquatic and terrestrial habitats; planning and community involvement as solutions to environmental challenges facing cities; case studies of particular North American urban ecosystems.

Geog 3532. Map Design and Graphic Methods. (4 cr; QP-1551, CS 1010, 40 cr or #; Stat 1565 recommended; SP-2552, CS 1011, 25 cr or #; Stat 1411 recommended; A-F only)
Thematic mapping of qualitative and quantitative data. Data measurement levels and their relationships to geographic phenomena and map symbols. Appropriate treatment (both statistical and representational) of map data. Designing and creating maps using computers. (2 hrs lect, 4 hrs lab)
Geog 3702. Geography of the United States and Canada. (3 cr; QP-40 cr incl 8 cr Geog or #; SP-25 cr incl 6 cr Geog or #; A-F only) Topical presentation of geographic patterns in the United States and Canada. Emphasis on contemporary social issues, including patterns of regional development and underdevelopment, environmental issues, regionalism, nationalism, cultural patterns and conflict, and social inequality.

Geog 3707. Geography of Minnesota. (2 cr; QP-40 cr incl 8 cr Geog or #; SP-25 cr incl 6 cr Geog or #; A-F only) Physical survey followed by study of human activities.

Geog 3712. Geography of Latin America. (4 cr; QP-40 cr incl 8 cr Geog or #; SP-25 cr incl 6 cr Geog or #; A-F only) Survey of cultural and physical diversities of Latin America. Physical resources, historical development, population characteristics, and economic activities.

Geog 3732. Geography of China and Japan. (4 cr; QP-40 cr incl 8 cr Geog or #; SP-25 cr incl 6 cr Geog or #; A-F only) Physical and cultural geography of China and Japan. Contemporary agriculture, resource use, trade, transport, industrialization, population, and urbanization.

Geog 3742. Geography of the Middle East and North Africa. (3 cr; QP-40 cr incl 8 cr Geog or #; SP-25 cr incl 6 cr Geog or #; A-F only) Study of one of the world's most strategic regions; geopolitical significance of this region; physical and cultural themes; role of oil and Arab-Israeli dispute in political geography of the Middle East.

Geog 3752. Geography of Russia and Other Commonwealth Republics. (3 cr; QP-40 cr incl 8 cr Geog or #; SP-25 cr incl 6 cr Geog or #) Physical and cultural geography of Russia and other republics of the former Soviet Union from an ethnic and geographical perspective.

Geog 3762. Geography of Europe. (3 cr; QP-40 cr incl 8 cr Geog or #; SP-25 cr incl 6 cr Geog or #; A-F only) Physical and cultural geography of countries of Europe considered regionally and through a more detailed discussion of topics dealing with environmental, energy, urban, and industrial issues.

Geog 3767. Geography of Scandinavia, Finland, and Iceland. (3 cr; QP-40 cr incl 8 cr Geog or #; SP-25 cr incl 6 cr Geog or #; A-F only) Cultural and physical geography of Scandinavia, Finland, and Iceland; introduction to their settlements in North America.

Geog 3991. Independent Study in Geography. (1-4 cr [max 6 cr]; QP-#; SP-#; A-F only) For students interested in doing advanced work in selected fields of geography.

Geog 3995. Special Topics in Geography: (Various Titles to be Assigned). (1-4 cr [max 8 cr]; QP-#; SP-#; A-F only) Topics in geography of current and special interest to students that are not offered in regular department curriculum. Topics may involve specialties of staff or visiting faculty.

Geog 3997. Internship in Geography. (1-6 cr [max 8 cr]; SP-Geog major, 60 cr or #) Scheduled assignments with direct supervision in public agencies or relevant private firms.

Geog 4393. Political Geography. (3 cr; QP-40 cr incl 8 cr Geog or #; SP-80 cr incl 6 cr Geog or #; A-F only) Survey of political geography past and present. Environmental-political theories, German geopolitics, territoriality, nation-states and nationalism, boundaries and frontiers, jurisdictional organization and reorganization, locational conflicts, electoral geography, locality studies, and urban politics.

Geog 4394. Feminist Geographies. (4 cr; QP-80 cr incl 6 cr Geog or #; A-F only) Gender differences in experiences of space and place; relationship between gender politics and geographies of cities, regions, nation-states, and other social institutions; gender differences in "making place" and interacting with environments; emphasis on possibility of feminist alternatives.

Geog 4563. Introduction to Geographic Information Science. (3 cr; SP-3532, 4564, 60 cr incl 16 cr Geog or #; A-F only) Theory of design, operation, and application of geographic information science (GIS); theoretical application of GIS to environmental, physical, and socioeconomic problems; from data gathering and coding through spatial analysis and interpretation.

Geog 4564. Laboratory in Geographic Information Science. (2 cr; SP-60 cr, 4563 or #; A-F only) Application of geographic information science (GIS) to environmental, physical, and socioeconomic problems; from planning and creating a spatial database to spatial analysis of database to explore contemporary spatial problems.

Geog 5431. Principles of Geographic Hydrology. (4 cr; QP-1403 or 1413, 45 cr or #; SP-1414, 30 cr or grad student or #; A-F only) Geography of water processes: relationships between rivers and landscape. Incorporating theoretical and empirical studies into hydrologic principles, stream channel processes, and fluvial geomorphology: spatial and temporal variations in water distribution, analyses of hydrologic data, flows, sediment, forecasting, hydrographs, and modeling.

Geog 5441. Water Resource Management. (3 cr; QP-1403 or 1413, 5340, 45 cr or grad student or #; SP-1414, 30 cr or grad student or #; A-F only) Geography of water distribution, planning, and management. Application of hydrological information in water management: aspects of water quantity and quality, groundwater availability, water use and treatment, resource development, political and administrative issues, basin management problems, forestry, agriculture, urbanization, floods, drought.

Geog 5543. Advanced Cartographic Methods. (4 cr; QP-3531, Stat 1565, 90 cr incl 16 cr Geog or grad student or #; SP-3532, Stat 1411, 60 cr incl 12 cr Geog or grad student or #; A-F only) Alternative map representations, such as multimedia representations, map animations, and maps for physically challenged individuals. Focuses on cognitive issues concerning map design, such as color perception and symbolization, that enhance map reading and understanding. (2 hrs lect, 4 hrs lab)

Geog 5571. Advanced Geographic Information Science. (4 cr; QP-3531, CS 1500 or CS 1501, Stat 1565, 90 cr incl 16 cr Geog, 5563/5564 or grad student or #; SP-#; A-F only) Coordinate systems, geocoding, vector/raster data structures, temporal data structures, surface modeling,
error modeling and data uncertainty, visualization, GIS application areas, decision making in a GIS context, system planning, and implementation. (2 hrs lect, 4 hrs lab)

**Geog 5612. Field Techniques.** (4 cr; QP–90 cr incl 16 cr
Geog or grad student or #; SP–60 cr incl 12 cr Geog or grad student or #; A-F only)

Geographic survey of physical and cultural aspects of selected urban and rural landscapes, including basic methods of observation, measurement, recording, analysis, and presentation of field data. Chiefly field training.

**Geog 5803. Geographic Thought.** (3 cr; QP–45 cr incl 16 cr
Geog or grad student or #; SP–30 cr incl 12 cr Geog or grad student or #; A-F only)

Development and significance of geographic concepts and thought. History and intellectual roots of contemporary geography, geographers, and geographic institutions.

**Geog 5991. Independent Study in Geography.** (1-4 cr
[max 6 cr]; QP–#; max 6 cr can be applied to Graduate School program; SP–#; max 4 cr can be applied to Graduate School program; A-F only)

Independent problems for postbaccalaureate students interested in doing additional work in selected fields in geography.

**Geog 5995. Special Topics in Geography: (Various Titles to be Assigned).** (1-4 cr
[max 8 cr]; QP–#; max 6 cr can be applied to Graduate School program; SP–Grad student or #; max 8 cr can be applied to Graduate School program; A-F only)

Topics of current and special interest to students that are not offered in regular curriculum. Topics may involve specialties of staff or visiting faculty.

**Geog 5999. Senior Project in Geography.** (3-4 cr; SP–#; max 3 cr can be applied to Graduate School program; A-F only)

Student-initiated field, lab, and/or library research topic. Formal written and oral presentation.

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**Geological Sciences (Geol)**

**Geol 1040. Freshman Seminar: Topics (Various Titles to be Assigned).** (3 cr; SP–Fewer than 30 cr; A-F only)

**Geol 1110. Introductory Geology.** (3 cr; A-F only)

Comprehensive survey of Earth’s composition, structure, and dynamics to develop an understanding of internal processes, plate tectonics, and surface processes as a framework for geological history and development of life. (2 hrs lect, 2 hrs lab)

**Geol 1120. Life and Death of the Dinosaurs.** (3 cr; A-F only)

Survey of dinosaurs, who dominated large-animal life on Earth for 150 million years; theories of dinosaur origins and extinction; habitat of dinosaurs on worldwide Mesozoic coastal plains; dinosaur fossilization and modern excavation. (3 hrs lect)

**Geol 1130. Introduction to Environmental Science.** (3 cr; A-F only)

Earth’s physical and biological systems and human interaction with the environment. Climate, soils, ecosystems, human population, food supply, air and water pollution, global climate change, ozone depletion, environmental policy. (2 hrs lect, 2 hrs lab)

**Geol 2100. Geological Computer Applications.** (1 cr;
QP–1110; SP–1110; A-F only)

Geological use of computer software, including spreadsheets, databases, contouring and drill hole plotting programs, Web page construction, and slide show presentation. (2 hrs lab)

**Geol 2210. Geomorphology.** (3 cr; QP–1110; SP–1110; A-F only)

Geologic processes of Earth’s surface environment that produce major elements of the landscape. Aerial photographs and topographic maps as tools for interpreting origin and geological history of landscapes. (2 hrs lect, 2 hrs lab)

**Geol 2300. Basic Mineralogy and Petrology.** (4 cr;
QP–$3324; 1110, 1 yr high school chem or 1 qtr of college chem, 30 cr or #; SP–$3321; 1110, sem or college chem or #; not for geol majors; A-F only)

Introduction to study of minerals and rocks; survey of the most common and economically important minerals and rock types, including their composition, identification, and origin. (2 hrs lect, 4 hrs lab, field trip)

**Geol 2311. Mineralogy and Petrology I.** (4 cr; QP–$3324;
1110, 1 qtr college chem; SP–$3320; 1110, 2 sem college chem or #; A-F only)

Common and important minerals; introduction to optical mineralogy; igneous rocks, including their classification, identification, origin, and interpretation. (2 hrs lect, 4 hrs lab, 2 field trips)

**Geol 2312. Mineralogy and Petrology II.** (4 cr; QP–3324;
SP–2311; A-F only)

Common and important sedimentary and metamorphic rocks, including their mineralogy, composition, classification, description, origin, and interpretation. (2 hrs lect, 4 hrs lab, field trips)

**Geol 2315. Mineral Resource Geology.** (2 cr; QP–3326;
SP–2312; A-F only)

Geological origin, extraction, and use of mineral resources; importance of minerals to modern society. (1 hr lect, 2 hrs lab)

**Geol 2350. Earth’s Resources.** (3 cr; SP–25 sem cr or #;
A-F only)

Distribution of Earth’s resources through space and time, including metals, minerals, fossil fuels, building materials, water, and soil. Relationships between population growth and Earth’s finite resources. (3 hrs lect, field trip)

**Geol 2410. Geology of North America.** (2 cr; QP–1110;
SP–1110; A-F only)

Survey of major physiographic and tectonic provinces of North America, including their geological nature, origin, and history. (2 hrs lect)

**Geol 2610. Oceanography.** (3 cr; A-F only)

Origin and history of ocean basins, sea floor morphology, chemistry of sea water, currents, waves, tides, life in the sea, primary productivity, nutrient dynamics, human impact. (3 hrs lect)

**Geol 2691. Independent Study.** (1-2 cr.[max 4 cr]; QP–#;
SP–#)

Directed readings and projects on topics not normally covered in other courses.

**Geol 3110. Environmental Geology.** (2 cr; QP–1110 or #;
SP–1110 or #; A-F only)

Human and planet Earth interactions; human impacts on geological environment; constraints and influences on
human activities imposed by geological processes and history; hazards of living on a dynamic planet; strategies for dealing with these problems. (2 hrs lect, field trip)

**Geol 3410. Stratigraphy-Sedimentation.** (3 cr; QP-3300 or 3325 or #; SP-2312; A-F only)
Stratigraphic principles and techniques used to study sedimentary rock and fossil record in order to interpret geologic history. Tectonic settings of basins. Development of life through time. (2 hrs lect, 2 hrs lab)

**Geol 3520. Structural Geology.** (4 cr; QP-3326; SP-2312; A-F only)
Introduction to brittle and ductile deformation, including joints, faults, shear zones, and folds; elementary stress and strain theory; deformation mechanisms; introduction to plate tectonics. Labs emphasize geologic map interpretation and structural analysis. (2 hrs lect, 4 hrs lab)

**Geol 3530. Field and Computer Methods.** (3 cr; QP-3520 or #; SP-3520 or #; A-F only)
Introduction to basic methods of geologic mapping and preparation of geologic reports. Field projects based on field instrumentation; computer-aided drafting and introduction to GIS. Students expected to use spreadsheets, databases, and word processing. (6 hrs lab)

**Geol 3710. Introduction to Geochemistry.** (3 cr; QP-Math 1296 or equiv, Chem 1112; SP-Math 1296 or equiv, Chem 1152 or #; A-F only)
Understanding chemical reactions occurring in geological processes on scales ranging from atomic to global. Geochemistry of the Earth; chemical reactions and stability of minerals; applications of geochemistry to understanding global processes and environmental problems. (3 hrs lect)

**Geol 4110. Advanced Earth Science for Teachers.** (2 cr; QP-Teaching earth sci or grad student or #; SP-Teaching earth and space sciences or grad student or #; A-F only)
Investigative approach to secondary school teaching of modern earth science curricula, including aspects of astronomy, meteorology, oceanography, and geology, the latter with an emphasis on plate tectonics. (2 hrs lect)

**Geol 4211. Applied Hydrogeology.** (3 cr; QP-3200, Math 1296 or #; SP-2210, Math 1296 or #; A-F only)
Introduction to hydrologic cycle, including precipitation, runoff, evapotranspiration, and groundwater recharge. Theory of groundwater flow, groundwater flow to wells, aquifer performance tests, geostatistics, wellhead protection, monitoring well networks, modeling, compilation of hydrogeological investigation reports. (2 hrs lect, 3 hrs lab)

**Geol 4212. Contaminant Hydrogeology.** (3 cr; QP-5210, Math 3299 or #; SP-4211; A-F only)
Introduction to sources and types of groundwater contamination, water balance and leachate quantity analysis, physical and chemical contaminant transport processes, transport equations, analytical and numerical transport modeling, groundwater quality investigations, and remedial actions. (2 hrs lect, 3 hrs lab)

**Geol 4500. Field Geology.** (6 cr; QP-3100, 3326, A; SP-3520, 3530, A; held at Wasatch-Uinta Field Camp, Park City, Utah, for 6 wks; students must have health insurance; A-F only)
Geological mapping of sedimentary, igneous, and metamorphic terranes and of Quaternary deposits and landforms; topographic maps and aerial photographs, including preparation of geologic maps and cross sections, and map unit descriptions.

**Geol 4810. Global Geophysics.** (3 cr; QP-1110 or #; SP-1110 or #; A-F only)
Integrated introduction to seismology, heat flow, gravity, and magnetics. Contribution of these phenomena to our understanding of Earth’s evolution and behavior. (3 hrs lect)

**Geol 5091. Geologic Problems.** (1-2 cr [max 4 cr]; QP-Grad student or #; SP-Grad student or #)
Individual research in lab or field problems.

**Geol 5095. Special Topics in Geology: [Various Titles to be Assigned].** (1-2 cr [max 4 cr]; QP-#; SP-#)
Topics not covered in regular curriculum. Topic announced before course offered.

**Geol 5100. Seminar.** (1-2 cr [max 4 cr]; QP-#; SP-#)
Oral and written presentation on topics of current significance to geoscientists. Participation by department staff.

**Geol 5210. Glacial and Quaternary Geology.** (3 cr; QP-3200 or #; SP-2210 or #; A-F only)
Physics of glaciers (glaciology), including erosional and depositional activities. Survey of geological and biological responses to changing environment resulting from climatic fluctuations during last three million years of Earth history. Field studies on the glacial deposits of Minnesota. (2 hrs lect, 2 hrs field lab)

**Geol 5220. Global Climate Change.** (2 cr; QP-#; SP-#; A-F only)
Analysis of past global change from climate proxy records in glacial ice, tree rings, ocean and lake sediments, ocean corals. Impact of ocean and atmospheric circulation on global climate; climate cycles; El Niño; human impact on global climate.

**Geol 5310. Advanced Petrology.** (3 cr; QP-3326 or #; SP-2312; A-F only)
Physico-chemical principles applied to origin of igneous and metamorphic rocks. Phase equilibria in important mineral systems. Lab study and interpretation of igneous and metamorphic rocks using petrographic microscope. (2 hrs lect, 2 hrs lab)

**Geol 5320. Precambrian Geology.** (2 cr; QP-3520 or #; SP-3520 or #; A-F only)
Nature, distribution, origin, correlation, and special problems of the Precambrian, emphasizing Lake Superior region. Term paper. (2 hrs lect, field trips; offered alt yrs)

**Geol 5350. Economic Geology.** (4 cr; QP-3326, 3150 or #; SP-2312, 3110 or #; A-F only)
Geologic description, distribution, and genesis of economic mineral deposits; processes leading to their formation; relationship to plate tectonics; exploration techniques and criteria for finding new deposits. (2 hrs lect, 4 hrs lab, field trip; offered alt yrs)

**Geol 5410. Petrology of Sedimentary Rocks.** (3 cr; QP-3325, 5305 or #; SP-2312 or #; A-F only)
Provenance, associations, and classifications of sedimentary rocks, including sandstones, carbonates, muddy rocks, and others. Microscopic study of thin sections and grain mounts; statistical techniques. Interpretation of rock suites. (2 hrs lect, 2 hrs lab; offered alt yrs)

**Geol 5420. Physical Sedimentology.** (3 cr; QP-3325 or #; SP-2312; A-F only)
Mechanics of sediment transport, determining grain size distributions, magnetic granulometry, and introduction to statistical analysis of sediments. Systematic study of
modern environments of deposition. Interpreting environments of deposition of ancient sedimentary rock units. (2 hrs lect, 3 hrs lab; offered alt yrs)

Geol 5710. Aqueous Geochemistry. (2 cr; QP-Chem 1112 or #; SP-Chem 1152 or #; A-F only) Principles of solution chemistry, with application to chemical weathering, acid deposition, rivers, lakes, and oceans. (2 hrs lect)

Geol 5720. Analytical Methods in Geology. (2 cr; QP-3326, Stat 3062 or equiv or #; SP-3710 or #; A-F only) Chemical analysis of geological samples using a range of analytical approaches, including inductively coupled plasma mass spectrometry (ICP-MS), UV-vis spectrophotometry, X-ray diffraction; practical application and data analysis. (1 hr lect, 3 hrs lab; offered alt yrs)

Geol 5810. Exploration Geophysics. (3 cr; QP-1110, Math 1297 or #; SP-1110, Math 1297 or #; A-F only) Review of primary geophysical techniques used in exploration industry. Emphasizes application of these techniques for solving near-surface-related problems. (3 hrs lect; offered alt yrs)

Geol 5804. Geologic Research. (1-6 cr; QP-#; SP-#; A-F only) Individual research.

Geol 8100. Seminar. (1-2 cr [max 6 cr]; QP-Grad geol major or #; SP-Grad geol major or #; S-N only) Oral and written presentations on topics of current significance to geoscientists. (1 cr lect)

Geol 8333. Geologic Research. (1-6 cr; QP-#; SP-#; A-F only) Individual research.

Geol 8094. Geologic Research. (1-6 cr; QP-#; SP-#; A-F only) Individual research.

German (Ger)

College of Liberal Arts

Ger 1101. Beginning German I. (4 cr; A-F only) Conversation and communicative course for students with little or no previous study of German. Emphasis on oral and aural skills; some grammar. Taught in German and English.

Ger 1102. Beginning German II. (4 cr; QP-1301 or equiv or #; SP-1-2 yrs high school Ger or 1101 or #; A-F only) Conversation and communicative course for students with previous study of German. Emphasis on oral and aural skills; some grammar. Taught in German and English.

Ger 1201. Intermediate German I. (4 cr; QP-Lang 1103 or equiv or #; SP-3-4 yrs high school Ger or 1102 or #; A-F only) Consolidation and enrichment of previously acquired abilities in speaking and understanding German, set within introduction to written German and survey of contemporary culture of German-speaking societies. Emphasis on oral, aural, and reading skills; vocabulary building; some writing. Taught in German.

Ger 1202. Intermediate German II. (4 cr; QP-1502 or equiv or #; SP-4 yrs high school Ger or 1201 or #; A-F only) Consolidation and enrichment of previously acquired abilities in speaking and understanding German, set within introduction to written German and survey of contemporary culture of German-speaking societies. Emphasis on oral, aural, and reading skills; vocabulary building; some writing. Taught in German.

Ger 2301. Advanced German. (4 cr; QP-1503 or equiv or #; SP-5 yrs high school Ger or 1202 or #; A-F only) Development of German literacy within a culturally authentic contemporary context. Emphasis on practical writing and formal oral and aural communication skills; vocabulary building; enhancement of reading skills; review of key grammar. Taught in German.

Ger 2402. Germany Today. (3 cr; SP-Does not count toward Ger major or minor; A-F only) Survey of culture, politics, and society of Germany and German-speaking countries, beginning with post-World War II era and emphasizing the European Union’s emergence and Germany’s role in contemporary Eastern Europe. Taught in English.

Ger 3006. Language Study Abroad. (1-5 cr [max 10 cr]; QP-#; SP-#; A-F only) For students pursuing formal study of German, beyond the beginning and intermediate levels, in a German-speaking country, under the auspices of another college or university by individual agreement.

Ger 3400. Culture and Civilization Study Abroad. (1-10 cr [max 20 cr]; QP-#; SP-#; A-F only) For students pursuing formal study of German culture and civilization, beyond the beginning and intermediate levels, in a German-speaking country, under the auspices of another college or university by individual agreement.

Ger 3401. Introduction to Literary Studies. (4 cr; QP-#; SP-#; A-F only) Techniques and tools for understanding and writing about German poetry, fiction, and drama both as literary texts and as cultural testimony. Emphasis on class discussion and writing critical essays in German.

Ger 3403. German Poetry and Theater. (4 cr; QP-#; SP-#; A-F only) Survey of major German poets since the Middle Ages (first five weeks) and modern German dramatists (remainder of semester). Emphasis on class discussion and interpretive reading in German, with two critical essays in German.

Ger 3591. Independent Study. (1-4 cr [max 8 cr]; QP-#; SP-#; A-F only) Students develop and carry out reading and research programs in consultation with the instructor.

Ger 4202. The German Novelle. (4 cr; QP-#; A-F only) Reading and analysis of short fiction created in German-speaking countries from late 1700s to modern era, with emphasis on texts as social commentary. Class discussion and term paper in German.
Ger 4404. Contemporary Germany. (4 cr; QP–1502; SP–2301 or equiv or #; cannot apply cr to Graduate School program; A-F only)
Civilization, culture, and politics of Germany and German-speaking countries since 1945. Research term paper in German.

Health (Hlth)

College of Education and Human Service Professions

Hlth 1000. Developing Wellness. (3 cr; A-F only)
Individual wellness components, including physiological, psychological, sociological, environmental, and spiritual moral issues. Emphasis on attaining optimum quality of life through health risk assessment. Personal decision-making concerning health behavior.

Hlth 1104. Health Science Terminology. (1-3 cr; A-F only)
Terms commonly used in health sciences and medical professions; emphasis on word structure.

Hlth 1470. Human Nutrition. (3 cr; A-F only)
Emphasis on chemical nature of dietary nutrients, physiological and metabolic aspects of human nutrition, effects of diet on human health, and global issues in health and nutrition.

Hlth 1600. Basic First Aid. (2 cr; A-F only)
Basic skills and knowledge to respond correctly in first aid emergencies. Leads to American Red Cross certification.

Hlth 1620. Wilderness Emergency Care. (3 cr; SP–91610; A-F only)
Emergency procedures to care for ill or injured persons in wilderness settings. Planning, equipment, and evacuation procedures used in nontechnical rescues. American Red Cross First Aid and CPR certification to first responder level.

Hlth 1650. CPR. (1 cr; A-F only)
Techniques of cardiopulmonary resuscitation involving one and two rescuers. American Red Cross certification for infant/child/adult CPR.

Hlth 1700. Advanced First Aid. (3 cr; SP–1650 or CPR certification; A-F only)
Principles of advanced first aid and accident prevention in the home and community; leads to first responder certification.

Hlth 2030. Applied Human Anatomy. (4 cr; SP–9Biol 1761; hlth ed or PE or exer sci or rec major; A-F only)
Introduction to human gross anatomy. Skeletal, muscular, nervous, circulatory, respiratory, and excretory systems. Applications in health and physical education. Demonstrations with pre dissected specimens.

Hlth 2040. Principles of Human Physiology. (4 cr; SP–1 sen each of college Biol, chem, anat recommended; A-F only)
Physiological mechanisms of cells, organs, and organ systems; function, control, and coordination of body systems.

Hlth 2042. Human Physiology Laboratory. (1 cr; SP–#; A-F only)
Non-invasive lab procedures in human physiology; emphasis on metabolic, muscular, cardiovascular, respiratory, and electro-physiology. (2 hrs lab)

Hlth 3101. Community Health. (3 cr; A-F only)
Health promotion and disease prevention at local, state, and national levels. Comparison between health problems of individuals and those of groups. Analysis of functions and roles of voluntary and official agencies. Exploration of community-based programs.

Hlth 3115. Consumer Health Education. (3 cr; A-F only)
Overview of concepts of marketing, analysis, selection, and decision making regarding health care, products, services, and providers.

Hlth 3117. Principles of Sex Education. (3 cr; SP–Hlth ed candidate or #; A-F only)
Planning and implementing comprehensive sex education programs in various settings. Sexual physiology, sociocultural aspects of sexuality, birth control, prevention of STDs/HIV, teen pregnancy, and other current topics. How community and family values affect sex education.

Hlth 3118. Women's Health Issues. (3 cr; A-F only)
Survey of American women health issues. Role of women as patients and as health care providers. Language, politics, and economics of women's health care. Comparison of American women's health status to that of women around the world.

Hlth 3202. Drug Education. (2 cr; SP–1502, admission to EdSe or BAS PE or BAS hlt ed ed or BAA exer sci or CSD program or #; A-F only)

Hlth 3301. Foundations of Health Education. (3 cr; SP–1000, hlt ed candidate or #; A-F only)
History, philosophy, and theories of health education; professional associations; basic functions of school and community health education programs; program planning.

Hlth 3302. Health Education Methods and Materials. (3 cr; SP–3301, hlt ed candidate or #; A-F only)
Health education methods, strategies, and materials for use in diverse settings. Determining health needs and interest, selecting content, stating objectives, developing learning opportunities, and evaluating programs. Responsibilities and competencies for entry-level health educator in program planning, implementation, and evaluation.

Hlth 3450. Health Promotion Programming. (3 cr; SP–Hlth ed candidate or #; A-F only)
Health promotion and program planning applied to various work-site settings through the development of program proposals. Practical applications: health assessment, goal setting, program methodology, program evaluation, budgeting, design, and research, through the constraints of a pilot project.

Hlth 3500. Environmental Health. (3 cr; SP–Hlth ed candidate or #; A-F only)
Biological, ecological, and physiological aspects of environmental health; concurrent effects on health of the community; and possible solutions to environmental problems.
Course Descriptions

Hlth 3990. Special Topics: (Various Titles to be Assigned). (1-3 cr [max 6 cr]; SP-#; A-F only)
Current health-related problems. Emphasis on promoting health/preventing disease in various populations.

Hlth 3991. Independent Study. (1-6 cr [max 6 cr]; SP-#; A-F only)
Opportunity for upper-division students to undertake an independent project that would serve to further their knowledge base and/or professional competencies.

Hlth 3992. Readings in Health. (1-4 cr; SP-#; A-F only)
Special complementary work and investigation in undergraduate student’s field of interest; survey of literature and resources available to health educators.

Hlth 3997. Practicum: Peer Education. (1-4 cr [max 4 cr]; SP-#; A-F only)
Development of personal and group skills for promoting healthy lifestyles through peer education program affiliated with Student Health and Counseling Center. Students plan and implement health education and health promotion programs for the student community.

Hlth 4996. Internship in Health Education. (1-15 cr; SP-Hlth ed major; #; cannot apply cr to Graduate School program; S-N only)
Supervised entry-level health education practical experience in hospital, work site, voluntary, or official agencies. Number of settings is limited to two.

Hlth 5161. School Health Programs: Early Childhood Through Middle School. (2 cr; SP-ECH or EflEd or hlth ed candidate or #; A-F only)
Survey of school health programs with in-depth study of selected health education curricula and topic areas, including alcohol, tobacco, drugs, communicable disease, and nutrition. Development of strategies and methods for teaching controversial areas.

Hlth 5166. Teaching “Growing Healthy” Curriculum. (1-6 cr [max 6 cr]; SP-120 cr or special student or #; A-F only)

Hlth 5341. Death Education. (3 cr; SP-cannot apply cr to Graduate School program; A-F only)
Grief, loss, death, dying, and bereavement in our society as understood by children, adolescents, and adults. Review of research and current literature; education program planning strategies for individuals associated with schools, agencies, organizations, or work sites.

Hlth 5990. Special Topics: (Various Titles to be Assigned). (1-3 cr [max 6 cr]; SP-#; A-F only)
Opportunity for upper-division and graduate students to explore current issues. Various health-related problem areas; emphasis on facilitating positive attitudinal and behavioral changes within students/clients.

Hlth 5991. Independent Study. (1-6 cr [max 6 cr]; SP-Adult spec or grad student, #; max 6 cr can be applied toward degree; A-F only)
Directed independent study, readings, research, or projects in a particular area of interest. Degree program plan and project proposal should be approved before course is taken by graduate students.

Hlth 5992. Readings in Health. (1-4 cr [max 4 cr]; SP-#; A-F only)
Special complementary readings and discussion in advanced or graduate student’s field of interest in health and health education.

Health, Physical Education & Recreation (HPER)

College of Education and Human Service Professions

HPER 3000. Organization and Administration of Health, Physical Education, and Recreation. (3 cr; SP-Hlth ed or PE or exer sci candidate or #; A-F only)
Theoretical and practical basis of administrative process and organizational structure of HPER programs.

HPER 3100. Risk Management. (2 cr; SP-Exer sci or rec major or #; A-F only)
Proactive approach to managing risks associated with conducting health, physical education, and recreation programs. Emphasis on planning for a safe environment.

HPER 3200. Research and Evaluation in Health and Human Services. (3 cr; Exer sci or hlth ed or PE or rec major or #; A-F only)
Principles of investigation and evaluation in health and human service professions with emphasis on methods, data analysis and presentation, and evaluation reports. Basic background information for scientific inquiry; use of evaluative data in health and human service programs.

HPER 4999. Senior Project. (6-12 cr; SP-Hlth ed or PE or rec or exer sci candidate with 90 cr; #; cannot apply cr to Graduate School program; S-N only)
Selection and completion of a project approved and supervised by faculty.

History (Hist)

College of Liberal Arts

Hist 1207. Dawn of Modern Europe. (3 cr; A-F only)
Early history of the modern era: Renaissance, Reformation, Age of Reason, French Revolution and its impact, Napoleonic era.

Hist 1208. Europe in the Modern Age. (3 cr; A-F only)
Making of modern Europe; analysis of economic and technological revolution, collision of ideologies, imperialist expansion, and revolutions and wars.

Hist 1304. American Heritage. (3 cr; A-F only)
Evolution of the United States from colonial origins into a modern nation. Frontier and agrarian heritage, constitutional development, emergence of modern U.S. political system, expansion of democracy and cultural diversity. Colonial period to 1877.

Hist 1305. American Challenges. (3 cr; A-F only)
Historical roots of major challenges facing Americans today: global responsibility as a world power; the quest for political, economic, and social justice; and community and family changes in modern society; 1877 to present.

Hist 2245. Science and Society: 1500 to Present. (3 cr; A-F only)
Explores a series of creative moments in the development of science and scientific methods within their broader social and cultural contexts.

Hist 2265. Russia in the 20th Century. (3 cr; A-F only)
Revolutions of 1917, the Soviet period, collapse of the Soviet Union and evolution of Soviet successor states; 1917 to present.
Hist 2357. Women in American History. (3 cr; A-F only)
Roles and contributions of women in American life from colonial period to present.

Hist 2515. Precolonial Africa. (3 cr; A-F only)
Political, cultural, and socioeconomic developments in precolonial Africa to 1800. Emphasis on slave trade, Islamic revolution, and European commercial penetration.

Hist 3091. Directed Readings in History. (1-4 cr [max 16 cr]; QP--SP; A-F only)
By arrangement in the department: individual study of material below the research level or formal study of history at an accredited institution abroad.

Hist 3095. Special Topics: (Various Titles to be Assigned). (3 cr; A-F only)
Upper division classroom course treating historical subjects not included in the regular curriculum.

Hist 3097. Internship in History. (1-3 cr [max 6 cr]; QP--JP; A-F only)
Supervised opportunity to pursue local or regional history under auspices of local museums, historical societies, commemorative commissions. Written and oral presentation of completed project.

Hist 3239. Europe in the Age of Renaissance and Reformation: 1348-1648. (3 cr; A-F only)
Social, economic, political, and cultural development of Europe from the Black Death to the Thirty Years' War. Central themes include Renaissance humanism and art, Columbus and European expansion, the Protestant and Catholic Reformation, and the era of religious wars.

Hist 3241. Europe in Revolution: 1789-1848. (3 cr; A-F only)
European Enlightenment, Ancient Regime, French Revolution and Napoleon, rise of nationalism, liberalism, beginnings of socialism.

Hist 3242. Europe in Ascendance: 1848-1914. (3 cr; A-F only)
The 1848 Revolution; nation building and nationalist movements; political and social reform; socialist movements; intellectual trends; the new imperialism and international politics.

Hist 3243. Europe in Crisis in the 20th Century. (3 cr; A-F only)
Causes, conduct, and consequences of World Wars I and II from European perspective. Offered during day school and in Individualized Learning Program.

Hist 3256. The Making of Modern Britain. (3 cr; A-F only)
Whig construction and shaping of modern British government, imperial expansion overseas, impact of American and French Revolutions, economic revolution, Victorian reforms and democracy, Irish problem, zenith of the Empire, Britain in two world wars, social transformations, Labour, and the welfare state.

Hist 3257. Modern France. (3 cr; A-F only)
History of France from 1789 to present.

Hist 3263. History of Russia I. (3 cr; A-F only)
Focus on Kievan Russia, Mongol Period, and rise of northern centers culminating in dominance of Moscow; covers Imperial period through reign of Peter I.

Hist 3264. History of Russia II. (3 cr; A-F only)
Peter I to end of reign of Alexander III.
Course Descriptions

Hist 3516. Society and Culture in 20th-Century Africa. (3 cr; A-F only)
Generational, class, and gender conflicts in the wake of European occupation, impact of colonial and neocolonial domination, and African responses to that occupation and to the world economy in the 20th century; selected films and literary sources.

Hist 3591. History of the Cold War. (3 cr; A-F only)
Main progress of the Cold War; its impact on relations between East and West, between industrial nations and the Third World; its impact on domestic politics and social developments of various nations. Offered in Individualized Learning Program.

Hist 3601. Colonial Latin America from Columbus to Bolivar: 1492-1830. (3 cr; A-F only)
Brief overview of pre-Columbian civilizations in the Americas; social, cultural, economic, and political development of Latin America from first European contacts in 1492 through end of the South American revolutions against Spain in 1830.

Hist 5094. Directed Research. (4 cr [max 12 cr]; QP-#; max 4 cr may be applied to Graduate School program; SP-#; max 4 cr may be applied to Graduate School program; A-F only)

Hist 5095. History Seminar. (4 cr [max 8 cr]; QP-#; SP-#; A-F only)
Advanced study and individual research on a selected historical topic or theme; senior capstone course for history majors. (2.5 hrs lect, 1 hr student/faculty consultation)

Humanities and Classics (HmCI)

College of Liberal Arts

HmCI 1004. From Classical Antiquity to Medieval Culture. (4 cr; A-F only)
Ancient Greek and Roman world. Historical and cultural contexts. Reorganization of late Roman world from Diocletian to 13th century A.D. Emergence of feudalism and medieval experience. Idea of “Classicism” which the Renaissance discovered and promoted.

HmCI 1005. Freshman Seminar: From Renaissance to Revolutions. (4 cr; SP-Fewer than 30 cr; A-F only)
Major ideas of European Renaissance; how they continue to inform and inspire the modern world. How these “perennial” notions are affected by changes in arts and humanities produced by political, scientific, social, and industrial revolutions.

HmCI 1007. From Renaissance to Revolutions. (4 cr; SP-$1005; A-F only)
Major ideas of European Renaissance; how they continue to inform and inspire the modern world. How these “perennial” notions are affected by changes in arts and humanities produced by political, scientific, social, and industrial revolutions.

HmCI 1021. Classical Mythology. (3 cr; A-F only)
Readings in Greek and Roman myths, especially in those that have influenced Western culture.

HmCI 1022. The Bible as Literature. (3 cr; A-F only)
The Hebrew Bible, the New Testament, and the Apocrypha examined as literary works of their time.

HmCI 1023. Folklore. (3 cr; A-F only)
Contemporary definitions of folklore and folk life studies; introduction to current interpretive approaches to verbal and nonverbal traditional cultures. Readings in folktales, myths, narrative poetry, and cultivated arts based on folk materials. Field research project required.

HmCI 1025. Zen Buddhism. (3 cr; A-F only)
Selected elements of Buddhist history and philosophy from 6th century B.C. India through Ch’an history and philosophy in China and Zen in Japan and America.

HmCI 3007. The Late Roman and Medieval Worlds. (3 cr; SP-30 cr or #; A-F only)
Reorganization of late Roman world from Diocletian to 9th century A.D. Origins of feudalism and the medieval experience.

HmCI 3021. The Age of the Heroes: Homer and His World. (3 cr; SP-30 cr or #; A-F only)
Organization and development of the Greek world from the fourth millennium B.C. to 700 B.C. Descriptive study of Minoan and Mycenaean worlds emphasizing critical evaluation of archaeological, mythological, and artistic significance of Homer.

HmCI 3022. Historical Jesus. (3 cr; QP-40 cr or #; SP-30 cr or #; A-F only)
Survey of work done by the Jesus Seminar, most notably its detailed commentary on the canonical gospels and its work on the historical Jesus by John Dominic Crossan and other biblical scholars. Readings and videotapes.

HmCI 3028. Gender and Culture in the Classical World. (4 cr; QP-40 cr or #; SP-30 cr or #; A-F only)
 Lives, social roles, statuses, and literary/mythical depictions of women and men in the classical world, from Bronze Age Greece through imperial Rome.

HmCI 3031. The Roman Republic. (3 cr; SP-30 cr or #; A-F only)
Republican Rome from origins through collapse in 44 B.C., with emphasis on cultural and political attributes, leading figures, and causes of its demise.

HmCI 3033. Medieval Literature in Its Cultural Context. (4 cr; SP-30 cr or #; A-F only)
Forms of life, thought, and art from earliest texts in English, French, German, and Italian to 15th century; appropriate selections in English translation; relationship of literature to its social backgrounds and major aesthetic movements, especially in visual arts.

HmCI 3035. The Music and Lives of the Beatles. (3 cr; QP-30 cr or #; SP-30 cr or #; A-F only)
Impact on our culture of music and lives of the Beatles. Their music; influence on music, fashion, and attitudes; Beatles’ movies; interrelationship with political and social movements; later careers; their legacy.

HmCI 3041. The Roman Empire. (3 cr; SP-30 cr or #; A-F only)
Imperial Rome from Age of the Caesars through 550 A.D., with emphasis on politics of pax Romana, rise and spread of Christianity, and Roman legacy to the modern world.

HmCI 3051. Science and Civilization. (3 cr; QP-30 cr or #; SP-30 cr or #; A-F only)
Nontechnical survey of critical periods and/or themes in history of science and their interconnections with other cultural issues.
HmCI 3055. The Ancient Near East. (3 cr; SP-30 cr or #; A-F only)
History of Ancient Near East from birth of civilization in Egypt and Mesopotamia (c. 3100 B.C.) to arrival of Alexander (330 B.C.). Review of the ancient cultures of Egypt, Babylonia, Assyria, the Hittites, Persia, Syria, and Palestine.

HmCI 3095. Special Topics in Humanities: (Various Titles to be Assigned). (1-5 cr [max 10 cr]; QP-40 cr or #; SP-30 cr or #; A-F only)

HmCI 3099. Project in the Humanities. (2 cr; SP-30 cr or #; A-F only)
Original paper or project under guidance of humanities and classics minor adviser. Primarily for humanities and classics minors.

HmCI 3151. Ancient Egyptian Culture. (3 cr; SP-30 cr or #; A-F only)
History, culture, and arts of ancient Egypt as known through the archaeological record.

HmCI 3161. Egyptian Literature and Language. (3 cr; QP-3150 or #; SP-3151 or #; A-F only)
Ancient Egyptian civilization explored through primary texts in religious, historical, secular, and technical literature. Elementary Egyptian vocabulary; opportunities to learn to read and write hieroglyphic.

HmCI 3221. Science Fiction. (3 cr; SP-30 cr or #; A-F only)
Selected science fiction short stories, novels, films, videos, and music that explore impact of physical, biological, and social sciences in producing changing views of human nature, values, institutions, and societies.

HmCI 3231. Utopian Images. (3 cr; SP-30 cr or #; A-F only)
Ways that humans imagine a better existence in a finer world, with examples from such expressive forms as utopian treatises, science fiction, pastoral poetry and art, religious traditions, landscape architecture, urban designs.

HmCI 3241. Women and Men in Popular Culture. (3 cr; QP-40 cr or #; SP-30 cr or #; A-F only)
Analysis of popular culture texts (literature, television, advertisements, music) and audiences to understand cultural construction of gender as reflected in representations of masculinity and femininity. Introduction to range of methods for cultural analysis.

HmCI 3271. Popular Culture in the 1960s. (3 cr; QP-40 cr or #; SP-30 cr or #; A-F only)
Interrelationships among the arts, popular culture, politics, and social change as found in literature, theatre, film, photography, painting, and music in the United States during the 1960s.

HmCI 3333. From Homer to Alexander: Archaic and Classical Greece. (3 cr; SP-30 cr or #; A-F only)
Early history of Greek world from Heroic Age to death of Alexander the Great, 850-323 B.C.

HmCI 3391. Independent Study. (1-4 cr [max 8 cr]; QP-#; SP-#; A-F only)
Topics studied in a tutorial setting.

HmCI 5033. Medieval Literature in Its Cultural Context. (4 cr; QP-90 cr or #; SP-90 cr or #; A-F only)
Forms of life, thought, and art from earliest texts in English, French, German, and Italian to 15th century; appropriate selections in English translation; relationship of literature to its social backgrounds and major aesthetic movements, especially in visual arts.

HmCI 5095. Special Topics in Humanities: (Various Titles to be Assigned). (1-4 cr [max 8 cr]; QP-90 cr or grad or #; SP-90 cr or grad or #; A-F only)
Topics announced in Class Schedule.

HmCI 5591. Independent Study. (1-4 cr [max 8 cr]; QP-#; SP-#; A-F only)
Students devise reading and research programs in consultation with the instructor.

Industrial Engineering (IE)

College of Science and Engineering

IE 1105. Introduction to Engineering Design. (3 cr; A-F only)
Engineering representation and analysis of systems using visualization and sketching; orthographic projection; isometric and oblique pictorials; scales and dimensions; and different coordinate systems. Manufacturing considerations in design and use of CAD for graphic representation.

IE 1205. Introduction to Manufacturing Engineering. (3 cr; QP-1025 or Engr 1025, Math 1296 or #; SP-1105, Math 1296 or #; A-F only)
Methods used to design and manufacture high quality products. Student teams study how manufacturers plan and perform operations to convert raw materials into finished products using acceptable manufacturing methods. Student teams work with cellular manufacturing systems.

IE 2105. Introduction to Material Science for Engineers. (3 cr; QP-Chem 1140 or #; SP-Chem 1151; A-F only)
Structures and properties of engineering materials, emphasizing metals, composites, polymers, and ceramics.

IE 3105. Human Factors. (4 cr; QP-Stat 3562, BIE candidate; SP-BSIE candidate; A-F only)
Design and analysis of the workplace using ergonomic principles; safety concerns; environmental considerations. Testing and performance measures in worker-machine environment.

IE 3115. Operations Research. (4 cr; QP-Math 3202, Stat 3562; SP-Math 3280, Stat 3611, BSIE candidate; A-F only)
Optimization. Linear programming, network analysis, Markov chains, and queuing theory.

IE 3125. Engineering Economic Analysis. (3 cr; QP-Math 3298, BChE or BIE candidate; SP-Stat 3611, BSIE candidate; A-F only)
Data analysis and methods for engineering decision making under risk; using time and value of money concepts; using expectation principles for project selection; and using forecasts.

IE 3135. Manufacturing Processes I. (4 cr; QP-3005 or Chem 3010, Engr 3016, Phy 1109, Stat 3562, BIE candidate; SP-2105, Stat 3611, BSIE candidate; A-F only)
Thermal and mechanical processing techniques for metals, plastics, and composites using special and general purpose machines and tools.

IE 3205. Project Management. (3 cr; QP-3061, 3110 or 3111, BIE candidate; SP-3125, BSIE candidate; A-F only)
Development and management of plans for resources needed in industrial projects. Life cycle of projects.

HmCI 5591. Independent Study. (1-4 cr [max 8 cr]; QP-#; SP-#; A-F only)
Students devise reading and research programs in consultation with the instructor.
Material removal processing techniques for metallic and non-metallic materials using special and general purpose machines and tools.

**IE 3255. Statistical Quality Control.** (3 cr; Op-Stat 3562, BSE candidate; SP-Stat 3611, BSE candidate; A-F only)
Statistical quality control in manufacturing modeling, process quality, control charts, process capability, acceptance sampling methods, reliability.

**IE 3265. Production and Operations Management.** (4 cr; OP-3301, 3070, BSE candidate; SP-3115, 3125, BSE candidate; A-F only)
Production system design and analysis based on inventory policies, production flow concepts, scheduling policies, material handling, and cost analysis. Plant location factors and Total Quality Management.

**IE 4115. Facility Planning and Simulation.** (4 cr; OP-3061, 3070, BSE candidate; SP-3265, BSE candidate; cannot apply cr to Graduate School program; A-F only)
Facility and process design and analysis using flow rates, design relationships, graphical aids, and computer simulation.

**IE 4135. Automation and Robotics.** (3 cr; OP-Math 3380, BSE or BCompE or BECE candidate; SP-Math 3280; cannot apply cr to Graduate School program; A-F only)
Automation using robots, material handling devices, jigs and fixtures. Robot position and motion theory; introduction to system control; modularity and flexibility in automated work cells.

**IE 4145. CAD/CAM.** (4 cr; OP-Engr 1025, Math 3380; SP-BSE candidate; cannot apply cr to Graduate School program; A-F only)
Use of CAD/CAM systems for design, analysis, and manufacturing as applied to parts, tooling, and fixtures. Use of system software.

**IE 4175. Machine Design.** (3 cr; SP-BSE candidate or #; cannot apply cr to Graduate School program; A-F only)
Analysis of mechanical components as used in mechanical devices. Theories of material failures, lubrication, and corrosion. Design of machinery considering performance, safety, packaging, wear, and recycling.

**IE 4196. Cooperative Education.** (2 cr [max 4 cr]; OP-BIE candidate; SP-BSE candidate; cannot apply cr to Graduate School program)
Practical work experience with employer closely associated with student’s academic area; arranged by mutual agreement among student, department, and employer. Biweekly status reports and final written report must be submitted to department.

**IE 4235. Manufacturing Systems Integration.** (4 cr; OP-4135, BSE candidate; cannot apply cr to Graduate School program; A-F only)
Design and use of hardware and software to integrate computer control and decision making into product development and manufacturing systems.

**IE 4255. Design of Industrial Systems.** (3 cr; OP-IE 36; SP-3205, BSE candidate; cannot apply cr to Graduate School program; A-F only)
Student teams use design and analysis methods learned in previous courses to design or improve an industrial system, which generally will be a real system from industries in local region.

**IE 4491. Independent Study.** (1-4 cr [max 4 cr]; OP-#; SP-BSE candidate; #; cannot apply cr to Graduate School program; A-F only)
Directed individual study arranged with instructor and department head before registration.

**IE 4495. Special Topics: (Various Titles to be Assigned).** (1-4 cr [max 8 cr]; OP-#; SP-#; cannot apply cr to Graduate School program)
Topics not available in regular department curriculum. May involve specialties of department or visiting faculty.

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### Interdisciplinary Archaeological Studies (InAr)

**College of Science and Engineering**

**InAr 5005. Geoarchaeology.** (3 cr; SP-Grad student or #; offered alt years; A-F only)
Systematic review of current research on application of geology and geography to solution of archaeological problems.

**InAr 5009. Cultural Resource Management.** (3 cr; SP-Grad student or #; offered alt years; A-F only)
Survey of cultural resource management archaeology, including applicable state and federal law, with practical problems.

**InAr 5100. Topics in Archaeology: (Various Titles to be Assigned).** (3 cr [max 9 cr]; SP-Grad student or #; A-F only)
Topics vary.

**InAr 5676. Field Research in Archaeology.** (1-10 [max 10 cr]; SP-Anth 1602 or Anth 1612 or #; A-F only)
Archaeological field excavation, survey, and research in historic and prehistoric sites in Minnesota.

**InAr 8001. Archaeological Method and Theory.** (3 cr; SP-Offered alt yrs; A-F only)
Contemporary methodological and theoretical issues and approaches in archaeology.

**InAr 8003. Archaeological Science.** (3 cr; SP-Offered alt years; A-F only)
Review and evaluation of application of theory and methodology of natural sciences to solution of archaeological problems.

**InAr 8100. Interdisciplinary Seminar.** (3 cr; SP-Offered alt years; A-F only)
Themes in successful applications of interdisciplinary studies in archaeology. Interdisciplinary project.

**InAr 8200. Directed Readings.** (1-4 cr [max 8 cr]; SP-#; A-F only)
Under direction of IAS staff.

**InAr 8300. Directed Research.** (1-4 cr [max 8 cr]; SP-#; A-F only)
Under direction of IAS staff.

**InAr 8333. FTE: Master’s.** (1 cr; SP-Master’s student, adviser and DGS consent)

**InAr 8444. FTE: Doctoral.** (1 cr; SP-Doctoral student, adviser and DGS consent)

**InAr 8666. Doctoral Pre-Thesis Credits.** (1-18 cr; SP-Max 18 cr per semester or summer; doctoral student who has not passed prelim oral)
InAr 8777. Thesis Credits: Master's. (1-18 cr; SP-Max 18 cr per semester or summer; 10 cr total required [Plan A only])
InAr 8888. Thesis Credits: Doctoral. (1-18 cr; SP-Max 18 cr per semester or summer; 24 cr required)

Interdisciplinary Studies (IS)

College of Liberal Arts

IS 3001. Interdisciplinary Methods Seminar. (3 cr; QP-IS major or #; SP-IS major or #; A-F only)
Definitions, history, and philosophy of interdisciplinary research, writing, learning, and teaching. Readings in major types of interdisciplinary work; preliminary methods for interdisciplinary projects.

IS 3095. Special Topics in Interdisciplinary Studies: (Various Titles to be Assigned). (1-4 cr; SP-15 cr or #)

IS 3099. Senior Project. (1-10 cr; QP--; SP-IS major or #; A-F only)
An agreement that specifies nature of the project, amount of work, and number of credits must be approved by two advisers and filed with director of interdisciplinary studies.

IS 5111. The Classical Heritage in the Modern World. (3 cr; SP-60 cr or grad student or #; A-F only)
Ancient Greek and Roman contributions to the modern world explored through readings, lectures, and visual presentations. Historical and cultural contexts. Classicism.

IS 5121. The Renaissance Legacy in the Modern World. (3 cr; SP-60 cr or grad student or #; A-F only)
Major ideas of European Renaissance such as the "Renaissance man"; the classical revival and humanism; how these ideas have continued to inform and inspire people of the modern world.

IS 5131. Technology, Revolution, and the Humanities. (3 cr; SP-60 cr or grad student or #; A-F only)
Sweeping changes in the arts and humanities brought about by technology and scientific, social, and industrial revolutions. Focuses on challenges to positivism, nationalism, and colonialism by technological relativism and cultural pluralism.

IS 5195. Special Topics in Liberal Studies: (Various Titles to be Assigned). (1-4 cr [max 8 cr]; QP--; SP-90 cr or grad student or #; A-F only)

IS 8001. Introduction to Liberal Studies. (1-4 cr [max 8 cr]; QP-Grad student or #; SP-MLS candidate or #; S-N only)
Introduction to methods of interdisciplinary liberal studies. Minimum of 4 credits required of M.L.S. candidates.

IS 8501. Seminar: Ethics and the Human Condition. (4 cr; QP--A; SP-MLS candidate or A-F only)
Explores applications of values and ethical considerations from humanistic study to problems of modern world.

IS 8591. Directed Study. (1-8 cr [max 8 cr]; QP-MLS candidate or A-SP-MLS candidate or A-F only)
Individualized study under supervision of the director of the master of liberal studies program.

International Business (IntB)

School of Business and Economics

IntB 3201. International Business. (3 cr; QP-SBE candidate of Q; SP-SBE candidate or Q; A-F only)
Identification of position of United States in world trade; impact of international trade on national businesses and policies; business and employment opportunities in international business.

International Studies (IntS)

College of Liberal Arts

IntS 1066. An Introduction to Britain. (3 cr; A-F only)
Interdisciplinary survey of British Isles: major geographic, historical, social, and cultural features of region.

IntS 1070. An Introduction to Scandinavia. (3 cr; A-F only)
Interdisciplinary survey of Scandinavia and its people: major historical, social, political, and cultural features of region.

IntS 1095. Special Topics: (Various Titles to be Assigned). (1-4 cr [max 8 cr]; QP--May be repeated simultaneously or sequentially for 8 cr max; A-F only)
Special topic identified at time course offered.

IntS 1191. International Study. (1-5 cr [max 15 cr]; QP--; SP--A-F only)
For students who want to take an independent study course while traveling or living in a foreign country. Course must be approved by supervising faculty member and director of international studies.

IntS 3166. Study in England Evaluation. (1 cr; QP--; SP--; S-N only)
Self-examination of study abroad experience in Britain.

IntS 3167. Study in Sweden Evaluation. (1 cr; QP--; SP--; S-N only)
Self-examination of study abroad experience in Sweden.

IntS 3168. Study in France Evaluation. (1 cr; QP--; SP--; S-N only)
Self-examination of study abroad experience in France.

IntS 3191. International Study. (1-5 cr [max 15 cr]; QP--; SP--A-F only)
For students who want to take an independent study course while traveling or living in a foreign country. Course must be approved by supervising faculty member and director of international studies.

IntS 3195. Special Topics: (Various Titles to be Assigned). (1-3 cr [max 8 cr]; QP--May be repeated simultaneously or sequentially for 8 cr max; A-F only)
Special topic identified at time course offered.

IntS 3197. International Internship. (1-6 cr [max 8 cr]; QP-70 cr; SP-50 cr; A-F max 4 cr may be applied to IntS major; SP-SBE candidate or A-F only)
Supervised work experience involving international interaction.

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Course Descriptions

IntS 3295. Special Topics: (Various Titles to be Assigned). (1-3 cr; max 8 cr; QP-May be repeated simultaneously or sequentially for 8 cr max; A-F only)
Special topic identified at time course offered.

IntS 4100. Seminar in International Studies. (4 cr; QP-Pol 1050, 90 cr incl 12 upper div cr approved IntS courses or #; SP-Pol 1050, 60 cr incl 8 upper div cr approved IntS courses or #; A-F only)
Analysis of and supervised research and writing on selected topics.

IntS 4891. Independent Study. (1-5 cr; max 10 cr; QP-12 cr IntS, #; SP-8 cr IntS, #; A-F only)
Advanced study and research under faculty member supervision.

IntS 4995. Special Topics: (Various Titles to be Assigned). (1-5 cr; max 10 cr; QP-70 cr incl 12 cr IntS or #; SP-50 cr incl 8 cr in IntS or #; A-F only)
Detailed examination of contemporary international studies topics.

Language (Lang)

College of Liberal Arts

Lang 1101. Beginning Foreign Language I. (4 cr; A-F only)
For students studying beginning language where that language is spoken, under the auspices of another college or university or by individual arrangement with prior approval by the Department of Foreign Languages and Literatures; or students studying a less frequently taught language at UMD.

Lang 1102. Beginning Foreign Language II. (4 cr; QP-1101 or equiv or #; SP-1101 or #; A-F only)
For students studying beginning language where that language is spoken, under the auspices of another college or university or by individual arrangement with prior approval by the Department of Foreign Languages and Literatures; or students studying a less frequently taught language at UMD.

Lang 1201. Intermediate Foreign Language I. (4 cr; QP-1103 or equiv or #; SP-1102 or #)
For students studying intermediate language under the auspices of another college or university or by individual arrangement with prior approval by the Department of Foreign Languages and Literatures; or students studying a less frequently taught language at UMD.

Lang 1202. Intermediate Foreign Language II. (4 cr; SP-1201 or #; A-F only)
For students studying intermediate language under the auspices of another college or university or by individual arrangement with prior approval by the Department of Foreign Languages and Literatures; or students studying a less frequently taught language at UMD.

Lang 3091. Directed Study. (1-3 cr; max 6 cr; QP-#, A; SP-, #; A-F only)
Students plan their program of study in conference with the instructor in an area not covered by regular courses.

Lang 3095. Special Topics in Languages: (Various Titles to be Assigned). (1-4 cr; max 8 cr; QP-Fr 3002 or Ger 1503 or Span 3002 or #; offered in study abroad programs; SP-#)
Selected topics, not currently offered, that deal with genres, periods, specific authors, or cultural movements of Germanic, Hispanic, Francophone, or other foreign worlds.

Lang 4044. Language Teaching Methods. (4 cr; QP-24 cr of a foreign language or #; SP-Fr 2301 or Ger 2301 or Span 2301 or equiv; cannot apply cr to Graduate School program; A-F only)
Theory and practice of teaching a second language. Survey and application of current methods used to teach skills and cultural concepts of world languages.

Lang 5198. Workshop: (Various Titles to be Assigned). (1-4 cr; QP-Tchg credentials in a foreign language or #; SP-Tchg credentials in a second lang or #; A-F only)
Service course for prospective and in-service teachers provides postgraduate study of any matters related to teaching of a foreign language.

Limnology (Lim)

College of Science and Engineering

Lim 5601. Limnology I: Physics and Chemistry. (4 cr; QP-15 qtr cr of upper div sciences, #; SP-10 sem cr of upper div sciences, #; A-F only)
Physical and chemical processes in lakes and watersheds. Origins, heat budgets, circulation dynamics, biogeochemical cycling of major and trace elements, nutrient dynamics. (3 hrs lect, 3 hrs lab, field trips)

Lim 5602. Limnology II: Biology and Geology. (4 cr; QP-5001, 5002, SP-5601; A-F only)
Biological and geological processes in lakes and watersheds. Trophic dynamics, ecosystem-level and watershed-level integration of biota with chemical and physical processes. Sedimentary processes and composition of sediments. Geochronology, paleolimnology. (3 hrs lect, 3 hrs lab, field trips)

Linguistics (Ling)

College of Liberal Arts

Ling 1811. Introduction to Language. (3 cr; A-F only)
Theoretical and practical study of the nature of language, including survey of linguistic science (grammar, vocabulary, first language acquisition, second language learning, regional and social dialects, how the brain processes language, and how language works in interpersonal communication).

Ling 3101. Introduction to Phonology. (3 cr; SP-1811 or #; A-F only)
Survey of the fundamentals of phonology and its place in linguistic science, with emphasis on descriptive analysis.

Ling 3102. Introduction to Syntax. (3 cr; SP-1811 or #; A-F only)
Survey of the fundamentals of syntax, with emphasis on systems for describing, analyzing, and creating natural languages, studied within the development of linguistic science.

Ling 3195. Special Topics in Linguistics: (Various Titles to be Assigned). (3 cr; SP-1811 or #; A-F only)
Selected topics, not currently offered, that deal with subdisciplines within linguistics, such as pragmatics, semantics, regional and social language variation, sociolinguistics, childhood language acquisition, second language learning, language change and linguistic reconstruction, and history of linguistic inquiry.
Management Studies (MgtS)

School of Business and Economics

MgtS 3397. SBE Internship. (3 cr; SP-SBE candidate, consent of internship director; S-N only)
Work-integrated learning program providing practical experiences within students' majors. Students participate in approved program within cooperating businesses, governmental agencies, or civic organizations. Requires minimum of 300 hours work experience, assigned written reports, and performance evaluations.

MgtS 3401. Organizational Behavior and Management. (3 cr; SP-SBE candidate or approved non-SBE Bus Adm or Mgmt-Human Resource or Mgmt-Organizational Mgmt minor or Q; A-F only)
Introduction to organizations, management process, and understanding human behavior at work. Effects of structure, technology, leadership, job design, teams, and reward systems on employee attitudes, motivation, and work-related behaviors.

MgtS 3491. Independent Study. (1-3 cr; SP-Δ; A-F only)
For students wishing to do special work in strategic, organizational, human resource, or marketing management that extends beyond, or in greater depth than, regular course offerings.

MgtS 3701. Principles of Marketing. (3 cr; SP-SBE candidate or approved non-SBE Bus Adm or Mkt minor or Q; A-F only)
Marketing as a process of exchange management. Emphasis on conceptual tools necessary to deal with both strategic marketing management issues and tactical management of product, price, promotion, and distribution.

MgtS 3711. Marketing Research. (3 cr; SP-3701, SBE candidate or approved non-SBE Mkt minor or Q; A-F only)
Emphasis on improving skills of conducting secondary research, designing a primary research study, and analyzing and reporting results of a research study.

MgtS 3741. Fundamentals of Selling. (3 cr; SP-SBE candidate or approved non-SBE Mkt minor or Q; A-F only)
Theory and practice of personal selling as used by organizations to develop long-term partnerships with customers. Emphasis on marketing, planning, communication, and presentation skills.

MgtS 3781. International Marketing. (3 cr; SP-3701, SBE candidate or approved non-SBE Mkt minor or Q; A-F only)
Marketing across national boundaries; effects of foreign economic, legal/political, and sociocultural environments on multinational marketing strategies.

MgtS 3801. Human Resource Management. (3 cr; SP-SBE candidate or approved non-SBE Bus Adm or Mgmt-Human Resource or Mgmt-Organizational Mgmt minor or Q; A-F only)
Introduction to theory and practice of human resource management in private and public organizations. Organizational, legal, and ethical influences on major personnel functions, including planning, staffing, training, performance appraisal, compensation, and labor-management relations.

MgtS 3997. Management of Community Projects. (1-3 cr; SP-3401, 3801, SBE candidate or consent of internship director; S-N only)
Requires design and administration of community-related project involving volunteers. Interns identify project, contact appropriate persons, obtain approval, and submit written proposal. Requires completion of minimum of 100-300 hours, maintenance of weekly journal, oral presentation, and written analysis.

MgtS 4411. Organizational Studies. (3 cr; SP-3401, SBE candidate or approved non-SBE Mgmt-Organizational Mgmt minor or Q; A-F only)
Survey of organization theories and their application to organizational structuring, coordination, control, job design, organizational decision making, leadership, and organizational development.

MgtS 4421. Managing Change. (3 cr; SP-3401, 3801 or equiv, SBE candidate with 90 cr or Q; A-F only)
Causes, goals, programs, and results of organizational change and employee responses to it. Assumptions, values, contingency factors, ethical considerations, models, and intervention strategies for organizational development. Role of managers as change agents.

MgtS 4431. Leadership. (3 cr; SP-SBE candidate or approved non-SBE Mgmt-Organizational Mgmt minor or Q; A-F only)
Nature and character of effective leadership; importance of leadership in organizations; traditional and contemporary views of leadership.

MgtS 4441. Managerial Decision Making. (3 cr; SP-3401, 3801, SBE candidate or Q; A-F only)
Decision-making models, styles, and strategies with goal of improving quality of decision making.

MgtS 4451. Management Inquiry. (3 cr; SP-3401, 3801, SBE candidate or Q; A-F only)
Methods employed by organizational specialists in conducting applied inquiry (research) to assist organizational decision making. Preparation and written/ oral presentation of research findings from student-conducted field, laboratory, or library research projects focused on contemporary management issues.
Course Descriptions

MgtS 4461. Business and Society. (3 cr; SP-SBE candidate or approved non-SBE Mgmt-Organizational Mgmt minor or Q; A-F only)
Business as part of larger system—economic, political, social. Emphasis on external environment—economics, culture, government, technology, international relations, labor—within which business operates. Business ethics and social responsibility.

MgtS 4471. Interpersonal Relations. (3 cr; SP-3401, SBE candidate or approved non-SBE Mgmt-Organizational Mgmt minor or Q; A-F only)
Issues and application of concepts affecting employer-employee and peer relationships at work. Topics may include conflict, counseling, feedback, group decision making, influence strategies, organizational politics, stress management.

MgtS 4472. Entrepreneurship. (3 cr; SP-SBE candidate or Q; A-F only)
Seminar on nature of entrepreneurship; the entrepreneurial character; situations and experiences encountered by entrepreneurs.

MgtS 4480. Seminar: Topics in Management Studies
(Variuos Titles to be Assigned). (1-3 cr [max 9 cr]; SP-SBE candidate or Q; A-F only)
Contemporary management problems in functional areas of strategic, organizational, human resource, or marketing management.

MgtS 4481. Strategic Management. (3 cr; SP-3401, 3701, FMIS 3301, FMIS 3601, 90 cr, SBE candidate or Q; cannot apply cr to Graduate School program; A-F only)
Integration of basic functions of marketing, finance, production, and behavioral sciences. Emphasis on organizational environments and development and implementation of competitive strategies that respond to social, political, and economic conditions from perspective of top management.

MgtS 4496. Management Field Studies. (3 cr; SP-90 cr, SBE candidate, Q; cannot apply cr to Graduate School program; A-F only)
Teams of two to four students provide hands-on management assistance, analysis, and other consulting to existing small businesses or economic development agencies.

MgtS 4711. Business-to-Business Marketing. (3 cr; SP-3701, SBE candidate or approved non-SBE Mkt minor or Q; A-F only)
Marketing goods to organizations. Emphasis on differences between marketing to organizations and consumers. Derived demand, long-term trade relationships, contact, negotiation, channels, promotion, physical distribution, product development, markets.

MgtS 4721. Advertising and Marketing Communications. (3 cr; SP-3701, SBE candidate or Q; A-F only)
Promotional planning. Emphasis on planning for advertising, sales promotion, public relations/publicity, direct marketing, and personal selling. Importance of integrated marketing communications to organizations.

MgtS 4731. Consumer Behavior. (3 cr; SP-3701, SBE candidate or approved non-SBE Mkt minor or Q; A-F only)
Buyer behavior and implications for marketing strategy. Emphasis on information processing concepts, influences on behavior, and decision-making processes from both conceptual and pragmatic perspectives. Students requiring graduate credit must complete additional coursework.

MgtS 4781. Marketing Management and Strategy. (3 cr; SP-3701, 3731, 1 other marketing course, 90 cr, SBE candidate or Q; cannot apply cr to Graduate School program; A-F only)
Planning, directing, and controlling an organization's marketing activity, including formulating marketing objectives, strategy, and tactics. Interpretation of information in decision making and strategy formulation. Case analysis used to develop marketing problem-solving, communication, and organization skills.

MgtS 4821. Staffing Work Organizations. (3 cr; SP-3801, SBE candidate or approved non-SBE Mgmt-Human Resource minor or Q; cannot apply cr to Graduate School program; A-F only)
Theory and practice of staffing work organizations. Emphasis on design and implementation of staffing systems, legal requirements, and career planning.

MgtS 4831. Compensation Systems. (3 cr; SP-3801, SBE candidate with 90 cr or approved non-SBE Mgmt-Human Resource minor or Q; cannot apply cr to Graduate School program)
Theory, design, and practice of employee compensation systems. Impacts of compensation, economic and institutional forces influencing employer compensation policies and practices, supplemental forms of compensation and administrative practices.

MgtS 4841. Training and Development. (3 cr; SP-3801, SBE candidate, approved non-SBE Mgmt-Human Resource minor or Q)
Design, implement, and evaluate human resource development systems. Elements of program planning and delivery: learning theory, needs analysis, objectives, training methods and coaching, presentational skills and techniques, assessment processes, and transfer strategies.

MgtS 4851. Unions and Collective Bargaining. (3 cr; SP-3801, SBE candidate with 90 cr or approved non-SBE Mgmt-Human Resource minor or Q)
Nature of and basis for contractual relationships between employers and unions. Emphasis on background of labor movement, union organizing, bargaining relationships, labor law, and contemporary trends in private and public sector labor relations.

MgtS 4881. Human Resource Issues and Trends. (3 cr; SP-3801, SBE candidate or Q)
Integrative, problem-solving approaches to contemporary human resource challenges.

Master of Business Administration (MBA)

School of Business and Economics

MBA 8111. Business, Government, and Society. (2 cr; SP-MBA student or [non-MBA grad student, Q]; A-F only)
How cultural, political, global, legal, and economic factors impact business activities. Issues of business ethics and social responsibility.

MBA 8211. Data Analysis and Statistics for Managers. (2 cr; OP-Econ 1203, Econ 1204 or equiv; SP-Econ 2020 or equiv; A-F only)
Concepts/principles of business statistics, data analysis, and presentation of results. Research process and design, secondary and primary data collection, measurement
commitment) that organizations have upon their members.

Theoretical models and empirical literature focused on understanding the effects (e.g., performance, motivation, and work-related attitudes—satisfactions and commitment) that organizations have upon their members through environmental factors such as job/work design, technology, and reward systems.

MBA 8311. Operations Management. (3 cr; QP—FMIS 3305 or equiv, grad student or QP—SP—FMIS 3301 or equiv, MBA student or [non-MBA grad student, Q; A—F only])

Operations management strategies for the organization. Computer-implemented decision support models introduced in contexts such as project management, resource allocation, forecasting, quality management, inventory management, and simulation.

MBA 8333. FTE: Master's. (1 cr; SP—Master's student, adviser and DGS consent)

MBA 8411. Policy Formulation and Implementation. (3 cr; QP—Acct 8512, FMIS 8211, FMIS 8611, MgtS 8711; SP—8311, 8501, 8611, 8711, MBA student or [non-MBA grad student, Q; A—F only])

Formulation and implementation of organizational strategy and policy that results in a sustainable competitive advantage. Develop skills in integrating all functional areas of business as well as identifying industry and competitive trends to determine organizational strategy.

MBA 8501. Management Accounting. (3 cr; QP—Acct 1995 or equiv, grad student; SP—Acct 2005 or equiv, MBA student or [non-MBA grad student, Q; A—F only])

Students develop an understanding of the significance and limitations of information presented in financial statements used by managers to evaluate overall performance of an organization and its segments. Provides managers with the skills and understanding to use tools to enhance quality of managerial decisions.

MBA 8512. Managerial Economics. (2 cr; QP—[Econ 1004, Econ 1005 or equiv], grad student or QP—[Econ 1022, Econ 1023 or equiv], MBA student or [non-MBA grad student, Q; A—F only])

Application of economic theory and economic methodology to managerial decision making. Supply and demand, production, consumer behavior, business and economic forecasting, pricing and marketing strategies under differing competitive conditions, government's role, and the global market.

MBA 8611. Financial Management. (3 cr; QP—FMIS 3611 or equiv, SP—FMIS 3601 or equiv, MBA student or [non-MBA grad student, Q; A—F only])

Corporate financial policy. Application of financial theory and decision-making tools.

MBA 8711. Marketing Management. (3 cr; QP—MgtS 3701 or equiv, grad student; SP—MgtS 3701 or equiv, MBA student or [non-MBA grad student, Q; A—F only])

Planning, implementation, evaluation, and control of organizational marketing activities. This process includes environmental market analysis in order to achieve competitive advantage and effective resource allocation.

MBA 8801. Organization Behavior and Human Performance. (3 cr; QP—Mgmt 3304 or equiv, grad student; SP—MgtS 3401 or equiv, MBA student or [non-MBA grad student, Q; A—F only])

Theoretical models and empirical literature focused on understanding the effects (e.g., performance, motivation, and work-related attitudes—satisfactions and commitment) that organizations have upon their members through environmental factors such as job/work design, technology, and reward systems.

MBA 8811. Human Resource Challenges. (3 cr; QP—Mgmt 3804 or equiv; SP—MgtS 3801 or equiv, MBA student or [non-MBA grad student, Q; A—F only])

Overview of contemporary human resource issues, human resource systems, procedures, and decisions that guide effective, efficient, and equitable management of people in organizations.

MBA 8991. Independent Study. (1-3 cr [max 6 cr]; SP—MBA student or [non-MBA grad student, Q; A—F only])

Provides opportunity for special study in areas useful to individual programs and objectives in accounting, economics, finance, information systems, management, human resource management, marketing, and other areas of business administration that extend beyond, or in greater depth than, regular courses.

MBA 8994. Directed Research. (1-6 cr [max 6 cr]; SP—MBA student; A—F only)

MBA 8995. Special Topics in Business: (Various Titles to be Assigned). (1-3 cr [max 6 cr]; SP—MBA student or [non-MBA grad student, Q; A—F only])

Special topics on or integrative, interdisciplinary study of problems in accounting, economics, and business administration.

MBA 8998. Workshop in Business: (Various Titles to be Assigned). (1-3 cr [max 6 cr]; SP—MBA student or [non-MBA grad student, Q; A—F only])

Workshops provide an opportunity for integrative, interdisciplinary study of problems in accounting, economics, and business administration.

MBA 8999. Projects in Business. (1-3 cr [max 6 cr]; SP—MBA student or [non-MBA grad student, Q; A—F only])

Community or campus-based projects involving analysis of an issue or problem in an organization and proposal of a solution. Provides an opportunity for integrative, interdisciplinary study of problems in accounting, economics, and business administration.

Mathematics (Math)

Mathematics and Statistics

College of Science and Engineering

(See Statistics for Stat courses.)

Math 1002. Euclidean Geometry. (3 cr, cannot apply cr toward degree; QP—1001 or equiv; SP—High school algebra; A—F only)

Plane and solid geometry. Brief introduction to analytic geometry. Intended for students who have not taken high school geometry or who need additional background in geometry.

Math 1004. Intermediate Algebra. (5 cr, cannot apply cr toward degree; QP—1001, 1002; SP—Math placement or A; A—F only)

Basic concepts of solving equations and inequalities. Introduction to function concept and graphing. Polynomial, rational, logarithmic, and exponential functions.

Math 1024. Introduction to Contemporary Mathematics. (3 cr; SP—1004 or math placement; A—F only)

Increases awareness and appreciation of uses, richness, and power of mathematics. Sample topics: graph theory for management science, scheduling, linear programming, statistical sampling and inference, coding information, decision making, voting theory, game theory, geometric growth, symmetry, and patterns.
Math 1141. Mathematics for Elementary Education. (4 cr; QP-1002, 1003; SP-Pre-element major or Δ; A-F only)
Subject matter for effective elementary school teaching. Problem solving, structure of number systems, and properties of geometric figures. Use of microcomputers in mathematics.

Math 1155. Trigonometry. (2 cr; QP-1002, 1003; SP-1002; A-F only)
Introduction to trigonometric functions and their inverses, identities, triangle trigonometry, and applications.

Math 1160. Finite Mathematics and Introduction to Calculus. (5 cr; QP-1002, 1003; SP-$\$1290, $\$1296; 1004; A-F only)
Counting theorems, elementary probability, conditional probability, Bayes' theorem, matrices, determinants, graphical and algebraic methods for solving systems of linear equations and inequalities, introduction to linear programming, and abbreviated treatment of calculus with business and social science applications.

Math 1234. Freshman Seminar: Topics (Various Titles to be Assigned). (3 cr; SP-Fewer than 30 cr; A-F only)

Math 1250. Precalculus Analysis. (4 cr; QP-1002, 1003; SP-1004 or math placement; A-F only)
Inequalities, analytical geometry; relations, functions, and graphs; exponential, logarithmic, and trigonometric functions; complex numbers and De Moivre's Theorem; permutations, combinations, binomial theorem, and mathematical induction.

Math 1290. Calculus for Modeling. (5 cr; SP-$\$1160, $\$1296; 1250 or math placement; A-F only)
Differential and integral calculus needed for modeling in earth and life sciences. Computational software. Not intended for students in mathematics, engineering, or physical sciences.

Math 1296. Calculus I. (5 cr; QP-1250, 1296; SP-$\$1160, $\$1290; 3 1/2 yrs high school algebra or trig or geometry or college precalc course; A-F only)
First part of a standard introduction to calculus of functions of a single variable. Limits, continuity, derivatives, integrals, and their applications.

Math 1297. Calculus II. (5 cr; QP-1296, 1297; SP-1296; A-F only)
Second part of a standard introduction to calculus. Vectors, applications of integrals, transcendental functions, series, and multivariable functions and partial derivatives.

Math 3010. Actuarial Calculus. (1 cr; cannot apply cr toward math major or minor; QP-3350; SP-3298; S-N only)
Problem-solving techniques in calculus and linear algebra needed in actuarial work.

Math 3091. Independent Study. (1-3 cr [max 8 cr]; QP-Δ; SP-Δ; A-F only)
Directed reading and/or research in mathematics. Must be arranged with instructor and department head before registration.

Math 3097. Internship. (1-3 cr; QP-Math major, 90 cr, Δ; SP-Math major, Δ; S-N only)
Practical, independent project in commercial, government, or industrial setting. Department approval required before beginning project.

Math 3110. Foundations of Mathematics and Geometry. (5 cr; QP-3298, 3320; SP-1297; A-F only)

Math 3120. Mathematics Tutorial Project. (1-2 cr [max 4 cr]; QP-1297; Δ; SP-1296; Δ; S-N only)
Primarily for $\$xx$ mathematics courses, under supervision of mathematics department member.

Math 3280. Differential Equations with Linear Algebra. (4 cr; QP-3298; SP-1297; A-F only)
First, second, and higher order equations; series methods; Laplace transforms; systems; software; modeling applications; introduction to vectors; matrix algebra, eigenvalues.

Math 3298. Calculus III. (4 cr; QP-3298; SP-1297; A-F only)
Third part of a standard introduction to calculus. Conic sections, vectors and vector-valued functions, partial derivatives and multiple integrals, vector fields, Green's and Stokes' theorems.

Math 3299. Intermediate Analysis. (3 cr; QP-3298; SP-1297; A-F only)
In-depth study of fundamental notions such as limit, convergence, continuity, differentiability, and integrability on which all reflective study of calculus must rest.

Math 3320. Introduction to Linear Algebra. (3 cr; QP-3298; SP-1297; A-F only)
Systems of linear equations, matrix algebra, determinants, real vector spaces, basis and dimension, linear transformations, eigenvectors and eigenvalues, Gram-Schmidt orthogonalization.

Math 3355. Discrete Mathematics. (4 cr; QP-3320, CS 1502 or CS 1621; SP-1296, college-level programming course, 1297 or 2nd programming course; A-F only)
Introduction to mathematical logic, predicates and quantifiers, sets, proof techniques, recursion and mathematical induction, recursive algorithms, analysis of algorithms, assertions and loop invariants, complexity measures of algorithms, combinatorial counting techniques, relations, graph theory.

Math 3941. Undergraduate Colloquium. (1 cr; QP-Math major, Δ; must regis during qtr of 16th point; SP-Math major or minor, Δ; must regis during sem of 16th point; S-N only)
Exposure to UMD mathematics-related colloquia. Sixteen points required: one for attending a colloquium; one for writing an acceptable report on a colloquium (at least four must be earned through writing); up to eight for giving a colloquium.

Math 3995. Special Topics: (Various Titles to be Assigned). (1-3 cr [max 6 cr]; QP-Δ; SP-Δ; A-F only)
Topics not available in standard curriculum.

Math 4230. Applied Mathematics: Complex Variables. (3 cr; QP-3350, 3699; SP-3280; A-F only)
Complex numbers and analytic functions; complex integration; complex power series, Taylor series, and Laurent series; theory of residues; conformal mapping.

Math 4240. Applied Mathematics: Operational Methods. (3 cr; QP-3380; SP-3280; A-F only)
Laplace transform; Fourier series, integrals, and transforms; Sturm-Liouville operator- and boundary-value problems; orthogonal functions; operator solutions of partial differential equations.
Math 4820. Applied Mathematics: Numerical Methods. (3 cr; QP—1297, 3320, proficiency in FORTRAN or Pascal; SP—3280 or 3320)
Computer representation of numbers; sources of error; introduction to interpolation, approximation, numerical integration, solution of linear and nonlinear systems, initial-value problem approximation; use of computer software.

Math 5201. Real Variables. (4 cr; QP—3699; SP—3299; A-F only)
Limits, sequence and series of real numbers, tests for convergence, rearrangements, summability, and the class $P$. Metric spaces; continuous functions, connectedness, completeness, compactness. Banach fixed-point theorem and Picard existence theorem for differential equations.

Math 5220. Optimization and Control. (3 cr; SP—3280; A-F only)
Introduction to control theory of linear systems. Controllability, stabilizability, linear quadratic regulator problem. (offered alt yrs)

Math 5260. Dynamical Systems. (3 cr; QP—3380 or 3381, 3699; SP—3280)
Fundamentals of differential equations (existence, uniqueness, continuation of solutions); linear systems, autonomous systems, and Poincare-Bendixson theory; periodic systems; discrete dynamical systems; bifurcation theory; chaos. (offered alt yrs)

Math 5270. Modeling with Dynamical Systems. (3 cr; QP—3380 or 3381, 3699; SP—3280)
Application and analysis of continuous and discrete dynamical systems. Model construction, simulation, and interpretation. (offered alt yrs)

Math 5280. Partial Differential Equations. (3 cr; QP—3380, 5380; SP—3280; A-F only)
Introduction, emphasizing use of Fourier series, Green's functions, and other classical techniques.

Math 5326. Linear Algebra I. (3 cr; QP—3320; SP—3280 or 3320; A-F only)
Fields, vector spaces over fields, subspaces, coordinates, change of basis, linear transformations, matrix representations, inner product spaces, Gram-Schmidt diagonalization, and orthogonal diagonalization.

Math 5327. Linear Algebra II. (3 cr; QP—5326; SP—5326; A-F only)
Linear operators, projection operators, annihilating polynomials, triangular and Jordan forms, singular-value decomposition, least squares and generalized least squares, quadratic and bilinear forms.

Math 5330. Theory of Numbers. (3 cr; QP—3320 or 3555; SP—3320 or 3355; A-F only)
Properties of integers, primes, divisibility, congruences, and quadratic reciprocity. Computational aspects include factoring algorithms and RSA cryptosystem. (offered alt yrs)

Math 5365. Graph Theory. (3 cr; QP—3320; SP—3280 or 3320; A-F only)
Finite graphs, including trees, connectivity, traversability, planarity, colorability, labeling, and matchings.

Math 5366. Enumerative Combinatorics. (3 cr; QP—3555; SP—3355; A-F only)
Permutations, combinations, binomial coefficients, inclusion-exclusion, recurrence relations, ordinary and exponential generating functions, Catalan numbers, selected topics from designs, finite geometries, Polya's enumeration formula.

Math 5371. Abstract Algebra I. (3 cr; QP—3320; SP—3280 or 3320; A-F only)
Introduction to groups and rings and their applications.

Math 5372. Abstract Algebra II. (3 cr; QP—3320, 5670; SP—5371; A-F only)
Polynomial rings, divisibility in integral domains, field extensions, finite fields, special topics, and applications.

Math 5384. Algebraic Coding Theory. (3 cr; QP—3320; SP—3280 or 3320; A-F only)
Introduction to linear error-correcting codes using binary vector spaces and finite fields. Hamming codes, Golay codes, linear codes in general, cyclic codes, BCH codes, and their encoding/decoding. (offered alt yrs)

Math 5810. Linear Programming. (3 cr; QP—5IE 3070; 3320; SP—3280 or 3320; A-F only)
Motivation problems, modeling, theory of simplex method, duality and sensitivity analysis, large-scale problems, complexity, and Karmarkar algorithm. (offered alt yrs)

Math 5830. Numerical Analysis: Approximation and Quadrature. (4 cr; QP—3380 or 3381, 3326, CS 1501; SP—3280 or 3320)
Error analysis, interpolation and approximation, numerical integration, solution of nonlinear systems. (offered alt yrs)

Math 5840. Numerical Analysis: Systems and Optimization. (4 cr; QP—3380 or 3381, 5326, CS 1501; SP—3280 or 3320)
Solution of systems of linear equations; elimination and factorization methods; iterative methods; error analysis; eigenvalue/eigenvector approximation; unconstrained optimization; nonlinear least squares. (offered alt yrs)

Math 5850. Numerical Differential Equations. (4 cr; QP—3380, 5380; SP—5280; A-F only)
Computational differencing techniques as applied to initial- and boundary-value problems. Introduction to variational formulations of differential equations and the general technique of weighed residuals.

Math 5900. Team Modeling Project. (3 cr; SP—ss, #; cannot apply cr to Graduate School program)
Team-based, model-design project. Applications and methods vary. (offered alt yrs)

Math 5991. Independent Study. (1-4 cr [max 8 cr]; QP—Δ; SP—Δ; cannot apply more than 6 cr to Graduate School program; A-F only)
Directed individual reading and/or research in mathematics; must be arranged with instructor and department head before registration.

Math 5995. Special Topics: (Various Titles to be Assigned). (1-3 cr [max 6 cr]; QP—Δ; SP—Δ; A-F only)
Topics not available in standard curriculum.

Math 8201. Real Analysis. (3 cr; QP—5701, 5702; SP—5201; A-F only)
Rigorous development of abstract measure spaces, measurable functions, and corresponding theory of integration. Lebesgue measure and Lebesgue integral developed as a particular model. (offered alt yrs)

Math 8333. FTE: Master's. (1 cr; SP—Master's student, adviser and DGS consent)

Math 8777. Thesis Credits: Master's. (1-18 cr; SP—max 18 cr per semester or summer; 10 cr total required [Plan A only]; S-N only)
Course Descriptions

Math 8870. Scientific Computation: Vector Processing. (3 cr; QP-5534, CS 5510; SP-5840 or #; prev exper with comp arch, FORTRAN programming desirable) Vector architecture; performance measures and modeling; benchmarking procedures; vector algorithms; code-optimization techniques; survey of applications. (offered alt yrs)

Math 8880. Scientific Computation: Parallel Processing. (3 cr; QP-5534, CS 5510; SP-5840 or #, FORTRAN or C programming) Parallel architectures; heterogeneous network computing; parallel algorithms; workload allocation and load balancing; message-passing libraries; applications. (offered alt yrs)

Math 8980. Graduate Seminar. (1 cr; QP-#; SP-#; A-F only) Survey of applications of discrete, continuous, and stochastic modeling techniques. For first-year graduate students in applied and computational mathematics.

Math 8994. Directed Research. (1-4 cr [max 12 cr]; QP-#; SP-#; A-F only) Original research in mathematics or statistics.

Math 8995. Special Topics: (Various Titles to be Assigned). (1-3 cr [max 6 cr]; QP-#; SP-#; A-F only) Topics not available in standard curriculum. (offered when feasible)

Medical and Molecular Physiology (Phsl)

School of Medicine

Phsl 3011. General Physiology. (4 cr; SP-Biol 1012, Chem 1101 or #; A-F only) Function and mechanisms of action of major organ systems; lab and/or lecture demonstrations illustrate key aspects of muscle contraction, heartbeat, and respiration. Primarily for students preparing for nursing, dental hygiene, pre-professional programs, communication disorders, or life science teaching.

Phsl 5211. Literature Seminar. (1-2 cr; QP-5927 or #; S-N only) Oral presentation of written literature review and research data reflecting student's research interests and thesis research results.

Phsl 5292. Readings in Physiology. (1-3 cr; SP-#) Topics in physiology selected for each student; written reviews prepared and discussed.

Phsl 5294. Research in Physiology. (1-15 cr; SP-#) Introduction and use of lab techniques and equipment used for research in various subspecialties of physiology, including neurophysiology, cardiovascular physiology, endocrinology, respiratory and transport process, electrophysiology, and renal physiology.

Phsl 5601. Physiology of Organ Systems I. (4 cr; QP-[Biol 3154 or Biol 3245], [Chem 3311 or Chem 5336], [3011 or #]; SP-[Biol 2101 or Biol 2201], [Chem 3322 or Chem 4341], [3011 or #]) Survey of physiologic functions and interrelationships of organ systems in mammals (musculoskeletal, cardiovascular, renal, respiratory, nervous, endocrine, and reproductive). Framework for understanding physiological processes, allowing students to integrate knowledge gained at molecular level with functions of whole organism.

Phsl 5602. Physiology of Organ Systems II. (2 cr; QP-5601 or #; SP-5601 or #; A-F only) Advanced study of organ system functions in context of interaction of organism with environment.

Phsl 8333. FTE: Master's. (1 cr; SP-Master's student, adviser and DGS consent)

Phsl 8401. Physiology of Aging. (2 cr; SP-5601, #) In-depth study of several theories concerning physiological processes that appear to set the limits of maximum human life span.

Phsl 8405. Muscle Physiology. (2 cr; SP-5601, #; A-F only) In-depth review and discussion of physiological processes involved in muscle contraction from subcellular events to neural-controlled function of whole muscle (skeletal, cardiac, and smooth muscle).

Phsl 8415. Topics in Endocrinology. (2 cr; SP-5601, #) Selected topics of current endocrine research interest examined in depth; historical background, questions posed by current research, and implications of current research for future development in the area.

Phsl 8441. Transport Processes. (2 cr; SP-5601, #) In-depth, quantitative approach to transport processes in biological systems.

Phsl 8444. FTE: Doctoral. (1 cr; SP-Doctoral student, adviser and DGS consent)

Phsl 8666. Doctoral Pre-Thesis Credits. (1-18 cr; SP-Max 18 cr per semester or summer; doctoral student who has not passed prelim oral)

Phsl 8777. Thesis Credits: Master's. (1-18 cr; SP-Max 18 cr per semester or summer; 10 cr total required [Plan A only])

Phsl 8888. Thesis Credits: Doctoral. (1-18 cr; SP-Max 18 cr per semester or summer; 24 cr required)

Medical Microbiology and Immunology (MicB)

School of Medicine

MicB 5545. Immunobiology. (3 cr; QP-Biol 2101 or #; SP-#; A-F only) The immune system and the cells and molecules that work in concert to keep us free from disease and aberrations resulting in immune disorders.

MicB 5591. Problems in Medical Microbiology and Immunology. (1-4 cr [max 8 cr]; SP-Open to med students or qualified upper div and grad students with #) Independent study on tutorial basis. Emphasis on basic and clinical microbiology problems under study at UMD School of Medicine, including immunology. Investigative work and appropriate reading arranged with tutorials consistent with interests and capabilities of individual students.

MicB 8333. FTE: Master's. (1 cr; SP-Master's student, adviser and DGS consent)

MicB 8444. FTE: Doctoral. (1 cr; SP-Doctoral student, adviser and DGS consent)

MicB 8554. Advanced Immunology and Immunobiology. (2 cr; SP-5545 or #; A-F only) Detailed study of mechanisms involved in immunologic defense. Emphasis on concepts and current literature.
Music

School of Fine Arts

Mu 0100. Recital Hour. (0 cr; OP—Students who do not qualify for fee waiver, Δ; SP—Music major, Δ; A-F only)
Attendance at scheduled musical events.

Mu 1001. Introduction to Music. (3 cr; OP—For music majors or minors unless specified by adviser; SP—For music majors or minors)
Various historical style periods; listening to develop understanding and enjoyment of music.

Mu 1003. Beethoven to the Beatles. (3 cr)
Survey of 19th- and 20th-century classical, jazz, rock, pop, and ethnic music genres.

Mu 1005. Jazz Studies. (3 cr)
Evolution of jazz; social problems in America that fostered its origin and continues to shape its development.

Mu 1101. Music Theory I. (3 cr; OP—1424 or equiv or passed piano proficiency; SP—1421 or equiv or passed piano proficiency; A-F only)
Study of basic diatonic material and structure with introduction to chromatic material. Analysis of vocal and instrumental scores; creative writing coordinated with ear training, sight singing, and elementary keyboard harmony.

Mu 1102. Music Theory II. (3 cr; OP—1424 or equiv or passed piano proficiency; SP—1421 or equiv or passed piano proficiency; A-F only)
Continued study of basic diatonic material and structure with an introduction to chromatic material. Analysis of vocal and instrumental scores; creative writing coordinated with ear training, sight singing, and elementary keyboard harmony.

Mu 1311. Voice. (1-3 cr [max 18 cr]; OP—Music major fee-waiver student, Δ; SP—Music major, Δ; A-F only)
Individual and one-hour group lesson weekly.

Mu 1312. Voice. (1 cr; OP—Students who do not qualify for fee waiver; SP—Non-music major or music major sec instr; may be repeated; A-F only)
Individual lesson: one-half hour weekly.

Mu 1321. Piano. (1-3 cr [max 18 cr]; OP—Music major fee-waiver student, Δ; SP—Music major, Δ; A-F only)
Individual and one-hour group lesson weekly.

Mu 1322. Piano. (1 cr; OP—Students who do not qualify for fee waiver; SP—Non-music major or music major sec instr; may be repeated; A-F only)
Individual lesson: one-half hour weekly.

Mu 1325. Jazz Piano. (1-3 cr [max 18 cr]; OP—Music major fee-waiver student, Δ; SP—Music major, Δ; A-F only)
Individual and one-hour group lesson weekly.

Mu 1326. Jazz Piano. (1 cr; OP—Students who do not qualify for fee waiver; SP—Non-music major or music major sec instr; may be repeated; A-F only)
Individual lesson: one-half hour weekly.

Mu 1331. Organ. (1-3 cr [max 18 cr]; OP—Music major fee-waiver student, Δ; SP—Music major, Δ; A-F only)
Individual and one-hour group lesson weekly.

Mu 1332. Organ. (1 cr; OP—Students who do not qualify for fee waiver; SP—Non-music major or music major sec instr; may be repeated; A-F only)
Individual lesson: one-half hour weekly.

Mu 1351. Strings. (1-3 cr [max 18 cr]; OP—Music major fee-waiver student, Δ; SP—Music major, Δ; A-F only)
Individual and one-hour group lesson weekly.

Mu 1352. Strings. (1 cr; OP—Students who do not qualify for fee waiver; SP—Non-music major or music major sec instr; may be repeated; A-F only)
Individual lesson: one-half hour weekly.

Mu 1357. Harp. (1-3 cr [max 18 cr]; OP—Music major fee-waiver student, Δ; SP—Music major, Δ; A-F only)
Individual and one-hour group lesson weekly.

Mu 1358. Harp. (1 cr; OP—Students who do not qualify for fee waiver; SP—Non-music major or music major sec instr; may be repeated; A-F only)
Individual lesson: one-half hour weekly.

Mu 1361. Woodwinds. (1-3 cr [max 18 cr]; OP—Music major fee-waiver student, Δ; SP—Music major, Δ; A-F only)
Individual and one-hour group lesson weekly.

Mu 1362. Woodwinds. (1 cr; OP—Students who do not qualify for fee waiver; SP—Non-music major or music major sec instr; may be repeated; A-F only)
Individual lesson: one-half hour weekly.

Mu 1371. Brass. (1-3 cr [max 18 cr]; OP—Music major fee-waiver student, Δ; SP—Music major, Δ; A-F only)
Individual and one-hour group lesson weekly.

Mu 1372. Brass. (1 cr; OP—Students who do not qualify for fee waiver; SP—Non-music major or music major sec instr; may be repeated; A-F only)
Individual lesson: one-half hour weekly.

Mu 1381. Percussion. (1-3 cr [max 18 cr]; OP—Music major fee-waiver student, Δ; SP—Music major, Δ; A-F only)
Individual and one-hour group lesson weekly.

Mu 1382. Percussion. (1 cr; OP—Students who do not qualify for fee waiver; SP—Non-music major or music major sec instr; may be repeated; A-F only)
Individual lesson: one-half hour weekly.

Mu 1391. Classical Guitar. (1-3 cr [max 18 cr]; OP—Music major fee-waiver student, Δ; SP—Music major, Δ; A-F only)
Individual and one-hour group lesson weekly.
Mu 1392. Classical Guitar. (1 cr; QP-Students who do not qualify for fee waiver; SP-Non-music major or music major sec instr; may be repeated; A-F only) Individual lesson: one-half hour weekly.

Mu 1395. Jazz Guitar. (1-3 cr [max 18 cr]; QP-Music major fee-waiver student, Δ; SP-Music major, Δ; A-F only) Individual and one-hour group lesson weekly.

Mu 1396. Jazz Guitar. (1 cr; QP-Students who do not qualify for fee waiver; SP-Non-music major or music major sec instr; may be repeated; A-F only) Individual lesson: one-half hour weekly.

Mu 1398. Pop Styles Guitar. (1 cr; QP-Students who do not qualify for fee waiver; maybe repeated; SP-Non-music major or music major sec instr; may be repeated) Weekly half-hour individual lesson; A-F only) Weekly half-hour individual lesson.

Mu 1411. Diction: Italian and English. (1 cr; QP-Voice major or #; SP-Principal instr voice or #; A-F only) Proper enunciation of English and Italian as applied to vocal literature.

Mu 1412. Diction: German. (1 cr; QP-Voice major or #; SP-1411 or #; A-F only) Proper enunciation of German as applied to vocal literature.

Mu 1413. Diction: French. (1 cr; QP-Music major or #; SP-1411 or #; A-F only) Proper enunciation of French as applied to vocal literature.

Mu 1421. Piano Class I. (1 cr [max 4 cr]; QP-Music major or #; SP-Non-music major or music major sec instr; may be repeated) Basic piano technique; sight reading, harmonizing melodies, improvisation for music major working toward department piano proficiency requirement.

Mu 1441. Vocal Techniques. (1 cr; QP-Music major; SP-Music major or #) Beginning group instruction in voice and vocal pedagogy; principles of vocal acoustics.

Mu 1442. Percussion Techniques. (1 cr; QP-Music major or #; SP-Music major or #; A-F only) Beginning group instruction and pedagogy on instruments in the percussion family; principles of percussion acoustics.

Mu 1491. Group Instruction in Applied Music. (1 cr [max 4 cr]; QP-Non-music major at beginning and intermediate levels; repeatable for 6 cr max; SP-Non-music major at beginning and intermediate levels; A-F only) Development of individual’s musical performance skills through group instruction.

Mu 1501. Concert Band. (1 cr; QP-Instructor determines placement, repeatable for 12 cr max; SP-Instructor determines placement, may be repeated) Study and performance of transcribed and original concert literature.

Mu 1502. Symphonic Wind Ensemble. (1 cr; QP-Instructor determines placement, repeatable for 6 cr max; SP-Instructor determines placement, may be repeated) Study and performance of symphonic wind ensemble and contemporary band literature by a select group.

Mu 1503. Symphony Orchestra. (1 cr; QP-High school performance experience in strings or brass or woodwind or percussion; instructor determines placement, repeatable for 12 cr max; SP-Instructor determines placement, may be repeated) Rehearsal and performance of representative musical literature for symphony orchestra.

Mu 1504. Chamber Orchestra. (1 cr; QP-#; may be repeated; SP-#; may be repeated) Rehearsal and performance of chamber orchestra literature.

Mu 1505. Jazz Ensemble. (1 cr; QP-Instructor determines placement, repeatable for 12 cr max; SP-Instructor determines placement, may be repeated) Study and performance of large jazz ensemble literature.

Mu 1510. Concert Chorale. (1 cr; QP-Instructor determines placement, repeatable for 12 cr max; SP-Instructor determines placement, may be repeated) Rehearsal and performance of representative choral literature from a variety of periods and cultures.

Mu 1511. University Singers. (1 cr; QP-Instructor determines placement, repeatable for 12 cr max; SP-Instructor determines placement, may be repeated) A select group for study and performance of distinctive choral literature from diverse historical periods, cultures, and languages. Regional tour usually taken during spring semester. Extended domestic or international tours when possible.

Mu 1512. Chamber Singers. (1 cr; QP-Instructor determines placement, repeatable for 12 cr max; SP-1511 or 4511; instructor determines placement, may be repeated) Study and performance of vocal chamber music.

Mu 1513. Jazz Choir. (1 cr; QP-Instructor determines placement, repeatable for 12 cr max; SP-Instructor determines placement, may be repeated) Study and performance of music for vocal jazz ensemble.

Mu 1514. Chamber Music. (0.5 cr; QP-#; may be repeated; SP-#; may be repeated; A-F only) Study and performance of chamber music literature, classical and/or jazz.

Mu 1601. Music Fundamentals. (1 cr; QP-For non-music major; SP-For elem ed major; A-F only) Functional music skills for classroom teachers; singing and playing classroom and accompanying instruments; introduction to music notation and elements of music.

Mu 1901. Music Technology I. (1 cr; QP-3151, 3152; SP-Music major or #; A-F only) Introduction to music notation software and ear-training software.

Mu 1902. Music Technology II. (1 cr; QP-3151, 3152; SP-1901 or #; A-F only) Theoretical and applied study in use of elements of musical instrument digital interface.


Mu 2007. The Power of Music. (3 cr)
Effects of music upon our physical, mental, and spiritual health.

Mu 2101. Music Theory III. (3 cr; QP–1116, 1424 or equiv or passed piano proficiency; SP–1102; A-F only)
Basic chromatic material and structure. Analysis of vocal and instrumental scores; creative writing coordinated with ear training, sight singing, and elementary keyboard harmony.

Mu 2102. Music Theory IV. (3 cr; QP–1124, 1424 or equiv or passed piano proficiency; SP–2101; A-F only)
Advanced study of chromatic material and structure. Analysis of vocal and instrumental scores; creative writing coordinated with ear training, sight singing, and elementary keyboard harmony.

Mu 2105. Composition I. (1 cr [max 4 cr]; QP–1116; repeatable for 6 cr max; SP–1102; A-F only)
Beginning music composition technique leading to creation of original works.

Mu 2421. Piano Class II. (1 cr [max 2 cr]; QP–Music major or #; repeatable for 6 cr max; SP–1421, #)
Continued development of piano skills for music major working toward department piano proficiency requirement. Sight reading, harmonizing melodies, and improvisation; grades two- and three-level piano literature.

Mu 2443. Woodwind Techniques I. (1 cr; QP–1442 or #; SP–Music major or #; A-F only)
Beginning group instruction and pedagogy on single reed instruments; principles of woodwind acoustics.

Mu 2444. Woodwind Techniques II. (1 cr; QP–1442, music major or #; SP–Music major or #; A-F only)
Beginning group instruction and pedagogy on double reed instruments; principles of double reed acoustics.

Mu 2445. String Techniques I. (1 cr; QP–1443 or #, music major; SP–Music major or #; A-F only)
Beginning group instruction and pedagogy on high string instruments; acoustic principles for strings.

Mu 2446. String Techniques II. (1 cr; QP–Music major, 1442 or #; SP–Music major or #; A-F only)
Beginning group instruction and pedagogy on low string instruments; acoustic principles for strings.

Mu 2447. Brass Techniques I. (1 cr; QP–Music major, 1441 or #; SP–Music major or #; A-F only)
Beginning group instruction and pedagogy on high brass instruments; acoustic principles for brass instruments.

Mu 2448. Brass Techniques II. (1 cr; QP–1441 or #; SP–Music major or #; A-F only)
Beginning group instruction and pedagogy on high brass instruments; acoustic principles for brass instruments.

Mu 2701. Fundamentals of Conducting. (1 cr; QP–1115, 1424 or equiv or passed piano proficiency, music major or #; SP–1102, music major or #; A-F only)
Beginning instruction in leading musical ensembles: meter patterns, conventional gestures, instrumental transposition, choral techniques.

Mu 2801. Improvisation. (1 cr; SP–1102; A-F only)
Introduction to basic principles and techniques.

Mu 2802. Introduction to Jazz Improvisation. (1 cr; QP–1114 or #; SP–2801; A-F only)
Beginning techniques and concepts.

Mu 3101. Form and Analysis. (2 cr; SP–2102; A-F only)
Overview of form in music; structure from Renaissance through 20th-century.

Mu 3105. Composition II. (1 cr [max 4 cr]; QP–1127 or #; repeatable for 6 cr max; SP–1102; A-F only)
Continued study of musical composition techniques leading to creation of original works.

Mu 3201. Music History I. (4 cr; QP–1202, 60 cr or #; SP–2202 or #; A-F only)
Study of Medieval, Renaissance, Baroque, and Classical eras of Western musical development, emphasizing works of Josquin, Palestrina, J.S. Bach, Handel, Haydn, Mozart, and Beethoven.

Mu 3202. Music History II. (4 cr; QP–1202, 60 cr or #; SP–3201 or #; A-F only)
Styles in 19th- and 20th-century Western music from romanticism through impressionism, atonality, primitivism, serialism, neo-classicism, to avant-garde and contemporary composers; non-Western musics.

Mu 3211. Art Song Literature. (2 cr; QP–1116, music major or #; SP–1102, music major or #; A-F only)
Survey of art song, emphasizing German, French, and English compositions and composers.

Mu 3212. Opera Literature. (2 cr; QP–1116, 40 cr, music major or #; SP–1102, music major or #; A-F only)
Survey of opera solo and ensemble literature from Italian, German, French, English, and American traditions.

Mu 3300. Recital. (1-3 cr; QP–#; may be repeated; A-F only)
Preparation and presentation of a solo performance.

Mu 3510. Opera Studio. (1 cr; QP–#; SP–#; may be repeated; A-F only)
Production techniques and performances of solo and ensemble opera literature.

Mu 3511. Performance Practicum. (1-2 cr [max 2 cr]; QP–#; repeatable for 3 cr max; SP–#; may be repeated; A-F only)
Performance of significant role in a musical production.

Mu 3601. Elementary School Music Teaching. (2 cr; QP–1002 or 1202 or 1260 or 1270, 1611, 80 cr, elem ed major or #; SP–1601, 1001 or 1005 or 2001 or 2003 or 2005, 60 cr or #; A-F only)
Methods and materials for teaching music in elementary school classroom. Philosophy of music education, curriculum design, lesson planning, implementation, evaluation, integrated arts experiences.

Mu 3603. Music for Early Childhood. (1 cr; QP–Educ 1000, ECh 1025 or # [except for piano pedagogy majors]; SP–#; A-F only)
Methods and materials for teaching music in a pre-school setting. Principles of children’s musical development ages birth to five years.

Mu 3605. Teaching Classroom Music. (4 cr; QP–80 cr, music major or #; SP–60 cr, music major or #; A-F only)
Philosophy, theory, techniques of instruction for general classroom music, grades K-12.

Mu 3607. Instrumental Music Methods. (3 cr; QP–80 cr, music major or #; SP–60 cr, music major or #; A-F only)
Methods and materials for teaching instrumental students in the secondary setting: role and extent of instrumental music in the school curriculum, philosophies and current trends in instrumental music education, recruiting, scheduling, administrative tasks, literature, organizing and training athletic bands.
### Course Descriptions

**Mu 3625. Art of Accompanying.** (1 cr [max 2 cr]; QP—Repeatable for 2 cr max; SP—#; A-F only)
Role of accompanist; musical, psychological, and technical problems.

**Mu 3701. Choral Conducting and Methods I.** (3 cr; QP—1116, 1124, 1791, 3792, 40 cr; music major or #; SP—2701 or #; A-F only)
Conducting, vocal pedagogy, and methods and materials related to choral rehearsal, emphasizing elementary and middle/junior high.

**Mu 3702. Choral Conducting and Methods II.** (3 cr; QP—1116, 1791, 1125, 3793, 40 cr; music major or #; SP—3701 or #; A-F only)
Continued conducting instruction, with methods and materials related to high school choral ensembles.

**Mu 3705. Instrumental Conducting I.** (1 cr; QP—1791, 80 cr incl 6 from major ensembles, music major or #; SP—2701 or #; A-F only)
Intermediate techniques, reading, and interpretation of full and condensed orchestral, band, and vocal scores; lab practice in rehearsal procedures.

**Mu 3706. Instrumental Conducting II.** (1 cr; QP—3798, 80 cr, music major or #; SP—3705 or #; A-F only)
Advanced techniques, reading, and interpretation of full and condensed orchestral, band, and vocal scores; lab practice in rehearsal procedures.

**Mu 3801. Jazz Improvisation III.** (1 cr; QP—1108 or #; SP—2802 or #; A-F only)
Study and development of improvisational facility as used in jazz idiom.

**Mu 3802. Jazz Improvisation IV.** (1 cr; QP—1108 or #; SP—3801 or #; A-F only)
Study and development of improvisational facility as used in jazz idiom.

**Mu 3805. Jazz Writing I.** (2 cr; QP—1126 or #; SP—2102 or #; A-F only)
Transpositions, voicings, and arranging concepts for large jazz ensemble; development of composition in jazz idiom.

**Mu 3806. Jazz Writing II.** (2 cr; QP—1126, 3102 or #; SP—2102, 3805 or #; A-F only)
Continuation of arranging concepts for large jazz ensemble; further development of composition in jazz idiom.

**Mu 3841. Jazz Rhythm Section.** (2 cr; SP—#)
Theoretical and applied methods for jazz rhythm instruments.

**Mu 3991. Independent Study.** (1-3 cr [max 6 cr]; QP—#; repeatable for 6 cr max; SP—#; A-F only)
Directed study in area of student interest arranged with instructor before registration.

**Mu 3995. Topics in Music: (Various Titles to be Assigned).** (1-3 cr [max 9 cr]; QP—#; repeatable for 12 cr max; SP—#; A-F only)
Selected topics defined by type, period, or composer.

**Mu 3997. Field Study in Music.** (1-4 cr [max 4 cr]; QP—#; repeatable for 6 cr max; SP—#; A-F only)
Off-campus travel, research, and creative activities in specialized area. Credit allowed depends on nature and scope of study. Requires advance planning with faculty sponsor and permission of department.

**Mu 4101. Instrumental Arranging.** (3 cr; QP—3143 or #; SP—1902, 3101 or #; A-F only)
Idiomatic scoring for instruments; individual assignments in problems and possibilities of various instrument combinations.

**Mu 4103. Contrapuntal Techniques.** (2 cr; QP—1126; SP—2102 or #; A-F only)
Study of, and practice in, use of linear devices in Western art music.

**Mu 4105. Composition III.** (1 cr [max 2 cr]; QP—3127; SP—3105; A-F only)
Advanced creative composition; individual assignments in various contexts.

**Mu 4201. Piano Literature.** (3 cr; QP—#; SP—Music major or #; A-F only)
Study of representative piano literature from various periods of music history.

**Mu 4311. Voice.** (1-3 cr [max 12 cr]; QP—Music major fee-waiver student, A; SP—Music major or fee-waiver student, A; A-F only)
Individual and one-hour group lesson weekly.

**Mu 4312. Voice.** (1 cr; QP—Students who do not qualify for fee waiver; SP—Non-music major or music major sec instr; may be repeated; A-F only)
Individual lesson: one-half hour weekly.

**Mu 4321. Piano.** (1-3 cr [max 12 cr]; QP—Music major fee-waiver student, A; SP—Music major, A; A-F only)
Individual and one-hour group lesson weekly.

**Mu 4322. Piano.** (1 cr; QP—Students who do not qualify for fee waiver; SP—Non-music major or music major sec instr; may be repeated; A-F only)
Individual lesson: one-half hour weekly.

**Mu 4325. Jazz Piano.** (1-3 cr; SP—Music major, A)
Individual and one-hour group lesson weekly.

**Mu 4331. Organ.** (1-3 cr [max 12 cr]; QP—Music major fee-waiver student, A; SP—Music major, A)
Individual and one-hour group lesson weekly.

**Mu 4332. Organ.** (1 cr; QP—Students who do not qualify for fee waiver; SP—Non-music major or music major sec instr; may be repeated; A-F only)
Individual lesson: one-half hour weekly.

**Mu 4351. Strings.** (1-3 cr [max 12 cr]; QP—Music major fee-waiver student, A; SP—Music major, A; A-F only)
Individual and one-hour group lesson weekly.

**Mu 4352. Strings.** (1 cr; QP—Students who do not qualify for fee waiver; SP—Non-music major or music major sec instr; may be repeated; A-F only)
Individual lesson: one-half hour weekly.

**Mu 4357. Harp.** (1-3 cr [max 12 cr]; QP—Music major fee-waiver student, A; SP—Music major, A)
Individual and one-hour group lesson weekly.

**Mu 4358. Harp.** (1 cr; QP—Students who do not qualify for fee waiver; SP—Non-music major or music major sec instr; may be repeated; A-F only)
Individual lesson: one-half hour weekly.

**Mu 4361. Woodwinds.** (1-3 cr [max 12 cr]; QP—Music major fee-waiver student, A; SP—Music major, A; A-F only)
Individual and one-hour group lesson weekly.

**Mu 4362. Woodwinds.** (1 cr; QP—Students who do not qualify for fee waiver; SP—Non-music major or music major sec instr; may be repeated; A-F only)
Individual lesson: one-half hour weekly.
Mu 4371. Brass. (1-3 cr; max 12 cr; QP—Music major fee-waiver student; SP—Music major; A-F only)
Individual and one-hour group lesson weekly.

Mu 4372. Brass. (1 cr; QP—Students who do not qualify for fee waiver; SP—Non-music major or music major sec instr; may be repeated; A-F only)
Individual lesson; one-half hour weekly.

Mu 4381. Percussion. (1-3 cr; max 12 cr; QP—Music major fee-waiver student; SP—Music major; A-F only)
Individual and one-half hour group lesson weekly.

Mu 4382. Percussion. (1 cr; QP—Students who do not qualify for fee waiver; SP—Non-music major or music major sec instr; may be repeated; A-F only)
Individual lesson; one-half hour weekly.

Mu 4391. Classical Guitar. (1-3 cr; max 12 cr; QP—Music major fee-waiver student; SP—Music major; A-F only)
Individual and one-half hour group lesson weekly.

Mu 4392. Classical Guitar. (1 cr; QP—Students who do not qualify for fee waiver; SP—Non-music major or music major sec instr; may be repeated; A-F only)
Individual lesson; one-half hour weekly.

Mu 4395. Jazz Guitar. (1-3 cr; max 12 cr; QP—Music major fee-waiver student; SP—Music major; A-F only)
Individual and one-half hour lesson weekly.

Mu 4396. Jazz Guitar. (1 cr; QP—Students who do not qualify for fee waiver; SP—Non-music major or music major sec instr; may be repeated; A-F only)
Individual lesson; one-half hour weekly.

Mu 4501. Concert Band. (1 cr; QP—Instructor determines placement; SP—Instructor determines placement; A-F only)
Study and performance of transcribed and original concert literature.

Mu 4502. Symphonic Wind Ensemble. (1 cr; QP—Instructor determines placement; SP—Instructor determines placement; A-F only)
Study and performance of symphonic wind ensemble and contemporary band literature by a select group.

Mu 4503. Symphony Orchestra. (1 cr; QP—High school performance experience in strings or brass or woodwinds or percussion; instructor determines placement, repeatable for 12 cr max; SP—Instructor determines placement; A-F only)
Rehearsal and performance of representative literature for symphony orchestra.

Mu 4504. Chamber Orchestra. (1 cr; QP—Instructor determines placement, repeatable for 12 cr max; SP—Instructor determines placement; A-F only)
Study and performance of chamber orchestra literature.

Mu 4505. Jazz Ensemble. (1-4 cr; QP—Instructor determines placement, repeatable for 12 cr max; SP—Instructor determines placement; A-F only)
Study and performance of large jazz ensemble literature.

Mu 4510. Concert Chorale. (1-4 cr; QP—Instructor determines placement, repeatable for 12 cr max; SP—Instructor determines placement; A-F only)
Study and performance of representative choral literature from various style periods and cultures.

Mu 4511. University Singers. (1 cr; QP—Instructor determines placement; SP—Instructor determines placement; A-F only)
A select group for study and performance of distinctive choral literature from diverse historical periods, cultures, and languages. Regional tour usually taken during spring semester. Extended domestic or international tours when possible.

Mu 4512. Chamber Singers. (1 cr; QP—instructor determines placement; SP—11511 or 4511; Instr—Instructor determines placement; A-F only)
Study and performance of vocal chamber music.

Mu 4513. Jazz Choir. (1 cr; QP—Instructor determines placement, repeatable for 12 cr max; SP—Instructor determines placement; A-F only)
Study and performance of music for vocal jazz ensemble.

Mu 4541. Chamber Music. (0.5 cr; QP—may be repeated; SP—may be repeated; A-F only)
Study and performance of chamber music literature, classical and/or jazz.

Mu 4601. Applied Music Teaching. (1 cr; QP—may be repeated once for cr; SP—A-F only)
Procedures and materials for class and individual instruction in approved fields of applied music; evaluation of solo literature; discussion of approved and experimental pedagogical practice; lesson observation; and supervised student teaching.

Mu 4621. Piano Pedagogy and Practicum I. (3 cr; QP—1321 or 1381, 8 cr or #; SP—1321 or 1382 or #; A-F only)
Principles and materials for teaching elementary piano students; supervised practice teaching.

Mu 4622. Piano Pedagogy and Practicum II. (3 cr; QP—1321 or 1381, 8 cr or #; SP—4621 or #; A-F only)
Principles and materials for teaching intermediate piano students; supervised practice teaching.

Mu 4623. Piano Techniques and Style. (3 cr; QP—5627 or #; SP—1321 or #; A-F only)
Technical and stylistic considerations for teaching and performing advanced piano literature.

Mu 4801. Evolution and Analysis of Jazz Styles. (1-2 cr; QP—1126 or #; SP—2102; A-F only)
Study and analysis of various jazz styles and idioms.

Mu 4803. Jazz Literature and Pedagogy. (3 cr; QP—1503, 1125 or #; SP—2102; A-F only)
Techniques and materials necessary to organize and develop a jazz band in junior and senior high school.

Mu 4805. MIDI Applications. (3 cr; QP—3141, #; SP—2102; A-F only)
Theoretical and applied study in the use of elements of music instrument digital interface.

Mu 4807. Music Industry. (2 cr; QP—#; SP—#; A-F only)
Study of developing commercial applications and trends in the music industry, including basic concepts of business and marketing.

Mu 4997. Internship in Music. (1-2 cr; max 4 cr; QP—#; SP—#; A-F only)
Participation in music tutoring or recognized campus/community activity related to student’s musical program and career objectives.

Mu 5005. African Roots of American Music. (3 cr; QP—3810, 8 cr or #; SP—60 cr or #; cannot apply cr to Graduate School program; A-F only)
Traditional African music and culture and their influences on American musical styles.
Course Descriptions

Mu 5201. Advanced Music History. (3 cr; QP-3200, 3201, 3202; SP-3201, 3202 or #; cannot apply cr to Graduate School program; A-F only)
Specialized study of selected composers and/or genres.

Mu 5203. Advanced Choral Literature. (3 cr; QP-3794 or #; SP-3706 or #; cannot apply cr to Graduate School program; A-F only)
Study of representative choral literature from various periods of music history.

Mu 5603. Computer Applications for Music Educators. (2 cr; QP-90 cr or #; SP-60 cr or #; cannot apply cr to Graduate School program; A-F only)
Training in use of microcomputer for music educators. Software applications such as spreadsheets, databases, music CAI, and music printing programs. Software for Macintosh and IBM-PC.

Mu 5695. Topics in Music Education (Various Titles to be Assigned). (1-3 cr [max 9 cr]; QP-#; can apply max 6 cr to Graduate School program, repeatable for 12 cr max; SP-#; can apply max 6 cr to Graduate School program; A-F only)
Selected topics of interest to music educators concerning philosophy, history, and teaching/learning theory and practice.

Mu 5701. Advanced Conducting. (3 cr; QP-#; SP-3702 or #; A-F only)
Score reading, analysis, styles, and conducting and rehearsal techniques related to performance.

Mu 5991. Independent Study. (1-3 cr [max 9 cr]; QP-Jr or sr or grad student or #; repeatable for 6 cr max; SP-Jr or sr or grad student or #; can apply max 6 cr to a Graduate School program; A-F only)
Directed study in areas of student interest arranged with instructor before registration.

Mu 5995. Topics in Music (Various Titles to be Assigned). (1-3 cr [max 6 cr]; SP-#; A-F only)
Selected studies in topics defined by type, period, or composer.

Mu 8222. Music Bibliography and Research. (3 cr; SP-Grad student or #; A-F only)
Research methods in music; preparation for writing plan B project.

Mu 8300. Graduate Recital. (1 cr [max 2 cr]; SP-Grad student; #; A-F only)
Preparation and presentation of a solo musical performance.

Mu 8301. Graduate Applied Music: Major Instrument. (1-2 cr [max 2 cr]; SP-Advanced proficiency, grad student; #; A-F only)
Studio lesson on major instrument or voice; one-half hour per week per credit.

Mu 8302. Graduate Applied Music: Secondary Instrument. (1 cr; SP-Intermediate proficiency, grad student; #; may be repeated; A-F only)
Half-hour weekly studio lesson; instrument or voice.

Mu 8333. FTE: Master’s. (1 cr; SP-Master’s student, adviser and DGS consent)

Mu 8600. Seminar in Music Education. (2 cr [max 6 cr]; SP-Grad student or #; A-F only)
Survey and analysis of current issues in music education research and/or practice.

Mu 8601. Foundations of Music Education. (3 cr; SP-Grad student or #; A-F only)
Philosophical, psychological, and historical foundations; principles of school music teaching and learning.

Mu 8605. Leadership in Music Education. (3 cr; SP-Grad student or #; A-F only)
Techniques, theories, and models of music and arts leadership; considerations for supervising music personnel, facilities, budgets, curricular programs, and policies.

Mu 8890. Problems in Music Education. (1-9 cr [max 12 cr]; SP-Grad student or #; A-F only)
Directed project.

Mu 8900. Seminar in Music. (2 cr [max 6 cr]; SP-Grad student; #; A-F only)
Survey and analysis of current issues and problems in music research, performance, and pedagogy.

Mu 8991. Independent Study. (1-2 cr [max 6 cr]; SP-Grad student; #; A-F only)
Directed study in areas of student interest arranged with instructor before registration; written report required.

Pharmacology (Phcl)

School of Medicine

Elementary course in pharmacology. Actions and use of drugs in selected health conditions.

Phcl 4094. Directed Research in Pharmacology I. (1-10 cr [max 10 cr]; QP-Upper div sci major; SP-Upper div sci major; A-F only)

Phcl 5094. Directed Research in Pharmacology II. (1-10 cr [max 10 cr]; QP-Grad student; SP-Grad student; #)

Phcl 5201. Pharmacology I. (6 cr; QP-Chem 5336, Chem 5337, Phcl 5601 or #; SP-Chem 4341-4342 or Phcl 5601 or #; A-F only)
Analysis of effects of pharmacologic agents on living systems; major classes of drugs; concepts of chemotherapy; characteristic pharmacologic agents, their reactions and therapeutic applications.

Phcl 5202. Pharmacology II. (5 cr; QP-5101 or #; SP-5201 or #; A-F only)
Analysis of effects of pharmacologic agents on living systems; major classes of drugs; concepts of chemotherapy; characteristic pharmacologic agents, their reactions and therapeutic applications.

Phcl 5204. Pharmacology Seminar. (1 cr [max 4 cr]; QP-Grad student; SP-Grad student; #; A-F only)
Presentation of selected research problems and current journal articles.

Phcl 5410. Advanced Pharmacology. (1 cr; QP-Phcl grad student or #; SP-Phcl grad student or #; A-F only)
Comprehensive lectures and discussion of principles of drug disposition; drug receptor interactions; mechanism of action of selected drugs emphasizing current advances and methodologies.

Phcl 8333. FTE: Master’s. (1 cr; SP-Master’s student, adviser and DGS consent)
Phil 8444. FTE: Doctoral. (1 cr; SP—Doctoral student, adviser and DGS consent)

Phil 8666. Doctoral Pre-Thesis Credits. (1-18 cr; SP—Max 18 cr per semester or summer; doctoral student who has not passed prelim oral)

Phil 8777. Thesis Credits: Master’s. (1-18 cr; SP—Max 18 cr per semester or summer; 10 cr total required [Plan A only])

Phil 8888. Thesis Credits: Doctoral. (1-18 cr; SP—Max 18 cr per semester or summer; 24 cr required)

Philosophy (Phil)

College of Liberal Arts

Phil 1001. Problems of Philosophy. (3 cr; A-F only)
Introduction to philosophy through examination of several classic philosophical problems: existence of God, nature of knowledge, free will versus determinism, relation of mind and body, character of moral responsibility, organization of society, and adoption of a world view.

Phil 1003. Ethics and Society. (3 cr; A-F only)
Classic theories addressing questions of whether morality is subjective or objective, cultural relativism versus universal rules, how right and wrong should be determined. Moral issues such as euthanasia, the environment, population and birth control, nuclear deterrence, alternative life styles, and capital punishment in their international dimension.

Phil 1007. Philosophy and World Religions. (3 cr; A-F only)
Comparative philosophical examination of teachings and practices of several major world religions selected from ancient polytheism, Christianity, Judaism, Islam, Taoism, Buddhism, Hinduism, and various Native American and African religions.

Phil 1008. Critical Thinking. (3 cr; A-F only)
Patterns of reasoning encountered in everyday life, including advertising, editorials, and politics. Use of language in formulating arguments; differences between deductive and inductive arguments; how to detect and avoid mistakes in reasoning.

Phil 1018. Logic. (4 cr; A-F only)
Introduction to symbolic logic. Nature of language, species of arguments, informal versus formal arguments, techniques of translation, methods of sentential logic, and methods of predicate logic.

Phil 2001. Existential Literature. (3 cr; QP—Comp 1120, 40 cr or #; SP—Comp 1120, 30 cr or #; A-F only)
Themes of love, death, boredom, and alienation through plays and novels of such 19th- and 20th-century authors as Kafka, Dostoyevsky, Barth, Sartre, Camus, Murdoch, and Fowles.

Phil 2011. Philosophy of Language. (3 cr; SP—Course in logic or literary analysis or human communication or CS or Math or #; A-F only)
Introduction to theories of meaning and truth and the structure of language. Relation of language to thought and the world; semantics and syntax; speech acts and performative utterances; descriptions and reference; and structuralism and the possibility of objective knowledge.

Phil 2021. Science and Pseudoscience: Thinking About Weird Things. (3 cr; A-F only)
Critical introduction to the nature of knowledge and belief by focusing on contemporary issues such as UFOs, ESP, mysticism, creationism and evolution, and near-death experiences; differences between rational beliefs and articles of faith and between science and pseudoscience.

Phil 2250. Feminist Issues in Philosophy. (3 cr; QP—1001 or #; SP—15 cr or #; A-F only)
Recent criticism by feminist philosophers and substantive feminist contributions, including gender bias in everyday modes of thought and in theories of human nature, relations between gender and morality, effects of patriarchal thinking on social and political theory, prospects for philosophy of human liberation.

Phil 3118. Selected Topics: (Various Titles to be Assigned). (3-9 cr [max 9 cr]; QP—1001 or #; SP—1001 or #; A-F only)
In-depth examination of a particular philosopher or problem in philosophy. Specific course announced in Class Schedule.

Phil 3222. Medical Ethics. (4 cr; A-F only)
Values underlying the health care professions and ethical dilemmas in medical contexts. Patients’ rights and autonomy, medical paternalism, confidentiality, truth-telling, euthanasia.

Phil 3231. Law and Punishment. (4 cr; SP—1001 or Soc 1301; A-F only)
Nature of law, natural law theory, and legal positivism and their relationship to traditional and contemporary theories of punishment; deterrence, reform, retribution, rehabilitation, social defense, restitution.

Phil 3242. Values and Technology. (3 cr; QP—90 cr or #; SP—60 cr or #; A-F only)
Problems related to science and technology. Application of moral theory to issues raised by technology, such as distribution of power, effects on environment, labor and social life, privacy, intellectual property rights, product liability, and professional codes of ethics.

Phil 3281. Ethical Theory. (4 cr; QP—1001 or 1003 or #; SP—1001 or 1003 or #; A-F only)
Characteristics and criteria of value statements; justification of moral standards; some 20th-century ethical theories.

Phil 3291. Current Social Political Philosophy. (4 cr; QP—1001 or 1003 or #; SP—1001 or 1003 or #; A-F only)
Detailed philosophical analysis of recent writings about social and political concepts such as freedom, democracy, socialism, communism, fascism, and anarchy.

Phil 3301. Greek Philosophy. (4 cr; QP—30 cr or #; SP—30 cr or #; A-F only)
Greek philosophy from pre-Socratic era through Socrates, Plato, and Aristotle, including philosophy of nature, possibility and limits of human knowledge, happiness, and the good life.

Phil 3303. The Birth of Modern Philosophy. (4 cr; QP—40 cr or #; SP—30 cr or course in phil or hist or pol sci or lit or #; A-F only)
Impact of science and secularity on the rationalism of Descartes, Spinoza, Leibniz and the empiricism of Locke, Berkeley, and Hume.

Phil 3305. 19th- and 20th-Century Philosophy. (4 cr; SP—3303 or #; A-F only)
Survey of main issues and philosophers, with emphasis on the analytic tradition.

Phil 3325. Environmental Ethics. (4 cr; QP—45 cr or #; SP—30 cr or #; A-F only)
Moral dimension of relationship between humans and earth’s natural environment. Pollution, energy policy,
Course Descriptions

economics, law, and environment: endangered species; rights of nonhumans; preservation and conservation; obligations toward future generations; ethical theory and environment.

Phil 3421. Oriental Philosophies. (4 cr; QP–5 cr Phil or #; SP–45 cr; 6 cr Phil or Asian hist or #; A-F only)
Overview of Hinduism, Buddhism, Confucianism, and Taoism. Analysis of basic concepts of Indian and Chinese civilizations.

Phil 3651. Advanced Logic. (4 cr; QP–1018 or Math 1296 or #; SP–1018 or Math 1296 or #; A-F only)
Dimensions of language; relation of logic to ordinary language and to mathematics; calculus of propositions, classes, and relations; properties of formal deductive systems.

Phil 3900. Colloquium for Majors. (1 cr; QP–A, phi major/minor; attendance at 10 dept-approved lectures/discussions over 4-year period, regis only during 1st yr, SP–A, phi major/minor; attendance at 12 dept-approved lectures/discussions over 4-yr period, regis only during semester of 12th yr; S-N only)
Lectures and discussion groups on variety of philosophical topics; required reading; places and topics to be announced.

Phil 4000. Major Philosophers. (2-4 cr; SP–Phil 3301, 3303; A-F only)
In-depth study of one or two important philosophers. Appropriate examples: Aristotle, Hegel, Wittgenstein, Russell, Hume, Hobbes, Nietzsche, Aquinas, Descartes, Mill, Dewey. Contact department (or department website) for particular semester offering.

Phil 4655. Theory of Knowledge. (4 cr; QP–8 cr Phil; SP–1001, 1008 or 1018 or #; cannot apply cr to Graduate School program; A-F only)
Introduction to theory of knowledge interpreted broadly to encompass perceptual, deductive, inductive, and other modes of knowledge. Beginning with standard conception of knowledge as warranted true belief, explores strengths and weaknesses of alternative accounts.

Phil 4900. Seminar in Philosophy. (4 cr [max 12 cr]; QP–12 cr Phil or #; max 6 cr may be applied to Graduate School program; SP–12 cr Phil or #; cannot apply cr to Graduate School program; A-F only)
Detailed examination of major topics or philosophical works. See department for details.

Phil 5245. Aesthetics. (3 cr; SP–60 cr; A-F only)
Possibility of definition of art or of the aesthetic experience examined through survey of classic aestheticians; philosophy of art criticism. Research paper required of graduate students.

Phil 5570. Philosophy of Psychology. (4 cr; QP–1001 or Psych 1003, 90 cr; SP–1001 or Psych 1003, 60 cr or #; cannot apply cr to Graduate School program; A-F only)
Current philosophical issues surrounding psychology: behaviorism, dualism, mind/brain identity theories, computer models of cognition, and functionalism.

Phil 5991. Independent Study. (1-3 cr [max 10 cr]; QP–#; cannot be used to satisfy requirements for phi major or minor; SP–#; cannot be used to satisfy requirements for phi major or minor; A-F only)
Work in problems of special interest to student arranged with instructor before registration. Written work required.

Phil 5997. Intern Teaching Assistantship. (2 cr [max 4 cr]; QP–#; SP–#; A-F only)
Practical experience in assisting teaching of philosophy. Application deadline one week before beginning of registration for the following semester.

Physical Education (PE)

College of Education and Human Service Professions

PE 1199. Special Topics in Physical Education Skills: (Various Titles to be Assigned). (1-4 cr [max 4 cr])
Contemporary topics.

PE 1200. Beginning Swimming. (1 cr)
Development of fundamental aquatic skills and techniques for personal participation. Understanding of the principles of safety in or on the water.

PE 1220. Intermediate Swimming. (1 cr)
Development of intermediate aquatic skills and techniques for personal participation. Intermediate principles of safety in and on the water.

PE 1300. Ballroom Dance. (1 cr)
Development of the basic steps and patterns for ballroom dance. Development of technical and choreographic skill for personal expressive communication through movement.

PE 1302. Folk Dance. (1 cr)
Development of the basic steps and patterns of folk dance. Development of technical and choreographic skill for personal expressive communication through movement.

PE 1304. Square Dance. (1 cr)
Development of the basic steps and patterns of square dance. Development of technical and choreographic skill for personal expressive communication through movement.

PE 1400. Badminton. (1 cr)
Development of personal sport skills and understanding for participation in badminton.

PE 1402. Tennis. (1 cr)
Development of personal skills in tennis. Understanding of strategies and concepts for participation in tennis.

PE 1410. Golf. (1 cr)
Development of personal golf skills and understandings for participation in the sport.

PE 1414. Bowling. (1 cr)
Development of personal skills in bowling. Understanding of concepts and strategies for participation in bowling.

PE 1500. Cross-Country Skiing. (1 cr)
Development of personal skills in cross country skiing. Understanding of the techniques and concepts for participation in cross-country skiing.

PE 1502. Alpine Skiing. (1 cr; A-F only)
Development of personal skills in alpine skiing. Understanding of the techniques and concepts for participation in alpine skiing.

PE 1504. Ice Skating. (1 cr)
Development of personal skills in ice skating. Understanding of techniques and concepts for participation in ice skating.
PE 1506. Sailing. (1 cr)
Development of personal skills in sailing. Understanding of the techniques and concepts for participation in sailing. Understanding of the principles of safety on the water.

PE 1507. Flatwater Kayaking. (1 cr)
Flatwater kayaking techniques. History, safety, kayak design, basic braces, paddle strokes, and maneuvering in flatwater conditions.

PE 1508. Flatwater Canoeing. (1 cr)
Basic skills and terminology relevant for safe canoeing on flatwater and slow-current streams.

PE 1510. Whitewater Kayaking. (1 cr; SP—1507 or #)
Rescue techniques, bracing, paddle strokes, maneuvering skills, examination of water hydraulics for use in whitewater conditions. Practical experience on local rivers and lakes. Successful completion results in certification from the American Canoe Association.

PE 1511. Sea Kayaking. (1 cr; SP—#)
History, safety, kayak design, basic braces, paddle strokes and maneuvering in large water conditions.

PE 1512. Fishing Skills. (1 cr)
Development of personal skills in fishing. Acquisition of understanding, techniques, and patterns for participation in the sport of fishing.

PE 1530. Rock Climbing. (1 cr)
History, techniques and safety, equipment, knots, basic belay systems, route finding, face and crack climbing, identification of environmental hazards.

PE 1600. Physical Fitness. (1 cr)
Development of personal skills related to physical fitness. Understanding and application of factors and participation patterns contributing to enhanced physical fitness.

PE 1601. Aerobics. (1 cr)
Knowledge of cardiovascular fitness, including aerobic exercise and hydro-aerobics. Physical development through cardiovascular training, muscle strengthening, and stretching.

PE 1612. Karate. (1 cr)
Development of personal skills in karate. Understanding history, cultural background, patterns, and strategies for participation in karate.

PE 1613. Karate: Advanced Belts. (1 cr; SP—1612 or #)
For experienced students who have achieved the basic competencies in karate.

PE 1614. Self Defense. (1 cr)
Development of personal skills related to self defense. Understanding of concepts, strategies, and skills for developing a personal system of self defense.

PE 1616. Weight Training. (1 cr)
Development of personal skills related to weight training. Understanding of principles, concepts, and conditioning regimens for participation in weight training.

PE 1620. Aikido. (1 cr)
Development of personal skills in aikido. Understanding of the history, cultural background, patterns, and strategies for participation in aikido.

PE 1702. Soccer. (1 cr)
Development of personal skills in soccer. Understanding of strategies, concepts, and skills for participation in the sport of soccer.

PE 1706. Volleyball. (1 cr)
Development of personal skills in volleyball. Understanding of strategies, concepts, and skills for participation in volleyball.

PE 1708. Basketball. (1 cr)
Development of personal skills in basketball. Understanding of strategies, concepts, and skills for participation in the sport.

PE 1710. Softball. (1 cr)
Development of personal skills in softball. Understanding of strategies, concepts, and skills for participation in softball.

PE 1901. Varsity Football. (1 cr [max 4 cr]; QP—#; SP—#; S-N only)
Participation in intercollegiate football competition.

PE 1903. Varsity Soccer. (1 cr [max 4 cr]; QP—#; SP—#; S-N only)
Participation in intercollegiate soccer competition.

PE 1905. Varsity Basketball. (1 cr [max 4 cr]; QP—#; SP—#; S-N only)
Participation in intercollegiate basketball competition.

PE 1913. Varsity Cross Country. (1 cr [max 4 cr]; QP—#; SP—#; S-N only)
Participation in intercollegiate cross country competition.

PE 1917. Varsity Volleyball. (1 cr [max 4 cr]; QP—#; SP—#; S-N only)
Participation in intercollegiate volleyball competition.

PE 1919. Varsity Track. (1 cr [max 4 cr]; QP—#; SP—#; S-N only)
Participation in intercollegiate track competition.

PE 1921. Varsity Tennis. (1 cr [max 4 cr]; QP—#; SP—#; S-N only)
Participation in intercollegiate tennis competition.

PE 1925. Varsity Baseball. (1 cr [max 4 cr]; QP—#; SP—#; S-N only)
Participation in intercollegiate baseball competition.

PE 1927. Varsity Softball. (1 cr [max 4 cr]; QP—#; SP—#; S-N only)
Participation in intercollegiate softball competition.

PE 2240. Lifeguarding Today. (1 cr; SP—Ability to swim 500 yards, #)
Provides knowledge and skills necessary to qualify as a non-surf lifeguard. Meets current American Red Cross standards. Includes CPR and first aid instruction.

PE 2244. Water Safety Instructor. (2 cr; SP—1240, 17 yrs old, knowledge and skill based on Emergency Water Safety Standard; A-F only)
Knowledge, skills, and strategies to teach American Red Cross swimming and water safety courses.

PE 3117. Sport and the American Society. (3 cr; A-F only)
In-depth examination of critical issues and controversies of sport in modern society.

PE 3126. Elementary School Physical Education. (2 cr; SP—EIEd major or #; A-F only)
Developing elementary school physical education program, for elementary school classroom teacher, with emphasis on planning appropriate curriculum guide and teaching developmental movement experiences.
Course Descriptions

PE 3470. Sports Nutrition I. (3 cr; SP–Exer sci or hlth ed or PE or rec major or #; A-F only)
Principles of sports nutrition; emphasis on effects of diet on body composition, metabolic processes, physiological function, and physical performance.

PE 3750. Movement Experience for the Young Child. (1 cr; SP–EdEd or SpEd candidate; A-F only)
Movement patterns, planning, and instruction in early childhood education.

PE 5470. Sports Nutrition II. (3 cr; SP–3470, Hlth 1470, exer sci or grad student or #; cannot apply cr to Graduate School program; A-F only)
Relationship between nutrients and special demands of physically active people. Body composition assessment. Caloric and fluid needs determination. Training, pre- and post-event meal planning. Focus on practical application of nutrition principles for specific populations (e.g., children, diabetics, elderly, elite athletes).

Physical Education Professional (PEP)

College of Education and Human Service Professions

PEP 1000. Teaching Elementary Games and Rhythms. (1 cr; SP–PE or exer sci or rec major or #; A-F only)
Basic skills, teaching strategies, practice, drills, and skill analysis for teaching elementary games and rhythms.

PEP 1002. Teaching Stunts: Tumbling and Apparatus. (1 cr; SP–PE or exer sci or rec major or #; A-F only)
Basic skills, teaching strategies, practice, drills, and skill analysis for teaching stunts, tumbling, and gymnastic apparatus.

PEP 1300. Teaching Ballroom Dancing. (1 cr; SP–PE or exer sci or rec major or #; A-F only)
Basic skills, teaching strategies, practice, drills, and skill analysis for teaching ballroom dancing.

PEP 1302. Teaching Folk Dance. (1 cr; SP–PE or exer sci or rec major or #; A-F only)
Basic skills, teaching strategies, practice, drills, and skill analysis for teaching folk dance.

PEP 1304. Teaching Square Dance. (1 cr; SP–PE or exer sci or rec major or #; A-F only)
Basic skills, teaching strategies, practice, drills, and skill analysis for teaching square dance.

PEP 1400. Teaching Tennis and Track. (1 cr; SP–PE or exer sci or rec major or #; A-F only)
Basic skills, teaching strategies, practice, drills, and skill analysis for teaching tennis and track.

PEP 1500. Teaching Cross-Country Skiing. (1 cr; SP–PE or exer sci or rec major or #; A-F only)
Basic skills, teaching strategies, practice, drills, and skill analysis for teaching cross-country skiing.

PEP 1504. Teaching Skiing. (1 cr; SP–PE or exer sci or rec major or #)
Basic skills, teaching strategies, practice, drills, and skill analysis for teaching skiing.

PEP 1505. Teaching Whitewater Kayaking. (1 cr; SP–PE 1510 or #)
Basic skills, teaching strategies, practice, drills, and skill analysis for teaching whitewater kayaking. Successful completion results in American Canoe Association instructor certification.

PEP 1506. Teaching Sea Kayaking. (1 cr; SP–PE 1507 or #)
Basic skills, teaching strategies, practice, drills, and skill analysis for teaching sea kayaking. Successful completion results in American Canoe Association instructor certification.

PEP 1507. Teaching Outdoor Skills. (1 cr; SP–#)
Basic skills, teaching strategies, practice, drills, and skill analysis for teaching outdoor recreation skills; includes navigation, camp craft, backpacking, back country travel, and safety.

PEP 1508. Teaching Rock Climbing. (1 cr; SP–PE 1530 or #)
Basic skills, teaching strategies, practice, drills, and skill analysis for teaching rock climbing.

PEP 1509. Teaching Canoeing. (1 cr; SP–PE 1508 or #)
Basic skills, teaching strategies, practice, drills, and skill analysis for teaching canoeing. Successful completion results in American Canoe Association instructor certification.

PEP 1520. Teaching Alpine Skiing. (1 cr; SP–PE or exer sci or rec major or #; A-F only)
Professional development as an alpine ski instructor.

PEP 1600. Teaching Fitness and Weight Training. (1 cr; SP–PE or exer sci or rec major or #; A-F only)
Basic skills, teaching strategies, practice, drills, and skill analysis for teaching physical fitness, weight training, and aerobics.

PEP 1700. Teaching Soccer and Softball. (1 cr; SP–PE or exer sci or rec major or #; A-F only)
Basic skills, teaching strategies, practice, drills, and skill analysis for teaching soccer and softball.

PEP 1710. Teaching Volleyball and Basketball. (1 cr; SP–PE or exer sci or rec major or #; A-F only)
Basic skills, teaching strategies, practice, drills, and skill analysis for teaching volleyball and basketball.

PEP 2000. Foundations of Physical Education. (3 cr; SP–Exer sci or PE major or #; A-F only)
Historical, philosophical, sociological, and scientific foundations within physical education and its subdisciplines.

PEP 2070. Elementary Physical Education Methods and Development. (4 cr; SP–1000, 1003, PE major or #; A-F only)
Analysis of philosophy, objectives, programs, methods, evaluation, and developmental motor patterns for elementary school physical education.

PEP 2071. Clinical Experience: Elementary. (1 cr; SP–11070, PE major or #; A-F only)
Supervised clinical teaching experience with responsibilities that include planning, managing, and implementing instructional experiences for elementary school children.

PEP 2610. Introduction to Athletic Training. (2 cr; SP–Exer sci major or #; A-F only)
Historical, organizational, and legal aspects of athletic training; focuses on the athletic trainer as a member of the sports medicine team.
PEP 2620. Principles of Athletic Training and Emergency Care. (2 cr; SP—Exer sci major, Hlth 2030, 2040 or #; A-F only)
Basic concepts of athletic training, including pre-participation screening, physiology of tissue repair, topographical anatomy, evaluation and assessment of illness and injuries, exercise science majors pursuing athletic training concentration.

PEP 3010. Adapted Physical Education. (2 cr; SP—Exer sci or PE major or #; A-F only)
Developmental/adapted physical education for children with disabilities.

PEP 3020. Motor Learning. (2 cr; SP—BAA or BAS PE candidate or #; A-F only)
Factors affecting motor learning: theories of learning and their application to the learning of physical skills; motor learning at beginning through advanced skill levels.

PEP 3030. Human Biomechanics. (3 cr; QP—SP 3118; [Hlth 1901 or Hlth 1903], [Hlth 1905 or Phsl 1043], [3-5 cr from Math 1156-1297 or #]; SP-Hlth 2030, Math 1160; A-F only)
Application of neurophysiological, anatomical, and physical principles to human movement. Cinematographical analysis of motion.

PEP 3040. Exercise Physiology. (3 cr; SP—Hlth 2040 or #; PE candidate or #; A-F only)
Physiological responses and adaptations to acute and chronic exercise. (2 hrs lect, 2 hrs lab)

PEP 3400. Exercise Testing and Prescription. (2 cr; SP—3040 or #; PE candidate or #; A-F only)
Physical fitness programming for adults; principles of exercise testing and prescription. (1 hr lect, 2 hrs lab)

PEP 3500. Facilities Management. (3 cr; SP—BAS or BAA PE candidate or #; A-F only)
Theory and practice of managing sports facilities.

PEP 3600. Sport Injury Assessment and Management. (3 cr; SP—BSC 3116; PE candidate or #; A-F only)
Assessment and management of sport-related trauma; injuries to axial region and lower and upper extremities; use of therapeutic modalities; legal considerations.

PEP 3610. Therapeutic Exercise. (3 cr; SP—3010, PE or exer sci candidate or #; A-F only)
Principles of therapeutic exercise for rehabilitation of acute and chronic injuries.

PEP 3620. Diagnosis and Treatment of Sport Injuries. (4 cr; SP—2610, 2620, 3600, exer sci candidate; A-F only)
Athletic trainer's role in diagnosis and treatment of musculoskeletal, cardiorespiratory, nervous system, gastrointestinal, and genitourinary injuries.

PEP 3630. Techniques in Preventing Athletic Injury. (2 cr; SP—2610, 2620, 3600, exer sci candidate; A-F only)
Lecture and lab in use of taping, bandaging, orthotics, and protective equipment in injury prevention.

PEP 3632. Advanced Techniques in Preventing Athletic Injury. (2 cr; SP—3630, exer sci candidate; A-F only)
Lecture and lab in use of advanced techniques for taping, bandaging, orthotics, and protective equipment in injury prevention.

PEP 3640. Principles and Techniques of Therapeutic Modalities. (3 cr; SP—3630, 3632, 3640 or #, exer sci candidate; A-F only)
Lecture and lab in use of therapeutic modalities by athletic trainers.

PEP 3700. Assessment Strategies in School Physical Education. (4 cr; SP—BAS PE candidate or #; A-F only)
Cognitive and motor performance test construction, selection, administration, evaluation, and statistical strategies; organization and analysis of test scores; grading theory and procedures; computer applications.

PEP 3730. Secondary Physical Education Methods and Curriculum. (4 cr; SP—PE major or #; A-F only)
Analysis of philosophy, objectives, programs, methods, and curriculum for secondary school physical education.

PEP 3731. Clinical Experience: Secondary. (1 cr; SP—3730, PE major or #; A-F only)
Supervised clinical teaching experience with responsibilities that include planning, managing, and implementing instructional experiences for secondary school children.

PEP 3970. Supervised Teaching: College. (1 cr; SP—3720 or PE 3122), [3730 or PE 3123], BAS PE candidate or #; A-F only)
Supervised teaching experience in a college setting.

PEP 3997. Athletic Training Practicum. (3 cr [max 9 cr]; SP—3630, 3632, 3640, #, exer sci candidate; S-N only)
Practical experience in athletic training under direct supervision of a National Athletic Trainers Association certified trainer at an on- or off-campus location.

PEP 4991. Independent Study. (1-4 cr [max 8 cr]; SP—PE or exer sci major or #; cannot apply cr to Graduate School program; A-F only)
Research or study in selected noncurricular area of exercise science or physical education.

PEP 4992. Directed Readings. (1-3 cr [max 6 cr]; SP—PE or exer sci candidate with 90 cr or #; cannot apply cr to Graduate School program; A-F only)

PEP 4996. Internship. (3-12 cr [max 12 cr]; SP—3040, 3400, PE candidate, #; cannot apply cr to Graduate School program; A-F only)
Supervised field internship experience in hospital, fitness facility, or agency setting.

PEP 4997. Practicum. (1-4 cr [max 4 cr]; SP—PE or exer sci major; cannot apply cr to Graduate School program; A-F only)
Supervised practical experience related to physical education teaching or exercise science professional experiences.

PEP 5041. Applied and Experimental Exercise Physiology. (4 cr; SP—3040 or #, exer sci candidate with 90 cr or adult spec or grad student; A-F only)
Advanced study and research in exercise physiology; methods of quantifying exercise responses and adaptations; basic research design.

PEP 5290. Research in Motor Learning. (2 cr; SP—3020 or #; A-F only)
Directed research.

PEP 5301. Techniques and Research in Computerized Videography. (4 cr; SP—3030 or #; A-F only)
Analysis and research in sport, dance, and aquatics through use of high-speed computerized videography.

PEP 5600. Prevention and Care of Athletic Injuries. (2 cr; SP—3600; A-F only)
Recognition, principles, and responsibilities related to athletic injuries in secondary and collegiate programs; demonstration and practice in training techniques.
**Course Descriptions**

**PEP 5991. Independent Study.** (1-4 cr [max 8 cr]; SP—Adult spec or grad student or #; A-F only)
Directed research and study in selected area of physical education or exercise science.

**PEP 5992. Directed Readings.** (1-3 cr [max 6 cr]; SP—Adult spec or grad student or #; A-F only)

**Physics (Phys)**

**College of Science and Engineering**

**Phys 1001. Introduction to Physics I.** (5 cr; SP—Algebra, trig; A-F only)
Noncalculus general physics course primarily for certain preprofessional fields. Topics in mechanics, heat, and sound.

**Phys 1002. Introduction to Physics II.** (5 cr; QP—1101; SP—1001; A-F only)
Noncalculus general physics course primarily for certain preprofessional fields. Topics in light, electricity, magnetism, and modern physics.

**Phys 1011. Ideas in Physics.** (3 cr; SP—Will not satisfy major or minor requirements in phys; A-F only)
Descriptive, nonmathematical survey of basic concepts in physics from Newton to present. Instructor has considerable latitude regarding content. Primarily for liberal arts students; not for preprofessional preparation.

**Phys 1101. Solving Physics Problems.** (2 cr; QP—4Math 1296; SP—Math 1296; A-F only)
Applying mathematical and reasoning skills to physics problems.

**Phys 1201. Mechanics.** (4 cr; QP—Math 1296; SP—Math 1290 or Math 1296; A-F only)
Calculus-level general physics course in Newtonian mechanics, including fluid mechanics.

**Phys 1202. Heat and Electricity.** (4 cr; QP—1107; SP—$1204; 1201; A-F only)
Calculus-level general physics, including DC circuits.

**Phys 1203. Magnetism, Waves, and Optics.** (4 cr; QP—1108, Math 1297; SP—$1204; 1202, Math 1297; A-F only)
Calculus-level general physics; also includes AC circuits.

**Phys 1204. Electricity, Magnetism, and Optics.** (5 cr; QP—1107, Math 1297; SP—$1202, $1203; 1201, Math 1297; A-F only)
Calculus-level general physics.

**Phys 1205. Waves and Heat.** (3 cr; QP—1107; SP—$1202, $1203; 1204; A-F only)
Calculus-level general physics; also includes AC circuits.

**Phys 2001. Oscillations.** (2 cr; QP—1109; SP—1203 or 1205; A-F only)
Waves and vibrations, superposition of periodic motion, free vibrations of physical systems, forced vibrations, resonance phenomena with examples from electricity, optics, and mechanics; progressive waves, boundary effects, interference.

**Phys 2021. Relativity and Quantum Physics.** (4 cr; QP—1109; SP—1202 or 1204; A-F only)
Descriptive course; relativity, quantum mechanics, hydrogen atom, multielectron atoms, molecular structure, quantum statistics, thermal radiation, solid state physics, nuclear physics.

**Phys 2031. Quantum Physics Laboratory.** (1 cr; QP—3500; SP—$2021; A-F only)
Experiments and computer simulations selected to provide experience with both concepts and techniques in modern physics.

**Phys 3061. Instrumentation.** (3 cr; QP—1109, 1 qtr programming; SP—1203 or 1204, 1 sem programming; A-F only)
Introduction to electronics for scientific applications. DC and AC circuits, linear and nonlinear devices, integrated circuits. Analog electronics, Transducers. Digital electronics. Applications of microcomputers to lab data acquisition.

**Phys 3091. Independent Study.** (1-3 cr [max 6 cr]; SP—A; A-F only)
Directed individual study.

**Phys 3094. Physics Research.** (1-6 cr [max 6 cr]; SP—A; S-N only)
Supervised research.

**Phys 3099. Physics Tutoring.** (1-2 cr [max 4 cr]; QP—1109, A; SP—1202 or 1204, A; may apply only 2 cr toward phys major; S-N only)
Tutoring students in 1xxx-level physics courses.

**Phys 4001. Classical Mechanics.** (4 cr; QP—3010, Math 3380; SP—2001, Math 3280; A-F only)
Theoretical mechanics, including Lagrangian and Hamiltonian functions, symmetries, and conservation laws.

**Phys 4011. Electromagnetic Theory.** (4 cr; QP—1109, Math 3380; SP—1203 or 1205, Math 3280; A-F only)
Electric and magnetic fields, Maxwell’s equations and applications, radiation.

**Phys 4021. Quantum Physics II.** (4 cr; QP—3500, Math 3380; SP—2021, Math 3280; A-F only)
Quantum wave mechanics with applications; Schrödinger equation, angular momentum, hydrogen atom, symmetries, identical particles.

**Phys 4031. Thermal and Statistical Physics.** (4 cr; QP—3500; SP—2021; A-F only)
Elements of thermodynamics; principles of statistical physics applied to equilibrium properties of classical and quantum systems.

**Phys 5041. Optics.** (3 cr; QP—3010; SP—2001; A-F only)
Fundamentals of physical optics.

**Phys 5051. Computational Physics.** (4 cr; QP—3500, Math 3380, 1 qtr programming; SP—2021, Math 3280, 1 sem programming; A-F only)
Application of numerical methods to problems in classical and quantum physics, emphasizing ordinary and partial differential equations. Computer modeling of physical systems.

**Phys 5061. Experimental Methods.** (3 cr; QP—3041, 3071; SP—2031, 3051; A-F only)
Instruction and practice in methods of experimental physics; microcomputer-based data acquisition; vacuum techniques.

**Phys 5062. Advanced Laboratory.** (2 cr; SP—$Comp 3150, #; A-F only)
Computational projects and/or experiments in physics or physical limnology.
Phys 5090. Physics Seminar. (1 cr [max 2 cr]; SP-Sr or grad student; A-F only)
Preparation and presentation of oral reports on approved physics topics, research projects, and journal articles.

Phys 5501. Advanced Classical Mechanics. (3 cr; QP-5124; SP-4001; A-F only)
Hamiltonian and Lagrangian formulations for discrete systems, canonical transformations, nonlinear dynamics, and chaos theory.

Phys 5511. Electrodynamics. (3 cr; QP-5125; SP-4011; A-F only)
Maxwell’s equations, relativity and electrodynamics, radiation and scattering of electromagnetic waves, relativistic particles in electromagnetic fields, and radiation reaction.

Phys 5521. Quantum Mechanics I. (3 cr; QP-5103; SP-4021; A-F only)
Schrödinger equation, operator formulation, angular momentum, symmetries.

Phys 5522. Quantum Mechanics II. (3 cr; QP-5177; SP-5521; A-F only)
Identical particles, perturbation theory, scattering, interaction with electromagnetic field.

Phys 5531. Introduction to Solid State Physics. (3 cr; QP-5103, 5107; SP-4021, 4031; A-F only)
Solid structure, thermal, and electronic properties of solids and solid surfaces.

Phys 5541. Fluid Dynamics. (3 cr; QP-3010, Math 3380; SP-2001, Math 3280; A-F only)
Analytic and numeric treatment of dynamics of fluids, Rotating, stratified fluids, with applications in limnology, oceanography, and meteorology.

Phys 5551. General Relativity. (4 cr; QP-5123; SP-4001; A-F only)
Differential geometry, tensors, metrics, curvature, Einstein’s equation, Newtonian limit, Killing vectors, cosmology, perfect fluids, Schwarzschild and Kerr solutions, observational tests, black holes.

Phys 5591. Independent Study. (1-3 cr [max 6 cr]; SP-Consent of director of graduate studies; S-N only)
Special studies, useful in individual graduate programs, not available in regular course offerings.

Phys 5594. Physics Research. (1-3 cr [max 6 cr]; SP-#; S-N only)

Phys 8333. FTE: Master’s. (1 cr; SP-Master’s student, adviser and DGS consent)

Phys 8777. Thesis Credits: Master’s. (1-18 cr; SP-Max 18 cr per semester or summer; 10 cr total required [Plan A only])

Political Science (Pol)

College of Liberal Arts

Pol 1011. American Government and Politics. (3 cr; QP-51010; A-F only)
Principles of American national government. Survey of American governmental system, structure, operations, and services; constitutionalism, federalism, civil liberties, parties, pressure groups, and elections.

Pol 1050. International Relations. (3 cr; A-F only)
Introduction to contemporary international politics: levels of analysis; the international system; nation-state behavior; foreign policy decision making; economic and defense policy issues.

Pol 1195. Special Topics: (Various Titles to be Assigned). (1-4 cr [max 8 cr]; QP-51902; 1113 or 1413 or 1513 or 1613 may be repeated for 8 cr max; A-F only)
Contemporary topics. Specific course announced in Class Schedule.

Pol 1200. Introduction to Public Policy. (3 cr; A-F only)
Public policy consists of political decisions for implementing programs to achieve societal goals such as reducing crime and poverty, improving education, maintaining national security, and preserving the environment. Introduction to how policy is made, implemented, and evaluated.

Pol 1500. Introduction to Comparative Politics. (3 cr; A-F only)
Survey of the politics of countries selected to reflect alternative styles of politics and forms of government; examples of Western liberal democratic, Communist and post-Communist, and Third World systems.

Pol 1610. Politics and Society. (3 cr; QP-51600, §3601, §3635; A-F only)
Survey of major contemporary political ideologies: liberalism, conservatism, socialism, Marxism, fascism, feminism, anarchism, ecologism, and liberation ideologies.

Pol 2700. Methodology and Analysis. (4 cr; QP-51700, §3200; 60 cr or #; A-F only)
Theory and methods of conducting political research: theory construction, concept formulation, survey research and sampling design, basic statistical analysis, and measurement of relationships.

Pol 3001. American Public Policy. (3 cr; QP-60 cr incl 1011 or #; SP-40 cr incl 1011 or #; A-F only)
Approaches to policy study, context of policy process, and discussion of policy issues.

Pol 3003. Public Choice: Markets Versus Governments. (4 cr; SP-1011 or 1610 or #; A-F only)
Ways in which public choices concerning resource allocation, property use, growth, development, and environmental use may be made by either markets or authoritative decisions of government. Failures of both markets and governments in making optimal, fair public choices.

Pol 3004. The Political Theory of the Welfare State. (4 cr; SP-1610 or Phil 1003 or #; A-F only)
Justifications and criticism of contemporary welfare state. How notions of social justice and equity, needs, desert, individual welfare, and social responsibility have been used in arguments for the welfare state. Criticisms of libertarian and new right theorists.

Pol 3020. State Government. (3 cr; QP-1011, 60 cr or #; SP-1011, 40 cr or #; A-F only)
The states in the American federal system; governmental institutions and processes; intergovernmental relations. Special reference to Minnesota.

Pol 3030. Urban Government and Politics. (3 cr; QP-1011, 60 cr or #; SP-1011, 40 cr or #; A-F only)
Legal, administrative, political, and social aspects of American local government; emphasis on intergovernmental relations and regional cooperation.
Course Descriptions

Pol 3040. Women and Politics. (3 cr; QP—§3801; 60 cr or #; SP—40 cr or #; A-F only)
Women's political status; implications of women's role in political process; women as political actors; feminist critique and vision of politics.

Pol 3070. Civil Liberties. (3 cr; QP—1011, 60 cr or #; SP—1011, 40 cr or #; A-F only)
Separation of church and state, death penalties, abortion, First Amendment rights, affirmative action. Legal, moral, and political implications of human rights.

Pol 3080. Environment and Politics. (3 cr; QP—1011, 60 cr or #; SP—1011, 40 cr or #; A-F only)
American natural resource problems with special attention to conservation activities on national, state, and local levels; development of conservation agencies in Minnesota.

Pol 3097. Government Internship. (1-6 cr [max 8 cr]; QP—§3710; Jr; #; 4 cr max from 3105, 3114, 3405, 3414, 3505, 3514, 3605, 3614 may be applied toward Pol major requirements; SP—Jr; #; 3 cr max from 3097, 3197, 3297 may be applied toward advanced Pol major requirements; S-N only)
Scheduled work assignments with direct supervision in performance of governmental functions; full- or part-time employment.

Pol 3109. Intern Teaching in Political Science. (1-2 cr [max 3 cr]; QP—§3900; Sr, Pol major; #; 4 cr max from 3109, 3409, 3509, 3609 may be applied toward general upper div Pol major requirements; SP—Sr, Pol major; #; 3 cr max may be applied to advanced Pol major requirements; S-N only)
Practical experience teaching in Department of Political Science. Application deadline one week before beginning of registration for the following semester. Before interning in a course, students must obtain a grade of at least B+ in the course.

Pol 3120. Congress and the Presidency. (4 cr; QP—§3160, §3325, §5160, §5320, §5325, 1011, 60 cr or #; SP—1011, 40 cr or #; A-F only)
Functioning and structure of the United States Congress and presidency. Members of Congress and the presidency: their characteristics, their selection, roles they play, how they interact with each other as well as with others in the policy-making process.

Pol 3130. The Judicial Process. (3 cr; QP—§3330, §5330; 1011, 60 cr or #; offered alt yrs; SP—1011, 40 cr or #; offered alt yrs; A-F only)
Structure of the American judiciary; selection of judges; process of litigation; influences on judicial decision; impact of and compliance with decisions.

Pol 3140. American Political Parties and Elections. (3 cr; QP—1011, 60 cr or #; SP—1011, 40 cr or #; A-F only)
American two-party system; structures and functions of political parties in America; nominations and elections of government officials.

Pol 3150. American Constitutional Law I. (4 cr; QP—§3110, §5311; 1011, 60 cr or #; SP—1011, 40 cr or #; A-F only)
Judicial review; national powers over commerce, taxing, and spending; presidential power; state powers to tax and regulate; regulation of economic and property interests; the Fourteenth Amendment and due process.

Pol 3151. American Constitutional Law II. (4 cr; QP—§3110, §5311; 1011, 60 cr or #; SP—1011, 40 cr or #; A-F only)
Rights of the accused; freedom of expression and association. Freedom of religion; equal protection; state action and personal rights; other civil rights; military, war, and foreign affairs powers.

Pol 3170. Political Interest Groups and Individuals. (3 cr; QP—§5170; 1011, 60 cr or #; SP—1011, 40 cr or #; A-F only)
Role of interest groups and individuals who lobby government to influence public policy. Internal dynamics of groups; strategies of lobbying and its regulation.

Pol 3195. Special Topics (Various Titles to be Assigned). (1-4 cr [max 8 cr]; QP—§3902; 60 cr incl 8 cr soc sci or #; 3113 or 3413 or 3513 or 3613 may be repeated for 8 cr max; SP—40 cr incl 6 cr soc sci or #; A-F only)
Contemporary topics in political science. Specific course announced in Class Schedule.

Pol 3197. Nongovernmental Internship. (1-6 cr [max 8 cr]; QP—Jr; Pol major; #; 4 cr max from 3105, 3114, 3405, 3414, 3505, 3514, 3605, 3614 may be applied to satisfy general upper div Pol major requirements; SP—Jr; #; 3 cr max from 3097, 3197, 3297 may be applied toward advanced Pol major requirements; S-N only)
Supervised, scheduled work assignments in performance of political functions in nongovernmental organizations; full- or part-time employment. Not all outside work is eligible; see department head for requirements.

Pol 3221. Public Administration. (3 cr; QP—§3220; 1011, 60 cr or #; SP—1011, 40 cr or #; A-F only)
Operations of bureaucratic organizations and their role in government policy making. Ability of modern bureaucracy to meet its own goal of technical efficiency; impact of bureaucratic forms of organization on democratic society.

Pol 3297. Public Policy Internship. (1-6 cr [max 8 cr]; SP—Intro courses for public policy concentration or #; 3 cr max may be applied toward public policy concentration advanced cr; 3 cr max total from 3097, 3197, 3297 may be applied toward advanced Pol major; S-N only)
Supervised, scheduled work assignments in policy settings related to student’s public policy track; full- or part-time employment.

Pol 3310. Public Opinion and Propaganda. (3 cr; QP—1011, 60 cr or #; SP—40 cr or #; A-F only)
Role of public opinion and propaganda in the political system; acquisition and measurement of opinion; persuasion and use of propaganda techniques by candidates, pressure groups, and others.

Pol 3400. Contemporary Issues in World Politics. (4 cr [max 8 cr]; QP—§3450; 1050, 60 cr or #; 4 cr max may be applied toward requirements for department field concentration; SP—1050, 40 cr or #; 4 cr max may be applied toward Pol major requirements; A-F only)
Detailed examination and analysis of selected contemporary issues in world politics and international relations. Policy recommendations dealing with each issue.

Pol 3402. American Foreign and Defense Policy. (3 cr; QP—§3002, §3065; 1011 or 1050, 60 cr or #; SP—1011 or 1050, 40 cr or #; A-F only)
Institutions and processes that determine U.S. foreign and defense policies; major developments; contemporary issues; effects on domestic politics.
Pol 3415. International Law. (4 cr; QP—$3420, $3421; 1050, 60 cr incl 12 cr soc sci or #; SP—40 cr incl 8 cr soc sci or #; A-F only)
Nature and sources of international law; cases, writers, and treaties that define content of international law, subjects; human rights; protection of aliens; extradition; territorial questions; diplomatic agents; international agreements; pacific settlement of disputes; law of war and war crimes.

Pol 3426. Politics of International Organizations. (4 cr; QP—1050, 60 cr incl 12 cr soc sci or #; SP—40 cr incl 8 cr soc sci or #; A-F only)
Investigation of development, operations, and significance of international organizations in contemporary international politics.

Pol 3451. Theories of International Relations. (4 cr; QP—$5100; 1050 or IntS 1010, 60 cr incl 12 cr soc sci or #; SP—40 cr incl 8 cr soc sci or #; A-F only)
Historical and contemporary theories of international relations. Views of contending theorists are analyzed and assessed.

Pol 3460. International Political Economy. (4 cr; QP—1050, 60 cr or #; SP—40 cr or #; A-F only)
Relationship between politics and economics at international level, focusing on international trade and monetary policies, politics of economic growth and development, role of transnational corporations, and relations between rich and poor states.

Pol 3510. Russian and Soviet Politics and Government. (4 cr; QP—60 cr incl 12 cr soc sci or #; SP—40 cr incl 8 cr soc sci or #; A-F only)
Reform and revolution in Tsarist Russia; political leadership and Soviet development under Lenin and Stalin; political issues in the post-1953 Stalinist system: conservatives and reformers from Khrushchev to Gorbachev; dissolution of the USSR and its aftermath; recreating the Russian policy.

Pol 3517. Western European Political Systems. (4 cr; QP—$3516; 60 cr incl 12 cr soc sci or #; SP—40 cr incl 8 cr soc sci or #; A-F only)
Comparative analysis of development and operation of political-governmental institutions and processes in selected Western European countries; political and ideological patterns and trends; problems of democratic politics; policy issues in advanced industrial societies and the future of the “welfare state.”

Pol 3520. Chinese Government and Politics. (4 cr; QP—60 cr incl 12 cr soc sci or #; SP—40 cr incl 8 cr soc sci or #; A-F only)

Pol 3550. Politics of Contemporary Southern Africa. (2 cr; QP—60 cr incl 12 cr soc sci or #; offered through Study in England Program; SP—40 cr incl 8 cr soc sci or #; offered through Study in England Program; A-F only)
Contemporary political, economic, and social trends in Southern Africa.

Pol 3560. Latin American Governments and Politics. (4 cr; QP—60 cr incl 12 cr soc sci or #; SP—40 cr incl 8 cr soc sci or #; A-F only)
Government institutions/processes in Latin American nations. Regional differences; colonialism/imperialism; military populist, Marxist regimes; government repression, political conflict, revolution; models of development and role of the state; debt crisis, structural adjustment; democratization; international relations.

Pol 3570. Third World and Development. (3 cr; QP—1050 or 1500 or 12 cr soc sci, 60 cr or #; SP—1050 or 1500 or 8 cr soc sci, 40 cr or #; A-F only)
Nature of political development; individual and institutional causes and consequences of development; political economy of Third World.

Pol 3600. Political Concepts. (4 cr; QP—$1600; 60 cr or #; SP—40 cr or #; A-F only)
Fundamental political concepts, including but not limited to justice, liberty, equality, power, democracy, political obligation, and community. Perspectives of diverse political philosophies and cultures may be addressed.

Pol 3610. Political Economy: An Introduction. (4 cr; QP—60 cr incl 8 cr soc sci or econ or bus or #; SP—40 cr incl 6 cr soc sci or econ or bus or #; A-F only)
Relationship between politics and economics and ways they affect each other, focusing on political and economic values/goals and their role in shaping public policy; policies and policy making in selected national systems; the international economy.

Pol 3640. Theory and Practice of Nonviolence. (4 cr; QP—60 cr or #; SP—40 cr or #; A-F only)
Nature of violence; philosophical bases, tactical strategies, and legitimate use of nonviolence for conflict resolution and social change.

Pol 3651. History of Western Political Thought I. (4 cr; QP—$5653; 60 cr or #; SP—1600 or 1610 or #; A-F only)
Justice and the political community; classical Greek thought and medieval thought, concentrating on Plato, Aristotle, Augustine, Aquinas, Machiavelli, and More.

Pol 3652. History of Western Political Thought II. (4 cr; QP—$5655; 60 cr incl 1600 or 1610 or #; SP—1600 or 1610 or #; A-F only)
Political thought from the Enlightenment to the present. Works of major political philosophers, including Hobbes, Locke, Rousseau, Wollstonecraft, Mill, Marx, and 20th-century philosophers.

Pol 3690. Left, Right, and Centre: Ideology and Politics. (1-4 cr; QP—Offered only in Birmingham, England; SP—Offered only in Birmingham, England; A-F only)
Political argument in Britain at end of 20th century.

Pol 3711. The Washington Semester: Introductory Seminar. (4 cr; QP—$3701, $3702, $3703, $3704; 1011 or 1050, #; SP—1011 or 1050, #; A-F only)
Introductory seminar in American domestic or foreign policy.

Pol 3712. The Washington Semester: Advanced Seminar. (4 cr; QP—$3701, $3702, $3703, $3704; 1011 or 1050, #; SP—1011 or 1050, #; A-F only)
Advanced seminar in American foreign or domestic policy.

Pol 3794. The Washington Semester: Research. (4 cr; QP—$3701, $3702, $3703, $3704; 1011 or 1050, #; SP—1011 or 1050, #; A-F only)
Research project in American domestic policy.
Course Descriptions

Pol 3797. The Washington Semester: Internship. (4 cr; QP--§3701, §3702, §3703, §3704; 1011 or 1050; #; SP--1011 or 1050; #; A-F only) Internship in American domestic policy.

Pol 3910. Honors Seminar: Landmarks in Political Science. (4 cr; QP--§3890; 80 cr, 3.00 GPA in Pol courses, Δ; SP--55 cr, 3.00 GPA in Pol courses, Δ; A-F only) Selected books and essays published in the last 40 years considered to be outstanding contributions to political science. The works’ arguments and contribution to political science.

Pol 4190. Senior Seminar. (4 cr; QP--§5190, §5390, §5490, §5590; 8 cr relevant upper div Pol courses, #; SP--§5190, §5390, §5490, §5590; 6 cr relevant upper div Pol courses, #; A-F only) Supervised research and writing in current areas or issues of politics and political science, subject matter varying with instructor.

Pol 4191. Independent Study. (1-4 cr; max 6 cr; QP--§5704; 12 cr Pol, 8 cr other soc sci; #; 5111 or 5411 or 5511 or 5611 may be repeated for 8 cr max; SP--8 cr Pol, 6 cr other soc sci; #; A-F only) Advanced study and research under supervision of a staff member; student must consult with instructor before registration.

Pol 4192. Senior Seminar in Policy Studies. (4 cr; SP--Completion of core course requirements for public policy concentration or #; A-F only) Capstone class for public policy concentration. Economic, political, and societal constraints on policy-making process; ethical values that policies promote.

Pol 4195. Special Topics: (Various Titles to be Assigned). (1-4 cr; max 6 cr; QP--§5195; 12 cr Pol, 8 cr other soc sci; #; SP--§5195; 6 cr relevant upper div Pol courses, #; A-F only) Contemporary topics in political science. Specific course announced in Class Schedule.

Pol 4198. Workshop: (Various Titles to be Assigned). (1-4 cr; max 6 cr; QP--70 cr incl 12 cr soc sci or #; 5101 or 5401 or 5501 or 5601 may be repeated; 6 cr max may be applied to Graduate School program; SP--50 cr; 4 cr max may be applied to Graduate School program; A-F only) Intensive study in various aspects of political science.

Pol 4610. Contemporary Political Theory. (3 cr; QP--1600 or 1610, 70 cr incl 8 cr relevant upper div Pol courses or #; SP--5610; 1610, 50 cr incl 6 cr relevant advanced Pol courses or #; A-F only) Issues still under vigorous debate in contemporary political theory: Marxism, feminism, critical theory, Rawls.

Psy 2021. Developmental Psychology. (4 cr; A-F only) Major processes in human development, conception through life span; biological and cultural influences on physical-motor, cognitive, social, and emotional development; effects of diverse cultural traditions and values; social policy implications.

Psy 2023. Marriages and Families Worldwide. (4 cr; A-F only) Family functions and structures worldwide; impact of expectations, gender roles, race, culture, and values on partner and parenting; love, sex, communication, power, abuse, stress, and satisfaction; small group experiences with focus on strengthening families.

Psy 2223. Gender in Society. (4 cr; A-F only) Sociocultural, historical, and developmental formations of men's and women's roles and experiences in society. Effects on personality, interpersonal relationships, and life choices.

Psy 3020. Statistical Methods. (4 cr; SP--Elem algebra, math placement test; A-F only) Descriptive statistics; introduction to correlational analysis and regression; sampling techniques and statistical inference; applications of simple and factorial design analysis of variance and other parametric and nonparametric hypothesis-test statistics in the behavioral sciences.

Psy 3021. Experimental Design and Methodology. (4 cr; SP--3020; A-F only) Introduction to problems and methods of experimentation in psychology; logical and scientific basis of experimental psychology; problems and techniques of designing, conducting, and reporting experiments. (3 hrs lect, 1 hr lab)

Psy 3022. Applied Methods and Measurement. (4 cr; SP--3020, 3021; A-F only) Designing, conducting, and reporting experiments; constructing, choosing, and interpreting psychological instruments; experimental procedures and research findings from various areas within psychology. (3 hrs lecture, 1 hr lab)

Psy 3061. Physiological Psychology. (4 cr; SP--4 cr Psy or #; A-F only) Physiological basis of behavior, including central and peripheral nervous systems, sensory processes as they relate to perception, cognition, emotion, motivation, intelligence, and learning.

Psy 3081. History and Systems of Psychology. (3 cr; SP--3 cr Psy; A-F only) Survey of historical development and current status of contemporary systems and theories in psychology.

Psy 3111. Theories of Personality. (3 cr; SP--3 cr Psy; A-F only) Basic concepts, issues, and methods involved in study of human personality; introduction to selected theories on motives, dynamics, development, and description of human nature.

Psy 3112. Psychology of Religion. (3 cr; SP--Upper div standing, strong interest in scientific study of religious experience and behavior; A-F only) Religious beliefs and their functional value in human life. Varieties of religious experience and behavior.
Psy 3211. Abnormal Psychology. (4 cr; SP–3 cr Psy; A–F only)
Mental disorders, including DSM-IV classification system, etiology, and treatment.

Psy 3201. Social Psychology. (3 cr; SP–3 cr Psy; A–F only)
How thoughts, feelings, and behavior of individuals are affected by others. Social influence and interaction. Attitude measurement and change, conformity, impression formation, attribution theory, aggression, and prosocial behavior.

Psy 3211. Group Dynamics. (3 cr; SP–3 cr Psy; A–F only)
Principles and processes of interaction in groups; structure and functioning of groups; leadership, communication, decision making, social influence; aspects of sensitivity training.

Psy 3215. Topics in Human Sexuality. (3 cr; SP–53216; 3 cr Psy; A–F only)
Biological and psychosocial factors relating to human sexuality, sexual functioning, gender, and related issues. Group discussion of societal factors, values, and attitudes and their impact on behavior.

Psy 3216. Human Sexuality: A Personal Perspective. (3 cr; SP–33215; A–F only)
Independent study course. Students deal with typical topics covered in human sexuality through viewing videotapes, reading text and journal articles, and personal evaluation.

Psy 3231. Psychology of Drug Use. (3 cr; SP–3 cr Psy; A–F only)
Basic understanding of drug effects: tolerance and withdrawal; commonality among drugs of abuse; how antischizophrenic, antianxiety, and antidepressant drugs are thought to work; reward centers in brain.

Psy 3371. Child and Adolescent Psychology. (3 cr; SP–1003; A–F only)
Growth of individual and social forms of human behavior. Interaction of heredity and environment on physical, intellectual, social, and emotional changes from conception to adulthood.

Psy 3381. Adult Development and Aging. (3 cr; SP–2021 or #; A–F only)
Change and continuity in physiological, psychological, and sociocultural development in early, middle, and late adulthood; theories and research on effects of demographics, cohort, race, ethnicity, gender, culture, family, friends, work, health, education, housing, public policies; dying, grief, bereavement.

Psy 3445. Transpersonal Psychology. (3 cr; SP–1003 or #; A–F only)
Branch of psychology that studies spiritual and transcendent experiences. Concerned with the whole of being, it recognizes potential for a variety of states of consciousness; it acknowledges developmental psychology and draws further insights from the spiritual dimensions of human beings. Lab fee.

Psy 3450. Dreamwork. (3 cr; SP–3 cr Psy; A–F only)
Historical perspective and theoretical overview of dreamwork. May include such theorists as Freud, Jung, Perls, Gendlin, and Ullman. Focuses on creative use of dreams as symbolic knowledge.

Psy 3524. Basic Helping Skills. (4 cr; A–F only)
Rationale for and practice of basic skills needed for effective interpersonal helping.

Psy 3527. Psychology and Social Responsibility. (4 cr; SP–3 cr Psy; A–F only)
How psychological development and psychological problems are influenced by political, social, economic, and other global issues. Designed to increase social and political awareness, broaden perspective of psychology, and promote social responsibility and activism. Includes field trips. Lab fee.

Psy 3535. Career Awareness and Development. (3 cr; SP–3 cr Psy; A–F only)
Theoretical base and practical experiences for students to use in their own career development, from awareness through job search and adjustment.

Psy 3540. Psychology of Food Abuse. (3 cr; SP–3 cr Psy; A–F only)
Basic understanding of eating disorders: obesity, binge eating, anorexia, bulimia, and social, psychological, and physical influences on normal and abnormal eating. Social evaluation of obesity.

Psy 3601. Psychology of Personal Development. (3 cr; SP–3 cr Psy; S–N only)
Focuses on discovery of self and spiritual journey. Examines personal development by exploring ways to change, grow, and achieve creative potential. Individual and group counseling experiences required to increase self-awareness and self-knowledge.

Psy 3611. Learning and Cognition. (4 cr; SP–3 cr Psy; A–F only)
Introduction to learning and cognition theories using historical, philosophical, and experimental perspectives; models of perception, memory, learning, conditioning, language, thinking, and reasoning; and application of these theories in human service professions.

Psy 3613. Behavior Modification. (3 cr; SP–3 cr Psy; A–F only)
Basic psychological methods, techniques, and findings in applications of operant and respondent conditioning to treatment of human behavior problems.

Psy 3661. Psychology of Language. (3 cr; SP–3 cr Psy; A–F only)
Psychological processes underlying comprehension, production, and acquisition of language(s); cognitive, social, biological, and educational perspectives on language and their applications.

Psy 3691. Sensation and Perception. (4 cr; A–F only)
Theories, methods, and findings in study of sensory and perceptual processes; psychophysics and psychophysiology of visual, auditory, gustatory, olfactory, cutaneous, kinesthetic, vestibular, and pain senses; analysis of perceptions of constancy, illusion, space, time, motion, and form.

Psy 3701. Personnel Psychology. (3 cr; SP–3 cr Psy; A–F only)
Introduction to personnel psychology. Testing, selection, performance appraisal, job analysis, job evaluation, validity issues in organizational settings, discrimination, and affirmative action programs.

Psy 3707. Organizational Psychology. (3 cr; SP–3 cr Psy; A–F only)
Overview of organizational topics within industrial/organizational psychology. Leadership, job satisfaction, motivation theories, goal setting, organizational behavior, organizational development, and industrial relations.
Course Descriptions

Psy 3896. Seminar: Professional Issues. (1 cr; SP--Jr or sr or BAS Psy major; A-F only)
Required for students seeking preprofessional field placement experience. Ethics, introduction to human service professions, and related professional issues.

Psy 3950. Workshop; (Various Titles to be Assigned). (1-4 cr [max 4 cr]; SP--S; N only)
Advanced students work with department faculty in planning and teaching undergraduate course.

Psy 3985. Honors Seminar in Psychology. (2 cr; SP--3021, Psy major with 60 cr, 3.00 GPA overall, 3.25 GPA in Psy; #; A-F only)
Concentrated study using original writings on major issue or by person with historical or theoretical importance within psychology. Bibliography, individual paper, and group project required.

Psy 3990. Special Topics in Psychology: (Various Titles to be Assigned). (1-3 cr [max 3 cr]; SP--3 cr Psy; A-F only)
Developed by psychology faculty in their expertise areas to instruct on selected advanced and current topics.

Psy 3991. Projects in Psychology. (1-4 cr [max 4 cr]; SP--Psy major or minor; #; S-N only)
Supervised practical experience in University or community activities to gain experience in application of psychological principles and techniques; written report required.

Psy 3994. Directed Research in Psychology. (1-4 cr [max 4 cr]; SP--Psy major or minor; #; S-N only)
Research problem chosen by instructor; written report required.

Psy 3995. Research in Psychology. (1-4 cr [max 4 cr]; SP--Psy major or minor; #; A-F only)
Intensive independent empirical research on problem in psychology chosen by student; research report required.

Psy 3996. Preprofessional Field Placement. (3-10 cr [max 10 cr]; SP--3896, sr BAS Psy major, #; S-N only)
Supervised experience in human service organization. Contract, log, site evaluation, and written report required. Minimum of three hours approved experience on site per week for each semester credit. One hour weekly group supervision required at UMD (time arranged).

Psy 3997. Honors Project in Psychology. (1-3 cr [max 3 cr]; SP--Sr Psy major, approval by Psy faculty, 3.00 GPA overall, 3.25 GPA in Psy; A-F only)
Advanced individual project demonstrating application of psychological principles based on sound theoretical and research foundations. A psychology faculty adviser, written report, and oral examination required.

Psy 3998. Honors Research in Psychology. (1-3 cr [max 3 cr]; SP--Sr Psy major, approval by Psy faculty, 3.00 GPA overall, 3.25 GPA in Psy; A-F only)
Advanced independent empirical research project proposed and conducted by student with psychology faculty adviser. Project must receive Human Use Committee approval and be reported in American Psychological Association publication style.

Psy 3999. Directed Instruction. (1-4 cr [max 4 cr]; SP--#; A-F only)
Students work with department faculty in planning and helping teach an undergraduate course.

Psy 5001. Transpersonal Development. (3 cr; QP--Psy or soc work grad major or #; SP--Couns psy or soc work grad major or #; A-F only)
Transpersonal perspectives of counseling, religions, and philosophies, including Sufism, Buddhism, Zen, Taoism, Native American spirituality, and Christianity. Includes experiential activities such as group interaction, meditation journaling, and vision quests.

Psy 5051. Research Methods and Measurement in Psychology. (3 cr; QP--Grad student or #; SP--Grad student or #; A-F only)
Research methods and design for the behavioral sciences; principles and practices of needs assessment, program evaluation, and individual assessment techniques; ethical and legal considerations in research and assessment.

Psy 5052. Advanced Statistical Methods. (3 cr; QP--3020, 5813 or #; SP--3020, 5051 or #; A-F only)
Advanced parametric and nonparametric statistics; application of variance, covariance, and linear regression analyses to a variety of multilevel and factorial research designs; psychometric statistics; computer-based data management; ethical and legal considerations.

Psy 5061. Research Problems I. (2 cr; QP--Ed psy grad major or #; SP--5061 or #; S-N only)
Application of principles and procedures of research methods, needs assessment, and program evaluations; integration of research concepts with counseling problems through guided study and practice; ethical and legal considerations. Partially fulfills Plan B requirement.

Psy 5062. Research Problems II. (2 cr; QP--Ed psy grad major or #; SP--5061 or #; S-N only)
Advanced application of principles and procedures of research methods, needs assessment, program evaluation, and statistics; integration of research concepts with counseling problems through guided study and practice; ethical and legal considerations. Partially fulfills Plan B requirement.

Psy 5121. Psychopathology Over the Life Span. (3 cr; QP--3121 or #; SP--3121 or grad student or #; A-F only)
Abnormal behavior in childhood, adolescence, and adulthood; development, classification, etiology, methods of assessment, treatment, and prevention; ethical considerations.

Psy 5123. Psychology of Addictive Behaviors. (3 cr; QP--Sr or grad student or #; SP--Sr or grad student or #; A-F only)
Examination of a wide spectrum of addictive behaviors, including drug addictions and process addictions, such as gambling, compulsive buying, and compulsive eating. Evaluation and treatment approaches.

Psy 5125. Biological Bases of Behavior, Psychopathology, and Pharmacotherapeutics. (3 cr; QP--Sr or grad student or #; SP--Sr or grad student or #; A-F only)
Biological bases of normal cognition, emotionality, social interactions, and motor control; biological reasons for disturbances; rationale and mode of action of various pharmacotherapeutic compounds for treatment; areas of interest include schizophrenia, depression, psychomotor epilepsy, drug abuse, and addiction.

Psy 5201. Childhood and Adolescence: Advanced Study. (3 cr; QP--3331 or 3371, sr or grad student or #; SP--2021 or 3371, sr or grad student or #; A-F only)
Current theories and research on physical, cognitive, social, and emotional development of children and adolescents in selected areas worldwide; influences on...
Psyc 5251. Parenting. (3 cr; QP–3331 or 3371 or #; sr or grad student or #; SP–2021 or 3371 or #; sr or grad student; A-F only)
Parent-child interaction, roles, and responsibilities throughout the life cycle; analysis of parenting strategies; contemporary variations of family cultures, structures, and lifestyles; sources of education and support.

Psyc 5501. Counseling Theories and Skills. (4 cr; QP–Ed psy grad major or #; SP–Couns psy grad major or #; A-F only)
Theoretical orientations in counseling; application of theories through intensive practice of skills and videotape review; ethical considerations.

Psyc 5502. Group Guidance and Counseling. (3 cr; QP–5521, 5525, ed psy grad major or #; SP–5501, couns psy grad major or #; A-F only)
Group theories, dynamics, leadership, guidance, and counseling; group guidance and counseling skills analyzed and practiced.

Psyc 5601. Life Span and Career Development: Theories and Counseling. (3 cr; QP–Ed psy grad major or #; SP–Couns psy grad major or #; A-F only)
Major life span, personality, and career development theories. Implementing theories in counseling. Nature and needs of all developmental levels; career decision making for life; interrelationships among work, family, and leisure. Assessment of normal personality, interests, abilities, and values. Occupational information sources. Ethical considerations.

Psyc 5603. Cultural and Family Counseling: Theories and Techniques. (3 cr; QP–Ed psy or soc work grad major or #; SP–Couns psy or soc work grad major or #; A-F only)
Theory, practice, and assessment of cultural and family counseling; systems, intergenerational, structural, communication, and strategic theories. Influences of gender, sexuality, race, ethnicity, socioeconomic status, age, physical disability, family patterns, language, intellectual ability, and other micro, macro, and exo-systems. Ethical and legal considerations.

Psyc 5611. Behavior and Cognitive Therapy Approaches. (3 cr; QP–Grad student or Psy 3611 or #; SP–Grad student or Psy 3611 or #; A-F only)
Selected therapeutic applications of learning principles to human behavior, including principles of cognitive therapies and behavior-based counseling techniques. Ethical, legal, and cultural considerations.

Psyc 5651. Psychological Consultation and Supervision. (2 cr; QP–2nd yr ed psy grad student or #; SP–2nd yr couns psy grad student or #; A-F only)
Theories, principles, practices, and procedures in consultation and supervision in human service systems and education; ethical and legal issues.

Psyc 5980. Selected Issues in Psychology and Counseling. (1-4 cr [max 8 cr]; QP–Sr or grad student or #; SP–Sr or grad student or #; A-F only)
Current developments and review of research in selected areas of psychology and/or counseling; analysis of issues based on theoretical frameworks; strategies and applications suitable for counseling and related fields.

Psyc 5990. Special Topics in Psychology and Counseling: (Various Titles to be Assigned). (1-4 cr [max 8 cr]; QP–Sr or grad student or #; SP–Sr or grad student or #; A-F only)
Analysis of selected advanced topics in psychology and/or counseling.

Psyc 5992. Directed Reading. (1-4 cr [max 4 cr]; QP–Grad student, #; SP–Grad student, #)
Readings in student's area of interest with faculty approval and direction; study to substantially further student's knowledge base of theory, research, and/or professional competencies; written report required.

Psyc 5993. Directed Study: Psychology and Counseling. (1-4 cr [max 8 cr]; QP–Grad student, #; SP–Grad student, #)
Individual in-depth explorations of psychological and/or counseling theories and principles approved and guided by faculty.

Psyc 5994. Directed Research. (1-4 cr [max 4 cr]; QP–5813 or equiv, #; SP–5051 or equiv, #)
Advanced individual research with faculty approval and direction; demonstration of sound theoretical foundations and research skills resulting in written report.

Psyc 5998. Residency: School Counseling, Grades K-8. (2-4 cr [max 4 cr]; QP–8510, 8532, 8541 at elementary school site; SP–8005, 8597 or 8797, 8697 or 8897, ed psy or couns psy MA student; A-F only)
Supervised school counseling and classroom teaching experience. Fulfills one-half year of full-time post-master's internship required for Minnesota licensure recommendation. Student is responsible for obtaining school site administrative and supervisory approvals before registration.

Psyc 5999. Residency: School Counseling, Grades 5-12. (2-4 cr [max 4 cr]; QP–8510, 8532, 8541 at a secondary school site; SP–8005, 8597 or 8797, 8697 or 8897, ed psy or couns psy MA student; A-F only)
Supervised school counseling and classroom teaching experience. Fulfills one-half year of full-time post-master's internship required for Minnesota licensure recommendation. Student is responsible for obtaining school site administrative and supervisory approvals before registration.

Psyc 8001. Ethical and Professional Issues in Community Counseling. (2 cr; QP–Ed psy grad major or #; SP–Couns psy grad major or #; A-F only)
Foundational and theoretical basis for practice of counseling in community settings. Contextual, ethical, and professional issues.

Psyc 8003. Ethical and Professional Issues in College Counseling. (2 cr; QP–Ed psy grad major or #; SP–Couns psy grad major or #; A-F only)
Core knowledge for counseling in college settings; characteristics and needs of college students from a developmental perspective. Ethical issues and professional role development for counselors.

Psyc 8005. Ethical and Professional Issues in School Counseling. (2 cr; QP–Ed psy grad major or #; SP–Couns psy grad major or #; A-F only)
Ethical and legal considerations in school counseling. History and philosophy of school counseling, current trends, and professional issues. Role and functions of school counselor contrasted with those of other professionals such as school psychologist or social worker. Program planning, management, and evaluation.
Course Descriptions

Psy 8101. Practicum: Developmental Outreach and Counseling. (2 cr; QP-5521, 5523, 5525, 5526, 5712, ed psy grad major or #; SP-5501, 5601, 5603, couns psy grad major or Δ; S-N only) Practice in individual and group counseling on UMD campus and other sites. Includes weekly one-to-one supervision and group supervision. Videotaping required.

Psy 8197. Internship I: Group Counseling in the Community. (3-6 cr; QP-8511, 8531, #; SP-8001, 8101, Δ; S-N only) Supervised practice of counseling skills with focus on group counseling at a community site. Videotaping required.

Psy 8297. Internship II: Individual Counseling in the Community. (3-6 cr; QP-8511, 8541, #; SP-8101, 8197, Δ; S-N only) Supervised practice of counseling skills with focus on individual counseling at a community site. Videotaping required.

Psy 8333. FTE: Master's. (1 cr; SP—Master’s student, adviser and DGS consent)

Psy 8397. Internship I: Group Counseling in Colleges. (3-6 cr; QP-8511, 8531, #; SP-8003, 8101, Δ; S-N only) Supervised practice of counseling skills with focus on group counseling at a college site. Videotaping required.

Psy 8497. Internship II: Individual Counseling in Colleges. (3-6 cr; QP-8511, 8531, #; SP-8003, 8397, Δ; S-N only) Supervised practice of counseling skills with focus on individual counseling at a college site. Videotaping required.

Psy 8597. Internship I: Group Counseling in Schools, K-8. (3-6 cr; QP-8510, 8531, #; SP-8101, Δ; S-N only) Supervised practice of counseling skills with focus on group counseling at a school site in grades K-8. Videotaping required.

Psy 8697. Internship II: Individual Counseling in Schools, K-8. (3-6 cr; QP-8510, 8531, #; SP-8005, 8101, 8597, Δ; S-N only) Supervised practice of counseling skills with focus on individual counseling at a school site in grades K-8. Videotaping required.

Psy 8797. Internship I: Group Counseling in Schools, 5-12. (3-6 cr; QP-8510, 8531, #; SP-8005, 8101, Δ; S-N only) Supervised practice of counseling skills with focus on group counseling at a school site in grades 5-12. Videotaping required.

Psy 8897. Internship II: Individual Counseling in Schools, 5-12. (3-6 cr; QP-8510, 8531, 8541; SP-8005, 8101, 8797, Δ; S-N only) Supervised practice of counseling skills with focus on individual counseling at a school site in grades 5-12. Videotaping required.

Recreation (Rec)

College of Education and Human Service Professions

Rec 1000. Introduction to Recreation. (4 cr; A-F only)
Overview of recreation and leisure and its impact on modern society.

Rec 1201. Outdoor Skills I. (2 cr; A-F only)
Instruction and practice in skills of fall and winter outdoor activities. Canoe camping, hiking, fishing, and hunting; equipment, shelters, and navigation.

Rec 1202. Outdoor Skills II. (2 cr; A-F only)
Instruction and practice in skills of winter and spring outdoor activities. Camping, basic packing, and fishing; equipment and navigation.

Rec 1203. Outdoor Skills I. (2 cr; QP—Rec major or minor or #; SP—Rec major or minor or #; A-F only) Instruction and practice in skills of fall and winter outdoor activities. Canoe camping, hiking, fishing, and hunting; equipment, shelters, and navigation.

Rec 1204. Outdoor Skills II. (2 cr; QP—Rec major or minor or #; SP—Rec major or minor or #; A-F only) Instruction and practice in skills of winter and spring outdoor activities. Camping, basic packing, and fishing; equipment and navigation.

Rec 3300. Recreation Programming. (3 cr; SP-3320 or 3340 or #; A-F only) Designing, presenting, and evaluating recreation programs. Components of planning, such as facilities management and equipment procurement. Leadership practices pertaining to outdoor education programs.

Rec 3310. Recreation Leadership. (2 cr; SP-3300 or #; A-F only) Practical and theoretical view of practices, methods, and processes involved in leadership development, including a detailed analysis of the qualities and roles of leaders in recreation activities. Field based; includes one-week camp trip.

Rec 3320. Recreational Sports. (3 cr; SP-1000 or #; A-F only) Organization and administration of intramural and formal sport programs in a recreational sport agency.

Rec 3327. Life Fitness Programs and Events Management. (3 cr; SP-3320 or #; A-F only) Organization and administration of life fitness activities and nonformal instruction in recreational sport programs. Design, implementation, and evaluation of large-scale recreational sports events such as triathlons and tournaments.

Rec 3341. Field Interpretive Techniques I. (3 cr; SP-1000 or #; A-F only) Techniques and methods used to interpret natural history of autumn and early winter environments. Emphasizes geomorphology, tree identification, and basic raptor ecology. Primarily field based at sites throughout northeastern Minnesota.

Rec 3342. Field Interpretive Techniques II. (3 cr; SP-3341 or #; A-F only) Techniques and methods used to interpret natural history of winter and spring environments. Ecology of winter, vernal ponds, spring wildflowers, biomes, and migratory birds. Primarily field based at sites throughout northeastern Minnesota.
Rec 4315. Recreation Management. (3 cr; SP—3300 or #; cannot apply cr to Graduate School program; A-F only) Methods and practice of administrative processes of personnel, fiscal, and facility management. Field study and presentation of a management plan.

Rec 4991. Independent Study. (1-4 cr; max 4 cr; SP—#; cannot apply cr to Graduate School program; A-F only) Independent project that would serve to further the student's knowledge base and/or professional competencies.

Rec 4992. Readings in Recreation. (1-4 cr; max 4 cr; SP—#; cannot apply cr to Graduate School program; A-F only) Supplementary readings and discussion in student's area of interest with faculty supervision.

Rec 4996. Recreation Internship. (12 cr; SP—Rec major; #; cannot apply cr to Graduate School program; S-N only) Supervised field experience in recreation agency.

Rec 4997. Recreation Practicum. (2 cr; SP—1000; #; cannot apply cr to Graduate School program; S-N only) Field-based experience through a selected recreation agency.

Rec 4998. Recreation Seminar. (1-3 cr; SP—Rec major; #; S-N only) Facilitated discussions and presentations of contemporary recreation research, curricula, and/or issues.

Safety (Safe)

College of Science and Engineering

Safe 3001. Safety Education. (2-3 cr; A-F only) Comprehensive approach to problems of safety in schools, home, community, and occupational world, emphasizing recognition, evaluation, control, and avoidance.

Safe 6001. OSHA and Other Regulatory Standards. (3 cr; SP—MIS student or Δ; can apply cr to MIS program only; A-F only) Overview of federal Occupational Safety and Health Act as well as other safety and health standards, codes, and regulations. Recognition of the more critical health and safety violations and guidelines for correcting workplace hazards.

Safe 6011. System Safety and Loss Control Techniques. (3 cr; SP—MIS student or Δ; can apply cr to MIS program only; A-F only) Analytical techniques of data collection, data analysis, and risk assessment in designing and implementing proactive system safety processes. Comprehensive approach to cost reduction and containment processes and programs, which minimize financial and accidental losses.

Safe 6012. Risk Management and Workers' Compensation. (2 cr; SP—MIS student or Δ; can apply cr to MIS program only; A-F only) Comprehensive overview of risk management strategies and insurance system; essential elements of workers' compensation cost reduction and containment programs in industry. Workers' compensation and occupational safety in preventing corporate financial losses.

Safe 6021. Physical Hazard Control. (3 cr; SP—MIS student or Δ; can apply cr to MIS program only; A-F only) Physical hazards in work environment and methods of control. Recognition of common and high hazard conditions, and design and application of corrective measures.

Safe 6051. Construction Safety. (2 cr; SP—MIS student or Δ; can apply cr to MIS program only; A-F only) Code of Federal Regulations 1926 and other standards and regulations that affect construction industry. Recognition, analysis, and corrective action.

Safe 6101. Principles of Industrial Hygiene. (3 cr; SP—MIS student or Δ; can apply cr to MIS program only; A-F only) Effects of chemical, physical, and biological agents on the body and typical methods of control; lab use of monitoring and corrective devices.

Safe 6102. Advanced Industrial Hygiene and Health Physics. (2 cr; SP—6101 or Δ; can apply cr to MIS program only; A-F only) Recognition, evaluation, and control techniques necessary for prevention of occupationally related diseases. Introduction to health hazards of radiated energy such as ionizing nuclear radiation and x-rays; nonionizing radiation hazards from microwaves, lasers, and infrared and ultraviolet light.

Safe 6111. Industrial Noise and Ventilation Control. (3 cr; SP—MIS student or Δ; can apply cr to MIS program only; A-F only) Physics of sound, industrial noise sources, effects of noise on humans, and noise control. Basic principles of ventilation as applied to control of air contaminants; elementary principles of design for exhaust ventilation systems; and fan specifications. Lab applications.

Safe 6112. Advanced Industrial Noise and Ventilation Control. (2 cr; SP—6111 or Δ; can apply cr to MIS program only; A-F only) Principles of noise control and ventilation for control of airborne chemical contaminants. Complex system design, principles and function of control devices, troubleshooting, and solutions to industrial problems. Field and lab applications.

Safe 6121. Epidemiology and Industrial Toxicology. (2 cr; SP—MIS student or Δ; can apply cr to MIS program only; A-F only) Introduction to principles and practice of toxicology as it relates to chemical hazards in the workplace. Interpretation and assessment of data and potential risk. Derivation and application of guidelines and regulations concerning toxic chemicals.

Safe 6201. Fire Prevention and Emergency Preparedness. (2 cr; SP—MIS student or Δ; can apply cr to MIS program only; A-F only) Hazard analysis and risk assessment as related to prevention and control of undesired fires; analytical study of flammable materials and extinguishing systems found in industrial settings; organization and development of emergency preparedness programs.
Course Descriptions

Safe 6211. Transportation Safety. (2 cr; SP-MIS student or Δ can apply cr to MIS program only; A-F only)
Study of health and safety programs used in rail, road, air, and marine transportation, emphasizing fleet safety programs.

Safe 6291. Independent Study in Industrial Safety. (1-3 cr; SP-MIS student or Δ can apply cr to MIS program only; S-N only)
Special projects, field studies, or research in industrial hygiene or safety topics

Safe 6295. Special Topics: (Various Titles to be Assigned). (1-3 cr; SP-MIS student or Δ can apply cr to MIS program only; A-F only)
Selected topics in industrial safety or hygiene. Similar topics may not be repeated for credit.

Safe 6301. Occupational Biomechanics and Work Physiology. (2 cr; SP-MIS student or Δ can apply cr to MIS program only; A-F only)
Overview to study physical interaction of workers with their tools, machines, and materials so as to enhance workers' performance while minimizing risk of future musculoskeletal disorders.

Safe 6302. Occupational Ergonomics and Injury Management. (3 cr; SP-MIS student or Δ can apply cr to MIS program only; A-F only)
Overview of occupational ergonomics and related disciplines such as work physiology, biomechanics, human anatomy, engineering design, medical management. Hands-on approach, including ergonomic job analysis, risk factor quantification, and documentation for demanding tasks.

Safe 6401. Environmental Safety and Legal Implications. (2 cr; SP-MIS student or Δ can apply cr to MIS program only; A-F only)
Federal, state, and local laws and judicial interpretations that have applications to environmental health and safety programs. Corporate responsibility regarding environment, employee, and product.

Safe 6801. Conference Leading and Team Dynamics. (2 cr; SP-MIS student or Δ can apply cr to MIS program only; S-N only)
Purposes, advantages, and limitations of team approach. Current theory, research, and application in group dynamics. Development of leadership skills in planning, leading, and evaluating conferences and other interactive situations.

Safe 6811. Behavioral Aspects of Safety. (2 cr; SP-MIS student or Δ can apply cr to MIS program only; A-F only)
Behavior-based approach to safety. Characterizes employees as mature human beings motivated to work safely through use of behavior-based programs.

Safe 6821. Organization and Administration of Safety Programs. (2 cr; SP-MIS student or Δ can apply cr to MIS program only; A-F only)
Current administrative practices. Involvement in design and development of safety programs suitable for an industrial facility.

Safe 6997. Internship in Industrial Safety. (3 cr; SP-MIS student or Δ can apply cr to MIS program only; S-N only)
Cooperative internship in an industrial, governmental, or other organization that has an established safety program or is in the process of implementing one. Requires a significant Plan B-type project for the firm.

School of Business and Economics (SBE)

School of Business and Economics

SBE 0102. Freshman Orientation. (0 cr; S-N only)
Orientation program for SBE students

SBE 1101. The Business Environment. (3 cr; A-F only)
Introduction to context, environment, and operation of business and organizations. Study of foundations and functional areas of business and entrepreneurship. Analysis of technological, ethical, diversity, and global issues from business and organizational perspectives.

Science (Sci)

College of Science and Engineering

Sci 3351. Chemistry for High School Teachers I. (2 cr;QP-Δ; SP-Δ)
Complete participation in Chem 2521—Organic Chemistry I required. Library research paper and special problems assigned. Lab includes experiments of particular importance to high school chemistry. (4 hrs lect, 3 hrs lab; offered summer only)

Sci 3352. Chemistry for High School Teachers II. (2 cr;QP-3351; SP-Δ)
Complete participation in Chem 2522—Organic Chemistry II required. Library research paper and special problems assigned. Lab assignments include experiments of particular importance to high school chemistry. (4 hrs lect, 3 hrs lab; offered summer only)

Social Work (SW)

College of Education and Human Service Professions

SW 1210. Global Issues. (3 cr; A-F only)
Global problems of war, peace, national security; population, food, hunger; environmental concerns, global resources; economic and social development; human rights. Examines issues from a global problem-solving perspective. Value, race, class, gender differences. Offered in day school and as an individualized learning program course on the World Wide Web.

SW 1619. Race, Class, and Gender in the United States. (3 cr; A-F only)
Race, class, and gender as pivotal dimensions in American society. Similarities and differences between groups, dynamics of discrimination, and efforts to meet needs and achieve potential for all groups in America.

SW 5032. Child Welfare and the Law. (2 cr)
Federal, state, and tribal laws and court processes regulating child welfare practice. Role of the social worker in legal proceedings.

SW 5061. Computers in the Human Services. (1-2 cr; SP-Jr or sr or grad student cr #)
Overview of computers in the human services, including word processing, spreadsheets, databases, communication, and Internet/World Wide Web. Emphasis on hands-on, practical applications.
SW 5091. Independent Study. (1-4 cr [max 8 cr]; SP-#) Directed reading, research, or other experiences leading to presentation of a report.

SW 5095. Special Topics in Social Work: (Various Titles to be Assigned). (1-4 cr [max 12 cr]) Proseminar on contemporary topics of concern to students and faculty. Topics announced in Class Schedule.

SW 5096. Special Project. (1-4 cr [max 8 cr]; SP-#; S-N only) Approval of faculty sponsor and field coordinator required to do a project in generalist or advanced generalist social work practice. Project may closely coordinate with another course or may be an independent area of interest.

SW 5098. Workshop: (Various Titles to be Assigned). (1-4 cr) Workshop on a topic of special concern to persons in the human services.

SW 5101. Human Behavior in the Social Environment. (3 cr; SP-Jr or sr or grad student or #; A-F only) Overview of social psychological and social systems concepts. Applications of concepts to social work and human service issues. Focus on individuals, human development, families, groups, organizations, communities, and society/culture.

SW 5104. Dynamics of Discrimination. (2 cr; SP-Jr or sr or grad student or #; A-F only) Conditions and processes fostering discrimination on the basis of "race," ethnicity, socioeconomic status, gender, sexual orientation, national origin, age, physical/mental functioning, and religion. Methods for reducing discrimination, particularly in the human service professions.

SW 5111. Grant Writing in the Human Services. (1-2 cr; SP-Jr or sr or grad student or #; A-F only) Overview of sources of grants: private foundations and public agencies. Needs assessment methodologies, budgeting, and program evaluation.

SW 5201. Social Welfare Policy. (3 cr; SP-Jr or sr or grad student or #; A-F only) Historical development of field of social welfare in the United States and emergence of social work profession. Social policy analysis techniques and ways to influence social policy and vulnerable/minority issues.

SW 5222. Intervention in Family Violence. (1-2 cr; SP-Jr or sr or grad student or #; A-F only) Current theory, research, and practice in field of family violence. Multidisciplinary assessment and intervention skills for working with families with diverse backgrounds.

SW 5235. American Indians and Social Policy. (2 cr; SP-5201 or #) Informs human service providers of policies affecting American Indians, including relationships of tribal governments with the United States and Minnesota governments, the interface between Indian and non-Indian service delivery systems, and Indian culture and politics.

SW 5271. Women and Social Policy. (2 cr; SP-Jr or sr or grad student or #; A-F only) Policies affecting the well-being of women; strategies for better meeting women's needs. Focuses on policies that affect women's roles and statuses within the domestic unit and within larger economic and political spheres.

SW 8006. Advanced Generalist Seminar. (2 cr; SP-Admission to advanced standing MSW program or #; A-F only) Introduction to advanced generalist practice in the social work profession. Review of foundation theory, knowledge, and skills for generalist practice.

SW 8021. Methods of Clinical Social Work Practice. (1-2 cr; SP-8111 or admission to advanced standing MSW program or #; A-F only) Advanced skill development in clinical assessment and intervention. Through an ecologically based framework, students learn how to address a wide variety of micro-level problems involving many different populations. Social work applications of the DSM-IV.

SW 8031. Child Welfare. (1-2 cr; SP-Soc work grad major or #; A-F only) Overview of current policy, practice, and research issues in child welfare practice. Emphasis on concerns of oppressed populations, such as the Indian Child Welfare Act and its implementation, gay/lesbian custody issues, kinship care, and culturally competent practice.

SW 8051. School Social Work. (1-2 cr; SP--Soc work grad major or #; A-F only) Overview of social work practice in educational settings, roles and functions of social workers within a complex ecological system, and skills and knowledge needed by social workers in a school setting.

SW 8101. Introduction to Research. (2 cr; SP-Soc work grad major or #; A-F only) Introduction to social science research and its applications to social work and social welfare.

SW 8102. Advanced Research. (2 cr; SP-8101 or admission to advanced standing MSW program or #; A-F only) Application of social science knowledge and skills to evaluate practice and to conduct community-based research and program evaluation projects.

SW 8103. Project Seminar I. (1 cr; SP-M-8102; S-N only) Application of research knowledge and skills to beginning stages of students' master's research paper (Plan B). Issues addressed: topic selection, literature reviews, formulation of research questions/hypothesis, data gathering instruments, methods of data analysis, proposal development.

SW 8104. Project Seminar II. (1 cr; SP-8103; S-N only) Application of research knowledge and skills to final stages of master's research project. Data collection and analysis procedures applied to the Plan B paper.

SW 8111. Generalist Practice: Micro. (4 cr; SP-Soc work grad major or #; A-F only) Overview of generalist social work practice, ethics, ecological perspective, and problem-solving model. Application to individuals, families, and groups and to diverse populations. Development of counseling skills.

SW 8112. Generalist Practice: Mezzo and Macro. (3 cr; SP-8111; A-F only) Problem-solving models of engagement, data collection, assessment, planning, intervention, evaluation, and termination with communities, task-centered groups, and organizations. Introduction to grant writing. Emphasis on community resource development with diverse populations.

SW 8333. FTE: Master's (1 cr; SP-Master's student, adviser and DGS consent)
SW 8441. Advanced Practice: Individuals, Families, and Small Groups. (2 cr; SP—8112 or advanced standing MSW student; A-F only) Examines a range of social work practice theories and their application to practice with individuals, families, and groups. Advanced skills in assessment and intervention in addressing complex problems with a focus on micro practice. Application to diverse populations and settings.

SW 8442. Advanced Group Work. (1-2 cr; SP—8441) Conceptual knowledge and applied experiences needed to lead groups in a variety of social work settings serving diverse populations. Treatment groups and task groups (on both the organizational and community levels). Builds on the advanced generalist framework.

SW 8551. Advanced Practice: Administration. (2 cr; SP—8112 or advanced standing MSW student; A-F only) Mezzo-level (administrative) knowledge and skills for management positions in human services organizations. Organizational theory, management functions, and supervision presented within problem-solving model. Information on vulnerable/minority issues.

SW 8661. Advanced Practice: Rural and Urban Community Organizing. (2 cr; SP—8112, advanced standing MSW student; A-F only) Intensive exposure to specific strategies and tactics for organizing and advocacy at community, regional, and state levels. Rural development, social policy, and social planning within problem-solving and ecological systems models. Attention to macro practice with diverse populations.

SW 8771. Health in American Indian Communities. (2 cr; SP—5235 or #; A-F only) Introduction to historical and contemporary concepts of American Indian health. Policy issues, cultural and sensitivity knowledge, and practice methods with American Indian clients and communities at micro, mezzo, and macro levels of intervention.

SW 8801. Field Placement I. (4-8 cr; max 8 cr; SP—8111 or 8112, 8111, 8112 or 8112, soc work grad major; enrollment required for entire academic yr or summer or #; S-N only) Practicum experience with emphasis on developing knowledge and skill base for “beginning generalist” practice in a community agency. Concurrent seminar assists students in integrating classroom theories and intervention methodologies with field experiences. Application to diverse populations.

SW 8802. Field Placement II. (4-8 cr; SP—8841, 8551, 8661 or #, soc work grad major; enrollment required for entire academic year or as summer block placement; S-N only) Developing knowledge and skill base for “advanced generalist” practice in a community agency. Concurrent seminar focuses on integrating classroom theories and intervention methodologies with experiences with client systems at micro, mezzo, and macro levels of practice. Attention to vulnerable/minority issues.

SW 8881. Dynamics of American Indian Families. (2 cr; SP—5235 or #; A-F only) Introduction to traditional and contemporary concepts relating to American Indian families. Public policy, social problems, cultural strengths, conflicts, and culturally competent social work practice.

SW 8991. Practice in the American Indian Community. (2-4 cr; SP—soc work grad major, 8771 or 8881, #; S-N only) Gives MSW students supervised direct practice experience in the American Indian community. Application of cultural knowledge and culturally competent practice skills.

**Sociology (Soc)**

**College of Liberal Arts**

**Soc 1101. Introduction to Sociology.** (3 cr; A-F only) Introduction to sociological concepts and their application.

**Soc 1201. Sociology of the Family.** (3 cr; A-F only) The family as a basic social institution: similarities and variations in family systems, their interrelationships with other institutions, and patterns of continuity and change.

**Soc 1301. Introduction to Criminology.** (3 cr; A-F only) Analysis of social justice with emphasis on criminal justice system in United States. Nature and extent of crime; social factors related to criminal behavior.

**Soc 2001. Sociological Perspective.** (3 cr; SP—1101 or 1301; A-F only) Sociological approach to explanation. Structural versus individual perspective. Major sociological explanatory concepts. Introduction to research design, sampling, data collection, and data analysis. Relationships between variables and rules of evidence. Differences and similarities between sociological and common-sense explanations.

**Soc 2111. Sociological Theory.** (3 cr; SP—1100 or Anth 1604 or #; SP—1101, 2001 or #; A-F only) Analysis of classical and contemporary sociological theory. Major theorists, including Durkheim, Weber, and Marx; major paradigms and their importance to sociological thought.

**Soc 2306. Deviance.** (3 cr; SP—1100, 1500, crim major or soc major or minor or crim-soc major, 40 cr or #; SP—1301, 2001 or #; A-F only) Behaviors, beliefs, and physical characteristics defined as deviant; legal and other formal and informal reactions to deviance; subjective and objective effects of being defined as deviant.

**Soc 3151. Research Methods and Analysis.** (3 cr; SP—1500, 3305 or 3400 or Anth 5626 or Δ, crim major or soc major or minor or crim-soc major or anh major or minor; SP—Crim major or soc major or minor or crim-soc major, 30 cr or #; A-F only) Logic of social scientific explanation. Research designs and measurement issues. Survey of quantitative and qualitative techniques of data analysis as they relate to theory and research procedures. Basic descriptive and inferential techniques and critical evaluation of published research.

**Soc 3152. Applied Research.** (3 cr; SP—3500 or Δ, crim major or soc major or minor or crim-soc major or anh major or minor; SP—3151 or #, crim major or soc major or minor or crim-soc major, 30 cr or #; A-F only) Continuation of Soc 3151. Emphasis on analysis of quantitative and qualitative data and logic of statistical inference. Application of course material in design and implementation of a research project.
Soc 3322. Law and Society. (3 cr; QP-1100, 40 cr or #; SP-Crim major or soc major or minor or soc-crim major, 30 cr or #; A-F only) Complexities, organization, and elements of legal systems, particularly in the United States. Legal theory used to explain the "working" of the law, historical development of law, current issues in law, and overall interrelationship between law and society.

Soc 3324. Sociology of Criminal Law. (3 cr; QP-1100, 1500, crim major or soc major or minor or crim-soc major, 55 cr or #; SP-3322, crim major or soc major or minor or crim-soc major, 30 cr or #; A-F only) Nature, goals, and problems in administration of the American criminal judicial process.

Soc 3326. Justice, Women, and Race. (3 cr; QP-1100 or 1300 or WS 1100, 40 cr or #; SP-Crim major or soc major or minor or crim-soc major, 30 cr or #; A-F only) Experiences of women and minorities in U.S. justice system. Attitudes toward crime and justice from perspective of women and minorities both as defendants and practitioners.

Soc 3328. Delinquency and Juvenile Justice. (3 cr; QP-1100, crim major or soc major or minor or crim-soc major, 40 cr or #; SP-3322, crim major or soc major or minor or crim-soc major, 30 cr or #; A-F only) Delinquency in contemporary American society. Major issues concerning causes, prevention, and treatment of juvenile offenders. Focus on U.S. juvenile justice system.

Soc 3342. Law Enforcement Administration. (3 cr; QP-1100, 40 cr or #; SP-Crim major or soc major or minor or crim-soc major, 30 cr or #; A-F only) Nature, goals, and problems of law enforcement agencies. Defines management as it relates to law enforcement processes.

Soc 3344. Law Enforcement and Society. (3 cr; QP-1100, 40 cr or #; SP-Crim major or soc major or minor or crim-soc major, 30 cr or #; A-F only) Role of police and relationship of law enforcement to the community; focuses on crime prevention.

Soc 3361. Correctional Continuum. (3 cr; QP-1100, crim major or soc major or minor or crim-soc major, 40 cr or #; SP-1101, crim major or soc major or minor or crim-soc major, 30 cr or #; A-F only) Analysis of traditional and nontraditional corrections programs for juveniles and adults. Cross-cultural examination of historical development of prisons and other correctional approaches and social forces involved in creation of penal sanctions.

Soc 3363. Correctional Agency Administration. (3 cr; QP-1300, crim major or soc major or minor or crim-soc major, 90 cr or #; SP-3361, crim major or soc major or minor or crim-soc major, 30 cr or #; A-F only) Assumptions, theories, and research related to change, control, and management in correctional systems. Evolution of management theory and effects of law, media, and the community on management of corrections organizations.

Soc 3395. Special Topics in Criminology: (Various Titles to be Assigned). (1-3 cr; max 6 cr; QP-90 cr or grad student or #; SP-90 cr or grad student or #; A-F only) Contemporary topics. Course announced in Class Schedule.

Soc 3595. Special Topics in Sociology: (Various Titles to be Assigned). Contemporary topics. Course announced in Class Schedule.

Soc 3701. Social Psychology. (3 cr; QP-1100, 40 cr or #; SP-2001, 30 cr or #; A-F only) Theory and research issues regarding relation of individual to society. Socialization, effects of social organization and disorganization, and interpersonal interaction.

Soc 3821. Sociology of Community. (3 cr; QP-3800, 70 cr or #, crim major or soc major or minor or crim-soc major or anth major or minor; SP-2111, 30 cr or #; A-F only) Theoretical orientations and empirical investigations of community structure, processes, conflict, and change. Community components and types; community development strategies reviewed and applied.

Soc 3831. Organization and Society. (3 cr; QP-1100, 40 cr or #; SP-Crim major or soc major or minor or crim-soc major, 30 cr or #; A-F only) Sociological examination of structure and processes of public and private formal organizations and patterns of adaptation to external social environments. Role of voluntary organizations in society.

Soc 3901. Social Change and Social Policy. (3 cr; QP-1100, 40 cr or #; SP-2111, 30 cr or #; A-F only) Social change and maintenance forces as they affect social life. Emphasis on social theory and research along with formation and implementation of social policy leading to both change and maintenance.

Soc 3945. Social Stratification. (3 cr; QP-1100, 40 cr or #; SP-2111, crim major or soc major or minor or crim-soc major, 30 cr or #; A-F only) Structural investigation of effect of social class on people's lives. Theories and research on social class; social mobility theory and effects. Intertwining of social class, gender, and race/ethnicities.

Soc 4382. Victimology. (3 cr; QP-1300, 90 cr or #; SP-3322 or 4925 or 4935, crim major or soc major or minor or crim-soc major, 60 cr or grad student or #; cannot apply cr to Graduate School program; A-F only) Extent, nature, and forms of criminal victimizations; profiles of crime victims; coping strategies; victims' rights; impact of victimizations on victims and nonvictims; victim attitudes about crime and interactions with justice system; evaluation of victim service programs.

Soc 4395. Special Topics in Criminology: (Various Titles to be Assigned). (1-3 cr [max 6 cr]; QP-90 cr or grad student or #; SP-90 cr or grad student or #; A-F only) Proseminar on contemporary topics. Course announced in Class Schedule.

Soc 4587. Internship Preparation. (1 cr; SP-#; cannot apply cr to Graduate School program; A-F only) Introduction to internship by learning about internship expectations, developing internship objectives, exploring internship opportunities, and developing an application for an internship.

Soc 4595. Special Topics in Sociology: (Various Titles to be Assigned). (1-3 cr [max 6 cr]; QP-90 cr or grad or #; SP-90 cr or grad or #; A-F only) Proseminar on contemporary topics. Course announced in Class Schedule.
Course Descriptions

**Soc 4597. Internship.** (1-14 cr [max 14 cr]; QP—#; SP—#; cannot apply cr to Graduate School program; S-N only) Supervised lab experience in a human service agency or project.

**Soc 4598. Workshop: (Various Titles to be Assigned).** (1-3 cr [max 6 cr]; QP—90 cr or grad student or #; SP—60 cr or grad student or #; S-N only) Topics of current general interest.

**Soc 4715. Popular Culture.** (3 cr; QP—1100, 40 cr or #; SP—3701, 60 cr or grad student or #; cannot apply cr to Graduate School program; A-F only) What qualifies as American popular culture, methodologies used to study popular culture, and sociological significance of such study.

**Soc 4860. Environmental Sociology.** (3 cr; QP—120 cr or grad student or #; SP—90 cr or grad student or #; A-F only) Introduction to environmental sociology—the relationship between social structure, human behavior, and the physical environment. Focuses on the "natural" environment, not the "built" environment.

**Soc 4862. Technology and Society.** (3 cr; QP—1100, 1500, 120 cr or #; SP—90 cr or grad student or #; A-F only) Applying sociological principles and methods to assessing effects of technology on communities, institutions, organizations, and individuals. Emphasis on topics involving cross-discipline effects.

**Soc 4911. Alcoholism and Other Addictions.** (3 cr; QP—1100, 1500, 90 cr or grad student or #; SP—90 cr or grad student or #; A-F only) Addictions considered by way of etiologies, social and behavioral involvement, treatment approaches, helping resources, outcome research, and public policy.

**Soc 4925. Sociology of Rape.** (3 cr; QP—1100 or 1300 or WS 1100, 40 cr or #; SP—1101 or 1301, 60 cr or grad student or #; A-F only) Social, moral, and legal definitions and implications of rape.

**Soc 4935. Conflict and Violence.** (3 cr; QP—1300, 3350, 40 cr or #; SP—Crim major or soc major or minor or crim-soc major, 60 cr or grad student or #; A-F only) Historical and contemporary reality and theoretical explanations of conflict and violence in society. Criminal justice and other societal responses to conflict and violence.

**Soc 4947. Sociology of Women.** (3 cr; QP—1100, 40 cr or #; SP—Crim major or soc major or minor or crim-soc major or 60 cr or grad student or #; A-F only) Women's status and role in society and culture from a structural approach. Behavior patterns, assumptions, social realities, and social institutions. Intertwining nature of gender, race, and social class.

**Soc 4949. Race and Ethnic Relations.** (3 cr; SP—Crim major or soc major or minor or crim-soc major or 60 cr or grad student or #; A-F only) Overview of race and ethnic relations in America; conditions of major racial and ethnic minorities; formation of racial/ethnic identities, sources of prejudice, discrimination; intergroup conflict; assimilation; persistence of ethnicity; intergroup diversity; major racial and ethnic groups; the new immigrants.

**Soc 4991. Independent Study in Sociology.** (1-3 cr [max 6 cr]; QP—Δ; SP—#; cannot apply cr to Graduate School program; A-F only) Directed reading, research, or involvement in social action leading to preparation of a paper or other product.

**Soc 4999. Honors Project.** (1-3 cr [max 6 cr]; QP—3520 or 3530, 120 cr, approval by dept honors program director; SP—90 cr, approval by dept honors program director; cannot apply cr to Graduate School program; A-F only) Advanced individual project in any area of sociology, demonstrating sound theoretical and research foundations and resulting in a written report.

### Spanish (Span)

**College of Liberal Arts**

**Span 1101. Beginning Spanish I.** (4 cr; A-F only) Conversation and communicative course for students with little or no previous study of Spanish. Emphasis on oral and aural skills; some grammar. Taught primarily in Spanish, with some English.

**Span 1102. Beginning Spanish II.** (4 cr; QP—1301 or equiv or #; SP—1-2 yrs high school Span or 1101 or #; A-F only) Conversation and communicative course for students with limited previous study of Spanish. Emphasis on oral and aural skills; some grammar. Taught primarily in Spanish, with some English.

**Span 1201. Intermediate Spanish I.** (4 cr; QP—Lang 1103 or equiv or #; SP—3-4 yrs high school Span or 1102 or #; A-F only) Consolidation and enrichment of previously acquired abilities in speaking and understanding Spanish, set within introduction to written Spanish and survey of contemporary culture of Spanish-speaking societies. Emphasis on oral, aural, and reading skills; vocabulary building; some writing. Taught in Spanish.

**Span 1202. Intermediate Spanish II.** (4 cr; QP—1502 or equiv or #; SP—4 yrs high school Span or 1201 or #; A-F only) Consolidation and enrichment of previously acquired abilities in speaking and understanding Spanish, set within introduction to written Spanish and survey of contemporary culture of Spanish-speaking societies. Emphasis on oral, aural, and reading skills; vocabulary building; some writing. Taught in Spanish.

**Span 1540. Freshman Seminar: Hispanic Realities.** (4 cr; SP—Fewer than 30 cr; A-F only) Literary and artistic works from Spain and Latin America which demonstrate cultural perspectives of reality.

**Span 2301. Advanced Spanish.** (4 cr; QP—1503 or equiv or #; SP—5 yrs high school Span or 1202 or #; A-F only) Development of Spanish literacy within a culturally authentic contemporary context. Emphasis on practical writing and formal oral and aural communication skills; vocabulary building; enhancement of reading skills; review of key grammar. Taught in Spanish.

**Span 2540. Latino Literatures and Cultures.** (3 cr; SP—Offered alt yrs; A-F only) Literatures and cultures of Latinos in the United States, with attention to their particular issues. Some readings in Spanish for the occasional Spanish major/minor student. Taught in English (unless entire class composed of students of Spanish).
Span 3030. Spanish Language Study Abroad. (1-4 cr [max 12 cr]; SP-1202, #; offered abroad only)
Advanced language study abroad.

Span 3040. Culture Study Abroad. (1-4 cr [max 24 cr]; SP- #; offered abroad only)
Study abroad of Spanish or Hispanic American culture.

Span 3042. Hispanic American Civilization and Culture. (4 cr; SP-3002 or equiv, C or better in last advanced Span language class taken or #; SP-2301 with C or better or #; offered alt yrs; A-F only)
Survey of important aspects of Hispanic American civilization and culture, pre- and post-Encounter. Taught in Spanish.

Span 3044. Spanish Civilization and Culture. (4 cr; SP-3002 or equiv, C or better in last advanced Span language class taken or #; SP-2301 with C or better or #; offered alt yrs; A-F only)
Historical survey. Taught in Spanish.

Span 3050. Mexican Culture. (3 cr; QP-3002 or equiv, #; SP-1202, C or better in last Span lang class taken and #; offered in Mexico; A-F only)
Study of Mexican culture, past and present, through on-site study. Taught in Spanish.

Span 4011. Hispanic American Prose. (4 cr; QP-3002 or equiv, C or better in last advanced Span language class taken or #; SP-2301 with C or better or #; cannot apply cr to Graduate School program; offered every 3rd yr; A-F only)
Prose fiction with emphasis on 20th and 21st centuries. Attention also to cultural background. Taught in Spanish.

Span 4013. Hispanic American Poetry and Drama. (4 cr; SP-3002 or equiv, C or better in last advanced Span lang class taken or #; SP-2301 with C or better or #; cannot apply cr to Graduate School program; offered every 3rd yr; A-F only)
Emphasis on 20th and 21st centuries. Attention also to cultural background. Taught in Spanish.

Span 4018. Hispanic America From Within. (4 cr; QP-3002 or equiv, C or better in last advanced Span lang class taken or #; SP-2301 with C or better or #; cannot apply cr to Graduate School program; offered every 3rd yr; A-F only)
Study of selected Hispanic American countries; historical, political, cultural, and other defining moments, and literary expressions of those moments, with goal of seeing the country "from within." Taught in Spanish.

Span 4022. Medieval and Golden Age Spain. (4 cr; QP-3002 or equiv, C or better in last advanced Span lang class taken or #; SP-2301 with C or better or #; cannot apply cr to Graduate School program; offered every 3rd yr; A-F only)
Survey of representative literary works, with attention to literature and cultural background. Taught in Spanish.

Span 4025. Cervantes. (4 cr; QP-3002 or equiv, C or better in last advanced Span lang class taken or #; SP-2301 with C or better or #; cannot apply cr to Graduate School program; offered every 3rd yr; A-F only)
Study of representative short works by Cervantes and his masterpiece Don Quijote as literary expressions of the time and with respect to the modern novel. Taught in Spanish.

Span 4026. 20th-Century Spain and Beyond. (4 cr; QP-3002 or equiv, C or better in last advanced Span lang class taken or #; SP-2301 with C or better or #; cannot apply cr to Graduate School program; offered every 3rd yr; A-F only)
Poetry, drama, and prose fiction of 20th and 21st centuries, with attention to literary period and genre and to cultural background. Taught in Spanish.

Span 4090. Aspects of the Hispanic World. (4 cr [max 8 cr]; QP-3002 or equiv, C or better in last advanced Span lang class taken or #; SP-2301 with C or better or #; cannot apply cr to Graduate School program; A-F only)
Sociopolitical, historical, literary, and cultural events of major importance in Hispanic America, Spain, or among Latinos in the United States.Taught in Spanish.

Span 4091. Independent Study. (1-3 cr [max 6 cr]; QP-3002 or equiv, C or better in last advanced Span lang class taken or #; SP-2301 with C or better or #; cannot apply cr to Graduate School program; A-F only)
Students devise programs of reading and research in consultation with instructor to expand upon a topic related to one studied in regular coursework. Taught in Spanish.

Span 4095. Special Topics in Spanish: [Various Titles to be Assigned]. (4 cr [max 8 cr]; QP-3002 or equiv, C or better in last advanced Span lang class taken or #; SP-2301 with C or better or #; cannot apply cr to Graduate School program; A-F only)
Literature and/or culture of Spanish-speaking populations; Spaniards, Hispanic Americans, or Latinos in the United States. Taught in Spanish.

Span 4096. Field Study. (1-4 cr [max 8 cr]; QP-3002 or equiv, C or better in last advanced Span lang class taken or #; SP-2301 with C or better or #; cannot apply cr to Graduate School program; A-F only)
Students work with some aspect of community service for Latinos in Minnesota, as available.

Special Education (SpEd)

College of Education and Human Service Professions

SpEd 1357. Individuals With Disabilities in Society. (3 cr; A-F only)
Major types of disabilities and giftedness, including definitions, causes, characteristics, and educational implications. Disability perspectives, Social, legal, and educational considerations of disability issues.

SpEd 3103. Infants and Toddlers With Special Needs. (4 cr; SP-ECh or SpEd major or #; A-F only)
Causation and development of disabling conditions in infants and toddlers. Effective intervention techniques in a variety of settings involving interagency collaboration and family involvement. Practicum.

SpEd 3105. Young Children With Special Needs: Ages Three to Eight. (4 cr; SP-#; A-F only)

SpEd 3205. Assessment in Early Childhood Special Education. (4 cr; SP-5103, 5105; A-F only)

SpEd 5103. Infants and Toddlers With Special Needs. (4 cr; SP-ECh or SpEd major or #; A-F only)
Causation and development of disabling conditions in infants and toddlers. Effective intervention techniques in a variety of settings involving interagency collaboration and family involvement. Practicum.
Course Descriptions

SpEd 5105. Young Children With Special Needs: Ages Three to Eight. (4 cr; SP-2103 or #; A-F only)

SpEd 5204. Special Education Assessment: Mild Disabilities. (4 cr; SP-90 cr, 5433 or #; A-F only)
Theory of assessment of students with mild disabilities; knowledge and practice in selecting and administering standardized tests and informal assessment instruments and in designing and conducting behavioral observations; scoring and interpreting assessment results for eligibility and educational planning decisions. Practicum.

SpEd 5205. Assessment in Early Childhood Special Education. (4 cr; SP-5103, 5105)

SpEd 5300. Special Education Seminar. (1 cr [max 6 cr]; SP-90 cr or #; cannot apply cr to Graduate School program)
In-depth discussion of practices, trends, issues, and problems related to student’s selected area in special education.

SpEd 5310. Adapting for Diverse Learners in General Education Settings. (4 cr; SP-ElEd or EdSe major or #; cannot apply cr to Graduate School program) Application of foundational knowledge of special education, Section 504 requirements, and students with disabilities and diverse learning needs to school curricula and environments at all levels. Understanding general educators’ responsibilities in the special education process. Skills in making adaptations and accommodations.

SpEd 5351. Learning Disabilities Characteristics and Interventions. (4 cr; SP-5433 or #; A-F only)
Characteristics of learning disabilities, emphasizing language and processing deficits and how they interfere with academic achievement and social relationships; assessment and intervention approaches for students with learning disabilities. Practicum.

SpEd 5381. Behavior Management Strategies. (4 cr; SP-90 cr, 5433 or #; A-F only)
Models of behavior change for preschool, elementary, and secondary students; identification and assessment of problem behaviors; proactive and reactive strategies for managing disruptive behavior; application of applied behavior analysis to modifying behaviors; legal and ethical issues in behavior change.

SpEd 5382. Advanced Theory and Practice in Emotiona!l Behalvioral Disorders. (4 cr; SP-5204, 5381 or #)
Behavioral and emotional disorders of school-aged children and youth; assessment approaches, models of instruction, curricula, advanced application of skills to change behaviors, crisis intervention skills, knowledge of community resources and services. Practicum.

SpEd 5433. Foundations in Special Education. (4 cr; SP-90 cr or #)
History, philosophy, theories, and issues of special education. Overview of special education rules and processes. Survey of exceptionalities, including disability perspectives.

SpEd 5435. Parent and Professional Communication and Collaboration. (4 cr; SP-5433 or #)
Group process, problem solving, decision making, collaboration, and teamwork applied to the special education process. Techniques for working with parents, professionals, paraprofessionals, and community agencies when planning and implementing Individualized Educational Plans.

SpEd 5452. Academic Interventions for Students With Disabilities. (4 cr; SP-5433, ElEd methods or #; A-F only)
Understanding various models for teaching students with reading, writing, or math difficulties; development of intervention plan based on assessment and observation. Practicum.

SpEd 5455. Instructional Strategies and Transitional Planning. (4 cr; SP-5433 or #; A-F only)
Overview and instruction in various learning strategies for middle and high school-age students with disabilities. Assessment procedures, planning and instructional methods to help students make the transition from school to postsecondary training, education, and employment. Practicum.

SpEd 5600. Student Teaching. (1-12 cr [max 12 cr]; SP-#; cannot apply cr to Graduate School program; S-N only)
Observational, evaluative, and instructional experience with students with disabilities in K-12 settings. Seminar included.

SpEd 5601. Student Teaching Seminar. (1 cr; SP-5600; cannot apply cr to Graduate School program)
Instruction and application of complete individual education planning process, field debriefing, career planning.

SpEd 5901. Research in Special Education. (1-9 cr; SP-#)
Directed independent study, readings, or projects of interest to student.

SpEd 5991. Independent Study. (1-6 cr [max 6 cr]; SP-#; A-F only)
Directed independent study, readings, or projects of interest to student. Specific title and content announced in Class Schedule.

SpEd 5993. Special Area Project. (1-4 cr; SP-#; cannot apply cr to Graduate School program; A-F only)
Independent project for advanced students to substantially further their theoretical knowledge base or professional competencies.

SpEd 5995. Topics in Special Education. (Various Titles to be Assigned). (1-6 cr [max 12 cr]; A-F only)
Current issues to meet needs and interests of various groups, particularly practicing professionals. Topics vary; specific title and content announced in Class Schedule.

SpEd 5998. Workshop: (Various Titles to be Assigned). (1-6 cr [max 6 cr]; SP-Tchg exper or #; A-F only)
Topics vary. Specific titles announced in Class Schedule.

SpEd 7710. Practice, Research, and Leadership I. (3 cr; SP-MEd student or #; A-F only)
Analysis of research approaches, preparation standards, leadership skills, and current issues and trends in special education, leading to a professional development plan. Information technology, professional ethics, and reflective change processes.

SpEd 7720. Practice, Research, and Leadership II. (3 cr; SP-7710 or #; A-F only)
Synthesis of research methods, special education research in selected areas, and change processes for groups in order to increase one’s leadership capacity. Technology-based sources of educational research, leadership models, and strategic planning processes.
SpEd 7730. Practice, Research, and Leadership III. (3 cr; SP-7720 or #; A-F only)
Application of research and leadership skills to improve one's practice in special education. Educational organizations and approaches to organizational change. Socialization into leadership roles in special education profession through presentations, publications, and participation in national discussions.

Statistics (Stat)

Mathematics and Statistics

College of Science and Engineering

(See Mathematics for Math courses.)

Stat 1411. Introduction to Statistics. (3 cr; QP-Math 1003; SP-Math 1004 or math placement or A-F only)
Statistical ideas involved in gathering, describing, and analyzing observational and experimental data. Experimental design, descriptive statistics, correlation and regression, probabilistic models, sampling, and statistical inference.

Stat 2411. Statistical Methods. (3 cr; QP-Math 1250; SP-Math 1250 or math placement; A-F only)
Graphical and numerical descriptions of data, elementary probability, sampling distributions, estimations, confidence intervals, one-sample and two-sample t-test.

Stat 3611. Introduction to Probability and Statistics. (4 cr; QP-Math 1297; SP-Math 1160 or Math 1296; A-F only)
Basic probability, including combinatorial methods, random variables, mathematical expectation. Binomial, normal, and other standard distributions. Moment-generating functions. Basic statistics, including descriptive statistics and sampling distributions. Estimation and statistical hypothesis testing.

Stat 4011. Actuarial Probability and Statistics. (1 cr; QP-5596; SP-5572; cannot apply cr toward Math major or minor or M5 in applied and computational math; S-N only)
Problem-solving techniques in probability and statistics needed in actuarial work.

Stat 4021. Actuarial Time Series. (1 cr; SP-5511, 5531, 5571; A-F only)
Problem-solving techniques in time-series analysis needed in actuarial work. (offered alt yrs)

Stat 5411. Analysis of Designed Experiments. (3 cr; QP-3062 or 3563, 5561, 5562, Math 3320; SP-2411 or 3611)
Analysis of variance techniques as applied to scientific experiments and studies. Randomized block designs, factorial designs, nesting. Checking model assumptions. Using statistical computer software.

Stat 5511. Regression Analysis. (3 cr; QP-3563, Math 3320; SP-3611, Math 3280 or Math 3320; A-F only)

Stat 5515. Multivariate Statistics. (3 cr; QP-5561, 5562; SP-5411, Math 3280 or Math 3320)
Hotelling T², multivariate analysis of variance, canonical correlation, discriminant analysis, principal components. Use of computer software. (offered alt years)

Stat 5531. Probability Models. (4 cr; QP-3562, 5585 or 5595, Math 3298; SP-3611, Math 1297; A-F only)
Development of probability models and their applications to science and engineering. Classical models such as binomial, Poisson, and exponential distributions. Random variables, joint distributions, expectation, covariance, independence, conditional probability. Markov processes and their applications. Selected topics in stochastic processes.

Stat 5571. Probability. (4 cr; QP-3562, Math 3350; SP-3611, Math 3298; A-F only)

Stat 5572. Statistical Inference. (4 cr; QP-3563, 5595; SP-5571; A-F only)
Developing statistical theory of general linear model. Distribution theory, testing, and estimation. Analysis of variance and regression. (offered alt yrs)

Stat 8444. FTE: Doctoral. (1 cr; SP-Doctoral student, adviser and DGS consent)

Stat 8611. Linear Models. (3 cr; QP-5596, Math 5326; SP-5515; A-F only)
Developing statistical theory of general linear model. Distribution theory, testing, and estimation. Analysis of variance and regression. (offered alt yrs)

Stat 8666. Doctoral Pre-Thesis Credits. (1-18 cr; SP-Max 18 cr per semester or summer; doctoral student who has not passed prelim oral; S-N only)

Stat 8711. Statistics Seminar. (3 cr; QP-8; SP-5572; S-N only)
Applications of probabilistic and statistical modeling methods, such as linear and nonlinear regression, generalized linear models, Markov chains, and Poisson processes. Case-study analyses of models from areas such as natural sciences, medicine, engineering, and industry.

Stat 8888. Thesis Credits: Doctoral. (1-18 cr; SP-Max 18 cr per semester or summer; 24 cr required)

Supportive Services Program (SSP)

Academic Support and Student Life

SSP 1000. Introduction to College Learning. (1-2 cr; A-F only)
Program to help facilitate the successful transition into college learning and student life at UMD.

SSP 1003. Basic Mathematics and Introductory Algebra. (3 cr; SP-Math 1004; cannot apply cr toward degree; S-N only)
Computational math skills and applications, including arithmetic, introductory geometry, and introductory algebra.
SSP 1052. College Writing Strategies. (2 cr; SP-6Comp 1120; S-N only) Individualized approach to learning skills necessary for argumentative writing process, including development of individual writing process, organization of argumentative paragraph and essay, and beginning research/library skills.

SSP 1054. College Study Strategies. (1 cr; S-N only) Time management, test taking strategies, note taking, concentration, and library orientation.

SSP 1101. Personal Development. (2 cr; A-F only) Introduction to some of the components of the human personality and the relationship of the individual to the environment. Focuses on such topics as human relations, values, interpersonal skills and competencies, decision making, and conflict resolution.

SSP 1802. English as a Second Language: Writing. (2 cr; S-N only) Preparation for Comp 1120.

SSP 1803. English as a Second Language: Reading. (2 cr; S-N only) Comprehension, speed, and vocabulary; uses university course reading material.

SSP 1804. English as a Second Language: Practice in Speaking and Understanding. (2 cr; S-N only) Pronunciation, intonation, and listening comprehension.

SSP 3001. Preparation for SSP Teaching Assistantship. (1-3 cr; SP-#; S-N only) Skills needed to develop and conduct effective small group learning experiences. Communication processes, leadership styles and responsibilities, goal setting, social influences, developmental stages of groups, learning theories, and content as related to appropriate SSP skills course.

SSP 3002. SSP Teaching Assistantship Practicum. (1-3 cr [max 6 cr]; SP-#; S-N only) Leading structured small groups in designated SSP courses. TA responsibilities outlined in contract with faculty supervisor.

SSP 3003. Tutor Training: Individualization of Instruction. (2 cr; SP-#; A-F only) Introduction to contemporary learning theory and its application to one-on-one and small group learning situations (tutorials). Emphasis on philosophy, procedures, and practices known to be effective in improving learning.

SSP 3004. Tutor Practicum. (1-2 cr [max 3 cr]; SP-3003 or #; A-F only) Supervised practicum for students leading one-on-one and small group tutorials. Tutor responsibilities outlined in contract with instructor.

SSP 3007. Student Advisers for Freshman Experience Training. (1 cr; SP-53001; #; A-F only) Introduces contemporary student development and learning theory, its application to small group and one-on-one learning situations. Emphasis on philosophy, procedures, and practices known to assist a student's multi-dimensional growth and learning. Enhances student leadership skills and knowledge.

SSP 3008. Student Advisers for Freshman Experience Practicum. (1 cr [max 3 cr]; SP-3007 or #; S-N only) Supervised practicum in small-group setting. Conditions of Safe experience outlined in Safe contract.

Theatre (Th)

School of Fine Arts

Th 1001. Introduction to Theatre Arts. (3 cr; A-F only) Appreciation of theatre arts. Developing sensitivity and critical sophistication as articulate, discriminating theatre-goers. Play viewing, play reading, critiques, and term projects.

Th 1051. Introduction to Film. (3 cr; A-F only) History and genres of film; how movies are made. Watching and analyzing films and developing an articulate and discerning viewpoint. (2 hrs lect, 2.5 hrs lab)

Th 1052. Freshman Seminar: Film and Society. (3 cr; SP-Fewer than 30 cr; A-F only) How films influence the moral and cultural life of our time and critical analysis of those effects.

Th 1071. Musical Theatre History. (3 cr; A-F only) Musical theatre genre focusing on integration of theatre, music, and dance. Major librettists, composers, directors, choreographers, and performers.

Th 1099. Production Practicum I. (1 cr [max 3 cr]; A-F only) Experience in backstage areas and front-of-house operations of theatrical productions; planning and execution of scenery, properties, costumes, makeup, lighting, sound, stage operation, publicity, box office, theatre management before/during performance runs for UMD Theatre productions. (45 hrs work per sem)

Th 1111. Acting Fundamentals I. (3 cr; SP-Not open to BFA Th majors; A-F only) Developing the ability to respond to imaginative situations with sincerity, individuality, and effectiveness; projects in elementary acting techniques.

Th 1112. Acting II. (3 cr; CP-1500, Th major; SP-1801, BFA Th major or #; A-F only) Introduction to fundamental skills of acting: objectives, actions, given circumstances, activities. Focus on freeing natural impulses through imagination and improvisation. For all theatre majors.

Th 1114. Musical Theatre: Theory/Sight Singing. (3 cr; SP-#; A-F only) Introduction to sight singing, music reading, written music transcription, and melody-line piano keyboard. For musical theatre student performers.

Th 1116. Audition Techniques. (3 cr; SP-#; A-F only) Theory, technique, and application of audition skills for the actor.

Th 1118. Voice and Movement for the Actor. (3 cr; SP-#; A-F only) Introduction to voice and movement techniques designed to liberate, develop, and strengthen actor’s body and voice.

Th 1199. Performance Practicum I. (1 cr [max 12 cr]; QP-#; by audition only; SP-#; by audition only; A-F only) Rehearsal and performance of minor role, as determined by instructor, in a play or dance performance before a public audience in UMD Theatre productions.

Th 1299. Theatre Marketing/Management Practicum. (2 cr [max 6 cr]; SP-Th major or minor; A-F only) Practical experience working in theatre box office, management, marketing, and advertising promotion for UMD Theatre productions. (90 hrs work)
Th 1301. Stagecraft. (4 cr; QP-1500 or #; SP-1801 or #; A-F only)
Introduction to methods of planning, constructing, painting, rigging, and shifting stage scenery. Lab work required constructing and painting scenery and properties for theatrical productions. (3 hrs lect, 3 hrs lab)

Th 1351. Stage Rendering Techniques. (3 cr; QP-1500 or #; SP-1801 or #; A-F only)
Practical course in study of different rendering mediums, styles, and techniques for the theatrical designer.

Th 1399. Scenery/Properties Practicum. (2 cr [max 6 cr]; SP-Th major or minor; A-F only)
Practical experience constructing and painting scenery and properties for theatrical productions. (90 hrs work)

Th 1401. Costume Construction I. (4 cr; QP-1500 or #; SP-1801 or #; A-F only)
Introduction to study and practice of methods and techniques used in building costumes for theatrical productions. Lab work required. (3 hrs lect, 3 hrs lab)

Th 1451. Stage Makeup. (3 cr; QP-1500 or #; SP-1801 or #; A-F only)
Introduction to principles and materials of stage makeup and their application in developing a character makeup for theatrical productions.

Th 1499. Costume Practicum. (2 cr [max 6 cr]; SP-Th major or minor; A-F only)
Practical experience working on costume construction and costume crafts for theatrical productions. (90 hrs work)

Th 1501. Stage Lighting I. (4 cr; QP-1500 or #; SP-1001, 1801 or #; A-F only)
Principles and practice of stage lighting.

Th 1551. Sound Design. (3 cr; QP-1500 or #; SP-1801 or #; A-F only)
Principles and practice of choosing, editing, and running sound cues for theatrical productions.

Th 1599. Lighting/Sound Practicum. (1 cr [max 3 cr]; SP-Th major or minor; A-F only)
Practical experience working on lighting and sound for theatrical productions. (45 hrs work)

Th 1601. Stage Management. (3 cr; A-F only)
Theory and practice of stage management techniques applicable to a variety of theatre forms and situations.

Th 1699. Running Crew Practicum. (2 cr [max 6 cr]; SP-#; A-F only)
Practical experience working backstage during the run of theatrical productions. (90 hrs work)

Th 1801. Elements of Theatre. (3 cr; QP-Th major; SP-Th major; A-F only)
Intensive study in rudimentary theatre vocabulary, research methods, principles of play production, preproduction script analyses, performance criticism, and postproduction assessment. Playviewing, play reading, critiques, and term projects.

Th 1901. B.F.A. Qualifying Presentation. (0 cr; QP-#; SP-#; S-N only)
Presentation of performance audition or technical portfolio for admission to full B.F.A. candidacy.

Th 2112. Acting II: American Realism. (3 cr; SP-#; A-F only)
Continuation of 1112 with a concentration on American realism, characterization, and living truthfully in the moment.

Th 2113. Acting III: Classical Styles. (3 cr; QP-#; SP-2112 or #; A-F only)
Acting styles from various classical periods, emphasizing Shakespeare and verse.

Th 2114. Acting: Musical Theatre. (3 cr; SP-#; A-F only)
Application of theories and techniques of musical theatre performance.

Th 2118. Speech for the Actor. (3 cr; SP-#; A-F only)
Ear training and articulation (in anticipation of dialects); acquisition of nonregional dialect for the stage through use of phonetics and classical texts.

Th 2119. Stage Dialects. (3 cr; SP-#; A-F only)
Facilitates actor’s acquisition and performance of stage dialects.

Th 3099. Production Practicum II. (2 cr [max 4 cr]; A-F only)
Experience in backstage areas and front-of-house operations of theatrical productions; planning/execution of scenery, properties, costumes, makeup, lighting, sound, stage operation, publicity, box office, and theatre management before/during performance runs in UMD Theatre productions. (90 hrs work per sem)

Th 3111. Acting Fundamentals II. (3 cr; QP-1110; not open to BFA Th majors; SP-1111, 1112 or #; not open to BFA Th majors; A-F only)
Continuation of 1111. Development of acting skills beyond the fundamental level for non-theatre majors. Project work emphasis on characterization and contemporary scene study.

Th 3151. Stage Combat/Circus. (3 cr; QP-1950 or #; SP-0901 or #; A-F only)
Intensive study of techniques and principles of stage combat focusing on armed (rapier/dagger/broadsword) and unarmed combat. Physical development through various circus skills: juggling, tumbling, and balancing.

Th 3171. Acting IV: Character/Masks. (3 cr; QP-80 cr; BFA Th major, #; SP-60 cr; BFA Th major, #; A-F only)
Using the body to express and develop character through mask work, improvisation, and selected scene work.

Th 3199. Performance Practicum II. (2 cr [max 12 cr]; QP-#; by audition only; SP-#; by audition only; A-F only)
Rehearsal and performance of major role, as determined by instructor, in a play or dance before a public audience of UMD Theatre productions.

Th 3201. Stage Direction I. (3 cr; QP-1112, 80 cr, Th major or minor or #; SP-1112, 60 cr, Th major or minor or #; A-F only)
Comprehensive, portfolio approach focusing on interpretive role of director in contemporary theatre. Major tasks facing director as collaborator; lecture, written assignments, workshops, and projects.

Th 3331. Scenic Design I. (3 cr; QP-1330, 1764 or #; SP-1301 or #; A-F only)
Elements of design used in creation of scenery for theatre.

Th 3331. Theatrical Drafting. (3 cr; QP-1330, 1764; SP-1301; A-F only)
Principles and practice in techniques of drafting traditional and nontraditional types of stage scenery.

Th 3355. Computer-Aided Theatrical Design. (3 cr; QP-1330, 1764 or #; SP-1301 or #; A-F only)
Computer-aided drafting and design with technical applications to scenic design, lighting design, and technical direction.
Course Descriptions

Th 3371. Scene Painting. (3 cr; QP-1330, 1764; SP-1301; A-F only)
Advanced work in use of both traditional and modern methods of painting stage scenery emphasizing practical lab work. (2 hrs lect, 2 hrs lab)

Th 3381. Theatre Design: Period Styles. (3 cr; QP-3331, 3444 or #; SP-3331, 3441 or #; A-F only)
Introduction to historical styles: architecture, painting, and dress as they influence theatrical design through the ages.

Th 3401. Costume Construction II. (3 cr; QP-1440, 1762 or #; SP-1401 or #; A-F only)
Advanced principles and practices of costume construction techniques emphasizing pattern drafting and draping and a study of advanced craft techniques.

Th 3441. Costume Design I. (3 cr; QP-1440, 1762, 1500 or #; SP-1401, 1801 or #; A-F only)
Principles and practice of costume design with emphasis on designing and rendering costumes from various historical periods.

Th 3699. Production Management. (2 cr [max 12 cr]; QP-51670, 53670; SP-#; A-F only)
Participation in management and leadership in all areas of theatre production. (90 hrs work)

Th 3801. Drama Titles. (1 cr; QP-1500 or #; SP-1801 or #; A-F only)
Survey of dramatic literature and theatre texts. Play reading, script analysis, term projects.

Th 3871. Playwriting. (3 cr; A-F only)
Instruction and practice in fundamentals of playwriting, including dialogue, character, and scenario development; traditional and experimental formal structures; emphasizes theatre format with peripheral screenplay information.

Th 3881. New Play Development Workshop. (3 cr [max 6 cr]; QP-#; SP-1001, 1801 or #; A-F only)
Intensive work in development of new scripts from initial reading to minimally staged performance.

Th 3991. Independent Study in Theatre. (1-3 cr [max 6 cr]; QP-#; SP-1801, 1001 or #; A-F only)
Directed readings and projects arranged between student and faculty mentor.

Th 3995. Topics in Theatre or Dance: (Various Titles to be Assigned). (1-3 cr [max 9 cr]; QP-#; SP-#; A-F only)
Intensive study of special topics falling outside usual theatre or dance courses. Topic announced before course offered.

Th 4151. Acting V: Senior Studio. (3 cr; QP-#; SP-#; cannot apply cr to Graduate School program; A-F only)
Capstone course utilizes scene study to access actor's skills, proficiencies, and artistic growth. Variety of styles make up final presentation of scenes and monologues rehearsed throughout semester.

Th 4171. Acting VI: Acting for the Camera. (3 cr; QP-#; SP-4151 or #; cannot apply cr to Graduate School program; A-F only)
Contemporary acting adjustments necessary for film, television, and commercials.

Th 4331. Scenic Design II. (3 cr; QP-3331; SP-3331; A-F only)
Advanced study in creating scenic designs for a variety of theatrical forms, including musical comedy, opera, dance, and legitimate theatre.

Th 4351. Portfolio Preparation and Presentation. (3 cr; QP-#; cannot apply cr to Graduate School program; SP-#; cannot apply cr to Graduate School program; A-F only)
Capstone course utilizes presentation of student's work in technical theatre/design to assess design/technical skills. Analysis of portfolio, job applications, résumé development, and portfolio development techniques.

Th 4399. Theatre: Special Projects. (1-2 cr [max 12 cr]; QP-55220, 55336, 5DN 5405; #; can apply max 6 cr to Graduate School program; SP-#; cannot apply cr to Graduate School program; A-F only)
Projects in directing, choreography of individual or groups, or designing of costumes, lighting, scenery, or sound.

Th 4441. Costume Design II. (3 cr; QP-3444 or #; SP-3441 or #; A-F only)
Advanced principles and practice of costume design with emphasis on designing and rendering costumes from various historical periods.

Th 4501. Stage Lighting II. (3 cr; QP-1337, 1663; SP-1501 or #; cannot apply cr to Graduate School program; A-F only)
Advanced theories and techniques used in designing lights for traditional and nontraditional theatre works.

Th 4801. History of the Theatre I. (4 cr; QP-1500 or #; SP-3801 or #; A-F only)
Survey of style, theory, performance, and production techniques of world theatre from theoretical origins through early 19th century.

Th 4802. History of the Theatre II. (4 cr; QP-5551, 5552; SP-4801 or #; A-F only)
Survey of style, theory, performance, and production techniques of world theatre from 19th century to present.

Th 4851. Dramatic and Performance Theory. (3 cr; QP-60 cr or #; SP-3801 or #; A-F only)
Survey and analysis of dramatic and performance theory texts, play scripts, and criticism.

Th 4901. Intern Teaching in Theatre. (3 cr [max 9 cr]; QP-#; SP-#; cannot apply cr to Graduate School program; A-F only)
Practical experience teaching beginning courses in department. Students serve as intern teachers, assisting instructor in administration of course.

Th 5991. Independent Study in Theatre. (1-3 cr [max 6 cr]; QP-Sr, Jr; SP-1301 or #; 5171 combined; SP-#; underg rads may not take more than 6 cr in 3171 and 5171 combined; A-F only)
Directed readings and projects arranged between student and faculty mentor.

Th 5997. Internship in Professional Theatre. (1-12 cr [max 12 cr]; QP-#; cannot apply cr to Graduate School program; SP-#; 1 cr for each 30 hrs work; can apply max 6 cr to Graduate School program; SP-#; 1 cr for each 45 hrs work; cannot apply cr to Graduate School program; S-N only)
Internship with a cooperating professional, commercial, or repertory theatre.
Toxicology (Txcl)

Graduate School

Txcl 5011. Principles of Toxicology. (2 cr; SP-Grad txcl major or #; A-F only)
Introduction to fundamentals of poisoning in individuals and the environment, assessment of potential health hazards, and application of toxicology in various professional careers.

Txcl 8012. Advanced Toxicology I. (3 cr; QP-5214 or PubH 5261; SP-5011, Chem 4341 or #; A-F only)
Absorption, distribution, metabolism, and excretion of xenobiotics; toxicokinetics; mechanisms of toxicity or specific classes of chemical agents.

Txcl 8013. Advanced Toxicology II. (3 cr; QP-5214 or PubH 5261; SP-8012, Chem 4342, Phsl 5601 or #; A-F only)
Kinetic and dynamic determinants of target organ toxicity; pathological alterations in structure/function relationships for major target organ systems; mechanisms of mutagenesis, carcinogenesis, and teratogenesis.

Txcl 8100. Investigative Toxicology. (1 cr [max 2 cr]; QP-5214; SP-8013 or #; A-F only)
Evaluating toxicology research issues and literature.

Txcl 8333. FTE: Master's. (1 cr; SP-Master's student, adviser and DGS consent)

Txcl 8444. FTE: Doctoral. (1 cr; SP-Doctoral student, adviser and DGS consent)

Txcl 8666. Doctoral Pre-Thesis Credits. (1-18 cr; SP-Max 18 cr per semester or summer; doctoral student who has not passed prelim oral)

Txcl 8777. Thesis Credits: Master's. (1-18 cr; SP-Max 18 cr per semester or summer; 10 cr total required [Plan A only])

Txcl 8888. Thesis Credits: Doctoral. (1-18 cr; SP-Max 18 cr per semester or summer; 24 cr required)

Urban and Regional Studies (URS)

College of Liberal Arts

URS 1001. Introduction and Orientation to Urban and Regional Studies. (3 cr; A-F only)
Interdisciplinary introduction to urban and regional issues. Political, historical, socioeconomic, and spatial processes in the United States. Intended for urban and regional studies sophomores and others considering it as a major.

URS 3097. Internship in Urban and Regional Studies. (1-6 cr [max 8 cr]; QP--URS major, jr or sr, #; SP--URS major, jr or sr, #; S-N only)
Scheduled assignments with direct supervision in public agencies or relevant private firms.

Water Resources Science (WRS)

College of Science and Engineering

WRS 5001. Introduction to Field Research in Water Resources. (2 cr; SP-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; SP-Grad student or #)
Control of water resources by natural system functions, user actions, and influence of social and political institutions. How these controls vary in space and time; complexities of each control and feedbacks among them.

WRS 8050. Special Topics in Water Resources Science [Various Titles to be Assigned]. (1-3 cr [max 6 cr]; SP-#; A-F only)

WRS 8060. Directed Studies in Water Resources Science. (1-3 cr [max 6 cr]; SP-#; A-F only)

WRS 8095. Plan B Project. (3 cr; SP-#; S-N only)
Satisfies Plan B project requirement. May appear on master's program, but does not count toward credit minimum in major. Project topic arranged between student and adviser. Written report required.

WRS 8100. Interdisciplinary Seminar in Water Resources. (1-3 cr [max 3 cr])

WRS 8333. FTE: Master's. (1 cr; SP-Master's student, adviser and DGS consent)

WRS 8444. FTE: Doctoral. (1 cr; SP-Doctoral student, adviser and DGS consent)

WRS 8666. Doctoral Pre-Thesis Credits. (1-18 cr; SP-Max 18 cr per semester or summer; doctoral student who has not passed prelim oral)

WRS 8777. Thesis Credits: Master's. (1-18 cr; SP-Max 18 cr per semester or summer; 10 cr total required [Plan A only])

WRS 8888. Thesis Credits: Doctoral. (1-18 cr; SP-Max 18 cr per semester or summer; 24 cr required)

Women's Studies (WS)

College of Liberal Arts

WS 1000. Introduction to Women's Studies. (3 cr; A-F only)
Women's studies as an interdisciplinary field of study; overview of the many issues related to current and changing role and status of women. International perspectives.

WS 2000. Feminist Inquiry. (3 cr; SP-1000 or #; A-F only)
Major issues, concepts, and questions addressed by feminist scholarship; context of feminist inquiry.

WS 2101. Women, Race, and Class. (3 cr; A-F only)
Complex influences of gender, race, and class on women's lives in the United States. Focuses on experiences, views, and cultural expression of contemporary women who are not white or middle class. Cross-cultural perspectives.
Course Descriptions

WS 3000. International Perspectives on Feminism. (3 cr; SP-1000 or #; A-F only)
Movements and perspectives of feminism worldwide; comparison and contrast with feminism in the United States.

WS 3150. Women-Identified Culture. (3 cr; SP-1000 or #; A-F only)
Chronological survey introducing a relatively new body of knowledge in women's studies about lesbian cultures. Lesbian studies in literature, history, law, sociology, aesthetics, and philosophy; international perspectives.

WS 3200. Women's Autobiographies. (3 cr; SP-1000 or #; A-F only)
Women's self-concepts as expressed in autobiographical writings. Meanings women give their lives as women; impact of race and class; choices for artistic, political, intellectual, and/or private lives. Autobiographical techniques and style.

WS 3300. Women, Religion, and Spirituality. (3 cr; SP-1000 or #; A-F only)
Religions and spirituality in relation to women. Historical and contemporary practices and beliefs.

WS 3350. Women and the Law. (3 cr; SP-1000 or #; A-F only)
Ways women's lives and gender relationships are influenced by laws and the judicial system; how the system can become more responsive to women's experience.

WS 3400. Women and Film. (3 cr; SP-1000 or #; A-F only)
American and foreign films screened, analyzed, and reviewed from a feminist perspective. Role of women in history, economics, and politics of filmmaking.

WS 3595. Special Topics in Women's Studies: (Various Titles to be Assigned). (3 cr [max 9 cr]; SP-1000 or #; A-F only)
Topics that fall outside current women's studies courses. Topic announced before course offered.

WS 3600. Ecofeminist Theories and Practices. (3 cr; SP-1000 or #; A-F only)
Environmental ethics from a feminist perspective; ecofeminist analysis applied to contemporary ethical, social, and environmental issues.

WS 3891. Independent Study. (1-3 cr; SP-53 cr or #; A-F only)
Directed readings, research, and/or projects on topics of interest to the student.

WS 3897. Internship. (1-9 cr; SP-WS major, 53 cr or #; S-N only)
Work in public agency, private organization, or service agency offering practical application of women's studies theories and/or experience not available in classroom. Students must set goals, fulfill requirements for credit earned, and submit written and oral evaluations of experience.

WS 4000. Seminar. (3 cr; SP-2000 or approved WS methods course, 6 cr approved WS, sr or #; A-F only)
Major issues, concepts, and questions addressed by feminist scholarship; context of feminist inquiry.

WS 4050. Feminist Theory. (4 cr; SP-80 cr or #; A-F only)
Historical and conceptual examination and analysis of central ideas and problems within several feminist theories.

WS 5595. Special Topics: (Various Titles to be Assigned). (3 cr; SP-80 cr or grad student or #; S-N only)
Advanced study. Topic announced before course offered.

WS 5991. Independent Study. (1-3 cr; SP-80 cr or grad student or #; S-N only)
Readings, research, and/or projects on topics of interest to graduate students concerning women and women's issues.
Administration and Faculty

Administration

University Regents
Patricia B. Spence, Rice, Chair
Maureen K. Reed, Stillwater, Vice Chair
Anthony R. Baraga, Side Lake
Robert S. Bergland, Roseau
Dallas Bohnsack, New Prague
William E. Hogan II, Minnetonka
Warren C. Larson, Bagley
David R. Metzen, South St. Paul
H. Bryan Neel III, Rochester
Michael O'Keefe, Minneapolis
William R. Peterson, Eagan
Jessica J. Phillips, Bloomington

University Administrators
Mark Yudof, President
Robert Bruininks, Executive Vice President and Provost
Frank B. Cerra, Senior Vice President for Health Sciences
McKinley Boston, Jr., Vice President for Student Development & Athletics
Carol Carrier, Vice President for Human Resources
Sandra Gardebring, Vice President for Institutional Relations
Eric Kruse, Vice President of University Services
Philip Larsen, Interim Dean, College of Agricultural, Food, and Environmental Sciences
Christine Maziar, Vice President for Research and Dean of the Graduate School

UMD Administrators
Kathryn A. Martin, Chancellor,
515 Darland Administration Building
Vincent R. Magnuson, Vice Chancellor for Academic Administration, 420 Darland Administration Building
Gregory R. Fox, Vice Chancellor for Finance and Operations, 519 Darland Administration Building
Bruce L. Gildseth, Vice Chancellor for Academic Support and Student Life, 297 Darland Administration Building
Sabra S. Anderson, Dean, College of Science and Engineering, 140 Engineering Building
Wm. Robert Bucker, Dean, School of Fine Arts, 212 Humanities Building
Paul N. Deputy, Dean, College of Education and Human Services Professions, 125 Bohannon Hall
Kjell Knudsen, Dean, School of Business and Economics, 104 School of Business and Economics Building
Linda T. Krug, Dean, College of Liberal Arts, 111 Cina Hall
Richard J. Ziegler, Dean, School of Medicine, 113 School of Medicine Building

James L. Anderson, Director, Health Services, 104 Health Services
Robert Corran, Director, Department of Intercollegiate Athletics, 170 Sports and Health Center
Linda L. Deneen, Director, Information Technology Systems and Services, 178 Marshall W. Alworth Hall
Martin D. DeWitt, Director, Tweed Museum of Art, 310 Humanities Building
Beth Esselstrom, Director, Admissions, 20 Campus Center
Jeff Gunderson, Acting Director, Minnesota Sea Grant College Program, 2305 East Fifth Street
Stephen C. Hedman, Associate Dean, Graduate School, and Associate Vice Chancellor for Academic Administration, 431 Darland Administration Building
Brenda H. Herzig, Director, Financial Aid and Registrar, 139 Darland Administration Building
Jackson Huntley, Director, Advisement Coordination Center, 8 Campus Center
Thomas C. Johnson, Director (UNIV-WIDE) Large Lakes Observatory, 215 Research Laboratory Building
Judith Karon, Director, Human Resources, 255 Darland Administration Building
Robert W. Krumwiede, Assistant Vice Chancellor for Academic Administration, 420 Darland Administration Building
Michael J. Lalich, Director, Natural Resources Research Institute, NRRI Building, 3151 Miller Trunk Highway
Richard Liu, Director, Institutional Research, 420 Darland Administration Building
William Miller, Director, Glensheen, 3300 London Road
James Morales, Coordinator of Equity Education and Services and Assistant Director of Admissions, 255 Darland Administration Building
Deborah S. Petersen-Perlman, Director, Affirmative Action, 247 Darland Administration Building
Louis F. Poirier III, Director, University College Duluth and Summer Session, and Associate Continuing Education Specialist, 403 Darland Administration Building
James A. Shearer, Acting Director, Facilities Management, 241 Darland Administration Building
Basil W. Sozansky, Director, Library, 248 Library Building
William Wade, Director, University Relations and Development, 315 Darland Administration Building
UMD Directory

This alphabetical listing features the names of faculty along with their title, highest degree, field, and alma mater.

Adams, Alice
Associate Professor
Ph.D., Microbiology
New York University

Adams, Stephen J.
Associate Professor
Ph.D., English
University of Minnesota

Aggarwal, Praveen
Assistant Professor
Ph.D., Marketing
Syracuse University

al'Absi, Mustafa
Assistant Professor
Ph.D., Biopsychology
University of Oklahoma

Albert, Elizabeth
Instructor
M.Ed., Education
University of Minnesota Duluth

Alt, Amy
Instructor
M.A., English Language
Mankato State University

Anderson, Ann
Professor
M.M., Music
Indiana University

Anderson, Curtis L.
Professor
Ph.D., Economics
University of Wyoming

Anderson, Duane E.
Associate Professor
M.A., Mathematics
University of Kansas

Anderson, James
Director, Health Services, and
Associate Professor
M.D., University of Wisconsin-Madison

Anderson, Paul M.
Professor
Ph.D., Biochemistry
University of Minnesota

Anderson, Sabra S.
Dean, College of Science and
Engineering, and Professor
Ed.D., Mathematics
University of Michigan

Arthur, John A.
Professor
Ph.D., Sociology
Pennsylvania State University

Aubid, David N.
Instructor
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