



UNIVERSITY
OF MINNESOTA
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University of Minnesota Twin Cities

2012-14 UNDERGRADUATE CATALOG

This file serves as an official record of University, college, and program requirements and policies during a specific time period. It includes a directory of undergraduate programs, majors, and course descriptions. It also includes a list of University policies.

NOTE: The information in this catalog is subject to change without notice. Colleges and departments make changes in their degree requirements and course descriptions frequently. For the most current information, check with department offices, advisers, and visit the **Online Catalog** at www.catalogs.umn.edu.

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Twin Cities Campus

Spanish Studies B.A.

Spanish & Portuguese

College of Liberal Arts

- Program Type: Baccalaureate
- Requirements for this program are current for Fall 2012
- Required credits to graduate with this degree: 120
- Required credits within the major: 34
- Degree: Bachelor of Arts

The program develops analytical skills and methodologies needed to explore Hispanic and Hispanic-American languages and cultures.

It is important to note that department majors and minors are not simply Spanish and Portuguese language majors or minors; rather, they are liberal arts majors and minors concentrating on Spanish, Latin American, and/or Luso-Brazilian literary, cultural, and linguistic studies with language skills at the foundation. All major and minor options in this department begin with prerequisite language courses, followed by advanced language skills courses (special arrangements may be made for native speakers of Spanish or Portuguese). These are followed by critical analysis skills courses in Hispanic literature, culture, and linguistics that prepare students to take advanced coursework in specific areas. The major options culminate in the completion of a senior project through a SPAN 5xxx course or SPAN 3972W.

Majors are required to enroll in a minimum 6-week study abroad experience, or a semester-long service learning course. The study abroad requirement must be fulfilled in a Spanish-speaking country, involve coursework in Spanish, and include courses related to Spanish studies. Students must meet with the department adviser prior to departure. The service learning requirement is fulfilled by SPAN 3401, or SPAN 3404, or other courses with adviser consent.

Detailed information regarding Spanish and Portuguese studies undergraduate academic issues is printed in the Undergraduate Advising Handbook (available at <http://spanport.cla.umn.edu>).

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Admission Requirements

For information about University of Minnesota admission requirements, visit the [Office of Admissions website](#).

General Requirements

All students are required to complete general University and college requirements including writing and liberal education courses. For more information about University-wide requirements, see the [liberal education requirements](#). Required courses for the major or minor in which a student receives a D grade (with or without plus or minus) do not count toward the major or minor (including transfer courses).

Program Requirements

Students are required to take 4 semester(s) of Spanish.

The Spanish Studies major is completed by a minimum of 34 credits and 11 courses and requires that students take at least 5-6 semesters of language above and beyond the CLA second language requirement. Spanish courses taken in fulfillment of CLA's second language requirement (SPAN 1001-1004 or their equivalents) do not count toward the major. Students pursuing a second CLA major may choose to complete the senior project requirement in their other major. These students are required to substitute 3 credits of advanced SPAN electives with a 31xx prereq for SPAN 3972W. Students must complete 6 major courses in residence: three can be taken at the UMNTC campus or through sponsored study abroad programs. The other 3 must be advanced electives courses (requiring a SPAN 31xx pre-requisite) and must be taken at the UMNTC campus (including the senior project).

Students may receive no more than one degree from the Dept of Spanish & Portuguese Studies: a B.A. in Spanish Studies or a B.A. in Spanish & Portuguese Studies or a minor in Spanish Studies or a minor in Portuguese Studies.

Beginning fall 2012, all incoming CLA freshman must complete the appropriate First Year Experience course sequence. Specific information about this collegiate requirement can be found at: http://class.umn.edu/degree_requirements/index.html



Advanced Language Course

[SPAN 3015](#) - Spanish Composition and Communication (4.0 cr)

Critical Analysis Courses

[SPAN 3104W](#) - Introduction to the Study of Hispanic Literatures [LITR, WI] (3.0 cr)

[SPAN 3105W](#) - Introduction to the Study of Hispanic Cultures [WI] (3.0 cr)

[SPAN 3107W](#) - Introduction to the Study of Hispanic Linguistics [WI] (3.0 cr)

Spanish Major Electives

Take 6 SPAN 3xxx courses. 4 of the 6 must have a SPAN 31xx prereq. Within the 6, take 1 course from each area: culture, linguistics, and literature. As an elective, SPAN 3970 must be taken for 3 credits. Honors students must take at least one SPAN 5xxx. Up to one course taught in English can count toward the major. Written departmental consent, via a signed contract, is required during the first week of classes. Adviser consent is needed to receive credit for all other courses not listed below

Take 6 or more course(s) totaling 18 or more credits(s) from the following:

•Electives

Literature Electives

Take 1 or more course(s) from the following:

- [SPAN 3211](#) - Discourses of Imperial Spain, 1492-1800 (3.0 cr)
- [SPAN 3212](#) - Discourses of Modern and Contemporary Spain, 1800-Present (3.0 cr)
- [SPAN 3221](#) - Latin American Colonial Discourses: Empire and Early Modernity (3.0 cr)
- [SPAN 3222](#) - Discourses of Modern and Contemporary Latin America (3.0 cr)
- [SPAN 3910](#) - Topics in Spanish Peninsular Literature (3.0 cr)
- [SPAN 3920](#) - Topics in Spanish-American Literature (3.0 cr)

Culture and Civilization Electives

Take 1 or more course(s) from the following:

- [SPAN 3501](#) - Roots of Modern Spain and Latin America (3.0 cr)
- [SPAN 3502](#) - Modern Spain (3.0 cr)
- [SPAN 3510](#) - Issues in Hispanic Cultures (3.0 cr)
- [SPAN 3512](#) - Modern Latin America (3.0 cr)
- [SPAN 3800](#) - Film Studies in Spanish (3.0 cr)

Linguistics Electives

Take 1 or more course(s) from the following:

- [SPAN 3701](#) - Structure of Spanish: Phonology and Phonetics (3.0 cr)
- [SPAN 3702](#) - Structure of Spanish: Morphology and Syntax (3.0 cr)
- [SPAN 3703](#) - Origins and History of Spanish and Portuguese (3.0 cr)
- [SPAN 3704](#) - Sociolinguistics of the Spanish-Speaking World (3.0 cr)
- [SPAN 3705](#) - Semantics and Pragmatics of Spanish (3.0 cr)
- [SPAN 3706](#) - Spanish Applied Linguistics (3.0 cr)
- [SPAN 3707](#) - Linguistic Accuracy Through Translation (3.0 cr)
- [SPAN 3730](#) - Topics in Hispanic Linguistics (3.0 cr)

SPAN 3970

Depending on the topic, this course may fulfill culture, literature, or linguistics requirement.

Take 0 or more course(s) from the following:

- [SPAN 3970](#) - Directed Studies (1.0 - 4.0 cr)

Additional Electives

Any courses not used to fulfill culture/literature/linguistics requirements may be taken as additional electives.

Take 0 or more course(s) from the following:

- [PORT 3001](#) - Portuguese for Spanish Speakers (4.0 cr)
- [SPAN 3022](#) - Advanced Business Spanish (4.0 cr)
or [SPAN 3044](#) - Advanced Medical Spanish (4.0 cr)
or [SPAN 3401](#) - Latino Immigration and Community Service [CIV] (3.0 cr)
or [SPAN 3404](#) - Medical Spanish and Community Health Service (3.0 cr)

Senior Seminar

Take a minimum of 3 credits. Majors fulfill the senior seminar requirement one of two ways: after all other major courses are complete, enroll in SPAN 3972W with departmental adviser permission and attend a graduation seminar informational/preparatory session offered by the department several times a year, or enroll in a SPAN 5xxx with instructor permission. Honors students must enroll in SPAN 3972W.

[SPAN 3972W](#) - Graduation Seminar [WI] (3.0 cr)

or SPAN 5xxx

Program Sub-plans



A sub-plan is not required for this program.

Honors UHP

This is an honors sub-plan.

Students admitted to the University Honors Program (UHP) must fulfill UHP requirements, in addition to degree program requirements. Honors courses used to fulfill degree program requirements will also fulfill UHP requirements.

Current departmental honors course offerings are listed at:

http://www.honors.umn.edu/academics/curriculum/dept_courses_current.html

Honors students must complete at least one SPAN 5xxx course, as well as an honors thesis project completed in the final year while taking SPAN 3972W.



Twin Cities Campus

Speech-Language-Hearing Sciences B.A.

Speech-Language-Hearing Sciences

College of Liberal Arts

- Program Type: Baccalaureate
- Requirements for this program are current for Fall 2012
- Required credits to graduate with this degree: 120
- Required credits within the major: 36 to 37
- Degree: Bachelor of Arts

The curriculum examines the physical, biological, and behavioral foundations of human communication. Courses focus on the study of variation in speech, language, and hearing processes, and seek to apply that knowledge to identifying, preventing, and managing disordered speech, language, and hearing.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Admission Requirements

For information about University of Minnesota admission requirements, visit the [Office of Admissions website](#).

General Requirements

All students are required to complete general University and college requirements including writing and liberal education courses. For more information about University-wide requirements, see the [liberal education requirements](#). Required courses for the major or minor in which a student receives a D grade (with or without plus or minus) do not count toward the major or minor (including transfer courses).

Program Requirements

Students are required to take 4 semester(s) of any second language.

Majors are advised to select additional courses beyond those needed to satisfy the liberal education requirements in the behavioral, biological, cognitive, physical, and social sciences.

Students may earn a B.A. or a minor in speech-language-hearing sciences, but not both.

Beginning fall 2012, all incoming CLA freshman must complete the appropriate First Year Experience course sequence. Specific information about this collegiate requirement can be found at: http://class.umn.edu/degree_requirements/index.html

Major Courses

- SLHS 3302 - Anatomy and Physiology of the Speech and Hearing Mechanisms (3.0 cr)
- SLHS 3303 - Language Acquisition and Science (3.0 cr)
- SLHS 3304 - Phonetics (3.0 cr)
- SLHS 3305W - Speech Science [WI] (3.0 cr)
- SLHS 3306 - Hearing Science (3.0 cr)
- SLHS 4301 - Introduction to the Neuroscience of Human Communication (3.0 cr)
- SLHS 4402 - Assessment and Treatment in Speech-Language Pathology (3.0 cr)
- SLHS 4801 - Hearing Measurement and Disorders (3.0 cr)
- SLHS 4802 - Rehabilitative Audiology (3.0 cr)
- SLHS 1301W - The Physics and Biology of Spoken Language [PHYS, WI] (4.0 cr)
or SLHS 1402 - The Talking Brain [SOCS] (3.0 cr)
- SLHS 1401 - Communication Differences and Disorders [SOCS] (3.0 cr)
or SLHS 3401 - Communication Differences and Disorders [SOCS] (3.0 cr)

Senior Project

- SLHS 3402W - Major Project in Speech and Hearing Science [WI] (3.0 cr)



Program Sub-plans

A sub-plan is not required for this program.

Honors UHP

This is an honors sub-plan.

Students admitted to the University Honors Program (UHP) must fulfill UHP requirements in addition to degree program requirements. Honors courses used to fulfill degree program requirements will also fulfill UHP requirements.

Current departmental honors course offerings are listed at:
http://www.honors.umn.edu/academics/curriculum/dept_courses_current.html

Honors students complete an honors thesis project in the final year, most often in conjunction with an honors thesis course, or with an honors directed studies or honors directed research course. Students select honors courses and plan for a thesis project in consultation with their UHP adviser and their departmental faculty adviser.



Twin Cities Campus

Statistics B.A.

Statistics, School of-ADM

College of Liberal Arts

- Program Type: Baccalaureate
- Requirements for this program are current for Fall 2012
- Required credits to graduate with this degree: 120
- Required credits within the major: 47 to 51
- Degree: Bachelor of Arts

Statistics is concerned with theories and methods of data collection, tabulation, analysis, and interpretation, and their use in learning from data and making decisions.

A bachelor's degree gives students an understanding of the theory of statistics and trains them in basic use of the most important types of statistical methods. The degree prepares students for graduate work or for jobs in diverse areas as marketing analysis, quality management, and support for scientific research.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Admission Requirements

For information about University of Minnesota admission requirements, visit the [Office of Admissions website](#).

General Requirements

All students are required to complete general University and college requirements including writing and liberal education courses. For more information about University-wide requirements, see the [liberal education requirements](#). Required courses for the major or minor in which a student receives a D grade (with or without plus or minus) do not count toward the major or minor (including transfer courses).

Program Requirements

Students are required to take 4 semester(s) of any second language.

Students must complete two years of mathematics, one course in computer programming, and 26 credits of STATS 3xxx or higher (two courses in statistical theory, two courses in statistical methods, at least three elective courses in statistics, and a senior project).

Students may earn no more than one degree from the Statistics program: a B.A. or a B.S. or a minor.

Beginning fall 2012, all incoming CLA freshman must complete the appropriate First Year Experience course sequence. Specific information about this collegiate requirement can be found at: http://class.umn.edu/degree_requirements/index.html

Mathematics

Take a total of five courses for twenty credits.

[MATH 1271](#) - Calculus I [MATH] (4.0 cr)

or [MATH 1371](#) - CSE Calculus I [MATH] (4.0 cr)

[MATH 1272](#) - Calculus II (4.0 cr)

or [MATH 1372](#) - CSE Calculus II (4.0 cr)

[MATH 2243](#) - Linear Algebra and Differential Equations (4.0 cr)

or [MATH 2373](#) - CSE Linear Algebra and Differential Equations (4.0 cr)

[MATH 2263](#) - Multivariable Calculus (4.0 cr)

or [MATH 2374](#) - CSE Multivariable Calculus and Vector Analysis (4.0 cr)

[MATH 4242](#) - Applied Linear Algebra (4.0 cr)

or **Honors Sequence**

[MATH 1571H](#) - Honors Calculus I [MATH] (4.0 cr)

[MATH 1572H](#) - Honors Calculus II (4.0 cr)

[MATH 2573H](#) - Honors Calculus III (4.0 cr)

[MATH 2574H](#) - Honors Calculus IV (4.0 cr)

[MATH 4242](#) - Applied Linear Algebra (4.0 cr)



Major Courses

Take five courses for 16-17 credits.

[STAT 3022](#) - Data Analysis (4.0 cr)

[STAT 4893W](#) - Senior Paper [WI] (1.0 cr)

[STAT 3011](#) - Introduction to Statistical Analysis [MATH] (4.0 cr)

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

Choose a theory course group:

Option 1

[STAT 4101](#) - Theory of Statistics I (4.0 cr)

[STAT 4102](#) - Theory of Statistics II (4.0 cr)

or Option 2

[STAT 5101](#) - Theory of Statistics I (4.0 cr)

[STAT 5102](#) - Theory of Statistics II (4.0 cr)

or Option 3

[MATH 5651](#) - Basic Theory of Probability and Statistics (4.0 cr)

[STAT 5102](#) - Theory of Statistics II (4.0 cr)

Programming for Statisticians

Take one course for 1-4 credits. Note: CSCI 1107 is for transfer student credit only.

[CSCI 1103](#) - Introduction to Computer Programming in Java (4.0 cr)

or [CSCI 1107](#) - FORTRAN Programming (1.0 - 3.0 cr)

or [CSCI 1113](#) - Introduction to C/C++ Programming for Scientists and Engineers (4.0 cr)

Electives

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

- [STAT 4931](#) - Topics in Statistics (3.0 cr)
- [STAT 5031](#) - Statistical Methods for Quality Improvement (4.0 cr)
- [STAT 5041](#) - Bayesian Decision Making (3.0 cr)
- [STAT 5201](#) - Sampling Methodology in Finite Populations (3.0 cr)
- [STAT 5302](#) - Applied Regression Analysis (4.0 cr)
- [STAT 5303](#) - Designing Experiments (4.0 cr)
- [STAT 5401](#) - Applied Multivariate Methods (3.0 cr)
- [STAT 5421](#) - Analysis of Categorical Data (3.0 cr)
- [STAT 5601](#) - Nonparametric Methods (3.0 cr)
- [STAT 5931](#) - Topics in Statistics (3.0 cr)
- [STAT 5932](#) - Topics in Statistics (3.0 cr)

Program Sub-plans

A sub-plan is not required for this program.

Honors UHP

This is an honors sub-plan.

Students admitted to the University Honors Program (UHP) must fulfill UHP requirements, in addition to degree program requirements. Honors courses used to fulfill degree program requirements will also fulfill UHP requirements.

Current departmental honors course offerings are listed at:

http://www.honors.umn.edu/academics/curriculum/dept_courses_current.html

Honors students complete an honors thesis project in the final year, most often in conjunction with an honors thesis course, or with an honors directed studies, or honors directed research course. Students select honors courses and plan for a thesis project in consultation with their UHP adviser and their departmental faculty adviser.



Twin Cities Campus

Studies in Cinema and Media Culture B.A.

Cultural Studies & Comparative Literature

College of Liberal Arts

- Program Type: Baccalaureate
- Requirements for this program are current for Fall 2012
- Required credits to graduate with this degree: 120
- Required credits within the major: 33 to 40
- Degree: Bachelor of Arts

Studies in Cinema and Media Culture (SCMC) examines cinema by emphasizing its location within the intricate social, historical, and cultural matrix of audiovisual forms and practices. Core courses and electives are offered not only in the Department of Cultural Studies and Comparative Literature (CSCL), but also in a number of other contributing departments. Through the program's interdisciplinary framework, students explore the sounds and images of cinema as they have changed throughout the 19th and 20th centuries. Print, photography, radio, television, video, and digital media are also considered crucial to understanding the medium. Students develop the ability to "read" the production and circulation of meaning in cinema, especially within the institutions of mass culture; examine the history of cinema cultures; engage the cross-cultural and global dynamics of cinema production and reception; and explore the theoretical models that have shaped thinking about the cinema and its relations to other media.

Although the major includes a production component, its principal focus is on cultural contexts, history, and theory.

Effective fall 2001, the Studies in Cinema and Media Culture major replaced the Film Studies major. Currently-declared Film Studies majors have the option of either completing their degree in Film Studies or transferring to the new SCMC major. The director of undergraduate studies can help students transfer programs.

For the latest information on the SCMC major, visit the CSCL website.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Admission Requirements

For information about University of Minnesota admission requirements, visit the [Office of Admissions website](#).

General Requirements

All students are required to complete general University and college requirements including writing and liberal education courses. For more information about University-wide requirements, see the [liberal education requirements](#). Required courses for the major or minor in which a student receives a D grade (with or without plus or minus) do not count toward the major or minor (including transfer courses).

Program Requirements

Students are required to take 4 semester(s) of any second language.

All major courses must be taken A-F.

In addition to the courses below, the department maintains a list of current-semester courses that also count toward the major. Please visit <http://cscl.umn.edu/ugrad/scmccourselists.html> for an updated list of approved courses.

Note on topics courses, directed studies, and internships: students may count up to three toward the major, but no more than two in any one category (two topics courses; two directed studies/internships). Such courses may be counted in Section C without prior approval as long as they appear on the current-semester SCMC-approved list. Directed studies and internships may also be counted in Section C with prior written approval from the SCMC undergraduate adviser or the director of undergraduate studies. In rare cases, such courses may be used in Section B, but only with prior written approval. For both internships and directed studies, students work with a faculty member of their choice to complete and submit a Faculty/Student Contract outlining the goals and scope of coursework. The course number of the internship or directed study should be selected appropriate to the home department (3993, 4993, or 5993).

Students may earn a B.A. or a minor in studies in cinema and media culture, but not both.

Beginning fall 2012, all incoming CLA freshman must complete the appropriate First Year Experience course sequence. Specific



information about this collegiate requirement can be found at: http://class.umn.edu/degree_requirements/index.html

Section A - Major Courses

Take at least three courses for a minimum of 12 credits. SCMC 5001 or 5002 may also serve as a basis for the senior project.

- [ARTH 1921W](#) - Introduction to Film Study [AH, WI] (4.0 cr)
 - or [CSCL 1201](#) - Introduction to Cinema and Media Culture [AH] (4.0 cr)
 - or [CSCL 1921W](#) - Introduction to Film Study [AH, WI] (4.0 cr)
 - or [SCMC 1201](#) - Introduction to Cinema and Media Culture [AH] (4.0 cr)
- [ARTH 3921W](#) - Art of the Film [AH, WI] (4.0 cr)
 - or [SCMC 3001W](#) - History of Cinema and Media Culture [WI] (4.0 cr)
- [SCMC 5001](#) - Critical Debates in the Study of Cinema and Media Culture (4.0 cr)
 - or [SCMC 5002](#) - Advanced Film Analysis (4.0 cr)

Section B - Context: Society, History, Culture Courses

Take 1 or more course(s) totaling 3 or more credits(s) from the following:

- [AMST 3252W](#) - American Popular Culture and Politics: 1900 to 1940 [HIS, CIV, WI] (4.0 cr)
- [AMST 3253W](#) - American Popular Culture and Politics: 1940 to the Present [HIS, CIV, WI] (4.0 cr)
- [COMM 3211](#) - Introduction to U.S. Electronic Media (3.0 cr)
- [COMM 3231](#) - Reality TV: History, Culture, and Economics (3.0 cr)
- [COMM 5261](#) - Political Economy of Media Culture (3.0 cr)
- [HSCI 4321](#) - History of Computing [TS, HIS] (3.0 cr)
- [JOUR 3614](#) - History of Media Communication [HIS, TS] (3.0 cr)
- [JOUR 3745](#) - Mass Media and Popular Culture [AH, DSJ] (3.0 cr)
- [JOUR 5615](#) - History of the Documentary (3.0 cr)

Section B - Practice: Production and Training Courses

Take 1 or more course(s) totaling 3 or more credits(s) from the following:

- [ARTS 3603](#) - Experimental Video (4.0 cr)
- [ARTS 5630](#) - Advanced Experimental Video (4.0 cr)
- [COMM 3201](#) - Introduction to Electronic Media Production (3.0 - 4.0 cr)
- [COMM 3204](#) - Advanced Electronic Media Production (4.0 cr)
- [ENGW 5205](#) - Screenwriting (4.0 cr)
- [ENGW 5207](#) - Screen writing II (4.0 cr)
- [SCMC 3201](#) - Fundamentals of Digital Filmmaking (4.0 cr)
- [SCMC 3202](#) - Intermediate Digital Filmmaking (4.0 cr)
- [TH 4550](#) - Video Technology (3.0 cr)

Section B - Difference: National, International, and "Foreign" Cinemas Courses

Take 1 or more course(s) totaling 3 or more credits(s) from the following:

- [AFRO 3655](#) - African American Cinema [AH, DSJ] (3.0 cr)
- [AFRO 3741](#) - People of Color and the Mass Media (3.0 cr)
- [ALL 3356W](#) - Chinese Film [AH, WI] (3.0 cr)
- [ALL 3456](#) - Japanese Film [GP] (3.0 cr)
- [ALL 3556](#) - Korean Film (3.0 cr)
- [AMIN 3402](#) - American Indians and the Cinema [AH, DSJ] (3.0 cr)
- [CSCL 3176](#) - Oppositional Cinemas [GP] (4.0 cr)
- [CSCL 5411](#) - Avant-Garde Cinema (4.0 cr)
- [FREN 3451](#) - North African Cinema (3.0 cr)
- [FRIT 3802](#) - Cinema and Realism (3.0 cr)
- [GER 3604W](#) - Introduction to German Cinema [AH, GP, WI] (3.0 cr)
- [JOUR 3741](#) - People of Color and the Mass Media [DSJ] (3.0 cr)

Section B - Analysis: Theory, Method, Critique Courses

Note: SCMC 5001 fulfills the Section B - Analysis requirement only if not previously counted toward the Section A - Major Courses requirement.

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

- [COMM 3263W](#) - Media Literacy: Decoding Media Images and Messages [WI] (3.0 cr)
- [COMM 4245](#) - Critical Television Studies (3.0 cr)
- [COMM 5211](#) - Critical Media Studies: Theory and Methods (3.0 cr)
- [CSCL 3115](#) - Cinema and Ideology [AH] (4.0 cr)
- [CSCL 3177](#) - On Television [CIV] (4.0 cr)
- [CSCL 3178W](#) - Documentary Cinema: History and Politics [WI] (4.0 cr)
- [GWSS 3307](#) - Feminist Film Studies [AH, DSJ] (3.0 cr)
- [SCMC 5001](#) - Critical Debates in the Study of Cinema and Media Culture (4.0 cr)



Section C - Electives

Take at least 3 courses, of which no more than one may be at the 1xxx-level. 3xxx-5xxx courses taken in Section C may also serve as a basis for the senior project. Courses used to fulfill other program requirements may not be counted toward Section C. Students may count a 3xxx-5xxx directed study as long as it is pre-approved by the departmental adviser. Visit <http://cscl.umn.edu/ugrad/scmccourselists.html> for an updated list of approved courses.

Take 3 or more course(s) totaling 9 or more credits(s) from the following:

- AFRO 3654 - African Cinema (4.0 cr)
- AFRO 3655 - African American Cinema [AH, DSJ] (3.0 cr)
- AFRO 3741 - People of Color and the Mass Media (3.0 cr)
- ALL 1001 - Asian Film and Animation (3.0 cr)
- ALL 3356W - Chinese Film [AH, WI] (3.0 cr)
- ALL 3456 - Japanese Film [GP] (3.0 cr)
- ALL 3556 - Korean Film (3.0 cr)
- AMIN 3402 - American Indians and the Cinema [AH, DSJ] (3.0 cr)
- AMST 3252W - American Popular Culture and Politics: 1900 to 1940 [HIS, CIV, WI] (4.0 cr)
- AMST 3253W - American Popular Culture and Politics: 1940 to the Present [HIS, CIV, WI] (4.0 cr)
- ARTH 1921W - Introduction to Film Study [AH, WI] (4.0 cr)
- ARTH 3921W - Art of the Film [AH, WI] (4.0 cr)
- ARTS 3601 - New Media: Making Art Interactive (4.0 cr)
- ARTS 3603 - Experimental Video (4.0 cr)
- ARTS 3703 - Photography: Digital Imaging (4.0 cr)
- ARTS 5610 - New Media: Making Art Interactive (4.0 cr)
- ARTS 5630 - Advanced Experimental Video (4.0 cr)
- COMM 3201 - Introduction to Electronic Media Production (3.0 - 4.0 cr)
- COMM 3204 - Advanced Electronic Media Production (4.0 cr)
- COMM 3211 - Introduction to U.S. Electronic Media (3.0 cr)
- COMM 3231 - Reality TV: History, Culture, and Economics (3.0 cr)
- COMM 3263W - Media Literacy: Decoding Media Images and Messages [WI] (3.0 cr)
- COMM 4245 - Critical Television Studies (3.0 cr)
- COMM 4263 - Feminist Media Studies [DSJ] (3.0 cr)
- COMM 5211 - Critical Media Studies: Theory and Methods (3.0 cr)
- COMM 5261 - Political Economy of Media Culture (3.0 cr)
- CSCL 1201 - Introduction to Cinema and Media Culture [AH] (4.0 cr)
- CSCL 1921W - Introduction to Film Study [AH, WI] (4.0 cr)
- CSCL 3115 - Cinema and Ideology [AH] (4.0 cr)
- CSCL 3176 - Oppositional Cinemas [GP] (4.0 cr)
- CSCL 3177 - On Television [CIV] (4.0 cr)
- CSCL 3178W - Documentary Cinema: History and Politics [WI] (4.0 cr)
- CSCL 3993 - Directed Study (1.0 - 3.0 cr)
- CSCL 4993 - Directed Study (1.0 - 3.0 cr)
- CSCL 5411 - Avant-Garde Cinema (4.0 cr)
- CSCL 5993 - Directed Study (1.0 - 3.0 cr)
- ENGL 3040 - Studies in Film (3.0 cr)
- ENGW 5205 - Screenwriting (4.0 cr)
- ENGW 5207 - Screen writing II (4.0 cr)
- FREN 3451 - North African Cinema (3.0 cr)
- FRIT 3802 - Cinema and Realism (3.0 cr)
- GER 1601 - Fleeing Hitler: German and Austrian Filmmakers Between Europe and Hollywood [AH] (3.0 cr)
- GER 3604W - Introduction to German Cinema [AH, GP, WI] (3.0 cr)
- GWSS 3307 - Feminist Film Studies [AH, DSJ] (3.0 cr)
- GWSS 3409W - Asian American Women's Cultural Production [AH, DSJ, WI] (3.0 cr)
- HSCI 4321 - History of Computing [TS, HIS] (3.0 cr)
- JOUR 1001 - Introduction to Mass Communication [SOCS, TS] (3.0 cr)
- JOUR 3614 - History of Media Communication [HIS, TS] (3.0 cr)
- JOUR 3615 - History of the Documentary [AH] (3.0 cr)
- JOUR 3741 - People of Color and the Mass Media [DSJ] (3.0 cr)
- JOUR 3745 - Mass Media and Popular Culture [AH, DSJ] (3.0 cr)
- JOUR 3796 - Mass Media and Politics (3.0 cr)
- JOUR 5615 - History of the Documentary (3.0 cr)
- SCMC 1201 - Introduction to Cinema and Media Culture [AH] (4.0 cr)
- SCMC 3001W - History of Cinema and Media Culture [WI] (4.0 cr)
- SCMC 3201 - Fundamentals of Digital Filmmaking (4.0 cr)
- SCMC 3202 - Intermediate Digital Filmmaking (4.0 cr)
- SCMC 3993 - Directed Study (1.0 - 3.0 cr)
- SCMC 4993 - Directed Study (1.0 - 3.0 cr)



- SCMC 5001 - Critical Debates in the Study of Cinema and Media Culture (4.0 cr)
- SCMC 5002 - Advanced Film Analysis (4.0 cr)
- SCMC 5993 - Directed Study (1.0 - 3.0 cr)
- SPAN 3800 - Film Studies in Spanish (3.0 cr)
- TH 4550 - Video Technology (3.0 cr)
- GEOG 3374W - The City in Film [AH, WI] (4.0 cr)
or GEOG 5374W - The City in Film [WI] (4.0 cr)

Senior Project

Complete one of the following as part of the minimum 33 credits required for graduation:

- (1) Project within a 3xxx-5xxx directed study
- (2) Project within a 3xxx-4xxx course (specially arranged with instructor)
- (3) Coursework, including substantial writing, in any 5xxx SCMC major course from the approved list
- (4) Honors project or thesis.

Although SCMC emphasizes contextual analysis, history, and theory, production projects (e.g., short films, video installations) are welcome.

Program Sub-plans

A sub-plan is not required for this program.

Honors UHP

This is an honors sub-plan.

Students admitted to the University Honors Program (UHP) must fulfill UHP requirements, in addition to degree program requirements. Honors courses used to fulfill degree program requirements will also fulfill UHP requirements.

Current departmental honors course offerings are listed at:

http://www.honors.umn.edu/academics/curriculum/dept_courses_current.html

Honors students complete an honors thesis project in the final year, most often in conjunction with an honors thesis course, or with an honors directed studies, or honors directed research course. Students select honors courses and plan for a thesis project in consultation with their UHP adviser and their departmental faculty adviser.



Twin Cities Campus

Theatre Arts B.A.

Theatre Arts & Dance

College of Liberal Arts

- Program Type: Baccalaureate
- Requirements for this program are current for Fall 2012
- Required credits to graduate with this degree: 120
- Required credits within the major: 43
- Degree: Bachelor of Arts

This degree program offers study of the art form in both theoretical historical context and the practice of live dramatic performance. Course offerings include theatre history and dramatic literature; acting, movement, and voice; directing; design and technology for scenery, costume, lighting, makeup, and sound; and stage and arts management.

Coursework also embraces theatre as a group art, an art in which individual excellence is often fully realized only in collaboration with other artists. The practical application of the art encourages students to test classroom experiences under the pressure of public performance in the laboratory of the University Theatre.

For students interested in a BFA program, see Acting BFA for requirements.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Admission Requirements

For information about University of Minnesota admission requirements, visit the [Office of Admissions website](#).

General Requirements

All students are required to complete general University and college requirements including writing and liberal education courses. For more information about University-wide requirements, see the [liberal education requirements](#). Required courses for the major or minor in which a student receives a D grade (with or without plus or minus) do not count toward the major or minor (including transfer courses).

Program Requirements

Students are required to take 4 semester(s) of any second language.

Students may earn no more than one undergraduate degree from the theatre arts program: a B.A. in theatre arts, or a B.F.A. in acting, or a minor in theatre arts.

Beginning fall 2012, all incoming CLA freshman must complete the appropriate First Year Experience course sequence. Specific information about this collegiate requirement can be found at: http://class.umn.edu/degree_requirements/index.html

Major Courses

[TH 1101W](#) - Introduction to the Theatre [AH, WI] (4.0 cr)

[TH 1321](#) - Beginning Acting: Fundamentals of Performance (3.0 cr)

[TH 1322](#) - Creating the Performance (3.0 cr)

[TH 1501](#) - Introduction to Design and Technology for Live Performance (3.0 cr)

[TH 3171](#) - History of the Theatre: Ancient Greece Through Neo-Classicism (3.0 cr)

[TH 3172](#) - History of the Theatre: Age of Enlightenment to Present (3.0 cr)

Dramatic Literature

[TH 4177W](#) - Survey of Dramatic Literature I: Strategic Interpretation [WI] (3.0 cr)

or [TH 4178W](#) - Survey of Dramatic Literature II: Representation and its Effects [WI] (3.0 cr)

Theatre Practicum

Take no more than 2 credits in acting.

Take 4 or more credits(s) from the following:

- [TH 3100](#) - Theatre Practicum (1.0 cr)

Design/Technology

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



- TH 3521 - Introduction to Scenic Design for Theater and Performance (3.0 cr)
- TH 3531 - Introduction to Theatrical Costume Design (3.0 cr)
- TH 3541 - Introduction to Stage Lighting Design (3.0 cr)
- TH 3571 - Introduction to Stage Technology (3.0 cr)

Electives

Take 3 or more course(s) totaling 9 or more credits(s) from the following:

- TH 3xxx
- TH 4xxx
- TH 5xxx
- DNCE 3xxx
- DNCE 4xxx
- DNCE 5xxx

Senior Seminar

TH 4901 - Senior Seminar (2.0 cr)

Program Sub-plans

A sub-plan is not required for this program.

Honors UHP

This is an honors sub-plan.

Students admitted to the University Honors Program (UHP) must fulfill UHP requirements, in addition to degree program requirements. Honors courses used to fulfill degree program requirements will also fulfill UHP requirements.

Current departmental honors course offerings are listed at:

http://www.honors.umn.edu/academics/curriculum/dept_courses_current.html

Honors students complete an honors thesis project in the final year, most often in conjunction with an honors thesis course, or with an honors directed studies, or honors directed research course. Students select honors courses and plan for a thesis project in consultation with their UHP adviser and their departmental faculty adviser.



Twin Cities Campus

Urban Studies B.A.

Geography

College of Liberal Arts

- Program Type: Baccalaureate
- Requirements for this program are current for Fall 2012
- Required credits to graduate with this degree: 120
- Required credits within the major: 36 to 43
- Degree: Bachelor of Arts

This cross-disciplinary major involves urban studies coursework, fieldwork experiences, internships, and coursework in disciplines that offer useful perspectives on contemporary urban and postindustrial society.

The program focuses on the conceptual and analytical frameworks and specialized skills needed for professions focused on urban change or development. Students completing the program work in public agencies or private business or pursue graduate study in urban planning, law, social welfare, public affairs, or the social and environmental sciences.

Students are encouraged to incorporate field study into the major or minor. Options include urban studies programs sponsored by the Higher Education Consortium for Urban Affairs (HECUA) in South America, Norway, and Minneapolis-St. Paul.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Admission Requirements

For information about University of Minnesota admission requirements, visit the [Office of Admissions website](#).

General Requirements

All students are required to complete general University and college requirements including writing and liberal education courses. For more information about University-wide requirements, see the [liberal education requirements](#). Required courses for the major or minor in which a student receives a D grade (with or without plus or minus) do not count toward the major or minor (including transfer courses).

Program Requirements

Students are required to take 4 semester(s) of any second language.

Students may earn no more than one undergraduate degree in urban studies: a B.A. or a B.S. or a minor.

Beginning fall 2012, all incoming CLA freshman must complete the appropriate First Year Experience course sequence. Specific information about this collegiate requirement can be found at: http://class.umn.edu/degree_requirements/index.html

Major Courses

[URBS 1001W](#) - Introduction to Urban Studies: The Complexity of Metropolitan Life [WI] (3.0 cr)
or [URBS 3001W](#) - Introduction to Urban Studies: The Complexity of Metropolitan Life [WI] (3.0 cr)

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

- [URBS 3201](#) - Urban Studies Colloquium (1.0 cr)
- [URBS 3202](#) - Urban Studies Colloquium (1.0 cr)

Take 6 or more credits(s) from the following:

- [URBS 3500](#) - Urban Studies Workshop (3.0 cr)

Skills and Methods Courses

Take 2 or more course(s) totaling 6 - 8 credits(s) from the following:

•Introductory Courses in Statistics & Research

- Take 0 - 1 course(s) from the following:
- [EPSY 3264](#) - Basic and Applied Statistics [MATH] (3.0 cr)
- [EPSY 5261](#) - Introductory Statistical Methods (3.0 cr)
- [GEOG 3511](#) - Principles of Cartography (4.0 cr)
- [GEOG 3531](#) - Numerical Spatial Analysis (4.0 cr)



- PA 5031 - Empirical Analysis I (4.0 cr)
- POL 3085 - Quantitative Analysis in Political Science [MATH] (4.0 cr)
- PSY 3001W - Introduction to Research Methods [WI] (4.0 cr)
- SOC 3801 - Sociological Research Methods (4.0 cr)
- SOC 3811 - Basic Social Statistics [MATH] (4.0 cr)
- STAT 3011 - Introduction to Statistical Analysis [MATH] (4.0 cr)
- STAT 3021 - Introduction to Probability and Statistics (3.0 cr)
- Intermediate Courses in Statistics & Quantitative Analysis**
 - Take 0 or more course(s) from the following:
 - FR 3131 - Geographical Information Systems (GIS) for Natural Resources [TS] (4.0 cr)
 - GEOG 3561 - Principles of Geographic Information Science (4.0 cr)
 - GEOG 5511 - Principles of Cartography (3.0 cr)
 - GEOG 5562 - Geographic Information Science and Analytical Cartography (3.0 cr)
 - GEOG 5563 - Advanced Geographic Information Science (3.0 cr)
 - STAT 3022 - Data Analysis (4.0 cr)
 - STAT 4101 - Theory of Statistics I (4.0 cr)
 - STAT 4102 - Theory of Statistics II (4.0 cr)
 - STAT 5021 - Statistical Analysis (4.0 cr)
 - STAT 5201 - Sampling Methodology in Finite Populations (3.0 cr)
 - STAT 5401 - Applied Multivariate Methods (3.0 cr)
 - STAT 5421 - Analysis of Categorical Data (3.0 cr)
- Applied Courses in Statistics & Quantitative Research Design**
 - Take 0 or more course(s) from the following:
 - CE 3101 - Computer Applications in Civil Engineering I (3.0 cr)
 - GEOG 5564 - Urban Geographic Information Science and Analysis (3.0 cr)
 - HIST 5011 - Quantitative Methods for Historical Research (4.0 cr)
 - HSG 5464 - Understanding Housing: Assessment and Analysis (3.0 cr)
 - PA 5022 - Economics For Policy Analysis and Planning II (1.5 - 3.0 cr)
 - PA 5271 - Geographic Information Systems: Applications in Planning and Policy Analysis (3.0 cr)
- Other Methods Courses**
 - Take 0 or more course(s) from the following:
 - AFRO 5551 - Methods: Use of Oral Traditions as Resources for History (3.0 cr)
 - GEOG 3401 - Geography of Environmental Systems and Global Change [ENV] (4.0 cr)
 - GEOG 3523 - Digital Mapping: Introduction to Making Online Maps for the Humanities and Sciences (3.0 cr)
 - GEOG 5401 - Geography of Environmental Systems and Global Change (4.0 cr)
 - GEOG 5565 - Geographical Analysis of Human-Environment Systems (3.0 cr)
 - GWSS 5101 - Feminist Approaches to Ethnography (3.0 cr)
 - HIST 3001 - Public History (3.0 cr)
 - MKTG 3010 - Marketing Research (4.0 cr)
 - PA 4101 - Nonprofit Management and Governance (3.0 cr)
 - PA 5035 - Survey Research and Data Collection (1.5 cr)
 - PA 5112 - Public Budgeting (3.0 cr)
 - PA 5221 - Private Sector Development (3.0 cr)
 - PA 5253 - Designing Planning and Participation Processes (3.0 cr)
 - PA 5511 - Community Economic Development (3.0 cr)
 - PA 5521 - Development Planning and Policy Analysis (4.0 cr)
 - WRIT 4573W - Writing Proposals and Grant Management [WI] (3.0 cr)
- Communication Courses**
 - Take 0 - 1 course(s) from the following:
 - COMM 3411 - Introduction to Small Group Communication (3.0 cr)
 - COMM 3441 - Introduction to Organizational Communication (3.0 cr)
 - COMM 5411 - Small Group Communication Research (3.0 cr)
 - COMM 5441 - Communication in Human Organizations (3.0 cr)
 - SW 3501 - Theories and Practices of Social Change Organizing (4.0 cr)
- Urban Form and Society Courses**
 - Take 2 or more course(s) totaling 6 - 8 credits(s) from the following:
 - AFRO 4013 - Cities in Africa: African, Islamic, European Traditions (3.0 cr)
 - ARCH 3412 - Architectural History Since 1750 [HIS, GP] (3.0 cr)
 - ARCH 4445W - Suburbia [WI] (3.0 cr)
 - CSCL 5256W - Suburbia [WI] (3.0 cr)
 - DES 3331 - Street Life Urban Design Seminar (3.0 cr)
 - GEOG 3371W - Cities, Citizens, and Communities [DSJ, WI] (4.0 cr)
 - GEOG 3373 - Changing Form of the City [HIS, GP] (3.0 cr)
 - GEOG 3973 - Geography of the Twin Cities [SOCS] (3.0 cr)



- HIST 3479 - History of Chinese Cities and Urban Life (3.0 - 4.0 cr)
- HSG 2463 - Housing and Community Development (3.0 cr)
- URBS 3301W - American Cities As Settings for Cultural Diversity [WI] (3.0 cr)
- URBS 3861 - Financing Cities (3.0 cr)
- URBS 3871 - A Suburban World (3.0 cr)
- URBS 5861 - Financing Cities (3.0 cr)

Internship and Senior Paper

Students planning to complete their degree requirements at the end of fall semester should take URBS 3993 in place of URBS 3955W.

URBS 3900 - Urban Studies Internship Seminar (2.0 cr)

URBS 3955W - Senior Paper Seminar [WI] (2.0 cr)

Urban Studies Concentrations

Social and Cultural Analysis of Urban Life

This is Track A.

Take 3 or more course(s) totaling 9 - 12 credits(s) from the following:

- AFRO 3072 - Racism: Social and Psychological Consequences for Black Americans (3.0 cr)
- AFRO 4231 - The Color of Public Policy: African Americans, American Indians, and Chicanos in the United States (3.0 cr)
- AFRO 5910 - Topics in African American and African Studies (3.0 cr)
- AMIN 4231 - The Color of Public Policy: African Americans, American Indians, and Chicanos in the United States (3.0 cr)
- AMIN 4511 - American Indian Political Economy [CD] (3.0 cr)
- CHIC 4231 - The Color of Public Policy: African Americans, American Indians, and Chicanos in the United States (3.0 cr)
- CHIC 4275 - Theory in Action: Community Engagement in a Social Justice Framework [CIV] (3.0 cr)
- COMM 3451W - Intercultural Communication: Theory and Practice [IP, WI] (3.0 cr)
- COMM 5451W - Intercultural Communication Processes [IP, WI] (3.0 cr)
- GEOG 3374W - The City in Film [AH, WI] (4.0 cr)
- GEOG 5374W - The City in Film [WI] (4.0 cr)
- GWSS 5404 - Working Class Women's Cultures (3.0 cr)
- HIST 3821 - United States in the 20th Century to 1945 (3.0 cr)
- HIST 3822 - United States in the 20th Century Since 1945 [HP] (3.0 cr)
- HIST 3865 - African American History, 1865 to Present (4.0 cr)
- HIST 3869 - Urban American History: Race, Class, Gender, and Sexuality in Urban America (3.0 cr)
- HIST 3872 - American Indian History: 1830 to the Present [HIS, DSJ] (3.0 cr)
- HSG 4467W - Housing and the Social Environment [WI] (4.0 cr)
- PA 5290 - Topics in Planning (1.0 - 3.0 cr)
- PA 5401 - Poverty, Inequality, and Public Policy (3.0 cr)
- PA 5601 - Survey of Women, Law, and Public Policy in the United States (3.0 cr)
- POL 3739 - Politics of Race, Class, and Ethnicity (3.0 cr)
- PSY 3201 - Introduction to Social Psychology (3.0 cr)
- SOC 3451W - Cities and Social Change [WI] (3.0 cr)
- SOC 4108 - Current Issues in Crime Control (3.0 cr)
- SW 5101 - Historical Origins and Contemporary Policies and Programs in Social Welfare (3.0 - 4.0 cr)
- URBS 3301W - American Cities As Settings for Cultural Diversity [WI] (3.0 cr)

-OR-

Urban Political Economy

This is Track B.

Take 3 or more course(s) totaling 9 - 12 credits(s) from the following:

- APEC 3611W - Environmental and Natural Resource Economics [ENV, WI] (3.0 cr)
- APEC 5321 - Regional Economic Analysis (3.0 cr)
- APEC 5341 - Public Finance (3.0 cr)
- APEC 5611 - Economic Aspects of Environmental Management (3.0 cr)
- ECON 4621H - Honors Course: Urban Economics (4.0 cr)
- ECON 4821 - Public Economics (3.0 cr)
- GEOG 3331 - Geography of the World Economy [SOCS, GP] (3.0 cr)
- GEOG 3361W - Geography and Public Policy [WI] (3.0 cr)
- GEOG 5361 - Geography and Real Estate (4.0 cr)
- HIST 3841 - American Business History (3.0 cr)
- HSG 5463 - Housing Policy (3.0 cr)
- LA 3004 - Regional Landscape Planning (3.0 cr)
- LA 3514 - Making the Mississippi [CIV] (3.0 cr)
- PA 4200 - Urban and Regional Planning (3.0 cr)
- PA 5004 - Introduction to Planning (3.0 cr)



- PA 5013 - Law and Urban Land Use (1.5 cr)
- PA 5211 - Land Use Planning (3.0 cr)
- PA 5221 - Private Sector Development (3.0 cr)
- PA 5261 - Housing Policy (3.0 cr)
- PA 5290 - Topics in Planning (1.0 - 3.0 cr)
- PA 5421 - Racial Inequality and Public Policy (3.0 cr)
- PA 5511 - Community Economic Development (3.0 cr)
- POL 3477 - Political Development [SOCS, GP] (3.0 - 4.0 cr)
- POL 3739 - Politics of Race, Class, and Ethnicity (3.0 cr)
- URBS 3771 - Fundamentals of Transit (3.0 cr)
- URBS 3861 - Financing Cities (3.0 cr)
- URBS 3871 - A Suburban World (3.0 cr)
- URBS 5861 - Financing Cities (3.0 cr)

-OR-

Urban Infrastructure and Environment

This is Track C.

Take 3 or more course(s) totaling 9 - 11 credits(s) from the following:

- APEC 3611W - Environmental and Natural Resource Economics [ENV, WI] (3.0 cr)
- ARCH 3711W - Environmental Design and the Sociocultural Context [WI] (3.0 cr)
- ARCH 4671 - Historic Preservation (3.0 cr)
- ARCH 4701W - Introduction to Urban Form and Theory [WI] (3.0 cr)
- ARCH 5672 - Historic Building Conservation (3.0 cr)
- ARCH 5673 - Historic Building Research and Documentation (3.0 cr)
- ARCH 5711 - Theory and Principles of Urban Design (3.0 cr)
- CE 3201 - Transportation Engineering (3.0 cr)
- CE 5211 - Traffic Engineering (3.0 cr)
- CE 5212 - Transportation Policy, Planning, and Deployment (4.0 cr)
- ESPM 3011W - Ethics in Natural Resources [WI] (3.0 cr)
- ESPM 3245 - Sustainable Land Use Planning and Policy [ENV] (3.0 cr)
- ESPM 3251 - Natural Resources in Sustainable International Development [GP] (3.0 cr)
- LA 3003 - Case Studies in Sustainable Landscape Planning and Design (3.0 cr)
- LA 3501 - Environmental Design and Its Biological and Physical Context [ENV] (3.0 cr)
- LA 4755 - Infrastructure, Natural Systems, and Space of Inhabited Landscapes [TS] (3.0 cr)
- LA 5204 - Metropolitan Landscape Ecology (3.0 cr)
- LA 5401 - Directed Studies in Emerging Areas of Landscape Architecture (1.0 - 3.0 cr)
- PA 5013 - Law and Urban Land Use (1.5 cr)
- PA 5212 - Managing Urban Growth and Change (3.0 cr)
- PA 5231 - Transit Planning and Management (3.0 cr)
- PA 5232 - Transportation Policy, Planning, and Deployment (4.0 cr)
- PA 5421 - Racial Inequality and Public Policy (3.0 cr)
- PA 5722 - Environmental and Resource Economics Policy (3.0 cr)
- SUST 4004 - Sustainable Communities (3.0 cr)
- URBS 3751 - Understanding the Urban Environment [ENV] (3.0 cr)
- URBS 3771 - Fundamentals of Transit (3.0 cr)

Program Sub-plans

A sub-plan is not required for this program.

Honors UHP

This is an honors sub-plan.

Students admitted to the University Honors Program (UHP) must fulfill UHP requirements, in addition to degree program requirements. Honors courses used to fulfill degree program requirements will also fulfill UHP requirements.

Current departmental honors course offerings are listed at:

http://www.honors.umn.edu/academics/curriculum/dept_courses_current.html

Honors students complete an honors thesis project in the final year, most often in conjunction with an honors thesis course, or with an honors directed studies, or honors directed research course. Students select honors courses and plan for a thesis project in consultation with their UHP adviser and their departmental faculty adviser.



Twin Cities Campus

Urban Studies B.S.

Geography

College of Liberal Arts

- Program Type: Baccalaureate
- Requirements for this program are current for Fall 2012
- Required credits to graduate with this degree: 120
- Required credits within the major: 42 to 51
- Degree: Bachelor of Science

This cross-disciplinary major involves urban studies coursework, fieldwork experiences, internships, and coursework in disciplines that offer useful perspectives on contemporary urban and postindustrial society.

The program focuses on the conceptual and analytical frameworks and specialized skills needed for professions focused on urban change or development. Students completing the program work in public agencies or private business or pursue graduate study in urban planning, law, social welfare, public affairs, or the social and environmental sciences.

Students are encouraged to incorporate field study into the major or minor. Options include urban studies programs sponsored by the Higher Education Consortium for Urban Affairs (HECUA) in South America, Norway, and Minneapolis-St. Paul.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Admission Requirements

For information about University of Minnesota admission requirements, visit the [Office of Admissions website](#).

General Requirements

All students are required to complete general University and college requirements including writing and liberal education courses. For more information about University-wide requirements, see the [liberal education requirements](#). Required courses for the major or minor in which a student receives a D grade (with or without plus or minus) do not count toward the major or minor (including transfer courses).

Program Requirements

Students may earn no more than one undergraduate degree in urban studies: a B.A. or a B.S. or a minor.

Beginning fall 2012, all incoming CLA freshman must complete the appropriate First Year Experience course sequence. Specific information about this collegiate requirement can be found at: http://class.umn.edu/degree_requirements/index.html

Major Courses

[URBS 1001W](#) - Introduction to Urban Studies: The Complexity of Metropolitan Life [WI] (3.0 cr)
or [URBS 3001W](#) - Introduction to Urban Studies: The Complexity of Metropolitan Life [WI] (3.0 cr)

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

- [URBS 3201](#) - Urban Studies Colloquium (1.0 cr)
- [URBS 3202](#) - Urban Studies Colloquium (1.0 cr)

Take 6 or more credits(s) from the following:

- [URBS 3500](#) - Urban Studies Workshop (3.0 cr)

Skills and Methods Courses

Take 4 or more course(s) totaling 12 - 16 credits(s) from the following:

•Introductory Courses in Statistics & Research

- Take 0 - 1 course(s) from the following:
 - [EPSY 3264](#) - Basic and Applied Statistics [MATH] (3.0 cr)
 - [EPSY 5261](#) - Introductory Statistical Methods (3.0 cr)
 - [GEOG 3511](#) - Principles of Cartography (4.0 cr)
 - [GEOG 3531](#) - Numerical Spatial Analysis (4.0 cr)
 - [PA 5031](#) - Empirical Analysis I (4.0 cr)
 - [POL 3085](#) - Quantitative Analysis in Political Science [MATH] (4.0 cr)



- PSY 3001W - Introduction to Research Methods [WI] (4.0 cr)
- SOC 3801 - Sociological Research Methods (4.0 cr)
- SOC 3811 - Basic Social Statistics [MATH] (4.0 cr)
- STAT 3011 - Introduction to Statistical Analysis [MATH] (4.0 cr)
- STAT 3021 - Introduction to Probability and Statistics (3.0 cr)
- Intermediate Courses in Statistics & Quantitative Analysis**
- Take 0 - 2 course(s) from the following:
 - FR 3131 - Geographical Information Systems (GIS) for Natural Resources [TS] (4.0 cr)
 - GEOG 3561 - Principles of Geographic Information Science (4.0 cr)
 - GEOG 5511 - Principles of Cartography (3.0 cr)
 - GEOG 5562 - Geographic Information Science and Analytical Cartography (3.0 cr)
 - GEOG 5563 - Advanced Geographic Information Science (3.0 cr)
 - STAT 3022 - Data Analysis (4.0 cr)
 - STAT 4101 - Theory of Statistics I (4.0 cr)
 - STAT 4102 - Theory of Statistics II (4.0 cr)
 - STAT 5021 - Statistical Analysis (4.0 cr)
 - STAT 5201 - Sampling Methodology in Finite Populations (3.0 cr)
 - STAT 5401 - Applied Multivariate Methods (3.0 cr)
 - STAT 5421 - Analysis of Categorical Data (3.0 cr)
- Applied Courses in Statistics & Quantitative Research Design**
- Take 0 - 2 course(s) from the following:
 - CE 3101 - Computer Applications in Civil Engineering I (3.0 cr)
 - GEOG 5564 - Urban Geographic Information Science and Analysis (3.0 cr)
 - HIST 3001 - Public History (3.0 cr)
 - HIST 5011 - Quantitative Methods for Historical Research (4.0 cr)
 - HSG 5464 - Understanding Housing: Assessment and Analysis (3.0 cr)
 - PA 5022 - Economics For Policy Analysis and Planning II (1.5 - 3.0 cr)
 - PA 5271 - Geographic Information Systems: Applications in Planning and Policy Analysis (3.0 cr)
- Other Methods Courses**
- Take 0 - 2 course(s) from the following:
 - AFRO 5551 - Methods: Use of Oral Traditions as Resources for History (3.0 cr)
 - GEOG 3401 - Geography of Environmental Systems and Global Change [ENV] (4.0 cr)
 - GEOG 3523 - Digital Mapping: Introduction to Making Online Maps for the Humanities and Sciences (3.0 cr)
 - GEOG 5401 - Geography of Environmental Systems and Global Change (4.0 cr)
 - GEOG 5563 - Advanced Geographic Information Science (3.0 cr)
 - GEOG 5565 - Geographical Analysis of Human-Environment Systems (3.0 cr)
 - GWSS 5101 - Feminist Approaches to Ethnography (3.0 cr)
 - HIST 3001 - Public History (3.0 cr)
 - MKTG 3010 - Marketing Research (4.0 cr)
 - PA 4101 - Nonprofit Management and Governance (3.0 cr)
 - PA 5035 - Survey Research and Data Collection (1.5 cr)
 - PA 5111 - Financial Management in Public and Nonprofit Organizations (3.0 cr)
 - PA 5112 - Public Budgeting (3.0 cr)
 - PA 5221 - Private Sector Development (3.0 cr)
 - PA 5253 - Designing Planning and Participation Processes (3.0 cr)
 - PA 5511 - Community Economic Development (3.0 cr)
 - PA 5521 - Development Planning and Policy Analysis (4.0 cr)
 - WRIT 4573W - Writing Proposals and Grant Management [WI] (3.0 cr)

Urban Form and Society Courses

- Take 2 or more course(s) totaling 6 - 8 credits(s) from the following:
- AFRO 4013 - Cities in Africa: African, Islamic, European Traditions (3.0 cr)
 - ARCH 3412 - Architectural History Since 1750 [HIS, GP] (3.0 cr)
 - ARCH 4445W - Suburbia [WI] (3.0 cr)
 - CSCL 5256W - Suburbia [WI] (3.0 cr)
 - DES 3331 - Street Life Urban Design Seminar (3.0 cr)
 - GEOG 3371W - Cities, Citizens, and Communities [DSJ, WI] (4.0 cr)
 - GEOG 3373 - Changing Form of the City [HIS, GP] (3.0 cr)
 - GEOG 3973 - Geography of the Twin Cities [SOCS] (3.0 cr)
 - HIST 3479 - History of Chinese Cities and Urban Life (3.0 - 4.0 cr)
 - HSG 2463 - Housing and Community Development (3.0 cr)
 - URBS 3301W - American Cities As Settings for Cultural Diversity [WI] (3.0 cr)
 - URBS 3861 - Financing Cities (3.0 cr)
 - URBS 3871 - A Suburban World (3.0 cr)
 - URBS 5861 - Financing Cities (3.0 cr)



Internship and Senior Paper

Students planning to complete their degree requirements at the end of fall semester should take URBS 3993 in place of URBS 3955W.

[URBS 3900](#) - Urban Studies Internship Seminar (2.0 cr)

[URBS 3955W](#) - Senior Paper Seminar [WI] (2.0 cr)

Urban Studies Concentrations

Social and Cultural Analysis of Urban Life

This is Track A.

Take 3 or more course(s) totaling 9 - 12 credits(s) from the following:

- [AFRO 3072](#) - Racism: Social and Psychological Consequences for Black Americans (3.0 cr)
- [AFRO 4231](#) - The Color of Public Policy: African Americans, American Indians, and Chicanos in the United States (3.0 cr)
- [AFRO 5910](#) - Topics in African American and African Studies (3.0 cr)
- [AMIN 4231](#) - The Color of Public Policy: African Americans, American Indians, and Chicanos in the United States (3.0 cr)
- [AMIN 4511](#) - American Indian Political Economy [CD] (3.0 cr)
- [CHIC 4231](#) - The Color of Public Policy: African Americans, American Indians, and Chicanos in the United States (3.0 cr)
- [CHIC 4275](#) - Theory in Action: Community Engagement in a Social Justice Framework [CIV] (3.0 cr)
- [COMM 3451W](#) - Intercultural Communication: Theory and Practice [IP, WI] (3.0 cr)
- [COMM 5451W](#) - Intercultural Communication Processes [IP, WI] (3.0 cr)
- [GEOG 3374W](#) - The City in Film [AH, WI] (4.0 cr)
- [GEOG 5374W](#) - The City in Film [WI] (4.0 cr)
- [GWSS 5404](#) - Working Class Women's Cultures (3.0 cr)
- [HIST 3821](#) - United States in the 20th Century to 1945 (3.0 cr)
- [HIST 3822](#) - United States in the 20th Century Since 1945 [HP] (3.0 cr)
- [HIST 3865](#) - African American History, 1865 to Present (4.0 cr)
- [HIST 3869](#) - Urban American History: Race, Class, Gender, and Sexuality in Urban America (3.0 cr)
- [HIST 3872](#) - American Indian History: 1830 to the Present [HIS, DSJ] (3.0 cr)
- [HSG 4467W](#) - Housing and the Social Environment [WI] (4.0 cr)
- [PA 5290](#) - Topics in Planning (1.0 - 3.0 cr)
- [PA 5401](#) - Poverty, Inequality, and Public Policy (3.0 cr)
- [PA 5601](#) - Survey of Women, Law, and Public Policy in the United States (3.0 cr)
- [POL 3739](#) - Politics of Race, Class, and Ethnicity (3.0 cr)
- [PSY 3201](#) - Introduction to Social Psychology (3.0 cr)
- [SOC 3451W](#) - Cities and Social Change [WI] (3.0 cr)
- [SOC 4108](#) - Current Issues in Crime Control (3.0 cr)
- [SW 5101](#) - Historical Origins and Contemporary Policies and Programs in Social Welfare (3.0 - 4.0 cr)
- [URBS 3301W](#) - American Cities As Settings for Cultural Diversity [WI] (3.0 cr)

-OR-

Urban Political Economy

This is Track B.

Take 3 or more course(s) totaling 9 - 12 credits(s) from the following:

- [APEC 3611W](#) - Environmental and Natural Resource Economics [ENV, WI] (3.0 cr)
- [APEC 5321](#) - Regional Economic Analysis (3.0 cr)
- [APEC 5341](#) - Public Finance (3.0 cr)
- [APEC 5611](#) - Economic Aspects of Environmental Management (3.0 cr)
- [ECON 4621H](#) - Honors Course: Urban Economics (4.0 cr)
- [ECON 4821](#) - Public Economics (3.0 cr)
- [GEOG 3331](#) - Geography of the World Economy [SOCS, GP] (3.0 cr)
- [GEOG 3361W](#) - Geography and Public Policy [WI] (3.0 cr)
- [GEOG 5361](#) - Geography and Real Estate (4.0 cr)
- [HIST 3841](#) - American Business History (3.0 cr)
- [HSG 5463](#) - Housing Policy (3.0 cr)
- [LA 3004](#) - Regional Landscape Planning (3.0 cr)
- [LA 3514](#) - Making the Mississippi [CIV] (3.0 cr)
- [PA 4200](#) - Urban and Regional Planning (3.0 cr)
- [PA 5004](#) - Introduction to Planning (3.0 cr)
- [PA 5013](#) - Law and Urban Land Use (1.5 cr)
- [PA 5211](#) - Land Use Planning (3.0 cr)
- [PA 5221](#) - Private Sector Development (3.0 cr)
- [PA 5261](#) - Housing Policy (3.0 cr)
- [PA 5290](#) - Topics in Planning (1.0 - 3.0 cr)
- [PA 5421](#) - Racial Inequality and Public Policy (3.0 cr)



- PA 5511 - Community Economic Development (3.0 cr)
- POL 3477 - Political Development [SOCS, GP] (3.0 - 4.0 cr)
- POL 3739 - Politics of Race, Class, and Ethnicity (3.0 cr)
- URBS 3771 - Fundamentals of Transit (3.0 cr)
- URBS 3861 - Financing Cities (3.0 cr)
- URBS 3871 - A Suburban World (3.0 cr)
- URBS 5861 - Financing Cities (3.0 cr)

-OR-

Urban Infrastructure and Environment

This is Track C.

Take 3 or more course(s) totaling 9 - 11 credits(s) from the following:

- APEC 3611W - Environmental and Natural Resource Economics [ENV, WI] (3.0 cr)
- ARCH 3711W - Environmental Design and the Sociocultural Context [WI] (3.0 cr)
- ARCH 4671 - Historic Preservation (3.0 cr)
- ARCH 4701W - Introduction to Urban Form and Theory [WI] (3.0 cr)
- ARCH 5672 - Historic Building Conservation (3.0 cr)
- ARCH 5673 - Historic Building Research and Documentation (3.0 cr)
- ARCH 5711 - Theory and Principles of Urban Design (3.0 cr)
- CE 3201 - Transportation Engineering (3.0 cr)
- CE 5211 - Traffic Engineering (3.0 cr)
- CE 5212 - Transportation Policy, Planning, and Deployment (4.0 cr)
- ESPM 3011W - Ethics in Natural Resources [WI] (3.0 cr)
- ESPM 3245 - Sustainable Land Use Planning and Policy [ENV] (3.0 cr)
- ESPM 3251 - Natural Resources in Sustainable International Development [GP] (3.0 cr)
- LA 3003 - Case Studies in Sustainable Landscape Planning and Design (3.0 cr)
- LA 3501 - Environmental Design and Its Biological and Physical Context [ENV] (3.0 cr)
- LA 4755 - Infrastructure, Natural Systems, and Space of Inhabited Landscapes [TS] (3.0 cr)
- LA 5204 - Metropolitan Landscape Ecology (3.0 cr)
- LA 5401 - Directed Studies in Emerging Areas of Landscape Architecture (1.0 - 3.0 cr)
- PA 5013 - Law and Urban Land Use (1.5 cr)
- PA 5212 - Managing Urban Growth and Change (3.0 cr)
- PA 5231 - Transit Planning and Management (3.0 cr)
- PA 5232 - Transportation Policy, Planning, and Deployment (4.0 cr)
- PA 5722 - Environmental and Resource Economics Policy (3.0 cr)
- SUST 4004 - Sustainable Communities (3.0 cr)
- URBS 3751 - Understanding the Urban Environment [ENV] (3.0 cr)
- URBS 3771 - Fundamentals of Transit (3.0 cr)

Program Sub-plans

A sub-plan is not required for this program.

Honors UHP

This is an honors sub-plan.

Students admitted to the University Honors Program (UHP) must fulfill UHP requirements, in addition to degree program requirements. Honors courses used to fulfill degree program requirements will also fulfill UHP requirements.

Current departmental honors course offerings are listed at:

http://www.honors.umn.edu/academics/curriculum/dept_courses_current.html

Honors students complete an honors thesis project in the final year, most often in conjunction with an honors thesis course, or with an honors directed studies, or honors directed research course. Students select honors courses and plan for a thesis project in consultation with their UHP adviser and their departmental faculty adviser.



Twin Cities Campus

Aerospace Engineering and Mechanics B.A.E.M.

Aerospace Engineering & Mechanics

College of Science and Engineering

- Program Type: Baccalaureate
- Requirements for this program are current for Fall 2012
- Required credits to graduate with this degree: 124
- Required credits within the major: 70
- Degree: Bachelor of Aerospace Engineering and Mechanics

The mission of the bachelor of aerospace engineering and mechanics (B.A.E.M.) program is to produce graduates who are prepared to enter and sustain the practice of aerospace engineering and related fields, or to pursue advanced studies. This mission is consistent with the mission of the University of Minnesota in learning and teaching, and with the mission of the College of Science and Engineering: to provide a rigorous and stimulating education for its undergraduate majors and to provide programs of instruction in engineering that meet nationally accepted standards for practice of the profession of engineering.

Aerospace engineering is a multidisciplinary field that encompasses many areas of science and engineering and plays a major role in the technological advancement of society. As a constantly changing profession, aerospace engineering is concerned with a wide range of problems and the latest technologies. An aerospace engineer must have a comprehensive fundamental education in mathematics, physical sciences, and engineering sciences. The four-year program leading to the B.A.E.M. provides this broad background. The program is accredited by the Engineering Accreditation Commission of ABET.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Admission Requirements

Students must complete 8 courses before admission to the program.

Freshman and transfer students are usually admitted to pre-major status before admission to this major

For information about University of Minnesota admission requirements, visit the [Office of Admissions website](#).

Mathematics Core

Honors math (MATH 1571H, 1572H, (2573H or 2574H)) may be taken in place of the listed courses

- MATH 1371 - CSE Calculus I [MATH] (4.0 cr)
or MATH 1271 - Calculus I [MATH] (4.0 cr)
- MATH 1372 - CSE Calculus II (4.0 cr)
or MATH 1272 - Calculus II (4.0 cr)
- MATH 2374 - CSE Multivariable Calculus and Vector Analysis (4.0 cr)
or MATH 2263 - Multivariable Calculus (4.0 cr)

Physics Core

- PHYS 1301W - Introductory Physics for Science and Engineering I [PHYS, WI] (4.0 cr)
or PHYS 1401V - Honors Physics I [PHYS, WI] (4.0 cr)
- PHYS 1302W - Introductory Physics for Science and Engineering II [PHYS, WI] (4.0 cr)
or PHYS 1402V - Honors Physics II [PHYS, WI] (4.0 cr)

Chemistry Core

- CHEM 1061 - Chemical Principles I [PHYS] (3.0 cr)
CHEM 1065 - Chemical Principles I Laboratory [PHYS] (1.0 cr)
or CHEM 1071H - Honors Chemistry I [PHYS] (3.0 cr)
CHEM 1075H - Honors Chemistry I Laboratory [PHYS] (1.0 cr)

Statics Core

- AEM 2011 - Statics (3.0 cr)

General Requirements



All students are required to complete general University and college requirements including writing and liberal education courses. For more information about University-wide requirements, see the [liberal education requirements](#). Required courses for the major or minor in which a student receives a D grade (with or without plus or minus) do not count toward the major or minor (including transfer courses).

Program Requirements

AEM Core

- AEM 2012 - Dynamics (3.0 cr)
- AEM 2301 - Mechanics of Flight (3.0 cr)
- AEM 3031 - Deformable Body Mechanics (3.0 cr)
- AEM 4201 - Fluid Mechanics (4.0 cr)
- AEM 4202 - Aerodynamics (4.0 cr)
- AEM 4203 - Aerospace Propulsion (4.0 cr)
- AEM 4301 - Orbital Mechanics (3.0 cr)
- AEM 4303W - Flight Dynamics and Control [WI] (4.0 cr)
- AEM 4331 - Aerospace Vehicle Design (4.0 cr)
- AEM 4501 - Aerospace Structures (3.0 cr)
- AEM 4601 - Instrumentation Laboratory (3.0 cr)
- AEM 4602W - Aeromechanics Laboratory [WI] (4.0 cr)

Math, Science, and Engineering

- CSCI 1113 - Introduction to C/C++ Programming for Scientists and Engineers (4.0 cr)
- EE 3005 - Fundamentals of Electrical Engineering (4.0 cr)
- EE 3006 - Fundamentals of Electrical Engineering Laboratory (1.0 cr)
- ME 3324 - Introduction to Thermal Science (3.0 cr)
- MATS 2001 - Introduction to the Science of Engineering Materials (3.0 cr)
or MATS 3011 - Introduction to Materials Science and Engineering (3.0 cr)
- PHYS 2503 - Physics III: Intro to Waves, Optics, and Special Relativity (4.0 cr)
or PHYS 2303 - Physics III: Physics of Matter (4.0 cr)
or PHYS 2403H - Honors Physics III (4.0 cr)
- MATH 2373 - CSE Linear Algebra and Differential Equations (4.0 cr)
or MATH 2243 - Linear Algebra and Differential Equations (4.0 cr)
or MATH 2574H - Honors Calculus IV (4.0 cr)

Technical Electives

At least three courses (to total at least 9 credits) are required. These are typically chosen from 4xxx and 5xxx AEM courses that extend material covered in the required courses. They may be from other engineering, math and science disciplines at the appropriate level. One may be a 2xxx or 3xxx math or science course. In particular AST 2001 may be used to complete a minor in astronomy. Details are available from: www.aem.umn.edu/teaching/undergraduate/advising_guide/index.shtml

Program Sub-plans

A sub-plan is not required for this program.

EIP

Students may obtain professional experience in an industry or government assignment through an internship. The internship program usually consists of one term experience, generally in the summer. The practical engineering experience obtained through an internship not only enhances a student's education but also gives an edge on employment after graduation.

Students can receive 3 credits by taking AEM 4796 (report required). These credits can be counted as a technical elective toward the B.A.E.M. degree.

Internship

- AEM 4796 - Professional Experience (3.0 cr)

Honors UHP

This is an honors sub-plan.

Students admitted to the University Honors Program (UHP) must fulfill UHP requirements in addition to degree program requirements. Honors courses used to fulfill degree program requirements will also fulfill UHP requirements.

Current departmental honors course offerings are listed at:
http://www.honors.umn.edu/academics/curriculum/dept_courses_current.html



Honors students complete an honors thesis project in the final year, most often in conjunction with an honors thesis course, or with an honors directed studies or honors directed research course. Students select honors courses and plan for a thesis project in consultation with their UHP adviser and their departmental faculty adviser.



Twin Cities Campus

Astrophysics B.S.Astrop.

Astrophysics, Minnesota Institute for

College of Science and Engineering

- Program Type: Baccalaureate
- Requirements for this program are current for Fall 2012
- Required credits to graduate with this degree: 120
- Required credits within the major: 43 to 56
- Degree: Bachelor of Science in Astrophysics

The astrophysics program enables students to tackle complex and ill-defined problems within the physical sciences. The program prepares students for careers in professional astronomy, computational astrophysics, secondary education in the physical sciences, ROTC programs in the Air Force or Navy, data analysis, or laboratory science.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Admission Requirements

Students must complete 8 courses before admission to the program.

Freshman and transfer students are usually admitted to pre-major status before admission to this major

For information about University of Minnesota admission requirements, visit the [Office of Admissions website](#).

Mathematics Core

- [MATH 1271](#) - Calculus I [MATH] (4.0 cr)
or [MATH 1371](#) - CSE Calculus I [MATH] (4.0 cr)
- [MATH 1272](#) - Calculus II (4.0 cr)
or [MATH 1372](#) - CSE Calculus II (4.0 cr)
- [MATH 2243](#) - Linear Algebra and Differential Equations (4.0 cr)
or [MATH 2373](#) - CSE Linear Algebra and Differential Equations (4.0 cr)

Physics Core

- [PHYS 1301W](#) - Introductory Physics for Science and Engineering I [PHYS, WI] (4.0 cr)
or [PHYS 1401V](#) - Honors Physics I [PHYS, WI] (4.0 cr)
- [PHYS 1302W](#) - Introductory Physics for Science and Engineering II [PHYS, WI] (4.0 cr)
or [PHYS 1402V](#) - Honors Physics II [PHYS, WI] (4.0 cr)
- [PHYS 2303](#) - Physics III: Physics of Matter (4.0 cr)
or [PHYS 2403H](#) - Honors Physics III (4.0 cr)
or [PHYS 2503](#) - Physics III: Intro to Waves, Optics, and Special Relativity (4.0 cr)

General Requirements

All students are required to complete general University and college requirements including writing and liberal education courses. For more information about University-wide requirements, see the [liberal education requirements](#). Required courses for the major or minor in which a student receives a D grade (with or without plus or minus) do not count toward the major or minor (including transfer courses).

Program Requirements

Students interested in astrophysics are encouraged to take AST 1011H.

Astrophysics Core

- [PHYS 2201](#) - Introductory Thermodynamics and Statistical Physics (3.0 cr)
- [PHYS 2601](#) - Quantum Physics (4.0 cr)
- [AST 2001](#) - Introduction to Astrophysics (4.0 cr)
[AST 4994W](#) - Directed Research [WI] (3.0 - 5.0 cr)
- [PHYS 2605](#) - Quantum Physics Laboratory (3.0 cr)
- [PHYS 4001](#) - Analytical Mechanics (4.0 cr)



PHYS 4002 - Electricity and Magnetism (4.0 cr)

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

- AST 4xxx
- AST 5xxx

MATH 2283 - Sequences, Series, and Foundations (3.0 cr)

or MATH 3xxx
or MATH 4xxx

MATH 2263 - Multivariable Calculus (4.0 cr)

or **MATH 2374** - CSE Multivariable Calculus and Vector Analysis (4.0 cr)

Astrophysics Focus

Data Analysis Specialist

This emphasis prepares students for careers in corporate and government labs and research divisions. Examples are programming, image processing, laboratory instrumentation, and general data analysis. Suggested courses are listed below.

Take 16 or more credits(s) from the following:

- AST 5201** - Methods of Experimental Astrophysics (4.0 cr)
- CSCI 1113** - Introduction to C/C++ Programming for Scientists and Engineers (4.0 cr)
- EE 3005** - Fundamentals of Electrical Engineering (4.0 cr)
- PHYS 4051** - Methods of Experimental Physics I (5.0 cr)
- PHYS 4052W** - Methods of Experimental Physics II [WI] (5.0 cr)

-OR-

Professional Astronomer

This emphasis prepares students for graduate school in astronomy. The program is similar to doing a double major in astrophysics and physics. The program emphasizes observational astronomy.

16 credits of AST, MATH, CHEM, PHYS, GEO, EE, or CSCI (3xxx, 4xxx, 5xxx)

Suggested courses are listed below.

Take 16 or more credits(s) from the following:

- PHYS 4101** - Quantum Mechanics (4.0 cr)
- PHYS 4201** - Statistical and Thermal Physics (3.0 cr)

•Take 0 or more course(s) from the following:

- AST 4xxx
- AST 5xxx

•Take 0 or more credits(s) from the following:

- CHEM 3xxx
- CHEM 4xxx
- CHEM 5xxx

•Take 0 or more course(s) from the following:

- CSCI 3xxx
- CSCI 4xxx
- CSCI 5xxx

•Take 0 or more course(s) from the following:

- EE 3xxx
- EE 4xxx
- EE 5xxx

•Take 0 or more course(s) from the following:

- GEO 3xxx
- GEO 4xxx
- GEO 5xxx

•Take 0 or more course(s) from the following:

- MATH 3xxx
- MATH 4xxx
- MATH 5xxx

•Take 0 or more course(s) from the following:

- PHYS 3xxx
- PHYS 4xxx
- PHYS 5xxx

-OR-

Secondary Education

This emphasis prepares students for entry to a master's program in secondary science education. In addition to the courses listed below, students must complete 100 hours of in-class experience across at least two semesters.



PSY 1001 - Introduction to Psychology [SOCS] (4.0 cr)
HSCI 1814 - Revolutions in Science: The Babylonians to Newton [HIS, GP] (3.0 - 4.0 cr)
or HSCI 4121W - History of 20th-Century Physics [WI] (3.0 cr)
PHIL 1005 - Scientific Reasoning (4.0 cr)
or PHIL 3601W - Scientific Thought [WI] (4.0 cr)
AST 5201 - Methods of Experimental Astrophysics (4.0 cr)
or **Physics Research**
This course pair replaces AST 4994 in the student's program.
PHYS 4051 - Methods of Experimental Physics I (5.0 cr)
PHYS 4052W - Methods of Experimental Physics II [WI] (5.0 cr)

-OR-

Technical Electives

Select 16 credits in consultation with your adviser.

Program Sub-plans

A sub-plan is not required for this program.

Honors UHP

This is an honors sub-plan.

Students admitted to the University Honors Program (UHP) must fulfill UHP requirements, in addition to degree program requirements. Honors courses used to fulfill degree program requirements will also fulfill UHP requirements.

Current departmental honors course offerings are listed at:
http://www.honors.umn.edu/academics/curriculum/dept_courses_current.html.

Honors students complete an honors thesis project in the final year, most often in conjunction with an honors thesis course, or with an honors directed studies, or honors directed research course. Students select honors courses and plan for a thesis project in consultation with their UHP adviser and their departmental faculty adviser.



Twin Cities Campus

Bio-Based Products Engineering B.B.P.E.

Bio-Based Products

College of Science and Engineering

• **Students will no longer be accepted into this program after Fall 2006. Program requirements below are for current students only.**

- Program Type: Baccalaureate
- Requirements for this program are current for Fall 2012
- Required credits to graduate with this degree: 128
- Required credits within the major: 113
- Degree: Bachelor of Bio-Based Products Engineering

Bio-based products are materials, chemicals, and energy derived from renewable, bio-resources including forestry, agriculture and other biomass. Many commercial products and forms of energy that come from fossil fuels can be derived from renewable, bio-resources. The molecular building blocks and components of biomass can be harnessed to heat homes, run cars, light buildings, and provide industrial and consumer products. These products include biofuels, biofibers and fiber-based products, paper, board, engineered wood, structural panels, bio-based composites, renewable plastics, and bio-derived chemicals and energy.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Admission Requirements

Students must complete 15 courses before admission to the program.

Freshman and transfer students are usually admitted to pre-major status before admission to this major

For information about University of Minnesota admission requirements, visit the [Office of Admissions website](#).

Preparatory Courses

- BBE 1001 - Bioproducts and Biosystems Engineering Orientation (1.0 cr)
- BBE 1002 - Biorenewable Resources [TS] (3.0 cr)
- BBE 1003 *{Inactive}*(1.0 cr)
- BIOL 1009 - General Biology [BIOL] (4.0 cr)
or BIOL 1009H - Honors: General Biology [BIOL] (4.0 cr)

Mathematics

- MATH 1271 - Calculus I [MATH] (4.0 cr)
or MATH 1371 - CSE Calculus I [MATH] (4.0 cr)
- MATH 1272 - Calculus II (4.0 cr)
or MATH 1372 - CSE Calculus II (4.0 cr)
- MATH 2263 - Multivariable Calculus (4.0 cr)
or MATH 2374 - CSE Multivariable Calculus and Vector Analysis (4.0 cr)
- MATH 2243 - Linear Algebra and Differential Equations (4.0 cr)
or MATH 2373 - CSE Linear Algebra and Differential Equations (4.0 cr)

Physical Sciences

- CHEM 1021 *{Inactive}*[PHYS] (4.0 cr)
or CHEM 1031H *{Inactive}*[PHYS] (4.0 cr)
- CHEM 1022 *{Inactive}*[PHYS] (4.0 cr)
or CHEM 1032H - Honors Chemistry II [PHYS] (4.0 cr)
- CHEM 2301 - Organic Chemistry I (3.0 cr)
- CHEM 2302 - Organic Chemistry II (3.0 cr)
- CHEM 3501 *{Inactive}*(3.0 cr)
- PHYS 1301W - Introductory Physics for Science and Engineering I [PHYS, WI] (4.0 cr)
or PHYS 1401V - Honors Physics I [PHYS, WI] (4.0 cr)
- PHYS 1302W - Introductory Physics for Science and Engineering II [PHYS, WI] (4.0 cr)
or PHYS 1402V - Honors Physics II [PHYS, WI] (4.0 cr)



General Requirements

All students are required to complete general University and college requirements including writing and liberal education courses. For more information about University-wide requirements, see the [liberal education requirements](#). Required courses for the major or minor in which a student receives a D grade (with or without plus or minus) do not count toward the major or minor (including transfer courses).

Program Requirements

Major Courses

- BBE 2001 - Mechanics and Structural Design (4.0 cr)
- BBE 4504W - Bio-based Products Development and Management [WI] (3.0 cr)

Engineering Courses

- BBE 3013 - Engineering Principles of Molecular and Cellular Processes (3.0 cr)
- BBE 4013 - Transport in Biological Processes II (3.0 cr)
- CE 3502 - Fluid Mechanics (4.0 cr)
- CHEN 2001 - Material and Energy Balances (4.0 cr)
- CHEN 3101 - Chemical Engineering Thermodynamics (4.0 cr)
- BBE 4713 - Biological Process Engineering (3.0 cr)
- BBE 4001 - Chemistry of Biomass and Biomass Conversion to Fuels and Products [ENV] (4.0 cr)
- BBE 4301 - Applied Surface and Colloid Science (3.0 cr)
- BBE 4302 - Biodegradation of Bioproducts (3.0 cr)
- BBE 4303 - Introduction to Bio-based Materials Science (3.0 cr)
- BBE 4401 - Bioproducts Engineering (3.0 cr)
- BBE 4402 - Bio-based Products Engineering Lab I (1.0 cr)
- BBE 4403 - Bio-based Products Engineering Lab II (1.0 cr)
- BBE 4404 - Biopolymers and Biocomposites Engineering (3.0 cr)
- BBE 4405 *{Inactive}*(3.0 cr)
- BBE 4501 *{Inactive}*(2.0 cr)
- BBE 4502W - BBE Capstone Design [WI] (4.0 cr)

Program Sub-plans

A sub-plan is not required for this program.

Honors

This is an honors sub-plan.

To graduate cum laude, students must complete a thesis and have a cumulative GPA of 3.50. To graduate magna cum laude, students must complete a thesis and at least one other honors experience, and have a cumulative GPA of 3.66. For summa cum laude, students must complete a thesis and three honors experiences, and have a cumulative GPA of 3.75. Consult an academic adviser for a list of possible honors experiences, or to petition the department to approve an honors experience not already listed.



Twin Cities Campus

Biomedical Engineering B.Bm.E.

Department of Biomedical Engineering

College of Science and Engineering

- Program Type: Baccalaureate
- Requirements for this program are current for Fall 2012
- Required credits to graduate with this degree: 124
- Required credits within the major: 71
- Degree: Bachelor of Biomedical Engineering

Biomedical engineers apply the fundamentals of mathematics, physics, chemistry, and biology to solve medically relevant problems. Examples of biomedical engineering activities include medical device design, fabrication and testing, prosthesis fabrication, ergonomics and human factors, physiological function monitoring, home health care technology development, biomedical informatics, functional imaging and tomography, biomaterial development and biocompatibility, artificial tissue and organ fabrication, cell- and biomolecule-based sensors and therapeutics, gene therapy development, and biomedical microsystems.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Admission Requirements

Students must complete 10 courses before admission to the program.

Freshman and transfer students are usually admitted to pre-major status before admission to this major

For information about University of Minnesota admission requirements, visit the [Office of Admissions website](#).

Mathematics

Honors math (MATH 1571H, 1572H, 2573H, 2574H) may be taken in place of the listed courses.

- [MATH 1271](#) - Calculus I [MATH] (4.0 cr)
or [MATH 1371](#) - CSE Calculus I [MATH] (4.0 cr)
- [MATH 1272](#) - Calculus II (4.0 cr)
or [MATH 1372](#) - CSE Calculus II (4.0 cr)
- [MATH 2243](#) - Linear Algebra and Differential Equations (4.0 cr)
or [MATH 2373](#) - CSE Linear Algebra and Differential Equations (4.0 cr)

Physical Sciences

- [CHEM 1061](#) - Chemical Principles I [PHYS] (3.0 cr)
or [CHEM 1071H](#) - Honors Chemistry I [PHYS] (3.0 cr)
- [CHEM 1065](#) - Chemical Principles I Laboratory [PHYS] (1.0 cr)
or [CHEM 1075H](#) - Honors Chemistry I Laboratory [PHYS] (1.0 cr)
- [CHEM 1062](#) - Chemical Principles II [PHYS] (3.0 cr)
or [CHEM 1072H](#) - Honors Chemistry II [PHYS] (3.0 cr)
- [CHEM 1066](#) - Chemical Principles II Laboratory [PHYS] (1.0 cr)
or [CHEM 1076H](#) - Honors Chemistry II Laboratory [PHYS] (1.0 cr)
- [CHEM 2301](#) - Organic Chemistry I (3.0 cr)
- [PHYS 1301W](#) - Introductory Physics for Science and Engineering I [PHYS, WI] (4.0 cr)
or [PHYS 1401V](#) - Honors Physics I [PHYS, WI] (4.0 cr)
- [PHYS 1302W](#) - Introductory Physics for Science and Engineering II [PHYS, WI] (4.0 cr)
or [PHYS 1402V](#) - Honors Physics II [PHYS, WI] (4.0 cr)

Preparatory Courses

- [BMEN 2401](#) - Programming for Biomedical Engineers (2.0 cr)
- [BMEN 2501](#) - Cellular and Molecular Biology for Biomedical Engineers [BIOL] (4.0 cr)

General Requirements

All students are required to complete general University and college requirements including writing and liberal education courses. For more information about University-wide requirements, see the [liberal education requirements](#). Required courses for the major or minor in which a student receives a D grade (with or without plus or minus) do not count toward the major or minor (including transfer courses).



Program Requirements

Statistics

[STAT 3021](#) - Introduction to Probability and Statistics (3.0 cr)

Major Courses

[BMEN 1601](#) - Biomedical Engineering Undergraduate Seminar I (1.0 cr)

[BMEN 1602](#) - Biomedical Engineering Undergraduate Seminar II (1.0 cr)

[BMEN 3001](#) - Biomechanics (4.0 cr)

[BMEN 3101](#) - Biomedical Transport Processes (4.0 cr)

[BMEN 3201](#) - Bioelectricity and Bioinstrumentation (4.0 cr)

[BMEN 3301](#) - Biomaterials (4.0 cr)

[BMEN 3401](#) - Biomedical Systems Analysis (4.0 cr)

[BMEN 4001W](#) - Biomedical Engineering Design I [WI] (3.0 cr)

[BMEN 4002W](#) - Biomedical Engineering Design II [WI] (3.0 cr)

[PHSL 3061](#) - Principles of Physiology (4.0 cr)

[PHSL 3701](#) - Physiology Laboratory (2.0 cr)

[BMEN 2101](#) - Biomedical Thermodynamics (3.0 cr)

Technical Electives

Take 27 credits of technical electives approved by an adviser. A maximum of 10 credits of science courses and a maximum of 6 credits of research may be counted toward the total.

Multivariable Calculus

[MATH 2374](#) - CSE Multivariable Calculus and Vector Analysis (4.0 cr)

or [MATH 2263](#) - Multivariable Calculus (4.0 cr)

Program Sub-plans

A sub-plan is not required for this program.

Honors UHP

This is an honors sub-plan.

Students admitted to the University Honors Program (UHP) must fulfill UHP requirements in addition to degree program requirements. Honors courses used to fulfill degree program requirements will also fulfill UHP requirements.

Current departmental honors course offerings are listed at:

http://www.honors.umn.edu/academics/curriculum/dept_courses_current.html

Honors students complete an honors thesis project in the final year, most often in conjunction with an honors thesis course, or with an honors directed studies or honors directed research course. Students select honors courses and plan for a thesis project in consultation with their UHP adviser and their departmental faculty adviser.



Twin Cities Campus

Bioproducts and Biosystems Engineering B.B.E.

Bioproducts and Biosystems Engineering

College of Science and Engineering

- Program Type: Baccalaureate
- Requirements for this program are current for Fall 2012
- Required credits to graduate with this degree: 125
- Required credits within the major: 72 to 80
- Degree: Bachelor of Bioproducts and Biosystems Engineering

The bioproducts and biosystems engineering curriculum provides a broad fundamental scientific and engineering background to harness the molecular building blocks of renewable resources for sustainable utilization, to design and develop biological systems, and to help improve the environment by developing solutions for environmental and natural resource issues affecting soil, water, and air. The curriculum offers three areas of specialization: bioproducts engineering, food engineering, and environmental and ecological engineering.

The program produces graduates who

- * have a broad fundamental engineering background, including mathematics, physical science, biological science, and engineering science and design;
- * serve the engineering needs of clientele in the areas of bioproducts, bioprocessing and food, and environment and ecology;
- * are successfully employed in engineering jobs in industry, consulting, government, or academia;
- * are engaged in professional development and lifelong learning.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Admission Requirements

Students must complete 10 courses before admission to the program.

Freshman and transfer students are usually admitted to pre-major status before admission to this major

For information about University of Minnesota admission requirements, visit the [Office of Admissions website](#).

Mathematics

- [MATH 1271](#) - Calculus I [MATH] (4.0 cr)
or [MATH 1371](#) - CSE Calculus I [MATH] (4.0 cr)
- [MATH 1272](#) - Calculus II (4.0 cr)
or [MATH 1372](#) - CSE Calculus II (4.0 cr)
- [MATH 2263](#) - Multivariable Calculus (4.0 cr)
or [MATH 2374](#) - CSE Multivariable Calculus and Vector Analysis (4.0 cr)

Biological and Physical Sciences

- [BIOL 1009](#) - General Biology [BIOL] (4.0 cr)
- [CHEM 1061](#) - Chemical Principles I [PHYS] (3.0 cr)
[CHEM 1065](#) - Chemical Principles I Laboratory [PHYS] (1.0 cr)
or [CHEM 1071H](#) - Honors Chemistry I [PHYS] (3.0 cr)
[CHEM 1075H](#) - Honors Chemistry I Laboratory [PHYS] (1.0 cr)
- [CHEM 1062](#) - Chemical Principles II [PHYS] (3.0 cr)
[CHEM 1066](#) - Chemical Principles II Laboratory [PHYS] (1.0 cr)
or [CHEM 1072H](#) - Honors Chemistry II [PHYS] (3.0 cr)
[CHEM 1076H](#) - Honors Chemistry II Laboratory [PHYS] (1.0 cr)
- [PHYS 1301W](#) - Introductory Physics for Science and Engineering I [PHYS, WI] (4.0 cr)
or [PHYS 1401V](#) - Honors Physics I [PHYS, WI] (4.0 cr)
- [PHYS 1302W](#) - Introductory Physics for Science and Engineering II [PHYS, WI] (4.0 cr)
or [PHYS 1402V](#) - Honors Physics II [PHYS, WI] (4.0 cr)



Additional Requirements

[BBE 2001](#) - Mechanics and Structural Design (4.0 cr)

General Requirements

All students are required to complete general University and college requirements including writing and liberal education courses. For more information about University-wide requirements, see the [liberal education requirements](#). Required courses for the major or minor in which a student receives a D grade (with or without plus or minus) do not count toward the major or minor (including transfer courses).

Program Requirements

Common Core

[BBE 1001](#) - Bioproducts and Biosystems Engineering Orientation (1.0 cr)
[BBE 2002](#) - Introduction to Engineering Design (3.0 cr)
[BBE 3013](#) - Engineering Principles of Molecular and Cellular Processes (3.0 cr)
[BBE 3033](#) - Material and Energy Balances in Biological Systems (3.0 cr)
[BBE 3043](#) - Biological and Environmental Thermodynamics (3.0 cr)
[BBE 3012](#) - Transport in Biological Processes I (4.0 cr)
[BBE 4013](#) - Transport in Biological Processes II (3.0 cr)
[BBE 4023W](#) - Process Control and Instrumentation [WI] (3.0 cr)
[BBE 4303](#) - Introduction to Bio-based Materials Science (3.0 cr)
[BBE 4502W](#) - BBE Capstone Design [WI] (4.0 cr)
[STAT 3021](#) - Introduction to Probability and Statistics (3.0 cr)
[MATH 2243](#) - Linear Algebra and Differential Equations (4.0 cr)
or [MATH 2373](#) - CSE Linear Algebra and Differential Equations (4.0 cr)

Program Sub-plans

Students are required to complete one of the following sub-plans. (Note for the Twin Cities and Morris campuses: The honors sub-plan does not meet this requirement. Honors students are required to complete one sub-plan plus the honors sub-plan. Please see an adviser if no honors sub-plan is listed for the program.)

Bioproducts Engineering

Chemistry

[CHEM 2301](#) - Organic Chemistry I (3.0 cr)
[CHEM 4501](#) - Introduction to Thermodynamics, Kinetics, and Statistical Mechanics (3.0 cr)

Emphasis Courses

[BBE 1002](#) - Biorenewable Resources [TS] (3.0 cr)
[BBE 4001](#) - Chemistry of Biomass and Biomass Conversion to Fuels and Products [ENV] (4.0 cr)
[BBE 4301](#) - Applied Surface and Colloid Science (3.0 cr)
[BBE 4401](#) - Bioproducts Engineering (3.0 cr)
[BBE 4402](#) - Bio-based Products Engineering Lab I (1.0 cr)
[BBE 4403](#) - Bio-based Products Engineering Lab II (1.0 cr)
[BBE 4713](#) - Biological Process Engineering (3.0 cr)

Technical Electives

See adviser for suggestions in creating a materials focus or an energy and manufacturing focus.

Take 2 or more course(s) totaling 6 or more credits(s) from the following:

- [BBE 3396](#) - Industrial Internship (Industrial Assignment) (1.0 cr)
- [BBE 4302](#) - Biodegradation of Bioproducts (3.0 cr)
- [BBE 4305](#) - Pulp and Paper Technology (3.0 cr)
- [BBE 4404](#) - Biopolymers and Biocomposites Engineering (3.0 cr)
- [BBE 4491](#) - Senior Topics: Independent Study (1.0 - 4.0 cr)
- [BBE 4504W](#) - Bio-based Products Development and Management [WI] (3.0 cr)
- [BBE 4733](#) - Renewable Energy Technologies [TS] (3.0 cr)
- [BBE 4900](#) - Intern Reports (2.0 cr)
- [IE 5513](#) - Engineering Safety (4.0 cr)

Other Technical Electives

Take 2 or more course(s) totaling 6 or more credits(s) from the following:

- [CHEM 2302](#) - Organic Chemistry II (3.0 cr)
- [CHEM 2311](#) - Organic Lab (4.0 cr)
- [CHEM 4221](#) - Introduction to Polymer Chemistry (3.0 cr)



- BIOC 3021 - Biochemistry (3.0 cr)
- MATS 3801 - Structural Characterization Lab (4.0 cr)
- MATS 4214 - Polymers (3.0 cr)
- ME 4431W - Energy Conversion Systems Laboratory [WI] (4.0 cr)
- CE 4502 - Water and Wastewater Treatment (3.0 cr)
- IE 5551 - Production Planning and Inventory Control (4.0 cr)

Honors UHP

This is an honors sub-plan.

Students admitted to the University Honors Program (UHP) must fulfill UHP requirements, in addition to degree program requirements. Honors courses used to fulfill degree program requirements will also fulfill UHP requirements.

Current departmental honors course offerings are listed at:

http://www.honors.umn.edu/academics/curriculum/dept_courses_current.html.

Honors students complete an honors thesis project in the final year, most often in conjunction with an honors thesis course, an honors directed studies, or honors directed research course. Students select honors courses and plan for a thesis project in consultation with their UHP adviser and their departmental faculty adviser.

Environmental and Ecological Engineering

Biochemistry

BIOC 2011 - Biochemistry for the Agricultural and Health Sciences (3.0 cr)

Emphasis Courses

BBE 3023 - Ecological Engineering Principles (3.0 cr)

Environmental and Ecological Engineering

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

- BBE 4523 - Ecological Engineering Design (3.0 cr)
- BBE 4535 - Assessment and Diagnosis of Impaired Waters (3.0 cr)
- BBE 5513 - Watershed Engineering (3.0 cr)

Engineering Technical Electives

Select at least 9 credits of engineering electives from BBE 4523, 4533, 4535, or 5513 if not taken above, and from the following list of courses.

Take 3 or more course(s) totaling 9 or more credits(s) from the following:

- BBE 4401 - Bioproducts Engineering (3.0 cr)
- BBE 4533 - Sustainable Waste Management Engineering (3.0 cr)
- BBE 4713 - Biological Process Engineering (3.0 cr)
- BBE 4723 - Food Process Engineering (3.0 cr)
- BBE 4733 - Renewable Energy Technologies [TS] (3.0 cr)
- CE 3202 - Surveying and Mapping (2.0 cr)
- CE 3402W - Civil Engineering Materials [WI] (3.0 cr)
- CE 3501 - Environmental Engineering [ENV] (3.0 cr)
- CE 4351 - Groundwater Mechanics (3.0 cr)
- CE 4502 - Water and Wastewater Treatment (3.0 cr)
- CE 4511 - Hydraulic Structures (3.0 cr)
- CE 4512 - Open Channel Hydraulics (4.0 cr)
- CE 4561 - Solid Hazardous Wastes (3.0 cr)
- CE 4562 - Environmental Remediation Technology (3.0 cr)
- CE 5591 - Environmental Law for Engineers (3.0 cr)
- IE 5513 - Engineering Safety (4.0 cr)

Other Technical Electives

Select at least 9 credits, with at least one course chosen from BIOL 3007W, BIOL 3407, EEB 3001, or EBB 5601.

Take 3 or more course(s) totaling 9 or more credits(s) from the following:

- BIOL 3007W - Plant, Algal, and Fungal Diversity and Adaptation [WI] (4.0 cr)
- BIOL 3407 - Ecology (3.0 cr)
- EEB 3001 - Ecology and Society [ENV] (3.0 cr)
- EEB 5601 - Limnology (3.0 cr)
- ESPM 3603 - Environmental Life Cycle Analysis (3.0 cr)
- ESPM 3606W - Pollution Prevention: Principles, Technologies, and Practices [WI] (3.0 cr)
- ESPM 3612W - Soil and Environmental Biology [WI] (3.0 cr)
- ESPM 4608 - Bioremediation (3.0 cr)
- ESPM 4609 - Air Pollution Impacts, Management, and Ethical Challenges [CIV] (3.0 cr)
- FR 3131 - Geographical Information Systems (GIS) for Natural Resources [TS] (4.0 cr)
- SOIL 3416 - Plant Nutrients in the Environment (3.0 cr)



EIP

This sub-plan is optional and does not fulfill the sub-plan requirement for this program.

This option provides students with hands-on work experience after freshman year of the degree program. Students can take up to two semesters of intern work with one or more employers. An example may be two summers and one semester. This may be adjusted to suit individual needs. Students have an opportunity to assist in design work and apply their knowledge to practical problem solving. The experience helps students choose a career and select electives for the degree.

During the academic portion of the intern program, students are expected to take a normal load of 11-13 credits. Graduation may be delayed because of the intern experience. It is important to plan ahead, since biosystems and agricultural engineering classes are usually offered only once per year, and in some cases, alternating years. Students registering for BBE 4900 must first submit a proposed plan of study with the intern coordinator.

Internship

A total of 4 BBE 4900 intern experience credits may be taken and applied toward the degree program as general engineering electives, but not as BBE electives.

[BBE 4900](#) - Intern Reports (2.0 cr)

Food Engineering

Emphasis Courses

[BBE 4402](#) - Bio-based Products Engineering Lab I (1.0 cr)

[BBE 4713](#) - Biological Process Engineering (3.0 cr)

[BBE 4723](#) - Food Process Engineering (3.0 cr)

[VBS 2032](#) - General Microbiology With Laboratory (5.0 cr)

[CHEM 2301](#) - Organic Chemistry I (3.0 cr)

[BIOC 3021](#) - Biochemistry (3.0 cr)

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

• [BBE 4401](#) - Bioproducts Engineering (3.0 cr)

• [BBE 4533](#) - Sustainable Waste Management Engineering (3.0 cr)

• [BBE 4733](#) - Renewable Energy Technologies [TS] (3.0 cr)

• [IE 5441](#) - Financial Decision Making (4.0 cr)

• [IE 5513](#) - Engineering Safety (4.0 cr)

Technical Electives

Select 9 credits from BBE 4401, BBE 4533, BBE 4733, IE 5513, IE 5441 if not taken above, and from the following list of courses.

Take 3 or more course(s) totaling 9 or more credits(s) from the following:

• [BBE 4001](#) - Chemistry of Biomass and Biomass Conversion to Fuels and Products [ENV] (4.0 cr)

• [FSCN 1102](#) - Food: Safety, Risks, and Technology [CIV] (3.0 cr)

• [FSCN 1112](#) - Principles of Nutrition (3.0 cr)

• [FSCN 3102](#) - Introduction to Food Science (3.0 cr)

• [FSCN 4112](#) - Food Chemistry and Functional Foods (3.0 cr)

• [FSCN 4121](#) - Food Microbiology (3.0 cr)

• [FSCN 4332](#) - Food Processing Operations (3.0 cr)



Twin Cities Campus

Biosystems and Agricultural Engineering B.B.A.E.

Bioproducts and Biosystems Engineering

College of Science and Engineering

• **Students will no longer be accepted into this program after Fall 2006. Program requirements below are for current students only.**

- Program Type: Baccalaureate
- Requirements for this program are current for Fall 2012
- Required credits to graduate with this degree: 128
- Required credits within the major: 30
- Degree: Bachelor of Biosystems and Agricultural Engr

The mission of the Department of Biosystems and Agricultural Engineering is to conduct research and educate people to solve engineering problems in agricultural and biological environments. Educational objectives for the program are to produce graduates with the following:

- A broad fundamental engineering background including mathematics, physical science, biological science, engineering science, and computational skills needed for their future practice of biosystems and agricultural engineering.
- The skills necessary to carry out an effective design process including the ability to think creatively, work cooperatively, formulate problems, synthesize information, develop and evaluate alternatives, implement solutions, and communicate effectively at all stages of the process.
- The ability to address issues of ethics, safety, professionalism, and social and economic impacts in engineering practice and design.
- Specific abilities to pursue careers that integrate engineering and biology to design efficient, economical systems to produce and deliver high quality, safe food to consumers; to design sustainable systems that protect the environment, humans, plants, and animals; and to design safe and efficient machines, processes, and practices for biological systems.
- Opportunities to develop in-depth background in one of the following areas of emphasis: Bioprocessing and Food, Environment, or Machinery Systems.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Admission Requirements

Students must complete 10 courses before admission to the program.

Freshman and transfer students are usually admitted to pre-major status before admission to this major

A GPA above 2.0 is preferred for the following:

- 2.50 transferring from outside the University

For information about University of Minnesota admission requirements, visit the [Office of Admissions website](#).

Mathematics

- MATH 1271 - Calculus I [MATH] (4.0 cr)
or MATH 1371 - CSE Calculus I [MATH] (4.0 cr)
- MATH 1272 - Calculus II (4.0 cr)
or MATH 1372 - CSE Calculus II (4.0 cr)
- MATH 2243 - Linear Algebra and Differential Equations (4.0 cr)
or MATH 2373 - CSE Linear Algebra and Differential Equations (4.0 cr)
- MATH 2263 - Multivariable Calculus (4.0 cr)
or MATH 2374 - CSE Multivariable Calculus and Vector Analysis (4.0 cr)

Biological and Physical Sciences

- BIOL 1009 - General Biology [BIOL] (4.0 cr)
or BIOL 1009H - Honors: General Biology [BIOL] (4.0 cr)



CHEM 1021 *{Inactive}*[PHYS] (4.0 cr)
or CHEM 1031H *{Inactive}*[PHYS] (4.0 cr)
CHEM 1022 *{Inactive}*[PHYS] (4.0 cr)
or CHEM 1032H - Honors Chemistry II [PHYS] (4.0 cr)
PHYS 1301W - Introductory Physics for Science and Engineering I [PHYS, WI] (4.0 cr)
or PHYS 1401V - Honors Physics I [PHYS, WI] (4.0 cr)
PHYS 1302W - Introductory Physics for Science and Engineering II [PHYS, WI] (4.0 cr)
or PHYS 1402V - Honors Physics II [PHYS, WI] (4.0 cr)

Statics and Dynamics

Take 1 or more course(s) from the following:

- AEM 2021 - Statics and Dynamics (4.0 cr)
- take the following course pair.
 - AEM 2011 - Statics (3.0 cr)
 - AEM 2012 - Dynamics (3.0 cr)

General Requirements

All students are required to complete general University and college requirements including writing and liberal education courses. For more information about University-wide requirements, see the [liberal education requirements](#). Required courses for the major or minor in which a student receives a D grade (with or without plus or minus) do not count toward the major or minor (including transfer courses).

Program Requirements

Major Courses

BBE 1011 *{Inactive}*(1.0 cr)
BBE 2113 *{Inactive}*(3.0 cr)
BBE 3013 - Engineering Principles of Molecular and Cellular Processes (3.0 cr)
BBE 3023 - Ecological Engineering Principles (3.0 cr)
BBE 4013 - Transport in Biological Processes II (3.0 cr)
BBE 4023W - Process Control and Instrumentation [WI] (3.0 cr)
BBE 4114W *{Inactive}*[WI] (4.0 cr)
BBE 5212 - Safety and Environmental Health Issues in Plant and Animal Production and Processing (3.0 cr)
AEM 3031 - Deformable Body Mechanics (3.0 cr)
CE 3502 - Fluid Mechanics (4.0 cr)
EE 3005 - Fundamentals of Electrical Engineering (4.0 cr)
ME 3331 - Thermal Sciences I (3.0 cr)
WRIT 3562W - Technical and Professional Writing [WI] (4.0 cr)
STAT 3021 - Introduction to Probability and Statistics (3.0 cr)

Electives

Students who wish to have a concentration within their elective coursework must take at least two courses belonging to the same designated emphasis. The designated emphases and the courses which comprise them are as follows: Bioprocessing and Food (BAE 4713, 4723); Environment (BAE 4523, 4533, 5513); and Machinery Systems (BAE 4313, 4323).

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

- BBE 4313 *{Inactive}*(3.0 cr)
- BBE 4323 *{Inactive}*(3.0 cr)
- BBE 4523 - Ecological Engineering Design (3.0 cr)
- BBE 4533 - Sustainable Waste Management Engineering (3.0 cr)
- BBE 4713 - Biological Process Engineering (3.0 cr)
- BBE 4723 - Food Process Engineering (3.0 cr)
- BBE 5513 - Watershed Engineering (3.0 cr)

Technical Electives

Complete 8 credits of engineering electives, 6 credits of biology electives, and at least 3 credits of technical electives (computer science or 3 additional credits of engineering or biology electives). Any of the emphases (sub-plans) may be completed as part of the requirement. See an adviser for a list of courses that fulfill electives or visit www.bae.umn.edu/teaching/ugrad/electives.html.
Technical Elective

Program Sub-plans



A sub-plan is not required for this program.

Bioprocessing and Food

Processing of agricultural and biological materials yields many important products, from foods to pharmaceuticals. In this emphasis, students are prepared for careers in the design and development of systems for processing, storing, and distributing food and agricultural products; processes to recover and purify products such as proteins produced through biotechnology; processes to make products such as biodegradable plastics from biological materials; new food products as a member of a team of food scientists and marketing specialists; and systems to ensure food safety and quality.

With completion of an additional 3 credits, this subplan fulfills the Technical Electives requirement.

Engineering Electives

Any non-required BAE course not used as a BAE elective.

Take 8 or more credits(s) from the following:

- CHEN 5754 *{Inactive}*(3.0 cr)
- CHEN 5759 *{Inactive}*(2.0 cr)
- EE 5821 *{Inactive}*(3.0 cr)
- IE 5531 - Engineering Optimization I (4.0 cr)
- IE 5541 - Project Management (4.0 cr)
- MATS 3011 - Introduction to Materials Science and Engineering (3.0 cr)
- ME 5381 - Biological Transport Processes (4.0 cr)

Biology Electives

See an adviser for other options.

Take 6 or more credits(s) from the following:

- BIOC 3021 - Biochemistry (3.0 cr)
- CHEM 2301 - Organic Chemistry I (3.0 cr)
- FSCN 4111 *{Inactive}*(3.0 cr)
- FSCN 4121 - Food Microbiology (3.0 cr)
- VBS 2022 - General Microbiology (3.0 cr)
- VBS 2032 - General Microbiology With Laboratory (5.0 cr)

EIP

This option provides students with a hands-on work experience after the freshman year of the degree program. Students can take up to two semesters of intern work with one or more employers. An example may be two summers and one semester. This may be adjusted to suit individual needs. Students have an opportunity to assist in design work and apply their knowledge to practical problem solving. The experience helps students choose a career and select electives for the degree.

During the academic portion of the intern program students are expected to take a normal load of 11-13 credits. Graduation may be delayed because of the intern experience. It is important to plan ahead, since biosystems and agricultural engineering classes are usually offered only once per year, and in some cases in alternating years. Students registering for BAE 4900 must first submit a proposed plan of study with the intern coordinator.

Internship

A total of 4 BAE 4900 intern Experience credits may be taken and applied toward the degree program as general engineering electives, but not as BAE electives.

BBE 4900 - Intern Reports (2.0 cr)

Environment

The world is faced with important environmental and natural resource issues affecting soil, water, and air. In this emphasis, students are prepared for careers in the design or development of systems to control runoff and flooding in agricultural and small urban watersheds; systems to manage water (drainage or irrigation) to enhance crop production; practices to improve water quality and control soil erosion; plans and practices to restore wetlands; systems to store, treat, and use livestock or food processing wastes; and processes for bioremediation of polluted areas.

With completion of an additional 3 credits, this Sub-plan fulfills the Technical Electives requirement.

Engineering Electives

See an adviser for other options.

Take 8 or more credits(s) from the following:

- CE 3202 - Surveying and Mapping (2.0 cr)
- CE 3301 - Soil Mechanics I (3.0 cr)
- CE 3402W - Civil Engineering Materials [WI] (3.0 cr)
- CE 3501 - Environmental Engineering [ENV] (3.0 cr)
- CE 4301 - Soil Mechanics II (3.0 cr)
- CE 4351 - Groundwater Mechanics (3.0 cr)



- CE 4501 - Hydrologic Design (4.0 cr)
- CE 4502 - Water and Wastewater Treatment (3.0 cr)
- CE 4511 - Hydraulic Structures (3.0 cr)
- CE 4512 - Open Channel Hydraulics (4.0 cr)

Biology Electives

See an adviser for other options.

Take 6 or more credits(s) from the following:

- BIOL 3007W - Plant, Algal, and Fungal Diversity and Adaptation [WI] (4.0 cr)
- BIOL 3407 - Ecology (3.0 cr)
- EEB 3001 - Ecology and Society [ENV] (3.0 cr)
- EEB 5601 - Limnology (3.0 cr)
- ESPM 3612W - Soil and Environmental Biology [WI] (3.0 cr)
- SOIL 3416 - Plant Nutrients in the Environment (3.0 cr)

Honors

This is an honors sub-plan.

For cum laude, students must complete a thesis and one honors experience and have a cumulative GPA of 3.50. To graduate magna cum laude, students must complete a thesis and two honors experiences and have a cumulative GPA of 3.66. For summa cum laude, students must complete a thesis and three honors experiences and have a cumulative GPA of 3.75. Consult an academic adviser for a list of possible honors experiences.

Machinery Systems

Machines are important components of systems for production and processing of food and other biological materials. In this emphasis, students are prepared for careers in the design and development of machines for agricultural, horticultural, and landscape industries; machines and systems that incorporate operator safety, health, and comfort; machines for food processing and handling; automated systems for identification, sorting, or grading; agricultural and other off-road vehicles to improve performance and minimize adverse impact to the soil; and systems for precision agriculture that use technologies such as global positioning systems and geographical information systems

With completion of an additional 3 credits, this sub-plan fulfills the Technical Electives requirement.

Engineering Electives

See an adviser for other options.

Take 8 or more credits(s) from the following:

- MATS 2001 - Introduction to the Science of Engineering Materials (3.0 cr)
- ME 3221 - Design and Manufacturing I: Engineering Materials and Manufacturing Processes (4.0 cr)
- ME 3222 - Design and Manufacturing II (4.0 cr)
- ME 3281 - System Dynamics and Control (4.0 cr)
- ME 5243 - Advanced Mechanism Design (4.0 cr)
- ME 5247 - Stress Analysis, Sensing, and Transducers (4.0 cr)
- ME 5248 - Vibration Engineering (4.0 cr)

Biology Electives

See an adviser for other options.

Take 6 or more credits(s) from the following:

- AGRO 4005 - Applied Crop Physiology and Development (4.0 cr)
- AGRO 4605 - Management Strategies for Crop Production (3.0 cr)
- BIOL 2022 - General Botany (3.0 cr)
- BIOL 3007W - Plant, Algal, and Fungal Diversity and Adaptation [WI] (4.0 cr)
- BIOL 3407 - Ecology (3.0 cr)
- EEB 3001 - Ecology and Society [ENV] (3.0 cr)
- ESPM 3612W - Soil and Environmental Biology [WI] (3.0 cr)
- SOIL 3416 - Plant Nutrients in the Environment (3.0 cr)



Twin Cities Campus

Chemical Engineering B.Ch.E.

Chemical Engineering & Materials Science

College of Science and Engineering

- Program Type: Baccalaureate
- Requirements for this program are current for Fall 2012
- Required credits to graduate with this degree: 125
- Required credits within the major: 70
- Degree: Bachelor of Chemical Engineering

Chemical engineering deals with operations such as materials handling, mixing, fluid flow and metering, extrusion, coating, heat exchange, filtration, drying, evaporation, distillation, absorption, extraction, ion exchange, combustion, catalysis, and processing in chemical and biochemical reactors.

Because many industries are based on some chemical or physical transformation of matter, chemical engineers are much in demand. They may work in the manufacture of inorganic products (fertilizers, paints, ceramics, electronic materials); in the manufacture of organic products (polymers, films, papers, petrochemicals); in the manufacture of batteries and fuel cells; in the processing of minerals and materials; in food processing and fermentation; or in the production of antibiotics and biochemical products.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Admission Requirements

Students must complete 14 courses before admission to the program.

Freshman and transfer students are usually admitted to pre-major status before admission to this major

For information about University of Minnesota admission requirements, visit the [Office of Admissions website](#).

Mathematics

Honors math (MATH 1571H, 1572H, 2573H, 2574H) may be taken in place of the listed courses.

[MATH 1271](#) - Calculus I [MATH] (4.0 cr)

or [MATH 1371](#) - CSE Calculus I [MATH] (4.0 cr)

[MATH 1272](#) - Calculus II (4.0 cr)

or [MATH 1372](#) - CSE Calculus II (4.0 cr)

[MATH 2263](#) - Multivariable Calculus (4.0 cr)

or [MATH 2374](#) - CSE Multivariable Calculus and Vector Analysis (4.0 cr)

Physical Sciences

[CHEM 1061](#) - Chemical Principles I [PHYS] (3.0 cr)

or [CHEM 1071H](#) - Honors Chemistry I [PHYS] (3.0 cr)

[CHEM 1065](#) - Chemical Principles I Laboratory [PHYS] (1.0 cr)

or [CHEM 1075H](#) - Honors Chemistry I Laboratory [PHYS] (1.0 cr)

[CHEM 1062](#) - Chemical Principles II [PHYS] (3.0 cr)

or [CHEM 1072H](#) - Honors Chemistry II [PHYS] (3.0 cr)

[CHEM 1066](#) - Chemical Principles II Laboratory [PHYS] (1.0 cr)

or [CHEM 1076H](#) - Honors Chemistry II Laboratory [PHYS] (1.0 cr)

Additional Lower Division Chemistry

[CHEM 2301](#) - Organic Chemistry I (3.0 cr)

Physics

[PHYS 1301W](#) - Introductory Physics for Science and Engineering I [PHYS, WI] (4.0 cr)

or [PHYS 1401V](#) - Honors Physics I [PHYS, WI] (4.0 cr)

[PHYS 1302W](#) - Introductory Physics for Science and Engineering II [PHYS, WI] (4.0 cr)

or [PHYS 1402V](#) - Honors Physics II [PHYS, WI] (4.0 cr)

Chemical Engineering Lower Division

[CHEN 2001](#) - Material and Energy Balances (4.0 cr)

Freshman Writing



WRIT 1301 - University Writing (4.0 cr)

General Requirements

All students are required to complete general University and college requirements including writing and liberal education courses. For more information about University-wide requirements, see the [liberal education requirements](#). Required courses for the major or minor in which a student receives a D grade (with or without plus or minus) do not count toward the major or minor (including transfer courses).

Program Requirements

Students interested in chemical engineering are encouraged to take CHEN 1001.

Additional Mathematics

MATH 2373 - CSE Linear Algebra and Differential Equations (4.0 cr)
or MATH 2243 - Linear Algebra and Differential Equations (4.0 cr)

Major Courses

CHEM 4501 - Introduction to Thermodynamics, Kinetics, and Statistical Mechanics (3.0 cr)
CHEM 4502 - Introduction to Quantum Mechanics and Spectroscopy (3.0 cr)
CHEM 2121 - Process Analytical Chemistry (3.0 cr)
CHEM 2302 - Organic Chemistry II (3.0 cr)
CHEM 2311 - Organic Lab (4.0 cr)
or CHEM 2312H - Honors Organic Lab (5.0 cr)
CHEN 3701 - Introduction to Biomolecular Engineering (3.0 cr)
CHEN 3006 - Mass Transport and Separation Processes (4.0 cr)
CHEN 3101 - Chemical Engineering Thermodynamics (4.0 cr)
CHEN 3102 - Reaction Kinetics and Reactor Engineering (4.0 cr)
CHEN 3201 - Numerical methods in ChEn applications (3.0 cr)
CHEN 4401W - Senior Chemical Engineering Lab [WI] (3.0 cr)
CHEN 4501W - Chemical Engineering Process Design [WI] (3.0 cr)
CHEN 4502W - Chemical Engineering Process Design II [WI] (2.0 cr)
CHEN 4601 - Process Control (3.0 cr)
MATS 3011 - Introduction to Materials Science and Engineering (3.0 cr)
CHEN 3005 - Transport Phenomena: Momentum and Heat (4.0 cr)
CHEN 3401W - Junior Chemical Engineering Lab [WI] (2.0 cr)

Technical Electives

Take 12 credits of electives. These normally include CHEN 4214 and 3 other courses selected with the aid of an adviser.

BBE 4723 - Food Process Engineering (3.0 cr)
or BBE 4733 - Renewable Energy Technologies [TS] (3.0 cr)
or BIOC 3021 - Biochemistry (3.0 cr)
or BIOC 4521 - Introduction to Physical Biochemistry (3.0 cr)
or BIOC 5527 - Introduction to Modern Structural Biology (4.0 cr)
or BIOL 4003 - Genetics (3.0 cr)
or BIOL 4004 - Cell Biology (3.0 cr)
or BMEN 5001 - Advanced Biomaterials (3.0 cr)
or BMEN 5041 - Tissue Engineering (3.0 cr)
or BMEN 5311 - Advanced Biomedical Transport Processes (3.0 - 4.0 cr)
or BMEN 5371 - Biomedical Applications of Heat Transfer in Humans (3.0 - 4.0 cr)
or BMEN 5501 - Biology for Biomedical Engineers (3.0 cr)
or CE 4502 - Water and Wastewater Treatment (3.0 cr)
or CE 4561 - Solid Hazardous Wastes (3.0 cr)
or CE 4562 - Environmental Remediation Technology (3.0 cr)
or CHEM 4001 - Chemistry of Biomass and Biomass Conversion to Fuels and Products [ENV] (4.0 cr)
or CHEM 4011 - Mechanisms of Chemical Reactions (3.0 cr)
or CHEM 4021 - Computational Chemistry (3.0 cr)
or CHEM 4066 - Chemistry of Industry (3.0 cr)
or CHEM 4201 - Materials Chemistry (3.0 cr)
or CHEM 4301 - Applied Surface and Colloid Science (3.0 cr)
or CHEM 4311W - Advanced Organic Chemistry Lab [WI] (4.0 cr)
or CHEM 4321 - Organic Synthesis (3.0 cr)
or CHEM 4322 - Advanced Organic Chemistry (3.0 cr)
or CHEM 4411 - Introduction to Chemical Biology (3.0 cr)



or CHEM 4413 - Nucleic Acids (3.0 cr)
or CHEM 4511W - Advanced Physical Chemistry Lab [WI] (3.0 cr)
or CHEM 4701 - Inorganic Chemistry (3.0 cr)
or CHEM 4711W - Advanced Inorganic Chemistry Lab [WI] (3.0 cr)
or CHEM 4725 - Organometallic Chemistry (3.0 cr)
or CHEM 4745 - Advanced Inorganic Chemistry (3.0 cr)
or CHEM 5210 - Materials Characterization (4.0 cr)
or CHEN 4214 - Polymers (3.0 cr)
or CHEN 4701 - Advanced Undergraduate Applied Math I: Linear Analysis (3.0 cr)
or CHEN 4702 - Advanced Undergraduate Rheology (2.0 cr)
or CHEN 4703 *{Inactive}*(3.0 cr)
or CHEN 4704 - Advanced Undergraduate Physical Rate Processes I: Transport (3.0 cr)
or CHEN 4706 - Advanced Undergraduate Physical and Chemical Thermodynamics (3.0 cr)
or CHEN 4707 - Advanced Undergraduate Statistical Thermodynamics and Kinetics (3.0 cr)
or CHEN 4708 - Advanced Undergraduate Chemical Rate Processes: Analysis of Chemical Reactors (3.0 cr)
or CHEN 5531 - Electrochemical Engineering and Renewable Energy (3.0 cr)
or CHEN 5551 - Survey of Renewable Energy Technologies (3.0 cr)
or CHEN 5751 - Biochemical Engineering (3.0 cr)
or CHEN 5752 *{Inactive}*(3.0 cr)
or CHEN 5753 - Biological Transport Processes (3.0 - 4.0 cr)
or CHEN 5759 *{Inactive}*(2.0 cr)
or CHEN 5771 - Colloids and Dispersions (3.0 cr)
or CSCI 5304 - Computational Aspects of Matrix Theory (3.0 cr)
or CSCI 5451 - Introduction to Parallel Computing: Architectures, Algorithms, and Programming (3.0 cr)
or EE 3015 - Signals and Systems (3.0 cr)
or EE 3161 - Semiconductor Devices (3.0 cr)
or EE 4231 - Linear Control Systems: Designed by Input/Output Methods (3.0 cr)
or EE 5171 - Microelectronic Fabrication (4.0 cr)
or EE 5173 - Basic Microelectronics Laboratory (1.0 cr)
or EE 5653 - Physical Principles of Magnetic Materials (3.0 cr)
or EE 5655 - Magnetic Recording (3.0 cr)
or FSCN 5441 - Introduction to New Product Development (2.0 cr)
or IE 4521 - Statistics, Quality, and Reliability (4.0 cr)
or IE 5441 - Financial Decision Making (4.0 cr)
or IE 5513 - Engineering Safety (4.0 cr)
or IE 5522 - Quality Engineering and Reliability (4.0 cr)
or MATH 2283 - Sequences, Series, and Foundations (3.0 cr)
or MATH 4457 *{Inactive}*(4.0 cr)
or MATH 4458 *{Inactive}*(4.0 cr)
or MATH 4567 - Applied Fourier Analysis (4.0 cr)
or MATH 5445 - Mathematical Analysis of Biological Networks (4.0 cr)
or MATH 5485 - Introduction to Numerical Methods I (4.0 cr)
or MATH 5486 - Introduction To Numerical Methods II (4.0 cr)
or MATS 3013 - Electrical and Magnetic Properties of Materials (3.0 cr)
or MATS 4212 - Ceramics (3.0 cr)
or MATS 4301W - Materials Processing [WI] (4.0 cr)
or MATS 4511W - Corrosion and Electrochemistry of Corrosion [WI] (4.0 cr)
or MATS 5531 - Electrochemical Engineering (3.0 cr)
or ME 4431W - Energy Conversion Systems Laboratory [WI] (4.0 cr)
or ME 5113 - Aerosol/Particle Engineering (4.0 cr)
or ME 5115 - Air Quality and Air Pollution Control (4.0 cr)
or ME 5223 - Materials in Design (4.0 cr)
or ME 5446 - Introduction to Combustion (4.0 cr)
or MICB 3301 - Biology of Microorganisms (5.0 cr)
or MICB 4121 - Microbial Ecology and Applied Microbiology (3.0 cr)
or MICB 4131 - Immunology (3.0 cr)
or NSCI 3101 - Introduction to Neuroscience I: From Molecules to Madness (3.0 cr)
or PHAR 6163 - Pharmacokinetics (3.0 cr)
or PHAR 6164 - Biopharmaceutics (3.0 cr)
or PHAR 6224 - Pharmacogenomics: Genetic Basis for Variability in Drug Response (2.0 cr)
or PHCL 5110 - Introduction to Pharmacology (3.0 cr)
or PHSL 5061 - Principles of Physiology for Biomedical Engineering (4.0 cr)
or PHYS 4911 - Introduction to Biopolymer Physics (3.0 cr)
or CHEM 4223W - Polymer Laboratory [WI] (2.0 cr)
or CHEN 4223W - Polymer Laboratory [WI] (2.0 cr)



or [MATS 4223W](#) - Polymer Laboratory [WI] (2.0 cr)
or [BBE 4301](#) - Applied Surface and Colloid Science (3.0 cr)
or [MATS 4214](#) - Polymers (3.0 cr)
or [CHEM 4214](#) - Polymers (3.0 cr)

Program Sub-plans

A sub-plan is not required for this program.

Honors UHP

This is an honors sub-plan.

Students admitted to the University Honors Program (UHP) must fulfill UHP requirements in addition to degree program requirements. Honors courses used to fulfill degree program requirements will also fulfill UHP requirements.

Current departmental honors course offerings are listed at:
http://www.honors.umn.edu/academics/curriculum/dept_courses_current.html.

Honors students complete an honors thesis project in the final year, most often in conjunction with an honors thesis course, or with an honors directed studies or honors directed research course. Students select honors courses and plan for a thesis project in consultation with their UHP adviser and their departmental faculty adviser.



Twin Cities Campus

Chemistry B.S.Chem.

Chemistry

College of Science and Engineering

- Program Type: Baccalaureate
- Requirements for this program are current for Fall 2012
- Required credits to graduate with this degree: 120
- Required credits within the major: 41
- Degree: Bachelor of Science in Chemistry

The mission of the Department of Chemistry is to enrich the science of chemistry through the education of students from all disciplines, the training of future professional chemists, and the pursuit of knowledge.

Chemistry probes the fundamental concepts of nature and helps us understand the world around us. It deals with all substances at the molecular level: their composition, their properties, and how they are transformed into new substances. Chemistry is a central science of great importance to society. It provides a broad range of opportunities in many specialized fields, including biotechnology, polymer chemistry, environmental chemistry, materials chemistry, and medicine.

After graduating with a bachelor's degree, many chemistry majors go on to graduate or professional schools to pursue advanced degrees. Other graduates find employment in industry, education, or government.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Admission Requirements

Students must complete 10 courses before admission to the program.

Freshman and transfer students are usually admitted to pre-major status before admission to this major

For information about University of Minnesota admission requirements, visit the [Office of Admissions website](#).

Mathematics

- MATH 1271** - Calculus I [MATH] (4.0 cr)
or **MATH 1371** - CSE Calculus I [MATH] (4.0 cr)
- MATH 1272** - Calculus II (4.0 cr)
or **MATH 1372** - CSE Calculus II (4.0 cr)
- MATH 2263** - Multivariable Calculus (4.0 cr)
or **MATH 2374** - CSE Multivariable Calculus and Vector Analysis (4.0 cr)

Physical Sciences

- CHEM 1061** - Chemical Principles I [PHYS] (3.0 cr)
or **CHEM 1071H** - Honors Chemistry I [PHYS] (3.0 cr)
- CHEM 1065** - Chemical Principles I Laboratory [PHYS] (1.0 cr)
or **CHEM 1075H** - Honors Chemistry I Laboratory [PHYS] (1.0 cr)
- CHEM 1062** - Chemical Principles II [PHYS] (3.0 cr)
or **CHEM 1072H** - Honors Chemistry II [PHYS] (3.0 cr)
- CHEM 1066** - Chemical Principles II Laboratory [PHYS] (1.0 cr)
or **CHEM 1076H** - Honors Chemistry II Laboratory [PHYS] (1.0 cr)
- CHEM 2301** - Organic Chemistry I (3.0 cr)
- PHYS 1301W** - Introductory Physics for Science and Engineering I [PHYS, WI] (4.0 cr)
or **PHYS 1401V** - Honors Physics I [PHYS, WI] (4.0 cr)
- PHYS 1302W** - Introductory Physics for Science and Engineering II [PHYS, WI] (4.0 cr)
or **PHYS 1402V** - Honors Physics II [PHYS, WI] (4.0 cr)

General Requirements

All students are required to complete general University and college requirements including writing and liberal education courses. For more information about University-wide requirements, see the [liberal education requirements](#). Required courses for the major or minor in which a student receives a D grade (with or without plus or minus) do not count toward the major or minor (including transfer courses).



Program Requirements

Additional Math, Science, or Statistics

Students must take an additional course in math or statistics. If the student takes the honors math sequence, this requirement is automatically fulfilled.

[MATH 2243](#) - Linear Algebra and Differential Equations (4.0 cr)
or [MATH 2373](#) - CSE Linear Algebra and Differential Equations (4.0 cr)
or [PHYS 2303](#) - Physics III: Physics of Matter (4.0 cr)
or [PHYS 2403H](#) - Honors Physics III (4.0 cr)
or [STAT 3021](#) - Introduction to Probability and Statistics (3.0 cr)

Major Courses

[CHEM 4501](#) - Introduction to Thermodynamics, Kinetics, and Statistical Mechanics (3.0 cr)
[CHEM 4502](#) - Introduction to Quantum Mechanics and Spectroscopy (3.0 cr)
[CHEM 4701](#) - Inorganic Chemistry (3.0 cr)
[CHEM 2101](#) - Introductory Analytical Chemistry Lecture (3.0 cr)
[CHEM 2111](#) - Introductory Analytical Chemistry Lab (2.0 cr)
[CHEM 2302](#) - Organic Chemistry II (3.0 cr)
Lab can be taken concurrent with or after taking CHEM 2302
[CHEM 2311](#) - Organic Lab (4.0 cr)

Electives

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

- [CHEM 4094W](#) - Directed Research [WI] (1.0 - 5.0 cr)
- [CHEM 4111W](#) - Modern Instrumental Methods of Chemical Analysis Lab [WI] (2.0 cr)
- [CHEM 4311W](#) - Advanced Organic Chemistry Lab [WI] (4.0 cr)
- [CHEM 4511W](#) - Advanced Physical Chemistry Lab [WI] (3.0 cr)
- [CHEM 4711W](#) - Advanced Inorganic Chemistry Lab [WI] (3.0 cr)
- [CHEM 4223W](#) - Polymer Laboratory [WI] (2.0 cr)

Select one course (3 credits) from any non-required upper division course in chemistry.

[CHEM 4xxx](#)
or [CHEM 5xxx](#)

Technical Electives

Take two 3xxx or higher courses of 3 credits or more in any field of science (at least 6 credits).

Technical Elective 1
Technical Elective 2

Program Sub-plans

A sub-plan is not required for this program.

Honors UHP

This is an honors sub-plan.

Students admitted to the University Honors Program (UHP) must fulfill UHP requirements in addition to degree program requirements. Honors courses used to fulfill degree program requirements will also fulfill UHP requirements.

Current departmental honors course offerings are listed at:

http://www.honors.umn.edu/academics/curriculum/dept_courses_current.html.

Honors students complete an honors thesis project in the final year, most often in conjunction with an honors thesis course, or with an honors directed studies or honors directed research course. Students select honors courses and plan for a thesis project in consultation with their UHP adviser and their departmental faculty adviser.



Twin Cities Campus

Civil Engineering B.C.E.

Civil Engineering

College of Science and Engineering

- Program Type: Baccalaureate
- Requirements for this program are current for Fall 2012
- Required credits to graduate with this degree: 125
- Required credits within the major: 64
- This program requires summer terms.
- Degree: Bachelor of Civil Engineering

Civil engineering deals with the science and art of engineering applied to solving problems and designing systems related to infrastructure and the environment. Principal fields within civil engineering are structural engineering, environmental engineering, water resources engineering, transportation engineering, and geotechnical engineering. The upper division civil engineering program requires students to take introductory courses in all of the above areas. In addition, students may emphasize a special interest in one of the areas by selecting appropriate technical electives in consultation with their adviser.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Admission Requirements

Students must complete 10 courses before admission to the program.

Freshman and transfer students are usually admitted to pre-major status before admission to this major

It is recommended that students take GEO 1001 and CE 1101, but these courses are not required to be admitted to the program.

For information about University of Minnesota admission requirements, visit the [Office of Admissions website](#).

Mathematics

Honors math (MATH 1571H, 1572H, 2573H, 2574H) may be taken in place of the listed courses.

[MATH 1271](#) - Calculus I [MATH] (4.0 cr)

or [MATH 1371](#) - CSE Calculus I [MATH] (4.0 cr)

[MATH 1272](#) - Calculus II (4.0 cr)

or [MATH 1372](#) - CSE Calculus II (4.0 cr)

[MATH 2263](#) - Multivariable Calculus (4.0 cr)

or [MATH 2374](#) - CSE Multivariable Calculus and Vector Analysis (4.0 cr)

Physical Science and Mechanics

[AEM 2011](#) - Statics (3.0 cr)

[AEM 3031](#) - Deformable Body Mechanics (3.0 cr)

[CHEM 1061](#) - Chemical Principles I [PHYS] (3.0 cr)

[CHEM 1065](#) - Chemical Principles I Laboratory [PHYS] (1.0 cr)

or [CHEM 1071H](#) - Honors Chemistry I [PHYS] (3.0 cr)

[CHEM 1075H](#) - Honors Chemistry I Laboratory [PHYS] (1.0 cr)

[CHEM 1062](#) - Chemical Principles II [PHYS] (3.0 cr)

[CHEM 1066](#) - Chemical Principles II Laboratory [PHYS] (1.0 cr)

or [CHEM 1072H](#) - Honors Chemistry II [PHYS] (3.0 cr)

[CHEM 1076H](#) - Honors Chemistry II Laboratory [PHYS] (1.0 cr)

[PHYS 1301W](#) - Introductory Physics for Science and Engineering I [PHYS, WI] (4.0 cr)

or [PHYS 1401V](#) - Honors Physics I [PHYS, WI] (4.0 cr)

[PHYS 1302W](#) - Introductory Physics for Science and Engineering II [PHYS, WI] (4.0 cr)

or [PHYS 1402V](#) - Honors Physics II [PHYS, WI] (4.0 cr)

CE Requirements

[CE 3101](#) - Computer Applications in Civil Engineering I (3.0 cr)

STAT 3021 may be substituted for CE 3102 with approval of the director of undergraduate studies.

[CE 3102](#) - Uncertainty and Decision Analysis in Civil Engineering (3.0 cr)

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



General Requirements

All students are required to complete general University and college requirements including writing and liberal education courses. For more information about University-wide requirements, see the [liberal education requirements](#). Required courses for the major or minor in which a student receives a D grade (with or without plus or minus) do not count toward the major or minor (including transfer courses).

Program Requirements

Major Courses

- CE 3201 - Transportation Engineering (3.0 cr)
- CE 3301 - Soil Mechanics I (3.0 cr)
- CE 3401 - Linear Structural Analysis (3.0 cr)
- CE 3402W - Civil Engineering Materials [WI] (3.0 cr)
- CE 3501 - Environmental Engineering [ENV] (3.0 cr)
- CE 3502 - Fluid Mechanics (4.0 cr)
- CE 4102W - Capstone Design [WI] (4.0 cr)
- CE 4301 - Soil Mechanics II (3.0 cr)
- CE 4401 - Steel and Reinforced Concrete Design (4.0 cr)
- CE 4501 - Hydrologic Design (4.0 cr)
- CE 4502 - Water and Wastewater Treatment (3.0 cr)
- AEM 2012 - Dynamics (3.0 cr)
 - or CHEM 2301 - Organic Chemistry I (3.0 cr)
 - or EE 2001 - Introduction to Circuits and Electronics (3.0 cr)
 - or MATS 2001 - Introduction to the Science of Engineering Materials (3.0 cr)
 - or CSCI 1113 - Introduction to C/C++ Programming for Scientists and Engineers (4.0 cr)
 - or ME 3331 - Thermal Sciences I (3.0 cr)
- MATH 2373 - CSE Linear Algebra and Differential Equations (4.0 cr)
 - or MATH 2243 - Linear Algebra and Differential Equations (4.0 cr)

Civil Engineering Electives

Students must take 10 credits of 4xxx or higher electives offered by the civil engineering department.

Take exactly 10 credits(s) from the following:

- CE 4xxx
- CE 5xxx

Technical Electives

Students must take an additional 11 credits of technical electives. All courses at 4xxx or higher from an engineering department (including Civil Engineering) are acceptable as technical electives. Additional courses are acceptable as technical electives upon approval of an adviser. Consult your adviser for assistance in selecting elective courses.

Take 11 or more credits(s) from the following:

- EE 4xxx
- ME 4xxx
- CSCI 4xxx
- BBE 4xxx
- GEOE 4xxx
- CHEN 4xxx
- BMEN 4xxx
- CE 3xxx
- CE 4xxx
- CE 5xxx
- ME 5xxx
- EE 5xxx
- CSCI 5xxx
- CHEN 5xxx
- BBE 5xxx
- BMEN 5xxx
- GEOE 5xxx

Program Sub-plans



A sub-plan is not required for this program.

Honors UHP

This is an honors sub-plan.

Students admitted to the University Honors Program (UHP) must fulfill UHP requirements in addition to degree program requirements. Honors courses used to fulfill degree program requirements will also fulfill UHP requirements.

Current departmental honors course offerings are listed at:

http://www.honors.umn.edu/academics/curriculum/dept_courses_current.html.

Honors students complete an honors thesis project in the final year, most often in conjunction with an honors thesis course, or with an honors directed studies or honors directed research course. Students select honors courses and plan for a thesis project in consultation with their UHP adviser and their departmental faculty adviser.



Twin Cities Campus

Computer Engineering B.Comp.E.

Electrical and Computer Engineering

College of Science and Engineering

- Program Type: Baccalaureate
- Requirements for this program are current for Fall 2012
- Required credits to graduate with this degree: 125
- Required credits within the major: 65 to 72
- Degree: Bachelor of Computer Engineering

The mission of the computer engineering program is to educate students in core topics, as well as in a broad set of specialties of computer engineering; to impart students with professional attributes that characterize a well-schooled engineer and citizen; and to provide students with opportunities for research experience in one of the leading computer engineering centers of scholarship.

The field of computer engineering resulted from the tremendous development of computers and, in particular, the evolution of microprocessors. The design process for almost every electronic system includes the specification and development of the control program for the system's microprocessor. A particular computer engineering job can be more closely related to hardware or software, to functional design or detailed design. The B.Comp.Eng. degree provides the background necessary for persons, with continuing study, to work in many computer engineering subfields. The bachelor's degree itself does not, however, provide highly specialized knowledge in any particular subfield.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Admission Requirements

Students must complete 9 courses before admission to the program.

Freshman and transfer students are usually admitted to pre-major status before admission to this major

Students interested in pursuing a degree in computer engineering or electrical engineering are encouraged to take EE 1001 in their first year.

For information about University of Minnesota admission requirements, visit the [Office of Admissions website](#).

Mathematics

- MATH 1271 - Calculus I [MATH] (4.0 cr)
or MATH 1371 - CSE Calculus I [MATH] (4.0 cr)
or MATH 1571H - Honors Calculus I [MATH] (4.0 cr)
- MATH 1272 - Calculus II (4.0 cr)
or MATH 1372 - CSE Calculus II (4.0 cr)
or MATH 1572H - Honors Calculus II (4.0 cr)
or MATH 2582H *{Inactive}*(5.0 cr)
- MATH 2243 - Linear Algebra and Differential Equations (4.0 cr)
or MATH 2373 - CSE Linear Algebra and Differential Equations (4.0 cr)
or MATH 2573H - Honors Calculus III (4.0 cr)
or MATH 2583H *{Inactive}*(5.0 cr)

Physics

- PHYS 1301W - Introductory Physics for Science and Engineering I [PHYS, WI] (4.0 cr)
or PHYS 1401V - Honors Physics I [PHYS, WI] (4.0 cr)
- PHYS 1302W - Introductory Physics for Science and Engineering II [PHYS, WI] (4.0 cr)
or PHYS 1402V - Honors Physics II [PHYS, WI] (4.0 cr)

Lower Division Core Courses Required for Admission to Upper Division

- CSCI 1901 - Structure of Computer Programming I (4.0 cr)
- CSCI 1902 - Structure of Computer Programming II (4.0 cr)
- EE 2001 - Introduction to Circuits and Electronics (3.0 cr)
- EE 2301 - Introduction to Digital System Design (4.0 cr)



General Requirements

All students are required to complete general University and college requirements including writing and liberal education courses. For more information about University-wide requirements, see the [liberal education requirements](#). Required courses for the major or minor in which a student receives a D grade (with or without plus or minus) do not count toward the major or minor (including transfer courses).

Program Requirements

Students interesting in pursuing computer engineering or electrical engineering as a major are encouraged to take EE 1001 during their first year.

Additional Lower Division Courses

Mathematics

- MATH 2374 - CSE Multivariable Calculus and Vector Analysis (4.0 cr)
- or MATH 2263 - Multivariable Calculus (4.0 cr)
- or MATH 2574H - Honors Calculus IV (4.0 cr)
- or MATH 3584H - Honors Calculus IV: Advanced Placement (5.0 cr)

Lower Division Core Courses

- EE 2002 - Introductory Circuits and Electronics Laboratory (1.0 cr)
- EE 2011 - Linear Systems, Circuits, and Electronics (3.0 cr)
- EE 2361 - Introduction to Microcontrollers (4.0 cr)
- CSCI 2011 - Discrete Structures of Computer Science (4.0 cr)

Upper Division Required Courses

Computer Science Core

- CSCI 4041 - Algorithms and Data Structures (4.0 cr)
- CSCI 4061 - Introduction to Operating Systems (4.0 cr)

Electrical Engineering Core

- EE 3015 - Signals and Systems (3.0 cr)
- EE 3025 - Statistical Methods in Electrical and Computer Engineering (3.0 cr)
- EE 3101 - Circuits and Electronics Laboratory I (2.0 cr)
- EE 3102 - Circuits and Electronics Laboratory II (2.0 cr)
- EE 3115 - Analog Electronics (3.0 cr)
- EE 4363 - Computer Architecture and Machine Organization (4.0 cr)

CompE Technical Electives

Students must complete 28 technical elective credits, with a minimum of 22 coming from EE 4xxx, EE 5xxx, CSCI 4xxx, or CSCI 5xxx courses. Of the technical electives, one course must be chosen from four of the specialty areas, and at least two courses must be chosen from one of the specialty areas. A senior design project is also required, as are two additional approved lab courses. Students who complete the two-semester senior honors project only need to take one additional EE lab course.

Take 28 or more credits(s) from the following:

- AEM 2021 - Statics and Dynamics (4.0 cr)
- AEM 4601 - Instrumentation Laboratory (3.0 cr)
- BBE 3013 - Engineering Principles of Molecular and Cellular Processes (3.0 cr)
- BIOC 3021 - Biochemistry (3.0 cr)
- BLAW 3058 - The Law of Contracts and Agency (4.0 cr)
- BMEN 5401 - Advanced Biomedical Imaging (3.0 cr)
- CE 3502 - Fluid Mechanics (4.0 cr)
- CE 4101W *{Inactive}[WI]* (3.0 cr)
- CHEM 2301 - Organic Chemistry I (3.0 cr)
- CHEM 2302 - Organic Chemistry II (3.0 cr)
- CHEM 2311 - Organic Lab (4.0 cr)
- IE 5441 - Financial Decision Making (4.0 cr)
- IE 5511 - Human Factors and Work Analysis (4.0 cr)
- IE 5512 - Applied Ergonomics (4.0 cr)
- IE 5513 - Engineering Safety (4.0 cr)
- IE 5522 - Quality Engineering and Reliability (4.0 cr)
- IE 5531 - Engineering Optimization I (4.0 cr)
- IE 5541 - Project Management (4.0 cr)
- IE 5551 - Production Planning and Inventory Control (4.0 cr)
- IE 5552 - Design and Analysis of Manufacturing Systems (4.0 cr)
- IE 5553 - Simulation (4.0 cr)
- MATS 3011 - Introduction to Materials Science and Engineering (3.0 cr)
- MATS 3012 - Metals and Alloys (3.0 cr)



- **MATS 3851W** - Materials Properties Lab [WI] (4.0 cr)
- **MATS 3013** - Electrical and Magnetic Properties of Materials (3.0 cr)
- **MATH 3283W** - Sequences, Series, and Foundations: Writing Intensive [WI] (4.0 cr)
- MATH 4xxx
- MATH 5xxx
- **ME 3324** - Introduction to Thermal Science (3.0 cr)
- **PHSL 3061** - Principles of Physiology (4.0 cr)
- **PHYS 2601** - Quantum Physics (4.0 cr)
- **PHYS 2605** - Quantum Physics Laboratory (3.0 cr)
- **PHYS 4101** - Quantum Mechanics (4.0 cr)
- **PHYS 4201** - Statistical and Thermal Physics (3.0 cr)
- **STAT 5101** - Theory of Statistics I (4.0 cr)
- **STAT 5041** - Bayesian Decision Making (3.0 cr)
- **STAT 5102** - Theory of Statistics II (4.0 cr)
- **PHYS 2303** - Physics III: Physics of Matter (4.0 cr)
- **PHYS 2403H** - Honors Physics III (4.0 cr)
- **PHYS 2503** - Physics III: Intro to Waves, Optics, and Special Relativity (4.0 cr)
- **ME 3331** - Thermal Sciences I (3.0 cr)
- **ME 3332** - Thermal Sciences II (3.0 cr)
- **ME 3333** - Thermal Sciences III (3.0 cr)
- Students must complete both courses to receive credit.
 - **AEM 2011** - Statics (3.0 cr)
 - **AEM 2012** - Dynamics (3.0 cr)
- Students must complete both courses to receive credit.
 - **AEM 2011** - Statics (3.0 cr)
 - **AEM 3031** - Deformable Body Mechanics (3.0 cr)
- Students must complete both courses to receive credit.
 - **EE 3041** - Industrial Assignment I (2.0 cr)
 - **EE 4043W** - Industrial Assignment II [WI] (4.0 cr)
- **Management Minor**
 - Students must complete a management minor to receive any credit. Only the following courses count.
 - **ACCT 3001** - Introduction to Management Accounting (3.0 cr)
 - or **FINA 3001** - Finance Fundamentals (3.0 cr)
 - or **MGMT 3001** - Fundamentals of Management (3.0 cr)
 - or **MKTG 3001** - Principles of Marketing (3.0 cr)
 - or **HRIR 3021** - Human Resource Management and Industrial Relations (3.0 cr)
 - or **MGMT 3010** - Introduction to Entrepreneurship (4.0 cr)
 - or **SCO 3001** - Introduction to Operations Management (3.0 cr)
 - or **PA 3003** - Nonprofit and Public Financial Management (3.0 cr)
 - or **PA 4101** - Nonprofit Management and Governance (3.0 cr)
- **Accounting Minor**
 - Students must complete an accounting minor to receive any credit. Only the following courses count.
 - **ACCT 5101** - Intermediate Accounting I (4.0 cr)
 - or **ACCT 5102W** - Intermediate Accounting II [WI] (4.0 cr)
 - or **ACCT 3201** - Intermediate Management Accounting (2.0 cr)
 - or **ACCT 5135** - Fundamentals of Federal Income Tax (4.0 cr)
 - or **ACCT 5160** - Financial Statement Analysis (2.0 cr)
 - or **ACCT 5180** - Consolidations and Advanced Reporting (2.0 cr)
 - or **ACCT 5310** - International Accounting (2.0 cr)
- **Biochemistry Minor**
 - Students must complete a biochem minor to receive any credit. Only the following courses count.
 - **BIOC 4331** - Biochemistry I: Structure, Catalysis, and Metabolism in Biological Systems (4.0 cr)
 - or **BIOC 4332** - Biochemistry II: Molecular Mechanisms of Signal Transduction and Gene Expression (4.0 cr)
 - or **BIOC 4025** - Laboratory in Biochemistry (2.0 cr)
- **Biology Minor**
 - Students must complete a biology minor to receive any credit. Only the following courses count.
 - BIOL 3xxx
 - or BIOL 4xxx
 - or BIOL 5xxx
- **Other Minors as approved by director of UG studies**
 - Other minors may count toward technical electives if approved by the ECE director of UG studies.
- **Department Electives**
 - Take 22 or more credits(s) including 0 or more sub-requirements(s) from the following:
 - **Senior Design Project**
 - A senior design project is required.



- EE 4951W - Senior Design Project [WI] (4.0 cr)
- or EE 4981H - Senior Honors Project I (2.0 cr)
- EE 4982V - Senior Honors Project II [WI] (2.0 cr)

•Lab Courses

- Two additional EE lab courses are required. Senior honors project students only need to take one.
- Take 2 or more course(s) from the following:
- EE 4111 - Advanced Analog Electronics Design (4.0 cr)
- EE 4235 - Linear Control Systems Laboratory (1.0 cr)
- EE 4237 - State Space Control Laboratory (1.0 cr)
- EE 4301 - Digital Design With Programmable Logic (4.0 cr)
- EE 4341 - Embedded System Design (4.0 cr)
- EE 4505 - Communications Systems Laboratory (1.0 cr)
- EE 4703 - Electric Drives Laboratory (1.0 cr)
- EE 4722 - Power System Analysis Laboratory (1.0 cr)
- EE 4743 - Switch-Mode Power Electronics Laboratory (1.0 cr)
- EE 4930 - Special Topics in Electrical and Computer Engineering Laboratory (1.0 - 2.0 cr)
- EE 5141 - Introduction to Microsystem Technology (4.0 cr)
- EE 5173 - Basic Microelectronics Laboratory (1.0 cr)
- EE 5327 - VLSI Design Laboratory (3.0 cr)
- EE 5545 - Digital Signal Processing Design (3.0 cr)
- EE 5613 - RF/Microwave Circuit Design Laboratory (2.0 cr)
- EE 5622 - Physical Optics Laboratory (1.0 cr)
- EE 5628 - Fiber Optics Laboratory (1.0 cr)
- EE 5657W - Physical Principles of Thin Film Technology [WI] (4.0 cr)
- CSCI 4511W - Introduction to Artificial Intelligence [WI] (4.0 cr)
- CSCI 5511 - Artificial Intelligence I (3.0 cr)

•Breadth and Depth Requirements (Specialty Areas)

- One course chosen from four specialty areas and two courses chosen from one specialty area.

Computer Architecture

Take 0 or more course(s) from the following:

- EE 4389W - Introduction to Predictive Learning [WI] (3.0 cr)
- EE 5364 - Advanced Computer Architecture (3.0 cr)
- EE 5371 - Computer Systems Performance Measurement and Evaluation (3.0 cr)
- EE 5393 - Circuits, Computation, and Biology (3.0 cr)
- CSCI 5104 - System Modeling and Performance Evaluation (3.0 cr)

Robotics and Embedded System Design

Take 0 or more course(s) from the following:

- EE 4233 - State Space Control System Design (3.0 cr)
- EE 4231 - Linear Control Systems: Designed by Input/Output Methods (3.0 cr)
- EE 4341 - Embedded System Design (4.0 cr)
- CSCI 5143 - Real-Time and Embedded Systems (3.0 cr)
- CSCI 5551 - Introduction to Intelligent Robotic Systems (3.0 cr)
- CSCI 5552 - Sensing and Estimation in Robotics (3.0 cr)
- CSCI 4511W - Introduction to Artificial Intelligence [WI] (4.0 cr)
- CSCI 5511 - Artificial Intelligence I (3.0 cr)
- CSCI 5512 - Artificial Intelligence II (3.0 cr)
- CSCI 5521 - Pattern Recognition (3.0 cr)
- CSCI 5561 - Computer Vision (3.0 cr)

VLSI and CAD

Take 0 or more course(s) from the following:

- EE 4301 - Digital Design With Programmable Logic (4.0 cr)
- EE 5301 - VLSI Design Automation I (3.0 cr)
- EE 5302 - VLSI Design Automation II (3.0 cr)
- EE 5323 - VLSI Design I (3.0 cr)
- EE 5324 - VLSI Design II (3.0 cr)
- EE 5329 - VLSI Digital Signal Processing Systems (3.0 cr)
- EE 5333 - Analog Integrated Circuit Design (3.0 cr)
- EE 5327 - VLSI Design Laboratory (3.0 cr)

Networks and Communication

Take 0 or more course(s) from the following:

- CSCI 4131 - Internet Programming (3.0 cr)
- CSCI 4211 - Introduction to Computer Networks (3.0 cr)
- CSCI 5131 - Advanced Internet Programming (3.0 cr)
- CSCI 5211 - Data Communications and Computer Networks (3.0 cr)
- CSCI 5221 - Foundations of Advanced Networking (3.0 cr)



- EE 5381 - Telecommunications Networks (3.0 cr)
- EE 5583 - Error Control Coding (3.0 cr)
- EE 4501 - Communications Systems (3.0 cr)

Systems and Software Design

Take 0 or more course(s) from the following:

- CSCI 4707 - Practice of Database Systems (3.0 cr)
- CSCI 5103 - Operating Systems (3.0 cr)
- CSCI 5105 - Introduction to Distributed Systems (3.0 cr)
- CSCI 5106 - Programming Languages (3.0 cr)
- CSCI 5115 - User Interface Design, Implementation and Evaluation (3.0 cr)
- CSCI 5161 - Introduction to Compilers (3.0 cr)
- CSCI 5451 - Introduction to Parallel Computing: Architectures, Algorithms, and Programming (3.0 cr)
- CSCI 5708 - Architecture and Implementation of Database Management Systems (3.0 cr)
- CSCI 5801 - Software Engineering I (3.0 cr)
- CSCI 5802 - Software Engineering II (3.0 cr)
- CSCI 4011 - Formal Languages and Automata Theory (4.0 cr)
- CSCI 4107 - Introduction to Computer Graphics Programming (3.0 cr)

Program Sub-plans

A sub-plan is not required for this program.

Honors UHP

This is an honors sub-plan.

Students admitted to the University Honors Program (UHP) must fulfill UHP requirement, in addition to degree program requirements. Honors courses used to fulfill degree program requirements will also fulfill UHP requirements.

Current departmental honors course offerings are listed at:

http://www.honors.umn.edu/academics/curriculum/dept_courses_current.html

Honors students complete an honors thesis project in the final year, most often in conjunction with an honors thesis course, or honors directed studies, or honors directed research course. Students select honors courses and plan for a thesis project in consultation with their UHP adviser and their departmental faculty adviser.

Qualified students may elect to participate in the senior honors design course. This two-semester, 2-credit per semester course is taken senior year and under the direction of a faculty adviser. Advance permission is required to register for the sequence.



Twin Cities Campus

Computer Science B.S. Comp.Sc.

Computer Science and Engineering

College of Science and Engineering

- Program Type: Baccalaureate
- Requirements for this program are current for Fall 2012
- Required credits to graduate with this degree: 120
- Required credits within the major: 77 to 79
- Degree: Bachelor of Science in Computer Science

Computer science is concerned with the study of hardware, software, and theoretical aspects of high-speed computing devices and with the application of these devices to scientific, technological, and business problems.

A bachelor's degree gives students a basic understanding of computer science. After completing a required set of fundamental courses, students arrange their subsequent work around one of several upper division tracks within either computer science or an interdisciplinary area involving computer applications. The degree prepares students for graduate work or for various industrial, governmental, and business positions involving the use of computers.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Admission Requirements

Students must complete 5 courses before admission to the program.

Freshman and transfer students are usually admitted to pre-major status before admission to this major

For information about University of Minnesota admission requirements, visit the [Office of Admissions website](#).

Mathematics Core

- [MATH 1371](#) - CSE Calculus I [MATH] (4.0 cr)
or [MATH 1271](#) - Calculus I [MATH] (4.0 cr)
- [MATH 1372](#) - CSE Calculus II (4.0 cr)
or [MATH 1272](#) - Calculus II (4.0 cr)

Computer Science Introductory Core

- [CSCI 1901](#) - Structure of Computer Programming I (4.0 cr)
- [CSCI 1902](#) - Structure of Computer Programming II (4.0 cr)
- [CSCI 2011](#) - Discrete Structures of Computer Science (4.0 cr)

General Requirements

All students are required to complete general University and college requirements including writing and liberal education courses. For more information about University-wide requirements, see the [liberal education requirements](#). Required courses for the major or minor in which a student receives a D grade (with or without plus or minus) do not count toward the major or minor (including transfer courses).

Program Requirements

Science Core

- [PHYS 1301W](#) - Introductory Physics for Science and Engineering I [PHYS, WI] (4.0 cr)
or [PHYS 1401V](#) - Honors Physics I [PHYS, WI] (4.0 cr)
- Take 1 or more course(s) from the following:
 - [PHYS 1302W](#) - Introductory Physics for Science and Engineering II [PHYS, WI] (4.0 cr)
 - [PHYS 1402V](#) - Honors Physics II [PHYS, WI] (4.0 cr)
 - [ESCI 2201](#) - Solid Earth Dynamics (4.0 cr)
 - [PSY 3011](#) - Introduction to Learning and Behavior (3.0 cr)
 - [GCD 3022](#) - Genetics (3.0 cr)
 - **Chemistry 1**
 - [CHEM 1061](#) - Chemical Principles I [PHYS] (3.0 cr)



[CHEM 1065](#) - Chemical Principles I Laboratory [PHYS] (1.0 cr)

•**Chemistry 1 Honors**

•[CHEM 1071H](#) - Honors Chemistry I [PHYS] (3.0 cr)

[CHEM 1075H](#) - Honors Chemistry I Laboratory [PHYS] (1.0 cr)

•**Chemistry 2**

•[CHEM 1062](#) - Chemical Principles II [PHYS] (3.0 cr)

[CHEM 1066](#) - Chemical Principles II Laboratory [PHYS] (1.0 cr)

•**Chemistry 2 Honors**

•[CHEM 1072H](#) - Honors Chemistry II [PHYS] (3.0 cr)

[CHEM 1076H](#) - Honors Chemistry II Laboratory [PHYS] (1.0 cr)

or CSci adviser-approved science course.

Computer Science Core

[CSCI 2021](#) - Machine Architecture and Organization (4.0 cr)

[CSCI 2033](#) - Elementary Computational Linear Algebra (4.0 cr)

[CSCI 3081W](#) - Program Design and Development [WI] (4.0 cr)

[CSCI 4041](#) - Algorithms and Data Structures (4.0 cr)

[CSCI 4061](#) - Introduction to Operating Systems (4.0 cr)

[STAT 3021](#) - Introduction to Probability and Statistics (3.0 cr)

Upper Division Math-Oriented Requirement

[CSCI 4011](#) - Formal Languages and Automata Theory (4.0 cr)

or [CSCI 5302](#) - Analysis of Numerical Algorithms (3.0 cr)

or [CSCI 5304](#) - Computational Aspects of Matrix Theory (3.0 cr)

or [CSCI 5403](#) - Computational Complexity (3.0 cr)

or [CSCI 5421](#) - Advanced Algorithms and Data Structures (3.0 cr)

or [CSCI 5471](#) - Modern Cryptography (3.0 cr)

or [CSCI 5481](#) - Computational Techniques for Genomics (3.0 cr)

or MATH 4xxx

or MATH 5xxx

Upper Division Track

Take 24 credits of an upper division track. Sample tracks listed below represent possible options; more information may be found at www.cs.umn.edu.

Architecture and Hardware Systems

A track is 24 credits, split into two parts. Take 13 credits from the course list below, including the two required courses: [CSCI 4203](#) and [CSCI 5204](#). And 11 credits from the following: advisor-approved CSci 4xxx, CSci 5xxx or other adviser-approved courses.

[CSCI 4203](#) - Computer Architecture (4.0 cr)

[CSCI 5204](#) - Advanced Computer Architecture (3.0 cr)

Architecture and Hardware Systems Sublist

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

•[CSCI 4211](#) - Introduction to Computer Networks (3.0 cr)

•[CSCI 5103](#) - Operating Systems (3.0 cr)

•[CSCI 5161](#) - Introduction to Compilers (3.0 cr)

•[CSCI 5451](#) - Introduction to Parallel Computing: Architectures, Algorithms, and Programming (3.0 cr)

•[EE 4341](#) - Embedded System Design (4.0 cr)

-OR-

Artificial Intelligence/Robotics

A track is 24 credits, split into two parts. Take 13 credits from the course list below, including the two required courses: [CSCI 4511W](#) and [CSCI 5512](#). And 11 credits from the following: advisor-approved CSci 4xxx, CSci 5xxx or other adviser-approved courses..

[CSCI 4511W](#) - Introduction to Artificial Intelligence [WI] (4.0 cr)

[CSCI 5512](#) - Artificial Intelligence II (3.0 cr)

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

•[CSCI 5521](#) - Pattern Recognition (3.0 cr)

•[CSCI 5523](#) - Introduction to Data Mining (3.0 cr)

•[CSCI 5551](#) - Introduction to Intelligent Robotic Systems (3.0 cr)

•[CSCI 5552](#) - Sensing and Estimation in Robotics (3.0 cr)

•[CSCI 5561](#) - Computer Vision (3.0 cr)

-OR-

Bioinformatics and Computational Biology



A track is 24 credits, split into two parts. Take 12 credits from the course list below, including the two required courses CSci 5461 and CSci 5481. And 12 credits from the following: advisor-approved CSci 4xxx, CSci 5xxx or other adviser-approved courses.

[CSCI 5461](#) - Functional Genomics, Systems Biology, and Bioinformatics (3.0 cr)

[CSCI 5481](#) - Computational Techniques for Genomics (3.0 cr)

Bioinformatics and Computational Biology Sublist

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

- [CSCI 4707](#) - Practice of Database Systems (3.0 cr)
- [CSCI 5521](#) - Pattern Recognition (3.0 cr)
- [CSCI 5523](#) - Introduction to Data Mining (3.0 cr)
- [CSCI 5421](#) - Advanced Algorithms and Data Structures (3.0 cr)

-OR-

Computational Science

A track is 24 credits, split into two parts. Take 12 credits from the course list below, including the two required courses: CSCI 5302 and CSCI 5304. And 12 credits from the following: advisor-approved CSci 4xxx, CSci 5xxx or other adviser-approved courses.

[CSCI 5302](#) - Analysis of Numerical Algorithms (3.0 cr)

[CSCI 5304](#) - Computational Aspects of Matrix Theory (3.0 cr)

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

- [CSCI 5109](#) - Visualization (3.0 cr)
- [CSCI 5451](#) - Introduction to Parallel Computing: Architectures, Algorithms, and Programming (3.0 cr)
- [CSCI 5461](#) - Functional Genomics, Systems Biology, and Bioinformatics (3.0 cr)
- [CSCI 5481](#) - Computational Techniques for Genomics (3.0 cr)
- [CSCI 5523](#) - Introduction to Data Mining (3.0 cr)
- [AST 4101](#) - Computational Methods in the Physical Sciences (4.0 cr)
- [MATH 5075](#) - Mathematics of Options, Futures, and Derivative Securities I (4.0 cr)
- [MATH 5467](#) - Introduction to the Mathematics of Image and Data Analysis (4.0 cr)
- [MATH 5587](#) - Elementary Partial Differential Equations I (4.0 cr)
- [MATH 5588](#) - Elementary Partial Differential Equations II (4.0 cr)
- [MATH 5711](#) - Linear Programming and Combinatorial Optimization (4.0 cr)

-OR-

Databases

A track is 24 credits, split into two parts. Take 12 credits from the course list below, including the two required courses CSci 4707 and CSci 5708. And 12 credits from the following: advisor-approved CSci 4xxx, CSci 5xxx or other adviser-approved courses.

[CSCI 4707](#) - Practice of Database Systems (3.0 cr)

[CSCI 5708](#) - Architecture and Implementation of Database Management Systems (3.0 cr)

Databases Sublist

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

- [CSCI 4131](#) - Internet Programming (3.0 cr)
- [CSCI 4211](#) - Introduction to Computer Networks (3.0 cr)
- [CSCI 5103](#) - Operating Systems (3.0 cr)
- [CSCI 5421](#) - Advanced Algorithms and Data Structures (3.0 cr)
- [CSCI 4511W](#) - Introduction to Artificial Intelligence [WI] (4.0 cr)
- [CSCI 5523](#) - Introduction to Data Mining (3.0 cr)
- [INET 4061](#) - Introduction to Data Warehousing (3.0 cr)

-OR-

Geographical Information Systems

A track is 24 credits, split into two parts. Take 12 credits from the course list below, including the two required courses CSci 4707 and CSci 5708. And 12 credits from the following: advisor-approved CSci 4xxx, CSci 5xxx or other adviser-approved courses.

[CSCI 4707](#) - Practice of Database Systems (3.0 cr)

[CSCI 5708](#) - Architecture and Implementation of Database Management Systems (3.0 cr)

Geographical Information Systems Sublist

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

- [CE 4341](#) - Engineering Geostatistics (3.0 cr)
- [FR 5131](#) - Geographical Information Systems (GIS) for Natural Resources (4.0 cr)
- [FR 5262](#) - Remote Sensing of Natural Resources and Environment (3.0 cr)
- [FR 5412](#) - Digital Remote Sensing (3.0 cr)
- [CSCI 4107](#) - Introduction to Computer Graphics Programming (3.0 cr)
or [CSCI 5107](#) - Fundamentals of Computer Graphics 1 (3.0 cr)

-OR-

Graphics and Visualization

A track is 24 credits, split into two parts. Take 12 credits from the course list below, including the two required courses CSci 4107 (or 5107) and CSci 5108 (or 5109). And 12 credits from the following: advisor-approved CSci 4xxx, CSci 5xxx or other adviser-approved



courses.

Requirement 1

[CSCI 4107](#) - Introduction to Computer Graphics Programming (3.0 cr)
or [CSCI 5107](#) - Fundamentals of Computer Graphics 1 (3.0 cr)

Requirement 2

[CSCI 5108](#) - Fundamentals of Computer Graphics II (3.0 cr)
or [CSCI 5109](#) - Visualization (3.0 cr)

Graphics and Visualization Sublist

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

- [CSCI 5109](#) - Visualization (3.0 cr)
- [CSCI 5115](#) - User Interface Design, Implementation and Evaluation (3.0 cr)
- [CSCI 5125](#) - Collaborative and Social Computing (3.0 cr)
- [CSCI 5302](#) - Analysis of Numerical Algorithms (3.0 cr)
- [CSCI 5523](#) - Introduction to Data Mining (3.0 cr)
- [CSCI 5561](#) - Computer Vision (3.0 cr)

-OR-

Human Computer Interaction

A track is 24 credits, split into two parts. Take 12 credits from the course list below, including the two required courses CSci 5115 and CSci 5125. And 12 credits from the following: advisor-approved CSci 4xxx, CSci 5xxx or other adviser-approved courses.

[CSCI 5115](#) - User Interface Design, Implementation and Evaluation (3.0 cr)
[CSCI 5125](#) - Collaborative and Social Computing (3.0 cr)

Human Computer Interaction Sublist

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

- [CSCI 5109](#) - Visualization (3.0 cr)
- [CSCI 5117](#) - Developing the Interactive Web (3.0 cr)
- [CSCI 5129](#) - e-Public Health: Online Intervention Design (3.0 cr)
- [KIN 5001](#) - Foundations of Human Factors/Ergonomics (3.0 cr)

-OR-

Networks

A track is 24 credits, split into two parts. Take 12 credits from the course list below, including the two required courses CSci 4211 and CSci 5221. And 12 credits from the following: advisor-approved CSci 4xxx, CSci 5xxx or other adviser-approved courses.

[CSCI 4211](#) - Introduction to Computer Networks (3.0 cr)
[CSCI 5221](#) - Foundations of Advanced Networking (3.0 cr)

Networks Sublist

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

- [CSCI 5103](#) - Operating Systems (3.0 cr)
- [CSCI 5104](#) - System Modeling and Performance Evaluation (3.0 cr)
- [CSCI 5105](#) - Introduction to Distributed Systems (3.0 cr)
- [CSCI 5231](#) - Wireless and Sensor Networks (3.0 cr)
- [CSCI 5271](#) - Introduction to Computer Security (3.0 cr)
- [CSCI 5471](#) - Modern Cryptography (3.0 cr)
- [MATH 5251](#) - Error-Correcting Codes, Finite Fields, Algebraic Curves (4.0 cr)
- [INET 4011](#) - Network Administration (4.0 cr)
- [INET 4021](#) - Network Programming (4.0 cr)
- [INET 4041](#) - Emerging Network Technologies and Applications (3.0 cr)
- [EE 5505](#) - Wireless Communication (3.0 cr)

-OR-

Security

A track is 24 credits, split into two parts. Take 12 credits from the course list below, including the two required courses CSci 4211 and CSci 5271. And 12 credits from the following: advisor-approved CSci 4xxx, CSci 5xxx or other adviser-approved courses.

[CSCI 4211](#) - Introduction to Computer Networks (3.0 cr)
[CSCI 5271](#) - Introduction to Computer Security (3.0 cr)

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

- [CSCI 5103](#) - Operating Systems (3.0 cr)
- [CSCI 5471](#) - Modern Cryptography (3.0 cr)
- [CSCI 5801](#) - Software Engineering I (3.0 cr)
- [MATH 5248](#) - Cryptology and Number Theory (4.0 cr)
- [INET 4011](#) - Network Administration (4.0 cr)

-OR-

Software and Data Systems Development



A track is 24 credits, split into two parts. Take 12 credits from the course list below, including the two required courses CSci 4707 and CSci 5801. And 12 credits from the following: advisor-approved CSci 4xxx, CSci 5xxx or other adviser-approved courses.

[CSCI 4707](#) - Practice of Database Systems (3.0 cr)

[CSCI 5801](#) - Software Engineering I (3.0 cr)

Software and Data Systems Development Sublist

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

- [CSCI 4131](#) - Internet Programming (3.0 cr)
- [CSCI 4211](#) - Introduction to Computer Networks (3.0 cr)
- [CSCI 5103](#) - Operating Systems (3.0 cr)
- [CSCI 5106](#) - Programming Languages (3.0 cr)
- [CSCI 5115](#) - User Interface Design, Implementation and Evaluation (3.0 cr)
- [CSCI 5161](#) - Introduction to Compilers (3.0 cr)
- [CSCI 5271](#) - Introduction to Computer Security (3.0 cr)
- [CSCI 5708](#) - Architecture and Implementation of Database Management Systems (3.0 cr)
- [CSCI 5802](#) - Software Engineering II (3.0 cr)
- [INET 4061](#) - Introduction to Data Warehousing (3.0 cr)

-OR-

Software Engineering/Programming Languages

A track is 24 credits, split into two parts. Take 12 credits from the course list below, including the two required courses: CSCI 5106 and CSCI 5801. And 12 credits from the following: advisor-approved CSci 4xxx, CSci 5xxx or other adviser-approved courses.

[CSCI 5106](#) - Programming Languages (3.0 cr)

[CSCI 5801](#) - Software Engineering I (3.0 cr)

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

- [CSCI 4011](#) - Formal Languages and Automata Theory (4.0 cr)
- [CSCI 5161](#) - Introduction to Compilers (3.0 cr)
- [CSCI 5802](#) - Software Engineering II (3.0 cr)
- [MATH 5165](#) - Mathematical Logic I (4.0 cr)

-OR-

Systems

A track is 24 credits, split into two parts. Take 12 credits from the course list below, including the two required courses: CSCI 4211 and CSCI 5103. And 12 credits from the following: advisor-approved CSci 4xxx, CSci 5xxx or other adviser-approved courses.

[CSCI 4211](#) - Introduction to Computer Networks (3.0 cr)

[CSCI 5103](#) - Operating Systems (3.0 cr)

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

- [CSCI 4131](#) - Internet Programming (3.0 cr)
- [CSCI 5104](#) - System Modeling and Performance Evaluation (3.0 cr)
- [CSCI 5105](#) - Introduction to Distributed Systems (3.0 cr)
- [CSCI 5143](#) - Real-Time and Embedded Systems (3.0 cr)
- [CSCI 5161](#) - Introduction to Compilers (3.0 cr)
- [CSCI 5221](#) - Foundations of Advanced Networking (3.0 cr)
- [CSCI 5231](#) - Wireless and Sensor Networks (3.0 cr)
- [CSCI 5271](#) - Introduction to Computer Security (3.0 cr)
- [CSCI 5551](#) - Introduction to Intelligent Robotic Systems (3.0 cr)

-OR-

Theory

A track is 24 credits, split into two parts. Take 13 credits from the course list below, including the two required courses: CSCI 4011 and CSCI 5421. And 11 credits from the following: advisor-approved CSci 4xxx, CSci 5xxx or other adviser-approved courses.

[CSCI 4011](#) - Formal Languages and Automata Theory (4.0 cr)

[CSCI 5421](#) - Advanced Algorithms and Data Structures (3.0 cr)

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

- [CSCI 5403](#) - Computational Complexity (3.0 cr)
- [CSCI 5451](#) - Introduction to Parallel Computing: Architectures, Algorithms, and Programming (3.0 cr)
- [CSCI 5471](#) - Modern Cryptography (3.0 cr)
- [CSCI 5481](#) - Computational Techniques for Genomics (3.0 cr)
- [MATH 5165](#) - Mathematical Logic I (4.0 cr)
- [MATH 5166](#) - Mathematical Logic II (4.0 cr)
- [MATH 5707](#) - Graph Theory and Non-enumerative Combinatorics (4.0 cr)
- [MATH 5711](#) - Linear Programming and Combinatorial Optimization (4.0 cr)

-OR-



Custom Track

In rare instances, students may create their own track. Such tracks must be approved by a CSci advisor before the elective courses constituting it are taken. Approval is not automatic; in particular, custom tracks must be highly coherent, sufficiently advanced, in accordance with a computer science degree, and aligned with the student's career goals.

Program Sub-plans

A sub-plan is not required for this program.

Honors UHP

This is an honors sub-plan.

Students admitted to the University Honors Program (UHP) must fulfill UHP requirements, in addition to degree program requirements. Honors courses used to fulfill degree program requirements will also fulfill UHP requirements.

Current departmental honors course offerings are listed at:

http://www.honors.umn.edu/academics/curriculum/dept_courses_current.html

Honors students complete an honors thesis project in the final year, most often in conjunction with an honors thesis course, or with an honors directed studies, or honors directed research course. Students select honors courses and plan for a thesis project in consultation with their UHP adviser and their departmental faculty adviser.



Twin Cities Campus

Earth Sciences B.S.

Department of Earth Sciences

College of Science and Engineering

- Program Type: Baccalaureate
- Requirements for this program are current for Fall 2012
- Required credits to graduate with this degree: 120
- Required credits within the major: 49
- This program requires summer terms.
- NA
- Degree: Bachelor of Science in Earth Sciences

Earth sciences is the study of the composition, structure, and history of the Earth and of the processes that operate on and within it, with emphasis on the crust, oceans, and atmosphere. The department's programs emphasize applications of physics, chemistry, and biology to understanding the Earth.

Earth scientists are employed in a wide range of fields, including exploration for and development of natural resources (hydrocarbons, minerals, groundwater); environmental science; urban planning; education; and oceanography. Potential employers include the oil, gas, and minerals industries; environmental consultants; federal and private research institutions; universities; schools; and government agencies. An advanced degree is usually required for a career in research or teaching.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Admission Requirements

Students must complete 5 courses before admission to the program.

Freshman and transfer students are usually admitted to pre-major status before admission to this major

Students interested in the earth sciences as a major may want to consider taking ESCI 1001 or other ESCI 1xxx course, which can be counted as an elective.

For information about University of Minnesota admission requirements, visit the [Office of Admissions website](#).

Mathematics

MATH 1271 - Calculus I [MATH] (4.0 cr)
or **MATH 1371** - CSE Calculus I [MATH] (4.0 cr)

Chemistry

Chemistry I

CHEM 1061 - Chemical Principles I [PHYS] (3.0 cr)
CHEM 1065 - Chemical Principles I Laboratory [PHYS] (1.0 cr)
or **CHEM 1071H** - Honors Chemistry I [PHYS] (3.0 cr)
CHEM 1075H - Honors Chemistry I Laboratory [PHYS] (1.0 cr)

Physics

PHYS 1301W - Introductory Physics for Science and Engineering I [PHYS, WI] (4.0 cr)
or **PHYS 1401V** - Honors Physics I [PHYS, WI] (4.0 cr)

Earth Sciences

ESCI 2201 - Solid Earth Dynamics (4.0 cr)
ESCI 2301 - Mineralogy (3.0 cr)

General Requirements

All students are required to complete general University and college requirements including writing and liberal education courses. For more information about University-wide requirements, see the [liberal education requirements](#). Required courses for the major or minor in which a student receives a D grade (with or without plus or minus) do not count toward the major or minor (including transfer courses).



Program Requirements

Mathematics

- MATH 1272 - Calculus II (4.0 cr)
or MATH 1372 - CSE Calculus II (4.0 cr)
- MATH 2243 - Linear Algebra and Differential Equations (4.0 cr)
or MATH 2263 - Multivariable Calculus (4.0 cr)
or MATH 2373 - CSE Linear Algebra and Differential Equations (4.0 cr)
or MATH 2374 - CSE Multivariable Calculus and Vector Analysis (4.0 cr)

Chemistry

- CHEM 1062 - Chemical Principles II [PHYS] (3.0 cr)
- CHEM 1066 - Chemical Principles II Laboratory [PHYS] (1.0 cr)
- or CHEM 1072H - Honors Chemistry II [PHYS] (3.0 cr)
- CHEM 1076H - Honors Chemistry II Laboratory [PHYS] (1.0 cr)

Physics

- PHYS 1302W - Introductory Physics for Science and Engineering II [PHYS, WI] (4.0 cr)
- or PHYS 1402V - Honors Physics II [PHYS, WI] (4.0 cr)

Major Courses

- Major core courses required for all focus groups.
- ESCI 2202 - Earth History (4.0 cr)
 - ESCI 2203 - Earth Surface Dynamics (4.0 cr)
 - ESCI 3202 - Fluid Earth Dynamics (4.0 cr)
 - ESCI 3303W - Geochemical Principles [WI] (4.0 cr)
 - ESCI 3891 - Field Methods (1.0 cr)

Fieldwork

- Take introductory field geology (ESCI 3911) and choose one advanced field course from advanced field geology (ESCI 4911) or field hydrogeology (ESCI 4971W).
- ESCI 3911 - Introductory Field Geology (4.0 cr)
 - ESCI 4911 - Advanced Field Geology (4.0 cr)
or ESCI 4971W - Field Hydrogeology [WI] (4.0 cr)

Technical Electives

- Take 8 credits of additional elective courses in physical and natural sciences or mathematics, chosen in consultation with an adviser.
Elective sciences

Upper Division Requirements

- The general requirement for completion of upper division is 26 credits in consultation with the director of undergraduate studies. Students may choose one of six focus groups (geology, geophysics, biogeoscience, hydrogeology, geochemistry, or environmental geology) for a recommended list of upper division courses.

Earth Sciences Focus Groups

Geology

- ESCI 2302 - Petrology (3.0 cr)
 - ESCI 4501 - Structural Geology (3.0 cr)
 - ESCI 4602 - Sedimentology and Stratigraphy (3.0 cr)
 - ESCI 4702 - General Hydrogeology (3.0 cr)
 - ESCI 4701 - Geomorphology (3.0 - 4.0 cr)
or ESCI 4703 - Glacial Geology (4.0 cr)
- 10-11 additional ESCI credits with at least 7 credits at 4xxx or 5xxx levels.

-OR-

Geophysics

- ESCI 2302 - Petrology (3.0 cr)
- ESCI 4211 - Solid Earth Geophysics I (3.0 cr)
- ESCI 4501 - Structural Geology (3.0 cr)
- MATH 2374 - CSE Multivariable Calculus and Vector Analysis (4.0 cr)
- PHYS 2303 - Physics III: Physics of Matter (4.0 cr)
or PHYS 2503 - Physics III: Intro to Waves, Optics, and Special Relativity (4.0 cr)



Choice of two from

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

- ESCI 4203 - Principles of Geophysical Exploration (3.0 cr)
- ESCI 4204 - Geomagnetism and Paleomagnetism (3.0 cr)
- ESCI 4212 - Solid Earth Geophysics II (3.0 cr)
- ESCI 5203 - Mineral and Rock Physics (3.0 cr)
- ESCI 5205 - Fluid Mechanics in Earth and Environmental Sciences (3.0 cr)

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

- ESCI 4xxx
- ESCI 5xxx

-OR-

Biogeoscience

- ESCI 4602 - Sedimentology and Stratigraphy (3.0 cr)
 - ESCI 4801 - Geomicrobiology (3.0 cr)
 - ESCI 5302 - Isotope Geology (3.0 cr)
 - ESCI 4401 - Aqueous Environmental Geochemistry (3.0 cr)
or ESCI 4402 - Biogeochemical Cycles in the Ocean (3.0 cr)
- 14 additional ESCI credits at least 9 at 4xxx or 5xxx

-OR-

Hydrogeology

- ESCI 4602 - Sedimentology and Stratigraphy (3.0 cr)
 - ESCI 4702 - General Hydrogeology (3.0 cr)
 - ESCI 4401 - Aqueous Environmental Geochemistry (3.0 cr)
or ESCI 4701 - Geomorphology (3.0 - 4.0 cr)
or ESCI 4703 - Glacial Geology (4.0 cr)
- 16-17 additional ESCI credits with at least 9 credits at 4xxx or 5xxx.

-OR-

Geochemistry

- ESCI 2302 - Petrology (3.0 cr)
 - ESCI 4501 - Structural Geology (3.0 cr)
 - ESCI 4801 - Geomicrobiology (3.0 cr)
 - ESCI 5302 - Isotope Geology (3.0 cr)
 - ESCI 4401 - Aqueous Environmental Geochemistry (3.0 cr)
or ESCI 4402 - Biogeochemical Cycles in the Ocean (3.0 cr)
- 11 additional ESCI credits with at least 9 credits at 4xxx or 5xxx.

-OR-

Environmental Geology

- ESCI 4401 - Aqueous Environmental Geochemistry (3.0 cr)
 - ESCI 4402 - Biogeochemical Cycles in the Ocean (3.0 cr)
 - ESCI 4702 - General Hydrogeology (3.0 cr)
 - ESCI 4703 - Glacial Geology (4.0 cr)
or ESCI 4801 - Geomicrobiology (3.0 cr)
- 13-14 additional ESCI credits with at least 9 credits at 4xxx or 5xxx.



Twin Cities Campus

Electrical Engineering B.E.E.

Electrical and Computer Engineering

College of Science and Engineering

- Program Type: Baccalaureate
- Requirements for this program are current for Fall 2012
- Required credits to graduate with this degree: 126
- Required credits within the major: 65 to 70
- Degree: Bachelor of Electrical Engineering

The mission of the electrical engineering program is to educate students in core topics, as well as in a broad set of specialties of electrical engineering. The program will impart students with professional attributes that characterize a well-schooled engineer and citizen and provide opportunities for research experience in one of the leading electrical engineering centers of scholarship.

Electrical engineers work in highly diverse areas such as computers, telecommunications, semiconductors, electric energy, consumer and entertainment electronics, biomedical technology, defense and aerospace systems, and automotive electronics. They design and develop components, software, and systems, and work in research, management, and sales. The bachelor of electrical engineering prepares students for immediate entry into professional work, for graduate study and further specialization in engineering, for advanced work in business and management, or for study in a different direction such as medicine.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Admission Requirements

Students must complete 10 courses before admission to the program.

Freshman and transfer students are usually admitted to pre-major status before admission to this major

Students interested in pursuing a degree in computer engineering or electrical engineering are encouraged to take EE 1001 in their first year.

For information about University of Minnesota admission requirements, visit the [Office of Admissions website](#).

Mathematics

- MATH 1371 - CSE Calculus I [MATH] (4.0 cr)
or MATH 1271 - Calculus I [MATH] (4.0 cr)
- MATH 1372 - CSE Calculus II (4.0 cr)
or MATH 1272 - Calculus II (4.0 cr)
- MATH 2373 - CSE Linear Algebra and Differential Equations (4.0 cr)
or MATH 2243 - Linear Algebra and Differential Equations (4.0 cr)

or Honors Curriculum

- For those students pursuing Latin Honors
- MATH 1571H - Honors Calculus I [MATH] (4.0 cr)
- MATH 1572H - Honors Calculus II (4.0 cr)
- MATH 2573H - Honors Calculus III (4.0 cr)
- or MATH 2582H (*Inactive*) (5.0 cr)
- MATH 2583H (*Inactive*) (5.0 cr)

Chemistry and Physics

- CHEM 1061 - Chemical Principles I [PHYS] (3.0 cr)
or CHEM 1071H - Honors Chemistry I [PHYS] (3.0 cr)
- CHEM 1065 - Chemical Principles I Laboratory [PHYS] (1.0 cr)
or CHEM 1075H - Honors Chemistry I Laboratory [PHYS] (1.0 cr)
- PHYS 1301W - Introductory Physics for Science and Engineering I [PHYS, WI] (4.0 cr)
or PHYS 1401V - Honors Physics I [PHYS, WI] (4.0 cr)
- PHYS 1302W - Introductory Physics for Science and Engineering II [PHYS, WI] (4.0 cr)
or PHYS 1402V - Honors Physics II [PHYS, WI] (4.0 cr)

Computer Science



EE 1301 - Introduction to Computing Systems (4.0 cr)

Lower Division Core Courses

EE 2001 - Introduction to Circuits and Electronics (3.0 cr)

EE 2301 - Introduction to Digital System Design (4.0 cr)

General Requirements

All students are required to complete general University and college requirements including writing and liberal education courses. For more information about University-wide requirements, see the [liberal education requirements](#). Required courses for the major or minor in which a student receives a D grade (with or without plus or minus) do not count toward the major or minor (including transfer courses).

Program Requirements

Additional Lower Division Courses

Mathematics

MATH 2374 - CSE Multivariable Calculus and Vector Analysis (4.0 cr)

or MATH 2263 - Multivariable Calculus (4.0 cr)

or MATH 2574H - Honors Calculus IV (4.0 cr)

or MATH 3584H - Honors Calculus IV: Advanced Placement (5.0 cr)

Physics or Chemistry

PHYS 2303 - Physics III: Physics of Matter (4.0 cr)

or PHYS 2311 - Modern Physics (4.0 cr)

or PHYS 2403H - Honors Physics III (4.0 cr)

or PHYS 2503 - Physics III: Intro to Waves, Optics, and Special Relativity (4.0 cr)

or Chemistry 2

CHEM 1062 - Chemical Principles II [PHYS] (3.0 cr)

or CHEM 1072H - Honors Chemistry II [PHYS] (3.0 cr)

CHEM 1066 - Chemical Principles II Laboratory [PHYS] (1.0 cr)

or CHEM 1076H - Honors Chemistry II Laboratory [PHYS] (1.0 cr)

Lower Division Core Courses

EE 2002 - Introductory Circuits and Electronics Laboratory (1.0 cr)

EE 2011 - Linear Systems, Circuits, and Electronics (3.0 cr)

EE 2361 - Introduction to Microcontrollers (4.0 cr)

Upper Division Required Courses

EE 3015 - Signals and Systems (3.0 cr)

EE 3025 - Statistical Methods in Electrical and Computer Engineering (3.0 cr)

EE 3101 - Circuits and Electronics Laboratory I (2.0 cr)

EE 3102 - Circuits and Electronics Laboratory II (2.0 cr)

EE 3115 - Analog Electronics (3.0 cr)

EE 3161 - Semiconductor Devices (3.0 cr)

EE 3601 - Transmission Lines, Fields, and Waves (3.0 cr)

EE Technical Electives

Students must complete 34 technical elective credits with a minimum of 22 coming from EE 4xxx or 5xxx courses. Of the technical electives, one course must be chosen from four of the specialty areas, and at least two courses must be chosen from one of the specialty areas. A senior design project is also required, as are two additional EE lab courses. Students who complete the two-semester senior honors project instead of the senior design project only need to take one additional EE lab course.

Take 34 or more credits(s) from the following:

- AEM 2021 - Statics and Dynamics (4.0 cr)
- AEM 4601 - Instrumentation Laboratory (3.0 cr)
- BBE 3013 - Engineering Principles of Molecular and Cellular Processes (3.0 cr)
- BIOC 3021 - Biochemistry (3.0 cr)
- BLAW 3058 - The Law of Contracts and Agency (4.0 cr)
- BMEN 5401 - Advanced Biomedical Imaging (3.0 cr)
- CE 3502 - Fluid Mechanics (4.0 cr)
- CE 4101W *{Inactive}[WI]* (3.0 cr)
- CHEM 2301 - Organic Chemistry I (3.0 cr)
- CHEM 2302 - Organic Chemistry II (3.0 cr)
- CHEM 2311 - Organic Lab (4.0 cr)
- CSCI 4xxx
- CSCI 5xxx



- IE 5441 - Financial Decision Making (4.0 cr)
- IE 5511 - Human Factors and Work Analysis (4.0 cr)
- IE 5512 - Applied Ergonomics (4.0 cr)
- IE 5513 - Engineering Safety (4.0 cr)
- IE 5522 - Quality Engineering and Reliability (4.0 cr)
- IE 5531 - Engineering Optimization I (4.0 cr)
- IE 5541 - Project Management (4.0 cr)
- IE 5551 - Production Planning and Inventory Control (4.0 cr)
- IE 5552 - Design and Analysis of Manufacturing Systems (4.0 cr)
- IE 5553 - Simulation (4.0 cr)
- MATS 3011 - Introduction to Materials Science and Engineering (3.0 cr)
- MATS 3012 - Metals and Alloys (3.0 cr)
- MATS 3851W - Materials Properties Lab [WI] (4.0 cr)
- MATS 3013 - Electrical and Magnetic Properties of Materials (3.0 cr)
- MATH 3283W - Sequences, Series, and Foundations: Writing Intensive [WI] (4.0 cr)
- MATH 4xxx
- MATH 5xxx
- ME 3324 - Introduction to Thermal Science (3.0 cr)
- PHSL 3061 - Principles of Physiology (4.0 cr)
- PHYS 2601 - Quantum Physics (4.0 cr)
- PHYS 2605 - Quantum Physics Laboratory (3.0 cr)
- PHYS 4101 - Quantum Mechanics (4.0 cr)
- PHYS 4201 - Statistical and Thermal Physics (3.0 cr)
- STAT 5101 - Theory of Statistics I (4.0 cr)
- STAT 5041 - Bayesian Decision Making (3.0 cr)
- STAT 5102 - Theory of Statistics II (4.0 cr)
- ME 3331 - Thermal Sciences I (3.0 cr)
- ME 3332 - Thermal Sciences II (3.0 cr)
- ME 3333 - Thermal Sciences III (3.0 cr)
- MGMT 4080W - Applied Technology Entrepreneurship [WI] (4.0 cr)
- IE 5111 - Systems Engineering I (2.0 cr)
- Students must complete both courses to receive credit.
 - AEM 2011 - Statics (3.0 cr)
 - AEM 2012 - Dynamics (3.0 cr)
- Students must complete both courses to receive credit.
 - AEM 2011 - Statics (3.0 cr)
 - AEM 3031 - Deformable Body Mechanics (3.0 cr)
- Students must complete both courses to receive credit.
 - EE 3041 - Industrial Assignment I (2.0 cr)
 - EE 4043W - Industrial Assignment II [WI] (4.0 cr)
- Management Minor**
 - Students must complete a management minor to receive any credit. Only the following courses count.
 - ACCT 3001 - Introduction to Management Accounting (3.0 cr)
 - or FINA 3001 - Finance Fundamentals (3.0 cr)
 - or MGMT 3001 - Fundamentals of Management (3.0 cr)
 - or MKTG 3001 - Principles of Marketing (3.0 cr)
 - or HRIR 3021 - Human Resource Management and Industrial Relations (3.0 cr)
 - or MGMT 3010 - Introduction to Entrepreneurship (4.0 cr)
 - or SCO 3001 - Introduction to Operations Management (3.0 cr)
 - or PA 3003 - Nonprofit and Public Financial Management (3.0 cr)
 - or PA 4101 - Nonprofit Management and Governance (3.0 cr)
- Accounting Minor**
 - Students must complete an accounting minor to receive any credit. Only the following courses count.
 - ACCT 5101 - Intermediate Accounting I (4.0 cr)
 - or ACCT 5102W - Intermediate Accounting II [WI] (4.0 cr)
 - or ACCT 3201 - Intermediate Management Accounting (2.0 cr)
 - or ACCT 5135 - Fundamentals of Federal Income Tax (4.0 cr)
 - or ACCT 5160 - Financial Statement Analysis (2.0 cr)
 - or ACCT 5180 - Consolidations and Advanced Reporting (2.0 cr)
 - or ACCT 5310 - International Accounting (2.0 cr)
- Biochemistry Minor**
 - Students must complete a biochem minor to receive any credit. Only the following courses count.
 - BIOC 4331 - Biochemistry I: Structure, Catalysis, and Metabolism in Biological Systems (4.0 cr)
 - or BIOC 4332 - Biochemistry II: Molecular Mechanisms of Signal Transduction and Gene Expression (4.0 cr)
 - or BIOC 4025 - Laboratory in Biochemistry (2.0 cr)



•**Biology Minor**

•Students must complete a biology minor to receive any credit. Only the following courses count.

- BIOL 3xxx
- or BIOL 4xxx
- or BIOL 5xxx

•**Other minors as approved by director of undergraduate studies**

•Other minors may count toward Technical Electives if approved by ECE director of UG studies.

•**Department Electives**

•Take 22 or more credits(s) including 0 or more sub-requirements(s) from the following:

•**Senior Design Project**

- A senior design project is required.
- EE 4951W - Senior Design Project [WI] (4.0 cr)
- or EE 4981H - Senior Honors Project I (2.0 cr)
- EE 4982V - Senior Honors Project II [WI] (2.0 cr)

•**Lab Courses**

•Two additional EE lab courses are required. Senior honors project students only need to take one.

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

- EE 4111 - Advanced Analog Electronics Design (4.0 cr)
- EE 4235 - Linear Control Systems Laboratory (1.0 cr)
- EE 4237 - State Space Control Laboratory (1.0 cr)
- EE 4301 - Digital Design With Programmable Logic (4.0 cr)
- EE 4341 - Embedded System Design (4.0 cr)
- EE 4505 - Communications Systems Laboratory (1.0 cr)
- EE 4703 - Electric Drives Laboratory (1.0 cr)
- EE 4722 - Power System Analysis Laboratory (1.0 cr)
- EE 4743 - Switch-Mode Power Electronics Laboratory (1.0 cr)
- EE 4930 - Special Topics in Electrical and Computer Engineering Laboratory (1.0 - 2.0 cr)
- EE 5141 - Introduction to Microsystem Technology (4.0 cr)
- EE 5173 - Basic Microelectronics Laboratory (1.0 cr)
- EE 5327 - VLSI Design Laboratory (3.0 cr)
- EE 5545 - Digital Signal Processing Design (3.0 cr)
- EE 5613 - RF/Microwave Circuit Design Laboratory (2.0 cr)
- EE 5622 - Physical Optics Laboratory (1.0 cr)
- EE 5628 - Fiber Optics Laboratory (1.0 cr)
- EE 5657W - Physical Principles of Thin Film Technology [WI] (4.0 cr)
- EE 4163 - Energy Conversion and Storage Laboratory (1.0 cr)

•**Breadth and Depth Requirements (Specialty Areas)**

•One course chosen from four specialty areas, and two courses chosen from one specialty area.

Communications, Signal Processing, and Biomedical

Take 0 or more course(s) from the following:

- EE 4501 - Communications Systems (3.0 cr)
- EE 4541 - Digital Signal Processing (3.0 cr)
- EE 5381 - Telecommunications Networks (3.0 cr)
- EE 5501 - Digital Communication (3.0 cr)
- EE 5505 - Wireless Communication (3.0 cr)
- EE 5531 - Probability and Stochastic Processes (3.0 cr)
- EE 5542 - Adaptive Digital Signal Processing (3.0 cr)
- EE 5545 - Digital Signal Processing Design (3.0 cr)
- EE 5549 - Digital Signal Processing Structures for VLSI (3.0 cr)
- EE 5551 - Multiscale and Multirate Signal Processing (3.0 cr)
- EE 5561 - Image Processing and Applications (3.0 cr)
- EE 5581 - Information Theory and Coding (3.0 cr)
- EE 5583 - Error Control Coding (3.0 cr)
- EE 5585 - Data Compression (3.0 cr)

Controls

Take 0 or more course(s) from the following:

- EE 4231 - Linear Control Systems: Designed by Input/Output Methods (3.0 cr)
- EE 4233 - State Space Control System Design (3.0 cr)
- EE 5231 - Linear Systems and Optimal Control (3.0 cr)
- EE 5235 - Robust Control System Design (3.0 cr)
- EE 5239 - Introduction to Nonlinear Optimization (3.0 cr)

Digital Systems and Computer Architecture

Take 0 or more course(s) from the following:

- EE 4301 - Digital Design With Programmable Logic (4.0 cr)
- EE 4341 - Embedded System Design (4.0 cr)



- EE 4363 - Computer Architecture and Machine Organization (4.0 cr)
- EE 4389W - Introduction to Predictive Learning [WI] (3.0 cr)
- EE 4609 - Digital Signal Integrity (3.0 cr)
- EE 5364 - Advanced Computer Architecture (3.0 cr)
- EE 5371 - Computer Systems Performance Measurement and Evaluation (3.0 cr)
- EE 5393 - Circuits, Computation, and Biology (3.0 cr)
- EE 5863 (*Inactive*)(2.0 cr)

VLSI and CAD

Take 0 or more course(s) from the following:

- EE 5301 - VLSI Design Automation I (3.0 cr)
- EE 5302 - VLSI Design Automation II (3.0 cr)
- EE 5323 - VLSI Design I (3.0 cr)
- EE 5324 - VLSI Design II (3.0 cr)
- EE 5327 - VLSI Design Laboratory (3.0 cr)
- EE 5329 - VLSI Digital Signal Processing Systems (3.0 cr)
- EE 5333 - Analog Integrated Circuit Design (3.0 cr)

Electronics, Microelectronics, and Semiconductor Devices

Take 0 or more course(s) from the following:

- EE 4111 - Advanced Analog Electronics Design (4.0 cr)
- EE 5121 - Transistor Device Modeling for Circuit Simulation (3.0 cr)
- EE 5141 - Introduction to Microsystem Technology (4.0 cr)
- EE 5163 - Semiconductor Properties and Devices I (3.0 cr)
- EE 5164 - Semiconductor Properties and Devices II (3.0 cr)
- EE 5171 - Microelectronic Fabrication (4.0 cr)
- EE 5181 - Introduction to Nanotechnology (4.0 cr)
- EE 4161W - Energy Conversion and Storage [WI] (3.0 cr)
- EE 5657W - Physical Principles of Thin Film Technology [WI] (4.0 cr)

Power and Energy

Take 0 or more course(s) from the following:

- EE 4701 - Electric Drives (3.0 cr)
- EE 4721 - Introduction to Power System Analysis (3.0 cr)
- EE 4741 - Power Electronics (3.0 cr)
- EE 5705 - Electric Drives in Sustainable Energy Systems (3.0 cr)
- EE 5721 - Power Generation Operation and Control (3.0 cr)
- EE 5725 - Power Systems Engineering (3.0 cr)
- EE 5741 - Advanced Power Electronics (3.0 cr)

Magnetics, Optics, and RF

Take 0 or more course(s) from the following:

- EE 4607 - Wireless Hardware System Design (3.0 cr)
- EE 5601 - Introduction to RF/Microwave Engineering (3.0 cr)
- EE 5602 - RF/Microwave Circuit Design (3.0 cr)
- EE 5611 - Plasma-Aided Manufacturing (4.0 cr)
- EE 5613 - RF/Microwave Circuit Design Laboratory (2.0 cr)
- EE 5616 - Antenna Theory and Design (3.0 cr)
- EE 5621 - Physical Optics (3.0 cr)
- EE 5624 - Optical Electronics (4.0 cr)
- EE 5627 - Optical Fiber Communication (3.0 cr)
- EE 5628 - Fiber Optics Laboratory (1.0 cr)
- EE 5629 - Optical System Design (2.0 cr)
- EE 5653 - Physical Principles of Magnetic Materials (3.0 cr)
- EE 5655 - Magnetic Recording (3.0 cr)

Program Sub-plans

A sub-plan is not required for this program.

Honors UHP

This is an honors sub-plan.

Students admitted to the University Honors Program (UHP) must fulfill UHP requirements, in addition to degree program requirements. Honors courses used to fulfill degree program requirements will also fulfill UHP requirements.

Current departmental honors course offerings are listed at:

http://www.honors.umn.edu/academics/curriculum/dept_courses_current.html.



Honors students complete an honors thesis project in the final year, most often in conjunction with an honors thesis course, or with an honors directed studies or honors directed research course. Students select honors courses and plan for a thesis project in consultation with their UHP adviser and their departmental faculty adviser.



Twin Cities Campus

Geoengineering B.GeoE.

Civil Engineering

College of Science and Engineering

- Program Type: Baccalaureate
- Requirements for this program are current for Fall 2012
- Required credits to graduate with this degree: 128
- Required credits within the major: 59 to 78
- This program requires summer terms.
- Degree: Bachelor of Geological Engineering

The mission of the geoenvironmental program comprises three overlapping and mutually supportive components:

- * Prepare students to become productive engineers and contributing members of their professional community.
- * Prepare students for continual learning and professional development.
- * Prepare students for formal advanced education.

The program has four core objectives:

1. Produce graduates with a strong fundamental scientific and technical knowledge base and critical thinking skills required for engineering problem formulation and problem solving.
2. Produce graduates with the ability to work as professional team members. This includes the ability to communicate effectively through both oral and written language.
3. Produce graduates with an understanding of their obligations as professional geological engineers to protect human health, welfare, and the environment.
4. Ensure that graduates have had opportunities to complement their academic studies with scholarly (research) investigations, co-ops, and internships.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Admission Requirements

Students must complete 10 courses before admission to the program.

Freshman and transfer students are usually admitted to pre-major status before admission to this major

For information about University of Minnesota admission requirements, visit the [Office of Admissions website](#).

Mathematics

Honors math (MATH 1571H, 1572H, 2573H, 2574H) may be taken in place of the listed courses.

[MATH 1271](#) - Calculus I [MATH] (4.0 cr)

or [MATH 1371](#) - CSE Calculus I [MATH] (4.0 cr)

[MATH 1272](#) - Calculus II (4.0 cr)

or [MATH 1372](#) - CSE Calculus II (4.0 cr)

[MATH 2263](#) - Multivariable Calculus (4.0 cr)

or [MATH 2374](#) - CSE Multivariable Calculus and Vector Analysis (4.0 cr)

Physical Sciences

[CHEM 1061](#) - Chemical Principles I [PHYS] (3.0 cr)

[CHEM 1065](#) - Chemical Principles I Laboratory [PHYS] (1.0 cr)

or [CHEM 1071H](#) - Honors Chemistry I [PHYS] (3.0 cr)

[CHEM 1075H](#) - Honors Chemistry I Laboratory [PHYS] (1.0 cr)

[CHEM 1062](#) - Chemical Principles II [PHYS] (3.0 cr)

[CHEM 1066](#) - Chemical Principles II Laboratory [PHYS] (1.0 cr)

or [CHEM 1072H](#) - Honors Chemistry II [PHYS] (3.0 cr)

[CHEM 1076H](#) - Honors Chemistry II Laboratory [PHYS] (1.0 cr)

[PHYS 1301W](#) - Introductory Physics for Science and Engineering I [PHYS, WI] (4.0 cr)

or [PHYS 1401V](#) - Honors Physics I [PHYS, WI] (4.0 cr)

[PHYS 1302W](#) - Introductory Physics for Science and Engineering II [PHYS, WI] (4.0 cr)

or [PHYS 1402V](#) - Honors Physics II [PHYS, WI] (4.0 cr)



Mechanics

[AEM 2011](#) - Statics (3.0 cr)

General Requirements

All students are required to complete general University and college requirements including writing and liberal education courses. For more information about University-wide requirements, see the [liberal education requirements](#). Required courses for the major or minor in which a student receives a D grade (with or without plus or minus) do not count toward the major or minor (including transfer courses).

Program Requirements

Earth Sciences

[ESCI 2301](#) - Mineralogy (3.0 cr)
[ESCI 2302](#) - Petrology (3.0 cr)
[ESCI 3891](#) - Field Methods (1.0 cr)
[ESCI 4501](#) - Structural Geology (3.0 cr)
[ESCI 1001](#) - Earth and Its Environments [PHYS, ENV] (4.0 cr)
or [ESCI 2201](#) - Solid Earth Dynamics (4.0 cr)
[ESCI 3911](#) - Introductory Field Geology (4.0 cr)
or [ESCI 4971W](#) - Field Hydrogeology [WI] (4.0 cr)

Engineering

[CE 3101](#) - Computer Applications in Civil Engineering I (3.0 cr)
[CE 3502](#) - Fluid Mechanics (4.0 cr)
[GEOE 4102W](#) - Capstone Design [WI] (4.0 cr)
[CE 3102](#) - Uncertainty and Decision Analysis in Civil Engineering (3.0 cr)
[CE 3501](#) - Environmental Engineering [ENV] (3.0 cr)
[GEOE 4121](#) - Computer Applications in Civil Engineering II (3.0 cr)
[AEM 3031](#) - Deformable Body Mechanics (3.0 cr)
[CE 3301](#) - Soil Mechanics I (3.0 cr)
or [GEOE 3301](#) - Soil Mechanics I (3.0 cr)
[AEM 2012](#) - Dynamics (3.0 cr)
or [CHEM 2301](#) - Organic Chemistry I (3.0 cr)
or [EE 2001](#) - Introduction to Circuits and Electronics (3.0 cr)
or [MATS 2001](#) - Introduction to the Science of Engineering Materials (3.0 cr)
or [CSCI 1113](#) - Introduction to C/C++ Programming for Scientists and Engineers (4.0 cr)
or [ME 3331](#) - Thermal Sciences I (3.0 cr)

Civil Engineering Elective

[CE 3402W](#) - Civil Engineering Materials [WI] (3.0 cr)
or [CE 4501](#) - Hydrologic Design (4.0 cr)
or [CE 4502](#) - Water and Wastewater Treatment (3.0 cr)

Geoengineering Elective

[GEOE 4301](#) - Soil Mechanics II (3.0 cr)
or [GEOE 4311](#) - Rock Mechanics (4.0 cr)
or [GEOE 4351](#) - Groundwater Mechanics (3.0 cr)

Earth Science Elective

[ESCI 4xxx](#)

Linear Algebra and Differential Equations

[MATH 2373](#) - CSE Linear Algebra and Differential Equations (4.0 cr)
or [MATH 2243](#) - Linear Algebra and Differential Equations (4.0 cr)

Program Sub-plans

Students are required to complete one of the following sub-plans. (Note for the Twin Cities and Morris campuses: The honors sub-plan does not meet this requirement. Honors students are required to complete one sub-plan plus the honors sub-plan. Please see an adviser if no honors sub-plan is listed for the program.)

Honors UHP



This is an honors sub-plan.

Students admitted to the University Honors Program (UHP) must fulfill UHP requirements in addition to degree program requirements. Honors courses used to fulfill degree program requirements will also fulfill UHP requirements.

Current departmental honors course offerings are listed at:

http://www.honors.umn.edu/academics/curriculum/dept_courses_current.html.

Honors students complete an honors thesis project in the final year, most often in conjunction with an honors thesis course, or with an honors directed studies or honors directed research course. Students select honors courses and plan for a thesis project in consultation with their UHP adviser and their departmental faculty adviser.

Geomechanics Engineering

Geomechanics Technical Electives

Students must take 12-14 credits from the approved list of technical electives.

Take 12 - 14 credits(s) from the following:

- AEM 4581 - Mechanics of Solids (3.0 cr)
- CE 4301 - Soil Mechanics II (3.0 cr)
- CE 4311 - Rock Mechanics (4.0 cr)
- CE 4341 - Engineering Geostatistics (3.0 cr)
- CE 4351 - Groundwater Mechanics (3.0 cr)
- CE 4352 - Groundwater Modeling (3.0 cr)
- CE 4501 - Hydrologic Design (4.0 cr)
- CE 5311 - Experimental Geomechanics (3.0 cr)
- CE 5321 - Geomechanics (3.0 cr)
- CE 5331 - Geomechanics Modeling (3.0 cr)
- ESCI 4203 - Principles of Geophysical Exploration (3.0 cr)
- MATH 4457 *{Inactive}*(4.0 cr)
- MATH 4458 *{Inactive}*(4.0 cr)
- MATH 4567 - Applied Fourier Analysis (4.0 cr)
- MATH 5583 - Complex Analysis (4.0 cr)
- CE 4502 - Water and Wastewater Treatment (3.0 cr)
- CE 4561 - Solid Hazardous Wastes (3.0 cr)
- CE 4562 - Environmental Remediation Technology (3.0 cr)
- CE 5180 - Special Topics (1.0 - 4.0 cr)
- CE 5541 - Environmental Water Chemistry (3.0 cr)
- CE 5551 - Environmental Microbiology (3.0 cr)
- CE 5542 - Experimental Methods in Environmental Engineering (3.0 cr)
- BBE 4533 - Sustainable Waste Management Engineering (3.0 cr)
- BBE 4733 - Renewable Energy Technologies [TS] (3.0 cr)
- EEB 4611 - Biogeochemical Processes (3.0 cr)
- STAT 5021 - Statistical Analysis (4.0 cr)
- CE 4511 - Hydraulic Structures (3.0 cr)
- CE 4512 - Open Channel Hydraulics (4.0 cr)
- ESCI 4701 - Geomorphology (3.0 - 4.0 cr)
- CE 4411 - Matrix Structural Analysis (3.0 cr)
- GEOE 5341 - Wave Methods for Nondestructive Testing (4.0 cr)

Adviser-Approved Technical Elective

Students must take an additional 3 credits in an area approved by the student's adviser.

Geoenvironmental Engineering

Geoenvironmental Technical Electives

Students must take 12-14 credits from the approved list of technical electives.

Take 12 - 14 credits(s) from the following:

- CE 4351 - Groundwater Mechanics (3.0 cr)
- CE 4352 - Groundwater Modeling (3.0 cr)
- CE 4501 - Hydrologic Design (4.0 cr)
- CE 4502 - Water and Wastewater Treatment (3.0 cr)
- CE 4561 - Solid Hazardous Wastes (3.0 cr)
- CE 4562 - Environmental Remediation Technology (3.0 cr)
- CE 5180 - Special Topics (1.0 - 4.0 cr)
- CE 5541 - Environmental Water Chemistry (3.0 cr)
- CE 5551 - Environmental Microbiology (3.0 cr)
- CE 5542 - Experimental Methods in Environmental Engineering (3.0 cr)



- BBE 4533 - Sustainable Waste Management Engineering (3.0 cr)
- BBE 4733 - Renewable Energy Technologies [TS] (3.0 cr)
- EEB 4611 - Biogeochemical Processes (3.0 cr)
- STAT 5021 - Statistical Analysis (4.0 cr)
- CE 4301 - Soil Mechanics II (3.0 cr)
- CE 4341 - Engineering Geostatistics (3.0 cr)
- CE 4511 - Hydraulic Structures (3.0 cr)
- CE 4512 - Open Channel Hydraulics (4.0 cr)
- ESCI 4701 - Geomorphology (3.0 - 4.0 cr)
- MATH 4457 *{Inactive}*(4.0 cr)
- MATH 4458 *{Inactive}*(4.0 cr)
- MATH 4567 - Applied Fourier Analysis (4.0 cr)
- MATH 5583 - Complex Analysis (4.0 cr)
- AEM 4581 - Mechanics of Solids (3.0 cr)
- CE 4311 - Rock Mechanics (4.0 cr)
- CE 5311 - Experimental Geomechanics (3.0 cr)
- CE 5321 - Geomechanics (3.0 cr)
- CE 5331 - Geomechanics Modeling (3.0 cr)
- ESCI 4203 - Principles of Geophysical Exploration (3.0 cr)
- CE 4411 - Matrix Structural Analysis (3.0 cr)
- GEOE 5341 - Wave Methods for Nondestructive Testing (4.0 cr)

Adviser-Approved Technical Elective

Students must take an additional 3 credits in an area approved by the student's adviser.

Geofluids Engineering

Geofluids Technical Electives

Students must take 12-14 credits from the approved list of technical electives.

Take 12 - 14 credits(s) from the following:

- CE 4301 - Soil Mechanics II (3.0 cr)
- CE 4341 - Engineering Geostatistics (3.0 cr)
- CE 4351 - Groundwater Mechanics (3.0 cr)
- CE 4352 - Groundwater Modeling (3.0 cr)
- CE 4501 - Hydrologic Design (4.0 cr)
- ESCI 4701 - Geomorphology (3.0 - 4.0 cr)
- MATH 4457 *{Inactive}*(4.0 cr)
- MATH 4458 *{Inactive}*(4.0 cr)
- MATH 4567 - Applied Fourier Analysis (4.0 cr)
- MATH 5583 - Complex Analysis (4.0 cr)
- CE 4511 - Hydraulic Structures (3.0 cr)
- CE 4512 - Open Channel Hydraulics (4.0 cr)
- CE 4502 - Water and Wastewater Treatment (3.0 cr)
- CE 4561 - Solid Hazardous Wastes (3.0 cr)
- CE 4562 - Environmental Remediation Technology (3.0 cr)
- CE 5180 - Special Topics (1.0 - 4.0 cr)
- CE 5541 - Environmental Water Chemistry (3.0 cr)
- CE 5551 - Environmental Microbiology (3.0 cr)
- CE 5542 - Experimental Methods in Environmental Engineering (3.0 cr)
- BBE 4533 - Sustainable Waste Management Engineering (3.0 cr)
- BBE 4733 - Renewable Energy Technologies [TS] (3.0 cr)
- EEB 4611 - Biogeochemical Processes (3.0 cr)
- STAT 5021 - Statistical Analysis (4.0 cr)
- AEM 4581 - Mechanics of Solids (3.0 cr)
- CE 4311 - Rock Mechanics (4.0 cr)
- CE 5311 - Experimental Geomechanics (3.0 cr)
- CE 5321 - Geomechanics (3.0 cr)
- CE 5331 - Geomechanics Modeling (3.0 cr)
- ESCI 4203 - Principles of Geophysical Exploration (3.0 cr)
- CE 4411 - Matrix Structural Analysis (3.0 cr)
- GEOE 5341 - Wave Methods for Nondestructive Testing (4.0 cr)

Adviser-Approved Technical Elective

Students must take an additional 3 credits in an area approved by the student's adviser.



Twin Cities Campus

Geology B.S.Geol.

Department of Earth Sciences

College of Science and Engineering

- **Students will no longer be accepted into this program after Spring 2010. Program requirements below are for current students only.**
- **Students interested in the Geology B.S.Geol. should consider the Earth Sciences B.S. in the College of Science and Engineering.**
- Program Type: Baccalaureate
- Requirements for this program are current for Fall 2012
- Required credits to graduate with this degree: 120
- Required credits within the major: 52
- This program requires summer terms.
- Degree: Bachelor of Science in Geology

Geology is the study of the composition, structure, and history of the Earth and of the processes that operate on and within it, with emphasis on the crust, oceans, and atmosphere. The department's programs emphasize applications of physics, chemistry, and biology to understanding the Earth.

Geologists and geophysicists are employed in a wide range of fields, including exploration for and development of natural resources (hydrocarbons, minerals, groundwater); environmental science; urban planning; education; and oceanography. Potential employers include the oil, gas, and minerals industries; environmental consultants; federal and private research institutions; universities; schools; and government agencies. An advanced degree is usually required for a career in research or teaching.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Admission Requirements

Students must complete 5 courses before admission to the program.

Freshman and transfer students are usually admitted to pre-major status before admission to this major

A GPA above 2.0 is preferred for the following:

- 2.50 transferring from outside the University

Students interested in geology as a major may want to consider taking GEO 1001, which can be counted as an elective.

For information about University of Minnesota admission requirements, visit the [Office of Admissions website](#).

Mathematics

MATH 1271 - Calculus I [MATH] (4.0 cr)

or **MATH 1371** - CSE Calculus I [MATH] (4.0 cr)

MATH 1272 - Calculus II (4.0 cr)

or **MATH 1372** - CSE Calculus II (4.0 cr)

Multivariable Calculus may be substituted.

MATH 2243 - Linear Algebra and Differential Equations (4.0 cr)

or **MATH 2263** - Multivariable Calculus (4.0 cr)

or **MATH 2373** - CSE Linear Algebra and Differential Equations (4.0 cr)

or **MATH 2374** - CSE Multivariable Calculus and Vector Analysis (4.0 cr)

Physical Sciences

CHEM 1021 *{Inactive}*[PHYS] (4.0 cr)

or **CHEM 1031H** *{Inactive}*[PHYS] (4.0 cr)

CHEM 1022 *{Inactive}*[PHYS] (4.0 cr)

or **CHEM 1032H** - Honors Chemistry II [PHYS] (4.0 cr)

One course of Physics I and one course of Physics II must be complete before admission to upper division

PHYS 1301W - Introductory Physics for Science and Engineering I [PHYS, WI] (4.0 cr)

or **PHYS 1401V** - Honors Physics I [PHYS, WI] (4.0 cr)



[PHYS 1302W](#) - Introductory Physics for Science and Engineering II [PHYS, WI] (4.0 cr)
or [PHYS 1402V](#) - Honors Physics II [PHYS, WI] (4.0 cr)

General Requirements

All students are required to complete general University and college requirements including writing and liberal education courses. For more information about University-wide requirements, see the [liberal education requirements](#). Required courses for the major or minor in which a student receives a D grade (with or without plus or minus) do not count toward the major or minor (including transfer courses).

Program Requirements

Major Courses

[ESCI 2201](#) - Solid Earth Dynamics (4.0 cr)
[ESCI 2301](#) - Mineralogy (3.0 cr)
[ESCI 2302](#) - Petrology (3.0 cr)
[ESCI 3303W](#) - Geochemical Principles [WI] (4.0 cr)
[ESCI 3202](#) - Fluid Earth Dynamics (4.0 cr)
[ESCI 3401](#) *{Inactive}* (3.0 cr)
[ESCI 3911](#) - Introductory Field Geology (4.0 cr)
[ESCI 4501](#) - Structural Geology (3.0 cr)
[ESCI 4602](#) - Sedimentology and Stratigraphy (3.0 cr)
[ESCI 4631W](#) *{Inactive}*[WI] (3.0 cr)

Workshops and Advanced Fieldwork

Take one course in advanced field geology during the summer after the junior year.

[ESCI 4911](#) - Advanced Field Geology (4.0 cr)
or [ESCI 4971W](#) - Field Hydrogeology [WI] (4.0 cr)

Electives

Take at least 12 additional credits of geology during the junior and senior years, with no more than 4 credits from 1xxx and 3 credits from 2xxx.

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

- GEO 1xxx
- GEO 2xxx
- GEO 3xxx
- GEO 4xxx
- GEO 5xxx

Technical Electives

Take 8 credits of additional elective courses in physical and natural sciences or mathematics, chosen in consultation with an adviser.

Program Sub-plans

A sub-plan is not required for this program.

Honors UHP

This is an honors sub-plan.

Students admitted to the University Honors Program (UHP) must fulfill UHP requirements in addition to degree program requirements. For any course required in a degree program, UHP students must register for the honors version if one is offered. Honors courses used to fulfill degree program requirements will also fulfill UHP requirements.



Twin Cities Campus

Geophysics B.S.Geop.

Department of Earth Sciences

College of Science and Engineering

- **Students will no longer be accepted into this program after Spring 2010. Program requirements below are for current students only.**
- **Students interested in the Geophysics B.S.Geop. should consider the Earth Sciences B.S. in the College of Science and Engineering.**
- Program Type: Baccalaureate
- Requirements for this program are current for Fall 2012
- Required credits to graduate with this degree: 120
- Required credits within the major: 52
- This program requires summer terms.
- Degree: Bachelor of Science in Geophysics

Geophysics is the study of the physical structure and properties of the Earth through application of the principles and techniques of classical physics. Major topics include the physical properties of rocks and minerals, the origin and dynamics of the Earth's gravity and magnetic fields, earthquakes and the propagation of waves in the Earth (seismology), and the dynamics of the Earth's crust, mantle, and deep interior.

Geologists and geophysicists are employed in a wide range of fields, including exploration for and development of natural resources (hydrocarbons, minerals, groundwater); environmental science; urban planning; education; and oceanography. Potential employers include the oil, gas, and minerals industries; environmental consultants; federal and private research institutions; universities; schools; and government agencies. An advanced degree is usually required for a career in research or teaching.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Admission Requirements

Students must complete 11 courses before admission to the program.

A GPA above 2.0 is preferred for the following:

- 2.50 transferring from outside the University

Students interested in a geophysics major may want to consider taking GEO 1001, which can be counted as a geology elective.

For information about University of Minnesota admission requirements, visit the [Office of Admissions website](#).

Mathematics

- MATH 1271 - Calculus I [MATH] (4.0 cr)
or MATH 1371 - CSE Calculus I [MATH] (4.0 cr)
- MATH 1272 - Calculus II (4.0 cr)
or MATH 1372 - CSE Calculus II (4.0 cr)
- MATH 2243 - Linear Algebra and Differential Equations (4.0 cr)
or MATH 2373 - CSE Linear Algebra and Differential Equations (4.0 cr)
- MATH 2263 - Multivariable Calculus (4.0 cr)
or MATH 2374 - CSE Multivariable Calculus and Vector Analysis (4.0 cr)

Physical Sciences

- CHEM 1021 *{Inactive}*[PHYS] (4.0 cr)
or CHEM 1031H *{Inactive}*[PHYS] (4.0 cr)
- CHEM 1022 *{Inactive}*[PHYS] (4.0 cr)
or CHEM 1032H - Honors Chemistry II [PHYS] (4.0 cr)
- PHYS 1301W - Introductory Physics for Science and Engineering I [PHYS, WI] (4.0 cr)
or PHYS 1401V - Honors Physics I [PHYS, WI] (4.0 cr)
- PHYS 1302W - Introductory Physics for Science and Engineering II [PHYS, WI] (4.0 cr)
or PHYS 1402V - Honors Physics II [PHYS, WI] (4.0 cr)
- PHYS 2303 - Physics III: Physics of Matter (4.0 cr)



General Requirements

All students are required to complete general University and college requirements including writing and liberal education courses. For more information about University-wide requirements, see the [liberal education requirements](#). Required courses for the major or minor in which a student receives a D grade (with or without plus or minus) do not count toward the major or minor (including transfer courses).

Program Requirements

Major Courses

- ESCI 2201 - Solid Earth Dynamics (4.0 cr)
- ESCI 2301 - Mineralogy (3.0 cr)
- ESCI 2302 - Petrology (3.0 cr)
- ESCI 3303W - Geochemical Principles [WI] (4.0 cr)
- ESCI 3202 - Fluid Earth Dynamics (4.0 cr)
- ESCI 3401 *{Inactive}*(3.0 cr)
- ESCI 3911 - Introductory Field Geology (4.0 cr)
- ESCI 4501 - Structural Geology (3.0 cr)
- ESCI 4911 - Advanced Field Geology (4.0 cr)
or ESCI 4971W - Field Hydrogeology [WI] (4.0 cr)

Take 9 or more credits(s) from the following:

- ESCI 4211 - Solid Earth Geophysics I (3.0 cr)
- ESCI 4212 - Solid Earth Geophysics II (3.0 cr)
- ESCI 4203 - Principles of Geophysical Exploration (3.0 cr)
- ESCI 4204 - Geomagnetism and Paleomagnetism (3.0 cr)
- ESCI 5203 - Mineral and Rock Physics (3.0 cr)

Electives

Take 9 additional credits of GEO courses, with no more than 4 credits of 1xxx and 3 credits of 2xxx.

Take 9 or more credits(s) from the following:

- GEO 1xxx
- GEO 2xxx
- GEO 3xxx
- GEO 4xxx
- GEO 5xxx

Technical Electives

Take 9 additional credits of math or science approved by adviser.

Program Sub-plans

A sub-plan is not required for this program.

Honors UHP

This is an honors sub-plan.

Students admitted to the University Honors Program (UHP) must fulfill UHP requirements in addition to degree program requirements. For any course required in a degree program, UHP students must register for the honors version if one is offered. Honors courses used to fulfill degree program requirements will also fulfill UHP requirements.



Twin Cities Campus

Industrial and Systems Engineering B.I.Sy.E.

Industrial and Systems Engineering

College of Science and Engineering

- Program Type: Baccalaureate
- Requirements for this program are current for Fall 2012
- Required credits to graduate with this degree: 122
- Required credits within the major: 74
- Degree: Bachelor of Industrial and Systems Engineering

The Industrial & Systems Engineering curriculum combines analytics (optimization, simulation, probability, and statistics) and management (project management, economics, marketing, and quality and reliability) to support the modeling, design, and optimization of systems across a wide range of applications and domains.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Admission Requirements

Students must complete 10 courses before admission to the program.

Freshmen students are usually admitted to pre-major status before admission to this major

For information about University of Minnesota admission requirements, visit the [Office of Admissions website](#).

Mathematics

Honors math (MATH 1571H, 1572H, 2573H, 2574H) may be taken in place of the listed courses.

[MATH 1372](#) - CSE Calculus II (4.0 cr)

or [MATH 1272](#) - Calculus II (4.0 cr)

[MATH 1371](#) - CSE Calculus I [MATH] (4.0 cr)

or [MATH 1271](#) - Calculus I [MATH] (4.0 cr)

Physical Sciences

Physics and Chemistry requirements

[CHEM 1061](#) - Chemical Principles I [PHYS] (3.0 cr)

[CHEM 1065](#) - Chemical Principles I Laboratory [PHYS] (1.0 cr)

[PHYS 1301W](#) - Introductory Physics for Science and Engineering I [PHYS, WI] (4.0 cr)

[PHYS 1302W](#) - Introductory Physics for Science and Engineering II [PHYS, WI] (4.0 cr)

CSE courses

Added the new course, CSE 1001

[CSE 1001](#) - First Year Experience (1.0 cr)

General Requirements

All students are required to complete general University and college requirements including writing and liberal education courses. For more information about University-wide requirements, see the [liberal education requirements](#). Required courses for the major or minor in which a student receives a D grade (with or without plus or minus) do not count toward the major or minor (including transfer courses).

Program Requirements

Non-ISyE Required Courses

[CSCI 1113](#) - Introduction to C/C++ Programming for Scientists and Engineers (4.0 cr)

[STAT 3021](#) - Introduction to Probability and Statistics (3.0 cr)

[ECON 1101](#) - Principles of Microeconomics [SOCS, GP] (4.0 cr)

[MKTG 3001](#) - Principles of Marketing (3.0 cr)

[MATH 2374](#) - CSE Multivariable Calculus and Vector Analysis (4.0 cr)

or [MATH 2263](#) - Multivariable Calculus (4.0 cr)

[MATH 2373](#) - CSE Linear Algebra and Differential Equations (4.0 cr)



or [MATH 2243](#) - Linear Algebra and Differential Equations (4.0 cr)

ISyE Courses

- [IE 1101](#) - Foundations of Industrial and Systems Engineering (4.0 cr)
- [IE 2021](#) - Engineering Economics (4.0 cr)
- [IE 3553](#) - Simulation (4.0 cr)
- [IE 3011](#) - Optimization I (4.0 cr)
- [IE 4011](#) - Stochastic Models (4.0 cr)
- [IE 3522](#) - Quality Engineering and Reliability (4.0 cr)
- [IE 4551](#) - Production and Inventory Control (4.0 cr)
- [IE 3012](#) - Optimization II (4.0 cr)
- [IE 4511](#) - Human Factors (4.0 cr)
- [IE 4541](#) - Project Management (4.0 cr)
- [IE 4041](#) - Senior Design (4.0 cr)

Technical Electives

Complete 15 credits of technical electives to be approved by an ISyE faculty adviser.



Twin Cities Campus

Materials Science and Engineering B.Mat.S.E.

Chemical Engineering & Materials Science

College of Science and Engineering

- Program Type: Baccalaureate
- Requirements for this program are current for Fall 2012
- Required credits to graduate with this degree: 123 to 124
- Required credits within the major: 76
- Degree: Bachelor of Materials Science and Engineering

The program in materials science and engineering leads to a bachelor's degree that enables students to immediately enter the profession. The program develops an understanding of the properties and the origin of these properties in a broad range of materials, including metals, ceramics, semiconductors, polymers, and composites. Because the program is broadly based, graduates find employment across a range of industries, including the automotive, chemical, electronics, energy, and medical technology industries. Graduates also find positions in consulting, research, technical management, and teaching.

The Materials Science and Engineering (MSE) program is designed to prepare students to achieve the following career and professional accomplishments after graduation:

- * Be employed as a materials engineer or a related engineering or science position, using and developing his or her skills based on the demands of the job.
- * Enter into a graduate or professional program, applying his or her knowledge and experience toward an advanced or professional degree.
- * Be an effective team member, using and developing communication and teamwork skills.
- * Be a responsible engineer/scientist or professional, demonstrating ethical and professional responsibility and continuing to learn through formal and informal educational experiences.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Admission Requirements

Students must complete 11 courses before admission to the program.

Freshman and transfer students are usually admitted to pre-major status before admission to this major

Students interested in materials science and engineering are recommended to take MATS 1001/CHEN 1001 to learn more about the field.

For information about University of Minnesota admission requirements, visit the [Office of Admissions website](#).

Mathematics

- [MATH 1271](#) - Calculus I [MATH] (4.0 cr)
or [MATH 1371](#) - CSE Calculus I [MATH] (4.0 cr)
- [MATH 1272](#) - Calculus II (4.0 cr)
or [MATH 1372](#) - CSE Calculus II (4.0 cr)
- [MATH 2263](#) - Multivariable Calculus (4.0 cr)
or [MATH 2374](#) - CSE Multivariable Calculus and Vector Analysis (4.0 cr)

Physical Sciences

- [CHEM 1061](#) - Chemical Principles I [PHYS] (3.0 cr)
or [CHEM 1071H](#) - Honors Chemistry I [PHYS] (3.0 cr)
- [CHEM 1065](#) - Chemical Principles I Laboratory [PHYS] (1.0 cr)
or [CHEM 1075H](#) - Honors Chemistry I Laboratory [PHYS] (1.0 cr)
- [CHEM 1062](#) - Chemical Principles II [PHYS] (3.0 cr)
or [CHEM 1072H](#) - Honors Chemistry II [PHYS] (3.0 cr)
- [CHEM 1066](#) - Chemical Principles II Laboratory [PHYS] (1.0 cr)
or [CHEM 1076H](#) - Honors Chemistry II Laboratory [PHYS] (1.0 cr)
- [PHYS 1301W](#) - Introductory Physics for Science and Engineering I [PHYS, WI] (4.0 cr)
or [PHYS 1401V](#) - Honors Physics I [PHYS, WI] (4.0 cr)
- [PHYS 1302W](#) - Introductory Physics for Science and Engineering II [PHYS, WI] (4.0 cr)



or [PHYS 1402V](#) - Honors Physics II [PHYS, WI] (4.0 cr)

Introduction to Materials Science and Engineering

[MATS 3011](#) - Introduction to Materials Science and Engineering (3.0 cr)

General Requirements

All students are required to complete general University and college requirements including writing and liberal education courses. For more information about University-wide requirements, see the [liberal education requirements](#). Required courses for the major or minor in which a student receives a D grade (with or without plus or minus) do not count toward the major or minor (including transfer courses).

Program Requirements

Major Courses

Students may wish to take [MatS 1001](#), Advances in Chemical Engineering and Materials Science (1 credit, S-N) in fall of their freshman year as an optional course to learn more about what materials science and chemical engineers do in the field.

[AEM 3031](#) - Deformable Body Mechanics (3.0 cr)

[AEM 4511](#) - Mechanics of Composite Materials (3.0 cr)

[CHEM 2301](#) - Organic Chemistry I (3.0 cr)

[CE 3101](#) - Computer Applications in Civil Engineering I (3.0 cr)

[AEM 2011](#) - Statics (3.0 cr)

[MATS 3012](#) - Metals and Alloys (3.0 cr)

[MATS 3801](#) - Structural Characterization Lab (4.0 cr)

[MATS 3851W](#) - Materials Properties Lab [WI] (4.0 cr)

[MATS 3001](#) - Thermodynamics of Materials (3.0 cr)

[MATS 3002](#) - Mass Transport and Kinetics (3.0 cr)

[MATS 3013](#) - Electrical and Magnetic Properties of Materials (3.0 cr)

[MATS 4212](#) - Ceramics (3.0 cr)

[MATS 4214](#) - Polymers (3.0 cr)

[MATS 4221](#) - Materials Performance (4.0 cr)

[MATS 4301W](#) - Materials Processing [WI] (4.0 cr)

[MATS 4400](#) - Senior Design Project (3.0 cr)

[MATH 2373](#) - CSE Linear Algebra and Differential Equations (4.0 cr)

or [MATH 2243](#) - Linear Algebra and Differential Equations (4.0 cr)

[CHEM 4502](#) - Introduction to Quantum Mechanics and Spectroscopy (3.0 cr)

or [PHYS 2303](#) - Physics III: Physics of Matter (4.0 cr)

Technical Electives

Students must take 13 credits of technical electives. See an adviser for a list of possible courses.

Program Sub-plans

A sub-plan is not required for this program.

Honors UHP

This is an honors sub-plan.

Students admitted to the University Honors Program (UHP) must fulfill UHP requirements in addition to degree program requirements. Honors courses used to fulfill degree program requirements will also fulfill UHP requirements.

Current departmental honors course offerings are listed at:

http://www.honors.umn.edu/academics/curriculum/dept_courses_current.html.

Honors students complete an honors thesis project in the final year, most often in conjunction with an honors thesis course, or with an honors directed studies or honors directed research course. Students select honors courses and plan for a thesis project in consultation with their UHP adviser and their departmental faculty adviser.



Twin Cities Campus

Mathematics B.S.Math.

School of Mathematics

College of Science and Engineering

- Program Type: Baccalaureate
- Requirements for this program are current for Fall 2012
- Required credits to graduate with this degree: 120
- Required credits within the major: 56
- Degree: Bachelor of Science in Mathematics

The mission of the program is to provide high-quality mathematics instruction in a stimulating intellectual atmosphere. The goal is to educate students at all levels to provide cultural enrichment, to give them the analytic tools they need to become responsible citizens, and to prepare them for careers involving mathematics.

The School of Mathematics offers a program leading to the bachelor of science degree. The course of study is flexible and may be adapted to satisfy a wide variety of interests and needs. Students may prepare for graduate study in mathematics or emphasize various fields of interest, such as preparation for secondary school teaching, actuarial science, or programs in applied mathematics, including industrial mathematics, biology, mathematics applicable to computer science, and numerical analysis. Programs for specializations in actuarial science, preparation for teaching in the secondary school, and mathematics applicable to computer science earn a designation that appears on the diploma.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Admission Requirements

Students must complete 4 courses before admission to the program.

Freshman and transfer students are usually admitted to pre-major status before admission to this major

For information about University of Minnesota admission requirements, visit the [Office of Admissions website](#).

Mathematics

Either sophomore Honors Math 2-course series (2573H & 2574H or 3592H & 3593H) may be taken in place of standard/CSE 3-course series (2243/2373 + 2263/2374 + 2283/3283W).

MATH 1271 - Calculus I [MATH] (4.0 cr)

or **MATH 1371** - CSE Calculus I [MATH] (4.0 cr)

or **MATH 1571H** - Honors Calculus I [MATH] (4.0 cr)

MATH 1272 - Calculus II (4.0 cr)

or **MATH 1372** - CSE Calculus II (4.0 cr)

or **MATH 1572H** - Honors Calculus II (4.0 cr)

MATH 2243 - Linear Algebra and Differential Equations (4.0 cr)

or **MATH 2373** - CSE Linear Algebra and Differential Equations (4.0 cr)

MATH 2263 - Multivariable Calculus (4.0 cr)

or **MATH 2374** - CSE Multivariable Calculus and Vector Analysis (4.0 cr)

MATH 2283 - Sequences, Series, and Foundations (3.0 cr)

or **MATH 3283W** - Sequences, Series, and Foundations: Writing Intensive [WI] (4.0 cr)

Physics

PHYS 1301W - Introductory Physics for Science and Engineering I [PHYS, WI] (4.0 cr)

or **PHYS 1401V** - Honors Physics I [PHYS, WI] (4.0 cr)

PHYS 1302W - Introductory Physics for Science and Engineering II [PHYS, WI] (4.0 cr)

or **PHYS 1402V** - Honors Physics II [PHYS, WI] (4.0 cr)

General Requirements

All students are required to complete general University and college requirements including writing and liberal education courses. For more information about University-wide requirements, see the [liberal education requirements](#). Required courses for the major or minor in which a student receives a D grade (with or without plus or minus) do not count toward the major or minor (including transfer courses).



Program Requirements

Students must complete eight upper division math courses at 4xxx or above and two technical elective courses, which can be mathematics courses.

The School of Mathematics will accept STAT 5101 and 5102 as part of the eight-course upper division mathematics requirement. The content of STAT 5101 is the same as MATH 5651. No other courses from other departments may be used as part of the eight-course math requirement, though other courses may be used as technical electives.

MATH 3113, 3116, 3118, 4113, 4116, 4118, 3283W, and 4005 may not be used to satisfy part of the eight-course upper division math requirement or as technical electives.

In addition to the specializations described below, students who wish to pursue a pure mathematics track or are planning to go to graduate school in mathematics should consult their adviser about appropriate course choices.

Specializations in Mathematics

Mathematics (No Specialization)

Students who do not choose one of the specializations complete the basic requirements listed here. For the technical electives requirement, students must take at least 6 credits from courses that meet the following criteria: prerequisite of calculus; 3xxx or higher; courses form a coherent part of the student's program.

Algebra Sequence

Both courses can be from Column X

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

•Theoretical Algebra - Column X

•Take 1 or more course(s) from the following:

- MATH 4281 - Introduction to Modern Algebra (4.0 cr)
- MATH 5248 - Cryptology and Number Theory (4.0 cr)
- MATH 5251 - Error-Correcting Codes, Finite Fields, Algebraic Curves (4.0 cr)
- MATH 5285H - Honors: Fundamental Structures of Algebra I (4.0 cr)
- MATH 5286H - Honors: Fundamental Structures of Algebra II (4.0 cr)
- MATH 5385 - Introduction to Computational Algebraic Geometry (4.0 cr)

•Applied Algebra - Column Y

•Take 0 or more course(s) from the following:

- MATH 4242 - Applied Linear Algebra (4.0 cr)
- MATH 5705 - Enumerative Combinatorics (4.0 cr)
- MATH 5707 - Graph Theory and Non-enumerative Combinatorics (4.0 cr)
- MATH 5711 - Linear Programming and Combinatorial Optimization (4.0 cr)
- MATH 5485 - Introduction to Numerical Methods I (4.0 cr)

Analysis Sequence

Depending on specialization chosen, choice of analysis courses may be restricted.

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

- MATH 4567 - Applied Fourier Analysis (4.0 cr)
- MATH 4604 - Advanced Calculus II (4.0 cr)
- MATH 5486 - Introduction To Numerical Methods II (4.0 cr)
- MATH 5525 - Introduction to Ordinary Differential Equations (4.0 cr)
- MATH 5535 - Dynamical Systems and Chaos (4.0 cr)
- MATH 5583 - Complex Analysis (4.0 cr)
- MATH 5587 - Elementary Partial Differential Equations I (4.0 cr)
- MATH 5588 - Elementary Partial Differential Equations II (4.0 cr)
- MATH 5615H - Honors: Introduction to Analysis I (4.0 cr)
- MATH 5616H - Honors: Introduction to Analysis II (4.0 cr)
- MATH 5652 - Introduction to Stochastic Processes (4.0 cr)
- MATH 5654 - Prediction and Filtering (4.0 cr)
- MATH 4603 - Advanced Calculus I (4.0 cr)
or MATH 4606 - Advanced Calculus (4.0 cr)
- MATH 5651 - Basic Theory of Probability and Statistics (4.0 cr)
or STAT 5101 - Theory of Statistics I (4.0 cr)

Computer Science Requirement

CSCI 1103 - Introduction to Computer Programming in Java (4.0 cr)

or CSCI 1107 - FORTRAN Programming (1.0 - 3.0 cr)

or CSCI 1113 - Introduction to C/C++ Programming for Scientists and Engineers (4.0 cr)

or CSCI 1901 - Structure of Computer Programming I (4.0 cr)

or CSCI 1901 - Structure of Computer Programming I (4.0 cr)



[CSCI 1902](#) - Structure of Computer Programming II (4.0 cr)

Third-Semester Physics

[PHYS 2303](#) - Physics III: Physics of Matter (4.0 cr)

or [PHYS 2311](#) - Modern Physics (4.0 cr)

or [PHYS 2503](#) - Physics III: Intro to Waves, Optics, and Special Relativity (4.0 cr)

Complete 6 credits of technical electives selected in consultation with your adviser.

-OR-

Actuarial Specialization

Complete the requirements for the actuarial sub-plan.

-OR-

Mathematics Education Specialization

Complete the requirements for the mathematics education sub-plan.

-OR-

Computer Applications Specialization

Complete the requirements for the computer applications sub-plan.

Program Sub-plans

A sub-plan is not required for this program.

Actuarial Science

Students should take 8 courses of mathematics or statistics and math electives in economics, accounting, insurance, and finance. For the computer science requirement, only 1103 or 1113 should be chosen.

Actuarial Subplan Requirements

Actuarial Mathematics Courses

[MATH 4065](#) - Theory of Interest (4.0 cr)

[MATH 5067](#) - Actuarial Mathematics I (4.0 cr)

[MATH 5068](#) - Actuarial Mathematics II (4.0 cr)

Algebra Requirement

Applied Algebra - Column Y

[MATH 4242](#) - Applied Linear Algebra (4.0 cr)

Theoretical Algebra - Column X

Take 1 or more course(s) from the following:

• [MATH 4281](#) - Introduction to Modern Algebra (4.0 cr)

• [MATH 5248](#) - Cryptology and Number Theory (4.0 cr)

• [MATH 5251](#) - Error-Correcting Codes, Finite Fields, Algebraic Curves (4.0 cr)

• [MATH 5285H](#) - Honors: Fundamental Structures of Algebra I (4.0 cr)

• [MATH 5286H](#) - Honors: Fundamental Structures of Algebra II (4.0 cr)

• [MATH 5385](#) - Introduction to Computational Algebraic Geometry (4.0 cr)

Analysis Requirement (Statistics)

[MATH 5651](#) - Basic Theory of Probability and Statistics (4.0 cr)

or [STAT 5101](#) - Theory of Statistics I (4.0 cr)

[MATH 5652](#) - Introduction to Stochastic Processes (4.0 cr)

or [STAT 5102](#) - Theory of Statistics II (4.0 cr)

Computer Science Requirement

[CSCI 1103](#) - Introduction to Computer Programming in Java (4.0 cr)

or [CSCI 1113](#) - Introduction to C/C++ Programming for Scientists and Engineers (4.0 cr)

Economics and Business

1101-1102

[ECON 1101](#) - Principles of Microeconomics [SOCS, GP] (4.0 cr)

[ECON 1102](#) - Principles of Macroeconomics (4.0 cr)

or 1104-05

[ECON 1104](#) *{Inactive}*(4.0 cr)

[ECON 1105](#) *{Inactive}*(4.0 cr)

[ACCT 2050](#) - Introduction to Financial Reporting (4.0 cr)

[ECON 3101](#) - Intermediate Microeconomics (4.0 cr)

[FINA 3001](#) - Finance Fundamentals (3.0 cr)

[ECON 4751](#) - Financial Economics (3.0 cr)

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

• [INS 4100](#) - Corporate Risk Management (2.0 cr)



- INS 4101 - Employee Benefits (2.0 cr)
- INS 4200 - Insurance Theory and Practice (2.0 cr)

Honors UHP

This is an honors sub-plan.

Students admitted to the University Honors Program (UHP) must fulfill UHP requirements in addition to degree program requirements. For any course required in a degree program, UHP students must register for the honors version if one is offered. Honors courses used to fulfill degree program requirements will also fulfill UHP requirements.

Mathematics Education

Preparation for teaching in secondary education.

Courses that are recommended but not required for this specialization include MATH 5652 Stochastic Processes or STAT 5102 Theory of Statistics II; and MATH 5336 Geometry II. The mathematics adviser should be consulted to approve the technical elective package. MATH 4653 is recommended as a prerequisite for Math Education Licensure, but it does not fulfill the analysis requirement.

Mathematics Education

Recommended courses for admission to the Mathematics Education Licensure Program are noted. Some courses for the specialization fulfill either the algebra or analysis requirement for the major. Other courses count toward the major but do not fulfill a major requirement.

MATH 5335 - Geometry I (4.0 cr)

MATH 4242 - Applied Linear Algebra (4.0 cr)

Column X - Theoretical Algebra

MATH 4281 - Introduction to Modern Algebra (4.0 cr)

or MATH 5285H - Honors: Fundamental Structures of Algebra I (4.0 cr)

Column Y - Applied Algebra

MATH 4707 - Introduction to Combinatorics and Graph Theory (4.0 cr)

or MATH 5705 - Enumerative Combinatorics (4.0 cr)

or MATH 5707 - Graph Theory and Non-enumerative Combinatorics (4.0 cr)

Analysis Requirement - Includes Probability

An additional analysis course must be taken if MATH 4653 is chosen for the math education probability requirement.

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

•MATH 4567 - Applied Fourier Analysis (4.0 cr)

•MATH 4604 - Advanced Calculus II (4.0 cr)

•MATH 4603 - Advanced Calculus I (4.0 cr)

or MATH 4606 - Advanced Calculus (4.0 cr)

•Take 1 or more course(s) from the following:

•MATH 4653 - Elementary Probability (4.0 cr)

•MATH 5651 - Basic Theory of Probability and Statistics (4.0 cr)

•STAT 5101 - Theory of Statistics I (4.0 cr)

Physics

Take one of the following physics courses in the third semester (fall semester of the second year).

PHYS 2303 - Physics III: Physics of Matter (4.0 cr)

or PHYS 2311 - Modern Physics (4.0 cr)

or PHYS 2503 - Physics III: Intro to Waves, Optics, and Special Relativity (4.0 cr)

Computer Science

CSCI 1103 - Introduction to Computer Programming in Java (4.0 cr)

or CSCI 1107 - FORTRAN Programming (1.0 - 3.0 cr)

or CSCI 1113 - Introduction to C/C++ Programming for Scientists and Engineers (4.0 cr)

or CSCI 1901 - Structure of Computer Programming I (4.0 cr)

or CSCI 1901 - Structure of Computer Programming I (4.0 cr)

CSCI 1902 - Structure of Computer Programming II (4.0 cr)

Technical Electives

Complete 6 credits of technical electives selected in consultation with math adviser. Earliest semester: Y3 fall; latest semester: Y4 spring.

Computer Applications

Take at least 24 credits of math/computer science courses relating to computer applications. Students who complete the computer application emphasis also satisfy the requirements for a minor in computer science.

MATH 5486 may be used toward the analysis distribution requirement and MATH 5485 toward the algebra requirement.

Computer Applications



MATH 5486 may be used toward the analysis distribution requirement and MATH 5485 toward the algebra requirement.

[CSCI 2011](#) - Discrete Structures of Computer Science (4.0 cr)

[MATH 5165](#) - Mathematical Logic I (4.0 cr)

[MATH 5485](#) - Introduction to Numerical Methods I (4.0 cr)

[MATH 5486](#) - Introduction To Numerical Methods II (4.0 cr)

[CSCI 1103](#) - Introduction to Computer Programming in Java (4.0 cr)

[CSCI 1113](#) - Introduction to C/C++ Programming for Scientists and Engineers (4.0 cr)

or [CSCI 1901](#) - Structure of Computer Programming I (4.0 cr)

[CSCI 1902](#) - Structure of Computer Programming II (4.0 cr)

Additional Algebra

Take 1 or more course(s) from the following:

•[MATH 4281](#) - Introduction to Modern Algebra (4.0 cr)

•[MATH 5248](#) - Cryptology and Number Theory (4.0 cr)

•[MATH 5251](#) - Error-Correcting Codes, Finite Fields, Algebraic Curves (4.0 cr)

•[MATH 5285H](#) - Honors: Fundamental Structures of Algebra I (4.0 cr)

•[MATH 5286H](#) - Honors: Fundamental Structures of Algebra II (4.0 cr)

•[MATH 5385](#) - Introduction to Computational Algebraic Geometry (4.0 cr)

Additional Analysis

Take 1 or more course(s) from the following:

•[MATH 4567](#) - Applied Fourier Analysis (4.0 cr)

•[MATH 4604](#) - Advanced Calculus II (4.0 cr)

•[MATH 5525](#) - Introduction to Ordinary Differential Equations (4.0 cr)

•[MATH 5535](#) - Dynamical Systems and Chaos (4.0 cr)

•[MATH 5583](#) - Complex Analysis (4.0 cr)

•[MATH 5587](#) - Elementary Partial Differential Equations I (4.0 cr)

•[MATH 5588](#) - Elementary Partial Differential Equations II (4.0 cr)

•[MATH 5652](#) - Introduction to Stochastic Processes (4.0 cr)

•[MATH 5654](#) - Prediction and Filtering (4.0 cr)

•[MATH 5615H](#) - Honors: Introduction to Analysis I (4.0 cr)

•[MATH 5616H](#) - Honors: Introduction to Analysis II (4.0 cr)

•[MATH 4603](#) - Advanced Calculus I (4.0 cr)

or [MATH 4606](#) - Advanced Calculus (4.0 cr)

•[MATH 5651](#) - Basic Theory of Probability and Statistics (4.0 cr)

or [STAT 5101](#) - Theory of Statistics I (4.0 cr)

Additional Computing-Related Mathematics

A course chosen from this group that also meets the algebra distribution requirement must be taken in addition to the two courses required for all majors.

[MATH 4242](#) - Applied Linear Algebra (4.0 cr)

or [MATH 5166](#) - Mathematical Logic II (4.0 cr)

or [MATH 5248](#) - Cryptology and Number Theory (4.0 cr)

or [MATH 5251](#) - Error-Correcting Codes, Finite Fields, Algebraic Curves (4.0 cr)

or [MATH 5285H](#) - Honors: Fundamental Structures of Algebra I (4.0 cr)

or [MATH 5286H](#) - Honors: Fundamental Structures of Algebra II (4.0 cr)

or [MATH 5385](#) - Introduction to Computational Algebraic Geometry (4.0 cr)

or [MATH 5487](#) (*Inactive*)(4.0 cr)

or [MATH 5705](#) - Enumerative Combinatorics (4.0 cr)

or [MATH 5707](#) - Graph Theory and Non-enumerative Combinatorics (4.0 cr)

or [MATH 5711](#) - Linear Programming and Combinatorial Optimization (4.0 cr)

Computer Science

Upper division computer science courses may be counted as technical electives.

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

•[CSCI 4041](#) - Algorithms and Data Structures (4.0 cr)

•[CSCI 5107](#) - Fundamentals of Computer Graphics 1 (3.0 cr)

•[CSCI 5108](#) - Fundamentals of Computer Graphics II (3.0 cr)

•[CSCI 5403](#) - Computational Complexity (3.0 cr)

•[CSCI 5421](#) - Advanced Algorithms and Data Structures (3.0 cr)

•[CSCI 5511](#) - Artificial Intelligence I (3.0 cr)

•[CSCI 5521](#) - Pattern Recognition (3.0 cr)

•[CSCI 5512](#) - Artificial Intelligence II (3.0 cr)

Physics

A physics course from the following list should be taken in the third semester (fall semester of the second year).

[PHYS 2303](#) - Physics III: Physics of Matter (4.0 cr)

or [PHYS 2311](#) - Modern Physics (4.0 cr)

or [PHYS 2503](#) - Physics III: Intro to Waves, Optics, and Special Relativity (4.0 cr)

Technical Electives



Complete 6 credits of technical electives selected in consultation with math adviser. Earliest semester: Y3 fall; latest semester: Y4 spring.



Twin Cities Campus

Mechanical Engineering B.M.E.

Mechanical Engineering

College of Science and Engineering

- Program Type: Baccalaureate
- Requirements for this program are current for Fall 2012
- Required credits to graduate with this degree: 125
- Required credits within the major: 74
- This program is 9 terms (4½ years) long.
- This program requires summer terms.
- Degree: Bachelor of Mechanical Engineering

The Department of Mechanical Engineering is committed to offering undergraduate and graduate education of the highest quality in mechanical and industrial engineering, to conducting significant basic and applied research in selected areas, and to providing professional service to the appropriate constituencies of a major land grant university.

Mechanical engineering is involved in most technological activities of society and dominates many, including automotive, transportation and materials handling, environmental and pollution control systems, refrigeration and cryogenics, power systems design, automation, system dynamics and control, computer-aided design and manufacturing, and machinery/consumer products production. A mechanical engineer may be engaged in design, development, research, testing, manufacturing, administration, marketing, consulting, or education.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Admission Requirements

Students must complete 10 courses before admission to the program.

Freshman and transfer students are usually admitted to pre-major status before admission to this major

For information about University of Minnesota admission requirements, visit the [Office of Admissions website](#).

Mathematics

Honors math (MATH 1571H, 1572H, 2573H, 2574H) may be taken in place of the listed courses.

- [MATH 1271](#) - Calculus I [MATH] (4.0 cr)
or [MATH 1371](#) - CSE Calculus I [MATH] (4.0 cr)
- [MATH 1272](#) - Calculus II (4.0 cr)
or [MATH 1372](#) - CSE Calculus II (4.0 cr)
- [MATH 2263](#) - Multivariable Calculus (4.0 cr)
or [MATH 2374](#) - CSE Multivariable Calculus and Vector Analysis (4.0 cr)

Physical Sciences

- [CHEM 1061](#) - Chemical Principles I [PHYS] (3.0 cr)
or [CHEM 1071H](#) - Honors Chemistry I [PHYS] (3.0 cr)
- [CHEM 1065](#) - Chemical Principles I Laboratory [PHYS] (1.0 cr)
or [CHEM 1075H](#) - Honors Chemistry I Laboratory [PHYS] (1.0 cr)
- [PHYS 1301W](#) - Introductory Physics for Science and Engineering I [PHYS, WI] (4.0 cr)
or [PHYS 1401V](#) - Honors Physics I [PHYS, WI] (4.0 cr)
- [PHYS 1302W](#) - Introductory Physics for Science and Engineering II [PHYS, WI] (4.0 cr)
or [PHYS 1402V](#) - Honors Physics II [PHYS, WI] (4.0 cr)

Statics and Dynamics

- [AEM 2021](#) - Statics and Dynamics (4.0 cr)
or take the following course pair
- [AEM 2011](#) - Statics (3.0 cr)
- [AEM 2012](#) - Dynamics (3.0 cr)

Material Science

- [MATS 2001](#) - Introduction to the Science of Engineering Materials (3.0 cr)



Course Group 4: Biology

[BIOL 1009](#) - General Biology [BIOL] (4.0 cr)
or Based on transfer credits or working with advisor

General Requirements

All students are required to complete general University and college requirements including writing and liberal education courses. For more information about University-wide requirements, see the [liberal education requirements](#). Required courses for the major or minor in which a student receives a D grade (with or without plus or minus) do not count toward the major or minor (including transfer courses).

Program Requirements

Linear Algebra & Differential Equations

[MATH 2373](#) - CSE Linear Algebra and Differential Equations (4.0 cr)
or [MATH 2243](#) - Linear Algebra and Differential Equations (4.0 cr)

Major Courses

[CSCI 1113](#) - Introduction to C/C++ Programming for Scientists and Engineers (4.0 cr)
[MATS 2002](#) - Introduction to the Science of Engineering Materials Laboratory (1.0 cr)
[AEM 3031](#) - Deformable Body Mechanics (3.0 cr)
[EE 3005](#) - Fundamentals of Electrical Engineering (4.0 cr)
[EE 3006](#) - Fundamentals of Electrical Engineering Laboratory (1.0 cr)
[IE 4521](#) - Statistics, Quality, and Reliability (4.0 cr)
[ME 2011](#) - Introduction to Engineering (4.0 cr)
[ME 3221](#) - Design and Manufacturing I: Engineering Materials and Manufacturing Processes (4.0 cr)
[ME 3222](#) - Design and Manufacturing II (4.0 cr)
[ME 3281](#) - System Dynamics and Control (4.0 cr)
[ME 3331](#) - Thermal Sciences I (3.0 cr)
[ME 3332](#) - Thermal Sciences II (3.0 cr)
[ME 3333](#) - Thermal Sciences III (3.0 cr)
[ME 4031W](#) - Basic Mechanical Measurements Laboratory [WI] (4.0 cr)
[ME 4054W](#) - Design Projects [WI] (4.0 cr)

Electives

[ME 4131W](#) - Thermal Environmental Engineering Laboratory [WI] (4.0 cr)
or [ME 4231](#) - Motion Control Laboratory (4.0 cr)
or [ME 4232](#) - Fluid Power Control Lab (4.0 cr)
or [ME 4331](#) - Thermal Energy Engineering Laboratory (4.0 cr)
or [ME 4431W](#) - Energy Conversion Systems Laboratory [WI] (4.0 cr)

Technical Electives

Complete 15 credits of upper division technical electives, with at least 8 credits in ME, or 4 credits in ME and 11 credits in IE. Students may choose options in power and propulsion, design and manufacturing, thermodynamics and heat transfer, environment, or select electives in consultation with their adviser.

Program Sub-plans

A sub-plan is not required for this program.

EIP

ME EIP program (engineering intern program or co-op program) is available during the last two years of study. Upper division status and a satisfactory GPA are required for admission. The co-op program provides applied engineering training in selected established industries during semesters of supervised assignments that alternate with semesters of University studies.

Students in the ME EIP program (engineering intern program or Co-op program) register for three industrial assignment courses. ME 3041 (2 credits), ME 4043W (4 credits), and ME 4044 (2 credits) for a total of 8 credits. These courses are used in place of two technical electives.

Students register for industrial assignments as they would for regular classes. Requirements for the course include writing a summary of an article in a technical journal, attending a workshop (ME 3041, ME 4043W), submitting a report draft, and writing a final report. The course grade is based on writing; work performance cannot be considered in assigning a grade. The second industrial assignment, ME 4043W, is oriented toward solving a design problem and fulfills a 4-credit intensive writing course requirement. Cooperation from



company personnel is required in accomplishing most reports, particularly the ME 4043W reports.

Internship

- [ME 3041](#) - Industrial Assignment I (2.0 cr)
- [ME 4043W](#) - Industrial Assignment II [WI] (4.0 cr)
- [ME 4044](#) - Industrial Assignment III (2.0 cr)

Honors UHP

This is an honors sub-plan.

Students admitted to the University Honors Program (UHP) must fulfill UHP requirements, in addition to degree program requirements. Honors courses used to fulfill degree program requirements will also fulfill UHP requirements.

Current departmental honors course offerings are listed at:

http://www.honors.umn.edu/academics/curriculum/dept_courses_current.html

Honors students complete an honors thesis project in the final year, most often in conjunction with an honors thesis course, or with an honors directed studies, or honors directed research course. Students select honors courses and plan for a thesis project in consultation with their UHP adviser and their departmental faculty adviser.

Honors

The honors thesis extends over two semesters. Students register for ME 4081 the first semester (2 credits) and ME 4082 during the second semester (2 credits). Credits earned during the second semester may be applied to the technical electives requirement.

Formal written theses must be submitted and presented orally by students during their final semester. Students are encouraged to form contacts late in the junior year with potential faculty advisers for the honors thesis.

- [ME 4081H](#) - Mechanical Engineering Honors Thesis I (2.0 cr)
- [ME 4082H](#) - Mechanical Engineering Honors Thesis II [WI] (2.0 cr)



Twin Cities Campus

Physics B.S. Phys.

School of Physics & Astronomy

College of Science and Engineering

- Program Type: Baccalaureate
- Requirements for this program are current for Fall 2012
- Required credits to graduate with this degree: 120
- Required credits within the major: 86 to 94
- Degree: Bachelor of Science in Physics

The physics program prepares students for employment, often in industrial or governmental laboratories, or for further study at graduate or professional schools in physics, engineering, biophysics, medicine, education, law, or business.

The program integrates a broad foundation in physics that can be flexibly combined with coursework in other technical disciplines or used to specialize in physics. Students should consult a physics adviser to help formulate objectives for study.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Admission Requirements

Students must complete 7 courses before admission to the program.

Freshman and transfer students are usually admitted to pre-major status before admission to this major

For information about University of Minnesota admission requirements, visit the [Office of Admissions website](#).

Core Coursework

All of the sub-plans start with a common foundation in physics and mathematics. This basic core of physics and math, taken during the first two years, provides the necessary tools to move into one of the sub-plans within physics.

The freshman and sophomore years give students a broad introduction to the fundamental ideas of physics. During this same period students learn the mathematical techniques that they will need for advanced work in physics and other sciences.

Introductory Physics Core Requirement

Physics I

[PHYS 1301W](#) - Introductory Physics for Science and Engineering I [PHYS, WI] (4.0 cr)

or [PHYS 1401V](#) - Honors Physics I [PHYS, WI] (4.0 cr)

Physics II

[PHYS 1302W](#) - Introductory Physics for Science and Engineering II [PHYS, WI] (4.0 cr)

or [PHYS 1402V](#) - Honors Physics II [PHYS, WI] (4.0 cr)

Physics III

Note: PHYS 2503 and 2403H offered only fall semester.

[PHYS 2503](#) - Physics III: Intro to Waves, Optics, and Special Relativity (4.0 cr)

or [PHYS 2403H](#) - Honors Physics III (4.0 cr)

Lower Division Core Physics Requirement

[PHYS 2201](#) - Introductory Thermodynamics and Statistical Physics (3.0 cr)

Mathematics Requirements

Calculus I

[MATH 1271](#) - Calculus I [MATH] (4.0 cr)

or [MATH 1371](#) - CSE Calculus I [MATH] (4.0 cr)

or [MATH 1571H](#) - Honors Calculus I [MATH] (4.0 cr)

Calculus II

[MATH 1272](#) - Calculus II (4.0 cr)

or [MATH 1372](#) - CSE Calculus II (4.0 cr)

or [MATH 1572H](#) - Honors Calculus II (4.0 cr)

Calculus III or IV

[MATH 2243](#) - Linear Algebra and Differential Equations (4.0 cr)

or [MATH 2373](#) - CSE Linear Algebra and Differential Equations (4.0 cr)

or [MATH 2573H](#) - Honors Calculus III (4.0 cr)

or [MATH 2263](#) - Multivariable Calculus (4.0 cr)



or [MATH 2374](#) - CSE Multivariable Calculus and Vector Analysis (4.0 cr)
or [MATH 2574H](#) - Honors Calculus IV (4.0 cr)

General Requirements

All students are required to complete general University and college requirements including writing and liberal education courses. For more information about University-wide requirements, see the [liberal education requirements](#). Required courses for the major or minor in which a student receives a D grade (with or without plus or minus) do not count toward the major or minor (including transfer courses).

Program Requirements

In addition to the core coursework, students must select one of the five sub-plans (professional, biological, computational, teaching, engineering) and complete the respective additional programmatic requirements (48-52 cr). These requirements are subject to departmental review for each student. Requirements for each sub-plan are detailed below.

Students intending to pursue graduate study in physics are strongly encouraged to take PHYS 4303.

Core Coursework

Lower Division Core Physics Requirements

[PHYS 2601](#) - Quantum Physics (4.0 cr)
[PHYS 2605](#) - Quantum Physics Laboratory (3.0 cr)

Remaining Calculus III or IV Course

[MATH 2243](#) - Linear Algebra and Differential Equations (4.0 cr)
or [MATH 2373](#) - CSE Linear Algebra and Differential Equations (4.0 cr)
or [MATH 2573H](#) - Honors Calculus III (4.0 cr)
or [MATH 2263](#) - Multivariable Calculus (4.0 cr)
or [MATH 2374](#) - CSE Multivariable Calculus and Vector Analysis (4.0 cr)
or [MATH 2574H](#) - Honors Calculus IV (4.0 cr)

Program Sub-plans

Students are required to complete one of the following sub-plans. (Note for the Twin Cities and Morris campuses: The honors sub-plan does not meet this requirement. Honors students are required to complete one sub-plan plus the honors sub-plan. Please see an adviser if no honors sub-plan is listed for the program.)

Professional

This sub-plan is ideal for those students who want the strongest possible grounding in physics. It is designed to suit the needs of students who are interested in fundamental physics or astrophysics, applying physics to the workplace, or who are planning on continuing their physics education in graduate school.

Professional Physics Sub-plan: Additional Programmatic Requirements (50-52 cr)

[PHYS 4001](#) - Analytical Mechanics (4.0 cr)
[PHYS 4002](#) - Electricity and Magnetism (4.0 cr)
[PHYS 4101](#) - Quantum Mechanics (4.0 cr)
[PHYS 4201](#) - Statistical and Thermal Physics (3.0 cr)
[PHYS 4051](#) - Methods of Experimental Physics I (5.0 cr)
[PHYS 4052W](#) - Methods of Experimental Physics II [WI] (5.0 cr)

Technical Electives (25 cr)

Take technical electives with the approval of your adviser. These are in addition to any courses listed above. Technical electives must include at least one upper division physics elective (3-4 cr) and at least one upper division math elective (3-4 cr). A physics elective is any course with a PHYS designator at 3xxx and above. PHYS 4303 is strongly recommended for those intending to pursue graduate study.

Technical electives must total 25 credits. A technical elective is any course in CSE or CBS at 3xxx and above. A 1xxx CSCI programming course in java and C++ is also accepted.

Biological

Students who are interested in entering the biological sciences or medicine will find this sub-plan an attractive option. Physics applies to biology at all levels, from the basics of biosystems to biomedical engineering. This option can be very useful to students who want to pursue a career in biomedical industry. It also provides a strong foundation for students interested in pursuing an advanced degree in biophysics, molecular biology, physiology, medical physics, biomedical engineering, or medical school. Combined with the physics core curriculum this biological sub-plan gives students powerful tools to achieve their goals.



Biological Sub-plan: Additional Programmatic Requirements (48-50 cr)

Chemistry Requirements

- CHEM 1061 - Chemical Principles I [PHYS] (3.0 cr)
- CHEM 1065 - Chemical Principles I Laboratory [PHYS] (1.0 cr)
- CHEM 1062 - Chemical Principles II [PHYS] (3.0 cr)
- CHEM 1066 - Chemical Principles II Laboratory [PHYS] (1.0 cr)
- CHEM 2301 - Organic Chemistry I (3.0 cr)

Biochemistry Requirements

- BIOC 3021 - Biochemistry (3.0 cr)

Biology Requirements

Counted in the CLE requirement.

- BIOL 1009 - General Biology [BIOL] (4.0 cr)

Upper Division Physics Requirements

Up to 2 of these may be replaced by similar courses in other departments with adviser approval.

- PHYS 4001 - Analytical Mechanics (4.0 cr)
- PHYS 4002 - Electricity and Magnetism (4.0 cr)
- PHYS 4101 - Quantum Mechanics (4.0 cr)
- PHYS 4201 - Statistical and Thermal Physics (3.0 cr)

Methods of Experimental Physics

- PHYS 4051 - Methods of Experimental Physics I (5.0 cr)
- PHYS 4052W - Methods of Experimental Physics II [WI] (5.0 cr)

Technical Electives (11 cr)

Take technical electives in biology and related areas with approval of adviser. These are in addition to any courses listed above. When choosing the appropriate courses for the biology requirement, students should consult with faculty who have expertise in these areas. It is strongly recommended that the technical electives include PHYS 4911.

Technical electives must total 11 credits. A technical elective is any course in CSE or CBS at 3xxx or above. A 1xxx CSCI programming course in java and C++ is also accepted.

Computational

This sub-plan is ideal for students who seek a strong grounding in physics and the computational techniques used in physics research. Computational physics connects physics, computer science, and applied mathematics to provide scientific solutions to realistic and often complex problems. Students who are interested in moving directly into industry as well as those who want to pursue a graduate degree in physics will find this program valuable.

Computational Sub-plan: Additional Programmatic Requirements (50-52 cr)

Upper Division Physics Requirements

- PHYS 4001 - Analytical Mechanics (4.0 cr)
- PHYS 4002 - Electricity and Magnetism (4.0 cr)
- PHYS 4101 - Quantum Mechanics (4.0 cr)
- PHYS 4201 - Statistical and Thermal Physics (3.0 cr)

Methods of Experimental Physics

- PHYS 4051 - Methods of Experimental Physics I (5.0 cr)
- Approved PHYS 4994 (3+ cr) project with significant computational component may be substituted for 4052W.
- PHYS 4052W - Methods of Experimental Physics II [WI] (5.0 cr)
- or PHYS 4994 - Directed Research (1.0 - 5.0 cr)

Computer Programming

Intro to C/C++

- CSCI 1113 - Introduction to C/C++ Programming for Scientists and Engineers (4.0 cr)
- or A comparable computer language course may be substituted for CSCI 1113.

Structure of Computer Programming

- CSCI 1901 - Structure of Computer Programming I (4.0 cr)

Technical Electives (19 cr)

Take technical electives with approval of adviser. These are in addition to any courses listed above. AST 4101/PHYS 4041 is strongly recommended. At least one of the electives must be a course emphasizing the application of computational methods. For example: CHEM 4021 and AEM 5251.

Technical electives must total 19 credits. A technical elective is any course in CSE or CBS at 3xxx and above.

Teaching

For students who are interested in teaching secondary school physics, this program offers a versatile broad-based education. It is particularly useful to students who are planning on teaching in Minnesota, as it has been optimized to fit well with the new state licensure procedures. And, should a student's needs or plans change, this program combined with the physics core curriculum also prepares him or her for a variety of other career tracks, including graduate study in physics.

Teaching Sub-plan: Additional Programmatic Requirements (50-52 cr)

Upper Division Physics Requirements



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

- PHYS 4001 - Analytical Mechanics (4.0 cr)
- PHYS 4002 - Electricity and Magnetism (4.0 cr)
- PHYS 4101 - Quantum Mechanics (4.0 cr)

Methods of Experimental Physics

- PHYS 4051 - Methods of Experimental Physics I (5.0 cr)
- PHYS 4052W - Methods of Experimental Physics II [WI] (5.0 cr)

Historical and Social Perspectives of Science

Take 1 or more course(s) from the following:

- PHYS 4111 (*Inactive*)(3.0 cr)
- PHYS 4121W - History of 20th-Century Physics [WI] (3.0 cr)
- HSCI 3814 - Revolutions in Science: The Babylonians to Newton [HIS, GP] (3.0 - 4.0 cr)
- HSCI 3815 - Revolutions in Science: Lavoisier, Darwin, and Einstein [HIS, GP] (3.0 - 4.0 cr)

General Psychology

Meets Lib Ed requirement of Social Sciences; therefore, credits do not count towards major.

Take 1 or more course(s) from the following:

- PSTL 1281 - Principles of Psychology [SOCS] (4.0 cr)
- PSY 1001 - Introduction to Psychology [SOCS] (4.0 cr)

Philosophical Foundations

Take 1 or more course(s) from the following:

- PHIL 1005 - Scientific Reasoning (4.0 cr)
- PHIL 3601W - Scientific Thought [WI] (4.0 cr)

Technical Electives (26 cr)

Take technical electives in physics and related areas with adviser approval. These are in addition to any courses listed above.

Students who intend to pursue physics graduate school are strongly encouraged to take all 4 upper division core courses: PHYS 4001, 4002, 4101, 4201. Up to 8 credits will count toward intro CHEM or BIO requirements for the general teaching licensure. Note: Courses used to satisfy liberal ed requirements cannot be counted as technical electives.

Technical Electives must total 26 credits. A technical elective is any course in CSE or CBS at 3xxx and above. A 1xxx CSCI programming course in java and C++ is also accepted.

Engineering

Students who are interested in the practical application of physics to the engineering fields, but who would like a less specialized education than they would find in an engineering department, will find that this sub-plan provides them with a solid education. In addition to the strong physics core curriculum, students can either focus on one area of engineering or explore a broad range of interests across a number of engineering fields. Students who are interested in moving directly into industry as well as those who want to pursue a graduate degree in either engineering or physics will find this program valuable.

Engineering Sub-plan: Additional Programmatic Requirements (48-50 cr)

Note that CHEM 1061 and 1065, which are required for several of the engineering majors, are strongly recommended.

Upper Division Physics Requirements

Up to 2 of these may be replaced by courses covering related material in other CSE departments with adviser approval.

- PHYS 4001 - Analytical Mechanics (4.0 cr)
- PHYS 4002 - Electricity and Magnetism (4.0 cr)
- PHYS 4101 - Quantum Mechanics (4.0 cr)
- PHYS 4201 - Statistical and Thermal Physics (3.0 cr)

Methods of Experimental Physics

- PHYS 4051 - Methods of Experimental Physics I (5.0 cr)
- PHYS 4052W - Methods of Experimental Physics II [WI] (5.0 cr)

Technical Electives (25 cr)

Take technical electives in engineering and related areas with approval of adviser. These are in addition to any courses listed above.

In filling the engineering portion of the technical electives, credits can be taken in a single area or distributed across several engineering fields, depending on a student's interest.

Technical Electives must total 25 credits. A technical elective is any course in CSE or CBS at 3xxx and above. A 1xxx CSCI programming course in java and C++ is also accepted.

Honors UHP

This is an honors sub-plan.

Students admitted to the University Honors Program (UHP) must fulfill UHP requirements in addition to degree program requirements. Honors courses used to fulfill degree program requirements will also fulfill UHP requirements.

Current departmental honors course offerings are listed at:

http://www.honors.umn.edu/academics/curriculum/dept_courses_current.html.

Honors students complete an honors thesis project in the final year, most often in conjunction with an honors thesis course, or with an honors directed studies or honors directed research course. Students select honors courses and plan for a thesis project in consultation



with their UHP adviser and their departmental faculty adviser.

Honors

[PHYS 4960H](#) - Honors Seminar (1.0 cr)



Twin Cities Campus

Statistics B.S. Stat.

College of Science and Engineering - Adm

College of Science and Engineering

- Program Type: Baccalaureate
- Requirements for this program are current for Fall 2012
- Required credits to graduate with this degree: 120
- Required credits within the major: 54 to 60
- Degree: Bachelor of Science in Statistics

This program gives students an understanding of the theory of statistics, trains them in basic use of the most important types of statistical methods, and prepares them for graduate work or for jobs in such diverse areas as marketing analysis, quality management, and support for scientific research.

The program provides a broad foundation in statistics that can be combined with coursework in other technical disciplines or as a basis for further specialization in statistics.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Admission Requirements

Students must complete 4 courses before admission to the program.

Freshman and transfer students are usually admitted to pre-major status before admission to this major

For information about University of Minnesota admission requirements, visit the [Office of Admissions website](#).

Mathematics

- [MATH 1271](#) - Calculus I [MATH] (4.0 cr)
or [MATH 1371](#) - CSE Calculus I [MATH] (4.0 cr)
- [MATH 1272](#) - Calculus II (4.0 cr)
or [MATH 1372](#) - CSE Calculus II (4.0 cr)
- [MATH 2263](#) - Multivariable Calculus (4.0 cr)
or [MATH 2374](#) - CSE Multivariable Calculus and Vector Analysis (4.0 cr)

Statistics

- [STAT 3011](#) - Introduction to Statistical Analysis [MATH] (4.0 cr)
or [STAT 3021](#) - Introduction to Probability and Statistics (3.0 cr)

General Requirements

All students are required to complete general University and college requirements including writing and liberal education courses. For more information about University-wide requirements, see the [liberal education requirements](#). Required courses for the major or minor in which a student receives a D grade (with or without plus or minus) do not count toward the major or minor (including transfer courses).

Program Requirements

Mathematics

- [MATH 2373](#) - CSE Linear Algebra and Differential Equations (4.0 cr)

Major Courses

- [MATH 4242](#) - Applied Linear Algebra (4.0 cr)
 - [STAT 3022](#) - Data Analysis (4.0 cr)
 - [STAT 4893W](#) - Senior Paper [WI] (1.0 cr)
- Take one of the following pairs of courses.
- [STAT 4101](#) - Theory of Statistics I (4.0 cr)
[STAT 4102](#) - Theory of Statistics II (4.0 cr)
 - or [STAT 5101](#) - Theory of Statistics I (4.0 cr)



STAT 5102 - Theory of Statistics II (4.0 cr)

Computer and Physical Sciences

CSCI 1103 - Introduction to Computer Programming in Java (4.0 cr)

or CSCI 1107 - FORTRAN Programming (1.0 - 3.0 cr)

or CSCI 1113 - Introduction to C/C++ Programming for Scientists and Engineers (4.0 cr)

Students must complete 3 science courses with a lab component, chosen from at least 2 of the fields of physics, chemistry, biology.

Take 3 or more course(s) including 2 or more sub-requirements(s) from the following:

•Take 0 - 1 course(s) from the following:

•BIOL 1009 - General Biology [BIOL] (4.0 cr)

•BIOL 1009H - Honors: General Biology [BIOL] (4.0 cr)

•Take 0 - 4 course(s) from the following:

•CHEM 1061 - Chemical Principles I [PHYS] (3.0 cr)

or CHEM 1071H - Honors Chemistry I [PHYS] (3.0 cr)

•CHEM 1065 - Chemical Principles I Laboratory [PHYS] (1.0 cr)

or CHEM 1075H - Honors Chemistry I Laboratory [PHYS] (1.0 cr)

•CHEM 1062 - Chemical Principles II [PHYS] (3.0 cr)

or CHEM 1072H - Honors Chemistry II [PHYS] (3.0 cr)

•CHEM 1066 - Chemical Principles II Laboratory [PHYS] (1.0 cr)

or CHEM 1076H - Honors Chemistry II Laboratory [PHYS] (1.0 cr)

•Take 0 - 2 course(s) from the following:

•PHYS 1301W - Introductory Physics for Science and Engineering I [PHYS, WI] (4.0 cr)

or PHYS 1401V - Honors Physics I [PHYS, WI] (4.0 cr)

•PHYS 1302W - Introductory Physics for Science and Engineering II [PHYS, WI] (4.0 cr)

or PHYS 1402V - Honors Physics II [PHYS, WI] (4.0 cr)

Electives

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

•STAT 5031 - Statistical Methods for Quality Improvement (4.0 cr)

•STAT 5041 - Bayesian Decision Making (3.0 cr)

•STAT 5201 - Sampling Methodology in Finite Populations (3.0 cr)

•STAT 5302 - Applied Regression Analysis (4.0 cr)

•STAT 5303 - Designing Experiments (4.0 cr)

•STAT 5401 - Applied Multivariate Methods (3.0 cr)

•STAT 5421 - Analysis of Categorical Data (3.0 cr)

•STAT 5601 - Nonparametric Methods (3.0 cr)

Technical Electives

Students complete 10 credits of adviser-approved courses in computer science, biostatistics, industrial engineering, mathematics, or other areas.

Technical Elective

Program Sub-plans

A sub-plan is not required for this program.

Honors UHP

This is an honors sub-plan.

Students admitted to the University Honors Program (UHP) must fulfill UHP requirements in addition to degree program requirements. Honors courses used to fulfill degree program requirements will also fulfill UHP requirements.

Current departmental honors course offerings are listed at:

http://www.honors.umn.edu/academics/curriculum/dept_courses_current.html.

Honors students complete an honors thesis project in the final year, most often in conjunction with an honors thesis course, or with an honors directed studies or honors directed research course. Students select honors courses and plan for a thesis project in consultation with their UHP adviser and their departmental faculty adviser.



Twin Cities Campus

Accounting B.S.B.

Accounting

Curtis L. Carlson School of Management

- Program Type: Baccalaureate
- Requirements for this program are current for Fall 2012
- Required credits to graduate with this degree: 120
- Required credits within the major: 78 to 79
- Degree: Bachelor of Science in Business

Accounting is the process of gathering financial information and presenting it in a manner that will help others make better decisions. Accountants are also frequently called upon to analyze financial information and provide important business advice. The terms and definitions that have emerged from the discipline are used widely. In fact, accounting is commonly described as the "language of business."

With increased automation over the years, the role of accountants has changed dramatically. Accountants have become recognized as valued business advisers and important members of an organization's management team.

The major areas of study within the accounting curriculum are financial accounting, management accounting, income taxation, auditing, and business law.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Admission Requirements

Freshman and transfer students are usually admitted to pre-major status before admission to this major

A GPA above 2.0 is preferred for the following:

- 3.00 transferring from another University of Minnesota college
- 3.00 transferring from outside the University

Students in the school have no restrictions on declaring the major but must complete the tool courses before continuing with the major requirements. Students from outside of the school must meet overall admission standards to enter this major, including completion of the tool courses. Students entering as sophomores should complete microeconomics, macroeconomics and calculus prior to transfer. Students entering as juniors should complete microeconomics, macroeconomics, calculus, statistics, and accounting prior to transfer.

For information about University of Minnesota admission requirements, visit the [Office of Admissions website](#).

Tool Courses

Microeconomics

- [ECON 1101](#) - Principles of Microeconomics [SOCS, GP] (4.0 cr)
- or [APEC 1101](#) - Principles of Microeconomics [SOCS, GP] (4.0 cr)
- or [APEC 1101H](#) - Principles of Microeconomics [SOCS, GP] (4.0 cr)

Macroeconomics

- [ECON 1102](#) - Principles of Macroeconomics (4.0 cr)
- or [APEC 1102](#) - Principles of Macroeconomics (3.0 cr)
- or [APEC 1102H](#) - Honors: Principles of Macroeconomics (4.0 cr)

Calculus

- [MATH 1142](#) - Short Calculus [MATH] (4.0 cr)
- or [MATH 1271](#) - Calculus I [MATH] (4.0 cr)
- or [MATH 1571H](#) - Honors Calculus I [MATH] (4.0 cr)
- or [MATH 1371](#) - CSE Calculus I [MATH] (4.0 cr)

Statistics

- [SCO 2550](#) - Business Statistics: Data Sources, Presentation, and Analysis (4.0 cr)
- or [SCO 2550H](#) - Honors: Business Statistics: Data Sources, Presentation, and Analysis (4.0 cr)

Accounting

- [ACCT 2050](#) - Introduction to Financial Reporting (4.0 cr)
- or [ACCT 2050H](#) - Honors: Introduction to Financial Reporting (4.0 cr)



General Requirements

All students are required to complete general University and college requirements including writing and liberal education courses. For more information about University-wide requirements, see the [liberal education requirements](#). Required courses for the major or minor in which a student receives a D grade (with or without plus or minus) do not count toward the major or minor (including transfer courses).

Program Requirements

Effective July 1, 2006: Students who wish to earn the Certified Public Accountant (CPA) certification will need to complete 150 credit hours of coursework.

Lower Division Requirements

Students entering the program as freshmen or sophomores take MGMT 1001. Students who transfer in as juniors complete MGMT 3001 instead.

[PSY 1001](#) - Introduction to Psychology [SOCS] (4.0 cr)

[BA 3000](#) - Career Skills (1.0 cr)

[MGMT 1001](#) - Contemporary Management (3.0 cr)

or [MGMT 3001](#) - Fundamentals of Management (3.0 cr)

Immersion Core

Students complete the Immersion Core as a cohort.

[FINA 3001](#) - Finance Fundamentals (3.0 cr)

[MKTG 3001](#) - Principles of Marketing (3.0 cr)

[SCO 3001](#) - Introduction to Operations Management (3.0 cr)

[MGMT 3004](#) - Business Strategy (3.0 cr)

Additional Core Requirements

[ACCT 3001](#) - Introduction to Management Accounting (3.0 cr)

[IDSC 3001](#) - Information Systems for Business Processes and Management (3.0 cr)

[HRIR 3021](#) - Human Resource Management and Industrial Relations (3.0 cr)

[MGMT 3033W](#) - Business Communication [WI] (3.0 cr)

or [MGMT 3033V](#) - Honors: Business Communication [WI] (3.0 cr)

Major Courses

[ACCT 5101](#) - Intermediate Accounting I (4.0 cr)

[ACCT 5102W](#) - Intermediate Accounting II [WI] (4.0 cr)

[ACCT 5125](#) - Auditing Principles and Procedures (4.0 cr)

[ACCT 5135](#) - Fundamentals of Federal Income Tax (4.0 cr)

[ACCT 3201](#) - Intermediate Management Accounting (2.0 cr)

[BLAW 3058](#) - The Law of Contracts and Agency (4.0 cr)

[ACCT 3150](#) - Role of the Accountant in Today's Finance Function (1.0 cr)

Electives

Take 4 or more credits(s) from the following:

• [ACCT 5160](#) - Financial Statement Analysis (2.0 cr)

• [ACCT 5180](#) - Consolidations and Advanced Reporting (2.0 cr)

• [ACCT 5236](#) - Introduction to Taxation of Business (2.0 cr)

• [ACCT 5310](#) - International Accounting (2.0 cr)

• [ACCT 5320](#) - Current Topics in Accounting (2.0 cr)

• [IDSC 4411](#) - Accounting Information Systems and IT Governance (2.0 cr)

• [ACCT 5126](#) - Internal Auditing (2.0 cr)

International Experience

Students must complete an international experience as part of the program requirements. Short-term programs or semester-length programs may be used to meet this requirement. Students participate in International Experience (IE) 101 early in their program to begin planning.

Program Sub-plans

A sub-plan is not required for this program.

Honors UHP

This is an honors sub-plan.



Students admitted to the University Honors Program (UHP) must fulfill UHP requirements, in addition to degree program requirements. Honors courses used to fulfill degree program requirements will also fulfill UHP requirements.

Current departmental honors course offerings are listed at:
http://www.honors.umn.edu/academics/curriculum/dept_courses_current.html.

Honors students complete an honors thesis project in the final year, most often in conjunction with an honors thesis course, an honors directed studies, or an honors directed research course. Students select honors courses and plan for a thesis project in consultation with their UHP adviser and their departmental faculty adviser.



Twin Cities Campus

Actuarial Science B.S.B.

Finance

Curtis L. Carlson School of Management

- Students will no longer be accepted into this program after Fall 2008. Program requirements below are for current students only.
- Students interested in actuarial science can apply to the Institute of Technology or College of Liberal Arts; each offers an actuarial science specialization through its mathematics program.
- Program Type: Baccalaureate
- Requirements for this program are current for Fall 2012
- Required credits to graduate with this degree: 120
- Required credits within the major: 23
- Degree: Bachelor of Science in Business

Actuarial science applies mathematics to insurance problems. Practicing actuaries calculate insurance premiums, policy and loss reserves (liabilities), and estimate costs of future losses.

Students are introduced to professional organizations, including The Society of Actuaries, American Academy of Actuaries, Casualty Actuarial Society, Conference of Consulting Actuaries, and American Society of Pension Actuaries. Students typically take at least two professional actuarial examinations before graduation.

There are multiple career opportunities for students with the mathematics, business, and communication skills developed through the actuarial science major. The insurance and actuarial community strongly supports this program.

The Carlson School Honors program offers students access to a richer undergraduate experience. Honors students have closer contact with their professors. They work in smaller classes and they put their skills to work for the benefit of the community. The program requires hard work and a strong commitment to learning.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Admission Requirements

Students must complete 50 credits before admission to the program.

A GPA above 2.0 is preferred for the following:

- 3.00 transferring from another University of Minnesota college
- 3.00 transferring from outside the University

Freshmen are admitted to Carlson School of Management, but do not declare a major until 50 credits have been completed. Part of the 50 credits should include the five tool courses and liberal education requirements. Those transferring in as sophomores need to complete microeconomics, macroeconomics, and calculus before admission. Juniors and above need to complete microeconomics, macroeconomics, calculus, business statistics, and accounting before admission.

For information about University of Minnesota admission requirements, visit the [Office of Admissions website](#).

Tool Courses

An adviser-approved statistics course may be taken in place of OMS 2550. MATH 1271 is recommended instead of MATH 1142 and is a prerequisite for future math courses in the major.

- ECON 1101 - Principles of Microeconomics [SOCS, GP] (4.0 cr)
or APEC 1101 - Principles of Microeconomics [SOCS, GP] (4.0 cr)
or ECON 1101H *(Inactive)* (4.0 cr)
or ECON 1104 *(Inactive)* (4.0 cr)
- ECON 1102 - Principles of Macroeconomics (4.0 cr)
or APEC 1102 - Principles of Macroeconomics (3.0 cr)
or ECON 1105 *(Inactive)* (4.0 cr)
or APEC 1102H - Honors: Principles of Macroeconomics (4.0 cr)
- MATH 1271 - Calculus I [MATH] (4.0 cr)
or MATH 1142 - Short Calculus [MATH] (4.0 cr)



or [MATH 1571H](#) - Honors Calculus I [MATH] (4.0 cr)
[SCO 2550](#) - Business Statistics: Data Sources, Presentation, and Analysis (4.0 cr)
or [SCO 2550H](#) - Honors: Business Statistics: Data Sources, Presentation, and Analysis (4.0 cr)
[ACCT 2050](#) - Introduction to Financial Reporting (4.0 cr)
or [ACCT 2050H](#) - Honors: Introduction to Financial Reporting (4.0 cr)

Additional program requirements

[PSY 1001](#) - Introduction to Psychology [SOCS] (4.0 cr)
[BA 3000](#) - Career Skills (1.0 cr)

Preparatory Mathematics

These courses are prerequisites to mathematics courses for the major.

[MATH 1272](#) - Calculus II (4.0 cr)
[MATH 2243](#) - Linear Algebra and Differential Equations (4.0 cr)
[MATH 2263](#) - Multivariable Calculus (4.0 cr)

General Requirements

All students are required to complete general University and college requirements including writing and liberal education courses. For more information about University-wide requirements, see the [liberal education requirements](#). Required courses for the major or minor in which a student receives a D grade (with or without plus or minus) do not count toward the major or minor (including transfer courses).

Program Requirements

Functional Core

[ACCT 3001](#) - Introduction to Management Accounting (3.0 cr)
[FINA 3001](#) - Finance Fundamentals (3.0 cr)
[HRIR 3021](#) - Human Resource Management and Industrial Relations (3.0 cr)
[IDSC 3001](#) - Information Systems for Business Processes and Management (3.0 cr)
[MGMT 3001](#) - Fundamentals of Management (3.0 cr)
[MKTG 3001](#) - Principles of Marketing (3.0 cr)
[SCO 3001](#) - Introduction to Operations Management (3.0 cr)

Communication, International, Business Policy Core

[MGMT 3033W](#) - Business Communication [WI] (3.0 cr)
or [MGMT 3033V](#) - Honors: Business Communication [WI] (3.0 cr)
[MGMT 3040](#) - Understanding the International Environment of Firms: International Business (2.0 cr)
or [MGMT 3040H](#) *{Inactive}*(3.0 cr)
[MGMT 4004W](#) - Business Policy: Strategy Formulation and Implementation [WI] (3.0 cr)
or [MGMT 4004V](#) *{Inactive}*[WI] (3.0 cr)

Major Courses

[MATH 4065](#) - Theory of Interest (4.0 cr)
[MATH 5067](#) - Actuarial Mathematics I (4.0 cr)
[MATH 5068](#) - Actuarial Mathematics II (4.0 cr)
[STAT 5101](#) - Theory of Statistics I (4.0 cr)
[STAT 5102](#) - Theory of Statistics II (4.0 cr)
or [STAT 4101](#) - Theory of Statistics I (4.0 cr)
[STAT 4102](#) - Theory of Statistics II (4.0 cr)
Adviser-approved probability course
or [MATH 5651](#) - Basic Theory of Probability and Statistics (4.0 cr)
[MATH 5652](#) - Introduction to Stochastic Processes (4.0 cr)

Electives

Take 4 or more credits(s) from the following:
•[INS 4100](#) - Corporate Risk Management (2.0 cr)
•[INS 4101](#) - Employee Benefits (2.0 cr)
•[INS 4200](#) - Insurance Theory and Practice (2.0 cr)
•[INS 4201](#) - Personal Financial Management (2.0 cr)
•[INS 4202](#) - Personal Financial Planning 2: Tax and Estate Planning Techniques (2.0 cr)



Program Sub-plans

A sub-plan is not required for this program.

Honors UHP

This is an honors sub-plan.

Students admitted to the University Honors Program (UHP) must fulfill UHP requirements in addition to degree program requirements. For any course required in a degree program, UHP students must register for the honors version if one is offered. Honors courses used to fulfill degree program requirements will also fulfill UHP requirements.

CSOM students are encouraged to participate in the Emerging Leaders Program as one of their honors experiences.



Twin Cities Campus

Entrepreneurial Management B.S.B.

Strategic Management & Organization

Curtis L. Carlson School of Management

- Program Type: Baccalaureate
- Requirements for this program are current for Fall 2012
- Required credits to graduate with this degree: 120
- Required credits within the major: 74
- Degree: Bachelor of Science in Business

The entrepreneurial management major provides current and future business professionals with the necessary skills and tools to successfully form and develop businesses and function as entrepreneurs or as productive members of entrepreneurial, emerging, or aggressively-positioned companies. These organizations require individuals that have the ability to manage risk, multitask across functional boundaries, and creatively engage and adapt to an environment that is constantly changing.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Admission Requirements

Freshman and transfer students are usually admitted to pre-major status before admission to this major

A GPA above 2.0 is preferred for the following:

- 3.00 transferring from another University of Minnesota college
- 3.00 transferring from outside the University

Students have no restrictions on declaring the major but must complete the tool courses before continuing the major requirements. Students from outside of the school must meet overall admission standards to enter this major, including completion of the tool courses. Students entering as sophomores should complete microeconomics, macroeconomics, and calculus prior to transfer. Students entering as juniors should complete microeconomics, macroeconomics, calculus, statistics, and accounting prior to transfer.

For information about University of Minnesota admission requirements, visit the [Office of Admissions website](#).

Tool Courses

Microeconomics

- [ECON 1101](#) - Principles of Microeconomics [SOCS, GP] (4.0 cr)
- or [APEC 1101](#) - Principles of Microeconomics [SOCS, GP] (4.0 cr)
- or [APEC 1101H](#) - Principles of Microeconomics [SOCS, GP] (4.0 cr)

Macroeconomics

- [ECON 1102](#) - Principles of Macroeconomics (4.0 cr)
- or [APEC 1102](#) - Principles of Macroeconomics (3.0 cr)
- or [APEC 1102H](#) - Honors: Principles of Macroeconomics (4.0 cr)

Calculus

- [MATH 1142](#) - Short Calculus [MATH] (4.0 cr)
- or [MATH 1271](#) - Calculus I [MATH] (4.0 cr)
- or [MATH 1571H](#) - Honors Calculus I [MATH] (4.0 cr)
- or Math 1371

Statistics

- [SCO 2550](#) - Business Statistics: Data Sources, Presentation, and Analysis (4.0 cr)
- or [SCO 2550H](#) - Honors: Business Statistics: Data Sources, Presentation, and Analysis (4.0 cr)

Accounting

- [ACCT 2050](#) - Introduction to Financial Reporting (4.0 cr)
- or [ACCT 2050H](#) - Honors: Introduction to Financial Reporting (4.0 cr)

General Requirements

All students are required to complete general University and college requirements including writing and liberal education courses. For more information about University-wide requirements, see the [liberal education requirements](#). Required courses for the major or minor in which a student receives a D grade (with or without plus or minus) do not count toward the major or minor (including transfer courses).



Program Requirements

Lower Division Requirements

Students entering the program as freshmen or sophomores take MGMT 1001. Students who transfer in as juniors complete MGMT 3001 instead.

- PSY 1001 - Introduction to Psychology [SOCS] (4.0 cr)
- BA 3000 - Career Skills (1.0 cr)
- MGMT 1001 - Contemporary Management (3.0 cr)
or MGMT 1001H - Honors: Contemporary Management (3.0 cr)
or MGMT 3001 - Fundamentals of Management (3.0 cr)

Immersion Core

Students complete the Immersion Core as a cohort.

- FINA 3001 - Finance Fundamentals (3.0 cr)
- MKTG 3001 - Principles of Marketing (3.0 cr)
- SCO 3001 - Introduction to Operations Management (3.0 cr)
- MGMT 3004 - Business Strategy (3.0 cr)

Additional Core Requirements

- ACCT 3001 - Introduction to Management Accounting (3.0 cr)
- IDSC 3001 - Information Systems for Business Processes and Management (3.0 cr)
- HRIR 3021 - Human Resource Management and Industrial Relations (3.0 cr)
- MGMT 3033W - Business Communication [WI] (3.0 cr)
or MGMT 3033V - Honors: Business Communication [WI] (3.0 cr)

Major Courses

- MGMT 3010 - Introduction to Entrepreneurship (4.0 cr)
- MGMT 4008 - Entrepreneurial Management (4.0 cr)
- MGMT 4050 - Management of Innovation and Change (2.0 cr)
- MGMT 4170W - New Business Feasibility and Planning [WI] (4.0 cr)
or MGMT 4171W - Entrepreneurship in Action I [WI] (4.0 cr)

Electives

Take 8 or more credits(s) from the following:

- ACCT 3201 - Intermediate Management Accounting (2.0 cr)
- ACCT 5160 - Financial Statement Analysis (2.0 cr)
- BLAW 3058 - The Law of Contracts and Agency (4.0 cr)
- FINA 4221 - Principles of Corporate Finance (2.0 cr)
- FINA 4422 - Financial Modeling (2.0 cr)
- FINA 4622 - International Finance (2.0 cr)
- HRIR 3031 - Staffing and Selection: Strategic and Operational Concerns (2.0 cr)
- HRIR 4100W - Undergraduate HRIR Leadership Capstone [WI] (4.0 cr)
- IDSC 3202 - Analysis and Modeling for Business Systems Development (4.0 cr)
- INS 4100 - Corporate Risk Management (2.0 cr)
- MGMT 4002 - Managerial Psychology (4.0 cr)
- MGMT 4040 - Negotiation Strategies (4.0 cr)
- MGMT 4060 - Entrepreneurial Perspectives (2.0 cr)
- MGMT 4172 - Entrepreneurship in Action II (4.0 cr)
- MGMT 4080W - Applied Technology Entrepreneurship [WI] (4.0 cr)
- MKTG 3010 - Marketing Research (4.0 cr)
- MKTG 4030 - Sales Management (4.0 cr)
- MKTG 4050 - Integrated Marketing Communications (4.0 cr)
- SCO 3041 - Project Management (2.0 cr)
- SCO 3056 - Supply Chain Planning and Control (4.0 cr)
- MGMT 3070 - Topics in Management (2.0 - 4.0 cr)

International Experience

Students must complete an international experience as part of the program requirements. Short-term programs or semester-length programs may be used to meet this requirement. Students participate in International Experience (IE) 101 early in their program to begin planning.



Program Sub-plans

A sub-plan is not required for this program.

Honors UHP

This is an honors sub-plan.

Students admitted to the University Honors Program (UHP) must fulfill UHP requirements, in addition to degree program requirements. Honors courses used to fulfill degree program requirements will also fulfill UHP requirements.

Current departmental honors course offerings are listed at:

http://www.honors.umn.edu/academics/curriculum/dept_courses_current.html

Honors students complete an honors thesis project in the final year, most often in conjunction with an honors thesis course, an honors directed studies, or an honors directed research course. Students select honors courses and plan for a thesis project in consultation with their UHP adviser and their departmental faculty adviser.



Twin Cities Campus

Finance & Risk Management Insurance B.S.B.

Finance

Curtis L. Carlson School of Management

- Program Type: Baccalaureate
- Requirements for this program are current for Fall 2012
- Required credits to graduate with this degree: 120
- Required credits within the major: 74
- Degree: Bachelor of Science in Business

Risk management is the practice of identifying the risks that affect a company's business and finding ways to mitigate and offset those risks. Risk management tools and techniques help corporations deal with many types of issues, legal concerns, and human resources changes.

This major introduces students to the risk management discipline and multiple career paths, including corporate risk manager, benefits manager, insurance agent/broker, underwriter, loss adjuster, consultant, and personal financial planner.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Admission Requirements

Freshman and transfer students are usually admitted to pre-major status before admission to this major

A GPA above 2.0 is preferred for the following:

- 3.00 transferring from another University of Minnesota college
- 3.00 transferring from outside the University

Students in the school have no restrictions on declaring the major but must complete the tool courses before starting the major coursework. Students from outside the school must meet overall admission standards to enter this major, including completion of the tool courses. Students entering as sophomores should complete microeconomics, macroeconomics, and calculus prior to transfer. Students entering as juniors should complete microeconomics, macroeconomics, calculus, statistics, and accounting prior to transfer.

For information about University of Minnesota admission requirements, visit the [Office of Admissions website](#).

Tool Courses

Microeconomics

- [ECON 1101](#) - Principles of Microeconomics [SOCS, GP] (4.0 cr)
- or [APEC 1101](#) - Principles of Microeconomics [SOCS, GP] (4.0 cr)
- or [APEC 1101H](#) - Principles of Microeconomics [SOCS, GP] (4.0 cr)

Macroeconomics

- [ECON 1102](#) - Principles of Macroeconomics (4.0 cr)
- or [APEC 1102](#) - Principles of Macroeconomics (3.0 cr)
- or [APEC 1102H](#) - Honors: Principles of Macroeconomics (4.0 cr)

Calculus

- [MATH 1142](#) - Short Calculus [MATH] (4.0 cr)
- or [MATH 1271](#) - Calculus I [MATH] (4.0 cr)
- or [MATH 1571H](#) - Honors Calculus I [MATH] (4.0 cr)
- or [MATH 1371](#) - CSE Calculus I [MATH] (4.0 cr)

Statistics

- [SCO 2550](#) - Business Statistics: Data Sources, Presentation, and Analysis (4.0 cr)
- or [SCO 2550H](#) - Honors: Business Statistics: Data Sources, Presentation, and Analysis (4.0 cr)

Accounting

- [ACCT 2050](#) - Introduction to Financial Reporting (4.0 cr)
- or [ACCT 2050H](#) - Honors: Introduction to Financial Reporting (4.0 cr)

General Requirements



All students are required to complete general University and college requirements including writing and liberal education courses. For more information about University-wide requirements, see the [liberal education requirements](#). Required courses for the major or minor in which a student receives a D grade (with or without plus or minus) do not count toward the major or minor (including transfer courses).

Program Requirements

Lower Division Requirements

Students entering the program as freshmen or sophomores take MGMT 1001. Students who transfer in as juniors complete MGMT 3001 instead.

- PSY 1001 - Introduction to Psychology [SOCS] (4.0 cr)
- BA 3000 - Career Skills (1.0 cr)
- MGMT 1001 - Contemporary Management (3.0 cr)
or MGMT 1001H - Honors: Contemporary Management (3.0 cr)
or MGMT 3001 - Fundamentals of Management (3.0 cr)

Immersion Core

Students complete the Immersion Core as a cohort.

- FINA 3001 - Finance Fundamentals (3.0 cr)
- MKTG 3001 - Principles of Marketing (3.0 cr)
- SCO 3001 - Introduction to Operations Management (3.0 cr)
- MGMT 3004 - Business Strategy (3.0 cr)

Additional Core Requirements

- ACCT 3001 - Introduction to Management Accounting (3.0 cr)
- IDSC 3001 - Information Systems for Business Processes and Management (3.0 cr)
- HRIR 3021 - Human Resource Management and Industrial Relations (3.0 cr)
- MGMT 3033W - Business Communication [WI] (3.0 cr)
or MGMT 3033V - Honors: Business Communication [WI] (3.0 cr)

Major Courses

- ACCT 5101 - Intermediate Accounting I (4.0 cr)
 - FINA 4121 - Financial Markets and Interest Rates (2.0 cr)
 - FINA 4221 - Principles of Corporate Finance (2.0 cr)
 - FINA 4321 - Portfolio Management and Performance Evaluation (2.0 cr)
 - FINA 4422 - Financial Modeling (2.0 cr)
 - FINA 4522 - Options in Corporate Finance (2.0 cr)
 - INS 4100 - Corporate Risk Management (2.0 cr)
 - INS 4101 - Employee Benefits (2.0 cr)
 - INS 4200 - Insurance Theory and Practice (2.0 cr)
- Take 2 or more credits(s) from the following:
- BLAW 3058 - The Law of Contracts and Agency (4.0 cr)
 - HRIR 5054 - Public Policies on Employee Benefits: Social Safety Nets (2.0 cr)
 - FINA 4122 - Banking Institutions (2.0 cr)
 - FINA 4621 - The Global Economy (Macro) (2.0 cr)
 - FINA 4622 - International Finance (2.0 cr)
 - FINA 4523 - Derivatives I (2.0 cr)
 - FINA 4920 - Topics in Finance (2.0 cr)
 - FINA 4329 - Security Analysis Capstone (2.0 cr)
 - FINA 4529 - Derivatives II Capstone (2.0 cr)
 - FINA 4242W - Corporate Investment Decisions [WI] (4.0 cr)
 - MATH 4065 - Theory of Interest (4.0 cr)
 - MATH 5067 - Actuarial Mathematics I (4.0 cr)

International Experience

Students must complete an international experience as part of the program requirements. Short-term or semester-length programs may be used to meet this requirement. Students participate in International Experience (IE) 101 early in their program to begin planning.

Program Sub-plans

A sub-plan is not required for this program.

Honors UHP



This is an honors sub-plan.

Students admitted to the University Honors Program (UHP) must fulfill UHP requirements, in addition to degree program requirements. Honors courses used to fulfill degree program requirements will also fulfill UHP requirements.

Current departmental honors course offerings are listed at:

http://www.honors.umn.edu/academics/curriculum/dept_courses_current.html

Honors students complete an honors thesis project in the final year, most often in conjunction with an honors thesis course, or with an honors directed studies, or honors directed research course. Students select honors courses and plan for a thesis project in consultation with their UHP adviser and their departmental faculty adviser.



Twin Cities Campus
Finance B.S.B.

Finance

Curtis L. Carlson School of Management

- Program Type: Baccalaureate
- Requirements for this program are current for Fall 2012
- Required credits to graduate with this degree: 120
- Required credits within the major: 74
- Degree: Bachelor of Science in Business

The finance major develops a student's understanding of principles and techniques of effective financial decision making. It provides the skills and knowledge required to assist businesses, governments, or individuals in answering questions regarding improving the value of the company, evaluating projects, measuring financial risk, raising funds, making investments, and understanding capital markets.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Admission Requirements

Freshman and transfer students are usually admitted to pre-major status before admission to this major

A GPA above 2.0 is preferred for the following:

- 3.00 transferring from another University of Minnesota college
- 3.00 transferring from outside the University

Students have no restrictions on declaring the major but must complete the tool courses before starting major coursework. Students from outside the school must meet overall admission standards to enter this major, including completion of the tool courses. Students entering as sophomores should complete microeconomics, macroeconomics, and calculus. Students entering as juniors should complete microeconomics, macroeconomics, calculus, statistics, and accounting prior to transfer.

For information about University of Minnesota admission requirements, visit the [Office of Admissions website](#).

Tool Courses

Microeconomics

- [ECON 1101](#) - Principles of Microeconomics [SOCS, GP] (4.0 cr)
- or [APEC 1101](#) - Principles of Microeconomics [SOCS, GP] (4.0 cr)
- or [APEC 1101H](#) - Principles of Microeconomics [SOCS, GP] (4.0 cr)

Macroeconomics

- [ECON 1102](#) - Principles of Macroeconomics (4.0 cr)
- or [APEC 1102](#) - Principles of Macroeconomics (3.0 cr)
- or [APEC 1102H](#) - Honors: Principles of Macroeconomics (4.0 cr)

Calculus

- [MATH 1142](#) - Short Calculus [MATH] (4.0 cr)
- or [MATH 1271](#) - Calculus I [MATH] (4.0 cr)
- or [MATH 1571H](#) - Honors Calculus I [MATH] (4.0 cr)
- or [MATH 1371](#) - CSE Calculus I [MATH] (4.0 cr)

Operations and Management Science

- [SCO 2550](#) - Business Statistics: Data Sources, Presentation, and Analysis (4.0 cr)
- or [SCO 2550H](#) - Honors: Business Statistics: Data Sources, Presentation, and Analysis (4.0 cr)

Accounting

- [ACCT 2050](#) - Introduction to Financial Reporting (4.0 cr)
- or [ACCT 2050H](#) - Honors: Introduction to Financial Reporting (4.0 cr)

General Requirements

All students are required to complete general University and college requirements including writing and liberal education courses. For more information about University-wide requirements, see the [liberal education requirements](#). Required courses for the major or minor in which a student receives a D grade (with or without plus or minus) do not count toward the major or minor (including transfer courses).



Program Requirements

Lower Division Requirements

Students entering the program as freshmen or sophomores take MGMT 1001. Students who transfer in as juniors complete MGMT 3001 instead.

BA 3000 - Career Skills (1.0 cr)

PSY 1001 - Introduction to Psychology [SOCS] (4.0 cr)

MGMT 1001 - Contemporary Management (3.0 cr)

or MGMT 1001H - Honors: Contemporary Management (3.0 cr)

or MGMT 3001 - Fundamentals of Management (3.0 cr)

Immersion Core

Students complete the Immersion Core as a cohort.

FINA 3001 - Finance Fundamentals (3.0 cr)

MKTG 3001 - Principles of Marketing (3.0 cr)

SCO 3001 - Introduction to Operations Management (3.0 cr)

MGMT 3004 - Business Strategy (3.0 cr)

Additional Core Requirements

ACCT 3001 - Introduction to Management Accounting (3.0 cr)

IDSC 3001 - Information Systems for Business Processes and Management (3.0 cr)

HRIR 3021 - Human Resource Management and Industrial Relations (3.0 cr)

MGMT 3033W - Business Communication [WI] (3.0 cr)

or MGMT 3033V - Honors: Business Communication [WI] (3.0 cr)

Major Courses

ACCT 5101 - Intermediate Accounting I (4.0 cr)

FINA 4121 - Financial Markets and Interest Rates (2.0 cr)

FINA 4221 - Principles of Corporate Finance (2.0 cr)

FINA 4321 - Portfolio Management and Performance Evaluation (2.0 cr)

FINA 4422 - Financial Modeling (2.0 cr)

FINA 4522 - Options in Corporate Finance (2.0 cr)

Electives

Take 8 or more credits(s) from the following:

- FINA 4122 - Banking Institutions (2.0 cr)
- FINA 4621 - The Global Economy (Macro) (2.0 cr)
- FINA 4622 - International Finance (2.0 cr)
- FINA 4523 - Derivatives I (2.0 cr)
- FINA 4329 - Security Analysis Capstone (2.0 cr)
- FINA 4242W - Corporate Investment Decisions [WI] (4.0 cr)
- FINA 4529 - Derivatives II Capstone (2.0 cr)
- FINA 4920 - Topics in Finance (2.0 cr)
- ACCT 5160 - Financial Statement Analysis (2.0 cr)

International Experience

Students must complete an international experience as part of the program requirements. Short-term or semester-length programs may be used to meet this requirement. Students participate in International Experience (IE) 101 early in their program to begin planning.

Program Sub-plans

A sub-plan is not required for this program.

Honors UHP

This is an honors sub-plan.

Students admitted to the University Honors Program (UHP) must fulfill UHP requirements, in addition to degree program requirements. Honors courses used to fulfill degree program requirements will also fulfill UHP requirements.

Current departmental honors course offerings are listed at:

http://www.honors.umn.edu/academics/curriculum/dept_courses_current.html

Honors students complete an honors thesis project in the final year, most often in conjunction with an honors thesis course, an honors directed studies, or an honors directed research course. Students select honors courses and plan for a thesis project in consultation with their UHP adviser and their departmental faculty adviser.



UNIVERSITY OF MINNESOTA

Driven to DiscoverSM



Twin Cities Campus

General Management B.S.B.

Curtis L. Carlson School of Management - Adm

Curtis L. Carlson School of Management

• **Students will no longer be accepted into this program after Spring 2006. Program requirements below are for current students only.**

- Program Type: Baccalaureate
- Requirements for this program are current for Fall 2012
- Required credits to graduate with this degree: 120
- Required credits within the major: 16
- Degree: Bachelor of Science in Business

The general management major is intended for students who wish to develop an area of expertise outside of the major programs offered by the Carlson School. Students who pursue this major should have a particular career goal or objective in mind that can be best addressed through a self-designed program of study.

The Carlson School Honors program offers students access to a richer undergraduate experience. Honors students have closer contact with their professors. They work in smaller classes and they put their skills to work for the benefit of the community. The program requires hard work and a strong commitment to learning.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Admission Requirements

Students must complete 50 credits before admission to the program.

A GPA above 2.0 is preferred for the following:

- 3.00 transferring from another University of Minnesota college
- 3.00 transferring from outside the University

Freshmen are admitted to Carlson School of Management, but do not declare a major until 50 credits have been completed. Part of the 50 credits should include the 5 tool courses and liberal education requirements. Those transferring in as sophomores need to complete microeconomics, macroeconomics, and calculus before admission. Juniors and above need to complete microeconomics, macroeconomics, calculus, business statistics, and accounting before admission.

For information about University of Minnesota admission requirements, visit the [Office of Admissions website](#).

Tool Courses

An adviser-approved statistics course may be taken in place of OMS 2550.

- ACCT 2050 - Introduction to Financial Reporting (4.0 cr)
- APEC 1101 - Principles of Microeconomics [SOCS, GP] (4.0 cr)
 - or ECON 1101 - Principles of Microeconomics [SOCS, GP] (4.0 cr)
 - or ECON 1101H *{Inactive}*(4.0 cr)
 - or ECON 1104 *{Inactive}*(4.0 cr)
- APEC 1102 - Principles of Macroeconomics (3.0 cr)
 - or ECON 1102 - Principles of Macroeconomics (4.0 cr)
 - or ECON 1102H *{Inactive}*[IP, SSCI] (4.0 cr)
 - or ECON 1105 *{Inactive}*(4.0 cr)
- MATH 1142 - Short Calculus [MATH] (4.0 cr)
 - or MATH 1271 - Calculus I [MATH] (4.0 cr)
 - or MATH 1571H - Honors Calculus I [MATH] (4.0 cr)
 - or MATH 1572H - Honors Calculus II (4.0 cr)
- SCO 2550 - Business Statistics: Data Sources, Presentation, and Analysis (4.0 cr)
 - or SCO 2550H - Honors: Business Statistics: Data Sources, Presentation, and Analysis (4.0 cr)

Technology and Psychology

BA 1001 is required for students admitted as freshmen and recommended for others who need additional background with technology.
BA 1001 *{Inactive}*(1.0 cr)



PSY 1001 - Introduction to Psychology [SOCS] (4.0 cr)

General Requirements

All students are required to complete general University and college requirements including writing and liberal education courses. For more information about University-wide requirements, see the [liberal education requirements](#). Required courses for the major or minor in which a student receives a D grade (with or without plus or minus) do not count toward the major or minor (including transfer courses).

Program Requirements

Functional Core

- ACCT 3001 - Introduction to Management Accounting (3.0 cr)
- BA 3000 - Career Skills (1.0 cr)
- FINA 3001 - Finance Fundamentals (3.0 cr)
- HRIR 3021 - Human Resource Management and Industrial Relations (3.0 cr)
- IDSC 3001 - Information Systems for Business Processes and Management (3.0 cr)
- MGMT 3001 - Fundamentals of Management (3.0 cr)
- MKTG 3001 - Principles of Marketing (3.0 cr)
- SCO 3001 - Introduction to Operations Management (3.0 cr)

Communication, International, Business Policy Core

- MGMT 3033W - Business Communication [WI] (3.0 cr)
or MGMT 3033V - Honors: Business Communication [WI] (3.0 cr)
- MGMT 3040 - Understanding the International Environment of Firms: International Business (2.0 cr)
or MGMT 3040H *{Inactive}*(3.0 cr)
- MGMT 4004W - Business Policy: Strategy Formulation and Implementation [WI] (3.0 cr)
or MGMT 4004V *{Inactive}*[WI] (3.0 cr)

Major Courses

16 credits of business electives must be taken in consultation with an adviser to complete the major. A proposal must also be submitted for approval.
Adviser-approved business electives

Program Sub-plans

A sub-plan is not required for this program.

Lower Division Honors

This is an honors sub-plan.

The Freshman/Sophomore Honors Program is designed for high achieving freshmen and sophomores interested in smaller classes and increased interaction with faculty. Freshmen are invited to apply to the Freshman/Sophomore Honors Program based on the original application for admission to the University Of Minnesota. Students who complete all three requirements of the program receive an award letter from the dean and the achievement is noted on their official University transcript.

The requirements for the Freshman/Sophomore Honors program are:

1. Complete the Emerging Leadership Program (ELP)
2. Complete four honors designated courses, including at least two from the list below. The remaining two courses can be selected from the courses listed below or from other honors course offerings outside of the Carlson School.
3. Achieve an overall GPA of 3.50 in the completion of 60 credits.

The Freshmen/Sophomore Honors Program is offered to undergraduate students as an introductory honors experience. The Freshmen/Sophomore Honors Program does not award designations at commencement. Instead, these students are recognized in the commencement book as having completed the Freshmen/Sophomore Honors Program. Additional rewards include smaller interactive courses, extended library privileges, and honors housing.

Freshman and Sophomore Honors

Emerging Leadership Program

Two courses may be honors courses from outside CSOM.

Take 4 or more course(s) from the following:

- ACCT 2050H - Honors: Introduction to Financial Reporting (4.0 cr)
- ECON 1101H *{Inactive}*(4.0 cr)



- ECON 1102H *(Inactive)*[IP, SSCI] (4.0 cr)
- ENGC 1011H *(Inactive)*(4.0 cr)
- MATH 1571H - Honors Calculus I [MATH] (4.0 cr)
- SCO 2550H - Honors: Business Statistics: Data Sources, Presentation, and Analysis (4.0 cr)

Upper Division Honors

This is an honors sub-plan.

The Junior/Senior Honors Program is designed for high achieving juniors and seniors interested in smaller class sizes, increased interaction with faculty, and the opportunity to work with other high achieving students.

Student may apply for the Junior/Senior Honors Program by completing the Upper Division Application. Students do not need to complete the Freshman/Sophomore Honors program to be admitted to the Junior/Senior Honors Program.

The requirements for the Junior/Senior Honors Program are:

1. Three required courses from the following list.
2. Two additional courses from the following list.
3. At least 60 credits at the University of Minnesota.
4. To qualify for graduation with Latin honors, students must achieve, in their final 60 credits, a GPA of 3.50 for cum laude, 3.66 for magna cum laude, and 3.75 for summa cum laude.



Twin Cities Campus

General Management Self-Designed B.S.B.

Curtis L. Carlson School of Management - Adm

Curtis L. Carlson School of Management

• **Students will no longer be accepted into this program after Fall 2008. Program requirements below are for current students only.**

- Program Type: Baccalaureate
- Requirements for this program are current for Fall 2012
- Required credits to graduate with this degree: 120
- Required credits within the major: 16
- Degree: Bachelor of Science in Business

The general management self-designed major is intended for students who wish to develop an area of expertise outside of the major programs offered by the Carlson School. Students who pursue this major should have a particular career goal or objective in mind that can best be addressed through a self-designed program of study.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Admission Requirements

Students must complete 50 courses before admission to the program.

Freshmen are admitted to Carlson School of Management, but do not declare a major until 50 credits have been completed. Part of the 50 credits should include the 5 tool courses and liberal education requirements.

For information about University of Minnesota admission requirements, visit the [Office of Admissions website](#).

Tool Courses

An adviser-approved statistics course may be taken in place of OMS 2550.

- ECON 1101** - Principles of Microeconomics [SOCS, GP] (4.0 cr)
or **APEC 1101** - Principles of Microeconomics [SOCS, GP] (4.0 cr)
or **ECON 1101H** *(Inactive)*(4.0 cr)
or **ECON 1104** *(Inactive)*(4.0 cr)
- ECON 1102** - Principles of Macroeconomics (4.0 cr)
or **APEC 1102** - Principles of Macroeconomics (3.0 cr)
or **ECON 1105** *(Inactive)*(4.0 cr)
or **APEC 1102H** - Honors: Principles of Macroeconomics (4.0 cr)
- MATH 1142** - Short Calculus [MATH] (4.0 cr)
or **MATH 1271** - Calculus I [MATH] (4.0 cr)
or **MATH 1571H** - Honors Calculus I [MATH] (4.0 cr)
- SCO 2550** - Business Statistics: Data Sources, Presentation, and Analysis (4.0 cr)
or **SCO 2550H** - Honors: Business Statistics: Data Sources, Presentation, and Analysis (4.0 cr)
- ACCT 2050** - Introduction to Financial Reporting (4.0 cr)
or **ACCT 2050H** - Honors: Introduction to Financial Reporting (4.0 cr)

Additional Program Requirements

- PSY 1001** - Introduction to Psychology [SOCS] (4.0 cr)
- BA 3000** - Career Skills (1.0 cr)

General Requirements

All students are required to complete general University and college requirements including writing and liberal education courses. For more information about University-wide requirements, see the [liberal education requirements](#). Required courses for the major or minor in which a student receives a D grade (with or without plus or minus) do not count toward the major or minor (including transfer courses).



Program Requirements

There are no specific course requirements for the general management self-designed major. Each student designs his or her own course of study in consultation with their adviser.

Functional Core

- ACCT 3001 - Introduction to Management Accounting (3.0 cr)
- FINA 3001 - Finance Fundamentals (3.0 cr)
- HRIR 3021 - Human Resource Management and Industrial Relations (3.0 cr)
- IDSC 3001 - Information Systems for Business Processes and Management (3.0 cr)
- MGMT 3001 - Fundamentals of Management (3.0 cr)
- MKTG 3001 - Principles of Marketing (3.0 cr)
- SCO 3001 - Introduction to Operations Management (3.0 cr)

Communication, International, Business Policy Core

- MGMT 3033W - Business Communication [WI] (3.0 cr)
or MGMT 3033V - Honors: Business Communication [WI] (3.0 cr)
- MGMT 3040 - Understanding the International Environment of Firms: International Business (2.0 cr)
or MGMT 3040H *{Inactive}*(3.0 cr)
- MGMT 4004W - Business Policy: Strategy Formulation and Implementation [WI] (3.0 cr)
or MGMT 4004V *{Inactive}*[WI] (3.0 cr)

Major Courses

16 credits of business electives must be taken in consultation with an adviser to complete the major. A proposal must also be submitted for approval.
Adviser-approved business electives

Program Sub-plans

A sub-plan is not required for this program.

Honors UHP

This is an honors sub-plan.

Students admitted to the University Honors Program (UHP) must fulfill UHP requirements in addition to degree program requirements. For any course required in a degree program, UHP students must register for the honors version if one is offered. Honors courses used to fulfill degree program requirements will also fulfill UHP requirements.

CSOM students are encouraged to participate in the Emerging Leaders Program as one of their honors experiences.



Twin Cities Campus

Human Resources and Industrial Relations B.S.B.

Industrial Relations Center

Curtis L. Carlson School of Management

- Program Type: Baccalaureate
- Requirements for this program are current for Fall 2012
- Required credits to graduate with this degree: 120
- Required credits within the major: 72
- Degree: Bachelor of Science in Business

The human resources and industrial relations (HRIR) major prepares graduates for positions involving the recruitment and/or selection of new employees, identification of training needs among new and current workers, the functional operation of compensation systems and benefits packages, and the management of employee relations.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Admission Requirements

Freshman and transfer students are usually admitted to pre-major status before admission to this major

A GPA above 2.0 is preferred for the following:

- 3.00 transferring from another University of Minnesota college
- 3.00 transferring from outside the University

Students have no restrictions on declaring the major but must complete the tool courses before starting the major. Students from outside the school must meet overall admission standards to enter this major, including completion of the tool courses. Students entering as sophomores should complete microeconomics, macroeconomics and calculus prior to transfer. Students entering as juniors should complete microeconomics, macroeconomics, calculus, statistics, and accounting prior to transfer.

For information about University of Minnesota admission requirements, visit the [Office of Admissions website](#).

Tool Courses

Microeconomics

- [ECON 1101](#) - Principles of Microeconomics [SOCS, GP] (4.0 cr)
- or [APEC 1101](#) - Principles of Microeconomics [SOCS, GP] (4.0 cr)
- or [APEC 1101H](#) - Principles of Microeconomics [SOCS, GP] (4.0 cr)

Macroeconomics

- [ECON 1102](#) - Principles of Macroeconomics (4.0 cr)
- or [APEC 1102](#) - Principles of Macroeconomics (3.0 cr)
- or [APEC 1102H](#) - Honors: Principles of Macroeconomics (4.0 cr)

Calculus

- [MATH 1142](#) - Short Calculus [MATH] (4.0 cr)
- or [MATH 1271](#) - Calculus I [MATH] (4.0 cr)
- or [MATH 1571H](#) - Honors Calculus I [MATH] (4.0 cr)
- or [MATH 1371](#) - CSE Calculus I [MATH] (4.0 cr)

Statistics

- [SCO 2550](#) - Business Statistics: Data Sources, Presentation, and Analysis (4.0 cr)
- or [SCO 2550H](#) - Honors: Business Statistics: Data Sources, Presentation, and Analysis (4.0 cr)

Accounting

- [ACCT 2050](#) - Introduction to Financial Reporting (4.0 cr)
- or [ACCT 2050H](#) - Honors: Introduction to Financial Reporting (4.0 cr)

General Requirements

All students are required to complete general University and college requirements including writing and liberal education courses. For more information about University-wide requirements, see the [liberal education requirements](#). Required courses for the major or minor in which a student receives a D grade (with or without plus or minus) do not count toward the major or minor (including transfer courses).



Program Requirements

Lower Division Requirements

Students entering the program as freshmen or sophomores take MGMT 1001. Students who transfer in as juniors complete MGMT 3001 instead.

[PSY 1001](#) - Introduction to Psychology [SOCS] (4.0 cr)

[BA 3000](#) - Career Skills (1.0 cr)

[MGMT 1001](#) - Contemporary Management (3.0 cr)

or [MGMT 3001](#) - Fundamentals of Management (3.0 cr)

Immersion Core

Students complete the Immersion Core as a cohort.

[FINA 3001](#) - Finance Fundamentals (3.0 cr)

[MKTG 3001](#) - Principles of Marketing (3.0 cr)

[SCO 3001](#) - Introduction to Operations Management (3.0 cr)

[MGMT 3004](#) - Business Strategy (3.0 cr)

Additional Core Requirements

[ACCT 3001](#) - Introduction to Management Accounting (3.0 cr)

[HRIR 3021](#) - Human Resource Management and Industrial Relations (3.0 cr)

[IDSC 3001](#) - Information Systems for Business Processes and Management (3.0 cr)

[MGMT 3033W](#) - Business Communication [WI] (3.0 cr)

or [MGMT 3033V](#) - Honors: Business Communication [WI] (3.0 cr)

Major Courses

[HRIR 3031](#) - Staffing and Selection: Strategic and Operational Concerns (2.0 cr)

[HRIR 3041](#) - The Individual in the Organization (2.0 cr)

[HRIR 3051](#) - Compensation: Theory and Practice (2.0 cr)

[HRIR 3071](#) - Union Organizing and Labor Relations (2.0 cr)

[HRIR 4100W](#) - Undergraduate HRIR Leadership Capstone [WI] (4.0 cr)

Electives

Take 8 or more credits(s) from the following:

- [HRIR 3032](#) - Training and Development (2.0 cr)
- [HRIR 3042](#) - The Individual and Organizational Performance (2.0 cr)
- [HRIR 3072](#) - Collective Bargaining and Dispute Resolution (2.0 cr)
- [HRIR 5022](#) - Managing Diversity (2.0 cr)
- [HRIR 5023](#) - Employment and Labor Law for the HRIR Professional (2.0 cr)
- [HRIR 5025](#) - Comparative and International Human Resources and Industrial Relations (2.0 cr)
- [HRIR 5054](#) - Public Policies on Employee Benefits: Social Safety Nets (2.0 cr)
- [HRIR 5061](#) - Public Policies on Work and Pay (3.0 cr)
- [HRIR 5062](#) - Personnel Economics (2.0 cr)
- [HRIR 5000](#) - Topics in Human Resources and Industrial Relations (2.0 cr)
- [INS 4101](#) - Employee Benefits (2.0 cr)

International Experience

Students must complete an international experience as part of the program requirements. Short-term or semester-length programs may be used to meet this requirement. Students participate in International Experience (IE) 101 early in their program to begin planning.

Program Sub-plans

A sub-plan is not required for this program.

Honors UHP

This is an honors sub-plan.

Students admitted to the University Honors Program (UHP) must fulfill UHP requirements, in addition to degree program requirements. Honors courses used to fulfill degree program requirements will also fulfill UHP requirements.

Current departmental honors course offerings are listed at:

http://www.honors.umn.edu/academics/curriculum/dept_courses_current.html

Honors students complete an honors thesis project in the final year, most often in conjunction with an honors thesis course, or with an honors directed studies, or honors directed research course. Students select honors courses and plan for a thesis project in consultation with their UHP adviser and their departmental faculty adviser.



UNIVERSITY OF MINNESOTA

Driven to DiscoverSM



Twin Cities Campus

International Business B.S.B.

Strategic Management & Organization

Curtis L. Carlson School of Management

- Program Type: Baccalaureate
- Requirements for this program are current for Fall 2012
- Required credits to graduate with this degree: 120 to 132
- Required credits within the major: 20
- Degree: Bachelor of Science in Business

The international business major provides students with a rigorous foundation for success in today's global business environment. Recognizing that career placement and early stage career success depends on strong functional skills (e.g., accounting, marketing, finance, human resources, operations, information systems, or entrepreneurship), the international business major must be completed with another major in Carlson. The international business major enhances any functional major with a comprehensive understanding of the additional complexity and contingencies required when conducting business across national borders.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Admission Requirements

Freshman and transfer students are usually admitted to pre-major status before admission to this major

A GPA above 2.0 is preferred for the following:

- 3.00 transferring from another University of Minnesota college
- 3.00 transferring from outside the University

Students in the school have no restrictions on declaring the major but must complete the tool courses before starting the major. Students from outside of the school must meet overall admission standards to enter this major, including completion of the tool courses. Students entering as sophomores should complete microeconomics, macroeconomics, and calculus prior to transfer. Students entering as juniors should complete microeconomics, macroeconomics, calculus, statistics, and accounting prior to transfer.

For information about University of Minnesota admission requirements, visit the [Office of Admissions website](#).

Tool Courses

Microeconomics

- [ECON 1101](#) - Principles of Microeconomics [SOCS, GP] (4.0 cr)
- or [APEC 1101](#) - Principles of Microeconomics [SOCS, GP] (4.0 cr)
- or [APEC 1101H](#) - Principles of Microeconomics [SOCS, GP] (4.0 cr)

Macroeconomics

- [ECON 1102](#) - Principles of Macroeconomics (4.0 cr)
- or [APEC 1102](#) - Principles of Macroeconomics (3.0 cr)
- or [APEC 1102H](#) - Honors: Principles of Macroeconomics (4.0 cr)

Calculus

- [MATH 1142](#) - Short Calculus [MATH] (4.0 cr)
- or [MATH 1271](#) - Calculus I [MATH] (4.0 cr)
- or [MATH 1571H](#) - Honors Calculus I [MATH] (4.0 cr)
- or [MATH 1371](#) - CSE Calculus I [MATH] (4.0 cr)

Statistics

- [SCO 2550](#) - Business Statistics: Data Sources, Presentation, and Analysis (4.0 cr)
- or [SCO 2550H](#) - Honors: Business Statistics: Data Sources, Presentation, and Analysis (4.0 cr)

Accounting

- [ACCT 2050](#) - Introduction to Financial Reporting (4.0 cr)
- or [ACCT 2050H](#) - Honors: Introduction to Financial Reporting (4.0 cr)

General Requirements

All students are required to complete general University and college requirements including writing and liberal education courses. For more information about University-wide requirements, see the [liberal education requirements](#). Required courses for the major or minor in which a student receives a D grade (with or without plus or minus) do not count toward the major or minor (including transfer courses).



Program Requirements

Students are required to take 4 semester(s) of any second language.

The international business major must be completed with another major within the Carlson School.

Lower Division Requirements

Students entering the program as freshmen or sophomores take MGMT 1001. Students who transfer in as juniors complete MGMT 3001 instead.

[PSY 1001](#) - Introduction to Psychology [SOCS] (4.0 cr)

[BA 3000](#) - Career Skills (1.0 cr)

[MGMT 1001](#) - Contemporary Management (3.0 cr)

or [MGMT 3001](#) - Fundamentals of Management (3.0 cr)

Immersion Core

Students complete the Immersion Core as a cohort.

[FINA 3001](#) - Finance Fundamentals (3.0 cr)

[MKTG 3001](#) - Principles of Marketing (3.0 cr)

[SCO 3001](#) - Introduction to Operations Management (3.0 cr)

[MGMT 3004](#) - Business Strategy (3.0 cr)

Additional Core Requirements

[ACCT 3001](#) - Introduction to Management Accounting (3.0 cr)

[IDSC 3001](#) - Information Systems for Business Processes and Management (3.0 cr)

[HRIR 3021](#) - Human Resource Management and Industrial Relations (3.0 cr)

[MGMT 3033W](#) - Business Communication [WI] (3.0 cr)

or [MGMT 3033V](#) - Honors: Business Communication [WI] (3.0 cr)

Major Courses

International Business Foundations

The international business foundations courses must be completed at the Carlson School.

[MGMT 3040](#) - Understanding the International Environment of Firms: International Business (2.0 cr)

CSOM International Courses

One course only may be double counted for the primary major and IB major.

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

• [MGMT 3900](#) - International Business Communication [GP] (3.0 cr)

• [ACCT 5310](#) - International Accounting (2.0 cr)

• [FINA 4621](#) - The Global Economy (Macro) (2.0 cr)

• [FINA 4622](#) - International Finance (2.0 cr)

• [HRIR 5025](#) - Comparative and International Human Resources and Industrial Relations (2.0 cr)

• [MKTG 4080W](#) - Marketing Strategy [WI] (4.0 cr)

• [IBUS 4090](#) - Corporate Strategy in Emerging Europe (4.0 cr)

• [IBUS 4082W](#) - Brand Management [WI] (4.0 cr)

• [IBUS 3010](#) - Introduction to Entrepreneurship: An International Perspective (4.0 cr)

• [IBUS 4050](#) - Management of Innovation and Change (4.0 cr)

• [IBUS 4010](#) - Management of Technology in the Middle East (3.0 cr)

• [IBUS 4080](#) - Life Sciences in South Africa--An International Business Perspective (4.0 cr)

• [IBUS 3080](#) - Sustainability and Corporate Social Responsibility in Costa Rica (4.0 cr)

International Environment Breadth

May be completed abroad with advising and department approval.

Take 2 or more course(s) totaling 6 or more credits(s) from the following:

• International Political Economy Survey Course

• Take 1 or more course(s) from the following:

• [POL 3410](#) - Topics in Comparative Politics (3.0 cr)

• [POL 3835](#) - International Relations [SOCS, GP] (3.0 cr)

• [POL 3872W](#) - Global Environmental Cooperation [WI] (4.0 cr)

• [POL 4481](#) - Governments and Markets (3.0 - 4.0 cr)

• [ECON 4401](#) - International Economics [GP] (3.0 cr)

• [ECON 4307](#) - Comparative Economic Systems (3.0 cr)

• [APEC 3007](#) - Applied Macroeconomics: Policy, Trade, and Development [GP] (3.0 cr)

• [APEC 5751](#) - Global Trade and Policy (3.0 cr)

• [GEOG 3331](#) - Geography of the World Economy [SOCS, GP] (3.0 cr)

• [GLOS 3415](#) - Global Institutions of Power: World Bank, International Monetary Fund, and World Trade Organization (3.0 cr)

• [HIST 3419](#) - History of Capitalism: Uneven Development Since 1500 (3.0 cr)



•Sociocultural Survey Course

- Take 1 or more course(s) from the following:
- GEOG 3379 - Environment and Development in the Third World [SOCS, ENV] (3.0 cr)
- GLOS 4802 - Cross-Cultural Perspectives on Work (4.0 cr)
- GLOS 3602 - Other Worlds: Globalization and Culture (3.0 cr)
- GLOS 4221 - Globalize This! Understanding Globalization Through Sociology [GP] (3.0 cr)
- ANTH 3003 - Cultural Anthropology (3.0 cr)
- ANTH 4031W - Anthropology and Social Justice [WI] (4.0 cr)
- ANTH 4053 - Economy, Culture, and Critique [SOCS, GP] (3.0 cr)
- ANTH 4065 - The Anthropology of Development (3.0 cr)
- AMST 4301 - Workers and Consumers in the Global Economy [DSJ] (3.0 cr)

International Business Environment Depth

May be completed abroad with advising and department approval. Courses may not count in more than one area of Depth, Breadth, or Business Foundations.

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

- MGMT 3900 - International Business Communication [GP] (3.0 cr)
- ACCT 5310 - International Accounting (2.0 cr)
- FINA 4621 - The Global Economy (Macro) (2.0 cr)
- FINA 4622 - International Finance (2.0 cr)
- HRIR 5025 - Comparative and International Human Resources and Industrial Relations (2.0 cr)
- MKTG 4080W - Marketing Strategy [WI] (4.0 cr)
- POL 3477 - Political Development [SOCS, GP] (3.0 - 4.0 cr)
- GLOS 3415 - Global Institutions of Power: World Bank, International Monetary Fund, and World Trade Organization (3.0 cr)
- GEOG 3378 - The Third World: Development, poverty, possibility (3.0 cr)
- PA 4414 - Child Human Rights: Work and Education (3.0 cr)
- HIST 3468 - Social Change in Modern China (3.0 cr)
- POL 4481 - Governments and Markets (3.0 - 4.0 cr)
- PSY 3301 - Introduction to Cultural Psychology (3.0 cr)
- ANTH 3023 - Culture and Society of India [GP, SOCS] (3.0 cr)
- GEOG 3379 - Environment and Development in the Third World [SOCS, ENV] (3.0 cr)
- OLPD 3380 - Developing Intercultural Competence (3.0 cr)

Senior Seminar in International Business

- MGMT 4500 - Senior Seminar in International Business (2.0 cr)

International Experience

Students in the International Business major will complete a study abroad experience of at least one full semester in length. OR They may complete a study abroad experience of any length, PLUS an internship with an international organization. (Please speak with an adviser about acceptable internships.)

Program Sub-plans

A sub-plan is not required for this program.

Honors UHP

This is an honors sub-plan.

Students admitted to the University Honors Program (UHP) must fulfill UHP requirements, in addition to degree program requirements. Honors courses used to fulfill degree program requirements will also fulfill UHP requirements.

Current departmental honors course offerings are listed at:

http://www.honors.umn.edu/academics/curriculum/dept_courses_current.html

Honors students complete an honors thesis project in the final year, most often in conjunction with an honors thesis course, or with an honors directed studies, or honors directed research course. Students select honors courses and plan for a thesis project in consultation with their UHP adviser and their departmental faculty adviser.



Twin Cities Campus

Management Information Systems B.S.B.

Information & Decision Sciences

Curtis L. Carlson School of Management

- Program Type: Baccalaureate
- Requirements for this program are current for Fall 2012
- Required credits to graduate with this degree: 120
- Required credits within the major: 74
- Degree: Bachelor of Science in Business

The management information systems (MIS) major prepares students to be leaders in conceptualizing, prescribing, developing, and delivering leading-edge information system applications that support business processes and management decision making. It provides students with an understanding of the functions of information systems in organizations and detailed knowledge of information system analysis, design, and operation.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Admission Requirements

Freshman and transfer students are usually admitted to pre-major status before admission to this major

A GPA above 2.0 is preferred for the following:

- 3.00 transferring from another University of Minnesota college
- 3.00 transferring from outside the University

Students in the school have no restrictions on declaring the major but must complete the tool courses before starting the major coursework. Students from outside of the school must meet overall admission standards to enter this major, including completion of the tool courses. Students entering as sophomores should complete microeconomics, macroeconomics, and calculus prior to transfer. Students entering as juniors should complete microeconomics, macroeconomics, calculus, statistics, and accounting prior to transfer.

For information about University of Minnesota admission requirements, visit the [Office of Admissions website](#).

Tool Courses

Microeconomics

- ECON 1101 - Principles of Microeconomics [SOCS, GP] (4.0 cr)
- or APEC 1101 - Principles of Microeconomics [SOCS, GP] (4.0 cr)
- or APEC 1101H - Principles of Microeconomics [SOCS, GP] (4.0 cr)

Macroeconomics

- ECON 1102 - Principles of Macroeconomics (4.0 cr)
- or APEC 1102 - Principles of Macroeconomics (3.0 cr)
- or APEC 1102H - Honors: Principles of Macroeconomics (4.0 cr)

Calculus

- MATH 1142 - Short Calculus [MATH] (4.0 cr)
- or MATH 1271 - Calculus I [MATH] (4.0 cr)
- or MATH 1571H - Honors Calculus I [MATH] (4.0 cr)
- or MATH 1371 - CSE Calculus I [MATH] (4.0 cr)

Statistics

- SCO 2550 - Business Statistics: Data Sources, Presentation, and Analysis (4.0 cr)
- or SCO 2550H - Honors: Business Statistics: Data Sources, Presentation, and Analysis (4.0 cr)

Accounting

- ACCT 2050 - Introduction to Financial Reporting (4.0 cr)
- or ACCT 2050H - Honors: Introduction to Financial Reporting (4.0 cr)

General Requirements

All students are required to complete general University and college requirements including writing and liberal education courses. For more information about University-wide requirements, see the [liberal education requirements](#). Required courses for the major or minor in which a student receives a D grade (with or without plus or minus) do not count toward the major or minor (including transfer courses).



Program Requirements

Lower Division Requirements

Students entering the program as freshmen or sophomores take MGMT 1001. Students who transfer in as juniors complete MGMT 3001 instead.

- PSY 1001 - Introduction to Psychology [SOCS] (4.0 cr)
- BA 3000 - Career Skills (1.0 cr)
- MGMT 1001 - Contemporary Management (3.0 cr)
or MGMT 3001 - Fundamentals of Management (3.0 cr)

Immersion Core

Students complete the Immersion Core as a cohort.

- FINA 3001 - Finance Fundamentals (3.0 cr)
- MKTG 3001 - Principles of Marketing (3.0 cr)
- SCO 3001 - Introduction to Operations Management (3.0 cr)
- MGMT 3004 - Business Strategy (3.0 cr)

Additional Core Requirements

- ACCT 3001 - Introduction to Management Accounting (3.0 cr)
- IDSC 3001 - Information Systems for Business Processes and Management (3.0 cr)
- HRIR 3021 - Human Resource Management and Industrial Relations (3.0 cr)
- MGMT 3033W - Business Communication [WI] (3.0 cr)
or MGMT 3033V - Honors: Business Communication [WI] (3.0 cr)

Major Courses

- IDSC 3101 - Introduction to Programming (2.0 cr)
- IDSC 3102 - Intermediate Programming (2.0 cr)
- IDSC 3103 - Data Modeling and Databases (2.0 cr)
- IDSC 3104 - Enterprise Systems (2.0 cr)
- IDSC 3202 - Analysis and Modeling for Business Systems Development (4.0 cr)
- IDSC 4204W - Information Services Management [WI] (4.0 cr)
- IDSC 4301 - Information Systems Capstone Course: A Live Case (2.0 cr)

Electives

Take 4 or more credits(s) from the following:

- IDSC 4401 - Information Security (2.0 cr)
- IDSC 4411 - Accounting Information Systems and IT Governance (2.0 cr)
- IDSC 4421 - Financial Information Systems and Technologies (2.0 cr)
- IDSC 4431 - Advanced Database Design (2.0 cr)
- IDSC 4441 - Electronic Commerce (2.0 cr)
- IDSC 4444 - Business Analytics (2.0 cr)
- IDSC 4455 - Web 2.0: The Business of Social Media (2.0 cr)
- IDSC 4490 - Information Systems Special Topics (2.0 cr)
- IDSC 4491 - Independent Study in Information Systems (1.0 - 4.0 cr)

International Experience

Students must complete an international experience as part of the program requirements. Short term or semester-length programs may be used to meet this requirement. Students participate in International Experience (IE) 101 early in their program to begin planning.

Program Sub-plans

A sub-plan is not required for this program.

Honors UHP

This is an honors sub-plan.

Students admitted to the University Honors Program (UHP) must fulfill UHP requirements, in addition to degree program requirements. Honors courses used to fulfill degree program requirements will also fulfill UHP requirements.

Current departmental honors course offerings are listed at:

http://www.honors.umn.edu/academics/curriculum/dept_courses_current.html

Honors students complete an honors thesis project in the final year, most often in conjunction with an honors thesis course, or with an



honors directed studies, or honors directed research course. Students select honors courses and plan for a thesis project in consultation with their UHP adviser and their departmental faculty adviser.



Twin Cities Campus

Marketing B.S.B.

Marketing

Curtis L. Carlson School of Management

- Program Type: Baccalaureate
- Requirements for this program are current for Fall 2012
- Required credits to graduate with this degree: 120
- Required credits within the major: 76
- Degree: Bachelor of Science in Business

Marketing focuses on the flow of goods and services through the economy and the distribution of both industrial and consumer goods. Because more than one half of the consumer dollar goes to pay for marketing services, marketing is a significant part of the economy, and the efficiency with which marketing activities are carried out has major social and economic implications.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Admission Requirements

Freshman and transfer students are usually admitted to pre-major status before admission to this major

A GPA above 2.0 is preferred for the following:

- 3.00 transferring from another University of Minnesota college
- 3.00 transferring from outside the University

Students have no restrictions on declaring the major but must complete the tool courses before starting upper division major requirements. Students from outside of the school must meet overall admission standards to enter this major, including completion of the tool courses. Students entering as sophomores should complete microeconomics, macroeconomics, and calculus prior to transfer. Students entering as juniors should complete microeconomics, macroeconomics, calculus, statistics, and accounting prior to transfer.

For information about University of Minnesota admission requirements, visit the [Office of Admissions website](#).

Tool Courses

Microeconomics

- [ECON 1101](#) - Principles of Microeconomics [SOCS, GP] (4.0 cr)
- or [APEC 1101](#) - Principles of Microeconomics [SOCS, GP] (4.0 cr)
- or [APEC 1101H](#) - Principles of Microeconomics [SOCS, GP] (4.0 cr)

Macroeconomics

- [ECON 1102](#) - Principles of Macroeconomics (4.0 cr)
- or [APEC 1102](#) - Principles of Macroeconomics (3.0 cr)
- or [APEC 1102H](#) - Honors: Principles of Macroeconomics (4.0 cr)

Calculus

- [MATH 1142](#) - Short Calculus [MATH] (4.0 cr)
- or [MATH 1271](#) - Calculus I [MATH] (4.0 cr)
- or [MATH 1571H](#) - Honors Calculus I [MATH] (4.0 cr)
- or [MATH 1371](#) - CSE Calculus I [MATH] (4.0 cr)

Statistics

- [SCO 2550](#) - Business Statistics: Data Sources, Presentation, and Analysis (4.0 cr)
- or [SCO 2550H](#) - Honors: Business Statistics: Data Sources, Presentation, and Analysis (4.0 cr)

Accounting

- [ACCT 2050](#) - Introduction to Financial Reporting (4.0 cr)
- or [ACCT 2050H](#) - Honors: Introduction to Financial Reporting (4.0 cr)

General Requirements

All students are required to complete general University and college requirements including writing and liberal education courses. For more information about University-wide requirements, see the [liberal education requirements](#). Required courses for the major or minor in which a student receives a D grade (with or without plus or minus) do not count toward the major or minor (including transfer courses).



Program Requirements

Lower Division Requirements

Students entering the program as freshmen or sophomores take MGMT 1001. Students who transfer in as juniors complete MGMT 3001 instead.

[PSY 1001](#) - Introduction to Psychology [SOCS] (4.0 cr)

[BA 3000](#) - Career Skills (1.0 cr)

[MGMT 1001](#) - Contemporary Management (3.0 cr)

or [MGMT 3001](#) - Fundamentals of Management (3.0 cr)

Immersion Core

Students complete the Immersion Core as a cohort.

[FINA 3001](#) - Finance Fundamentals (3.0 cr)

[MKTG 3001](#) - Principles of Marketing (3.0 cr)

[SCO 3001](#) - Introduction to Operations Management (3.0 cr)

[MGMT 3004](#) - Business Strategy (3.0 cr)

Additional Core Requirements

[ACCT 3001](#) - Introduction to Management Accounting (3.0 cr)

[IDSC 3001](#) - Information Systems for Business Processes and Management (3.0 cr)

[HRIR 3021](#) - Human Resource Management and Industrial Relations (3.0 cr)

[MGMT 3033W](#) - Business Communication [WI] (3.0 cr)

or [MGMT 3033V](#) - Honors: Business Communication [WI] (3.0 cr)

Major requirements

[MKTG 3010](#) - Marketing Research (4.0 cr)

[MKTG 3040](#) - Buyer Behavior (4.0 cr)

[MKTG 4080W](#) - Marketing Strategy [WI] (4.0 cr)

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

- [MKTG 4030](#) - Sales Management (4.0 cr)
- [MKTG 4050](#) - Integrated Marketing Communications (4.0 cr)
- [MKTG 4060](#) - Marketing Channels (4.0 cr)
- [MKTG 4082W](#) - Brand Management [WI] (4.0 cr)
- [MKTG 4090](#) - Marketing Topics (2.0 - 4.0 cr)

International Experience

Students must complete an international experience as part of the program requirements. Short-term or semester-length programs may be used to meet this requirement. Students participate in International Experience (IE) 101 early in their program to begin planning.

Program Sub-plans

A sub-plan is not required for this program.

Honors UHP

This is an honors sub-plan.

Students admitted to the University Honors Program (UHP) must fulfill UHP requirements, in addition to degree program requirements. Honors courses used to fulfill degree program requirements will also fulfill UHP requirements.

Current departmental honors course offerings are listed at:

http://www.honors.umn.edu/academics/curriculum/dept_courses_current.html

Honors students complete an honors thesis project in the final year, most often in conjunction with an honors thesis course, or an honors directed studies or honors directed research course. Students select honors courses and plan for a thesis project in consultation with their UHP adviser and their departmental faculty adviser.



Twin Cities Campus

Operations B.S.B.

Supply Chain & Operations

Curtis L. Carlson School of Management

- **Students will no longer be accepted into this program after Fall 2008. Program requirements below are for current students only.**
- **See supply chain and operations management B.S.B.**

- Program Type: Baccalaureate
- Requirements for this program are current for Fall 2012
- Required credits to graduate with this degree: 120
- Required credits within the major: 20
- Degree: Bachelor of Science in Business

Operations management is responsible for supplying the product or service of the organization. The operations area manages the conversion or transformation process that converts inputs into outputs. The operations area manages the vast majority of resources and physical assets, and is primarily responsible for the profitability of most firms. Operations managers make decisions regarding the operations function and its connection with other functions. The operations managers plan and control the production system and its interfaces within the organization and with the external environment.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Admission Requirements

Students must complete 50 credits before admission to the program.

A GPA above 2.0 is preferred for the following:

- 3.00 transferring from another University of Minnesota college
- 3.00 transferring from outside the University

Freshmen are admitted to Carlson School of Management, but do not declare a major until 50 credits have been completed. Part of the 50 credits should include the five tool courses and liberal education requirements. Those transferring in as sophomores need to complete microeconomics, macroeconomics, and calculus before admission. Juniors and above need to complete microeconomics, macroeconomics, calculus, business statistics, and accounting before admission.

For information about University of Minnesota admission requirements, visit the [Office of Admissions website](#).

Tool Courses

An adviser-approved statistics course may be taken in place of OMS 2550.

- [ECON 1101](#) - Principles of Microeconomics [SOCS, GP] (4.0 cr)
or [APEC 1101](#) - Principles of Microeconomics [SOCS, GP] (4.0 cr)
or [ECON 1101H](#) *{Inactive}* (4.0 cr)
or [ECON 1104](#) *{Inactive}* (4.0 cr)
- [ECON 1102](#) - Principles of Macroeconomics (4.0 cr)
or [APEC 1102](#) - Principles of Macroeconomics (3.0 cr)
or [ECON 1105](#) *{Inactive}* (4.0 cr)
or [APEC 1102H](#) - Honors: Principles of Macroeconomics (4.0 cr)
- [MATH 1142](#) - Short Calculus [MATH] (4.0 cr)
or [MATH 1271](#) - Calculus I [MATH] (4.0 cr)
or [MATH 1571H](#) - Honors Calculus I [MATH] (4.0 cr)
- [SCO 2550](#) - Business Statistics: Data Sources, Presentation, and Analysis (4.0 cr)
or [SCO 2550H](#) - Honors: Business Statistics: Data Sources, Presentation, and Analysis (4.0 cr)
- [ACCT 2050](#) - Introduction to Financial Reporting (4.0 cr)
or [ACCT 2050H](#) - Honors: Introduction to Financial Reporting (4.0 cr)

Additional Program Requirements

- [PSY 1001](#) - Introduction to Psychology [SOCS] (4.0 cr)
- [BA 3000](#) - Career Skills (1.0 cr)



General Requirements

All students are required to complete general University and college requirements including writing and liberal education courses. For more information about University-wide requirements, see the [liberal education requirements](#). Required courses for the major or minor in which a student receives a D grade (with or without plus or minus) do not count toward the major or minor (including transfer courses).

Program Requirements

Functional Core

- ACCT 3001 - Introduction to Management Accounting (3.0 cr)
- FINA 3001 - Finance Fundamentals (3.0 cr)
- HRIR 3021 - Human Resource Management and Industrial Relations (3.0 cr)
- IDSC 3001 - Information Systems for Business Processes and Management (3.0 cr)
- MGMT 3001 - Fundamentals of Management (3.0 cr)
- MKTG 3001 - Principles of Marketing (3.0 cr)
- SCO 3001 - Introduction to Operations Management (3.0 cr)

Communication, International, Business Policy Core

- MGMT 3033W - Business Communication [WI] (3.0 cr)
or MGMT 3033V - Honors: Business Communication [WI] (3.0 cr)
- MGMT 3040 - Understanding the International Environment of Firms: International Business (2.0 cr)
or MGMT 3040H *{Inactive}*(3.0 cr)
- MGMT 4004W - Business Policy: Strategy Formulation and Implementation [WI] (3.0 cr)
or MGMT 4004V *{Inactive}*[WI] (3.0 cr)

Major Requirements

- SCO 3041 - Project Management (2.0 cr)
- SCO 3056 - Supply Chain Planning and Control (4.0 cr)
- SCO 3059 - Quality Management and Lean Six Sigma (4.0 cr)
- OMS 4081 *{Inactive}*(4.0 cr)

Electives

Take 6 or more credits(s) from the following:

- IDSC 3202 - Analysis and Modeling for Business Systems Development (4.0 cr)
- IDSC 4441 - Electronic Commerce (2.0 cr)
- MKTG 4020 *{Inactive}*(2.0 - 3.0 cr)
- MKTG 4060 - Marketing Channels (4.0 cr)
- SCO 3045 - Sourcing and Supply Management (2.0 cr)
- OMS 5170 *{Inactive}*(4.0 cr)

Program Sub-plans

A sub-plan is not required for this program.

Honors UHP

This is an honors sub-plan.

Students admitted to the University Honors Program (UHP) must fulfill UHP requirements in addition to degree program requirements. For any course required in a degree program, UHP students must register for the honors version if one is offered. Honors courses used to fulfill degree program requirements will also fulfill UHP requirements.

CSOM students are encouraged to participate in the Emerging Leaders Program as one of their honors experiences.



Twin Cities Campus

Public & Nonprofit Management B.S.B

Strategic Management & Organization

Curtis L. Carlson School of Management

- Program Type: Baccalaureate
- Requirements for this program are current for Fall 2012
- Required credits to graduate with this degree: 120
- Required credits within the major: 73
- Degree: Bachelor of Science in Business

The nonprofit sector is one of the most important components of American life, yet one of the most misunderstood. Nonprofit organizations vary enormously in scope and scale, ranging from grassroots charitable groups to multimillion dollar foundations, university, and health care organizations. There is little doubt that every American is directly or indirectly touched by the services of nonprofits in their daily life.

The nonprofit major blends general management-focused courses from the Carlson School with nonprofit-focused courses from the Humphrey Institute of Public Affairs. All students complete an additional major within Carlson; therefore, every student is able to apply their functional specialty of business to the intricacies of the nonprofit sector.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Admission Requirements

Freshman and transfer students are usually admitted to pre-major status before admission to this major

A GPA above 2.0 is preferred for the following:

- 3.00 transferring from another University of Minnesota college
- 3.00 transferring from outside the University

Students in the school have no restrictions on declaring the major but must complete the tool courses before starting the major coursework. Students from outside the school must meet overall admission standards to enter this major, including completion of the tool courses. Students entering as sophomores should complete microeconomics, macroeconomics, and calculus. Students who enter as juniors should complete microeconomics, macroeconomics, calculus, statistics, and accounting prior to transfer.

For information about University of Minnesota admission requirements, visit the [Office of Admissions website](#).

Tool Courses

Microeconomics

- [ECON 1101](#) - Principles of Microeconomics [SOCS, GP] (4.0 cr)
- or [APEC 1101](#) - Principles of Microeconomics [SOCS, GP] (4.0 cr)
- or [APEC 1101H](#) - Principles of Microeconomics [SOCS, GP] (4.0 cr)

Macroeconomics

- [ECON 1102](#) - Principles of Macroeconomics (4.0 cr)
- or [APEC 1102](#) - Principles of Macroeconomics (3.0 cr)
- or [APEC 1102H](#) - Honors: Principles of Macroeconomics (4.0 cr)

Calculus

- [MATH 1142](#) - Short Calculus [MATH] (4.0 cr)
- or [MATH 1271](#) - Calculus I [MATH] (4.0 cr)
- or [MATH 1571H](#) - Honors Calculus I [MATH] (4.0 cr)
- or [MATH 1371](#) - CSE Calculus I [MATH] (4.0 cr)

Statistics

- [SCO 2550](#) - Business Statistics: Data Sources, Presentation, and Analysis (4.0 cr)
- or [SCO 2550H](#) - Honors: Business Statistics: Data Sources, Presentation, and Analysis (4.0 cr)

Accounting

- [ACCT 2050](#) - Introduction to Financial Reporting (4.0 cr)
- or [ACCT 2050H](#) - Honors: Introduction to Financial Reporting (4.0 cr)



General Requirements

All students are required to complete general University and college requirements including writing and liberal education courses. For more information about University-wide requirements, see the [liberal education requirements](#). Required courses for the major or minor in which a student receives a D grade (with or without plus or minus) do not count toward the major or minor (including transfer courses).

Program Requirements

This major may only be completed as a second major within the Carlson School.

Lower Division Requirements

Students who enter the program as freshmen or sophomores take MGMT 1001. Students who transfer in as juniors take MGMT 3001 instead.

- PSY 1001 - Introduction to Psychology [SOCS] (4.0 cr)
- BA 3000 - Career Skills (1.0 cr)
- MGMT 1001 - Contemporary Management (3.0 cr)
or MGMT 1001H - Honors: Contemporary Management (3.0 cr)
or MGMT 3001 - Fundamentals of Management (3.0 cr)

Immersion Core

Students complete the immersion core as a cohort.

- FINA 3001 - Finance Fundamentals (3.0 cr)
- MKTG 3001 - Principles of Marketing (3.0 cr)
- SCO 3001 - Introduction to Operations Management (3.0 cr)
- MGMT 3004 - Business Strategy (3.0 cr)

Additional Core Requirements

- IDSC 3001 - Information Systems for Business Processes and Management (3.0 cr)
- ACCT 3001 - Introduction to Management Accounting (3.0 cr)
- HRIR 3021 - Human Resource Management and Industrial Relations (3.0 cr)
- MGMT 3033W - Business Communication [WI] (3.0 cr)
or MGMT 3033V - Honors: Business Communication [WI] (3.0 cr)

Public & Nonprofit Focus

- PA 3003 - Nonprofit and Public Financial Management (3.0 cr)
- PA 4101 - Nonprofit Management and Governance (3.0 cr)
- PA 3961 - Leadership, You, and Your Community (3.0 cr)
or PA 4190 - Topics in Public and Nonprofit Leadership and Management (3.0 cr)
or PA 5251 - Strategic Planning and Management (3.0 cr)
or PA 5123 - Philanthropy in America: History, Practice, and Trends (3.0 cr)

Business Focus

Take 8 or more credits(s) from the following:

- MGMT 3010 - Introduction to Entrepreneurship (4.0 cr)
- MGMT 4008 - Entrepreneurial Management (4.0 cr)
- MGMT 4040 - Negotiation Strategies (4.0 cr)
- MGMT 4050 - Management of Innovation and Change (2.0 cr)
- MGMT 4002 - Managerial Psychology (4.0 cr)
- MGMT 4170W - New Business Feasibility and Planning [WI] (4.0 cr)

Capstone Course

- MGMT 4000 - Issues in Nonprofit Management (4.0 cr)

International Experience

Students must complete an international experience as part of the program requirements. Short-term or semester-length programs may be used to meet this requirement. Students participate in International Experience (IE) 101 early in their program to begin planning.

Program Sub-plans

A sub-plan is not required for this program.

Honors UHP

This is an honors sub-plan.



Students admitted to the University Honors Program (UHP) must fulfill UHP requirements, in addition to degree program requirements. Honors courses used to fulfill degree program requirements will also fulfill UHP requirements.

Current departmental honors course offerings are listed at:
http://www.honors.umn.edu/academics/curriculum/dept_courses_current.html

Honors students complete an honors thesis project in the final year, most often in conjunction with an honors thesis course, or with an honors directed studies, or honors directed research course. Students select honors courses and plan for a thesis project in consultation with their UHP adviser and their departmental faculty adviser.



Twin Cities Campus

Risk Management and Insurance B.S.B.

Finance

Curtis L. Carlson School of Management

- **Students will no longer be accepted into this program after Summer 2008. Program requirements below are for current students only.**
- **Please see the Finance & Risk Management Insurance B.S.B.**

- Program Type: Baccalaureate
- Requirements for this program are current for Fall 2012
- Required credits to graduate with this degree: 120
- Required credits within the major: 11 to 12
- Degree: Bachelor of Science in Business

Risk management is the practice of identifying the risks that affect a company's business and finding ways to mitigate and offset those risks. Risk management tools and techniques help corporations deal with all types of issues, legal concerns, and human resources changes.

This major introduces students to the risk management discipline and multiple career paths, including corporate risk manager, benefits manager, insurance agent/broker, underwriter, loss adjuster, consultant, and personal financial planner.

The Carlson School Honors program offers students access to a richer undergraduate experience. Honors students have closer contact with their professors. They work in smaller classes and they put their skills to work for the benefit of the community. The program requires hard work and a strong commitment to learning.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Admission Requirements

Students must complete 50 credits before admission to the program.

A GPA above 2.0 is preferred for the following:

- 3.00 transferring from another University of Minnesota college
- 3.00 transferring from outside the University

Freshmen are admitted to Carlson School of Management, but do not declare a major until 50 credits have been completed. Part of the 50 credits should include the five tool courses and liberal education requirements. Those transferring in as sophomores need to complete microeconomics, macroeconomics, and calculus before admission. Juniors and above need to complete microeconomics, macroeconomics, calculus, business statistics, and accounting before admission.

For information about University of Minnesota admission requirements, visit the [Office of Admissions website](#).

Tool Courses

An adviser-approved statistics course may be taken in place of OMS 2550.

- [ECON 1101](#) - Principles of Microeconomics [SOCS, GP] (4.0 cr)
 - or [APEC 1101](#) - Principles of Microeconomics [SOCS, GP] (4.0 cr)
 - or [ECON 1101H](#) *{Inactive}*(4.0 cr)
 - or [ECON 1104](#) *{Inactive}*(4.0 cr)
- [ECON 1102](#) - Principles of Macroeconomics (4.0 cr)
 - or [APEC 1102](#) - Principles of Macroeconomics (3.0 cr)
 - or [ECON 1102H](#) *{Inactive}*[IP, SSCI] (4.0 cr)
 - or [ECON 1105](#) *{Inactive}*(4.0 cr)
- [MATH 1142](#) - Short Calculus [MATH] (4.0 cr)
 - or [MATH 1271](#) - Calculus I [MATH] (4.0 cr)
 - or [MATH 1571H](#) - Honors Calculus I [MATH] (4.0 cr)
- [SCO 2550](#) - Business Statistics: Data Sources, Presentation, and Analysis (4.0 cr)
 - or [SCO 2550H](#) - Honors: Business Statistics: Data Sources, Presentation, and Analysis (4.0 cr)
- [ACCT 2050](#) - Introduction to Financial Reporting (4.0 cr)
 - or [ACCT 2050H](#) - Honors: Introduction to Financial Reporting (4.0 cr)



Additional Program Requirements

- PSY 1001 - Introduction to Psychology [SOCS] (4.0 cr)
- BA 3000 - Career Skills (1.0 cr)

General Requirements

All students are required to complete general University and college requirements including writing and liberal education courses. For more information about University-wide requirements, see the [liberal education requirements](#). Required courses for the major or minor in which a student receives a D grade (with or without plus or minus) do not count toward the major or minor (including transfer courses).

Program Requirements

Functional Core

- ACCT 3001 - Introduction to Management Accounting (3.0 cr)
- FINA 3001 - Finance Fundamentals (3.0 cr)
- HRIR 3021 - Human Resource Management and Industrial Relations (3.0 cr)
- IDSC 3001 - Information Systems for Business Processes and Management (3.0 cr)
- MGMT 3001 - Fundamentals of Management (3.0 cr)
- MKTG 3001 - Principles of Marketing (3.0 cr)
- SCO 3001 - Introduction to Operations Management (3.0 cr)

Communication, International, Business Policy Core

- MGMT 3033W - Business Communication [WI] (3.0 cr)
or MGMT 3033V - Honors: Business Communication [WI] (3.0 cr)
- MGMT 3040 - Understanding the International Environment of Firms: International Business (2.0 cr)
or MGMT 3040H *{Inactive}*(3.0 cr)
- MGMT 4004W - Business Policy: Strategy Formulation and Implementation [WI] (3.0 cr)
or MGMT 4004V *{Inactive}*[WI] (3.0 cr)

Major Courses

- INS 4100 - Corporate Risk Management (2.0 cr)
- INS 4101 - Employee Benefits (2.0 cr)
- INS 4200 - Insurance Theory and Practice (2.0 cr)
- INS 4201 - Personal Financial Management (2.0 cr)

Electives

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

- BLAW 3058 - The Law of Contracts and Agency (4.0 cr)
- FINA 4241 *{Inactive}*(4.0 cr)
- FINA 4242W - Corporate Investment Decisions [WI] (4.0 cr)
- MATH 4065 - Theory of Interest (4.0 cr)
- MATH 5067 - Actuarial Mathematics I (4.0 cr)
- MATH 5068 - Actuarial Mathematics II (4.0 cr)
- INS 4202 - Personal Financial Planning 2: Tax and Estate Planning Techniques (2.0 cr)



Twin Cities Campus

Supply Chain & Operations Management B.S.B.

Supply Chain & Operations

Curtis L. Carlson School of Management

- Program Type: Baccalaureate
- Requirements for this program are current for Fall 2012
- Required credits to graduate with this degree: 120
- Required credits within the major: 74
- Degree: Bachelor of Science in Business

The supply chain and operations program in the Carlson School of Management focuses on process excellence from both intra-organizational and inter-organizational points of view and is led by an award-winning faculty. The program leverages strong relationships with the Supply Chain and Operations Advisory Board to provide significant experiential learning opportunities for students.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Admission Requirements

Freshman and transfer students are usually admitted to pre-major status before admission to this major

A GPA above 2.0 is preferred for the following:

- 3.00 transferring from another University of Minnesota college
- 3.00 transferring from outside the University

Students in the school have no restrictions on declaring the major. Students from outside of the school must meet overall admission standards to enter this major, including completion of the tool courses. Students entering as sophomores should complete microeconomics, macroeconomics, and calculus prior to transfer. Students entering as juniors should complete microeconomics, macroeconomics, calculus, statistics, and accounting prior to transfer.

For information about University of Minnesota admission requirements, visit the [Office of Admissions website](#).

Tool Courses

Microeconomics

- [ECON 1101](#) - Principles of Microeconomics [SOCS, GP] (4.0 cr)
- or [APEC 1101](#) - Principles of Microeconomics [SOCS, GP] (4.0 cr)
- or [APEC 1101H](#) - Principles of Microeconomics [SOCS, GP] (4.0 cr)

Macroeconomics

- [ECON 1102](#) - Principles of Macroeconomics (4.0 cr)
- or [APEC 1102](#) - Principles of Macroeconomics (3.0 cr)
- or [APEC 1102H](#) - Honors: Principles of Macroeconomics (4.0 cr)

Calculus

- [MATH 1142](#) - Short Calculus [MATH] (4.0 cr)
- or [MATH 1271](#) - Calculus I [MATH] (4.0 cr)
- or [MATH 1571H](#) - Honors Calculus I [MATH] (4.0 cr)
- or [MATH 1371](#) - CSE Calculus I [MATH] (4.0 cr)

Statistics

- [SCO 2550](#) - Business Statistics: Data Sources, Presentation, and Analysis (4.0 cr)
- or [SCO 2550H](#) - Honors: Business Statistics: Data Sources, Presentation, and Analysis (4.0 cr)

Accounting

- [ACCT 2050](#) - Introduction to Financial Reporting (4.0 cr)
- or [ACCT 2050H](#) - Honors: Introduction to Financial Reporting (4.0 cr)

General Requirements

All students are required to complete general University and college requirements including writing and liberal education courses. For more information about University-wide requirements, see the [liberal education requirements](#). Required courses for the major or minor in which a student receives a D grade (with or without plus or minus) do not count toward the major or minor (including transfer courses).



Program Requirements

Lower Division Requirements

Students entering the program as freshmen or sophomores take MGMT 1001. Students who transfer in as juniors complete MGMT 3001 instead.

- PSY 1001 - Introduction to Psychology [SOCS] (4.0 cr)
- BA 3000 - Career Skills (1.0 cr)
- MGMT 1001 - Contemporary Management (3.0 cr)
or MGMT 3001 - Fundamentals of Management (3.0 cr)

Immersion Core

Students complete the Immersion Core as a cohort.

- FINA 3001 - Finance Fundamentals (3.0 cr)
- MKTG 3001 - Principles of Marketing (3.0 cr)
- MGMT 3004 - Business Strategy (3.0 cr)
- SCO 3001 - Introduction to Operations Management (3.0 cr)

Additional Core Requirements

- ACCT 3001 - Introduction to Management Accounting (3.0 cr)
- IDSC 3001 - Information Systems for Business Processes and Management (3.0 cr)
- HRIR 3021 - Human Resource Management and Industrial Relations (3.0 cr)
- MGMT 3033W - Business Communication [WI] (3.0 cr)
or MGMT 3033V - Honors: Business Communication [WI] (3.0 cr)

Major Requirements

- SCO 3056 - Supply Chain Planning and Control (4.0 cr)
- SCO 3059 - Quality Management and Lean Six Sigma (4.0 cr)
- SCO 3045 - Sourcing and Supply Management (2.0 cr)
- SCO 3048 - Transportation and Logistics Management (2.0 cr)
- SCO 3072 - Managing Technologies in the Supply Chain (2.0 cr)
- SCO 4065W - Supply Chain and Operations Strategy [WI] (4.0 cr)

Major electives

Take 1 or more course(s) totaling 4 or more credits(s) from the following:

- SCO 3041 - Project Management (2.0 cr)
- SCO 3051 - Service Management (2.0 cr)
- SCO 3061 - Lean Thinking (2.0 cr)
- MKTG 4060 - Marketing Channels (4.0 cr)
- IDSC 3202 - Analysis and Modeling for Business Systems Development (4.0 cr)
- BLAW 3058 - The Law of Contracts and Agency (4.0 cr)
- MGMT 4040 - Negotiation Strategies (4.0 cr)

International Experience

Students must complete an international experience as part of the program requirements. Short-term or semester-length programs may be used to meet this requirement. Students are encouraged to start planning with their adviser early in the program.

Program Sub-plans

A sub-plan is not required for this program.

Honors UHP

This is an honors sub-plan.

Students admitted to the University Honors Program (UHP) must fulfill UHP requirements, in addition to degree program requirements. Honors courses used to fulfill degree program requirements will also fulfill UHP requirements.

Current departmental honors course offerings are listed at:

http://www.honors.umn.edu/academics/curriculum/dept_courses_current.html

Honors students complete an honors thesis project in the final year, most often in conjunction with an honors thesis course, or an honors directed studies or honors directed research course. Students select honors courses and plan for a thesis project in consultation with their UHP adviser and their departmental faculty adviser.



Twin Cities Campus

Supply Chain Management B.S.B.

Marketing

Curtis L. Carlson School of Management

- **Students will no longer be accepted into this program after Fall 2008. Program requirements below are for current students only.**
- **See supply chain and operations management B.S.B.**

- Program Type: Baccalaureate
- Requirements for this program are current for Fall 2012
- Required credits to graduate with this degree: 120
- Required credits within the major: 20
- Degree: Bachelor of Science in Business

Supply chain management manages the flow of goods, information, and services in order to deliver maximum value to the consumer while minimizing the costs of the flow. It is an integrative process across functions within a firm and between trading partners. It is also considered an essential strategy for product-oriented firms as they seek competitive advantage.

The Carlson School honors program offers students access to a richer undergraduate experience. Honors students have closer contact with their professors. They work in smaller classes and they put their skills to work for the benefit of the community. The program requires hard work and a strong commitment to learning.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Admission Requirements

Students must complete 50 credits before admission to the program.

A GPA above 2.0 is preferred for the following:

- 3.00 transferring from another University of Minnesota college
- 3.00 transferring from outside the University

Freshmen are admitted to Carlson School of Management, but do not declare a major until 50 credits have been completed. Part of the 50 credits should include the five tool courses and liberal education requirements. Those transferring in as sophomores need to complete microeconomics, macroeconomics, and calculus before admission. Juniors and above need to complete microeconomics, macroeconomics, calculus, business statistics, and accounting before admission.

For information about University of Minnesota admission requirements, visit the [Office of Admissions website](#).

Tool Courses

An adviser-approved statistics course may be taken in place of OMS 2550.

- ECON 1101** - Principles of Microeconomics [SOCS, GP] (4.0 cr)
or **APEC 1101** - Principles of Microeconomics [SOCS, GP] (4.0 cr)
or **ECON 1101H** *(Inactive)*(4.0 cr)
or **ECON 1104** *(Inactive)*(4.0 cr)
- ECON 1102** - Principles of Macroeconomics (4.0 cr)
or **APEC 1102** - Principles of Macroeconomics (3.0 cr)
or **ECON 1105** *(Inactive)*(4.0 cr)
or **APEC 1102H** - Honors: Principles of Macroeconomics (4.0 cr)
- MATH 1142** - Short Calculus [MATH] (4.0 cr)
or **MATH 1271** - Calculus I [MATH] (4.0 cr)
or **MATH 1571H** - Honors Calculus I [MATH] (4.0 cr)
or **MATH 1572H** - Honors Calculus II (4.0 cr)
- SCO 2550** - Business Statistics: Data Sources, Presentation, and Analysis (4.0 cr)
or **SCO 2550H** - Honors: Business Statistics: Data Sources, Presentation, and Analysis (4.0 cr)
- ACCT 2050** - Introduction to Financial Reporting (4.0 cr)
or **ACCT 2050H** - Honors: Introduction to Financial Reporting (4.0 cr)

Additional Program requirements



PSY 1001 - Introduction to Psychology [SOCS] (4.0 cr)
BA 3000 - Career Skills (1.0 cr)

General Requirements

All students are required to complete general University and college requirements including writing and liberal education courses. For more information about University-wide requirements, see the [liberal education requirements](#). Required courses for the major or minor in which a student receives a D grade (with or without plus or minus) do not count toward the major or minor (including transfer courses).

Program Requirements

Functional Core

ACCT 3001 - Introduction to Management Accounting (3.0 cr)
FINA 3001 - Finance Fundamentals (3.0 cr)
HRIR 3021 - Human Resource Management and Industrial Relations (3.0 cr)
IDSC 3001 - Information Systems for Business Processes and Management (3.0 cr)
MGMT 3001 - Fundamentals of Management (3.0 cr)
MKTG 3001 - Principles of Marketing (3.0 cr)
SCO 3001 - Introduction to Operations Management (3.0 cr)

Communication, International, Business Policy Core

MGMT 3033W - Business Communication [WI] (3.0 cr)
or MGMT 3033V - Honors: Business Communication [WI] (3.0 cr)
MGMT 3040 - Understanding the International Environment of Firms: International Business (2.0 cr)
or MGMT 3040H *{Inactive}*(3.0 cr)
MGMT 4004W - Business Policy: Strategy Formulation and Implementation [WI] (3.0 cr)
or MGMT 4004V *{Inactive}*[WI] (3.0 cr)

Major Courses

IDSC 3202 - Analysis and Modeling for Business Systems Development (4.0 cr)
MKTG 4060 - Marketing Channels (4.0 cr)
SCO 3045 - Sourcing and Supply Management (2.0 cr)
SCO 3056 - Supply Chain Planning and Control (4.0 cr)

Electives

Take 6 or more credits(s) from the following:

- IDSC 4204W - Information Services Management [WI] (4.0 cr)
- IDSC 4441 - Electronic Commerce (2.0 cr)
- MGMT 3070 - Topics in Management (2.0 - 4.0 cr)
- MKTG 4020 *{Inactive}*(2.0 - 3.0 cr)
- MKTG 4030 - Sales Management (4.0 cr)
- MKTG 4070 *{Inactive}*(2.0 cr)
- SCO 3041 - Project Management (2.0 cr)
- SCO 3059 - Quality Management and Lean Six Sigma (4.0 cr)
- OMS 5170 *{Inactive}*(4.0 cr)

Program Sub-plans

A sub-plan is not required for this program.

Honors UHP

This is an honors sub-plan.

Students admitted to the University Honors Program (UHP) must fulfill UHP requirements in addition to degree program requirements. For any course required in a degree program, UHP students must register for the honors version if one is offered. Honors courses used to fulfill degree program requirements will also fulfill UHP requirements.

CSOM students are encouraged to participate in the Emerging Leaders Program as one of their honors experiences.



Twin Cities Campus

Dental Hygiene B.S.

School of Dentistry - Adm

School of Dentistry

- Program Type: Baccalaureate
- Requirements for this program are current for Fall 2012
- Required credits to graduate with this degree: 127
- Required credits within the major: 69 to 70
- This program requires summer terms.
- Students will have some clinical experiences in community clinics affiliated with the University of MN, School of Dentistry.
- Degree: Bachelor of Science

Within the University's liberal arts curriculum, the baccalaureate program provides advanced knowledge and practice in both general university courses and dental hygiene theory and research methodology. It prepares the dental hygienist to assume roles in many different health care environments such as general and specialty practices, public schools, community health clinics, insurance companies, dental hygiene educational programs, extended care facilities, and in the health products industry.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Admission Requirements

Students must complete 33 credits before admission to the program.

Freshmen students are usually admitted to pre-major status before admission to this major

All prerequisite courses must be taken A-F. Biology and chemistry must be taken within five years of entry into the program and one or the other must be completed prior to application so grades are on the transcript submitted at the time of application. In addition, applicants are strongly encouraged to have completed composition and psychology and/or sociology prior to application so grades are on the transcript submitted at the time of application.

For information about University of Minnesota admission requirements, visit the [Office of Admissions website](#).

General Requirements

All students are required to complete general University and college requirements including writing and liberal education courses. For more information about University-wide requirements, see the [liberal education requirements](#). Required courses for the major or minor in which a student receives a D grade (with or without plus or minus) do not count toward the major or minor (including transfer courses).

Program Requirements

Year One Fall Courses

- [BIOL 1009](#) - General Biology [BIOL] (4.0 cr)
- [PSY 1001](#) - Introduction to Psychology [SOCS] (4.0 cr)
- [CHEM 1015](#) - Introductory Chemistry: Lecture (3.0 cr)
- [CHEM 1017](#) - Introductory Chemistry: Laboratory (1.0 cr)

Year One Spring Courses

- [COMM 1101](#) - Introduction to Public Speaking [CIV] (3.0 cr)
- [FSCN 1112](#) - Principles of Nutrition (3.0 cr)
- [SOC 1001](#) - Introduction to Sociology [SOCS] (4.0 cr)
- [PHSL 3051](#) - Human Physiology (4.0 cr)
- [PSTL 1135](#) - Essentials of Human Anatomy and Physiology [BIOL] (4.0 cr)

Year Two Fall Courses

- [BIOC 2011](#) - Biochemistry for the Agricultural and Health Sciences (3.0 cr)
- [DH 2111](#) - Dental Anatomy (2.0 cr)
- [DH 2121](#) - The Dental Hygiene Care Process Clinical Application I (5.0 cr)
- [DH 2132](#) - Head and Neck Anatomy (1.0 cr)



MICB 3303 - Biology of Microorganisms (3.0 cr)

Year Two Spring Courses

DH 2212 - Dental Hygienist-Patient Relationship (2.0 cr)
DH 2215 - Oral Histology and Embryology (2.0 cr)
DH 2221 - Periodontology (3.0 cr)
DH 2222 - Dental Hygiene Care Process Clinical Application II (3.0 cr)
DH 3151 - Oral and Maxillofacial Radiology (2.0 cr)
DH 2231 - Cariology and Applied Nutrition in Dental Hygiene Care (3.0 cr)

Year Two Summer Courses

DH 3120 - General and Oral Pathology (2.0 cr)
DH 3121 - Local Anesthesia and Pain Management (2.0 cr)
DH 3126 - Oral and Maxillofacial Radiology Clinic I (0.0 cr)
DH 3123 - The Dental Hygiene Care Process Clinical Application III (4.0 cr)
DH 3133 - Pharmacology (2.0 cr)
DH 3134 - Pediatric Dentistry (1.0 cr)

Year Three Fall Courses

DH 3211 - Biomaterials and Principles of Restorative Techniques I (4.0 cr)
DH 3224W - Dental Hygiene Care Process: Clinical Application IV [WI] (6.0 cr)
DH 3227 - Oral and Maxillofacial Radiology Clinic II (0.0 cr)
DH 3238 - Dental Public Health and Academic Service Learning (3.0 cr)
DH 3228 - Ethics and Jurisprudence for the Dental Hygienist (1.0 cr)
STAT 1001 - Introduction to the Ideas of Statistics [MATH] (4.0 cr)

Year Three Spring Courses

DH 4125W - Dental Hygiene Care Process: Clinical Application V [DSJ, WI] (6.0 cr)
DH 4128 - Oral and Maxillofacial Radiology Clinic III (0.0 cr)
DH 4135W - Research Methods in Dental Hygiene [WI] (3.0 cr)
DH 4136 - Periodontology III Lecture (1.0 cr)
DH 4139 - Dental Public Health and Academic Service Learning II (1.0 cr)
WRIT 3562W - Technical and Professional Writing [WI] (4.0 cr)
DH 4130 - Management and Supervision of a Dental Practice (2.0 cr)

Year Three Summer Courses

DH 4226 - Dental Hygiene Care Process Clinical Application VI (6.0 cr)
DH 4229 - Oral and Maxillofacial Radiology Clinic IV (3.0 cr)
DH 4234 - Leadership and Professional Development (2.0 cr)
DH 4211 - Principles of Restorative Techniques II (3.0 cr)

Program Sub-plans

A sub-plan is not required for this program.



Twin Cities Campus

Dental Therapy B.S.

School of Dentistry - Adm

School of Dentistry

- Program Type: Baccalaureate
- Requirements for this program are current for Fall 2012
- Required credits to graduate with this degree: 129
- Required credits within the major: 80 to 97
- This program requires summer terms.
- Part of the program includes clinical outreach experiences. Students will perform dental procedures on patients in community clinics affiliated with the University of Minnesota School of Dentistry.
- Degree: Bachelor of Science

The program blends a strong dental therapy education with the study of the biological, behavioral, and social sciences, as well as liberal arts. It provides didactic, laboratory, and clinical experiences required in assessment and treatment of specified dental procedures.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Admission Requirements

Students must complete 7 courses before admission to the program.

A GPA above 2.0 is preferred for the following:

- 3.00 already admitted to the degree-granting college
- 3.00 transferring from another University of Minnesota college
- 3.00 transferring from outside the University

Personal interview.

For information about University of Minnesota admission requirements, visit the [Office of Admissions website](#).

Biomedical Courses

Biomedical Courses

- [BIOC 2011](#) - Biochemistry for the Agricultural and Health Sciences (3.0 cr)
- [BIOL 1009](#) - General Biology [BIOL] (4.0 cr)
- [PSTL 1135](#) - Essentials of Human Anatomy and Physiology [BIOL] (4.0 cr)
- [PSY 1001](#) - Introduction to Psychology [SOCS] (4.0 cr)
- [STAT 1001](#) - Introduction to the Ideas of Statistics [MATH] (4.0 cr)
- [CHEM 1065](#) - Chemical Principles I Laboratory [PHYS] (1.0 cr)
- [CHEM 1061](#) - Chemical Principles I [PHYS] (3.0 cr)

General Requirements

All students are required to complete general University and college requirements including writing and liberal education courses. For more information about University-wide requirements, see the [liberal education requirements](#). Required courses for the major or minor in which a student receives a D grade (with or without plus or minus) do not count toward the major or minor (including transfer courses).

Program Requirements

Biomedical Courses

- [MICB 3303](#) - Biology of Microorganisms (3.0 cr)

Physiology

- [PHSL 3051](#) - Human Physiology (4.0 cr)
- or [PHAR 3601](#) - Basic Human Physiology for the Health Professions (3.0 cr)

Clinical Courses

- [DT 3110](#) - Periodontology I (1.0 cr)



- DT 3130 - Preclinical Pediatric Dentistry (2.0 cr)
- DT 3211 - Applied Pharmacology for the Dental Therapist (2.0 cr)
- DT 3212 - Local Anesthesia and Pain Management (2.0 cr)
- DT 3230 - Oral and Maxillofacial Radiology (2.0 cr)
- DT 3232 - Oral and Maxillofacial Radiology Preclinical Laboratory (0.0 cr)
- DT 3250 - Oral Histology and Embryology (2.0 cr)
- DT 3331 - Provider Patient Relationships (2.0 cr)
- DT 3332 - Cariology and Applied Nutrition in Dental Therapy Care (3.0 cr)
- DT 3333 - Dental Public Health and Academic Service Learning I (3.0 cr)
- DT 3334W - Dental Therapy Care Process: Clinical Application II [WI] (4.0 cr)
- DT 3336 - Ethics and Jurisprudence for the Dental Therapist (1.0 cr)
- DT 4337 - Dental Public Health and Service Learning II (2.0 cr)
- DT 4338W - Research Methods in Dental Therapy [WI] (3.0 cr)
- DT 3430 - Oral Anatomy (2.0 cr)
- DT 3431 - Oral Anatomy Laboratory (3.0 cr)
- DT 3432 - Operative Dentistry I (2.0 cr)
- DT 3433 - Operative Dentistry I Pre-Clinic Laboratory (2.0 cr)
- DT 3434 - Operative Dentistry II for the Dental Therapist, Lecture (1.0 cr)
- DT 4140 - Preventive Pediatric Dentistry Clinic (1.0 cr)
- DT 4335 - Dental Practice Management (2.0 cr)
- DT 4241 - Oral Radiology Clinic II (1.0 cr)
- DT 4443 - Operative Clinic III (4.0 cr)
- DT 3210 - Head and Neck Anatomy (1.0 cr)
- DT 3429 - Introduction to Psychomotor Skill Development (1.0 cr)
- DT 3330 - Clinical Application I (3.0 cr)
- DT 3231 - Oral and Maxillofacial Radiology II (1.0 cr)
- DT 3471 - Prosthodontic Topics for Dental Therapy (2.0 cr)
- DT 3435 - Operative Dentistry II for the Dental Therapist, Lab (1.0 cr)
- DT 4320 - Comprehensive Care Clinic (4.0 cr)
- DT 4141 - Clinical Pediatric Dentistry III (2.0 cr)
- DT 3251 - General and Oral Pathology (2.0 cr)
- DT 4460 - Essentials of Clinical Care I For the Dental Therapist (1.0 - 12.0 cr)
- DT 4960 - Essentials of Clinical Care II for Dental Therapists (5.0 - 10.0 cr)
- DT 3521 - Foundations of Interprofessional Professionalism, Communication and Collaboration (1.0 cr)
- DT 3410 - Applied Dental Biomaterials (1.0 cr)
- DT 4360 - Outreach Experiences in Dental Therapy (1.0 cr)
- DT 4361 - Outreach Experiences II (2.0 cr)



Twin Cities Campus

Apparel Design B.S.

DHA Clothing Design

College of Design

- Program Type: Baccalaureate
- Requirements for this program are current for Fall 2012
- Required credits to graduate with this degree: 120
- Required credits within the major: 81 to 88
- Degree: Bachelor of Science

Apparel design students learn to design, produce, and market apparel products by developing the creative thinking and technical expertise to address contemporary issues while using industry technologies, communicating design ideas, and gaining an understanding of the global apparel industry. The program incorporates custom design and industry production approaches and features projects that emphasize fashion and function. The program focuses on a research-based design process used by many design industries, and courses incorporate industry-sponsored projects and community service projects. Studio courses closely replicate the professional working methods of apparel designers. In addition to providing a strong liberal arts curriculum, courses offer essential background in costume history, consumer behavior, and social and cultural meanings of apparel. A required internship and mentor experience provides students with professional experience. An annual fashion show presents students' achievements to the professional community.

Students enter the program as pre-apparel design majors. To attain full major status, they must complete six required pre-apparel design courses with a grade of at least C-, maintain a 2.50 GPA, and pass a competitive portfolio review. Students entering the program should also have apparel construction/assembly competence and a working knowledge of microcomputers and software.

To complete the major, students must take six sequential apparel design studio courses. They are also encouraged to use the liberal education categories to explore multicultural themes and to strengthen knowledge that supports their major coursework.

Graduates of the program work in various settings, including product development and quality assurance for large retail companies, product design for small and large manufacturers, theater and film design, wearable art, and custom design.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Admission Requirements

Students must complete 7 courses before admission to the program.

Freshman and transfer students are usually admitted to pre-major status before admission to this major

A GPA above 2.0 is preferred for the following:

- 2.50 already admitted to the degree-granting college
- 2.50 transferring from another University of Minnesota college
- 2.50 transferring from outside the University

Admission to the pre-major status is done by a competitive holistic review. Students must maintain a GPA of 2.50 during pre-major coursework. In addition, students must receive a minimum grade of C- or better in the required pre-major courses before going through portfolio review (not just a 2.50 GPA). Once students have achieved major status, they must maintain a GPA of 2.00.

Students must pass a portfolio review to be admitted into the degree program.

For information about University of Minnesota admission requirements, visit the [Office of Admissions website](#).

Pre-Apparel Design Courses

Students must demonstrate competence in basic apparel construction skills by successfully completing ADES 1221.

Note: Students must be admitted to pre-major status to take most of these courses.

[ADES 1221](#) - Apparel Assembly Fundamentals (3.0 cr)

[ADES 2221](#) - Apparel Design Studio I (4.0 cr)

[DES 1101W](#) - Introduction to Design Thinking [AH, WI] (4.0 cr)

[DES 2101](#) - Design and Visual Presentation (3.0 cr)



[GDES 1311](#) - Foundations: Drawing and Design in Two and Three Dimensions (4.0 cr)
[GDES 1312](#) - Foundations: Color and Design in Two and Three Dimensions (4.0 cr)
[RM 1201](#) - Fashion, Ethics, and Consumption [CIV] (3.0 cr)

General Requirements

All students are required to complete general University and college requirements including writing and liberal education courses. For more information about University-wide requirements, see the [liberal education requirements](#). Required courses for the major or minor in which a student receives a D grade (with or without plus or minus) do not count toward the major or minor (including transfer courses).

Program Requirements

All coursework in the major must be taken A-F (with the exception of the internship).

Communication Course

[WRIT 3562W](#) - Technical and Professional Writing [WI] (4.0 cr)
or [WRIT 3029W](#) - Business and Professional Writing [WI] (3.0 cr)
or [ENGL 3027W](#) - The Essay [WI] (4.0 cr)

Major Courses

[ADES 2211](#) - Illustration for Apparel Design (3.0 cr)
[ADES 2213](#) - Textile Analysis (4.0 cr)
[ADES 2214](#) - Softlines Analysis (3.0 cr)
[ADES 2222](#) - Apparel Design Studio II (4.0 cr)
[ADES 3217](#) - Fashion: Trends and Communication (3.0 cr)
[ADES 3223](#) - Apparel Design Studio III (3.0 cr)
[ADES 3224](#) - Apparel Design Studio IV (3.0 cr)
[ADES 3225](#) - Apparel Design Research (1.0 cr)
[ADES 3227](#) - Technical Design Studio (3.0 cr)
[ADES 3228](#) - Portfolio Development (2.0 cr)
[ADES 4121](#) - History of Costume (4.0 cr)
[ADES 4196](#) - Internship in Apparel Design (1.0 - 4.0 cr)
[ADES 4215](#) - Product Development: Softlines (4.0 cr)
[ADES 4225](#) - Apparel Design Studio V (3.0 cr)
[DES 3201](#) - Career and Internship Preparation for Design (1.0 cr)
[GDES 3312](#) - Color and Form in Surface Design (4.0 cr)
[RM 2215](#) - Multichannel Retailing (3.0 cr)
[RM 4212W](#) - Dress, Society, and Culture [WI] (3.0 cr)
[DES 5185](#) - Human Factors in Design (3.0 cr)
or [GDES 4330](#) - Surface Fabric Design Workshop (4.0 cr)
or [RM 3196](#) - Field Study: National or International (1.0 - 4.0 cr)
or [ADES 4218](#) - Fashion, Design, and the Global Industry (3.0 cr)
or Fiber-based Split Rock course

Program Sub-plans

A sub-plan is not required for this program.

Honors UHP

This is an honors sub-plan.

Students admitted to the University Honors Program (UHP) must fulfill UHP requirements, in addition to degree program requirements. Honors courses used to fulfill degree program requirements will also fulfill UHP requirements.

Current departmental honors course offerings are listed at:
http://www.honors.umn.edu/academics/curriculum/dept_courses_current.html

Honors students complete an honors thesis project in the final year, most often in conjunction with an honors thesis course, or with an honors directed studies, or honors directed research course. Students select honors courses and plan for a thesis project in consultation with their UHP adviser and their departmental faculty adviser.



Twin Cities Campus

Architecture B.D.A.

School of Architecture

College of Design

- Program Type: Baccalaureate
- Requirements for this program are current for Fall 2012
- Required credits to graduate with this degree: 120
- Required credits within the major: 86
- Degree: Bachelor of Design in Architecture

The bachelor of design in architecture (B.D.A.) is a flexible design degree that thinks through architecture. The program requires an understanding of social, cultural, and physical contexts as a foundation for the examination of the methods, values, precedents, and material reality characteristic of the process of shaping natural and built environments. It includes many architectural electives and priority access to design workshops. The B.D.A. is the best option for those interested in exploring the breadth of the architectural discipline.

All major coursework must be taken A-F.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Admission Requirements

Students must complete 30 credits before admission to the program.

A GPA above 2.0 is preferred for the following:

- 2.80 already admitted to the degree-granting college
- 2.80 transferring from another University of Minnesota college
- 2.80 transferring from outside the University

For information about University of Minnesota admission requirements, visit the [Office of Admissions website](#).

Prerequisite Courses

Students must also complete first-year writing requirement (with a minimum grade of C-), all high school prep requirements, and a total of 30 credits.

- [ARCH 1281](#) - Design Fundamentals I (4.0 cr)
- [ARCH 1701](#) - The Designed Environment (3.0 cr)

General Requirements

All students are required to complete general University and college requirements including writing and liberal education courses. For more information about University-wide requirements, see the [liberal education requirements](#). Required courses for the major or minor in which a student receives a D grade (with or without plus or minus) do not count toward the major or minor (including transfer courses).

Program Requirements

B.D.A. Major Core

- [ARCH 2301](#) - Introduction to Drawing in Architecture (4.0 cr)
- [ARCH 2281](#) - Design Fundamentals II (4.0 cr)
- [ARCH 3711W](#) - Environmental Design and the Sociocultural Context [WI] (3.0 cr)
- [ARCH 3411W](#) - Architectural History to 1750 [HIS, GP, WI] (3.0 cr)
- [ARCH 3412](#) - Architectural History Since 1750 [HIS, GP] (3.0 cr)
- [ARCH 3611](#) - Design in the Digital Age (3.0 cr)
- [ARCH 4561](#) - Architecture and Ecology (3.0 cr)
- [ARCH 4701W](#) - Introduction to Urban Form and Theory [WI] (3.0 cr)
- [LA 3501](#) - Environmental Design and Its Biological and Physical Context [ENV] (3.0 cr)
- [ARCH 4421W](#) - Architecture and Interpretation: The Cave and the Light [WI] (3.0 cr)
or [ARCH 4423](#) - Gothic Architecture (3.0 cr)



or ARCH 4424 - Renaissance Architecture (3.0 cr)
or ARCH 4425 - Baroque Architecture (3.0 cr)
or ARCH 4432 - Modern Architecture (3.0 cr)
or ARCH 4434 - Contemporary Architecture (3.0 cr)
or ARCH 4445W - Suburbia [WI] (3.0 cr)
or ARCH 4461 - North American Indian Architecture (3.0 cr)

Calculus

MATH 1142 - Short Calculus [MATH] (4.0 cr)
or MATH 1271 - Calculus I [MATH] (4.0 cr)

Physics

PHYS 1101W - Introductory College Physics I [PHYS, WI] (4.0 cr)
or PHYS 1201W - Introductory Physics for Biology and Pre-medicine I [PHYS, WI] (5.0 cr)
or PHYS 1301W - Introductory Physics for Science and Engineering I [PHYS, WI] (4.0 cr)

Design Workshops

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

- ARCH 3250 - Design Workshop (1.0 - 6.0 cr)

Architecture Electives

Take 3 courses, 9 credits minimum, but may not include ARCH 3351, 3352, 5351, or 5352.

Take 9 or more credits(s) from the following:

- ARCH 3xxx
- ARCH 4xxx

Upper Division Classes Outside the Major

Take 9 upper division credits outside the major. May not include ARCH 3351, 3352, 5351, or 5352.

Upper Div/Outside Major

Upper division arch or upper division outside the major

9 additional credits of either upper division arch classes or upper division classes outside the major. Student choice, but may not include ARCH 3351, 3352, 5351, or 5352.

Program Sub-plans

A sub-plan is not required for this program.

Honors UHP

This is an honors sub-plan.

Students admitted to the University Honors Program (UHP) must fulfill UHP requirements, in addition to degree program requirements. Honors courses used to fulfill degree program requirements will also fulfill UHP requirements.

Current departmental honors course offerings are listed at:

http://www.honors.umn.edu/academics/curriculum/dept_courses_current.html

Honors students complete an honors thesis project in the final year, most often in conjunction with an honors thesis course, honors directed studies, or honors directed research course. Students select honors courses and plan for a thesis project in consultation with their UHP adviser and their departmental faculty adviser.



Twin Cities Campus

Architecture B.S.

School of Architecture

College of Design

- Program Type: Baccalaureate
- Requirements for this program are current for Fall 2012
- Required credits to graduate with this degree: 120
- Required credits within the major: 98 to 99
- Degree: Bachelor of Science

The bachelor of science degree with a major in architecture provides instruction in history, representation, design, theory, and technology, emphasizing the development of architecture as a language of form, space, and order. The program requires an understanding of social, cultural, and physical contexts as a foundation for the examination of the methods, values, precedents, and material reality characteristic of the process of shaping natural and built environments. The major combines core prerequisites with a focused introduction to the discipline of architecture, including required courses in representation, history, theory, technology, and design processes.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Admission Requirements

Students must complete 11 credits before admission to the program.

Freshman and transfer students are usually admitted to pre-major status before admission to this major

A GPA above 2.0 is preferred for the following:

- 2.80 already admitted to the degree-granting college
- 2.80 transferring from another University of Minnesota college
- 2.80 transferring from outside the University

For information about University of Minnesota admission requirements, visit the [Office of Admissions website](#).

Requirements for the B.A. or B.D.A.

[ARCH 1281](#) - Design Fundamentals I (4.0 cr)

[ARCH 1701](#) - The Designed Environment (3.0 cr)

Courses to be taken before admission to B.S.

[ARCH 2301](#) - Introduction to Drawing in Architecture (4.0 cr)

[ARCH 2281](#) - Design Fundamentals II (4.0 cr)

[ARCH 3711W](#) - Environmental Design and the Sociocultural Context [WI] (3.0 cr)

[ARCH 3411W](#) - Architectural History to 1750 [HIS, GP, WI] (3.0 cr)

[ARCH 3412](#) - Architectural History Since 1750 [HIS, GP] (3.0 cr)

[LA 3501](#) - Environmental Design and Its Biological and Physical Context [ENV] (3.0 cr)

[MATH 1142](#) - Short Calculus [MATH] (4.0 cr)

or [MATH 1271](#) - Calculus I [MATH] (4.0 cr)

[PHYS 1101W](#) - Introductory College Physics I [PHYS, WI] (4.0 cr)

or [PHYS 1201W](#) - Introductory Physics for Biology and Pre-medicine I [PHYS, WI] (5.0 cr)

or [PHYS 1301W](#) - Introductory Physics for Science and Engineering I [PHYS, WI] (4.0 cr)

General Requirements

All students are required to complete general University and college requirements including writing and liberal education courses. For more information about University-wide requirements, see the [liberal education requirements](#). Required courses for the major or minor in which a student receives a D grade (with or without plus or minus) do not count toward the major or minor (including transfer courses).

Program Requirements



Students should maintain a portfolio of all freehand drawings, projects, and architecture studio designs. A portfolio is required for application to the B.S. and the accelerated program and the graduate professional degree program.

All courses, including courses in math, physics, and English composition must be taken A-F with grades of C- or better to satisfy degree requirements and to progress in sequence courses.

Accelerated status in architecture is a competitive opportunity for qualified undergraduates to complete the B.S. degree with a major in architecture and the M.Arch. degree in six years rather than seven. See an adviser for more information.

Major coursework

- ARCH 3281 - Undergraduate Architecture Studio I (6.0 cr)
- ARCH 3282 - Undergraduate Architecture Studio II (6.0 cr)
- ARCH 4283 - Undergraduate Architecture Studio III (6.0 cr)
- ARCH 4284 - Undergraduate Architecture Studio IV (6.0 cr)
- ARCH 4511 - Materials and Methods I (3.0 cr)
- ARCH 4521 - Environmental Technology I (3.0 cr)
- ARCH 4571 - Architectural Structures I (3.0 cr)

Courses to be completed any time prior to graduation

- ARCH 3611 - Design in the Digital Age (3.0 cr)
- ARCH 4561 - Architecture and Ecology (3.0 cr)
- ARCH 4701W - Introduction to Urban Form and Theory [WI] (3.0 cr)
- ARCH 4421W - Architecture and Interpretation: The Cave and the Light [WI] (3.0 cr)
 - or ARCH 4423 - Gothic Architecture (3.0 cr)
 - or ARCH 4424 - Renaissance Architecture (3.0 cr)
 - or ARCH 4425 - Baroque Architecture (3.0 cr)
 - or ARCH 4432 - Modern Architecture (3.0 cr)
 - or ARCH 4434 - Contemporary Architecture (3.0 cr)
 - or ARCH 4445W - Suburbia [WI] (3.0 cr)
 - or ARCH 4461 - North American Indian Architecture (3.0 cr)

Architecture electives

Nine upper division architecture credits not used elsewhere. ARCH 3351 and 3352 do not satisfy this requirement.

Take 9 or more credits(s) from the following:

- ARCH 3xxx
- ARCH 4xxx

Upper division credits outside the major

Take 9 upper division credits outside the major.

Program Sub-plans

A sub-plan is not required for this program.

Honors UHP

This is an honors sub-plan.

Students admitted to the University Honors Program (UHP) must fulfill UHP requirements, in addition to degree program requirements. Honors courses used to fulfill degree program requirements will also fulfill UHP requirements.

Current departmental honors course offerings are listed at:

http://www.honors.umn.edu/academics/curriculum/dept_courses_current.html

Honors students complete an honors thesis project in the final year, most often in conjunction with an honors thesis course, or with an honors directed studies, or honors directed research course. Students select honors courses and plan for a thesis project in consultation with their UHP adviser and their departmental faculty adviser.

Accelerated Program

Accelerated status in architecture is a competitive opportunity for qualified undergraduates to complete the B.S. with a major in architecture and the M.Arch. degree in six years rather than seven. Accelerated status applicants must complete all but 15 credits of upper division architecture courses before their senior year.

Students complete the first year of the graduate professional degree program in their senior year; courses carry upper division credit and complete the B.S.



To be considered for accelerated status, students must be enrolled at the University as a B.S. major in architecture, have completed one year of architecture design studio (ARCH 3281, ARCH 3282), have completed 90 credits, and have earned an overall GPA of 3.50. Admission to accelerated status does not guarantee admission to the graduate professional program; separate requirements, such as the Graduate Record Examination (GRE) and other application documents, must be submitted in January of the year admission to the graduate program is sought. See the director of graduate studies in the School of Architecture for additional criteria. Deadline for consideration is June 15.



Twin Cities Campus

Architecture B.S. Arch.

School of Architecture

College of Design

• **Students will no longer be accepted into this program after Fall 2007. Program requirements below are for current students only.**

- Program Type: Baccalaureate
- Requirements for this program are current for Fall 2012
- Required credits to graduate with this degree: 120
- Required credits within the major: 87
- Degree: Bachelor of Science in Architecture

The bachelor of science (B.S.Arch.) degree with a major in architecture provides instruction in history, representation, design, theory, and technology, emphasizing the development of architecture as a language of form, space, and order. The program requires an understanding of social, cultural, and physical contexts as a foundation for the examination of the methods, values, precedents, and material reality characteristic of the process of shaping natural and built environments. The major combines core prerequisites with a focused introduction to the discipline of architecture, including required courses in representation, history, theory, technology, and design processes.

All major coursework must be taken A-F.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Admission Requirements

Students must complete 11 courses before admission to the program.

Freshman and transfer students are usually admitted to pre-major status before admission to this major

A GPA above 2.0 is preferred for the following:

- 2.80 already admitted to the degree-granting college
- 2.80 transferring from another University of Minnesota college
- 2.80 transferring from outside the University

Students apply for admission to the bachelor of science in architecture (B.S.Arch.) at the end of their sophomore year. Admission is competitive and based on portfolio review, GPA, and courses completed. Students must be admitted first to the bachelor of arts with a major in architecture (B.A.) or the bachelor of design in architecture (B.D.A.) to apply for the B.S.Arch. The first group of courses (plus freshman comp and all high school prep classes) must be completed with a minimum grade of C- before admission to the B.A. or the B.D.A. The second group of courses need to be completed prior to admission to the B.S.Arch.

For information about University of Minnesota admission requirements, visit the [Office of Admissions website](#).

Requirements for the B.A. or B.D.A.

- [ARCH 1281](#) - Design Fundamentals I (4.0 cr)
- [ARCH 1701](#) - The Designed Environment (3.0 cr)

Courses to be taken before admission to B.S.Arch.

- [ARCH 2301](#) - Introduction to Drawing in Architecture (4.0 cr)
- [ARCH 2281](#) - Design Fundamentals II (4.0 cr)
- [ARCH 3711W](#) - Environmental Design and the Sociocultural Context [WI] (3.0 cr)
- [ARCH 3411W](#) - Architectural History to 1750 [HIS, GP, WI] (3.0 cr)
- [ARCH 3412](#) - Architectural History Since 1750 [HIS, GP] (3.0 cr)
- [LA 3501](#) - Environmental Design and Its Biological and Physical Context [ENV] (3.0 cr)
- [MATH 1142](#) - Short Calculus [MATH] (4.0 cr)
or [MATH 1271](#) - Calculus I [MATH] (4.0 cr)
- [PHYS 1101W](#) - Introductory College Physics I [PHYS, WI] (4.0 cr)
or [PHYS 1201W](#) - Introductory Physics for Biology and Pre-medicine I [PHYS, WI] (5.0 cr)
or [PHYS 1301W](#) - Introductory Physics for Science and Engineering I [PHYS, WI] (4.0 cr)



General Requirements

All students are required to complete general University and college requirements including writing and liberal education courses. For more information about University-wide requirements, see the [liberal education requirements](#). Required courses for the major or minor in which a student receives a D grade (with or without plus or minus) do not count toward the major or minor (including transfer courses).

Program Requirements

Students should maintain a portfolio of all freehand drawings, projects, and architecture studio designs. A portfolio is required for application to B.S.Arch. and the accelerated program and the graduate professional degree program.

All courses, including courses in math, physics, and English composition must be taken A-F with grades of C- or better to satisfy degree requirements and to progress in sequence courses.

Accelerated status in architecture is a competitive opportunity for qualified undergraduates to complete the B.S.Arch. or the B.A. degree with a major in architecture and the M.Arch. degree in six years rather than seven. See an adviser for more information.

Major coursework

- ARCH 3281 - Undergraduate Architecture Studio I (6.0 cr)
- ARCH 3282 - Undergraduate Architecture Studio II (6.0 cr)
- ARCH 4283 - Undergraduate Architecture Studio III (6.0 cr)
- ARCH 4284 - Undergraduate Architecture Studio IV (6.0 cr)
- ARCH 4511 - Materials and Methods I (3.0 cr)
- ARCH 4521 - Environmental Technology I (3.0 cr)
- ARCH 4571 - Architectural Structures I (3.0 cr)

Courses to be completed any time prior to graduation

- ARCH 3611 - Design in the Digital Age (3.0 cr)
- ARCH 4561 - Architecture and Ecology (3.0 cr)
- ARCH 4701W - Introduction to Urban Form and Theory [WI] (3.0 cr)
- ARCH 4421W - Architecture and Interpretation: The Cave and the Light [WI] (3.0 cr)
 - or ARCH 4423 - Gothic Architecture (3.0 cr)
 - or ARCH 4424 - Renaissance Architecture (3.0 cr)
 - or ARCH 4425 - Baroque Architecture (3.0 cr)
 - or ARCH 4431W *{Inactive}*[WI] (3.0 cr)
 - or ARCH 4432 - Modern Architecture (3.0 cr)
 - or ARCH 4434 - Contemporary Architecture (3.0 cr)
 - or ARCH 4445W - Suburbia [WI] (3.0 cr)
 - or ARCH 4446 *{Inactive}*(3.0 cr)
 - or ARCH 4461 - North American Indian Architecture (3.0 cr)

Architecture electives

Nine upper division architecture credits not used elsewhere. ARCH 3351 and 3352 do not satisfy this requirement.

Take 9 or more credits(s) from the following:

- ARCH 3xxx
- ARCH 4xxx

Upper division credits outside the major

Nine upper division credits outside the major.

Program Sub-plans

A sub-plan is not required for this program.

Accelerated Program

Accelerated status in architecture is a competitive opportunity for qualified undergraduates to complete the B.S.Arch. or the B.A. degree with a major in architecture and the M.Arch. degree in six years rather than seven. Accelerated status applicants must complete all but 14 credits of upper division architecture courses before their senior year.

Students complete the first year of the graduate professional degree program in their senior year; courses carry upper division credit and complete the B.S.Arch. or B.A. degree.



To be considered for accelerated status, students must be enrolled at the University as a B.S.Arch. or B.A. major in architecture, have completed one year of architecture design studio (ARCH 3281, ARCH 3282), have completed 90 credits, and have earned an overall GPA of 3.50. Admission to accelerated status does not guarantee admission to the graduate professional program; separate requirements, such as the Graduate Record Examination (GRE) and other application documents, must be submitted in January of the year admission to the graduate program is sought. See the director of graduate studies in the School of Architecture for additional criteria. Deadline for consideration is June 15.

Honors

This is an honors sub-plan.

See an adviser for honors program requirements.



Twin Cities Campus

Graphic Design B.F.A.

DHA Graphic Design

College of Design

- Program Type: Baccalaureate
- Requirements for this program are current for Fall 2012
- Required credits to graduate with this degree: 120
- Required credits within the major: 79 to 91
- Degree: Bachelor of Fine Arts

The graphic design program educates students in design thinking, design methods, design theory, creative problem solving, and visual and verbal literacy. An emphasis is placed on visual components: how humans communicate, perceive, interpret, and understand visual information. The program fosters flexibility, which enables graduates to adapt to social, cultural, and technological change in graphic design. The program's foundation is broadly based. Students begin with courses in fundamental aspects of visual studies. Upper division courses prepare them for graphic design positions in print and electronic media. An internship of 1-3 credits is required.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Admission Requirements

Students must complete 5 courses before admission to the program.

Freshman and transfer students are usually admitted to pre-major status before admission to this major

A GPA above 2.0 is preferred for the following:

- 2.50 already admitted to the degree-granting college
- 2.50 transferring from another University of Minnesota college
- 2.50 transferring from outside the University

Admission to pre-major status is decided by a competitive holistic review. Students must maintain an overall GPA of 2.50 during pre-major coursework. In addition, students must receive a minimum grade of C- or better in the required pre-major courses before going through portfolio review (not just a 2.50 GPA). Once students have achieved major status, they must maintain a GPA of 2.00.

Students must be admitted to the pre-major status program to take most of the pre-graphic design coursework.

For information about University of Minnesota admission requirements, visit the [Office of Admissions website](#).

Pre-Graphic Design Courses

- [DES 1101W](#) - Introduction to Design Thinking [AH, WI] (4.0 cr)
- [GDES 1311](#) - Foundations: Drawing and Design in Two and Three Dimensions (4.0 cr)
- [GDES 1312](#) - Foundations: Color and Design in Two and Three Dimensions (4.0 cr)
- [GDES 1315](#) - Foundations: The Graphic Studio (4.0 cr)
- [DES 2101](#) - Design and Visual Presentation (3.0 cr)

General Requirements

All students are required to complete general University and college requirements including writing and liberal education courses. For more information about University-wide requirements, see the [liberal education requirements](#). Required courses for the major or minor in which a student receives a D grade (with or without plus or minus) do not count toward the major or minor (including transfer courses).

Program Requirements

All coursework must be taken A-F (with the exception of the internship).

Communication Courses

- [COMM 1101](#) - Introduction to Public Speaking [CIV] (3.0 cr)
or [PSTL 1461](#) - Multicultural Perspectives in Public Speaking [CIV] (3.0 cr)



or [DES 3309](#) - Storytelling and Design (3.0 cr)
[WRIT 3562W](#) - Technical and Professional Writing [WI] (4.0 cr)
or [ENGL 3027W](#) - The Essay [WI] (4.0 cr)
or [WRIT 3029W](#) - Business and Professional Writing [WI] (3.0 cr)

Art History Courses

[ARCH 3411W](#) - Architectural History to 1750 [HIS, GP, WI] (3.0 cr)
or [ARCH 3412](#) - Architectural History Since 1750 [HIS, GP] (3.0 cr)
or [ARTH 1xxx](#)
or [ARTH 2xxx](#)
or [ARTH 3xxx](#)
or [ARTH 4xxx](#)
or [ARTH 5xxx](#)
or [ADES 4121](#) - History of Costume (4.0 cr)
or [IDES 3161](#) - History of Interiors and Furnishings: Ancient to 1750 [GP] (4.0 cr)

Business, Economics, or Marketing Courses

Students must select one course in either business, economics, or marketing.

[ACCT 1xxx](#)
or [ACCT 2xxx](#)
or [ACCT 3xxx](#)
or [ACCT 4xxx](#)
or [ACCT 5xxx](#)
or [APEC 1101](#) - Principles of Microeconomics [SOCS, GP] (4.0 cr)
or [APEC 1102](#) - Principles of Macroeconomics (3.0 cr)
or [APEC 1251](#) - Principles of Accounting (3.0 cr)
or [ECON 1xxx](#)
or [ECON 2xxx](#)
or [ECON 3xxx](#)
or [ECON 4xxx](#)
or [ECON 5xxx](#)
or [MGMT 3xxx](#)
or [MKTG 3xxx](#)
or [PSTL 1511](#) - Introduction to Business and Society (4.0 cr)

Photography Courses

[ARTS 1701](#) - Photography [AH] (4.0 cr)
or [ARTS 1703](#) - Digital Photography [AH] (4.0 cr)
or [GDES 4351](#) - Design Process: Photography (3.0 cr)
or [PSTL 1485](#) - Creativity: Photography (4.0 cr)

Major Courses

Basic Design Requirements

[GDES 2342](#) - Web Design (3.0 cr)
[GDES 2345](#) - Typography (4.0 cr)

Advanced Design Requirements

[DES 3201](#) - Career and Internship Preparation for Design (1.0 cr)
[GDES 2399W](#) - Design and its Discontents: Design, Society, Economy and Culture [WI] (3.0 cr)
[GDES 3312](#) - Color and Form in Surface Design (4.0 cr)
[GDES 3351](#) - Text and Image (3.0 cr)
[GDES 3352](#) - Identity and Symbols (3.0 cr)
[GDES 3353](#) - Packaging and Display (3.0 cr)
[GDES 4131W](#) - History of Graphic Design [WI] (4.0 cr)
[GDES 4196](#) - Internship in Graphic Design (1.0 - 3.0 cr)
[GDES 4345](#) - Advanced Typography (4.0 cr)
[GDES 4361W](#) - Thesis Studio and Writing [WI] (4.0 cr)
[GDES 4362](#) - Senior Thesis and Exhibition (4.0 cr)

Electives

Other GDES topics courses or GDES field study may be used for this requirement. See your adviser.

Take exactly 3 course(s) from the following:

- [DES 3311](#) - Travels in Typography (3.0 cr)
- [DES 3341](#) - (un)Wrapping It Up: New Materials for Design, Design for New Materials (3.0 cr)
- [DES 5165](#) - Design and Globalization (3.0 cr)
- [DES 5168](#) - Evidence-Based Design (3.0 cr)



- DES 5185 - Human Factors in Design (3.0 cr)
- GDES 2350 - Design Material Topics (1.0 - 4.0 cr)
- GDES 4350 - Advanced Design Material Topics (1.0 - 4.0 cr)
- GDES 4351 - Design Process: Photography (3.0 cr)
- GDES 4352 - Design Process: Bookmaking (3.0 cr)
- GDES 5341 - Interactive Design (3.0 cr)
- GDES 5342 - Web and Interface Design (3.0 cr)
- GDES 5383 - Digital Illustration and Animation (3.0 cr)
- GDES 5386 - Fundamentals of Game Design (3.0 cr)
- GDES 5388 - Graphic Design Research (3.0 cr)
- GDES 5399 - Theory of Electronic Design (3.0 cr)
- PDES 5701 - Creativity, Idea Generation, and Innovation (2.0 cr)
- PDES 5702 - Concept Sketching and Rendering (2.0 cr)
- PDES 5711 - Toy Product Design (4.0 cr)

Program Sub-plans

A sub-plan is not required for this program.

Honors UHP

This is an honors sub-plan.

Students admitted to the University Honors Program (UHP) must fulfill UHP requirements, in addition to degree program requirements. Honors courses used to fulfill degree program requirements will also fulfill UHP requirements.

Current departmental honors course offerings are listed at:
http://www.honors.umn.edu/academics/curriculum/dept_courses_current.html.

Honors students complete an honors thesis project in the final year, most often in conjunction with an honors thesis course, or with an honors directed studies, or honors directed research course. Students select honors courses and plan for a thesis project in consultation with their UHP adviser and their departmental faculty adviser.



Twin Cities Campus

Graphic Design B.S.

Design, Housing & Apparel

College of Design

- **Students will no longer be accepted into this program after Spring 2010. Program requirements below are for current students only.**
- **In fall 2010, the degree associated with the graphic design program changed from the B.S. to the B.F.A.**
- Program Type: Baccalaureate
- Requirements for this program are current for Fall 2012
- Required credits to graduate with this degree: 120
- Required credits within the major: 86 to 91
- Degree: Bachelor of Science

The graphic design program educates students in design methods, design theory, creative problem solving, and visual and verbal literacy. An emphasis is placed on visual components: how humans communicate, perceive, interpret, and understand visual information. The program fosters flexibility, which enables graduates to adapt to social, cultural, and technological change in graphic design. The program's foundation is broadly based. Students begin with courses in fundamental aspects of visual studies. Upper division courses prepare them for graphic design positions in print and electronic media. An internship of 1-4 credits is required.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Admission Requirements

Students must complete 4 courses before admission to the program.

Freshman and transfer students are usually admitted to pre-major status before admission to this major

A GPA above 2.0 is preferred for the following:

- 2.50 already admitted to the degree-granting college
- 2.50 transferring from another University of Minnesota college
- 2.50 transferring from outside the University

Admission to pre-major status is decided by a competitive holistic review. Students must maintain a GPA of 2.50 during pre-major coursework. In addition, students must receive a minimum grade of C- or better in the required pre-major courses before going through portfolio review (not just a 2.50 GPA). Once students have achieved major status, they must maintain a GPA of 2.00.

Students must be admitted to the pre-major status program to take most of the pre-graphic design coursework.

For information about University of Minnesota admission requirements, visit the [Office of Admissions website](#).

Pre-Graphic Design Courses

[DES 1101W](#) - Introduction to Design Thinking [AH, WI] (4.0 cr)

[GDES 1311](#) - Foundations: Drawing and Design in Two and Three Dimensions (4.0 cr)

[GDES 1312](#) - Foundations: Color and Design in Two and Three Dimensions (4.0 cr)

[GDES 1315](#) - Foundations: The Graphic Studio (4.0 cr)

General Requirements

All students are required to complete general University and college requirements including writing and liberal education courses. For more information about University-wide requirements, see the [liberal education requirements](#). Required courses for the major or minor in which a student receives a D grade (with or without plus or minus) do not count toward the major or minor (including transfer courses).

Program Requirements

All coursework must be taken A-F (with the exception of the internship).



Communication Courses

- COMM 1101 - Introduction to Public Speaking [CIV] (3.0 cr)
or PSTL 1461 - Multicultural Perspectives in Public Speaking [CIV] (3.0 cr)
- WRIT 3562W - Technical and Professional Writing [WI] (4.0 cr)
or ENGL 3027W - The Essay [WI] (4.0 cr)

Art History Courses

- ARCH 3411W - Architectural History to 1750 [HIS, GP, WI] (3.0 cr)
or ARCH 3412 - Architectural History Since 1750 [HIS, GP] (3.0 cr)
or ARTH 1xxx
or ARTH 2xxx
or ARTH 3xxx
or ARTH 4xxx
or ARTH 5xxx
- or ADES 4121 - History of Costume (4.0 cr)
- or IDES 3161 - History of Interiors and Furnishings: Ancient to 1750 [GP] (4.0 cr)

Business, Economics, or Marketing Courses

Students must select one course in either business, economics, or marketing.

- ACCT 1xxx
or ACCT 2xxx
or ACCT 3xxx
or ACCT 4xxx
or ACCT 5xxx
- or APEC 1101 - Principles of Microeconomics [SOCS, GP] (4.0 cr)
- or APEC 1102 - Principles of Macroeconomics (3.0 cr)
- or APEC 1251 - Principles of Accounting (3.0 cr)
- or ECON 1xxx
or ECON 2xxx
or ECON 3xxx
or ECON 4xxx
or ECON 5xxx
- or PSTL 1511 - Introduction to Business and Society (4.0 cr)
- or PSTL 1513 *{Inactive}*(3.0 cr)
- or MGMT 3xxx
or MKTG 3xxx

History Courses

- AFRO 3204 - History of South Africa to 1910 (3.0 cr)
or AFRO 3205 - History of South Africa from 1910 (3.0 cr)
- or AFRO 3431 - Early Africa and Its Global Connections [HIS, GP] (4.0 cr)
- or AFRO 3432 - Modern Africa in a Changing World [HP, IP] (4.0 cr)
- or AFRO 3864 - African American History: 1619 to 1865 (4.0 cr)
- or AFRO 3865 - African American History: 1865 to the Present (4.0 cr)
- or AMIN 3871 - American Indian History: Pre-Contact to 1830 [HIS, DSJ] (3.0 cr)
- or AMIN 3872 - American Indian History: 1830 to the Present (3.0 cr)
- or CNES 1043 - Introduction to Greek and Roman Archaeology (4.0 cr)
- or PSTL 1231 - U.S. History: Multicultural Perspectives [HIS, DSJ] (4.0 cr)
- or PSTL 1251 - Global History and Culture [HIS, GP] (4.0 cr)
- or HIST 1011V *{Inactive}*[WI] (4.0 cr)
- or HIST 1011W - Civilization and the Environment: World History to 1500 [HIS, ENV, WI] (4.0 cr)
- or HIST 1012V *{Inactive}*[WI] (4.0 cr)
- or HIST 1012W - The Age of Global Contact [HIS, GP, WI] (4.0 cr)
- or HIST 1015W - Globalization: Issues and Challenges [GP, WI] (4.0 cr)
- or HIST 1017 - Origins: Global Societies Before 1500 (3.0 cr)
- or HIST 1018 - The Age of Global Contact (3.0 cr)
- or HIST 1019 - Globalization: Issues and Challenges (3.0 cr)
- or HIST 1026 - Europe and the World: Expansion, Encounter, and Exchange to 1500 (3.0 cr)
- or HIST 1027 - Europe and the World: Expansion, Encounter, and Exchange from 1500 to Present (3.0 cr)
- or HIST 1031V *{Inactive}*[WI] (4.0 cr)
- or HIST 1031W - Europe and the World: Expansion, Encounter, and Exchange to 1500 [HIS, GP, WI] (4.0 cr)
- or HIST 1032V *{Inactive}*[WI] (4.0 cr)
- or HIST 1032W - Europe and the World: Expansion, Encounter, and Exchange from 1500 to Present [HIS, GP, WI] (4.0 cr)
- or HIST 1301V *{Inactive}*[WI] (4.0 cr)
- or HIST 1301W - Authority and Rebellion: American History to 1865 [HIS, DSJ, WI] (4.0 cr)



or HIST 1302V *{Inactive}*[WI] (4.0 cr)
or HIST 1302W - Global America: U.S. History Since 1865 [HIS, DSJ, WI] (4.0 cr)
or HIST 1307 - Authority and Rebellion: American History to 1865 [HIS] (3.0 cr)
or HIST 1308 - Global America: U.S. History Since 1865 [HIS] (3.0 cr)
or HIST 3151W - British History to the 17th Century [HIS, GP, WI] (4.0 cr)
or HIST 3152 - British History From the Seventeenth Century [HIS, GP] (4.0 cr)
or HIST 3211 - History of Sexuality in Europe (3.0 cr)
or HIST 3347 - Women in Early and Victorian America: 1600-1890 [HIS, DSJ] (3.0 cr)
or HIST 3348 - Women in Modern America (3.0 - 4.0 cr)
or HIST 3401W - Early Latin America to 1825 [HIS, GP, WI] (4.0 cr)
or HIST 3402W - Modern Latin America 1825 to Present [HIS, GP, WI] (4.0 cr)
or HIST 3421 *{Inactive}*[HP, IP] (3.0 cr)
or HIST 3431 - Early Africa and Its Global Connections [HIS, GP] (4.0 cr)
or HIST 3432 - Modern Africa in a Changing World [HIS, GP] (4.0 cr)
or HIST 3461 - Introduction to East Asia I: The Imperial Age (3.0 - 4.0 cr)
or HIST 3462 - From Subjects to Citizens: The History of East Asia From 1500 to the Present [HIS, GP] (3.0 - 4.0 cr)
or HIST 3467W *{Inactive}*[WI] (3.0 cr)
or HIST 3468 - Social Change in Modern China (3.0 cr)
or HIST 3471 - Modern Japan, Meiji to the Present (1868-2000) [HIS] (3.0 cr)
or HIST 3472 *{Inactive}*(3.0 cr)
or HIST 3474 *{Inactive}*[HP, IP] (3.0 cr)
or HIST 3608W - History of the Catholic Church in the Middle Ages [WI] (3.0 cr)
or HIST 3611 - Medieval Cities of Europe: 500-1500 [HIS, GP] (3.0 cr)
or HIST 3615W - Women in European History: 1500 to the Present [HIS, GP, WI] (3.0 cr)
or HIST 3616 - France in the Middle Ages (3.0 cr)
or HIST 3621 - Renaissance Italy: 1200-1550 (3.0 cr)
or HIST 3626 *{Inactive}*(3.0 cr)
or HIST 3703W *{Inactive}*[WI] (3.0 cr)
or HIST 3704W - Daily Life in Europe: 1300-1800 [HIS, GP, WI] (3.0 cr)
or HIST 3721 - Studies in 20th-Century Europe From the Turn of the Century to the End of World War II: 1900-45 (3.0 cr)
or HIST 3722 - Studies in 20th-Century Europe From the End of World War II to the End of the Cold War: 1945-91 (3.0 cr)
or HIST 3801 - The People of Early America: 16th to 18th Centuries (3.0 cr)
or HIST 3871 - American Indian History: Pre-Contact to 1830 [HIS, DSJ] (3.0 cr)
or HIST 3872 - American Indian History: 1830 to the Present [HIS, DSJ] (3.0 cr)
or HSCI 1714 - Technology and Civilization: Stone Tools to Steam Engines [HIS, TS] (3.0 - 4.0 cr)
or HSCI 1715 - Technology and Civilization: Waterwheels to the Web [HIS, TS] (3.0 - 4.0 cr)
or HSCI 1814 - Revolutions in Science: The Babylonians to Newton [HIS, GP] (3.0 - 4.0 cr)
or HSCI 1815 - Revolutions in Science: Lavoisier, Darwin, and Einstein [HIS, GP] (3.0 - 4.0 cr)
or HSCI 3331 - Technology and American Culture [HIS, TS] (3.0 cr)
or HSCI 3332 - Science and American Culture [HIS, DSJ] (3.0 cr)
or HSCI 3714 - Technology and Civilization: Stone Tools to Steam Engines [HIS, TS] (3.0 - 4.0 cr)
or HSCI 3715 - Technology and Civilization: Waterwheels to the Web [HIS, TS] (3.0 - 4.0 cr)
or HSCI 3814 - Revolutions in Science: The Babylonians to Newton [HIS, GP] (3.0 - 4.0 cr)
or HSCI 3815 - Revolutions in Science: Lavoisier, Darwin, and Einstein [HIS, GP] (3.0 - 4.0 cr)

Photography Courses

ARTS 1701 - Photography [AH] (4.0 cr)
or GDES 4351 - Design Process: Photography (3.0 cr)
or PSTL 1485 - Creativity: Photography (4.0 cr)
or UC 1485 - Creativity: Photography (4.0 cr)

Major Courses

GDES 2311 *{Inactive}*(3.0 cr)
GDES 2334 *{Inactive}*(3.0 cr)
GDES 2345 - Typography (4.0 cr)
GDES 3351 - Text and Image (3.0 cr)
GDES 2385W *{Inactive}*[WI] (4.0 cr)
GDES 3312 - Color and Form in Surface Design (4.0 cr)
GDES 3352 - Identity and Symbols (3.0 cr)
GDES 3353 - Packaging and Display (3.0 cr)
GDES 4131W - History of Graphic Design [WI] (4.0 cr)
ADES 4196 - Internship in Apparel Design (1.0 - 4.0 cr)
GDES 4334 *{Inactive}*(3.0 cr)
GDES 4345 - Advanced Typography (4.0 cr)
GDES 4355 - Graphic Design Portfolio (3.0 cr)



GDES 4354 - Graphic Design IV: Integrative Campaign (4.0 cr)
GDES 4365W ~~{Inactive}~~[WI] (3.0 cr)

Emphasizing Materials Courses

Students must take one course emphasizing materials (DHA 4351 may be used if not taken for photography requirement). See an adviser for course options other than those in the list below.

GDES 4330 - Surface Fabric Design Workshop (4.0 cr)
or DHA 4340 ~~{Inactive}~~(4.0 cr)
or GDES 4351 - Design Process: Photography (3.0 cr)
or GDES 4352 - Design Process: Bookmaking (3.0 cr)

Electives

See an adviser for course options other than those listed below.

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

- GDES 5341 - Interactive Design (3.0 cr)
- GDES 5342 - Web and Interface Design (3.0 cr)
- DHA 5382 ~~{Inactive}~~(3.0 cr)
- GDES 5383 - Digital Illustration and Animation (3.0 cr)
- GDES 5386 - Fundamentals of Game Design (3.0 cr)

Program Sub-plans

A sub-plan is not required for this program.

Honors UHP

This is an honors sub-plan.

Students admitted to the University Honors Program (UHP) must fulfill UHP requirements in addition to degree program requirements. For any course required in a degree program, UHP students must register for the honors version if one is offered. Honors courses used to fulfill degree program requirements will also fulfill UHP requirements.

College of Design students in honors programs complete sophisticated academic and creative projects that provide intensive learning experiences. In the final year, students must complete an honors project.



Twin Cities Campus

Housing Studies B.S.

DHA Housing Studies

College of Design

- Program Type: Baccalaureate
- Requirements for this program are current for Fall 2012
- Required credits to graduate with this degree: 120
- Required credits within the major: 68 to 80
- This program requires summer terms.
- Degree: Bachelor of Science

The housing studies program allows students to study shelter in its multiple dimensions. Coursework in the program includes social and behavioral sciences, economics, public policy, planning, and technology.

After first acquiring a broad background of housing courses, students select one of five areas of concentration: community development and policy, housing technology, management and finance, selected populations, or sustainability.

The housing studies program provides the academic background and professional preparation needed for graduate studies leading to college teaching, research, or planning/administrative positions.

Depending upon prior coursework, the housing studies major requirements can often be completed in two years. Students are encouraged to meet with an adviser to discuss their specific situations.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Admission Requirements

For information about University of Minnesota admission requirements, visit the [Office of Admissions website](#).

General Requirements

All students are required to complete general University and college requirements including writing and liberal education courses. For more information about University-wide requirements, see the [liberal education requirements](#). Required courses for the major or minor in which a student receives a D grade (with or without plus or minus) do not count toward the major or minor (including transfer courses).

Program Requirements

All coursework in the major must be taken A-F (with the exception of the internship).

Communication Courses

- COMM 1101 - Introduction to Public Speaking [CIV] (3.0 cr)
or PSTL 1461 - Multicultural Perspectives in Public Speaking [CIV] (3.0 cr)
- WRIT 3562W - Technical and Professional Writing [WI] (4.0 cr)
or ENGL 3027W - The Essay [WI] (4.0 cr)
or WRIT 3029W - Business and Professional Writing [WI] (3.0 cr)

Required Major Coursework

An internship of at least 300 hours in a situation related to the student's area of specialization is required. Students must complete at least half of the required core program courses before enrolling in the internship (HSG 4196).

- HSG 2401 - Introduction to Housing (3.0 cr)
- HSG 2463 - Housing and Community Development (3.0 cr)
- HSG 4196 - Internship in Housing Studies (1.0 - 4.0 cr)
- HSG 4461 - Housing Development and Management (3.0 cr)
- HSG 4467W - Housing and the Social Environment [WI] (4.0 cr)
- HSG 5463 - Housing Policy (3.0 cr)
- DES 1101W - Introduction to Design Thinking [AH, WI] (4.0 cr)
or ARCH 1701 - The Designed Environment (3.0 cr)
or ARCH 1281 - Design Fundamentals I (4.0 cr)



or LA 1201 - Learning from the Landscape [AH, DSJ] (3.0 cr)
HSG 4465 - Housing in a Global Perspective (3.0 cr)
or HSG 5484 - Rural Housing Issues (3.0 cr)
HSG 5481 - Promoting Independence in Housing and Community (3.0 cr)
or HSG 3482 - Sustainable Housing: Community, Environment, and Technology [TS] (3.0 cr)
APEC 1101 - Principles of Microeconomics [SOCS, GP] (4.0 cr)
or APEC 1102 - Principles of Macroeconomics (3.0 cr)
or ECON 1101 - Principles of Microeconomics [SOCS, GP] (4.0 cr)
or ECON 1102 - Principles of Macroeconomics (4.0 cr)
or ECON 3701 - Money and Banking (3.0 cr)
or ECON 3801 - Elements of Public Economics (3.0 cr)
FSOS 3101 - Personal and Family Finances (3.0 cr)
or FSOS 3102 - Family Systems and Diversity [SOCS, DSJ] (3.0 cr)
or FSOS 4106 - Family Resource Management (3.0 cr)
GEOG 3371W - Cities, Citizens, and Communities [DSJ, WI] (4.0 cr)
or PA 4200 - Urban and Regional Planning (3.0 cr)
EPSY 3264 - Basic and Applied Statistics [MATH] (3.0 cr)
or PSTL 1004 - Statistics [MATH] (4.0 cr)
or SCO 2550 - Business Statistics: Data Sources, Presentation, and Analysis (4.0 cr)
or STAT 1001 - Introduction to the Ideas of Statistics [MATH] (4.0 cr)
or STAT 3011 - Introduction to Statistical Analysis [MATH] (4.0 cr)
HSG 4413 - A Systems Approach to Residential Construction (4.0 cr)
or BBE 4413 - Systems Approach to Residential Construction (4.0 cr)

Program Sub-plans

Students are required to complete one of the following sub-plans. (Note for the Twin Cities and Morris campuses: The honors sub-plan does not meet this requirement. Honors students are required to complete one sub-plan plus the honors sub-plan. Please see an adviser if no honors sub-plan is listed for the program.)

Management/Finance

Courses in economics and business prepare students to work in public and private housing management, state finance agencies, commercial banks, and mortgage and title companies.

Students must complete at least 20 credits for the concentration.

Management and Finance Concentration

Courses listed below are suggested, but not inclusive. Students should consult with an adviser for other appropriate courses. Concentration courses must be primarily upper division and must be taken A-F. A minimum grade of C- is required. Note: a course may be used only once to satisfy program requirements.

Completion of a minor in applied economics, economics, entrepreneurial management, or management may be used toward the credit requirements in this concentration.

Take 20 or more credits(s) from the following:

- APEC 3001 - Applied Microeconomics: Consumers, Producers, and Markets (4.0 cr)
- APEC 3002 - Applied Microeconomics: Managerial Economics (4.0 cr)
- APEC 3006 - Applied Macroeconomics: Government and the Economy (3.0 cr)
- APEC 5341 - Public Finance (3.0 cr)
- BLAW 3058 - The Law of Contracts and Agency (4.0 cr)
- HSG 3482 - Sustainable Housing: Community, Environment, and Technology [TS] (3.0 cr)
- HSG 4465 - Housing in a Global Perspective (3.0 cr)
- HSG 5464 - Understanding Housing: Assessment and Analysis (3.0 cr)
- HSG 5481 - Promoting Independence in Housing and Community (3.0 cr)
- HSG 5484 - Rural Housing Issues (3.0 cr)
- ECON 3701 - Money and Banking (3.0 cr)
- ECON 3801 - Elements of Public Economics (3.0 cr)
- FINA 3001 - Finance Fundamentals (3.0 cr)
- GEOG 5361 - Geography and Real Estate (4.0 cr)
- MGMT 3001 - Fundamentals of Management (3.0 cr)
- MGMT 4002 - Managerial Psychology (4.0 cr)
- MKTG 3001 - Principles of Marketing (3.0 cr)
- MKTG 3010 - Marketing Research (4.0 cr)
- MKTG 3040 - Buyer Behavior (4.0 cr)
- WRIT 4573W - Writing Proposals and Grant Management [WI] (3.0 cr)



- APEC 1101 - Principles of Microeconomics [SOCS, GP] (4.0 cr)
or ECON 1101 - Principles of Microeconomics [SOCS, GP] (4.0 cr)
- APEC 1102 - Principles of Macroeconomics (3.0 cr)
or ECON 1102 - Principles of Macroeconomics (4.0 cr)
- APEC 1251 - Principles of Accounting (3.0 cr)
or ACCT 2050 - Introduction to Financial Reporting (4.0 cr)

Selected Populations

An area of concentration in selected populations may be fulfilled in two ways.

Option One and Option Two

Option One

Complete an appropriate minor along with additional credits in supporting courses. A concentration can be done in such minors as African-American and African studies; American Indian studies; Chicano studies; family social science; gay, lesbian, bi-sexual, and transgendered minor; gender, women, and sexuality studies; global studies; Latin American studies; social justice; or youth studies. For admission procedures and minor requirements, contact the department offering the minor.
Minor and coursework to total 20 credits

-OR-

Option Two

Concentrate on one or more special populations for which no specific undergraduate minor is offered. Choose courses from selected populations: older persons, low income, communities of color, and households with children. Courses from either list are approved for selected populations option two.

Selected Populations: older persons

Take 20 or more credits(s) from the following:

- HSG 5481 - Promoting Independence in Housing and Community (3.0 cr)
- HSG 5484 - Rural Housing Issues (3.0 cr)
- FSOS 4154W - Families and Aging [WI] (3.0 cr)
- GERO 5105 - Multidisciplinary Perspectives on Aging (3.0 cr)
- KIN 5385 - Exercise for Disease Prevention and Management (3.0 cr)
- PA 5412 - Aging and Disability Policy (3.0 cr)
- PSY 5138 - Psychology of Aging (3.0 cr)
- PUBH 3001 - Personal and Community Health (2.0 cr)
- WRIT 4573W - Writing Proposals and Grant Management [WI] (3.0 cr)
- SW 1001 - Introduction to the World of Social Work: A Global Perspective (3.0 cr)
- SW 5313 - Social Work with Older Adults (2.0 cr)
- GWSS 4201 - The Older Woman: A Feminist Perspective (3.0 cr)

or Selected Populations: low income, communities of color, and households with children

Take 20 or more credits(s) from the following:

- CPSY 3301 - Introductory Child Psychology for Social Sciences (4.0 cr)
- HSG 5464 - Understanding Housing: Assessment and Analysis (3.0 cr)
- HSG 5484 - Rural Housing Issues (3.0 cr)
- FSOS 3101 - Personal and Family Finances (3.0 cr)
- FSOS 3102 - Family Systems and Diversity [SOCS, DSJ] (3.0 cr)
- FSOS 3426 - Alcohol and Drugs: Families and Culture (3.0 cr)
- FSOS 4106 - Family Resource Management (3.0 cr)
- FSOS 4153 - Family Financial Counseling (3.0 cr)
- FSOS 4156 - Legal-Economic Controversies in Families (3.0 cr)
- PA 5401 - Poverty, Inequality, and Public Policy (3.0 cr)
- PA 5421 - Racial Inequality and Public Policy (3.0 cr)
- POL 1001 - American Democracy in a Changing World [SOCS] (4.0 cr)
- PUBH 3001 - Personal and Community Health (2.0 cr)
- PUBH 3003 - Fundamentals of Alcohol and Drug Abuse (2.0 cr)
- SOC 1001 - Introduction to Sociology [SOCS] (4.0 cr)
- SOC 3201 - Inequality: Introduction to Stratification (3.0 cr)
- SOC 3211W - American Race Relations [SOCS, DSJ, WI] (3.0 cr)
- SOC 3251W - Sociological Perspectives on Race, Class, and Gender [SOCS, DSJ, WI] (3.0 cr)
- SOC 3451W - Cities and Social Change [WI] (3.0 cr)
- SOC 3501 - Sociology of Families [SOCS, DSJ] (3.0 cr)
- SW 1001 - Introduction to the World of Social Work: A Global Perspective (3.0 cr)
- SW 5101 - Historical Origins and Contemporary Policies and Programs in Social Welfare (3.0 - 4.0 cr)
- WRIT 4573W - Writing Proposals and Grant Management [WI] (3.0 cr)



Sustainability

Courses in sustainability prepare students to work in government, housing construction and development firms, and in organizations focused on sustainability.

Sustainability Concentration

Courses listed below are suggested but not inclusive. Students should consult with an adviser for other appropriate courses.

Concentration courses must be primarily upper division and must be taken A-F. A minimum grade of C- is required. Note: a course may be used only once to satisfy housing studies program requirements. Completion of the sustainability studies minor is recommended.

Take 20 or more credits(s) from the following:

- [AFEE 5361](#) - World Development Problems (3.0 cr)
- [AGRO 3203W](#) - Environment, Global Food Production, and the Citizen [GP, WI] (3.0 cr)
- [AGRO 5321](#) - Ecology of Agricultural Systems (3.0 cr)
- [ANSC 3203W](#) - Environment, Global Food Production, and the Citizen [GP, WI] (3.0 cr)
- [ANTH 3041](#) - Ecological Anthropology (3.0 cr)
- [ANTH 4053](#) - Economy, Culture, and Critique [SOCS, GP] (3.0 cr)
- [ANTH 4069](#) (*Inactive*)(3.0 cr)
- [APEC 3611W](#) - Environmental and Natural Resource Economics [ENV, WI] (3.0 cr)
- [APEC 5611](#) - Economic Aspects of Environmental Management (3.0 cr)
- [ARCH 4561](#) - Architecture and Ecology (3.0 cr)
- [BBE 4733](#) - Renewable Energy Technologies [TS] (3.0 cr)
- [BIOL 3407](#) - Ecology (3.0 cr)
- [BIOL 3408W](#) - Ecology [WI] (3.0 cr)
- [CE 3501](#) - Environmental Engineering [ENV] (3.0 cr)
- [CE 4561](#) - Solid Hazardous Wastes (3.0 cr)
- [CE 5212](#) - Transportation Policy, Planning, and Deployment (4.0 cr)
- [CE 5214](#) - Transportation Systems Analysis (4.0 cr)
- [CHEN 5551](#) - Survey of Renewable Energy Technologies (3.0 cr)
- [EEB 3001](#) - Ecology and Society [ENV] (3.0 cr)
- [EEB 4609W](#) - Ecosystem Ecology [ENV, WI] (3.0 cr)
- [EEB 5146](#) - Science and Policy of Global Environmental Change (3.0 cr)
- [ENGL 3501](#) - Public Discourse: Coming to Terms With the Environment [LITR, ENV] (3.0 cr)
- [ESPM 3011W](#) - Ethics in Natural Resources [WI] (3.0 cr)
- [ESPM 3241W](#) - Natural Resource and Environmental Policy [SOCS, CIV, WI] (3.0 cr)
- [ESPM 3245](#) - Sustainable Land Use Planning and Policy [ENV] (3.0 cr)
- [ESPM 3251](#) - Natural Resources in Sustainable International Development [GP] (3.0 cr)
- [ESPM 3261](#) - Economics and Natural Resources Management [SOCS, ENV] (4.0 cr)
- [ESPM 3601](#) - Sustainable Housing--Community, Environment, and Technology [TS] (3.0 cr)
- [ESPM 3602](#) - Regulations and Corporate Environmental Management (3.0 cr)
- [ESPM 3603](#) - Environmental Life Cycle Analysis (3.0 cr)
- [ESPM 3604](#) - Environmental Management Systems and Strategy (3.0 cr)
- [ESPM 5245](#) - Sustainable Land Use Planning and Policy (3.0 cr)
- [ESPM 5602](#) - Regulations and Corporate Environmental Management (3.0 cr)
- [FR 5146](#) - Science and Policy of Global Environmental Change (3.0 cr)
- [FW 4102](#) - Principles of Conservation Biology [ENV] (3.0 cr)
- [ESCI 3005](#) - Earth Resources (3.0 cr)
- [GEOG 3379](#) - Environment and Development in the Third World [SOCS, ENV] (3.0 cr)
- [GEOG 3401](#) - Geography of Environmental Systems and Global Change [ENV] (4.0 cr)
- [GLOS 3303](#) - Environment and Development in the Third World [SOCS, ENV] (3.0 cr)
- [HSCI 3244](#) - History of Ecology and Environmentalism [HIS, ENV] (3.0 cr)
- [HSG 3482](#) - Sustainable Housing: Community, Environment, and Technology [TS] (3.0 cr)
- [ID 3591](#) - HECUA Off-Campus Study Program: Environmental Sustainability: Adaptive Ecosystem Management [ENV] (4.0 cr)
- [ID 3592](#) - HECUA Off-Campus Study Program: Environmental Sustainability: Dimensions of Environmental Change [SOCS] (4.0 cr)
- [LA 3501](#) - Environmental Design and Its Biological and Physical Context [ENV] (3.0 cr)
- [LA 4755](#) - Infrastructure, Natural Systems, and Space of Inhabited Landscapes [TS] (3.0 cr)
- [PA 5232](#) - Transportation Policy, Planning, and Deployment (4.0 cr)
- [PHIL 3301](#) - Environmental Ethics [ENV] (4.0 cr)
- [SOC 3613W](#) - Food, Culture, and Society [SOCS, GP, WI] (3.0 cr)
- [SOC 4305](#) - Society and the Environment: A Growing Conflict (3.0 cr)
- [SOC 4311](#) - Race, Class, and the Politics of Nature (3.0 cr)
- [SUST 3003](#) - Sustainable People, Sustainable Planet [ENV] (3.0 cr)
- [SUST 4004](#) - Sustainable Communities (3.0 cr)
- [URBS 3751](#) - Understanding the Urban Environment [ENV] (3.0 cr)



Comm Dev/Policy

Courses in planning, geography, political science, and urban studies prepare students to work with housing and redevelopment authorities, city or regional planning departments, and nonprofit organizations in policy making, planning, and housing development.

HSG 5464 and 17 credits from a variety of courses are required.

Community Development and Policy Concentration

Courses listed below are suggested, but not inclusive. Students should consult with an adviser for other appropriate courses.

Concentration courses must be primarily upper division and must be taken A-F. A minimum grade of C- is required. Note: A course may be used only once to satisfy program requirements.

Completion of a minor in landscape design and planning, geography, social justice, or urban studies may be used toward the credit requirements in this concentration.

HSG 5464 - Understanding Housing: Assessment and Analysis (3.0 cr)

Take 17 or more credits(s) from the following:

- ARCH 5645 - Real Estate Development in Architecture (3.0 cr)
- HSG 3482 - Sustainable Housing: Community, Environment, and Technology [TS] (3.0 cr)
- HSG 4465 - Housing in a Global Perspective (3.0 cr)
- HSG 5481 - Promoting Independence in Housing and Community (3.0 cr)
- HSG 5484 - Rural Housing Issues (3.0 cr)
- FSOS 3102 - Family Systems and Diversity [SOCS, DSJ] (3.0 cr)
- GEOG 3371W - Cities, Citizens, and Communities [DSJ, WI] (4.0 cr)
- GEOG 3373 - Changing Form of the City [HIS, GP] (3.0 cr)
- GEOG 5361 - Geography and Real Estate (4.0 cr)
- PA 4200 - Urban and Regional Planning (3.0 cr)
- PA 5002 - Introduction to Policy Analysis (1.5 cr)
- PA 5004 - Introduction to Planning (3.0 cr)
- PA 5013 - Law and Urban Land Use (1.5 cr)
- PA 5212 - Managing Urban Growth and Change (3.0 cr)
- POL 1001 - American Democracy in a Changing World [SOCS] (4.0 cr)
- SOC 1001 - Introduction to Sociology [SOCS] (4.0 cr)
- SOC 3201 - Inequality: Introduction to Stratification (3.0 cr)
- SOC 3211W - American Race Relations [SOCS, DSJ, WI] (3.0 cr)
- SOC 3451W - Cities and Social Change [WI] (3.0 cr)
- URBS 1001W - Introduction to Urban Studies: The Complexity of Metropolitan Life [WI] (3.0 cr)
- URBS 3301W - American Cities As Settings for Cultural Diversity [WI] (3.0 cr)
- URBS 3751 - Understanding the Urban Environment [ENV] (3.0 cr)
- URBS 5101 - The City and the Metropolis: An Exploration (3.0 cr)
- WRIT 4573W - Writing Proposals and Grant Management [WI] (3.0 cr)

Housing Technology

Courses in design, technology, architecture, and environmental studies prepare students to work in housing construction, renovation, and development firms; energy and housing inspection programs; and historic preservation organizations.

Students must complete at least 20 credits for the concentration.

Housing Technology Concentration

Courses listed below are suggested, but not inclusive. Students should consult with an adviser for other appropriate courses.

Concentration courses must be primarily upper division and must be taken A-F. A minimum grade of C- is required. Note: a course may be used only once to satisfy program requirements.

Completion of a minor in architecture or construction management may be used toward the credit requirements in this concentration.

Take 20 or more credits(s) from the following:

- ARCH 3412 - Architectural History Since 1750 [HIS, GP] (3.0 cr)
- ARCH 4671 - Historic Preservation (3.0 cr)
- ARCH 4672 - Historic Building Conservation (3.0 cr)
- ARCH 5673 - Historic Building Research and Documentation (3.0 cr)
- ARTH 5546 - American Architecture: 1840 to 1914 (3.0 cr)
- BBE 4416 - Building Testing and Diagnostics (2.0 cr)
- IDES 1601 - Interior Design Studio I (4.0 cr)
- IDES 1602 - Interior Design Studio II (4.0 cr)
- IDES 2612 - Interior Materials and Specifications [ENV] (4.0 cr)
- IDES 2613 - Lighting Design and Life Safety Issues (4.0 cr)
- IDES 2621 - Computer Aided Design: Interior Design (4.0 cr)



- [HSG 3482](#) - Sustainable Housing: Community, Environment, and Technology [TS] (3.0 cr)
- [HSG 4465](#) - Housing in a Global Perspective (3.0 cr)
- [HSG 5464](#) - Understanding Housing: Assessment and Analysis (3.0 cr)
- [HSG 5481](#) - Promoting Independence in Housing and Community (3.0 cr)
- [HSG 5484](#) - Rural Housing Issues (3.0 cr)
- [PUBH 3001](#) - Personal and Community Health (2.0 cr)
- [PUBH 3004](#) - Basic Concepts in Personal and Community Health (4.0 cr)
- [PUBH 3102](#) - Issues in Environmental and Occupational Health (3.0 cr)
- [WRIT 4573W](#) - Writing Proposals and Grant Management [WI] (3.0 cr)

Honors UHP

This is an honors sub-plan.

Students admitted to the University Honors Program (UHP) must fulfill UHP requirements, in addition to degree program requirements. Honors courses used to fulfill degree program requirements will also fulfill UHP requirements.

Current departmental honors course offerings are listed at:

http://www.honors.umn.edu/academics/curriculum/dept_courses_current.html.

Honors students complete an honors thesis project in the final year, most often in conjunction with an honors thesis course, or with an honors directed studies, or honors directed research course. Students select honors courses and plan for a thesis project in consultation with their UHP adviser and their departmental faculty adviser.



Twin Cities Campus

Interior Design B.S.

DHA Interior Design

College of Design

- Program Type: Baccalaureate
- Requirements for this program are current for Fall 2012
- Required credits to graduate with this degree: 120
- Required credits within the major: 89 to 90
- This program requires summer terms.
- Degree: Bachelor of Science

Interior design is a professional program accredited by the Council for Interior Design Accreditation (CIDA). Its focus is providing for human welfare by improving the quality of life and protecting human health and safety through design of the interior environment. Students study fundamentals, theory, process, communication, research, and technology to identify and solve problems related to people and their use of interior space. They analyze human behavior to determine clients' functional, aesthetic, social, and psychological needs, which prepares them to solve interior design problems. They design various types of interiors such as hospitals, offices, schools, residences, restaurants, hotels, and entertainment facilities. To do this, students acquire

- * a foundation in basic design;
- * understanding of the relationship between individuals and their environments;
- * understanding of the contextual relationship of the site, the building, and its systems to the interior;
- * knowledge of regulations that govern their practice of interior design;
- * the ability to research users' needs and apply their findings to problem identification and solution;
- * understanding of historical precedent and contemporary design theories;
- * technical knowledge and communication skills;
- * understanding of business issues and professional ethics; and
- * a sense of responsibility to society, especially in the use of resources.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Admission Requirements

Students must complete 7 courses before admission to the program.

Freshman and transfer students are usually admitted to pre-major status before admission to this major

A GPA above 2.0 is preferred for the following:

- 2.50 already admitted to the degree-granting college
- 2.50 transferring from another University of Minnesota college
- 2.50 transferring from outside the University

Admission to the pre-major status is done by a competitive holistic review. Students must maintain a GPA of 2.50 during pre-major coursework. In addition, students must receive a minimum grade of C- or better in the required pre-major courses before going through portfolio review (not just a 2.50 GPA). Once students have achieved major status, they must maintain a GPA of 2.00.

For information about University of Minnesota admission requirements, visit the [Office of Admissions website](#).

Pre-Interior Design Courses

Students must complete freshman composition and at least one additional liberal education course in addition to the required coursework below to be admitted to major status in the interior design program.

Note: Students must be admitted to a pre-major status to take most of these courses.

- [DES 1101W](#) - Introduction to Design Thinking [AH, WI] (4.0 cr)
- [GDES 1311](#) - Foundations: Drawing and Design in Two and Three Dimensions (4.0 cr)
- [GDES 1312](#) - Foundations: Color and Design in Two and Three Dimensions (4.0 cr)
- [IDES 1601](#) - Interior Design Studio I (4.0 cr)
- [IDES 1602](#) - Interior Design Studio II (4.0 cr)



General Requirements

All students are required to complete general University and college requirements including writing and liberal education courses. For more information about University-wide requirements, see the [liberal education requirements](#). Required courses for the major or minor in which a student receives a D grade (with or without plus or minus) do not count toward the major or minor (including transfer courses).

Program Requirements

Students must complete a 400-hour internship (IDES 4196) after completing IDES 3606 and IDES 3614. All coursework in the major must be taken A-F (with the exception of the internship).

Business Courses

[MGMT 3001](#) - Fundamentals of Management (3.0 cr)

Communication Course

[WRIT 3562W](#) - Technical and Professional Writing [WI] (4.0 cr)

or [ENGL 3027W](#) - The Essay [WI] (4.0 cr)

or [WRIT 3029W](#) - Business and Professional Writing [WI] (3.0 cr)

Psychology Courses

[PSY 1001](#) - Introduction to Psychology [SOCS] (4.0 cr)

or [PSTL 1281](#) - Principles of Psychology [SOCS] (4.0 cr)

Major Courses

Recommended courses to take if elective credits are needed:

GDES 4131W, GDES 4330, DES 4165, and HSG 5481.

[ADES 2213](#) - Textile Analysis (4.0 cr)

[ARTH 1001](#) - Introduction to Art History: Prehistoric to Contemporary [AH] (3.0 cr)

[IDES 2603](#) - Interior Design Studio III (4.0 cr)

[IDES 2604](#) - Interior Design Studio IV (4.0 cr)

[IDES 2612](#) - Interior Materials and Specifications [ENV] (4.0 cr)

[IDES 2613](#) - Lighting Design and Life Safety Issues (4.0 cr)

[IDES 2621](#) - Computer Aided Design: Interior Design (4.0 cr)

[IDES 3161](#) - History of Interiors and Furnishings: Ancient to 1750 [GP] (4.0 cr)

[IDES 3162](#) - History of Interiors and Furnishings: 1750 to Present [HIS] (4.0 cr)

[IDES 3605](#) - Interior Design Studio V (4.0 cr)

[IDES 3606](#) - Interior Design Studio VI (4.0 cr)

[IDES 3614](#) - Interior Design Ethics and Professional Practice [CIV] (4.0 cr)

[IDES 4196](#) - Internship in Interior Design (1.0 - 2.0 cr)

[IDES 4607](#) - Interior Design Studio VII (4.0 cr)

[IDES 4608](#) - Interior Design Thesis (4.0 cr)

[IDES 4615W](#) - Interior Design Research [WI] (2.0 cr)

Program Sub-plans

A sub-plan is not required for this program.

Honors UHP

This is an honors sub-plan.

Students admitted to the University Honors Program (UHP) must fulfill UHP requirements, in addition to degree program requirements. Honors courses used to fulfill degree program requirements will also fulfill UHP requirements.

Current departmental honors course offerings are listed at:

http://www.honors.umn.edu/academics/curriculum/dept_courses_current.html

Honors students complete an honors thesis project in the final year, most often in conjunction with an honors thesis course, or with an honors directed studies, or honors directed research course. Students select honors courses and plan for a thesis project in consultation with their UHP adviser and their departmental faculty adviser.



Twin Cities Campus

Landscape Design and Planning B.E.D.

Landscape Architecture

College of Design

- Program Type: Baccalaureate
- Requirements for this program are current for Fall 2012
- Required credits to graduate with this degree: 120
- Required credits within the major: 77 to 83
- Degree: Bachelor of Environmental Design

Landscape design and planning focuses on the creation of livable communities that sustain ecological function, fulfill human aspirations for community development, public health, and safety, and are artistically evocative and meaningful. Core courses in design and planning introduce students to the history, theory, and practice of landscape design and planning at various geographic scales and in diverse settings. Students create integrative, collaborative, and beautiful designs for regions, communities, and sites to conserve ecosystems services and water and air resources, protect biodiversity, and to reduce dependence on fossil fuels.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Admission Requirements

A GPA above 2.0 is preferred for the following:

- 2.80 already admitted to the degree-granting college
- 2.80 transferring from another University of Minnesota college
- 2.80 transferring from outside the University

For information about University of Minnesota admission requirements, visit the [Office of Admissions website](#).

General Requirements

All students are required to complete general University and college requirements including writing and liberal education courses. For more information about University-wide requirements, see the [liberal education requirements](#). Required courses for the major or minor in which a student receives a D grade (with or without plus or minus) do not count toward the major or minor (including transfer courses).

Program Requirements

Design

- LA 1201 - Learning from the Landscape [AH, DSJ] (3.0 cr)
- LA 1401 - The Designed Environment (3.0 cr)
- LA 3001 - Understanding and Creating Landscape Space (3.0 cr)
- LA 3002 - Informants of Creating Landscape Space (3.0 cr)
- LA 3003 - Case Studies in Sustainable Landscape Planning and Design (3.0 cr)
- LA 4001 - Sustainable Landscape Design and Planning Practices (3.0 cr)
- LA 4002 - Implementation of Sustainable Landscape Design and Planning Practices (3.0 cr)
- LA 4096 - Internship in Landscape Design and Planning (1.0 cr)
- LA 4755 - Infrastructure, Natural Systems, and Space of Inhabited Landscapes [TS] (3.0 cr)

Design Communication

- LA 1301 - Introduction to Landscape Architecture Drawing [AH] (3.0 cr)
- LA 2301 - Advanced Representation for Environmental Design (3.0 cr)
- LA 2302 - Computer-Aided Representation for Environmental Design (3.0 cr)

Ecosystem Pattern and Process Core

- ESPM 3108 - Ecology of Managed Systems [ENV] (3.0 cr)
- HORT 1001 - Plant Propagation [BIOL] (4.0 cr)
- LA 3501 - Environmental Design and Its Biological and Physical Context [ENV] (3.0 cr)
- LA 3204 - Holistic Landscape Ecology and Bioregional Practice (3.0 cr)
- LA 3571 - Landscape Construction: Site Systems and Engineering (3.0 cr)



Social and Cultural Systems Core

- [LA 3413](#) - Introduction to Landscape Architectural History [HIS, GP] (3.0 cr)
- [ARCH 3711W](#) - Environmental Design and the Sociocultural Context [WI] (3.0 cr)

Program Sub-plans

Students are required to complete one of the following sub-plans. (Note for the Twin Cities and Morris campuses: The honors sub-plan does not meet this requirement. Honors students are required to complete one sub-plan plus the honors sub-plan. Please see an adviser if no honors sub-plan is listed for the program.)

Accelerated Program

This sub-plan is optional and does not fulfill the sub-plan requirement for this program.

The accelerated status option admits a limited number of students annually and allows qualified undergraduates to complete the B.E.D. and M.L.A. in six years rather than seven years.

Applicants for the accelerated status must complete the first three years of the B.E.D. degree requirements before their senior year. Students must complete the first year of the professional degree program in their undergraduate senior year. These courses carry upper division credit and satisfy senior year B.E.D. requirements.

Accelerated status is granted on a competitive basis and does not admit any student to the graduate professional program. Separate requirements, such as letters of recommendation, a letter of interest, and other application documents, must be submitted in January of the year that students are seeking admission to the graduate program. B.E.D. graduates who have completed the accelerated status option and applied to the M.L.A. professional degree program will receive advanced standing in the M.L.A. program upon acceptance by the Department of Landscape Architecture and the Graduate School.

Landscape Design

The design track prepares students for a career in the design of sustainable landscapes at the residential and small-scale commercial level.

The landscape design track also requires students to take courses in biological science, plant materials, landscape management, and small business management.

Landscape Design--Ecosystem Pattern and Process

- [HORT 1015](#) - Woody and Herbaceous Plants (4.0 cr)
- [HORT 3005W](#) - Environmental Effects on Horticultural Crops [WI] (4.0 cr)
- [HORT 4061W](#) - Turfgrass Management [WI] (3.0 cr)
- [MATH 1031](#) - College Algebra and Probability [MATH] (3.0 cr)
or [MATH 1142](#) - Short Calculus [MATH] (4.0 cr)
- [CHEM 1015](#) - Introductory Chemistry: Lecture (3.0 cr)
- [CHEM 1017](#) - Introductory Chemistry: Laboratory (1.0 cr)

Landscape Design--Social and Cultural Systems

- [APEC 1101](#) - Principles of Microeconomics [SOCS, GP] (4.0 cr)
- [MGMT 3010](#) - Introduction to Entrepreneurship (4.0 cr)

Landscape Planning

The landscape planning track prepares students for work planning sustainable landscape at the urban and regional scale.

The landscape planning track requires additional courses in urban geography, urban and regional planning, natural resource planning and management, as well as biological and physical sciences. Students in this track should select GEOG 1502 to complete the mathematical thinking requirement.

Landscape Planning--Ecosystem Pattern and Process

- [FR 3131](#) - Geographical Information Systems (GIS) for Natural Resources [TS] (4.0 cr)
 - [LA 3004](#) - Regional Landscape Planning (3.0 cr)
 - [LA 3514](#) - Making the Mississippi [CIV] (3.0 cr)
- Take 2 or more course(s) from the following:
- [BBE 3023](#) - Ecological Engineering Principles (3.0 cr)
 - [BBE 5513](#) - Watershed Engineering (3.0 cr)
 - [BIOL 3407](#) - Ecology (3.0 cr)
 - [BIOL 3409](#) - Evolution (3.0 cr)
 - [CE 3501](#) - Environmental Engineering [ENV] (3.0 cr)



- [EEB 3603](#) - Science, Protection, and Management of Aquatic Environments (3.0 cr)
- [EEB 4609W](#) - Ecosystem Ecology [ENV, WI] (3.0 cr)
- [ESPM 3101](#) - Conservation of Plant Biodiversity (3.0 cr)
- [ESPM 3111](#) - Hydrology and Water Quality Field Methods (3.0 cr)
- [ESPM 3221](#) - Soil Conservation and Land-Use Management (3.0 cr)
- [ESPM 3575](#) - Wetlands Conservation (3.0 cr)
- [ESPM 4061W](#) - Water Quality and Natural Resources [WI] (3.0 cr)
- [FR 3104](#) - Forest Ecology (4.0 cr)
- [FR 3114](#) - Hydrology and Watershed Management (3.0 cr)
- [FR 3203](#) - Forest Fire and Disturbance Ecology (3.0 cr)
- [FR 3501](#) - Arboriculture: Selection and Maintenance of Trees (3.0 cr)
- [FR 5153](#) - Forest and Wetland Hydrology (3.0 cr)
- [FW 5603W](#) - Habitats and Regulation of Wildlife [WI] (3.0 cr)
- [ESCI 3002](#) - Climate Change and Human History [ENV] (3.0 cr)
- [ESCI 3004](#) - Water and Society (3.0 cr)
- [ESCI 3005](#) - Earth Resources (3.0 cr)
- [ESCI 4631W](#) *{Inactive}*[WI] (3.0 cr)
- [ESCI 4701](#) - Geomorphology (3.0 - 4.0 cr)
- [ESCI 4703](#) - Glacial Geology (4.0 cr)
- [GEOG 3401](#) - Geography of Environmental Systems and Global Change [ENV] (4.0 cr)
- [HORT 5071](#) - Ecological Restoration (4.0 cr)
- [LA 5574](#) - Identification of Minnesota Flora (3.0 cr)
- [PBIO 4321](#) - Minnesota Flora (3.0 cr)
- [LAAS 5515](#) - Soil Formation: Earth Surface Processes and Biogeochemistry (3.0 cr)
- [SOIL 5555](#) - Wetland Soils (3.0 cr)
- [URBS 3751](#) - Understanding the Urban Environment [ENV] (3.0 cr)

Landscape Planning--Social and Cultural Systems

[GEOG 3371W](#) - Cities, Citizens, and Communities [DSJ, WI] (4.0 cr)

Take one course from the following

- [ARCH 4445W](#) - Suburbia [WI] (3.0 cr)
- or [ARCH 4671](#) - Historic Preservation (3.0 cr)
- or [ARCH 4701W](#) - Introduction to Urban Form and Theory [WI] (3.0 cr)
- or [DES 3331](#) - Street Life Urban Design Seminar (3.0 cr)
- or [ESPM 3245](#) - Sustainable Land Use Planning and Policy [ENV] (3.0 cr)
- or [FR 4501](#) - Urban Forest Management: Managing Greenspaces for People (3.0 cr)
- or [GEOG 3361W](#) - Geography and Public Policy [WI] (3.0 cr)
- or [GEOG 3373](#) - Changing Form of the City [HIS, GP] (3.0 cr)
- or [GEOG 3376](#) - Political Ecology of North America [ENV] (3.0 cr)
- or [GEOG 3973](#) - Geography of the Twin Cities [SOCS] (3.0 cr)
- or [GEOG 5393](#) - Rural Landscapes and Environments (4.0 cr)
- or [LA 4755](#) - Infrastructure, Natural Systems, and Space of Inhabited Landscapes [TS] (3.0 cr)
- or [PA 4200](#) - Urban and Regional Planning (3.0 cr)
- or [PA 5013](#) - Law and Urban Land Use (1.5 cr)
- or [PA 5211](#) - Land Use Planning (3.0 cr)
- or [PA 5221](#) - Private Sector Development (3.0 cr)
- or [PA 5251](#) - Strategic Planning and Management (3.0 cr)
- or [PA 5253](#) - Designing Planning and Participation Processes (3.0 cr)
- or [RRM 4232W](#) - Managing Recreational Lands [WI] (4.0 cr)
- or [URBS 3001W](#) - Introduction to Urban Studies: The Complexity of Metropolitan Life [WI] (3.0 cr)
- or [URBS 3301W](#) - American Cities As Settings for Cultural Diversity [WI] (3.0 cr)
- or [URBS 3751](#) - Understanding the Urban Environment [ENV] (3.0 cr)

Honors UHP

This is an honors sub-plan.

Students admitted to the University Honors Program (UHP) must fulfill UHP requirements, in addition to degree program requirements. Honors courses used to fulfill degree program requirements will also fulfill UHP requirements.

Current departmental honors course offerings are listed at:

http://www.honors.umn.edu/academics/curriculum/dept_courses_current.html

Honors students complete an honors thesis project in the final year, most often in conjunction with an honors thesis course, or with an honors directed studies, or honors directed research course. Students select honors courses and plan for a thesis project in consultation with their UHP adviser and their departmental faculty adviser.



Twin Cities Campus

Retail Merchandising B.S.

DHA Retail Merchandising

College of Design

- Program Type: Baccalaureate
- Requirements for this program are current for Fall 2012
- Required credits to graduate with this degree: 120
- Required credits within the major: 82 to 99
- Degree: Bachelor of Science

The retail merchandising program offers a wide range of educational and career opportunities, including visits to international retailers, travel to foreign and domestic retail centers, and professional experiences, such as study abroad and internships with national and international retailers. Program graduates begin their careers in store or corporate environments. Entry-level positions include merchandising, marketing, product development, distribution, store management, buying, advertising, sales promotion, and human resources.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Admission Requirements

Admission is competitive and space is limited.

For information about University of Minnesota admission requirements, visit the [Office of Admissions website](#).

General Requirements

All students are required to complete general University and college requirements including writing and liberal education courses. For more information about University-wide requirements, see the [liberal education requirements](#). Required courses for the major or minor in which a student receives a D grade (with or without plus or minus) do not count toward the major or minor (including transfer courses).

Program Requirements

All coursework in the major must be taken A-F (with the exception of the internship).

Design Courses

- [DES 1101W](#) - Introduction to Design Thinking [AH, WI] (4.0 cr)
- [DES 1111](#) - Creative Problem Solving (3.0 cr)
- [DES 2101](#) - Design and Visual Presentation (3.0 cr)

Retail Merchandising Courses

- [RM 1201](#) - Fashion, Ethics, and Consumption [CIV] (3.0 cr)
- [RM 4216](#) - Retail Promotion and Consumer Decision Making (4.0 cr)
- [RM 2215](#) - Multichannel Retailing (3.0 cr)
- [RM 3201](#) - Career and Internship Preparation for Retail Merchandising (1.0 cr)
- [RM 3242](#) - Retail Buying (3.0 cr)
- [RM 3243](#) - Visual Merchandising (3.0 cr)
- [RM 4196](#) - Internship in Retail Merchandising (1.0 - 4.0 cr)
- [RM 4217](#) - International Retail Markets [GP] (3.0 cr)

Business Courses

- [HRIR 3021](#) - Human Resource Management and Industrial Relations (3.0 cr)
- [MATH 1031](#) - College Algebra and Probability [MATH] (3.0 cr)
- [MGMT 3001](#) - Fundamentals of Management (3.0 cr)
- [MKTG 3001](#) - Principles of Marketing (3.0 cr)
- [MKTG 3010](#) - Marketing Research (4.0 cr)
- [PSTL 1571](#) - Computer Literacy and Problem Solving (4.0 cr)
- [ACCT 2050](#) - Introduction to Financial Reporting (4.0 cr)
or [APEC 1251](#) - Principles of Accounting (3.0 cr)



ECON 1101 - Principles of Microeconomics [SOCS, GP] (4.0 cr)
or APEC 1101 - Principles of Microeconomics [SOCS, GP] (4.0 cr)
ECON 1102 - Principles of Macroeconomics (4.0 cr)
or APEC 1102 - Principles of Macroeconomics (3.0 cr)
PSY 1001 - Introduction to Psychology [SOCS] (4.0 cr)
or PSTL 1281 - Principles of Psychology [SOCS] (4.0 cr)
SCO 2550 - Business Statistics: Data Sources, Presentation, and Analysis (4.0 cr)
or SOC 3811 - Basic Social Statistics [MATH] (4.0 cr)
or STAT 3011 - Introduction to Statistical Analysis [MATH] (4.0 cr)

Communication Courses

COMM 1101 - Introduction to Public Speaking [CIV] (3.0 cr)
or PSTL 1461 - Multicultural Perspectives in Public Speaking [CIV] (3.0 cr)
WRIT 3562W - Technical and Professional Writing [WI] (4.0 cr)
or ENGL 3027W - The Essay [WI] (4.0 cr)

Program Sub-plans

Students are required to complete one of the following sub-plans. (Note for the Twin Cities and Morris campuses: The honors sub-plan does not meet this requirement. Honors students are required to complete one sub-plan plus the honors sub-plan. Please see an adviser if no honors sub-plan is listed for the program.)

Honors UHP

This is an honors sub-plan.

Students admitted to the University Honors Program (UHP) must fulfill UHP requirements, in addition to degree program requirements. Honors courses used to fulfill degree program requirements will also fulfill UHP requirements.

Current departmental honors course offerings are listed at:
http://www.honors.umn.edu/academics/curriculum/dept_courses_current.html

Honors students complete an honors thesis project in the final year, most often in conjunction with an honors thesis course, or with an honors directed studies, or honors directed research course. Students select honors courses and plan for a thesis project in consultation with their UHP adviser and their departmental faculty adviser.

Retail merchandising general emphasis

Merchandising Advanced Courses

RM 4247 - Advanced Buying and Sourcing (3.0 cr)
RM 4117W - Retail Environments and Human Behavior [WI] (3.0 cr)

Business Advanced Course

APEC 3451 - Food and Agricultural Sales (3.0 cr)
or APEC 3821 - Retail Center Management (3.0 cr)
or MGMT 3010 - Introduction to Entrepreneurship (4.0 cr)
or MGMT 4002 - Managerial Psychology (4.0 cr)
or MKTG 4030 - Sales Management (4.0 cr)
or RM 3196 - Field Study: National or International (1.0 - 4.0 cr)
or RM 4123 - Living in a Consumer Society (3.0 cr)
or RM 4124 - Consumers of Design (3.0 cr)

Retail merchandising apparel emphasis

Advanced Retail Merchandising Courses

ADES 2213 - Textile Analysis (4.0 cr)
ADES 2214 - Softlines Analysis (3.0 cr)
RM 4212W - Dress, Society, and Culture [WI] (3.0 cr)
ADES 4215 - Product Development: Softlines (4.0 cr)
ADES 3217 - Fashion: Trends and Communication (3.0 cr)
or ADES 4121 - History of Costume (4.0 cr)
or RM 3196 - Field Study: National or International (1.0 - 4.0 cr)
or RM 4123 - Living in a Consumer Society (3.0 cr)
or RM 4124 - Consumers of Design (3.0 cr)



Twin Cities Campus

Medical Technology B.S.

Medical School - Adm

Medical School

• **Students will no longer be accepted into this program after Summer 2007. Program requirements below are for current students only.**

- Program Type: Baccalaureate
- Requirements for this program are current for Fall 2012
- Required credits to graduate with this degree: 120
- Required credits within the major: 60
- This program is 9 terms (4½ years) long.
- This program requires summer terms.
- Degree: Bachelor of Science

The medical technology program prepares students to work as clinical laboratory scientists in hospital, clinical, and medical research laboratories. Students can be accepted in either the junior or senior year. All medical technology courses are taken in the fall and spring semester of the senior year, followed by 22 weeks of clinical coursework.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Admission Requirements

Students must complete 9 courses before admission to the program.

Freshmen students are usually admitted to pre-major status before admission to this major

A GPA above 2.0 is preferred for the following:

- 2.50 already admitted to the degree-granting college
- 2.50 transferring from another University of Minnesota college
- 2.50 transferring from outside the University

Upon admission, students are required to submit proof of certain immunizations and vaccinations.

For information about University of Minnesota admission requirements, visit the [Office of Admissions website](#).

Pre-Medical Technology Courses

Students must take one math course at the level of college algebra or higher and one course in calculus or statistics. The same course may not be used to satisfy both distribution requirements.

MATH 1031 - College Algebra and Probability [MATH] (3.0 cr)

or **MATH 1051** - Precalculus I [MATH] (3.0 cr)

or **MATH 1142** - Short Calculus [MATH] (4.0 cr)

or **MATH 1271** - Calculus I [MATH] (4.0 cr)

MATH 1142 - Short Calculus [MATH] (4.0 cr)

or **MATH 1151** - Precalculus II [MATH] (3.0 cr)

or **MATH 1271** - Calculus I [MATH] (4.0 cr)

or **MATH 1272** - Calculus II (4.0 cr)

or **STAT 3011** - Introduction to Statistical Analysis [MATH] (4.0 cr)

BIOL 1009 - General Biology [BIOL] (4.0 cr)

or **BIOL 1001** - Introductory Biology: Evolutionary and Ecological Perspectives [BIOL] (4.0 cr)

BIOL 1002W *{Inactive}*[WI] (5.0 cr)

CHEM 1021 *{Inactive}*[PHYS] (4.0 cr)

CHEM 1022 *{Inactive}*[PHYS] (4.0 cr)

CHEM 2301 - Organic Chemistry I (3.0 cr)

CHEM 2302 - Organic Chemistry II (3.0 cr)

PHSL 3051 - Human Physiology (4.0 cr)



General Requirements

All students are required to complete general University and college requirements including writing and liberal education courses. For more information about University-wide requirements, see the [liberal education requirements](#). Required courses for the major or minor in which a student receives a D grade (with or without plus or minus) do not count toward the major or minor (including transfer courses).

Program Requirements

INMD 3001, LAMP 4177, MEDT 1010, and MICB 4131 are highly recommended but not required for students pursuing a B.S. degree in medical technology.

Students are placed in a variety of clinical settings during their clinical coursework. In accord with Minnesota law, a criminal background check is required of each student before clinical courses. The Division of Medical Technology arranges this check.

Junior Year Courses

- BIOC 3021 - Biochemistry (3.0 cr)
- BIOL 4003 - Genetics (3.0 cr)
or GCD 3022 - Genetics (3.0 cr)
- BIOL 2032 *{Inactive}*(4.0 cr)
or MICB 3301 - Biology of Microorganisms (5.0 cr)

Senior Year Courses

- CLSP 4501 - Introduction to Transfusion Medicine (2.0 cr)
- CLSP 4502 - Introduction to Transfusion Medicine: Laboratory (2.0 cr)
- CLSP 4101 - Diagnostic Microbiology II (2.0 cr)
- CLSP 4102 - Principles of Diagnostic Microbiology (2.0 cr)
- CLSP 4103 - Diagnostic Microbiology: Laboratory (2.0 cr)
- CLSP 4602 - Basic Concepts in Education and Research as Applied to the Clinical Laboratory (1.0 cr)
- CLSP 4203 - Hemostasis (1.0 cr)
- CLSP 4302 - Clinical Chemistry I: Lecture and Lab (3.0 cr)
- CLSP 4311 *{Inactive}*(2.0 cr)
- CLSP 4304 - Clinical Chemistry II: Lecture (2.0 cr)
- CLSP 4305 - Clinical Chemistry II: Laboratory (2.0 cr)
- CLSP 4401 - Immunology (1.0 cr)
- CLSP 4201 - Hematology I (3.0 cr)
- CLSP 4202 - Hematology II (2.0 cr)

Clinical Courses

These courses should be completed during the 22 weeks of clinical rotations in the summer and fall terms following the senior year, including six weeks of clinical chemistry, five weeks in hematology and coagulation, five weeks in immunohematology, five weeks in microbiology, and one week in a specialty laboratory area.

- CLSP 4703 - Applied Clinical Chemistry and Urinalysis (2.0 cr)
- CLSP 4702 - Applied Clinical Hematology/Hemostasis (2.0 cr)
- CLSP 4704 - Applied Transfusion Medicine (2.0 cr)
- CLSP 4701 - Applied Diagnostic Microbiology (2.0 cr)
- CLSP 4089 *{Inactive}*(1.0 cr)



Twin Cities Campus

Mortuary Science B.S.

Medical School - Adm

Medical School

- Program Type: Baccalaureate
- Requirements for this program are current for Fall 2012
- Required credits to graduate with this degree: 120
- Required credits within the major: 85
- This program requires summer terms.
- N/A
- Degree: Bachelor of Science

The Program of Mortuary Science at the University of Minnesota, established in 1908, was the first program of its kind to be organized at a state university.

For detailed information, please visit the program's website (www.mortuaryscience.umn.edu), or contact the program office 612-624-6464.

Accreditation:

The Bachelor of Science (B.S.) degree program with a major in mortuary science at the University of Minnesota is accredited by the American Board of Funeral Service Education (ABFSE), 3414 Ashland Avenue, Suite G, St. Joseph, Missouri 64506 (816) 233-3747. Web: www.abfse.org. The annual passage rate of first-time takers on the National Board Examination (NBE) for the most recent three-year period for this institution and all ABFSE accredited funeral service education programs is posted on the ABFSE Web site (www.abfse.org).

Mission:

Funeral directors are health care professionals who serve others during a time of loss, pain, and grief. The mission of the program is to skillfully combine the study of behavioral, physical, and applied sciences for the goal of preparing graduates for careers as knowledgeable, skilled, and innovative funeral service professionals. Program graduates will be prepared to serve bereaved members of their communities in a manner that is proficient, dignified, and caring.

Aims:

The Program of Mortuary Science at the University of Minnesota states as its central aims the recognition of the importance of funeral service personnel as:

1. members of a human services profession;
2. members of the community in which they serve;
3. participants in the relationship between bereaved families and those engaged in the funeral service profession;
4. professionals knowledgeable of and compliant with federal, state, provincial/territorial, and local regulatory guidelines in the geographic area where they practice;
5. professionals sensitive to the responsibility for public health, safety, and welfare in caring for human remains.

Objectives:

The program recognizes an obligation to students, the profession, and the community. Its objectives have been adopted by the Program's Advisory Board and conform with the accreditation standards set forth by the American Board of Funeral Service Education. The objectives of the program are:

1. To enlarge the background and knowledge of students about the funeral service profession;
2. To educate students in every phase of funeral service, and to help enable them to develop proficiency and skills necessary for the profession;
3. To educate students concerning the responsibilities of the funeral service profession to the community at large;
4. To emphasize high standards of ethical conduct;
5. To provide a curriculum at the post-secondary level of instruction;
6. To encourage student and faculty research in the field of funeral service;
7. To encourage faculty and students to be advocates for the profession of funeral service.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Admission Requirements

Students must complete 60 credits before admission to the program.



Freshman and transfer students are usually admitted to pre-major status before admission to this major

A GPA above 2.0 is preferred for the following:

- 2.50 already admitted to the degree-granting college
- 2.50 transferring from another University of Minnesota college
- 2.50 transferring from outside the University

Upon admission, students are required to submit proof of certain immunizations and vaccinations. Students must submit a professional statement and two letters of recommendation as part of the admission process. Criteria for the essay and letters of recommendation are available on the program's web site: www.mortuaryscience.umn.edu.

For information about University of Minnesota admission requirements, visit the [Office of Admissions website](#).

Pre-Mortuary Science Courses

Students usually enter the program at the beginning of their junior year. Freshmen and sophomores are urged to contact the program office for counsel in planning an appropriate preprofessional program. The following courses are required for admission to the B.S. program (except PUBH 3001 and PHAR 1002, which are not required but strongly recommended).

[BIOL 1001](#) - Introductory Biology: Evolutionary and Ecological Perspectives [BIOL] (4.0 cr)

or [BIOL 1009](#) - General Biology [BIOL] (4.0 cr)

or [BIOL 2002](#) - Foundations of Biology for Biological Sciences Majors, Part I [BIOL] (6.0 cr)

[BIOL 2003](#) - Foundations of Biology for Biological Sciences Majors, Part II (3.0 cr)

[CHEM 1015](#) - Introductory Chemistry: Lecture (3.0 cr)

[CHEM 1017](#) - Introductory Chemistry: Laboratory (1.0 cr)

or [CHEM 1061](#) - Chemical Principles I [PHYS] (3.0 cr)

[CHEM 1065](#) - Chemical Principles I Laboratory [PHYS] (1.0 cr)

[PSTL 1135](#) - Essentials of Human Anatomy and Physiology [BIOL] (4.0 cr)

or [ANAT 3001](#) - Human Anatomy (3.0 cr)

or [ANAT 3601](#) - Principles of Human Anatomy (3.0 cr)

or [ANAT 3611](#) - Principles of Human Anatomy (3.0 cr)

[ACCT 2050](#) - Introduction to Financial Reporting (4.0 cr)

[COMM 3402](#) - Introduction to Interpersonal Communication (3.0 cr)

[PSY 1001](#) - Introduction to Psychology [SOCS] (4.0 cr)

[SOC 1001](#) - Introduction to Sociology [SOCS] (4.0 cr)

[WRIT 1301](#) - University Writing (4.0 cr)

[BIOL 3272](#) - Applied Biostatistics (3.0 cr)

or [EPSY 3264](#) - Basic and Applied Statistics [MATH] (3.0 cr)

or [EPSY 5261](#) - Introductory Statistical Methods (3.0 cr)

or [PSTL 1004](#) - Statistics [MATH] (4.0 cr)

or [PSY 3801](#) - Introduction to Psychological Measurement and Data Analysis [MATH] (4.0 cr)

or [SOC 3811](#) - Basic Social Statistics [MATH] (4.0 cr)

or [STAT 1001](#) - Introduction to the Ideas of Statistics [MATH] (4.0 cr)

or [STAT 3011](#) - Introduction to Statistical Analysis [MATH] (4.0 cr)

Letters of Recommendation, Personal Statement

Applicants must provide the program with two letters of recommendation and a personal statement as part of the application process. Criteria for the letters of recommendation and personal statement are found on the program's Web site: www.mortuaryscience.umn.edu.

General Requirements

All students are required to complete general University and college requirements including writing and liberal education courses. For more information about University-wide requirements, see the [liberal education requirements](#). Required courses for the major or minor in which a student receives a D grade (with or without plus or minus) do not count toward the major or minor (including transfer courses).

Program Requirements

60 credits of upper division coursework are required.

Students must take the National Board Examination of the International Conference of Funeral Service Examining Boards as a requirement for graduation, as per American Board of Funeral Service Education Accreditation Standard 11.5.

Junior Year Courses



MORT 3014 - Funeral Service Rules and Regulations (2.0 cr)
MORT 3018 - Funeral Practice (2.0 - 3.0 cr)
MORT 3021W - Funeral Service Psychology [WI] (3.0 cr)
MORT 3171 - Human Anatomy Laboratory (2.0 cr)
MORT 3370 - Death and Dying Across Cultures and Religions (3.0 cr)
MORT 3049 - Microbiology (2.0 cr)
MORT 3050 - Pathology (3.0 cr)
MORT 3065 - Embalming Chemistry (2.0 cr)
PHAR 1002 - Health Sciences Terminology (2.0 cr)
PUBH 3001 - Personal and Community Health (2.0 cr)

Senior Year Courses

MORT 3016 - Funeral Service Marketing and Merchandising (3.0 cr)
MORT 3025 - Business Law (3.0 cr)
MORT 3051 - Restorative Art (2.0 cr)
MORT 3061 - Embalming Theory (3.0 cr)
MORT 3151 - Restorative Art Laboratory (1.0 cr)
MORT 3161 - Embalming Laboratory (1.0 cr)
MORT 3012W - Organization and Management of Funeral Business [WI] (3.0 cr)
MORT 3019 - Funeral Practice II (3.0 cr)
MORT 3022W - Funeral Service Arrangements [WI] (3.0 cr)
MORT 3030 - Funeral Service Law (2.0 cr)
MORT 3379 - Clinical Funeral Service Rotation (1.0 - 4.0 cr)

Senior Year Summer Courses

MORT 3379 - Clinical Funeral Service Rotation (1.0 - 4.0 cr)

After January 1, 2004, each accredited program in funeral service education must require that each funeral service student take the National Board Examination (NBE) as a requirement for graduation. (ABFSE Accreditation Standard 11.5)



Twin Cities Campus

Nursing B.S.N.

School of Nursing

School of Nursing

- Program Type: Baccalaureate
- Requirements for this program are current for Fall 2012
- Required credits to graduate with this degree: 120
- Required credits within the major: 73 to 79
- University of Minnesota Rochester
- Degree: Bachelor of Science in Nursing

The four-year B.S.N. program consists of one year of prerequisite courses and a three-year nursing sequence. Students are admitted to the three-year sequence after completing the prerequisites. Admission is once a year for the upcoming fall semester. The program has a full-time, primarily day school curriculum.

The program prepares students to be professional nurses who think critically and analytically as they encounter today's complex health care issues and a wide variety of client needs. Graduates are eligible to take the registered nurse (R.N.) licensure examination and be certified as public health nurses. The School of Nursing is accredited by the Commission on Collegiate Nursing Education (CCNE).

The School of Nursing at the University of Minnesota is improving nursing care through nursing education, research, and community service. The school is proud to offer students opportunities to learn from internationally renowned faculty who emphasize inquiry, critical thinking and analysis, clinical excellence, and leadership. Throughout their education, undergraduate and graduate students have the opportunity to collaborate with faculty on research projects as well as serve the vibrant communities that surround them. Nursing courses at both the Twin Cities and Rochester locations include advanced use of the Internet, interactive television, and other technology-enhanced delivery methods.

As a part of one of the nation's most extensive interdisciplinary academic health centers, the University of Minnesota's School of Nursing is located in the heart of two of the most progressive health care communities. The school prepares nurses to the best of its ability by providing them with the technical and human-interaction skills necessary to integrate cutting-edge research into practice.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Admission Requirements

Students must complete 6 courses before admission to the program.

A GPA above 2.0 is preferred for the following:

- 2.80 already admitted to the degree-granting college
- 2.80 transferring from another University of Minnesota college
- 2.80 transferring from outside the University

Send an application for B.S.N. to School of Nursing.

For information about University of Minnesota admission requirements, visit the [Office of Admissions website](#).

Prerequisite Courses

Students must maintain at least a 2.80 GPA in the pre-nursing required courses, with at least 4 of the prerequisite courses taken A-F.

FSCN 1112 - Principles of Nutrition (3.0 cr)

BIOL 1009 - General Biology [BIOL] (4.0 cr)

or **BIOL 1010** - Human Biology: Concepts and Current Ethical Issues [BIOL, CIV] (4.0 cr)

PSY 1001 - Introduction to Psychology [SOCS] (4.0 cr)

or **PSTL 1281** - Principles of Psychology [SOCS] (4.0 cr)

CHEM 1021 *{Inactive}* [PHYS] (4.0 cr)

or **CHEM 1015** - Introductory Chemistry: Lecture (3.0 cr)

or **CHEM 1061** - Chemical Principles I [PHYS] (3.0 cr)

CHEM 1065 - Chemical Principles I Laboratory [PHYS] (1.0 cr)

NURS 2001 - Human Growth and Development: A Life Span Approach (3.0 cr)

or **FSOS 1201** - Human Development in Families: Lifespan [SOCS, DSJ] (4.0 cr)

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



- NURS 3690 - Life Span, Growth, and Development I (2.0 cr)
- NURS 3691 - Life Span, Growth, and Development II (1.0 cr)

Freshman Composition

- WRIT 1301 - University Writing (4.0 cr)
or WRIT 1401 - Writing and Academic Inquiry (4.0 cr)

General Requirements

All students are required to complete general University and college requirements including writing and liberal education courses. For more information about University-wide requirements, see the [liberal education requirements](#). Required courses for the major or minor in which a student receives a D grade (with or without plus or minus) do not count toward the major or minor (including transfer courses).

Program Requirements

Major Requirements

- PHSL 3051 - Human Physiology (4.0 cr)
NURS 3703 - Assessment and Beginning Interventions: Nursing Lab 1 (2.0 cr)
NURS 3801 - Patient Centered Care of Adults/Older Adults I (3.0 cr)
NURS 3806 - Nurse as Professional (2.0 cr)
NURS 3803 - Application of Genetics in Nursing (2.0 cr)
PHAR 3800 - Pharmacotherapy for the Health Professions (3.0 cr)
NURS 3705 - Nursing Interventions (2.0 cr)
NURS 4106 - Nurse as Collaborator (2.0 cr)
NURS 4305 - Practicum: Community-based Care of Families Across Life Span (3.0 cr)
NURS 4104 - Ethical Sensitivity and Reasoning in Health Care [CIV] (2.0 cr)
NURS 4312 - Patient Centered Care: Nursing Care of Families II (4.0 cr)
NURS 4301 - Person Centered Care of Adults and Older Adults II (4.0 cr)
NURS 4205W - Nursing Theory and Research [WI] (3.0 cr)
NURS 3115 - Health Informatics and Information Technology [TS] (3.0 cr)
NURS 4321 - Public Health Nursing (2.0 cr)
NURS 4303 - Practicum: Person Centered Care of Adults in Acute Care (3.0 cr)
NURS 4703 - Specialty Focused Practicum I (6.0 cr)
NURS 4705 - Specialty Focused Practicum II (6.0 cr)
NURS 4402 - Taking Ethical Action in Health Care [CIV] (1.0 cr)
NURS 3802 - Patient Centered Care: Nursing Care of Families I (3.0 cr)
NURS 4777W - Senior Project in the Nursing Major [WI] (3.0 cr)
NURS 4707 - Nursing Leadership: Professional Practice in Complex Systems (2.0 cr)
NURS 4706 - Transition to Practice (1.0 cr)
NURS 5010 - Foundations of Interprofessional Communication and Collaboration (1.0 cr)
VBS 2032 - General Microbiology With Laboratory (5.0 cr)
or MICB 3301 - Biology of Microorganisms (5.0 cr)
ANAT 3001 - Human Anatomy (3.0 cr)
or ANAT 3601 - Principles of Human Anatomy (3.0 cr)
NURS 3710 - Statistics for Clinical Practice and Research [MATH] (3.0 cr)
or STAT 3011 - Introduction to Statistical Analysis [MATH] (4.0 cr)
or EPSY 3264 - Basic and Applied Statistics [MATH] (3.0 cr)
or SCO 2550 - Business Statistics: Data Sources, Presentation, and Analysis (4.0 cr)
or SOC 3811 - Basic Social Statistics [MATH] (4.0 cr)
or STAT 3021 - Introduction to Probability and Statistics (3.0 cr)
or STAT 4101 - Theory of Statistics I (4.0 cr)

Program Sub-plans

A sub-plan is not required for this program.

Honors UHP

This is an honors sub-plan.

Students admitted to the University Honors Program (UHP) must fulfill UHP requirements in addition to degree program requirements. Honors courses used to fulfill degree program requirements will also fulfill UHP requirements.

Current departmental honors course offerings are listed at:

http://www.honors.umn.edu/academics/curriculum/dept_courses_current.html



Honors students complete an honors thesis project in the final year, most often in conjunction with an honors thesis course, or with an honors directed studies or honors directed research course. Students select honors courses and plan for a thesis project in consultation with their UHP adviser and their departmental faculty adviser.

Honors students must take NURS 4205V and 5040H as choices within their regular curriculum. In addition, they take NURS 4404H.

Honors Applied Clinical Research

[NURS 4404V](#) - Honors: Applied Research and Research Utilization [WI] (3.0 cr)

[NURS 5040H](#) - Seeking Solutions to Global Health Issues [GP] (3.0 cr)

Rochester

The nursing major is available at two campus locations, the University of Minnesota, Twin Cities and the University of Minnesota, Rochester. Policies, application materials, and course content are the same at both campuses.

Please note that at the Rochester campus admission prerequisites differ slightly due to course availability at the University of Minnesota, Rochester (UMR). Students admitted to the Rochester location may have a slightly different course sequence but the program requirements and timeline are the same at both the Twin Cities and Rochester locations. Contact the School of Nursing for specific information.



Twin Cities Campus

Clinical Laboratory Sciences B.S.

Allied-Medical Technology

Academic Health Center Shared

- Program Type: Baccalaureate
- Requirements for this program are current for Fall 2012
- Required credits to graduate with this degree: 120
- Required credits within the major: 40 to 52
- This program is 9 terms (4½ years) long.
- This program requires summer terms.
- We have two performance sites - Mpls. and Rochester which were approved with the initial program proposal. No additional sites requested at this time.
- Degree: Bachelor of Science

The clinical laboratory sciences program prepares students to work in hospital, clinical, and medical research laboratories. Students can be accepted in either the junior or senior year. All courses for the major are taken in the fall and spring semester of the senior year, followed by 22 weeks of clinical coursework. Starting fall 2008, courses will be offered at two locations, Minneapolis and Rochester.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Admission Requirements

Students must complete 9 courses before admission to the program.

Freshmen students are usually admitted to pre-major status before admission to this major

A GPA above 2.0 is preferred for the following:

- 2.50 already admitted to the degree-granting college
- 2.50 transferring from another University of Minnesota college
- 2.50 transferring from outside the University

Upon admission, students are required to submit proof of certain immunizations and vaccinations.

For information about University of Minnesota admission requirements, visit the [Office of Admissions website](#).

Preparatory Courses

Students must take one statistics course and either pre-calculus or calculus.

[MATH 1051](#) - Precalculus I [MATH] (3.0 cr)

or [MATH 1142](#) - Short Calculus [MATH] (4.0 cr)

or [MATH 1271](#) - Calculus I [MATH] (4.0 cr)

[STAT 3011](#) - Introduction to Statistical Analysis [MATH] (4.0 cr)

[BIOL 1009](#) - General Biology [BIOL] (4.0 cr)

[CHEM 1061](#) - Chemical Principles I [PHYS] (3.0 cr)

[CHEM 1062](#) - Chemical Principles II [PHYS] (3.0 cr)

[CHEM 2301](#) - Organic Chemistry I (3.0 cr)

[CHEM 2302](#) - Organic Chemistry II (3.0 cr)

[PHSL 3051](#) - Human Physiology (4.0 cr)

[CHEM 1065](#) - Chemical Principles I Laboratory [PHYS] (1.0 cr)

[CHEM 1066](#) - Chemical Principles II Laboratory [PHYS] (1.0 cr)

General Requirements

All students are required to complete general University and college requirements including writing and liberal education courses. For more information about University-wide requirements, see the [liberal education requirements](#). Required courses for the major or minor in which a student receives a D grade (with or without plus or minus) do not count toward the major or minor (including transfer courses).



Program Requirements

MICB 4131, INMD 3001, LAMP 4177, and CLSP 1010 are highly recommended but not required for students pursuing a B.S. degree in clinical laboratory sciences.

Students are placed in a variety of clinical settings during their clinical coursework. In accord with Minnesota law, a criminal background check is required of each student before clinical courses. The program arranges this check.

Junior Year Courses

- BIOC 3021 - Biochemistry (3.0 cr)
- BIOL 4003 - Genetics (3.0 cr)
or GCD 3022 - Genetics (3.0 cr)
- VBS 2032 - General Microbiology With Laboratory (5.0 cr)
or MICB 3301 - Biology of Microorganisms (5.0 cr)

Senior Year Courses

- CLSP 4501 - Introduction to Transfusion Medicine (2.0 cr)
- CLSP 4502 - Introduction to Transfusion Medicine: Laboratory (2.0 cr)
- CLSP 4101 - Diagnostic Microbiology II (2.0 cr)
- CLSP 4102 - Principles of Diagnostic Microbiology (2.0 cr)
- CLSP 4103 - Diagnostic Microbiology: Laboratory (2.0 cr)
- CLSP 4602 - Basic Concepts in Education and Research as Applied to the Clinical Laboratory (1.0 cr)
- CLSP 4203 - Hemostasis (1.0 cr)
- CLSP 4302 - Clinical Chemistry I: Lecture and Lab (3.0 cr)
- CLSP 4304 - Clinical Chemistry II: Lecture (2.0 cr)
- CLSP 4305 - Clinical Chemistry II: Laboratory (2.0 cr)
- CLSP 4401 - Immunology (1.0 cr)
- CLSP 4402 - Molecular Diagnostics (2.0 cr)
- CLSP 4601W - Management and Professional Issues [WI] (2.0 cr)
- CLSP 4301 - Urinalysis (1.0 cr)
- CAHP 5110 - Foundations of Interprofessional Communication and Collaboration (1.0 cr)
- CLSP 4201 - Hematology I (3.0 cr)
- CLSP 4202 - Hematology II (2.0 cr)

Clinical Courses

These courses should be completed during the clinical rotations in the summer and fall terms following the senior year, including clinical chemistry, hematology and coagulation, transfusion medicine, microbiology, and a specialty laboratory area.

- CLSP 4703 - Applied Clinical Chemistry and Urinalysis (2.0 cr)
- CLSP 4702 - Applied Clinical Hematology/Hemostasis (2.0 cr)
- CLSP 4704 - Applied Transfusion Medicine (2.0 cr)
- CLSP 4701 - Applied Diagnostic Microbiology (2.0 cr)

Program Sub-plans

A sub-plan is not required for this program.

Rochester

The clinical laboratory sciences major is available at two campus locations, the University of Minnesota, Twin Cities, and the University of Minnesota, Rochester. Policies, application materials, and course content are the same at both campuses.

Prerequisites are the same for both performance locations.

Honors UHP

This is an honors sub-plan.

Students admitted to the University Honors Program (UHP) must fulfill UHP requirements in addition to degree program requirements. Honors courses used to fulfill degree program requirements will also fulfill UHP requirements.

Current departmental honors course offerings are listed at:
http://www.honors.umn.edu/academics/curriculum/dept_courses_current.html.

Honors students complete an honors thesis project in the final year, most often in conjunction with an honors thesis course, or with an honors directed studies or honors directed research course. Students select honors courses and plan for a thesis project in consultation with their UHP adviser and their departmental faculty adviser.



Inserted missing comma in UMTC campus designation. No other changes necessary.



Twin Cities Campus

Pharmacology Minor

College of Biological Sciences - Adm

College of Biological Sciences

- Program Type: Undergraduate free-standing minor
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 12

Pharmacology studies how drugs affect biological systems. It is the foundation of medicine, pharmacy, dentistry, veterinary medicine, nursing, and other health care professions. Pharmacology employs scientific principles and techniques of its own, as well as from disciplines such as physiology, biochemistry, cellular and molecular biology, microbiology, immunology, genetics, structural biology, and pathology. The objectives of pharmacology include identifying new targets for therapeutic intervention, developing new therapeutics, and understanding environmental/toxicological implications.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Students who wish to declare a minor in pharmacology can do so online at the College of Biological Sciences website.

Pharmacology for Pre-Med and Life Science Students

Take 1 or more course(s) from the following:

- [PHCL 3100](#) - Pharmacology for Pre-Med and Life Science Students (2.0 cr)

Upper Level Courses in Pharmacology

Take 7 - 10 credits(s) from the following:

- [PHCL 4001](#) - Mechanisms of Drug Action (2.0 cr)
- [PHCL 4010](#) - Current Research Topics in Pharmacology (1.0 cr)
- [PHCL 5110](#) - Introduction to Pharmacology (3.0 cr)
- [PHCL 5111](#) - Pharmacogenomics (3.0 cr)

Additional Coursework

Take 0 - 3 credits(s) from the following:

- [PHSL 3xxx](#)
- [PHSL 4xxx](#)
- [PHSL 5xxx](#)
- [BIOC 4xxx](#)
- [BIOC 5xxx](#)
- [BIOL 3xxx](#)
- [BIOL 4xxx](#)
- [BIOL 5xxx](#)
- [NSCI 4xxx](#)
- [NSCI 5xxx](#)
- [GCD 4xxx](#)
- [MICB 4111](#) - Microbial Physiology and Diversity (3.0 cr)
- [MICB 4121](#) - Microbial Ecology and Applied Microbiology (3.0 cr)
- [MICB 4131](#) - Immunology (3.0 cr)
- [MICB 4141W](#) - Biology, Genetics, and Pathogenesis of Viruses: Writing Intensive [WI] (4.0 cr)
- [MICB 4171](#) - Biology, Genetics, and Pathogenesis of Viruses (3.0 cr)
- [MICB 4151](#) - Molecular and Genetic Bases for Microbial Diseases (3.0 cr)
- [MICB 4161W](#) - Eukaryotic Microbiology [WI] (3.0 cr)

Directed Research or Directed Studies in Pharmacology

Take 0 - 3 credits(s) from the following:

- [PHCL 4994](#) - Directed Research (1.0 - 3.0 cr)
- [PHCL 4993](#) - Directed Studies (1.0 - 3.0 cr)



Twin Cities Campus

Joint Military Science Leadership Minor

CCE Degree and Credit Programs Administration

College of Continuing Education

- Program Type: Undergraduate free-standing minor
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 18 to 20

This minor provides students with basic concepts and principles of military science and the art of leadership. Areas of study include citizenship, military history, values, ethics, integrity, honor, responsibility, management, and leadership skills. Students gain practical leadership experience, develop self-discipline, and gain confidence—all of which are valuable qualities when applied to service in a military or civilian career. In consultation with the ROTC programs, this minor is now distinct from participation in ROTC, is open to all qualified students, and does not require physical training.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Students choose one of four program tracks: Aerospace Science, Military Science, Naval Science-Navy, or Naval Science-Marines.

Program Sub-plans

Students are required to complete one of the following sub-plans. (Note for the Twin Cities and Morris campuses: The honors sub-plan does not meet this requirement. Honors students are required to complete one sub-plan plus the honors sub-plan. Please see an adviser if no honors sub-plan is listed for the program.)

Aerospace Science

Aerospace Science Option

The history requirement can be satisfied by the completion of AIR 1204 and AIR 1205 or by the completion of Air Force ROTC Field Training.

- [AIR 1204](#) - History of Airpower and Communication Skills (1.0 cr)
- [AIR 1205](#) - Quality Air Force, Group Leadership Problems, and Presentation Techniques (1.0 cr)
- [AIR 3301](#) - Air Force Leadership, Quality, and Communication (3.0 cr)
- [AIR 3302](#) - Air Force Officership, Quality, and Communication (3.0 cr)
- [AIR 3401](#) - National Security Policy (3.0 cr)
- [AIR 3402](#) - Preparation for Active Duty (3.0 cr)

Complete a 4-credit philosophy, rhetoric, or leadership course approved by the Professor of Aerospace/Chair of the Department of Aerospace Science.

Military Science

Military Science Option

- [MIL 3301](#) - Adaptive Tactical Leadership (3.0 cr)
- [MIL 3302](#) - Applied Team Leadership (3.0 cr)
- [MIL 3401](#) - Developing Adaptive Leaders (3.0 cr)
- [MIL 3402](#) - Leadership in a Complex World (3.0 cr)
- [MIL 3970](#) - Military History (3.0 cr)

Complete a 4-credit philosophy, rhetoric, or leadership course approved by the Professor of Military Science/Chair of the Department of Military Science.

Naval Science--Marines

Naval Science-Marines Option

- [NAV 1102](#) - Seapower and Maritime Affairs (3.0 cr)
- [NAV 3310](#) - Evolution of Warfare (3.0 cr)
- [NAV 4401W](#) - Leadership and Management I [WI] (3.0 cr)
- [NAV 4402W](#) - Leadership and Ethics [CIV, WI] (3.0 cr)
- [NAV 4410](#) - Amphibious Warfare (3.0 cr)

Complete a 4-credit philosophy, rhetoric, or leadership course approved by the Professor of Military/Chair of the Department of Naval Science.



Naval Science--Navy

Naval Science Option

[NAV 1102](#) - Seapower and Maritime Affairs (3.0 cr)

[NAV 2201](#) - Ship Systems I: Naval Engineering (3.0 cr)

[NAV 3301](#) - Navigation I: Piloting and Celestial Navigation (3.0 cr)

[NAV 4401W](#) - Leadership and Management I [WI] (3.0 cr)

[NAV 4402W](#) - Leadership and Ethics [CIV, WI] (3.0 cr)

Complete a 4-credit philosophy, rhetoric, or leadership course approved by the Professor of Military Science/Chair of the Department of Naval Science.



Twin Cities Campus

Applied Psychology in Educational and Community Settings Minor

Educational Psychology

College of Education and Human Development

- Program Type: Undergraduate free-standing minor
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 18

The applied psychology in educational and community settings (APECS) minor is an 18-credit program in the application of psychological theory (systems-ecological, developmental, behavioral, cognitive-behavioral) and scientific findings in educational settings to enhance the academic, social, and emotional competence of youth and adults. Emphasis areas include child/adolescent/adult learning and interpersonal, social, cultural, institutional, and economic contexts that shape cognition, motivation, and performance. Students gain direct experience by enrolling in either a research or community service practicum course. The APECS minor is designed to meet the needs of learners from diverse backgrounds and provide the tools necessary to keep pace with the increasing diversity found in schools and communities.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

APECS Required Courses

- [EPSY 3301](#) - Introduction to Educational Psychology [SOCS] (3.0 cr)
- [EPSY 3264](#) - Basic and Applied Statistics [MATH] (3.0 cr)
- [EPSY 3132](#) - Psychology of Multiculturalism in Education [DSJ] (3.0 cr)
- [EPSY 3302](#) - Introduction to Communication Skills for Educational and Community Settings (3.0 cr)

APECS Practicum

Complete 3 credits of practicum.

- [EPSY 3133](#) - Practicum: Service Learning, Psychology of Multiculturalism in Education (1.0 - 3.0 cr)
- or [EPSY 3303](#) - Educational Psychology Undergraduate Research Practicum (3.0 cr)

APECS Electives

- [EPSY 3119](#) - Learning, Cognition, and Assessment (3.0 cr)
- or [EPSY 5613](#) - Foundations of Special Education I (3.0 cr)
- or [EPSY 5616](#) - Behavior Analysis and Classroom Management (3.0 cr)
- or [EPSY 5461](#) - Cross-Cultural Counseling (3.0 cr)
- or [EPSY 5401](#) - Counseling Procedures (3.0 cr)
- or [EPSY 5432](#) - Foundations of Individual/Organizational Career Development (3.0 cr)
- or [EPSY 5221](#) - Principles of Educational and Psychological Measurement (3.0 cr)
- or [YOST 3234](#) - Youth Agencies, Organizations, and Youth Service Systems (3.0 cr)
- or [YOST 3235](#) (*Inactive*)(4.0 cr)
- or [YOST 4315](#) - Youthwork in Schools (4.0 cr)
- or [YOST 4317](#) - Youthwork in Contested Spaces (3.0 cr)



Twin Cities Campus

Coaching Minor

Kinesiology, School of

College of Education and Human Development

- Program Type: Undergraduate free-standing minor
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 23 to 30

The coaching minor offers an in-depth study of the theoretical and practical nature of coaching through a planned and integrated series of courses. Completion of the coaching minor also will qualify the student for the University of Minnesota Coaching Certificate.

Additional program offerings also include a certificate in coaching.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Admission is open to all University students. A Coaching Program Application Form must be submitted. Students must also maintain a 2.50 GPA in courses submitted for the completion of the coaching minor.

Minor Courses

Students completing the minor are required to take the courses listed below.

KIN 3113 - First Responder for Coaches and Athletic Trainers (3.0 cr)
or Current American Red Cross Standard First Aid and CPR Certification

KIN 3114 - Prevention and Care of Athletic Injuries (3.0 cr)

KIN 4641 - Training and Conditioning for Sport (3.0 cr)

Organization and Management

KIN 3143 - Organization and Administration of Sport (3.0 cr)

or **KIN 5725** - Organization and Management of Physical Education and Sport (3.0 cr)

Human Anatomy

Take one of the following KIN or ANAT courses

KIN 3027 - Human Anatomy for Kinesiology Students (3.0 cr)

or **ANAT 3601** - Principles of Human Anatomy (3.0 cr)

or **ANAT 3611** - Principles of Human Anatomy (3.0 cr)

or take the following course pair

ANAT 3001 - Human Anatomy (3.0 cr)

ANAT 3602 - Principles of Human Anatomy Laboratory (2.0 cr)

Electives

In addition to the courses below, any program-related course approved by the coaching program coordinator can be applied toward this minor.

Sport Psychology - Sociology

Take 1 or more course(s) from the following:

- **KIN 3126W** - Sport and Exercise Psychology [WI] (3.0 cr)
- **KIN 5126** - Sport Psychology (3.0 cr)
- **KIN 5136** - Psychology of Coaching (3.0 cr)
- **KIN 5371** - Sport and Society (3.0 cr)
- **KIN 5723** - Psychology of Sport Injury (3.0 cr)
- **SMGT 3501** - Sport in a Diverse Society [SOCS, DSJ] (3.0 cr)
- **SMGT 3601** - Ethics and Values in Sport (2.0 cr)
- **KIN 3136** - Mental Skills Training for Sport (3.0 cr)
- **SMGT 3861** - Legal Aspects of Sport (3.0 cr)

Sport Physical Sciences

Take 1 or more course(s) from the following:

- **KIN 3112** - Introduction to Biomechanics (4.0 cr)
- **KIN 3135** - Introduction to Motor Learning and Control (3.0 cr)
- **KIN 4385** - Exercise Physiology (4.0 cr)
- **KIN 4641** - Training and Conditioning for Sport (3.0 cr)
- **KIN 4741** - Strength and Power Development and Program Design (3.0 cr)



- [KIN 4841](#) - Athletic Performance and Environmental Considerations (3.0 cr)
- [KIN 5142](#) - Applied Sport Nutrition for Athletic Performance (3.0 cr)
- [KIN 5375](#) - Competitive Sport for Children and Youth (3.0 cr)
- [KIN 5641](#) - Scientific Theory and Application of Training and Conditioning in Sport (3.0 cr)
- [KIN 5720](#) - Special Topics in Kinesiology (1.0 - 8.0 cr)

Coaching Theory

Take 1 or more course(s) from the following:

- [KIN 3168](#) - Soccer Coaching Theory and Skill Development (2.0 cr)
- [KIN 3169](#) - Volleyball Coaching Theory and Skill Development (2.0 cr)
- [KIN 3171](#) - Baseball Coaching Theory and Skill Development (2.0 cr)
- [KIN 3172](#) - Basketball Coaching Theory and Skill Development (2.0 cr)
- [KIN 3173](#) - Football Coaching Theory and Skill Development (2.0 cr)
- [KIN 3174](#) *{Inactive}*(2.0 cr)
- [KIN 3175](#) *{Inactive}*(2.0 cr)
- [KIN 3176](#) *{Inactive}*(2.0 cr)
- [KIN 3177](#) *{Inactive}*(2.0 cr)
- [KIN 3178](#) - Tennis Coaching Theory and Skill Development (2.0 cr)
- [KIN 3179](#) - Track and Field Coaching Theory and Skill Development (2.0 cr)
- [KIN 3181](#) *{Inactive}*(2.0 cr)
- [KIN 3184](#) *{Inactive}*(2.0 cr)

Student Coaching

KIN 4697 includes a coaching experience under the supervision of a head coach or athletic director generally in a 7-12 grade setting, as well as a class requiring three integrated papers incorporating a personal coaching philosophy, the role of sport in society, and the identification of challenges in coaching in today's society.

[KIN 4697](#) - Student Coaching and Seminar (3.0 cr)



Twin Cities Campus

Family Violence Prevention Minor

School of Social Work

College of Education and Human Development

- Program Type: Undergraduate free-standing minor
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 15

The family violence prevention minor is a 15-credit undergraduate program for students interested in strengthening their educational experience with a research base and a set of practical skills in family violence prevention. It is an intensive, interdisciplinary learning experience for students in all fields of study.

Courses are in fields related to social services, education, health care, and other direct services addressing issues related to child abuse and neglect, adult domestic violence, elder abuse, and intergenerational abuse. Students learn theories and research related to violent behavior, examine relationships between violence in society and violence within families, and explore different professional responses to violence. Elective courses provide the opportunity to integrate these concepts into further study within a major or in other fields of interest.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Minor Courses

[SW 3701](#) - Introduction to Child Maltreatment: Intervention and Prevention (3.0 cr)

[SW 3702](#) - Introduction to Adult Intimate Partner Violence: Intervention and Prevention (3.0 cr)

[SW 3703](#) - Gender Violence in Global Perspective [IP] (3.0 cr)

Take 6 or more credits(s) from the following:

- [CAPY 5623](#) - Assessment and Treatment Interventions: Anxiety and Depression in Children and Adolescents (1.0 cr)
- [CSPH 5211](#) - Peacemaking and Spirituality: A Journey Toward Healing and Strength (2.0 - 3.0 cr)
- [FSOS 1101](#) - Intimate Relationships [SOCS] (4.0 cr)
- [FSOS 3104](#) - Global and Diverse Families [SOCS, GP] (3.0 cr)
- [FSOS 3426](#) - Alcohol and Drugs: Families and Culture (3.0 cr)
- [GWSS 3415](#) - Feminist Perspectives on Domestic Violence and Sexual Assault [DSJ] (3.0 cr)
- [JWST 3521W](#) - History of the Holocaust [WI] (3.0 cr)
- [SOC 3101](#) - Introduction to the American Criminal Justice System [SOCS, CIV] (3.0 cr)
- [SOC 3102](#) - Introduction to Criminal Behavior and Social Control (3.0 cr)
- [SOC 3501](#) - Sociology of Families [SOCS, DSJ] (3.0 cr)
- [SOC 4109](#) - Domestic Criminal Violence (3.0 cr)
- [SOC 4461](#) - Sociology of Ethnic and Racial Conflict [DSJ] (3.0 cr)
- [YOST 5322](#) - Work With Youth: Families (2.0 cr)
- [AFRO 3072](#) - Racism: Social and Psychological Consequences for Black Americans (3.0 cr)
or [AFRO 5072](#) - Racism: Social and Psychological Consequences for Black Americans (3.0 cr)



Twin Cities Campus

Leadership Minor

Organizational Leadership, Policy and Development

College of Education and Human Development

- Program Type: Undergraduate free-standing minor
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 17

The 17-credit undergraduate leadership minor prepares students for real-life leadership experiences by combining social change and adaptive theories of leadership with authentic community and global leadership experiences. Students gain hands-on, adaptive leadership experience, as well as an understanding of how ethics, citizenship, social justice, community building, and communication skills support effective leadership. This minor is a collaborative effort of the College of Education and Human Development's department of Organizational Leadership, Policy, and Development, the Hubert H. Humphrey School of Public Affairs, and the Office for Student Affairs.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Leadership, You and Your Community

- [OLPD 3302](#) - Leadership, You, and Your Community (3.0 cr)
or [PA 3961](#) - Leadership, You, and Your Community (3.0 cr)

Field Experience

- [OLPD 3306](#) - Leadership Minor: Field Experience (3.0 cr)
or [PA 3971](#) - Leadership Minor: Field Experience (3.0 cr)

Leadership for Global Citizenship

- [OLPD 4303W](#) - Leadership for Global Citizenship [WI] (3.0 cr)
or [PA 4961W](#) - Leadership for Global Citizenship [WI] (3.0 cr)

Leadership Electives

In consultation with the leadership minor office, take at least 5 additional credits to complete the 17-credit requirement. The following approved elective options form one list composed of courses from colleges across Twin Cities campus.

Take 1 or more course(s) totaling 5 or more credits(s) from the following:

- [ABUS 4012](#) - Strategic Decision Making and Problem Solving (3.0 cr)
- [ABUS 4022](#) - Management in Organizations (3.0 cr)
- [ABUS 4023W](#) - Communicating for Results [WI] (3.0 cr)
- [ABUS 4031](#) - Strategic Use of Business Information Systems (3.0 cr)
- [ABUS 4041](#) - Dynamics of Leadership (3.0 cr)
- [ABUS 4043](#) - Project Management in Practice (3.0 cr)
- [AFEE 2221](#) - People Skills for Leadership (3.0 cr)
- [AFEE 4221](#) - Rural Leadership Development (3.0 cr)
- [AFRO 3072](#) - Racism: Social and Psychological Consequences for Black Americans (3.0 cr)
- [AFRO 3131](#) - Contemporary Issues in Africa (3.0 cr)
- [AFRO 3543](#) - Psychology and the Black American Experience (3.0 cr)
- [AFRO 4105](#) - Ways of Knowing in Africa and the African Diaspora (3.0 cr)
- [AFRO 4432](#) - Colloquium: Before the Field: Internships, Community Service, and Study Abroad (3.0 cr)
- [AFRO 4478](#) - Contemporary Politics in Africa and the Colonial Legacy (3.0 cr)
- [AFRO 4598](#) *{Inactive}* (3.0 cr)
- [AMST 3114](#) - America in International Perspective [DSJ] (3.0 cr)
- [AMST 3837](#) *{Inactive}* (3.0 cr)
- [AMST 4101](#) - Gender, Sexuality, and Politics in America [HIS, DSJ] (3.0 cr)
- [ANTH 1005W](#) - Introduction to Cultural Diversity and the World System [SOCS, GP, WI] (4.0 cr)
- [ANTH 3002](#) - Sex, Evolution, and Behavior: Examining Human Evolutionary Biology (4.0 cr)
- [ANTH 3015W](#) - Biology, Evolution, and cultural Development of Language [SOCS, WI] (3.0 cr)
- [ANTH 3041](#) - Ecological Anthropology (3.0 cr)
- [ANTH 3242W](#) - Hero, Savage, or Equal? Representations of NonWestern Peoples in the Movies [WI] (3.0 cr)
- [ANTH 4009W](#) - Warfare and Human Evolution [WI] (3.0 cr)



- ANTH 4071 - Race, Culture, and Vision (3.0 cr)
- ASL 3705 - Cultural Perspectives of Deafness (3.0 cr)
- BA 3000 - Career Skills (1.0 cr)
- BA 3100 - Global Seminar (3.0 cr)
- BA 3900 - Topics (1.0 - 4.0 cr)
- BA 3990H - Honors Topics (2.0 - 4.0 cr)
- BA 4503 - Carlson Ventures Enterprise (2.0 cr)
- BIOL 1301 - Becoming a Reflective Leader (1.0 cr)
- BIOL 2301 - Leadership and Service (2.0 cr)
- BIOL 3600 - Directed Instruction (1.0 - 2.0 cr)
- CHIC 4275 - Theory in Action: Community Engagement in a Social Justice Framework [CIV] (3.0 cr)
- CI 1911 - Ethics, Wealth, and Education in a Democracy (3.0 cr)
- CI 2311W - Introduction to Technology and Ethics in Society [CIV, WI] (3.0 cr)
- CI 4311W - Technology and Ethics in Society [CIV, WI] (3.0 cr)
- CLA 1401 - Leadership, Citizenship, and the University (3.0 cr)
- CLA 2005 - Introduction to Liberal Education and Responsible Citizenship (3.0 cr)
- COLA 3011 - Move to Question: A Lab for Creative Practice (3.0 cr)
- COLA 3521 - Collaboratory II: Collaborative Research Laboratory (1.0 cr)
- COMM 1101 - Introduction to Public Speaking [CIV] (3.0 cr)
- COMM 1313W - Analysis of Argument [WI] (3.0 cr)
- COMM 3401 - Introduction to Communication Theory (3.0 cr)
- COMM 3409 - Nonverbal Communication [SOCS] (3.0 cr)
- COMM 3411 - Introduction to Small Group Communication (3.0 cr)
- COMM 3422 - Interviewing and Communication (3.0 cr)
- COMM 3441 - Introduction to Organizational Communication (3.0 cr)
- COMM 3451W - Intercultural Communication: Theory and Practice [IP, WI] (3.0 cr)
- COMM 3452W - Communication and the Intercultural Reentry [WI] (3.0 cr)
- COMM 3605W - Persuasive Speaking and Speech Writing [WI] (3.0 cr)
- COMM 3615 - Argumentation [C/PE] (3.0 cr)
- COMM 3625 - Communication Ethics (3.0 cr)
- COMM 3631 - Freedom of Speech [CIV] (3.0 cr)
- COMM 3645W - How Pictures Persuade [WI] (3.0 cr)
- COMM 4235 - Electronic Media and Ethnic Minorities--A World View [IP] (3.0 cr)
- COMM 4263 - Feminist Media Studies [DSJ] (3.0 cr)
- COMM 4291 - New Telecommunication Media (3.0 cr)
- COMM 4404 - Language Borderlands [CD] (3.0 cr)
- COMM 4407 - Communication and Conflict (3.0 cr)
- COMM 5411 - Small Group Communication Research (3.0 cr)
- CPSY 4996 - Field Study in Child Psychology (1.0 - 4.0 cr)
- CSCI 3921W - Social, Legal, and Ethical Issues in Computing [CIV, WI] (3.0 cr)
- CSCL 3979 - Issues in Cultural Pluralism [DSJ] (3.0 cr)
- CSPH 3201 - Introduction to Mindfulness-Based Stress Reduction (2.0 cr)
- DES 1111 - Creative Problem Solving (3.0 cr)
- DES 1111H - Honors: Creative Problem Solving (3.0 cr)
- DES 4165 - Design and Globalization [DSJ] (3.0 cr)
- EDHD 5005 - School and Society (2.0 cr)
- OLPD 3310 - Special Topics for Undergraduates (1.0 - 3.0 cr)
- OLPD 3336 - Religion, Ethics, and Educational Policy [CIV] (3.0 cr)
- OLPD 3330 - Global Identity: Connecting Your International Experience to Your Future (1.0 cr)
- OLPD 3318 - Introduction to Project Management (3.0 cr)
- OLPD 3303 *(Inactive)*(3.0 cr)
- OLPD 3304 - Strategic Leadership for Future Societies (3.0 cr)
- OLPD 3305 - Learning About Leadership Through Film and Literature (3.0 cr)
- OLPD 4318 - Advanced Project Management (3.0 cr)
- OLPD 5048 - Cross-Cultural Perspectives on Leadership (3.0 cr)
- OLPD 5080 - Special Topics: Educational Policy and Administration (1.0 - 3.0 cr)
- OLPD 5095 - Problems: Educational Policy and Administration (1.0 - 3.0 cr)
- EDPA 5101 *(Inactive)*(3.0 cr)
- OLPD 5323 - Women in Leadership (3.0 cr)
- EEB 4329 - Primate Ecology and Social Behavior (3.0 cr)
- ENGL 3505 - Community Learning Internships I (3.0 cr)
- ENGL 3506 - Learning Internships II (4.0 cr)
- ENGL 3741 - Literacy and American Cultural Diversity [LITR, CIV] (4.0 cr)
- EPSY 3101 - Creativity and Intelligence: an Introduction (3.0 cr)
- EPSY 3111W *(Inactive)*[WI] (3.0 cr)



- EPSY 3132 - Psychology of Multiculturalism in Education [DSJ] (3.0 cr)
- EPSY 3133 - Practicum: Service Learning, Psychology of Multiculturalism in Education (1.0 - 3.0 cr)
- EPSY 3302 - Introduction to Communication Skills for Educational and Community Settings (3.0 cr)
- EPSY 3303 - Educational Psychology Undergraduate Research Practicum (3.0 cr)
- EPSY 5135 - Human Relations Workshop (4.0 cr)
- ESPM 3011W - Ethics in Natural Resources [WI] (3.0 cr)
- ESPM 3202W - Environmental Conflict Management, Leadership, and Planning [WI] (3.0 cr)
- FSCN 3615 - Sociocultural Aspects of Food, Nutrition, and Health [GP] (3.0 cr)
- FSOS 2101 - Preparation for Working With Families (2.0 cr)
- GEOG 3158 *{Inactive}*(3.0 cr)
- GEOG 3371W - Cities, Citizens, and Communities [DSJ, WI] (4.0 cr)
- GEOG 3381W - Population in an Interacting World [SOCS, GP, WI] (4.0 cr)
- GEOG 3605W *{Inactive}*[WI] (4.0 cr)
- GEOG 4382 *{Inactive}*(3.0 - 5.0 cr)
- GEOG 4700 - Community Service Learning (1.0 - 3.0 cr)
- GLOS 1015W - Globalization: Issues and Challenges [GP, WI] (4.0 cr)
- GLOS 3143 - Living in the Global (3.0 cr)
- GLOS 3144 - Knowledge, Power, and the Politics of Representation in Global Studies (4.0 cr)
- GLOS 3144H - Honors: Knowledge, Power, and the Politics of Representation in Global Studies (4.0 cr)
- GLOS 3402 - Human Rights Internship (3.0 cr)
- GLOS 3602 - Other Worlds: Globalization and Culture (3.0 cr)
- GLOS 3605 - From Printing Press to Internet: Media, Communications, and History (3.0 cr)
- GLOS 3607 *{Inactive}*(3.0 cr)
- GLOS 3643 - Islam and the West (3.0 cr)
- GLOS 3645 *{Inactive}*(3.0 cr)
- GLOS 4801 - International Development: Critical Perspectives on Theory and Practice (4.0 cr)
- GLOS 4802 - Cross-Cultural Perspectives on Work (4.0 cr)
- GLOS 4803 - MSID Country Analysis (4.0 cr)
- GLOS 4805 - Community Internships in the Global South (4.0 cr)
- GLOS 4807 - Applied Field Methods (4.0 cr)
- GLOS 4809 - Advanced International Development Internship (4.0 cr)
- GWSS 3003 - Gender and Global Politics [SOCS, GP] (3.0 cr)
- GWSS 3003H - Honors: Gender and Global Politics (3.0 - 4.0 cr)
- GWSS 3190 - Topics: Theory, Knowledge, and Power (3.0 cr)
- GWSS 3351 - Women and Diasporas in Modern History (3.0 cr)
- GWSS 3404 - Transnational Sexualities [GP] (3.0 cr)
- GWSS 3406 - Gender, Labor, and Politics [SOCS, GP] (3.0 cr)
- GWSS 3590 - Topics: Social Change, Activism, Law, and Policy Studies (3.0 cr)
- OLPD 3640 - Introduction to Organization Development (3.0 cr)
- OLPD 4602 - Managing Work Teams (3.0 cr)
- OLPD 4608 - Introduction to International Human Resource Development (3.0 cr)
- OLPD 4627 - Management and Supervisory Training and Development (3.0 cr)
- OLPD 5607 - Organization Development (3.0 cr)
- HRD 5821 *{Inactive}*(3.0 cr)
- HRIR 3021 - Human Resource Management and Industrial Relations (3.0 cr)
- HRIR 3032 - Training and Development (2.0 cr)
- HRIR 3041 - The Individual in the Organization (2.0 cr)
- HRIR 3042 - The Individual and Organizational Performance (2.0 cr)
- HRIR 4100W - Undergraduate HRIR Leadership Capstone [WI] (4.0 cr)
- HSCI 3242 - The Darwinian Revolution [HIS] (3.0 cr)
- HSCI 3331 - Technology and American Culture [HIS, TS] (3.0 cr)
- HSCI 3333W - Issues in American Science and Technology in the Past Century [HIS, CIV, WI] (3.0 cr)
- HSCI 3401 - Ethics in Science and Technology [HIS, CIV] (3.0 cr)
- HSCI 4321 - History of Computing [TS, HIS] (3.0 cr)
- HSCI 4455 - Women, Gender, and Science [HIS, DSJ] (3.0 cr)
- HSG 2401 - Introduction to Housing (3.0 cr)
- HSG 2463 - Housing and Community Development (3.0 cr)
- IBUS 3003 - Information Systems for Business Processes and Management: An International Perspective (4.0 cr)
- IBUS 3010 - Introduction to Entrepreneurship: An International Perspective (4.0 cr)
- IBUS 3021 - Human Resources Management: An International Perspective (4.0 cr)
- IBUS 4050 - Management of Innovation and Change (4.0 cr)
- ID 3201 - Career Planning (2.0 cr)
- ID 3208 - Internship Reflection: Making Meaning of Your Experience (1.0 cr)
- ID 3551 *{Inactive}*(3.0 cr)
- ID 3552 - Community Leadership Internship: Leadership, Ethics, and Community Building in Nonprofits (3.0 cr)



- ID 3571 - HECUA: Inequality in America - Contested Theories of Poverty, Inequality, and Social Change [SOCS] (4.0 cr)
- ID 3572 - HECUA: Inequality in America - Social Policy and Anti-Poverty Strategies in Theory and Practice [DSJ] (4.0 cr)
- ID 3573 - HECUA: Inequality in America Internship Seminar [CIV] (8.0 cr)
- IDSC 4301 - Information Systems Capstone Course: A Live Case (2.0 cr)
- INET 3065 - Computer Security for the Business Professional (3.0 cr)
- INET 4082 - IT Infrastructure Projects and Processes (2.0 cr)
- INET 4153 - Policy and Regulation: Effects on Global IT Infrastructure (3.0 cr)
- INET 4165 - Information Security: Technology, Ethics, Legality, and Standards (3.0 cr)
- IS 4151 - Innovation for Leaders and Organizations (3.0 cr)
- IS 5001 - Introduction to Innovation Studies (1.0 - 4.0 cr)
- IS 5002 - Final Project for Innovation Studies (1.0 - 4.0 cr)
- JOUR 3005 - Mass Media Effects [SOCS] (3.0 cr)
- JOUR 3251 - Evaluative Research in Strategic Communication (3.0 cr)
- JOUR 3551 - Economics of New Media [TS] (3.0 cr)
- JOUR 3552 - Internet and Global Society (3.0 cr)
- JOUR 3741 - People of Color and the Mass Media [DSJ] (3.0 cr)
- JOUR 3745 - Mass Media and Popular Culture [AH, DSJ] (3.0 cr)
- JOUR 3745H - Honors: Mass Media and Popular Culture (3.0 cr)
- JOUR 3771 - Mass Media Ethics: Moral Reasoning and Case Studies [CIV] (3.0 cr)
- JOUR 3796 - Mass Media and Politics (3.0 cr)
- JOUR 4259 - Strategic Communication Case Analysis (3.0 cr)
- JOUR 4272 - Interactive Advertising (3.0 cr)
- JOUR 4302 - Electronic Photojournalism (3.0 cr)
- JOUR 4551 - New Media and Culture [AH, TS] (3.0 cr)
- JOUR 4721 - Mass Media and U.S. Society [SOCS, DSJ] (3.0 cr)
- JOUR 4801 - Global Communication (3.0 cr)
- JWST 3111 - Too Jewish? The Complex Construction of the Jewish American Psyche in Literature, Art, and Film (3.0 cr)
- JWST 3113 - African American and Jewish American Relations in the United States (3.0 cr)
- JWST 3520 - History of the Holocaust (3.0 cr)
- JWST 3521W - History of the Holocaust [WI] (3.0 cr)
- JWST 3522 - History of the Arab-Israeli Conflict (3.0 cr)
- LAS 3441 - Chicana/o History to 1900 (3.0 cr)
- LAS 3442 *{Inactive}*(3.0 cr)
- LAS 4465 - Housing in World Perspective (3.0 cr)
- LS 5100 - Liberal Studies Seminar (1.0 - 4.0 cr)
- MGMT 3010 - Introduction to Entrepreneurship (4.0 cr)
- MGMT 3014 - Topics in International Business, Government, and Society (4.0 cr)
- MGMT 3040 - Understanding the International Environment of Firms: International Business (2.0 cr)
- MGMT 3080 - Topics in Ethics (4.0 cr)
- MGMT 3090 - Topics in Leadership (2.0 - 4.0 cr)
- MGMT 4000 - Issues in Nonprofit Management (4.0 cr)
- MGMT 4002 - Managerial Psychology (4.0 cr)
- MGMT 4004W - Business Policy: Strategy Formulation and Implementation [WI] (3.0 cr)
- MGMT 4008 - Entrepreneurial Management (4.0 cr)
- MGMT 4080W - Applied Technology Entrepreneurship [WI] (4.0 cr)
- MGMT 4171W - Entrepreneurship in Action I [WI] (4.0 cr)
- MGMT 4172 - Entrepreneurship in Action II (4.0 cr)
- MIL 3130 *{Inactive}*(3.0 cr)
- MIL 3131 *{Inactive}*(3.0 cr)
- MIL 3140 *{Inactive}*(3.0 cr)
- MIL 3301 - Adaptive Tactical Leadership (3.0 cr)
- MIL 3302 - Applied Team Leadership (3.0 cr)
- MIL 3303 - MS III One Credit Lead Lab (1.0 cr)
- MIL 3304 - MS III One Credit Lead Lab (1.0 cr)
- MIL 3401 - Developing Adaptive Leaders (3.0 cr)
- MIL 3402 - Leadership in a Complex World (3.0 cr)
- MIL 3403 - MS IV One Credit Lead Lab (1.0 cr)
- MIL 3404 - MS IV One Credit Lead Lab (1.0 cr)
- MKTG 3001 - Principles of Marketing (3.0 cr)
- MKTG 4050 - Integrated Marketing Communications (4.0 cr)
- MKTG 4080W - Marketing Strategy [WI] (4.0 cr)
- MOT 4001 - Leadership, Professionalism and Business Basics for Engineers (2.0 cr)
- NAV 4401W - Leadership and Management I [WI] (3.0 cr)
- NAV 4402W - Leadership and Ethics [CIV, WI] (3.0 cr)
- NSCI 3102W - Introduction to Neuroscience II: Biological Basis of Behavior [WI] (3.0 cr)



- NSCI 4167 - Neuroscience in the Community (1.0 - 3.0 cr)
- NURS 3706 - Therapeutic Communication (3.0 cr)
- NURS 3806 - Nurse as Professional (2.0 cr)
- NURS 4104 - Ethical Sensitivity and Reasoning in Health Care [CIV] (2.0 cr)
- NURS 4106 - Nurse as Collaborator (2.0 cr)
- NURS 4305 - Practicum: Community-based Care of Families Across Life Span (3.0 cr)
- NURS 4322 - Population-based Public Health Nursing (5.0 cr)
- NURS 4324 - Transcultural Nursing and Global Health [GP] (3.0 cr)
- NURS 4402 - Taking Ethical Action in Health Care [CIV] (1.0 cr)
- NURS 4406W *{Inactive}*[WI] (4.0 cr)
- NURS 4500W - Nursing Leadership and Health Care Systems [WI] (4.0 cr)
- NURS 4706 - Transition to Practice (1.0 cr)
- NURS 4707 - Nursing Leadership: Professional Practice in Complex Systems (2.0 cr)
- PA 1401 - Public Affairs: Community Organizing Skills for Public Action [CIV] (3.0 cr)
- PA 3401 *{Inactive}*(3.0 cr)
- PA 3990 - General Topics in Public Policy (1.0 - 3.0 cr)
- PA 3991 - Independent Study (1.0 - 3.0 cr)
- PA 4101 - Nonprofit Management and Governance (3.0 cr)
- PA 4190 - Topics in Public and Nonprofit Leadership and Management (3.0 cr)
- PA 4421 *{Inactive}*(3.0 cr)
- PA 5001 - Intellectual Foundations of Public Action (3.0 cr)
- PA 5490 - Topics in Social Policy (1.0 - 4.0 cr)
- PA 5920 - Skills Workshop (0.5 - 4.0 cr)
- PA 5941 - Leadership for the Common Good (4.0 cr)
- PHIL 1003W - Introduction to Ethics [CIV, WI] (4.0 cr)
- PHIL 1006W - Philosophy and Cultural Diversity [AH, DSJ, WI] (4.0 cr)
- PHIL 3234 *{Inactive}*(4.0 cr)
- PHIL 3302W - Moral Problems of Contemporary Society [CIV, WI] (4.0 cr)
- PHIL 3307 - Social Justice and Community Service [AH, CIV] (4.0 cr)
- PHIL 3308 *{Inactive}*(4.0 cr)
- PHIL 4324 *{Inactive}*(3.0 cr)
- PHIL 4325 - Education and Social Change [AH, CIV] (4.0 cr)
- PHIL 4326 - Lives Worth Living: Questions of Self, Vocation, and Community [CIV, AH] (6.0 cr)
- POL 1234 - Citizen U: Building Tomorrow's Citizens Today (3.0 cr)
- POL 3235W - Democracy and Citizenship [CIV, WI] (3.0 cr)
- POL 3306 - Presidential Leadership and American Democracy (3.0 cr)
- POL 3739 - Politics of Race, Class, and Ethnicity (3.0 cr)
- POL 3766 - Political Psychology of Mass Behavior [SOCS] (3.0 cr)
- POL 3767 - Political Psychology of Elite Behavior [CIV] (3.0 cr)
- POL 3835 - International Relations [SOCS, GP] (3.0 cr)
- POL 3873V - Global Citizenship and International Ethics [CIV, WI] (3.0 cr)
- POL 4225 *{Inactive}*(3.0 - 4.0 cr)
- POL 4331 - Thinking Strategically in Domestic Politics (3.0 - 4.0 cr)
- POL 4463 - The Cuban Revolution Through the Words of Cuban Revolutionaries [GP] (3.0 cr)
- POL 4487 - The Struggle for Democratization and Citizenship (4.0 cr)
- POL 4489W - Citizens, Consumers, and Corporations [CIV, WI] (3.0 cr)
- POL 4771 - Racial Attitudes and Intergroup Conflict (3.0 cr)
- POL 4773W - Interest Groups, Social Movements and Politics of Race, Class, and Gender [DSJ, WI] (3.0 cr)
- POL 4885W - International Conflict and Security [GP, WI] (4.0 cr)
- POL 4887 - Thinking Strategically in International Politics (3.0 cr)
- PSTL 1461 - Multicultural Perspectives in Public Speaking [CIV] (3.0 cr)
- PSTL 3214 - Community Action (4.0 cr)
- PSTL 4216 - Solving Complex Problems: Community-based Approaches (4.0 cr)
- PSTL 4217 - Inquiry and Assessment for Citizen Scholars (4.0 cr)
- PSY 3061 - Introduction to Biological Psychology (3.0 cr)
- PSY 3201 - Introduction to Social Psychology (3.0 cr)
- PSY 3633 - Happiness: Integrating Research Across Psychological Sciences (3.0 cr)
- PSY 3711 - Introduction to Industrial and Organizational Psychology (3.0 cr)
- PSY 3960 - Undergraduate Seminar in Psychology (1.0 - 5.0 cr)
- PUBH 3050 - Practicum in Peer Education I (2.0 cr)
- PUBH 3052 - Practicum in Peer Education II (2.0 cr)
- PUBH 3093 - Directed Study: Public Health (1.0 - 4.0 cr)
- REC 2151 - Outdoor and Camp Leadership (3.0 cr)
- RELS 3111 - Too Jewish? The Complex Construction of the Jewish American Psyche in Literature, Art, and Film (3.0 cr)
- RELS 3373 - Religion and Society in Imperial China (3.0 cr)



- RELS 3623 - Religion and the U.S. Founding: Contests Then and Now Over the Place of Religion in Politics [HIS] (3.0 cr)
- RELS 3715 - History of the Crusades (3.0 cr)
- RELS 3801 - Philosophy of Religion (3.0 cr)
- RELS 4049 - Religion and Culture (3.0 cr)
- RELS 5111 - Problems in Historiography and Representation of the Holocaust (3.0 cr)
- RM 1203 - Computer Literacy and Problem Solving (3.0 cr)
- SMGT 3501 - Sport in a Diverse Society [SOCS, DSJ] (3.0 cr)
- SMGT 3601 - Ethics and Values in Sport (2.0 cr)
- SOC 3201 - Inequality: Introduction to Stratification (3.0 cr)
- SOC 3211W - American Race Relations [SOCS, DSJ, WI] (3.0 cr)
- SOC 3301W - Politics and Society [WI] (3.0 cr)
- SOC 3411W - Organizations and Society [WI] (3.0 cr)
- SOC 3451W - Cities and Social Change [WI] (3.0 cr)
- SOC 4090 - Topics in Sociology (3.0 cr)
- SOC 4305 - Society and the Environment: A Growing Conflict (3.0 cr)
- SOC 4309 - Prophets, Pundits, and Priests: Public Religion in the United States Today [CIV] (3.0 cr)
- SOC 4461 - Sociology of Ethnic and Racial Conflict [DSJ] (3.0 cr)
- SOC 4703 - Contemporary American Culture [CIV] (3.0 cr)
- SPAN 3401 - Latino Immigration and Community Service [CIV] (3.0 cr)
- SW 3101 *{Inactive}*(3.0 cr)
- SW 3203 *{Inactive}*(3.0 cr)
- SW 3301 - GLBT Social Movements (3.0 cr)
- SW 3501 - Theories and Practices of Social Change Organizing (4.0 cr)
- SW 3703 - Gender Violence in Global Perspective [IP] (3.0 cr)
- SW 3810 - Special Topics (1.0 - 4.0 cr)
- URBS 3001W - Introduction to Urban Studies: The Complexity of Metropolitan Life [WI] (3.0 cr)
- URBS 3301W - American Cities As Settings for Cultural Diversity [WI] (3.0 cr)
- URBS 3500 - Urban Studies Workshop (3.0 cr)
- OLPD 3820 - Principles of Supervisory Management (3.0 cr)
- OLPD 3821 *{Inactive}*(3.0 cr)
- OLPD 3801 - Foundations of Philosophy and Practice of Career and Technical Education (2.0 cr)
- OLPD 3828 - Diversity in the Workplace (3.0 cr)
- OLPD 5821 *{Inactive}*(3.0 cr)
- OLPD 5804 - Leadership in WHRE (2.0 cr)
- WRIT 3108 *{Inactive}*[DSJ] (3.0 cr)
- WRIT 3152W - Writing on Issues of Science and Technology [WI] (4.0 cr)
- WRIT 3244W - Critical Literacies: How Words Change the World [AH, DSJ, WI] (3.0 cr)
- WRIT 3361 - Literature of Social Movements in the United States: 1950 to 2000 [LITR, CIV] (3.0 cr)
- WRIT 3371 - Technology, Self, and Society (3.0 cr)
- WRIT 3577W - Rhetoric, Technology, and the Internet [TS, WI] (3.0 cr)
- WRIT 3671 - Visual Rhetoric and Document Design (3.0 cr)
- WRIT 3751W - Seminar: Theory and Practice of Writing Consultancy [WI] (4.0 cr)
- WRIT 4501 - Usability and Human Factors in Technical Communication (3.0 cr)
- WRIT 4562 *{Inactive}*(3.0 cr)
- WRIT 4573W - Writing Proposals and Grant Management [WI] (3.0 cr)
- WRIT 4662W - Writing With Digital Technologies [WI] (4.0 cr)
- YOST 3101 - Youthwork: Orientations and Approaches (4.0 cr)
- YOST 3235 *{Inactive}*(4.0 cr)
- YOST 4316 - Media and Youth: Learning, Teaching, and Doing (2.0 cr)
- YOST 4325 - Improving Everyday Youthwork: Practical Program Evaluation (3.0 cr)



Twin Cities Campus

Social Justice Minor

School of Social Work

College of Education and Human Development

- Program Type: Undergraduate free-standing minor
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 17 to 18

The social justice minor offers undergraduate students the opportunity to theorize about the meanings of social justice and practice "doing" social justice advocacy in community organizations. The minor is an interdisciplinary, cross-collegiate undergraduate program. Students create socially just communities and a respectful space for all opinions in the dialogue-based classrooms. Teaching faculty, students, and community groups become partners in creating and sharing in an authentic collective learning experience. The program is based on the belief in equity and fairness in every aspect of human experience and the importance of recognizing the struggles for liberation and the social movements of many peoples globally.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

The social justice minor requires three of the four core courses (11 to 12 credits), all of which include 30 hours of service learning in social justice organizations, and 6 credits of elective courses.

Core Courses

These courses include 30 hours of service learning in social justice organizations.

- [SW 3501](#) - Theories and Practices of Social Change Organizing (4.0 cr)
- [SW 4501](#) - Senior Seminar in Social Justice (4.0 cr)
- [SW 2501W](#) - Introduction to Social Justice [WI] (4.0 cr)
- or [SW 1501](#) - Introduction to Peace Studies (3.0 cr)

Electives

Take 6 or more credits(s) from the following:

- [AAS 1101](#) - Imagining Asian America [SOCS, DSJ] (3.0 cr)
- [AAS 3301](#) - Asian America Through Arts and Culture [AH, DSJ] (3.0 cr)
- [AFRO 3120](#) - Social and Intellectual Movements in the African Diaspora (3.0 cr)
- [AFRO 3251W](#) - Sociological Perspectives on Race, Class, and Gender [WI] (3.0 cr)
- [AFRO 3426](#) - African Americans, Social Policy, and the Welfare State (3.0 cr)
- [AFRO 3866](#) - The Civil Rights and Black Power Movement, 1954-1984 (3.0 cr)
- [AMST 3001](#) - Contemporary Perspectives on Asian America [DSJ] (3.0 cr)
- [CHIC 1112](#) - Introduction to Chicana/o Studies: Critical Paradigms [DSJ] (3.0 cr)
- [CHIC 1275](#) - Service Learning in the Chicano/Latino Community [CIV] (3.0 cr)
- [CHIC 3212](#) - Chicana Studies: La Chicana in Contemporary Society [AH, DSJ] (3.0 cr)
- [CHIC 3275](#) - Service Learning in the Chicano/Latino Community [CIV] (3.0 cr)
- [CHIC 3374](#) - Migrant Farmworkers in the United States: Families, Work, and Advocacy [CIV] (3.0 cr)
- [CHIC 3446](#) - Chicana/o History II: WWII, El Movimiento, and the New Millennium [HIS, DSJ] (3.0 cr)
- [CHIC 4275](#) - Theory in Action: Community Engagement in a Social Justice Framework [CIV] (3.0 cr)
- [CI 2311W](#) - Introduction to Technology and Ethics in Society [CIV, WI] (3.0 cr)
- [EPSY 3132](#) - Psychology of Multiculturalism in Education [DSJ] (3.0 cr)
- [EPSY 3133](#) - Practicum: Service Learning, Psychology of Multiculturalism in Education (1.0 - 3.0 cr)
- [ESPM 3480](#) - Topics in Natural Resources (1.0 - 4.0 cr)
- [FSOS 3104](#) - Global and Diverse Families [SOCS, GP] (3.0 cr)
- [GEOG 3379](#) - Environment and Development in the Third World [SOCS, ENV] (3.0 cr)
- [GLBT 3301](#) - Gay, Lesbian, Bisexual, and Transgender Social Movements in the United States (3.0 cr)
- [GWSS 1002](#) - Politics of Sex [SOCS, DSJ] (3.0 cr)
- [GWSS 3003](#) - Gender and Global Politics [SOCS, GP] (3.0 cr)
- [GWSS 3590](#) - Topics: Social Change, Activism, Law, and Policy Studies (3.0 cr)
- [HIST 3877](#) - Asian American History, 1850-Present [HIS, DSJ] (3.0 cr)
- [OLPD 3304](#) - Strategic Leadership for Future Societies (3.0 cr)
- [PHIL 1004W](#) - Introduction to Political Philosophy [AH, CIV, WI] (4.0 cr)
- [PHIL 1007](#) - Introduction to Political Philosophy Practicum (1.0 cr)



- PHIL 3301 - Environmental Ethics [ENV] (4.0 cr)
- PHIL 3302W - Moral Problems of Contemporary Society [CIV, WI] (4.0 cr)
- PHIL 3307 - Social Justice and Community Service [AH, CIV] (4.0 cr)
- PHIL 4231 - Philosophy of Language (3.0 cr)
- PHIL 4325 - Education and Social Change [AH, CIV] (4.0 cr)
- POL 4210 - Topics in Political Theory (3.0 cr)
- SOC 3003 - Social Problems (3.0 cr)
- SOC 3201 - Inequality: Introduction to Stratification (3.0 cr)
- SOC 3211W - American Race Relations [SOCS, DSJ, WI] (3.0 cr)
- SOC 3251W - Sociological Perspectives on Race, Class, and Gender [SOCS, DSJ, WI] (3.0 cr)
- SOC 3322W - Social Movements, Protests, and Change [CIV, WI] (3.0 cr)
- SOC 4461 - Sociology of Ethnic and Racial Conflict [DSJ] (3.0 cr)
- SPAN 3401 - Latino Immigration and Community Service [CIV] (3.0 cr)
- SW 3301 - GLBT Social Movements (3.0 cr)
- SW 3703 - Gender Violence in Global Perspective [IP] (3.0 cr)
- TH 5117 - Performance and Social Change (3.0 cr)
- YOST 3101 - Youthwork: Orientations and Approaches (4.0 cr)
- AAS 3409W - Asian American Women's Cultural Production [AH, DSJ, WI] (3.0 cr)
or GWSS 3409W - Asian American Women's Cultural Production [AH, DSJ, WI] (3.0 cr)
- AAS 4231 - The Color of Public Policy: African Americans, American Indians, and Chicanos in the United States (3.0 cr)
or AFRO 4231 - The Color of Public Policy: African Americans, American Indians, and Chicanos in the United States (3.0 cr)
or AMIN 4231 - The Color of Public Policy: African Americans, American Indians, and Chicanos in the United States (3.0 cr)
or CHIC 4231 - The Color of Public Policy: African Americans, American Indians, and Chicanos in the United States (3.0 cr)
- ID 3561 - HECUA Off Campus Programs: Literature in Political, Social, and Historical Contexts [LITR] (4.0 cr)
or ID 3563 - HECUA Off-Campus Study Program: WSC Internship Seminar [CIV] (8.0 cr)
or ID 3571 - HECUA: Inequality in America - Contested Theories of Poverty, Inequality, and Social Change [SOCS] (4.0 cr)
or ID 3572 - HECUA: Inequality in America - Social Policy and Anti-Poverty Strategies in Theory and Practice [DSJ] (4.0 cr)
or ID 3573 - HECUA: Inequality in America Internship Seminar [CIV] (8.0 cr)



Twin Cities Campus

Agronomy Minor

Agronomy & Plant Genetics

College of Food, Agricultural and Natural Resource Sciences

- Program Type: Undergraduate free-standing minor
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 17

This minor provides strong science-based courses emphasizing crop management in the context of sustainable ecosystems. It is well suited for students majoring in agriculture, food and environmental education; animal science; business and economics; environmental science, or for students seeking knowledge and principles of crop production. The minor allows students to complete coursework providing the minimal background needed to prepare for the Certified Crop Advisor (CCA) exams. Students must complete a minimum of 17 credits.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Minor Courses

- [CFAN 3001](#) - Pests and Crop Protection (3.0 cr)
- [AGRO 4005](#) - Applied Crop Physiology and Development (4.0 cr)
- [AGRO 4660](#) - Senior Capstone (2.0 cr)
- [SOIL 3416](#) - Plant Nutrients in the Environment (3.0 cr)

Electives

Take 5 or more credits(s) from the following:

- [AGRO 2104](#) *{Inactive}* (2.0 cr)
- [AGRO 2501](#) - Plant Identification for Urban and Rural Landscapes (2.0 cr)
- [AGRO 4093](#) - Directed Studies for Advanced Students (1.0 - 4.0 cr)
- [AGRO 4401](#) - Plant Genetics and Breeding (4.0 cr)
- [AGRO 4505](#) - Biology, Ecology, and Management of Invasive Plants (3.0 cr)
- [AGRO 4605](#) - Management Strategies for Crop Production (3.0 cr)
- [AGRO 4603](#) - Field Crop Scouting and Problem Diagnosis (3.0 cr)



Twin Cities Campus

Climatology Minor

Soil, Water, & Climate

College of Food, Agricultural and Natural Resource Sciences

- Program Type: Undergraduate free-standing minor
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 20

The minor allows students to broaden their expertise in weather and climate studies. Students who will be working for any industry or agency that depends on understanding weather and climate change will find the minor useful. Students take a required course in meteorology and the atmosphere. Electives are in climate variations and change, atmospheric composition and air pollution, biometeorology, and global environmental change. Students must complete at least 20 credits to complete the minor.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Minor Courses

[ESPM 1425](#) - The Atmosphere [PHYS, ENV] (4.0 cr)

Electives

Take 16 or more credits(s) from the following:

- [ESPM 3425](#) - Atmospheric Composition: From Smog to Climate Change (3.0 cr)
- [ESPM 3131](#) - Environmental Physics (3.0 cr)
- [ESPM 4609](#) - Air Pollution Impacts, Management, and Ethical Challenges [CIV] (3.0 cr)
- [ESPM 5402](#) - Biometeorology (3.0 cr)
- [LAAS 5425](#) - Atmospheric Processes I: Thermodynamics and Dynamics of the Atmosphere (3.0 cr)
- [LAAS 5426](#) - Atmospheric Processes II: Radiation, Composition, and Climate (3.0 cr)
- [EEB 5146](#) - Science and Policy of Global Environmental Change (3.0 cr)
- [GEOG 3401](#) - Geography of Environmental Systems and Global Change [ENV] (4.0 cr)
- [GEOG 5426](#) - Climatic Variations (3.0 cr)
- [ESCI 1006](#) - Oceanography [PHYS, ENV] (4.0 cr)
- [ESCI 3002](#) - Climate Change and Human History [ENV] (3.0 cr)
- [ESCI 3402](#) - Science and Politics of Global Warming [ENV] (3.0 cr)



Twin Cities Campus

Entomology Minor

Entomology

College of Food, Agricultural and Natural Resource Sciences

- Program Type: Undergraduate free-standing minor
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 12

This minor provides a strong background in entomological principles and theory suitable for students interested in a variety of professions or advanced degree programs. Examples include programs in entomology, veterinary science, or public health; teaching biology in secondary educational institutions; or enhancing marketable skills for a variety of professional careers, such as forest health specialist, crop consultant, grounds manager, pest management specialist, agronomist, greenhouse or nursery technician, natural resource manager, or water quality specialist. Specific courses are selected based on students' educational objectives, in consultation with a minor adviser.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Minor Courses

- [CFAN 3001](#) - Pests and Crop Protection (3.0 cr)
- or [ENT 1005](#) - Insect Biology [BIOL] (4.0 cr)
- or [ENT 4015](#) - Ornamentals and Turf Entomolgy (3.0 cr)
- or [ENT 4251](#) - Forest and Shade Tree Entomology (3.0 cr)
- or [ENT 3281](#) - Veterinary Entomology (3.0 cr)

Electives

The course used to satisfy the minor requirement may not be used toward fulfilling this 9-credit elective requirement. Students may take a maximum of six credits, total, from the two special entomology courses (ENT 5910 and ENT 5920) toward the 9 credits.

Take 9 or more credits(s) from the following:

- [CFAN 3001](#) - Pests and Crop Protection (3.0 cr)
- [ENT 1005](#) - Insect Biology [BIOL] (4.0 cr)
- [ENT 3281](#) - Veterinary Entomology (3.0 cr)
- ENT 3xxx
- [ENT 4015](#) - Ornamentals and Turf Entomolgy (3.0 cr)
- [ENT 4251](#) - Forest and Shade Tree Entomology (3.0 cr)
- ENT 4xxx
- [ENT 5910](#) - Special Problems in Entomology (1.0 - 6.0 cr)
- [ENT 5920](#) - Special Lectures in Entomology (1.0 cr)
- ENT 5xxx



Twin Cities Campus

Food Systems and the Environment Minor

College of Food, Agri & Natural Resource Sciences

College of Food, Agricultural and Natural Resource Sciences

- Program Type: Undergraduate free-standing minor
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 15

This interdisciplinary minor, based in CFANS, serves students from other colleges who have an interest in and a desire to acquire some breadth about food systems and the environment. Students completing this minor will be better prepared to understand the complexity of modern global food systems, interdependence of rural and urban societies, and environmental impact of consumer driven food systems choices; manage natural resources used for food and fiber for the benefit of society; and make more responsible personal and public decisions impacting food systems and the environment.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Minor Courses

Students may only choose one course from each designator, in consultation with the minor adviser.

Take 15 or more credits(s) from the following:

- **CFAN 1501** - Biotechnology, People, and the Environment [TS] (3.0 cr)
- **CFAN 3001** - Pests and Crop Protection (3.0 cr)
- **CFAN 3500** - International Field Studies Seminar (1.0 - 3.0 cr)
- **AGRO 1103** - Crops, Environment, and Society [ENV] (4.0 cr)
- **ANSC 1011** - Animals and Society [CIV] (3.0 cr)
- **ANSC 1101** - Introductory Animal Science (4.0 cr)
- **APEC 3611W** - Environmental and Natural Resource Economics [ENV, WI] (3.0 cr)
- **BBE 5203** - Environmental Impacts of Food Production (3.0 cr)
- **ENT 4015** - Ornamentals and Turf Entomology (3.0 cr)
- **ESPM 3221** - Soil Conservation and Land-Use Management (3.0 cr)
- **FSCN 1102** - Food: Safety, Risks, and Technology [CIV] (3.0 cr)
- **FSCN 1112** - Principles of Nutrition (3.0 cr)
- **WRIT 3315** - Writing on Issues of Land and the Environment [AH, DSJ] (3.0 cr)
- **SOIL 1125** - The Soil Resource [ENV] (4.0 cr)
- **AGRO 3203W** - Environment, Global Food Production, and the Citizen [GP, WI] (3.0 cr)
or **ANSC 3203W** - Environment, Global Food Production, and the Citizen [GP, WI] (3.0 cr)
- **AGRO 4103** - World Food Problems [GP] (3.0 cr)
or **APEC 4103** - World Food Problems [GP] (3.0 cr)



Twin Cities Campus

Integrated Pest Management in Cropping Systems Minor

Agronomy & Plant Genetics

College of Food, Agricultural and Natural Resource Sciences

- Program Type: Undergraduate free-standing minor
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 21 to 25
- This program requires summer terms.

Students selecting this interdisciplinary minor learn how the environment and cropping systems interact with the biology of the major agronomic or horticultural crop pests. Students also learn to select and apply efficient, environmentally sound pest management procedures. Courses come from agronomy and plant genetics, entomology, horticultural science, plant pathology, and soil, water, and climate.

The minor provides sufficient knowledge and skills for employment in agricultural crop protection, product development and sales, crop management consultation, pest regulation, research, or application of agricultural crop protection materials. Students must complete at least 20 credits for this minor.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Minor Courses

- [AGRO 2501](#) - Plant Identification for Urban and Rural Landscapes (2.0 cr)
- [AGRO 4505](#) - Biology, Ecology, and Management of Invasive Plants (3.0 cr)
- [ENT 1005](#) - Insect Biology [BIOL] (4.0 cr)
- [PLPA 2001](#) - Introductory Plant Pathology (3.0 cr)
- [AGRO 4005](#) - Applied Crop Physiology and Development (4.0 cr)
 - or [BIOL 3002](#) - Plant Biology: Function (2.0 cr)
 - [HORT 3005W](#) - Environmental Effects on Horticultural Crops [WI] (4.0 cr)

Management

- [AGRO 4605](#) - Management Strategies for Crop Production (3.0 cr)
 - or ENT 5211 *{Inactive}*(3.0 cr)
 - or [HORT 4061W](#) - Turfgrass Management [WI] (3.0 cr)
 - or [HORT 5032](#) - Organic Vegetable Production (3.0 cr)
 - or [ENT 5341](#) - Biological Control of Insects and Weeds (3.0 - 4.0 cr)

Applied Courses

- [AGRO 4603](#) - Field Crop Scouting and Problem Diagnosis (3.0 cr)
 - or [AGRO 4888](#) - Issues in Sustainable Agriculture (2.0 cr)
 - or [ESPM 3612W](#) - Soil and Environmental Biology [WI] (3.0 cr)
 - or [PLPA 5202](#) - Field Plant Pathology (2.0 cr)



Twin Cities Campus

International Agriculture Minor

College of Food, Agri & Natural Resource Sciences

College of Food, Agricultural and Natural Resource Sciences

- Program Type: Undergraduate free-standing minor
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 18

Due to the international nature of food and agricultural systems, and the interdependence of environmental systems, CFANS students are strongly encouraged to incorporate an international experience into their academic degree program. Students with a particular interest in international agriculture can minor in international agriculture and choose between a self-contained block of courses or a series of courses integrated into the degree program. The minor is structured to include a general overview of international agriculture, followed by area, culture, or language studies; expanded coursework in agriculture; and an international experience. Students are required to travel outside the United States for a minimum two-week academic experience.

The program for a minor in international agriculture must be developed in coordination with International Programs in the college. Students must complete 18 credits with a minimum GPA of 2.00.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

International Opportunities:

The University of Minnesota is partnering with a number of universities to provide short term and semester study abroad opportunities taught in English. Courses can include: agricultural economics, tropical agriculture, organic food chain management, and environmental and agricultural food production.

Additional international practical or internship experiences may qualify for the minor. Arrangements can be made through MAST International or Career and Internship Services on the St. Paul campus.

Travel grants for overseas experience are available through the Academic Enrichment Program. Students are also eligible for scholarships through the Learning Abroad Center.

Minor Courses

Take 6 credits 3xxx or 4xxx area culture or language studies

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

- [CFAN 3000](#) - Directed Studies in International Agriculture (2.0 - 4.0 cr)

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

- [CFAN 3500](#) - International Field Studies Seminar (1.0 - 3.0 cr)
- [CFAN 3501](#) - Costa Rica--Sustainable Development [GP] (3.0 cr)
- [CFAN 3502](#) - Bahamas--Tropical Marine Biology and Shark Ecology (2.0 cr)
- [CFAN 3503](#) - Switzerland--Mountain Agriculture [GP] (3.0 cr)
- [CFAN 3504](#) - Vertebrate Research Design and Field Survey Techniques [GP] (3.0 cr)
- [CFAN 3505](#) - France: Sustainable Food Culture I [GP] (3.0 cr)
- [CFAN 3508](#) - Europe--Global Environmental Leadership [GP] (3.0 cr)
- [CFAN 3509](#) - South Africa: One Country, Two Food Systems [GP] (3.0 cr)
- [CFAN 3512](#) - France: Sustainable Food Culture II (3.0 cr)
- [CFAN 3513](#) - The Natural History of Norway [GP] (3.0 cr)

Take 7 or more credits(s) from the following:

- [AFEE 5361](#) - World Development Problems (3.0 cr)
- [AGRO 3203W](#) - Environment, Global Food Production, and the Citizen [GP, WI] (3.0 cr)
- [APEC 3007](#) - Applied Macroeconomics: Policy, Trade, and Development [GP] (3.0 cr)
- [APEC 3071](#) - Agriculture and Economic Growth in Developing Countries (3.0 cr)
- [APEC 5751](#) - Global Trade and Policy (3.0 cr)
- [FSCN 3615](#) - Sociocultural Aspects of Food, Nutrition, and Health [GP] (3.0 cr)
- [COMM 3676W](#) - Communicating Terrorism [GP, WI] (3.0 cr)
- [AGRO 4103](#) - World Food Problems [GP] (3.0 cr)
or [APEC 4103](#) - World Food Problems [GP] (3.0 cr)



UNIVERSITY OF MINNESOTA

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Twin Cities Campus

Native American Environmental Knowledge Minor

College of Food, Agri & Natural Resource Sciences

College of Food, Agricultural and Natural Resource Sciences

- Program Type: Undergraduate free-standing minor
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 17

This minor allows students to study Native American perspectives on the environment and natural resource systems from an interdisciplinary, culturally informed perspective, including coursework, practical experience, and community service. Required courses emphasize understanding the unique perspective of Native American approaches to science as it is applied to natural resources and the environment.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Introduction to Cultural Systems

[CFAN 1902](#) - Topics: Freshman Seminar [DSJ] (3.0 cr)

Introduction to Cultural Systems Additional Requirement

Students taking CFAN 1902 must take an additional topic from the one above.

[CFAN 1902](#) - Topics: Freshman Seminar [DSJ] (3.0 cr)

or [AMIN 1902](#) - Freshman Seminar [DSJ] (3.0 cr)

or [AMIN 1001](#) - American Indian Peoples in the United States [DSJ] (3.0 cr)

or [AMIN 1002](#) - Indigenous Peoples in Global Perspective [GP] (3.0 cr)

or [AMIN 1003](#) - American Indians in Minnesota [HIS, DSJ] (3.0 cr)

American Indian Studies

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

- AMIN 3xxx
- AMIN 4xxx
- AMIN 5xxx

Integrating Project

Two credits under appropriate departmentally-housed directed studies, independent studies, or special topics designators.

Additional Credits

Three additional credits approved by the minor program coordinator (must be 3xxx, 4xxx, or 5xxx).

Service Learning Project

Students are expected to become familiar with community interests and needs. This is accomplished by completing a 3 credit service-learning project in community.

[CFAN 4293](#) - Directed Study (1.0 - 5.0 cr)



Twin Cities Campus

Soil Science Minor

Soil, Water, & Climate

College of Food, Agricultural and Natural Resource Sciences

- Program Type: Undergraduate free-standing minor
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 20

This minor provides a strong background in basic soil sciences, covering such topics as soil biology, conservation, contaminants, water movement, and land use. Students completing the minor meet the minimum requirements for employment with the Natural Resources Conservation Service as a soil conservationist. They are also prepared to take the Professional Soil Science Examination for geoscientists. Students must complete at least 20 credits for the minor.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Minor Courses

- [SOIL 3416](#) - Plant Nutrients in the Environment (3.0 cr)
- [SOIL 4511](#) - Field Study of Soils (2.0 cr)
- [ESPM 3221](#) - Soil Conservation and Land-Use Management (3.0 cr)
- [ESPM 3612W](#) - Soil and Environmental Biology [WI] (3.0 cr)
- [ESPM 4601](#) - Soils and Pollution (3.0 cr)
- [SOIL 2125](#) - Basic Soil Science [PHYS, ENV] (4.0 cr)
or [SOIL 1125](#) - The Soil Resource [ENV] (4.0 cr)

Electives

- [LAAS 5515](#) - Soil Formation: Earth Surface Processes and Biogeochemistry (3.0 cr)
or [ESPM 4021W](#) - Problem Solving: Environmental Review [WI] (4.0 cr)
- or [ESPM 4216](#) - Contaminant Hydrology (2.0 cr)
- or [ESPM 5555](#) - Wetland Soils (3.0 cr)



Twin Cities Campus

Sustainability Studies Minor

College of Food, Agri & Natural Resource Sciences

College of Food, Agricultural and Natural Resource Sciences

- Program Type: Undergraduate free-standing minor
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 15 to 18
- NA

One of the greatest challenges facing the world in the 21st century is jointly sustaining the environment, as well as human health and well-being. The sustainability studies minor provides students from across the University with a unique opportunity to address this sustainability challenge. Students will explore the fundamental ecological, social, ethical, political, and economic forces that influence the long-term quality and viability of human society and the natural environment. The introductory core course provides a conceptual overview of various models for understanding sustainability, and uses case studies to demonstrate the challenges of putting sustainability into practice. Additional electives are chosen from courses that explore multiple disciplinary perspectives related to sustainability. Finally, the capstone experience allows students to synthesize and apply their knowledge to real sustainability problems.

For this minor, students must complete 6 credits of required courses for the core and the capstone, and 9-12 restricted electives, for a total of 15-18 credits.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Core

- [SUST 3003](#) - Sustainable People, Sustainable Planet [ENV] (3.0 cr)
- [SUST 4004](#) - Sustainable Communities (3.0 cr)

Electives

Take three courses, not more than one from each of four categories. You may also petition for study abroad, summer, special topics, new, and other courses to count toward elective requirements.

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

•Economics and Policy

- Take no more than 1 course(s) from the following:
- [AFEE 5361](#) - World Development Problems (3.0 cr)
- [APEC 3611W](#) - Environmental and Natural Resource Economics [ENV, WI] (3.0 cr)
- [APEC 5611](#) - Economic Aspects of Environmental Management (3.0 cr)
- [CE 5212](#) - Transportation Policy, Planning, and Deployment (4.0 cr)
- [CE 5214](#) - Transportation Systems Analysis (4.0 cr)
- [EEB 5146](#) - Science and Policy of Global Environmental Change (3.0 cr)
- [ESPM 3241W](#) - Natural Resource and Environmental Policy [SOCS, CIV, WI] (3.0 cr)
- [ESPM 3245](#) - Sustainable Land Use Planning and Policy [ENV] (3.0 cr)
- [ESPM 3251](#) - Natural Resources in Sustainable International Development [GP] (3.0 cr)
- [ESPM 3261](#) - Economics and Natural Resources Management [SOCS, ENV] (4.0 cr)
- [ESPM 3603](#) - Environmental Life Cycle Analysis (3.0 cr)
- [ESPM 3604](#) - Environmental Management Systems and Strategy (3.0 cr)
- [FR 5146](#) - Science and Policy of Global Environmental Change (3.0 cr)
- [PA 5232](#) - Transportation Policy, Planning, and Deployment (4.0 cr)
- [ESPM 3602](#) - Regulations and Corporate Environmental Management (3.0 cr)
- [ESPM 4242](#) - Methods for Environmental and Natural Resource Policy Analysis (3.0 cr)
- [MGMT 5019](#) - Business, Natural Environment, and Global Economy (2.0 cr)

•Social Science and Humanities

- Take no more than 1 course(s) from the following:
- [ANTH 3041](#) - Ecological Anthropology (3.0 cr)
- [ANTH 4053](#) - Economy, Culture, and Critique [SOCS, GP] (3.0 cr)
- [ANTH 4069](#) *{Inactive}*(3.0 cr)
- [ENGL 3501](#) - Public Discourse: Coming to Terms With the Environment [LITR, ENV] (3.0 cr)
- [ESPM 3011W](#) - Ethics in Natural Resources [WI] (3.0 cr)
- [GEOG 3379](#) - Environment and Development in the Third World [SOCS, ENV] (3.0 cr)



- GLOS 3303 - Environment and Development in the Third World [SOCS, ENV] (3.0 cr)
- HIST 3452 - African Conservation Histories (3.0 cr)
- HSCI 3244 - History of Ecology and Environmentalism [HIS, ENV] (3.0 cr)
- ID 3592 - HECUA Off-Campus Study Program: Environmental Sustainability: Dimensions of Environmental Change [SOCS] (4.0 cr)
- PHIL 3301 - Environmental Ethics [ENV] (4.0 cr)
- SOC 3613W - Food, Culture, and Society [SOCS, GP, WI] (3.0 cr)
- SOC 4305 - Society and the Environment: A Growing Conflict (3.0 cr)
- SOC 4311 - Race, Class, and the Politics of Nature (3.0 cr)

•**Biophysical Sciences**

- Take no more than 1 course(s) from the following:
- AGRO 3203W - Environment, Global Food Production, and the Citizen [GP, WI] (3.0 cr)
- AGRO 5321 - Ecology of Agricultural Systems (3.0 cr)
- ANSC 3203W - Environment, Global Food Production, and the Citizen [GP, WI] (3.0 cr)
- BIOL 3407 - Ecology (3.0 cr)
- BIOL 3408W - Ecology [WI] (3.0 cr)
- EEB 3001 - Ecology and Society [ENV] (3.0 cr)
- EEB 4609W - Ecosystem Ecology [ENV, WI] (3.0 cr)
- FW 4102 - Principles of Conservation Biology [ENV] (3.0 cr)
- ESCI 3005 - Earth Resources (3.0 cr)
- GEOG 3401 - Geography of Environmental Systems and Global Change [ENV] (4.0 cr)
- ID 3591 - HECUA Off-Campus Study Program: Environmental Sustainability: Adaptive Ecosystem Management [ENV] (4.0 cr)
- ESPM 3108 - Ecology of Managed Systems [ENV] (3.0 cr)
- RRM 3101 - Park and Protected Area Tourism (3.0 cr)
- AGRO 3131 - Student Organic Farm Planning, Growing, and Marketing (3.0 cr)
- HORT 3131 - Student Organic Farm Planning, Growing, and Marketing (3.0 cr)

•**Design and Technology**

- Take no more than 1 course(s) from the following:
- ARCH 4561 - Architecture and Ecology (3.0 cr)
- BBE 4733 - Renewable Energy Technologies [TS] (3.0 cr)
- CE 3501 - Environmental Engineering [ENV] (3.0 cr)
- CE 4561 - Solid Hazardous Wastes (3.0 cr)
- CHEN 5551 - Survey of Renewable Energy Technologies (3.0 cr)
- ESPM 3601 - Sustainable Housing--Community, Environment, and Technology [TS] (3.0 cr)
- HSG 3482 - Sustainable Housing: Community, Environment, and Technology [TS] (3.0 cr)
- LA 3003 - Case Studies in Sustainable Landscape Planning and Design (3.0 cr)
- LA 3004 - Regional Landscape Planning (3.0 cr)
- LA 3501 - Environmental Design and Its Biological and Physical Context [ENV] (3.0 cr)
- LA 4755 - Infrastructure, Natural Systems, and Space of Inhabited Landscapes [TS] (3.0 cr)
- URBS 3751 - Understanding the Urban Environment [ENV] (3.0 cr)



Twin Cities Campus

Sustainable Agriculture Minor

Agronomy & Plant Genetics, College of Food, Agri & Natural Resource Sciences

College of Food, Agricultural and Natural Resource Sciences

- Program Type: Undergraduate free-standing minor
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 17

This minor allows students to study the sustainability of agricultural food systems from an integrated perspective, including coursework, practical experience, and community reflection. Required courses and courses from the foundational clusters--land and public policy; agriculture, environment, and natural resources; and citizens, science, and society--define the student's minor curriculum. In addition, each student works with a minor adviser to design an individualized practical experience (e.g., internship, experiential learning opportunity) in some aspect of sustainable agriculture. Through the student-led seminar series, What's Up in Sustainable Agriculture (WUSA), and the senior capstone, students synthesize their learning about sustainability for local, national and global agricultural food systems. For this minor, students must complete 8-10 credits of required courses and a minimum of 9 credits of foundational coursework, for a total of at least 17 credits.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Minor Courses

AGRO 4660 should be taken concurrently with or after completion of the internship.

[AGRO 4660](#) - Senior Capstone (2.0 cr)

[AGRO 4888](#) - Issues in Sustainable Agriculture (2.0 cr)

[AGRO 3203W](#) - Environment, Global Food Production, and the Citizen [GP, WI] (3.0 cr)

or [ANSC 3203W](#) - Environment, Global Food Production, and the Citizen [GP, WI] (3.0 cr)

Take 1 - 3 credits(s) from the following:

- [AFEE 3096](#) - Experiential Learning: Production and Business (1.0 - 8.0 cr)
- [AGRO 4096](#) - Professional Experience Program: Internship (1.0 - 3.0 cr)
- [ANSC 4096](#) - Professional Experience Program: Internship (1.0 - 3.0 cr)
- [APEC 4096](#) - Professional Experience Program: Internship (1.0 - 3.0 cr)
- [ESPM 4096](#) - Professional Experience Program: Internship (1.0 cr)
- [HORT 4096](#) - Professional Experience Program: Internship (1.0 cr)
- [FSCN 4096](#) - Professional Experience Program: Internship (1.0 - 4.0 cr)
- [PLPA 4096](#) - Professional Experience Program: Internship (1.0 - 3.0 cr)

Foundation Course Clusters

Select one course from each of the following clusters. Other courses may be substituted with approval of the minor adviser and coordinator.

Take 9 or more credits(s) including 3 or more sub-requirements(s) from the following:

•Land and Public Policy

- [APEC 3041W](#) *{Inactive}*[WI] (3.0 cr)
- or [GEOG 3361W](#) - Geography and Public Policy [WI] (3.0 cr)
- or [PA 5002](#) - Introduction to Policy Analysis (1.5 cr)
- or [AGRO 4103](#) - World Food Problems [GP] (3.0 cr)
- or [APEC 4103](#) - World Food Problems [GP] (3.0 cr)

•Agriculture/Environment and Natural Resources

- [CFAN 3001](#) - Pests and Crop Protection (3.0 cr)
- or [AGRO 1103](#) - Crops, Environment, and Society [ENV] (4.0 cr)
- or [AGRO 5999](#) - Special Topics: Workshop in Agronomy (1.0 - 6.0 cr)
- or [ANSC 1101](#) - Introductory Animal Science (4.0 cr)
- or [ESPM 3221](#) - Soil Conservation and Land-Use Management (3.0 cr)
- or [GEOG 3355](#) *{Inactive}*(3.0 cr)
- or [SOIL 1125](#) - The Soil Resource [ENV] (4.0 cr)
- or [SOIL 2125](#) - Basic Soil Science [PHYS, ENV] (4.0 cr)

•Citizens/Science and Society

- [CFAN 1501](#) - Biotechnology, People, and the Environment [TS] (3.0 cr)
- or [BBE 5212](#) - Safety and Environmental Health Issues in Plant and Animal Production and Processing (3.0 cr)



or [GEOG 3371W](#) - Cities, Citizens, and Communities [DSJ, WI] (4.0 cr)

or [WRIT 3371](#) - Technology, Self, and Society (3.0 cr)

or [SOC 3451W](#) - Cities and Social Change [WI] (3.0 cr)



Twin Cities Campus

Urban and Community Forestry Minor

Forest Resources

College of Food, Agricultural and Natural Resource Sciences

- Program Type: Undergraduate free-standing minor
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 18
- This program requires summer terms.

The urban and community forestry minor enables students in programs such as education, landscape architecture, horticultural sciences, natural resources, and related areas to understand the science and practice underlying the management of urban and community forests. The minor incorporates fundamental science, arboriculture, forest health, and resource management coursework. Students must complete 18 credits for this minor.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Minor Courses

- [ENT 4251](#) - Forest and Shade Tree Entomology (3.0 cr)
or [PLPA 3003](#) - Diseases of Forest and Shade Trees (3.0 cr)
- [FR 3501](#) - Arboriculture: Selection and Maintenance of Trees (3.0 cr)
- [FR 4501](#) - Urban Forest Management: Managing Greenspaces for People (3.0 cr)

Electives

Take 9 or more credits(s) from the following:

- [ESPM 3211](#) - Survey, Measurement, and Modeling for Environmental Analysis (3.0 cr)
- [FR 3104](#) - Forest Ecology (4.0 cr)
- [FR 3218](#) - Measuring and Modeling Forests (3.0 cr)
- [HORT 1015](#) - Woody and Herbaceous Plants (4.0 cr)
- [RRM 4232W](#) - Managing Recreational Lands [WI] (4.0 cr)
- Cloquet Program
 - [FR 2101](#) - Identifying Forest Plants (1.0 cr)
with [FR 2102](#) - Northern Forests: Field Ecology (2.0 cr)
 - with [FR 2104](#) - Measuring Forest Resources (1.0 cr)



Twin Cities Campus

Water Science Minor

Soil, Water, & Climate

College of Food, Agricultural and Natural Resource Sciences

- Program Type: Undergraduate free-standing minor
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 20

The minor provides students the opportunity to broaden their expertise in the area of water science. Students interested in qualifying as a hydrologist should determine the exact requirements for the Minnesota civil service position by checking the Hydrologist I (Hydrogeology) and Hydrologist I (Water Resources) position descriptions.

Students must complete at least 20 credits for the minor.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Minor Courses

- [FR 3114](#) - Hydrology and Watershed Management (3.0 cr)
- [EEB 5601](#) - Limnology (3.0 cr)
 - or [ESCI 4702](#) - General Hydrogeology (3.0 cr)
- [ESPM 5555](#) - Wetland Soils (3.0 cr)
 - or [SOIL 5232](#) - Vadose Zone Hydrology (3.0 cr)

Electives

Courses used to fulfill requirements above cannot be chosen to fulfill electives.

Take 11 or more credits(s) from the following:

- [CE 5541](#) - Environmental Water Chemistry (3.0 cr)
- [EEB 5605](#) - Limnology Laboratory (2.0 cr)
- [ESPM 4061W](#) - Water Quality and Natural Resources [WI] (3.0 cr)
- [ESPM 4216](#) - Contaminant Hydrology (2.0 cr)
- [ESPM 5131](#) (*Inactive*)(3.0 cr)
- [GEOE 4351](#) - Groundwater Mechanics (3.0 cr)
- [FR 5153](#) - Forest and Wetland Hydrology (3.0 cr)
 - or [ESCI 4702](#) - General Hydrogeology (3.0 cr)
- [ESPM 5555](#) - Wetland Soils (3.0 cr)
 - or [SOIL 5232](#) - Vadose Zone Hydrology (3.0 cr)



Twin Cities Campus

Asian American Studies Minor

Institute for Global Studies

College of Liberal Arts

- Program Type: Undergraduate free-standing minor
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 15

The minor focuses on the history, politics, and culture of Americans of Asian descent. Courses explore the diversity of Asian American communities, and the history and present conditions of racial formation in the United States and other parts of the Americas. The minor draws from courses in a number of disciplines and academic approaches and encourages social awareness, critical thinking, the development of new perspectives, and artistic appreciation. Courses included in the minor allow students to develop their knowledge of Asian American issues in many different contexts. Some courses emphasize an in-depth study of Asian American history, literature and culture, social issues, politics, and psychology. Others include significant attention to Asian American studies topics in the course of broader discussions.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Students complete at least 15 credits of 3xxx-5xxx coursework, including one core course. Students interested in the minor should make an appointment with the Asian American Studies director (778 Social Sciences Building, 612-626-9812). Students may request credit towards the minor for other courses with Asian American studies content by submitting a course syllabus and proof of completion to the Asian American Studies director.

Core Courses

Take 1 or more course(s) from the following:

- **AAS 3001** - Contemporary Perspectives on Asian America [DSJ] (3.0 cr)
or **AMST 3001** - Contemporary Perspectives on Asian America [DSJ] (3.0 cr)
- **AAS 3301** - Asian America Through Arts and Culture [AH, DSJ] (3.0 cr)
or **ENGL 3301** - Asian America Through Arts and Culture [AH, DSJ] (3.0 cr)
- **AAS 3409W** - Asian American Women's Cultural Production [AH, DSJ, WI] (3.0 cr)
or **GWSS 3409W** - Asian American Women's Cultural Production [AH, DSJ, WI] (3.0 cr)
- **AAS 3877** - Asian American History, 1850 to Present [HIS, DSJ] (3.0 cr)
or **HIST 3877** - Asian American History, 1850-Present [HIS, DSJ] (3.0 cr)
- **AAS 4311** - Asian American Literature and Drama [LITR, DSJ] (3.0 cr)
or **ENGL 4311** - Asian American Literature and Drama [LITR, DSJ] (3.0 cr)

Elective Courses

In addition to the required core course, take 12 or more credits of any 3xxx, 4xxx, or 5xxx AAS course (or other adviser-approved courses).

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

- **AAS 3001** - Contemporary Perspectives on Asian America [DSJ] (3.0 cr)
- **AMST 3001** - Contemporary Perspectives on Asian America [DSJ] (3.0 cr)
- **AMST 3113W** - America's Diverse Cultures [DSJ, WI] (3.0 cr)
- **SOC 3211W** - American Race Relations [SOCS, DSJ, WI] (3.0 cr)
- **AAS 3251W** - Sociological Perspectives on Race, Class, and Gender [SOCS, DSJ, WI] (3.0 cr)
- **SOC 3251W** - Sociological Perspectives on Race, Class, and Gender [SOCS, DSJ, WI] (3.0 cr)
- **AAS 3301** - Asian America Through Arts and Culture [AH, DSJ] (3.0 cr)
- **ENGL 3301** - Asian America Through Arts and Culture [AH, DSJ] (3.0 cr)
- **AAS 3409W** - Asian American Women's Cultural Production [AH, DSJ, WI] (3.0 cr)
- **GWSS 3409W** - Asian American Women's Cultural Production [AH, DSJ, WI] (3.0 cr)
- **AAS 3483** - Hmong History Across the Globe (3.0 cr)
- **HIST 3483** - Hmong History Across the Globe (3.0 cr)
- **DNCE 3495** - Dance and Global Tourism [GP] (3.0 cr)
- **AAS 3875W** - Comparative Race and Ethnicity in U.S. History [WI] (3.0 - 4.0 cr)
- **HIST 3875W** - Comparative Race and Ethnicity in US History [HIS, DSJ, WI] (4.0 cr)



- [AAS 3877](#) - Asian American History, 1850 to Present [HIS, DSJ] (3.0 cr)
- [HIST 3877](#) - Asian American History, 1850-Present [HIS, DSJ] (3.0 cr)
- [AAS 4231](#) - The Color of Public Policy: African Americans, American Indians, and Chicanos in the United States (3.0 cr)
- [AFRO 4231](#) - The Color of Public Policy: African Americans, American Indians, and Chicanos in the United States (3.0 cr)
- [ENGL 4232](#) - American Drama by Writers of Color (3.0 cr)
- [AAS 4311](#) - Asian American Literature and Drama [LITR, DSJ] (3.0 cr)
- [ENGL 4311](#) - Asian American Literature and Drama [LITR, DSJ] (3.0 cr)



Twin Cities Campus

Austrian and Central European Studies Minor

German, Scandinavian, & Dutch

College of Liberal Arts

- Program Type: Undergraduate free-standing minor
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 16
- This program requires summer terms.

The minor allows students to focus a group of electives on the study of Austrian and Central European culture, history, and society. Courses address specific social and political circumstances, cultural traditions, and shared history of Austria and other countries of Central Europe. The minor is supported by the Center for Austrian Studies, student exchange programs with universities in Vienna, Salzburg, and Graz, and visiting Austrian scholars sponsored by the Austrian-American Education Commission.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Students are required to take 4 semester(s) of German.

The minor consists of a minimum of 16 credits in 3xxx, 4xxx, and 5xxx courses with no more than one being a directed or independent study course. All courses in the minor must be taken A-F. At least one course must be taken in the German program of the University of Minnesota Twin Cities campus. Students majoring in German studies may elect an ACES minor, but no courses may count for both the German studies major and the Austrian studies minor. Therefore, students majoring in German studies must take one additional course to substitute for GER 3011W, which is a core requirement for both the German studies major and Austrian studies minor. The minor program must be approved by the director of undergraduate studies.

Minor Courses

[GER 3011W](#) - Conversation and Composition [WI] (4.0 cr)

[GER 3520](#) - Topics in Austrian and Central European Culture (3.0 cr)

Two courses in the art, culture, or literature of Austria and Central Europe.

One course in the history, politics, and society of Austria and Central Europe.



Twin Cities Campus

Biblical Studies Minor

Classical & Near Eastern Studies

College of Liberal Arts

- Program Type: Undergraduate free-standing minor
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 15
- This program requires summer terms.

The academic study of the Bible is an extraordinarily broad interdisciplinary field. Research in the field can involve many disciplines, including a number of ancient and modern languages, archaeology, history, various social sciences (including comparative religion), and literary studies. Biblical studies focuses on the Hebrew Bible and the New Testament in terms of their formation, cultural settings, and the history of their interpretation. The minor lets students who might not have the linguistic foundation to read the biblical texts in their original languages pursue more advanced biblical studies.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Students are required to take 2 semester(s) of Greek or Hebrew.

Minor Courses

CNES 3072 - The New Testament (3.0 cr)

3-credit biblical survey and text seminar. Select this course in consultation with a biblical studies faculty member.

Biblical Context and Content

Take 3 or more course(s) totaling 9 or more credits(s) from the following:

- **CNES 3172** - Archaeology of Israel (3.0 cr)
- **CNES 3502** - Ancient Israel: From Conquest to Exile (3.0 cr)
- **RELS 3201** - The Bible: Context and Interpretation [LITR] (3.0 cr)
- **RELS 3202** - Prophecy in Ancient Israel (3.0 cr)
- **RELS 3203** - The Bible: Wisdom, Poetry, and Apocalyptic (3.0 cr)



Twin Cities Campus

Comparative U.S. Race and Ethnicity Minor

Afr American/African Studies, American Indian Studies, American Studies, Chicano Studies

College of Liberal Arts

- Program Type: Undergraduate free-standing minor
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 15

This minor exposes students to key content, methodologies, and theories in the comparative study of African Americans, American Indians, Asian Americans, Chicanos, and Latinos in the United States. Students explore various methodologies and core concepts within the social sciences and humanities. Students develop a general knowledge of how diverse racial and ethnic individuals and groups have historically interacted with one another and might redefine themselves today. This minor draws from courses in a number of disciplines and academic approaches, and encourages social awareness, critical thinking, the development of new perspectives, and artistic appreciation.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Core Course

Take 1 or more course(s) totaling 3 or more credits(s) from the following:

- **AFRO 4231** - The Color of Public Policy: African Americans, American Indians, and Chicanos in the United States (3.0 cr)
- **AMST 3113W** - America's Diverse Cultures [DSJ, WI] (3.0 cr)
- **ANTH 4047** - Anthropology of American Culture [SOCS] (3.0 cr)
- **GWSS 3002W** - Gender, Race, and Class: Women's Lives in the United States [DSJ, WI] (3.0 cr)
- **GWSS 3203W** - Blood, Bodies and Science [TS, SOCS, WI] (3.0 cr)
- **GWSS 3303W** - Writing Differences: Literature by U.S. Women of Color [LITR, DSJ, WI] (3.0 cr)
- **HIST 3875W** - Comparative Race and Ethnicity in US History [HIS, DSJ, WI] (4.0 cr)
- **SOC 3211W** - American Race Relations [SOCS, DSJ, WI] (3.0 cr)

Electives

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

- **AAS 3301** - Asian America Through Arts and Culture [AH, DSJ] (3.0 cr)
- **AAS 4311** - Asian American Literature and Drama [LITR, DSJ] (3.0 cr)
- **AFRO 3112** - In the Heart of the Beat: the Poetry of Rap (3.0 cr)
- **AFRO 3251W** - Sociological Perspectives on Race, Class, and Gender [WI] (3.0 cr)
- **AFRO 3597W** - Introduction to African American Literature and Culture I [WI] (4.0 cr)
- **AFRO 3598W** - Introduction to African American Literature and Culture II [LITR, WI] (4.0 cr)
- **AFRO 3864** - African American History: 1619 to 1865 (4.0 cr)
- **AFRO 3865** - African American History: 1865 to the Present (4.0 cr)
- **AFRO 3866** - The Civil Rights and Black Power Movement, 1954-1984 (3.0 cr)
- **AMIN 3201W** - American Indian Literature [LITR, DSJ, WI] (3.0 cr)
- **AMIN 3301** - American Indian Philosophies [AH, DSJ] (4.0 cr)
- **AMIN 3409** - American Indian Women: Ethnographic and Ethnohistorical Perspectives [HIS, DSJ] (3.0 cr)
- **AMIN 3501** - American Indian Tribal Governments and Politics [HIS, DSJ] (3.0 cr)
- **AMIN 3601** - American Indian Oral Traditions [CD, LIT] (3.0 cr)
- **AMIN 3871** - American Indian History: Pre-Contact to 1830 [HIS, DSJ] (3.0 cr)
- **AMIN 3872** - American Indian History: 1830 to the Present (3.0 cr)
- **AMST 3001** - Contemporary Perspectives on Asian America [DSJ] (3.0 cr)
- **AMST 3117** - Latinos in America's Global Cities [SOCS, DSJ] (3.0 cr)
- **CHIC 3212** - Chicana Studies: La Chicana in Contemporary Society [AH, DSJ] (3.0 cr)
- **CHIC 3223** - Chicana/o and Latina/o Representation in Film [AH, DSJ] (3.0 cr)
- **CHIC 3444** - Chicana and Chicano History: 1821-1945 [HIS, DSJ] (3.0 cr)
- **CHIC 3446** - Chicana/o History II: WWII, El Movimiento, and the New Millennium [HIS, DSJ] (3.0 cr)
- **CHIC 3452** - Chicana/Indigena Studies: History, Culture, and Politics [DSJ] (3.0 cr)
- **CHIC 3507W** - Introduction to Chicana/o Literature [LITR, DSJ, WI] (3.0 cr)
- **CHIC 3752** - Chicanas and Chicanos in Contemporary Society [DSJ] (3.0 cr)
- **GWSS 3409W** - Asian American Women's Cultural Production [AH, DSJ, WI] (3.0 cr)
- **GWSS 4401** - Chicana/Latina Cultural Studies [AH, DSJ] (3.0 cr)



•[HIST 3877](#) - Asian American History, 1850-Present [HIS, DSJ] (3.0 cr)



Twin Cities Campus

Dutch Studies Minor

German, Scandinavian, & Dutch

College of Liberal Arts

- Program Type: Undergraduate free-standing minor
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 15
- This program requires summer terms.

The minor includes study of the spoken language, literature, culture, and civilization.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Students are required to take 4 semester(s) of Dutch.

The four required semesters of a second language do not factor into the overall length of credits in the minor.

The minor consists of a minimum of 15 credits in 3xxx, 4xxx (beyond 4004), and 5xxx courses with no more than one course being directed or independent study. At least one course must be taken in the Dutch Studies program at the University of Minnesota - Twin Cities campus. The program must be approved by the director of undergraduate studies.

Minor Courses

Up to two electives from other departments may be applied to the Dutch studies minor after consultation with the director of undergraduate studies.

[DTCH 3011W](#) - Conversation and Composition [WI] (3.0 cr)

[DTCH 3012](#) - Conversation and Composition (3.0 cr)

Take 9 or more credits(s) from the following:

- DTCH 3xxx
- DTCH 4xxx
- DTCH 5xxx



Twin Cities Campus

East Asian Studies Minor

Institute for Global Studies

College of Liberal Arts

- Program Type: Undergraduate free-standing minor
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 15
- This program requires summer terms.

Students take four semesters of an East Asian language and four East Asian culture courses. Additional information may be found at <http://igs.cla.umn.edu>.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Students are required to take 4 semester(s) of Chinese, Japanese, or Korean.

Courses must be drawn from at least three different departments. A maximum of 3 credits of directed studies or directed research may count toward the minor. The program must be approved by the global studies adviser.

Preparatory Courses

Note: these courses do not count toward the overall length in credits for the minor.

Chinese

- [CHN 1011](#) - Beginning Modern Chinese (6.0 cr)
- [CHN 1012](#) - Beginning Modern Chinese (6.0 cr)
- [CHN 3021](#) - Intermediate Modern Chinese (5.0 cr)
- [CHN 3022](#) - Intermediate Modern Chinese (5.0 cr)

or Japanese

- [JPN 1011](#) - Beginning Japanese (6.0 cr)
- [JPN 1012](#) - Beginning Japanese (6.0 cr)
- [JPN 3021](#) - Intermediate Japanese (5.0 cr)
- [JPN 3022](#) - Intermediate Japanese (5.0 cr)

or Korean

- [KOR 1011](#) - Beginning Korean (5.0 cr)
- [KOR 1012](#) - Beginning Korean (5.0 cr)
- [KOR 3021](#) - Intermediate Korean (5.0 cr)
- [KOR 3022](#) - Intermediate Korean (5.0 cr)

Minor Courses

Students must complete five courses for a minimum of 15 credits.

Take two 3xxx-5xxx courses in the humanities dealing with East Asia or a single East Asian society.

Take one 3xxx-5xxx course in social sciences or history dealing with East Asia or a single East Asian society.

- [EAS 3461](#) - Introduction to East Asia I: The Imperial Age (3.0 - 4.0 cr)
- [EAS 3462](#) - From Subjects to Citizens: The History of East Asia From 1500 to the Present [HIS, GP] (4.0 cr)



Twin Cities Campus

English as a Second Language Minor

Second Language Studies

College of Liberal Arts

- Program Type: Undergraduate free-standing minor
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 15

The minor requires four courses.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Minor Courses

- [SLS 3001W](#) - Basics in Teaching English as a Second Language [WI] (4.0 cr)
- [SLS 3501](#) - Practical Language Learning for International Communication (3.0 cr)
- [LING 3001](#) - Introduction to Linguistics [SOCS] (4.0 cr)
or [LING 5001](#) - Introduction to Linguistics (4.0 cr)
- [SLS 3401](#) - Introduction to Pronunciation and Grammar for ESL Teachers (4.0 cr)
or [SLS 5401](#) - Language Analysis for Teachers of English as a Second Language (4.0 cr)



Twin Cities Campus

European Area Studies Minor

Institute for Global Studies

College of Liberal Arts

- Program Type: Undergraduate free-standing minor
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 15

Students must complete the CLA second language requirement in a European language and take five courses (at least 15 credits) of 3xxx-5xxx coursework focusing on a particular topic in European area studies (excluding language courses). Additional information may be found on the Institute for Global Studies Web site at <http://igs.cla.umn.edu>.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Students are required to take 4 semester(s) of Any European language.

The four required semesters of a second language do not factor into the overall length of credits in the minor.

A maximum of 3 credits of directed studies or directed research may count toward the minor. Courses must be taken from a minimum of three different departments. The minor program must be approved by the global studies adviser.

Minor Courses

[GEOG 3161](#) - Europe: A Geographic Perspective (3.0 cr)

[HIST 3722](#) - Studies in 20th-Century Europe From the End of World War II to the End of the Cold War: 1945-91 (3.0 cr)

At least 6 credits of humanities from any department with approval of a global studies adviser.

After completing the GEOG 3161, HIST 3722, and six credits in humanities, take any course in any discipline focusing on some aspect of Europe, with the approval of a global studies adviser.



Twin Cities Campus

Gay, Lesbian, Bisexual, Transgender Minor

Gender, Women and Sexuality

College of Liberal Arts

- Program Type: Undergraduate free-standing minor
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 18

The minor focuses on the history, politics, and cultures of gay, lesbian, bisexual, and transgendered persons. Courses explore the diversity of GLBT communities, the history and present conditions of sexual identity formation, and the functioning and institutionalization of ideologies of sexuality in a democratic society. Core courses focus on issues related to the history, culture, social, and political formations; experiences of GLBT people; and GLBT/queer theory. Elective courses are drawn from lists of GLBT-focused courses (emphasizing GLBT issues/experiences) and of GLBT-component courses (having at least one-quarter of their content related to GLBT/queer theory or the history, culture, social, political formations, and experiences of GLBT people).

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Minor Courses

- [GLBT 1001](#) - Introduction to GLBT Studies [DSJ, SOCS] (3.0 cr)
- [GLBT 3301](#) - Gay, Lesbian, Bisexual, and Transgender Social Movements in the United States (3.0 cr)
- [CSCL 3456W](#) - Sexuality and Culture [DSJ, WI] (3.0 cr)
 - or [GWSS 3404](#) - Transnational Sexualities [GP] (3.0 cr)
 - or [GWSS 4403](#) - Queering Theory (3.0 cr)
 - or [CSCL 3472](#) - Gay Men and Homophobia in American Culture [DSJ] (3.0 cr)
 - or [GLBT 3472](#) - Gay Men and Homophobia in American Culture (3.0 cr)

Electives

Other courses may be used to meet this requirement with permission from the department. SOC 4090 meets the requirement only if the topic is sociology of sexuality.

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

- [AMST 4101](#) - Gender, Sexuality, and Politics in America [HIS, DSJ] (3.0 cr)
- [ENGL 3330](#) - Gay, Lesbian, Bisexual, and Transgendered Literature (3.0 cr)
- [FSOS 4152](#) - Gay, Lesbian, and Bisexual People in Families (3.0 cr)
- [GLBT 3610](#) - Topics in GLBT Studies (3.0 cr)
- [HIST 3212](#) - Dissident Sexualities in U.S. History (3.0 cr)
- [SOC 4090](#) - Topics in Sociology (3.0 cr)
- [SOC 4521](#) - Love, Sex, and Marriage (3.0 cr)



Twin Cities Campus

Geographic Information Science Minor

Geography

College of Liberal Arts

- Program Type: Undergraduate free-standing minor
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 16

The interdisciplinary undergraduate minor in geographic information science examines geospatial technologies and their underlying principles, applications, and societal dimensions. Examples of geospatial technologies and research include internet mapping, in-vehicle navigation systems, digital cartography, imagery taken by airplanes and satellites, spatial analysis and modeling of social and natural processes, and visualization and data mining of complex information.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

No more than two courses used for the minor may be used to fulfill the requirements of another degree program.

Several of the courses for the minor have prerequisites that must be satisfied first. Admission to the minor does not imply automatic enrollment in individual courses.

Core Courses

- [GEOG 5563](#) - Advanced Geographic Information Science (3.0 cr)
- [GEOG 3561](#) - Principles of Geographic Information Science (4.0 cr)
or [FR 3131](#) - Geographical Information Systems (GIS) for Natural Resources [TS] (4.0 cr)

Electives

No more than two courses with the same designator may be used to fulfill the requirement.

Take 3 or more course(s) totaling 9 or more credits(s) from the following:

- [HSG 5464](#) - Understanding Housing: Assessment and Analysis (3.0 cr)
- [ESPM 3031](#) - Applied Global Positioning Systems for Geographic Information Systems (3.0 cr)
- [ESPM 4295W](#) - GIS in Environmental Science and Management [WI] (4.0 cr)
- [FR 3262](#) - Remote Sensing of Natural Resources and Environment (3.0 cr)
- [FR 5412](#) - Digital Remote Sensing (3.0 cr)
- [GIS 5571](#) - ArcGIS I (3.0 cr)
- [GIS 5572](#) - ArcGIS II (3.0 cr)
- [SOIL 4111](#) - Introduction to Precision Agriculture (3.0 cr)
- Take no more than 2 course(s) from the following:
 - [CSCI 4041](#) - Algorithms and Data Structures (4.0 cr)
 - [CSCI 4107](#) - Introduction to Computer Graphics Programming (3.0 cr)
 - [CSCI 4707](#) - Practice of Database Systems (3.0 cr)
 - [CSCI 5115](#) - User Interface Design, Implementation and Evaluation (3.0 cr)
- Take no more than 2 course(s) from the following:
 - [GEOG 3511](#) - Principles of Cartography (4.0 cr)
 - [GEOG 3531](#) - Numerical Spatial Analysis (4.0 cr)
 - [GEOG 5564](#) - Urban Geographic Information Science and Analysis (3.0 cr)
 - [GEOG 5565](#) - Geographical Analysis of Human-Environment Systems (3.0 cr)



Twin Cities Campus

History of Medicine Minor

College of Liberal Arts - Adm

College of Liberal Arts

- **Students will no longer be accepted into this program after Spring 2012. Program requirements below are for current students only.**
- Program Type: Undergraduate free-standing minor
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 14

History of medicine courses explore the development of medical knowledge, institutions, practices, and cultural authority; the history of diseases; the history of public health and health policy; and the role of medicine, health, and disease in history. This minor provides valuable grounding for students interested in the health professions, history and the social sciences, environmental studies, public policy, and the sciences. Students gain research experience and have opportunities to tailor their curriculum to meet their specific interests.

For additional information, please contact the director of undergraduate studies for the Program in the History of Medicine at hmed@umn.edu or 612-624-1909.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Minor Courses

Health Care in History

Take either pair of courses.

[HMED 3001W](#) - Health, Disease, and Healing I [HIS, WI] (4.0 cr)

[HMED 3002W](#) - Health Care in History II [HIS, WI] (3.0 cr)

or History of Medicine

[HMED 5200](#) - Early History of Medicine to 1700 (3.0 cr)

[HMED 5201](#) - History of Medicine from 1700 to 1900 (3.0 cr)

Electives

Take 8 or more credits(s) from the following:

- HMED 3xxx
- HMED 4xxx
- HMED 5xxx



Twin Cities Campus

History of Science and Technology Minor

College of Liberal Arts - Adm

College of Liberal Arts

- **Students will no longer be accepted into this program after Spring 2012. Program requirements below are for current students only.**
- Program Type: Undergraduate free-standing minor
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 14

Courses for this minor address the history of science and technology, including the cultural and social contexts of their development. Students taking the minor work with the director of undergraduate studies to develop a coherent program of courses to allow for breadth as well as focus. For a list of specific courses offered, see <http://www.hst.umn.edu/academics/courses.html>.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Minor Courses

Take 11 or more credits(s) from the following:

- HSCI 3xxx
- HSCI 4xxx
- HSCI 5xxx

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

- HSCI 4xxx
- HSCI 5xxx



Twin Cities Campus

History of Science, Technology, and Medicine Minor

College of Liberal Arts - Adm

College of Liberal Arts

- Program Type: Undergraduate free-standing minor
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 14

The undergraduate minor in the history of science, technology, and medicine (HSTM) combines upper-division coursework in the history of science and technology (HSCI) with upper-division coursework in the history of medicine (HMED) to build a humanistic background to the basic applied sciences, technologies and/or healthcare professions. Students interested in the HSTM minor should consult with the director of undergraduate studies for the HSTM program and draw up a plan of study that represents a coherent theme within the history of sciences, technology, and medicine. Normally such a coherent program entails survey coursework in the history of science, the history of technology, or the history of medicine, along with more advanced historical work around a specific field (science, technology, or medicine) or theme (focus on a particular time period, geographical focus, type of history, etc.).

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Minor Courses

Take a minimum of 14 credits of HSCI 3xxx-5xxx or HMED 3xxx-5xxx. No more than 25 percent of the total credits in the minor program may consist of directed study, directed instruction, or independent study. No more than 25 percent of the total credits may be taken S-N.

Take 14 or more credits(s) from the following:

- HSCI 3xxx
- HSCI 4xxx
- HSCI 5xxx
- HMED 3xxx
- HMED 4xxx
- HMED 5xxx



Twin Cities Campus

Humanities in the West Minor

College of Liberal Arts - Adm

College of Liberal Arts

• **Students will no longer be accepted into this program after Summer 2011. Program requirements below are for current students only.**

- Program Type: Undergraduate free-standing minor
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 18

Humanities offers integrated study of areas of civilization and major humanistic problems, drawing mainly on primary sources in literature, philosophy, history, and the arts and on relevant aspects of the human and natural sciences. This breadth of perspective provides an understanding of men and women as heirs to and creators of civilization, concerned with values and the development of the whole person.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

The minor program must be approved by the humanities program coordinator. No more than one 3xxx-4xxx course in the program may be taken directed study, directed instruction, or independent study. All courses must be taken A-F.

Minor Courses

No more than one 1xxx HUM course may be taken to fulfill this requirement.

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

• Take no more than 1 course(s) from the following:

- HUM 1001 *{Inactive}*[AH] (4.0 cr)
- HUM 1002 *{Inactive}*[AH] (4.0 cr)
- HUM 1003 *{Inactive}*[AH] (4.0 cr)
- HUM 1004 *{Inactive}*[AH] (4.0 cr)
- HUM 1005 *{Inactive}*[AH] (4.0 cr)
- HUM 1006 *{Inactive}*[AH, GP] (4.0 cr)

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

- HUM 3001 *{Inactive}*[AH] (4.0 cr)
- HUM 3002 *{Inactive}*[AH] (4.0 cr)
- HUM 3003 *{Inactive}*[AH] (4.0 cr)
- HUM 3004 *{Inactive}*[AH] (4.0 cr)
- HUM 3005 *{Inactive}*[AH] (4.0 cr)
- HUM 3006 *{Inactive}*[AH, GP] (4.0 cr)

Electives

Take 2 or more course(s) totaling 6 or more credits(s) from the following:

- HUM 3xxx
- HUM 4xxx
- HUM 5xxx



Twin Cities Campus

Latin American Studies Minor

Institute for Global Studies

College of Liberal Arts

- Program Type: Undergraduate free-standing minor
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 17

The minor requires successful completion of SPAN 1004 or PORT 1104 (or equivalent), plus five 3xxx-5xxx courses related to Latin America. Additional information may be found at <http://igs.cla.umn.edu>.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Students are required to take 4 semester(s) of Spanish or Portuguese.

A maximum of 3 credits may be in directed studies or directed research, and courses must be drawn from a minimum of three different departments. The minor program must be approved by the global studies adviser.

Preparatory Courses

Complete the SPAN language sequence or the PORT language sequence. Note: this coursework does not factor into the overall length in credits of the minor.

Spanish

- SPAN 1001 - Beginning Spanish (5.0 cr)
- SPAN 1002 - Beginning Spanish (5.0 cr)
- SPAN 1003 - Intermediate Spanish (5.0 cr)
- SPAN 1004 - Intermediate Spanish (5.0 cr)
- or SPAN 1014 - Business Spanish (5.0 cr)
- or SPAN 1044 - Intermediate Medical Spanish (5.0 cr)

or Portuguese

- PORT 1101 - Beginning Portuguese (5.0 cr)
- PORT 1102 - Beginning Portuguese (5.0 cr)
- PORT 1103 - Intermediate Portuguese (5.0 cr)
- PORT 1104 - Intermediate Portuguese (5.0 cr)

Minor Courses

GEOG 4121W - Latin America [WI] (4.0 cr)

Two courses (6 cr) in the humanities related to Latin America as a region or a specific Latin American country, chosen in consultation with a global studies adviser.

One course (3 cr) focusing on any aspect of Latin America, chosen in consultation with a global studies adviser.

Latin American History

- HIST 3401W** - Early Latin America to 1825 [HIS, GP, WI] (4.0 cr)
- or **HIST 3402W** - Modern Latin America 1825 to Present [HIS, GP, WI] (4.0 cr)



Twin Cities Campus

Learning Abroad Minor

College of Liberal Arts - Adm

College of Liberal Arts

- Program Type: Undergraduate free-standing minor
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 18 to 19

The minor helps students integrate their study abroad with supporting University coursework from a variety of disciplines. Since some of the required courses must be taken before departure, careful advance planning is essential. A detailed explanation of requirements and guidance concerning course selection is available from the academic advisers at the Learning Abroad Center in 230 Heller Hall. For more information call 612-626-9000 or 888-700-UOFM, email UMabroad@umn.edu, or visit www.UMabroad.umn.edu.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Students are required to take 4 semester(s) of a language appropriate to their country of study.

The four required semesters of a second language do not factor into the overall length of credits in the minor.

The Learning Abroad minor requires a minimum 8-week study abroad experience worth at least 6 credits. Two years of a second language appropriate to your study abroad experience is also required. To declare the minor, call 612-626-9000 to make an appointment with the minor adviser. A final clearance appointment is required once all degree requirements have been completed.

Intercultural Communication

Complete COMM 3451W prior to departing for your study abroad program, and complete COMM 3452W upon returning from your study abroad program. (1) COMM 5451 and OLPD 3330, or (2) MGMT 3900, or (3) SLS 3501 can be substituted for COMM 3451, contingent on prior adviser approval.

Pre-Study Abroad

[COMM 3451W](#) - Intercultural Communication: Theory and Practice [IP, WI] (3.0 cr)

or [MGMT 3900](#) - International Business Communication [GP] (3.0 cr)

or [SLS 3501](#) - Practical Language Learning for International Communication (3.0 cr)

or **Global Identity Series**

[COMM 5451W](#) - Intercultural Communication Processes [IP, WI] (3.0 cr)

[OLPD 3330](#) - Global Identity: Connecting Your International Experience to Your Future (1.0 cr)

Post-Study Abroad

[COMM 3452W](#) - Communication and the Intercultural Reentry [WI] (3.0 cr)

Study Abroad Courses

Study abroad for a minimum of eight weeks. Take at least six credits of coursework.

Electives

Take a minimum of six credits of electives at the 3xxx-5xxx level focusing on your country of study.



Twin Cities Campus

Medieval Studies Minor

Center for Medieval Studies

College of Liberal Arts

- Program Type: Undergraduate free-standing minor
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 15
- This program requires summer terms.

The minor covers the period between roughly 300 and 1500 B.C.E. It includes the history, art history, theater and music history, literature, and languages of the period, including Latin, French, Italian, English, Old English, Scandinavian, and German.

The program allows students with an interest in the medieval period or who are planning to pursue graduate work in one of the related areas to concentrate their studies as a coherent whole.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

The minor is administered through the Center for Medieval Studies in the College of Liberal Arts. Coursework must be upper-division (3xxx-5xxx), chosen from approved course lists in consultation with the director of undergraduate studies. All applicable courses originate in other departments. Many of these are cross-listed as MEST 3610, MEST 4610, and MEST 5610. A list of appropriate courses is available at the Center for Medieval Studies.

Minor Courses

15 credits of Medieval Studies courses



Twin Cities Campus

New Media Studies Minor

College of Liberal Arts - Adm

College of Liberal Arts

- Program Type: Undergraduate free-standing minor
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 15
- This program requires summer terms.

This interdisciplinary minor explores multiple perspectives of how information or content is created and shaped in new and emerging media, as well as the role and impact of those media on human communication. New media refers to the emerging digital technologies that enable information to be produced, stored, transmitted, and displayed in new ways. Students will have an understanding of how these technologies change the ways in which various types of content can be created, managed, and distributed to potentially change the content itself.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

At least one course must be 4xxx or above. No more than 8 credits of elective courses (courses without the JOUR designator) may be earned from a single department. Students may not use only technical (hands-on or skills) courses to fulfill the electives requirement (see list below). Other electives may be chosen only if they represent new courses offered by the same department that are similar to those on the approved list. The list of electives is updated periodically--students should see the SJMC website for the most current list. Approval of alternative electives for the minor is made by the chair of the faculty steering committee in consultation with the appropriate department.

Minor Courses

Take 15 or more credits(s) from the following:

•Media Studies/Journalism Core

- Take 2 or more course(s) totaling 6 or more credits(s) from the following:
- [JOUR 3551](#) - Economics of New Media [TS] (3.0 cr)
- [JOUR 3552](#) - Internet and Global Society (3.0 cr)
- [JOUR 4551](#) - New Media and Culture [AH, TS] (3.0 cr)
- [JOUR 5552](#) - Law of Internet Communications (3.0 cr)

•Electives

- Take 2 or more course(s) totaling 6 or more credits(s) from the following:
- [ARTS 3601](#) - New Media: Making Art Interactive (4.0 cr)
- [COMM 3211](#) - Introduction to U.S. Electronic Media (3.0 cr)
- [COMM 4291](#) - New Telecommunication Media (3.0 cr)
- [CSCL 3173W](#) - The Rhetoric of Everyday Life [CIV, WI] (3.0 cr)
- [CSCL 3461](#) - Monsters, Robots, Cyborgs [LITR] (3.0 cr)
- [ENGL 3351W](#) - Voices from the Gaps: Writing and Art by Women of Color [AH, GP, WI] (4.0 cr)
- [ENGL 4722](#) - Alphabet to Internet: History of Writing Technologies (4.0 cr)
- [GEOG 3561](#) - Principles of Geographic Information Science (4.0 cr)
- [HIST 3705](#) - From Printing Press to Internet: Media, Communications, and History (3.0 cr)
- [HSCI 3331](#) - Technology and American Culture [HIS, TS] (3.0 cr)
- [HSCI 3715](#) - Technology and Civilization: Waterwheels to the Web [HIS, TS] (3.0 - 4.0 cr)
- [HSCI 4321](#) - History of Computing [TS, HIS] (3.0 cr)
- [SCMC 3001W](#) - History of Cinema and Media Culture [WI] (4.0 cr)
- [TH 4555](#) - Audio Technology (3.0 cr)
- [TH 4556](#) - Digital Audio and MIDI for Performance (3.0 cr)
- [TH 5554](#) - Multimedia Production for Live Performance (3.0 cr)
- [WRIT 3371](#) - Technology, Self, and Society (3.0 cr)
- [WRIT 3577W](#) - Rhetoric, Technology, and the Internet [TS, WI] (3.0 cr)
- [WRIT 4501](#) - Usability and Human Factors in Technical Communication (3.0 cr)



Twin Cities Campus

Public Health Minor

Geography, Sociology

College of Liberal Arts

- Program Type: Undergraduate free-standing minor
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 14 to 16

Protecting the public's health requires addressing challenges that are influenced as much by individual and social behavior as they are by biology, chemistry, and physics. Biology, the environment, social and political systems, technology, and more intersect to describe the methods to protect the health and well-being of the population. Liberal arts students, and students from other colleges who complement their major degree programs with a public health minor, will understand how to help society by improving health and preventing disease on a population level.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Specific program requirements are subject to change. Minors must follow the degree requirements current for the semester in which they declared.

Introduction to the Discipline

Take a minimum of two courses (4-6 credits). Note: PUBH 3004 is a 4-credit course that combines PUBH 3001 and PUBH 3003. If taking PUBH 3004, do not take PUBH 3001 or PUBH 3003. (PUBH 3004 satisfies half of the "Introduction to the Discipline" sub-requirement and all of the "Applying Public Health Theory" sub-requirement below.)

Part I

- PUBH 3202 - What is Public Health? (2.0 cr)
- or PUBH 3001 - Personal and Community Health (2.0 cr)
- or PUBH 3004 - Basic Concepts in Personal and Community Health (4.0 cr)

Part II

- PUBH 3350 - Epidemiology: People, Places, and Disease (2.0 cr)
- or PUBH 3106 - Making Sense of Health Studies (2.0 cr)

Understanding Health Issues From Varying Social Scientific Contexts

Take 6 or more credits(s) from the following:

- AFRO 4231 - The Color of Public Policy: African Americans, American Indians, and Chicanos in the United States (3.0 cr)
- ANTH 3306W - Medical Anthropology [GP, WI] (3.0 cr)
- ANTH 4075 - Cultural Histories of Healing [SOCS, GP] (3.0 cr)
- CNES 5535 - Death and the Afterlife in the Ancient World (3.0 cr)
- CSCL 3456W - Sexuality and Culture [DSJ, WI] (3.0 cr)
- CSCL 3458W - The Body and the Politics of Representation [HIS, WI] (3.0 cr)
- ECON 5890 - Economics of the Health-Care System (3.0 cr)
- GEOG 3381W - Population in an Interacting World [SOCS, GP, WI] (4.0 cr)
- GEOG 3379 - Environment and Development in the Third World [SOCS, ENV] (3.0 cr)
- GEOG 3401 - Geography of Environmental Systems and Global Change [ENV] (4.0 cr)
- GEOG 3411W - Geography of Health and Health Care [WI] (4.0 cr)
- GLOS 3613W - Food, Culture, and Society [SOCS, GP, WI] (3.0 cr)
- JOUR 5541 - Mass Communication and Public Health (3.0 cr)
- JOUR 5543 - Public Health Campaign Evaluation (3.0 cr)
- PHIL 3305 - Medical Ethics (4.0 cr)
- PSY 3206 - Introduction to Health Psychology (3.0 cr)
- PSY 5138 - Psychology of Aging (3.0 cr)
- PSY 5205 - Applied Social Psychology (3.0 cr)
- PSY 5206 - Social Psychology and Health Behavior (3.0 cr)
- SOC 3501 - Sociology of Families [SOCS, DSJ] (3.0 cr)
- SOC 3511 - World Population Problems [GP] (3.0 cr)
- SOC 3681 - Gender and the Family in the Islamic World (3.0 cr)
- SOC 4246 - Sociology of Health and Illness (3.0 cr)



Applying Public Health Theory

Note: Students who take PUBH 3004 in fulfillment of the "Introduction to the Discipline" sub-requirement will also have fulfilled the "Applying Public Health Theory" sub-requirement.

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

- FSCN 4614 - Community Nutrition [SOCS, DSJ] (3.0 cr)
- PUBH 3003 - Fundamentals of Alcohol and Drug Abuse (2.0 cr)
- PUBH 3004 - Basic Concepts in Personal and Community Health (4.0 cr)
- PUBH 3010 - Public Health Approaches to HIV/AIDS (2.0 cr)
- PUBH 3102 - Issues in Environmental and Occupational Health (3.0 cr)
- PUBH 3104 - Environmental Health Effects: Introduction to Toxicology (2.0 cr)
- PUBH 3639 - Prevention: Theory, Practice, and Application in Public Health Services (3.0 cr)
- PUBH 3801 - Health Economics and Policy (3.0 cr)
- PUBH 3905 - Nutrition for Public Health Promotion and Disease Prevention (2.0 cr)
- PUBH 3940 - Concepts and Controversies in Public Health Nutrition and Health Promotion (1.0 cr)

Global Impact

Take PUBH 3107, or another adviser-approved course, for a minimum of two credits. Offerings vary by semester; consult your minor adviser about current course options.

- PUBH 3107 - Global Public Health and the Environment (2.0 cr)



Twin Cities Campus

Russian Area Studies Minor

Institute for Global Studies

College of Liberal Arts

- Program Type: Undergraduate free-standing minor
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 15

The minor requires one year of Russian language and 15 credits (five courses) related to Russia. Students must complete at least two courses in humanities. Additional information may be found at <http://igs.cla.umn.edu>.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Students are required to take 2 semester(s) of Russian.

The minor program must be approved by the global studies adviser.

Minor Courses

Students must complete five courses for a minimum of 15 credits. HIST 3636 may be substituted for HIST 3637.

[HIST 3637](#) - Modern Russia: From Peter the Great to the Present (3.0 cr)

Complete one course in the social sciences or humanities on Russia or Central Asia approved by the global studies adviser.

Complete one course in the humanities on Russia or Central Asia approved by the global studies adviser.

[RUSS 3421](#) - Literature: Middle Ages to Dostoevsky in Translation [LITR, GP] (3.0 cr)

[RUSS 3422](#) - Literature: Tolstoy to the Present in Translation [LITR] (3.0 cr)



Twin Cities Campus

South Asian and Middle Eastern Studies Minor

Institute for Global Studies

College of Liberal Arts

- Program Type: Undergraduate free-standing minor
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 15

The minor requires completion of five 3xxx-5xxx courses (totaling at least 15 credits) related to South Asia and the Middle East.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Two years of an adviser-approved Middle Eastern or South Asian language is strongly recommended. A maximum of 3 credits of directed study or directed research may count toward the minor, and courses must be drawn from at least three departments. All courses must be taken A-F. The minor program must be approved by the global studies adviser.

Minor Courses

One course (3 credits) in the humanities of South Asia or the Middle East.

One course (3 credits) in the social sciences or history of South Asia or the Middle East.

9 credits of coursework relating to South Asia or the Middle East, chosen in consultation with a global studies adviser.



Twin Cities Campus

Information Technology Minor

Computer Science and Engineering

College of Science and Engineering

- Program Type: Undergraduate free-standing minor
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 16

This interdisciplinary minor requires at least 16 credits, including two core courses from the College of Science & Engineering and three breadth courses from the Colleges of Liberal Arts or Design. The minor enables students in nontechnical disciplines to supplement their major with a practical set of courses focused on information technology.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Minor Courses

Take exactly 2 course(s) from the following:

- **CSCI 1001** - Overview of Computer Science [MATH, TS] (4.0 cr)
- **CSCI 1103** - Introduction to Computer Programming in Java (4.0 cr)

Breadth Courses

Some of the courses below have prerequisites or require instructor permission. Please see the course catalog or a Department of Computer Science and Engineering adviser for more information.

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

- **COMM 3201** - Introduction to Electronic Media Production (3.0 - 4.0 cr)
- **COMM 3211** - Introduction to U.S. Electronic Media (3.0 cr)
- **COMM 4235** - Electronic Media and Ethnic Minorities--A World View [IP] (3.0 cr)
- **COMM 4291** - New Telecommunication Media (3.0 cr)
- **GDES 2334** *{Inactive}*(3.0 cr)
- **GDES 4334** *{Inactive}*(3.0 cr)
- **GDES 5383** - Digital Illustration and Animation (3.0 cr)
- **GEOG 3561** - Principles of Geographic Information Science (4.0 cr)
- **GEOG 5563** - Advanced Geographic Information Science (3.0 cr)
- **GEOG 5564** - Urban Geographic Information Science and Analysis (3.0 cr)
- **JOUR 3004W** - Information for Mass Communication [WI] (3.0 cr)
- **JOUR 3614** - History of Media Communication [HIS, TS] (3.0 cr)
- **JOUR 3776** - Mass Communication Law (3.0 cr)



Twin Cities Campus

Management Minor

Curtis L. Carlson School of Management - Adm

Curtis L. Carlson School of Management

- Program Type: Undergraduate free-standing minor
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 16

The Carlson School's management minor covers business principles through the study of seven functional areas of business. The minor is available to students in all majors at the University of Minnesota, Twin Cities. The Carlson School has partnered with the Hubert H. Humphrey Institute of Public Affairs to offer courses within the minor that focus on the nonprofit environment.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Minor Courses

ACCT 2050 - Introduction to Financial Reporting (4.0 cr)

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

- **ACCT 3001** - Introduction to Management Accounting (3.0 cr)
- **FINA 3001** - Finance Fundamentals (3.0 cr)
- **HRIR 3021** - Human Resource Management and Industrial Relations (3.0 cr)
- **IDSC 3001** - Information Systems for Business Processes and Management (3.0 cr)
- **MGMT 3001** - Fundamentals of Management (3.0 cr)
- **MGMT 3010** - Introduction to Entrepreneurship (4.0 cr)
- **MKTG 3001** - Principles of Marketing (3.0 cr)
- **SCO 3001** - Introduction to Operations Management (3.0 cr)
- **PA 3003** - Nonprofit and Public Financial Management (3.0 cr)
- **PA 4101** - Nonprofit Management and Governance (3.0 cr)



Twin Cities Campus

Design Minor

College of Design - Admin

College of Design

- Program Type: Undergraduate free-standing minor
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 18

The design minor is an interdisciplinary program that shows how design can be used as a catalyst for exploration and research. Choosing from a selection of both lecture and studio courses, students are introduced to the history, theory, and practice of design across multiple design disciplines. With the design minor, students may compose their own individual program in which they will understand the interdisciplinary nature of the design process, appreciate the role design plays in everyday life, experience design thinking and action, explore and expand their own design interests, and understand how to work with designers in their chosen field. The design minor provides an integrated education in design where students enhance their learning by making connections between traditional design courses and nontraditional views of design.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Two courses may double-dip with the the student's major or other minor. The minor requires a minimum of 18 total credits.

Category A: Introductory Design Thinking "Big Picture"

Courses from this category introduce students to the scope of design thinking. These courses combine lectures with projects or case studies.

- [ARCH 1701](#) - The Designed Environment (3.0 cr)
- or [DES 1000](#) - D@MN: Design@Minnesota (3.0 cr)
- or [DES 1101V](#) - Honors: Introduction to Design Thinking [AH, WI] (4.0 cr)
- or [DES 1101W](#) - Introduction to Design Thinking [AH, WI] (4.0 cr)
- or [LA 1001](#) - Sustainability by Design [ENV] (3.0 cr)
- or [LA 1401](#) - The Designed Environment (3.0 cr)

Category B: Introductory Design Thinking "Hands-on"

Courses from this category introduce students to design thinking and making in a studio setting.

- [ARCH 1281](#) - Design Fundamentals I (4.0 cr)
- or [DES 1111](#) - Creative Problem Solving (3.0 cr)
- or [DES 1111H](#) - Honors: Creative Problem Solving (3.0 cr)
- or [DES 2101](#) - Design and Visual Presentation (3.0 cr)
- or [GDES 1315](#) - Foundations: The Graphic Studio (4.0 cr)
- or [GDES 3312](#) - Color and Form in Surface Design (4.0 cr)
- or [LA 1301](#) - Introduction to Landscape Architecture Drawing [AH] (3.0 cr)
- or [ME 2011](#) - Introduction to Engineering (4.0 cr)
- or [PDES 3702](#) - Concept Sketching and Rendering (2.0 cr)
- or [PDES 3711](#) - Toy Product Design (4.0 cr)
- or [PDES 5702](#) - Concept Sketching and Rendering (2.0 cr)
- or [PDES 5711](#) - Toy Product Design (4.0 cr)

Category C: Electives

Courses from this category allow students to explore design from a variety of perspectives. Take three or four courses to complete the total required credits for the minor (18).

Take 3 - 4 course(s) totaling 10 - 12 credits(s) from the following:

- [ADES 4121](#) - History of Costume (4.0 cr)
- [ADES 4218](#) - Fashion, Design, and the Global Industry (3.0 cr)
- [ARCH 3411V](#) - Architectural History to 1750 [HIS, GP, WI] (3.0 cr)
- [ARCH 3411W](#) - Architectural History to 1750 [HIS, GP, WI] (3.0 cr)
- [ARCH 3412](#) - Architectural History Since 1750 [HIS, GP] (3.0 cr)
- [ARCH 3412H](#) - Honors: Architectural History Since 1750 [HIS, GP] (3.0 cr)
- [ARCH 3611](#) - Design in the Digital Age (3.0 cr)
- [ARCH 3641](#) - Introduction to Heritage Preservation (3.0 cr)



- ARCH 3711V - Honors: Environmental Design and the Sociocultural Context [C/PE, WI] (3.0 cr)
- ARCH 3711W - Environmental Design and the Sociocultural Context [WI] (3.0 cr)
- ARCH 4423 - Gothic Architecture (3.0 cr)
- ARCH 4424 - Renaissance Architecture (3.0 cr)
- ARCH 4425 - Baroque Architecture (3.0 cr)
- ARCH 4432 - Modern Architecture (3.0 cr)
- ARCH 4434 - Contemporary Architecture (3.0 cr)
- ARCH 4461 - North American Indian Architecture (3.0 cr)
- ARCH 4561 - Architecture and Ecology (3.0 cr)
- ARCH 4701W - Introduction to Urban Form and Theory [WI] (3.0 cr)
- BBE 4413 - Systems Approach to Residential Construction (4.0 cr)
- DES 2101 - Design and Visual Presentation (3.0 cr)
- DES 3131 - User Experience in Design (3.0 cr)
- DES 3160 - Topics in Design (1.0 - 4.0 cr)
- DES 3170 - Topics in Design (1.0 - 4.0 cr)
- DES 3309 - Storytelling and Design (3.0 cr)
- DES 3311 - Travels in Typography (3.0 cr)
- DES 3321 - Introduction to Furniture Design (3.0 cr)
- DES 3331 - Street Life Urban Design Seminar (3.0 cr)
- DES 3341 - (un)Wrapping It Up: New Materials for Design, Design for New Materials (3.0 cr)
- DES 3351 - Phenomenon of Everyday Design (3.0 cr)
- DES 3361 - History of Modern Design (3.0 cr)
- DES 4160 - Topics in Design (1.0 - 4.0 cr)
- DES 4165 - Design and Globalization [DSJ] (3.0 cr)
- DES 4301 - Design Minor Seminar (3.0 cr)
- DES 5160 - Topics in Design (1.0 - 4.0 cr)
- DES 5185 - Human Factors in Design (3.0 cr)
- GDES 2342 - Web Design (3.0 cr)
- GDES 2345 - Typography (4.0 cr)
- GDES 2399W - Design and its Discontents: Design, Society, Economy and Culture [WI] (3.0 cr)
- GDES 3312 - Color and Form in Surface Design (4.0 cr)
- GDES 4131W - History of Graphic Design [WI] (4.0 cr)
- GDES 4330 - Surface Fabric Design Workshop (4.0 cr)
- GDES 4351 - Design Process: Photography (3.0 cr)
- GDES 4352 - Design Process: Bookmaking (3.0 cr)
- GDES 5341 - Interactive Design (3.0 cr)
- GDES 5342 - Web and Interface Design (3.0 cr)
- GDES 5383 - Digital Illustration and Animation (3.0 cr)
- GDES 5386 - Fundamentals of Game Design (3.0 cr)
- GDES 5399 - Theory of Electronic Design (3.0 cr)
- HSG 3482 - Sustainable Housing: Community, Environment, and Technology [TS] (3.0 cr)
- HSG 4413 - A Systems Approach to Residential Construction (4.0 cr)
- HSG 5481 - Promoting Independence in Housing and Community (3.0 cr)
- IDES 2612 - Interior Materials and Specifications [ENV] (4.0 cr)
- IDES 3161 - History of Interiors and Furnishings: Ancient to 1750 [GP] (4.0 cr)
- IDES 3162 - History of Interiors and Furnishings: 1750 to Present [HIS] (4.0 cr)
- JOUR 3745 - Mass Media and Popular Culture [AH, DSJ] (3.0 cr)
- KIN 3505 - Intro to Human-Centered Design (3.0 cr)
- LA 1001 - Sustainability by Design [ENV] (3.0 cr)
- LA 3001 - Understanding and Creating Landscape Space (3.0 cr)
- LA 3002 - Informants of Creating Landscape Space (3.0 cr)
- LA 3003 - Case Studies in Sustainable Landscape Planning and Design (3.0 cr)
- LA 3413 - Introduction to Landscape Architectural History [HIS, GP] (3.0 cr)
- LA 3501 - Environmental Design and Its Biological and Physical Context [ENV] (3.0 cr)
- LA 3514 - Making the Mississippi [CIV] (3.0 cr)
- LA 4755 - Infrastructure, Natural Systems, and Space of Inhabited Landscapes [TS] (3.0 cr)
- PDES 3701 - Creativity, Idea Generation, and Innovation (2.0 cr)
- PDES 3702 - Concept Sketching and Rendering (2.0 cr)
- PDES 3703 - Product Form and Model Making (4.0 cr)
- PDES 3711 - Toy Product Design (4.0 cr)
- PDES 5701 - Creativity, Idea Generation, and Innovation (2.0 cr)
- PDES 5702 - Concept Sketching and Rendering (2.0 cr)
- PDES 5703 - Product Form and Model Making (4.0 cr)
- PDES 5711 - Toy Product Design (4.0 cr)
- RM 3243 - Visual Merchandising (3.0 cr)



- [RM 4117W](#) - Retail Environments and Human Behavior [WI] (3.0 cr)
- [RM 4212W](#) - Dress, Society, and Culture [WI] (3.0 cr)
- [RM 4218](#) - Fashion and Culture (3.0 cr)



Twin Cities Campus

Fashion Studies Minor

Design, Housing & Apparel

College of Design

- Program Type: Undergraduate free-standing minor
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 15 to 16

The fashion studies minor provides students who have an interest in fashion the opportunity to gain knowledge about fashion product, theory, and industry specific practices. Fashion is a major global industry with a broad range of career opportunities from business and design to engineering and chemistry.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

This major is not available for apparel design or retail merchandising majors. Transfer courses must be approved by the fashion studies minor adviser. No more than one transfer course may be used toward the minor. Transfer coursework may be accepted for prerequisite courses upon review: this is not included in the one-course limit.

Required courses

[ADES 3217](#) - Fashion: Trends and Communication (3.0 cr)

[ADES 4121](#) - History of Costume (4.0 cr)

[RM 4212W](#) - Dress, Society, and Culture [WI] (3.0 cr)

Choose two courses from this list

[RM 1201](#) - Fashion, Ethics, and Consumption [CIV] (3.0 cr)

or [ADES 2214](#) - Softlines Analysis (3.0 cr)

or [RM 2215](#) - Multichannel Retailing (3.0 cr)

or [ADES 3196](#) - Field Study: National or International (1.0 - 10.0 cr)

or [ADES 4218](#) - Fashion, Design, and the Global Industry (3.0 cr)



Twin Cities Campus

Biochemistry Minor

Biochemistry, Molecular Biology, & Biophysics TCBS

College of Biological Sciences

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 10

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

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Students who wish to declare a minor in biochemistry can do so online at the College of Biological Sciences Web site.

Minor Courses

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

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

[BIOC 4025](#) - Laboratory in Biochemistry (2.0 cr)



Twin Cities Campus

Biology Minor

College of Biological Sciences - Adm

College of Biological Sciences

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 20 to 22

Biology is the scientific exploration of the diverse world of living organisms. Today, biological research spans an almost infinite spectrum of studies from molecules to ecosystems. The field of biology has expanded enormously within the past four decades.

Within a flexible curriculum, the biology minor provides an opportunity for non-CBS students to gain a broad understanding of the fundamental nature and characteristics of living things, or explore specific areas of the field in greater depth. The minor offers great freedom for students to select coursework that is most relevant to their interests and academic goals.

The biology minor is available to non-CBS students only. Due to significant course overlap, the following majors are not eligible to complete the biology minor:

- * Biology, society, and the environment
- * Physiology
- * Clinical laboratory sciences
- * Nutrition (nutritional sciences sub-plan only)
- * Fisheries and wildlife (all sub-plans)
- * Individually designed programs with a life sciences emphasis

Additionally, students completing a microbiology minor are not eligible for the biology minor.

Students interested in declaring a biology minor can do so online at the College of Biological Sciences website.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

To count for the biology minor, all courses must be taken A-F and receive a grade of C- or higher (or an S in Directed Research or Directed Studies). Courses that are cross-listed with CBS designators may be allowed for use in the minor. Up to 3 credits from a transfer institution (including those taken abroad) may be applied toward the 12 elective credits. In order to count for the biology minor, transfer courses must be evaluated by a faculty member for both biology content and the level at which they were taught.

Minor Courses

- [CHEM 1061](#) - Chemical Principles I [PHYS] (3.0 cr)
- [CHEM 1065](#) - Chemical Principles I Laboratory [PHYS] (1.0 cr)
- [BIOL 1001](#) - Introductory Biology: Evolutionary and Ecological Perspectives [BIOL] (4.0 cr)
 - or [BIOL 1003](#) - Evolution and Biology of Sex [BIOL] (4.0 cr)
 - or [BIOL 1009](#) - General Biology [BIOL] (4.0 cr)
 - or [BIOL 1010](#) - Human Biology: Concepts and Current Ethical Issues [BIOL, CIV] (4.0 cr)
 - or [BIOL 2002](#) - Foundations of Biology for Biological Sciences Majors, Part I [BIOL] (6.0 cr)
 - or [BIOL 2002H](#) - Foundations of Biology for Biological Sciences Majors, Part I [BIOL] (6.0 cr)

Electives

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

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

- Take 0 - 9 credits(s) from the following:
 - [BIOC 2331](#) - Chemical Mechanisms in Biology (3.0 cr)
 - [BIOL 2003](#) - Foundations of Biology for Biological Sciences Majors, Part II (3.0 cr)
 - [BIOL 2003H](#) - Foundations of Biology for Biological Sciences Majors, Part II (3.0 cr)
 - [BIOL 2004](#) - Foundations of Biology for Biological Sciences Majors, Part II Laboratory (3.0 cr)
 - [BIOL 2004H](#) - Foundations of Biology for Biological Sciences Majors, Part II Laboratory (3.0 cr)
 - [BIOL 2005](#) - Animal Diversity Laboratory (2.0 cr)
 - [BIOL 2012](#) - General Zoology (4.0 cr)



- BIOL 2022 - General Botany (3.0 cr)
- VBS 2032 - General Microbiology With Laboratory (5.0 cr)
- Take 3 or more credits(s) from the following:
 - BIOL 3002 - Plant Biology: Function (2.0 cr)
 - BIOL 3005W - Plant Function Laboratory [WI] (2.0 cr)
 - BIOL 3007W - Plant, Algal, and Fungal Diversity and Adaptation [WI] (4.0 cr)
 - BIOL 3209 - Understanding the Evolution-Creationism Controversy [CIV] (3.0 cr)
 - BIOL 3211 - Physiology of Humans and Other Animals (3.0 cr)
 - BIOL 3272 - Applied Biostatistics (3.0 cr)
 - BIOL 3407 - Ecology (3.0 cr)
 - BIOL 3408W - Ecology [WI] (3.0 cr)
 - BIOL 3409 - Evolution (3.0 cr)
 - BIOL 3411 - Introduction to Animal Behavior (3.0 cr)
 - BIOL 3503 - Biology of Aging (2.0 cr)
 - BIOL 3600 - Directed Instruction (1.0 - 2.0 cr)
 - BIOL 3610 - Internship: Professional Experience in Biological Sciences (1.0 - 6.0 cr)
 - BIOL 3700 - Undergraduate Seminar (1.0 - 3.0 cr)
 - BIOL 3807 - Ecology (4.0 cr)
 - BIOL 3811 - Introduction to Animal Behavior (4.0 cr)
 - BIOL 3820 - Aquatic Toxicology (2.0 cr)
 - BIOL 3825 - Ecological Genetics (2.0 cr)
 - BIOL 3960H - Communicating in the Biological Sciences (1.0 cr)
 - BIOL 4003 - Genetics (3.0 cr)
 - BIOL 4004 - Cell Biology (3.0 cr)
 - BIOL 4035 - Metagenomics Laboratory (3.0 cr)
 - BIOL 4201 - Teaching in the Biology Laboratory (1.0 cr)
 - BIOL 4700 - Cell Physiology (3.0 cr)
 - BIOL 4793W - Directed Studies: Writing Intensive [WI] (1.0 - 6.0 cr)
 - BIOL 4794W - Directed Research [WI] (1.0 - 6.0 cr)
 - BIOL 4850 - Special Topics in Biology (1.0 - 5.0 cr)
 - BIOL 4862 - Biological Photography and Digital Imaging Techniques (3.0 cr)
 - BIOL 4894 - Directed Research at Itasca (1.0 - 7.0 cr)
 - BIOL 4950 - Special Topics in Biology (1.0 - 4.0 cr)
 - BIOL 4993 - Directed Studies (1.0 - 6.0 cr)
 - BIOL 4994 - Directed Research (1.0 - 6.0 cr)
 - BIOL 5485 - Bioinformatics: Experimental Design and Computational Analysis in Systems Biology (3.0 cr)
 - BIOL 5950 - Special Topics in Biology (1.0 - 4.0 cr)
- BIOC 3021 - Biochemistry (3.0 cr)
- BIOC 3960 - Research Topics in Biochemistry (1.0 cr)
- BIOC 4025 - Laboratory in Biochemistry (2.0 cr)
- BIOC 4125 - Laboratory in Molecular Biology and Biotechnology (3.0 cr)
- BIOC 4325 - Laboratory in Mass Spectrometry (1.0 cr)
- BIOC 4331 - Biochemistry I: Structure, Catalysis, and Metabolism in Biological Systems (4.0 cr)
- BIOC 4332 - Biochemistry II: Molecular Mechanisms of Signal Transduction and Gene Expression (4.0 cr)
- BIOC 4521 - Introduction to Physical Biochemistry (3.0 cr)
- BIOC 4793W - Directed Studies: Writing Intensive [WI] (1.0 - 7.0 cr)
- BIOC 4794W - Directed Research: Writing Intensive [WI] (1.0 - 6.0 cr)
- BIOC 4950 - Computer Simulation and Data Analysis in Biochemistry (3.0 cr)
- BIOC 4960 - Special Topics in Biochemistry (3.0 cr)
- BIOC 4993 - Directed Studies (1.0 - 7.0 cr)
- BIOC 4994 - Directed Research (1.0 - 6.0 cr)
- EEB 3001 - Ecology and Society [ENV] (3.0 cr)
- EEB 3002 - Sex, Evolution, and Behavior: Examining Human Evolutionary Biology (4.0 cr)
- EEB 3361 *{Inactive}*(4.0 cr)
- EEB 3603 - Science, Protection, and Management of Aquatic Environments (3.0 cr)
- EEB 3963 - Modeling Nature and the Nature of Modeling (3.0 cr)
- EEB 4014 *{Inactive}*(3.0 cr)
- EEB 4068 - Plant Physiological Ecology (3.0 cr)
- EEB 4129 - Mammalogy (4.0 cr)
- EEB 4134 - Introduction to Ornithology (4.0 cr)
- EEB 4329 - Primate Ecology and Social Behavior (3.0 cr)
- EEB 4330 - Animal Communication (3.0 cr)
- EEB 4609W - Ecosystem Ecology [ENV, WI] (3.0 cr)
- EEB 4611 - Biogeochemical Processes (3.0 cr)
- EEB 4631 *{Inactive}*(4.0 cr)



- EEB 4793W - Directed Studies: Writing Intensive [WI] (1.0 - 7.0 cr)
- EEB 4794W - Directed Research: Writing Intensive [WI] (1.0 - 6.0 cr)
- EEB 4801 *{Inactive}*(4.0 cr)
- EEB 4809 *{Inactive}*(3.0 cr)
- EEB 4814 - Plant Community Ecology (4.0 cr)
- EEB 4817 - Vertebrate Ecology (4.0 cr)
- EEB 4825 - Telemetry and Animal Behavior (2.0 cr)
- EEB 4839 - Field Studies in Mammalogy (4.0 cr)
- EEB 4842 - Arctic Field Ecology (4.0 cr)
- EEB 4844 - Field Ornithology (4.0 cr)
- EEB 4993 - Directed Studies (1.0 - 7.0 cr)
- EEB 4994 - Directed Research (1.0 - 6.0 cr)
- EEB 5001 *{Inactive}*(3.0 cr)
- EEB 5009 *{Inactive}*(3.0 cr)
- EEB 5013 *{Inactive}*(2.0 cr)
- EEB 5033 *{Inactive}*(4.0 cr)
- EEB 5042 - Quantitative Genetics (3.0 cr)
- EEB 5053 - Ecology: Theory and Concepts (4.0 cr)
- EEB 5068 - Plant Physiological Ecology (3.0 cr)
- EEB 5146 - Science and Policy of Global Environmental Change (3.0 cr)
- EEB 5221 - Molecular Evolution (3.0 cr)
- EEB 5321 *{Inactive}*(3.0 cr)
- EEB 5322 - Evolution and Animal Cognition (3.0 cr)
- EEB 5323 - Neural and Endocrine Mechanisms Underlying Vertebrate Behavior (2.0 cr)
- EEB 5327 *{Inactive}*(3.0 cr)
- EEB 5371 - Principles of Systematics (3.0 cr)
- EEB 5601 - Limnology (3.0 cr)
- EEB 5605 - Limnology Laboratory (2.0 cr)
- EEB 5609 - Ecosystem Ecology (3.0 cr)
- EEB 5963 - Modeling Nature and the Nature of Modeling (3.0 cr)
- GCD 3022 - Genetics (3.0 cr)
- GCD 3485 - Bioinformatic Analysis: Introduction to the Computational Characterization of Genes and Proteins (3.0 cr)
- GCD 4025 - Cell Biology Laboratory (2.0 cr)
- GCD 4034 - Molecular Genetics (3.0 cr)
- GCD 4111 - Histology: Cell and Tissue Organization (4.0 cr)
- GCD 4134 - Endocrinology (3.0 cr)
- GCD 4143 - Human Genetics (3.0 cr)
- GCD 4151 - Molecular Biology of Cancer (3.0 cr)
- GCD 4161 - Developmental Biology (3.0 cr)
- GCD 4171 - Stem Cells in Biology and Medicine (3.0 cr)
- GCD 4793W - Directed Studies: Writing Intensive [WI] (1.0 - 7.0 cr)
- GCD 4794W - Directed Research: Writing Intensive [WI] (1.0 - 6.0 cr)
- GCD 4993 - Directed Studies (1.0 - 7.0 cr)
- GCD 4994 - Directed Research (1.0 - 6.0 cr)
- GCD 5036 - Molecular Cell Biology (3.0 cr)
- MICB 3301 - Biology of Microorganisms (5.0 cr)
- MICB 3303 - Biology of Microorganisms (3.0 cr)
- MICB 4111 - Microbial Physiology and Diversity (3.0 cr)
- MICB 4121 - Microbial Ecology and Applied Microbiology (3.0 cr)
- MICB 4131 - Immunology (3.0 cr)
- MICB 4141W - Biology, Genetics, and Pathogenesis of Viruses: Writing Intensive [WI] (4.0 cr)
- MICB 4151 - Molecular and Genetic Bases for Microbial Diseases (3.0 cr)
- MICB 4161W - Eukaryotic Microbiology [WI] (3.0 cr)
- MICB 4171 - Biology, Genetics, and Pathogenesis of Viruses (3.0 cr)
- MICB 4215 - Advanced Laboratory: Microbial Physiology and Diversity (3.0 cr)
- MICB 4225W - Advanced Laboratory: Microbial Genetics [WI] (3.0 cr)
- MICB 4235 - Advanced Laboratory: Virology, Immunology, and Microbial Genetics (3.0 cr)
- MICB 4793W - Directed Studies: Writing Intensive [WI] (1.0 - 7.0 cr)
- MICB 4794W - Directed Research: Writing Intensive [WI] (1.0 - 7.0 cr)
- MICB 4993 - Directed Studies (1.0 - 6.0 cr)
- MICB 4994 - Directed Research (1.0 - 7.0 cr)
- NSCI 3001W - Neuroscience and Society [CIV, WI] (4.0 cr)
- NSCI 3101 - Introduction to Neuroscience I: From Molecules to Madness (3.0 cr)
- NSCI 3102W - Introduction to Neuroscience II: Biological Basis of Behavior [WI] (3.0 cr)
- NSCI 4100 - Development of the Nervous System: Cellular and Molecular Mechanisms (3.0 cr)



- NSCI 4105 - Neurobiology Laboratory I (3.0 cr)
- NSCI 4151 - Advanced Topics in Neuroscience (3.0 cr)
- NSCI 4167 - Neuroscience in the Community (1.0 - 3.0 cr)
- NSCI 4793W - Directed Studies: Writing Intensive [WI] (1.0 - 6.0 cr)
- NSCI 4794W - Directed Research: Writing Intensive [WI] (1.0 - 6.0 cr)
- NSCI 4993 - Directed Studies (1.0 - 7.0 cr)
- NSCI 4994 - Directed Research (1.0 - 6.0 cr)
- PBIO 4321 - Minnesota Flora (3.0 cr)
- PBIO 4404 - Developmental Plant Anatomy (3.0 cr)
- PBIO 4511 - Flowering Plant Diversity (3.0 cr)
- PBIO 4516W - Plant Cell Biology: Writing Intensive [WI] (3.0 cr)
- PBIO 4601 - Topics in Plant Biochemistry (3.0 cr)
- PBIO 4793W - Directed Studies: Writing Intensive [WI] (1.0 - 7.0 cr)
- PBIO 4794W - Directed Research: Writing Intensive [WI] (1.0 - 6.0 cr)
- PBIO 4993 - Directed Studies (1.0 - 7.0 cr)
- PBIO 4994 - Directed Research (1.0 - 6.0 cr)
- PBIO 5109 - Current Questions in Fungal Biology (2.0 cr)
- PBIO 5301 - Plant Genomics (3.0 cr)
- BIOL 5309 - Molecular Ecology And Ecological Genomics (3.0 cr)
- PBIO 5412 - Plant Physiology (3.0 cr)
- PBIO 5514 - Plant Molecular Genetics and Development (3.0 cr)
- PBIO 5516 - Plant Cell Biology (3.0 cr)
- PBIO 5601 - Topics in Plant Biochemistry (3.0 cr)
- PBIO 5960 - Special Topics (1.0 - 3.0 cr)



Twin Cities Campus

Microbiology Minor

Microbiology

College of Biological Sciences

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 14

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

Students completing the biology minor are not eligible for the microbiology minor.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Students who wish to declare a minor in microbiology can do so online at the College of Biological Sciences website.

Microbiology Minor

Transfer credit may only be used to fulfill MICB 3301. All other coursework needs to be completed at the University of Minnesota-Twin Cities.

MICB 3301 - Biology of Microorganisms (5.0 cr)

Take 2 or more course(s) totaling 6 or more credits(s) from the following:

- **MICB 4111** - Microbial Physiology and Diversity (3.0 cr)
- **MICB 4121** - Microbial Ecology and Applied Microbiology (3.0 cr)
- **MICB 4131** - Immunology (3.0 cr)
- **MICB 4151** - Molecular and Genetic Bases for Microbial Diseases (3.0 cr)
- **MICB 4161W** - Eukaryotic Microbiology [WI] (3.0 cr)
- **MICB 4171** - Biology, Genetics, and Pathogenesis of Viruses (3.0 cr)

Take 1 or more course(s) totaling 3 or more credits(s) from the following:

- **MICB 4215** - Advanced Laboratory: Microbial Physiology and Diversity (3.0 cr)
- **MICB 4225W** - Advanced Laboratory: Microbial Genetics [WI] (3.0 cr)
- **MICB 4235** - Advanced Laboratory: Virology, Immunology, and Microbial Genetics (3.0 cr)



Twin Cities Campus

Neuroscience Minor

Neuroscience

College of Biological Sciences

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 14

The neuroscience minor provides an in-depth contemporary understanding of how the nervous system functions in both health and disease. The goal of the minor is to provide instruction that will enrich the curriculum through an array of academic majors. As we will all experience the impact of nervous system disease ourselves or through family members and/or friends, instruction in this minor will offer insights into the nervous system that students can utilize throughout their lifetimes.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Only one course (maximum 3 credits) from a student's major may count towards the elective credits for the minor.

Neuroscience Minor

[NSCI 1001](#) - Fundamental Neuroscience: Understanding Ourselves [TS] (3.0 cr)

[NSCI 1100](#) - Human Neuroanatomy [BIOL] (4.0 cr)

[NSCI 3001W](#) - Neuroscience and Society [CIV, WI] (4.0 cr)

Additional Elective

One additional course (at least 3 credits) will be required that may come from neuroscience course offerings or from courses with a neuroscience emphasis taught in other departments. Approval of any elective course will be at the discretion of the Director of Undergraduate Studies. A sampling of potential courses includes:

ANTH 1001

BIOL 1xxx

CPSY 4343

GWSS 3203W

KIN 4133

NSCI 3101

NSCI 4100

PSY 3011

PSY 3031

PSY 3061

SLHS 3302



Twin Cities Campus

Plant Biology Minor

Plant Biology

College of Biological Sciences

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 10

Plant biologists seek to understand plants and associated organisms, including fungi and algae, at all levels of biological organization, from molecules to ecosystems. Biochemical, physiological, developmental, genetic, evolutionary, and ecological studies of plants are fundamental to improve human welfare and global conditions in the areas of health, food, energy, and environment. Some current examples of research in plant biology include developmental genetics for bioenergy and food production, ecological studies of carbon cycling, evolutionary responses to climate change, cellular responses to pathogens and abiotic stress, natural product discovery, symbiosis, molecular evolution, informatics, and the pursuit of other fundamental questions.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

The plant biology minor is available to students in the College of Biological Sciences pursuing another major in the college as well as to non-CBS students. Minor courses must be completed A-F and a grade of C- or better is required. Students must take at least one 4xxx or 5xxx course.

Students who wish to declare a minor in plant biology can do so online at the College of Biological Sciences website.

Minor Courses

Up to 4 credits of plant biology Directed Research (PBIO 4994/4794W) and/or Directed Studies (PBIO 4993/4793W) may be used.

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

- BIOL 2022 - General Botany (3.0 cr)
- BIOL 3002 - Plant Biology: Function (2.0 cr)
- BIOL 3005W - Plant Function Laboratory [WI] (2.0 cr)
- BIOL 3007W - Plant, Algal, and Fungal Diversity and Adaptation [WI] (4.0 cr)
- EEB 4068 - Plant Physiological Ecology (3.0 cr)
- FR 3104 - Forest Ecology (4.0 cr)
- PBIO 4321 - Minnesota Flora (3.0 cr)
- PBIO 4511 - Flowering Plant Diversity (3.0 cr)
- PBIO 4516W - Plant Cell Biology: Writing Intensive [WI] (3.0 cr)
- PBIO 4601 - Topics in Plant Biochemistry (3.0 cr)
- PBIO 4993 - Directed Studies (1.0 - 7.0 cr)
- PBIO 4994 - Directed Research (1.0 - 6.0 cr)
- PBIO 4793W - Directed Studies: Writing Intensive [WI] (1.0 - 7.0 cr)
- PBIO 4794W - Directed Research: Writing Intensive [WI] (1.0 - 6.0 cr)
- PBIO 5301 - Plant Genomics (3.0 cr)
- BIOL 5309 - Molecular Ecology And Ecological Genomics (3.0 cr)
- PBIO 5412 - Plant Physiology (3.0 cr)
- PBIO 5514 - Plant Molecular Genetics and Development (3.0 cr)
- PBIO 5516 - Plant Cell Biology (3.0 cr)
- PBIO 5960 - Special Topics (1.0 - 3.0 cr)
- PLPA 5203 - Introduction to Fungal Biology (3.0 cr)
- PBIO 4811 *{Inactive}*(3.0 cr)



Twin Cities Campus

Construction Management Minor

CCE Applied Professional Studies

College of Continuing Education

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 19

A minor in construction management provides foundation knowledge, industry insight, and business competencies essential in the construction sector.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Sixty percent of credits in the minor must be completed at the University of Minnesota-Twin Cities.

Minor Courses

- CMGT 3001 - Introduction to Construction (3.0 cr)
- CMGT 4011 - Construction Documents and Contracts (3.0 cr)
- CMGT 4021 - Construction Planning and Scheduling (3.0 cr)
- CMGT 4022 - Construction Estimating (3.0 cr)
- CMGT 4031 - Construction Safety and Loss Control (3.0 cr)
- CE 4101W *(Inactive)*[WI] (3.0 cr)
- Department approved related 1-credit course



Twin Cities Campus

Manufacturing Operations Management Minor

CCE Applied Professional Studies

College of Continuing Education

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 16

The Manufacturing Operations Management minor explores systems, processes, and tools integral to global enterprise. Study of the emerging manufacturing environment and quality engineering combines with technical elective options to enhance effectiveness in diverse research/production oriented industries (biomedical, chemical, construction, electronic, environmental, food, textiles, and transportation).

Program Delivery

This program is available:

- partially online (between 50% to 80% of instruction is online)

Minor Requirements

Minor Coursework

Note: MM 4035 prerequisite is ABUS 4102 or equivalent operations course or professional experience.

[MM 3001](#) - Manufacturing in a Global Economy (3.0 cr)

[MM 4102](#) - Manufacturing Operations (3.0 cr)

Technical electives

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

- [MM 3205](#) - Engineering for Manufacturing Operations (3.0 cr)
- [MM 4011](#) - Design of Manufacturing Systems and Simulations (3.0 cr)
- [MM 4012](#) - Manufacturing Processes and Technology (3.0 cr)
- [MM 4035](#) - Global Supply Chain Management (3.0 cr)
- [MM 4039](#) - Manufacturing Outsourcing Decisions (2.0 cr)
- [MM 4045](#) - Regulated Industry Compliance (3.0 cr)
- [MM 4201](#) - Quality Engineering and Process Improvement (3.0 cr)
- [MM 4311](#) - Sustainable Lean Manufacturing (2.0 cr)
- [MM 4596](#) - Internship/Capstone (1.0 - 4.0 cr)



Twin Cities Campus

Family Social Science Minor

Family Social Science

College of Education and Human Development

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 15

See major description for more information.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Minor Courses

[FSOS 1101](#) - Intimate Relationships [SOCS] (4.0 cr)

[FSOS 3102](#) - Family Systems and Diversity [SOCS, DSJ] (3.0 cr)

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

- [FSOS 2103](#) - Family Policy (3.0 cr)
- [FSOS 3101](#) - Personal and Family Finances (3.0 cr)
- [FSOS 3104](#) - Global and Diverse Families [SOCS, GP] (3.0 cr)
- [FSOS 3426](#) - Alcohol and Drugs: Families and Culture (3.0 cr)
- [FSOS 4101](#) - Sexuality and Gender in Families and Close Relationships (3.0 cr)
- [FSOS 4104W](#) - Family Psychology [WI] (3.0 cr)
- [FSOS 4106](#) - Family Resource Management (3.0 cr)
- [FSOS 4152](#) - Gay, Lesbian, and Bisexual People in Families (3.0 cr)
- [FSOS 4154W](#) - Families and Aging [WI] (3.0 cr)
- [FSOS 4155](#) - Parent-Child Relationships (3.0 cr)



Twin Cities Campus

Sport Management Minor

Kinesiology, School of

College of Education and Human Development

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 17

The sport management minor provides students from different disciplines the opportunity to explore interest in the sport industry, while combining their passion for sport with sport management concepts and practices.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Minor Coursework

Students completing the minor are required to take the courses listed below.

[SMGT 3111](#) - Sports Facility and Event Management (3.0 cr)

[SMGT 3143](#) - Organization and Management of Sport (3.0 cr)

[SMGT 3421](#) - Business of Sport (3.0 cr)

[SMGT 3631](#) - Sport Marketing (3.0 cr)

Minor Elective Coursework

Students must also elect to take one additional course (3 credits) from the SMGT designator courses or, if in consultation with the minor adviser, they are pre-approved to take one of the graduate level KIN designated courses related to sport management.

Additional electives will be available in consultation with the sport management minor program director.

[SMGT 3632](#) - Sport Sales and Fund-raising (3.0 cr)

or [SMGT 3861](#) - Legal Aspects of Sport (3.0 cr)

or [SMGT 3993](#) - Directed Study in Sport Management (1.0 - 3.0 cr)



Twin Cities Campus

Youth Studies Minor

School of Social Work

College of Education and Human Development

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 16

The youth studies is a 16-credit undergraduate minor that addresses youth as an idea, youth as young people, youthhood as the everyday lives of young people, and the responses of communities to this population.

Participants in the youth studies minor learn about and critically analyze at a beginning level the families of ideas, models, concepts, discourses, and ways of understanding, responding to, and working with young people. Participants craft their unique program from among the required designated courses to prepare for graduate training/education in the many scholarly and youth work professional fields. Participants do not become trained workers with youth nor receive any certification to do youth work in any participating field.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Youth Studies Minor Courses

YOST 1001 - Seeing Youth, Thinking Youth: Media, Popular Media, and Scholarship (3.0 cr)

Youth Studies Electives

Electives to be chosen in consultation with youth studies adviser.

Take exactly 13 credits(s) from the following:

- YOST 3xxx
- YOST 4xxx



Twin Cities Campus

Animal Science Minor

Animal Science

College of Food, Agricultural and Natural Resource Sciences

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 20

This minor is for students who want to include animal science coursework to enhance or supplement their major program. Students have flexibility in choosing courses to meet the requirements.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Students must complete at least 20 credits of courses with an animal science (ANSC) designator.

Minor Courses

At least 10 credits must be 3xxx or higher.

Take 20 or more credits(s) from the following:

• Take at most 10 credits(s) from the following:

- ANSC 1xxx
- ANSC 2xxx

• Take 10 or more credits(s) from the following:

- ANSC 3xxx
- ANSC 4xxx
- ANSC 5xxx



Twin Cities Campus

Applied Economics Minor

Applied Economics

College of Food, Agricultural and Natural Resource Sciences

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 15

This minor is for students who want to include a basic core of applied economics coursework to enhance or supplement their major program. Students have flexibility in choosing courses to meet these minor requirements. Students who wish to minor in applied economics should consult with the major coordinator for applied economics to obtain approval before completion of 9 credits in the minor. No more than 6 credits may be counted for both the major and the applied economics minor. Students must complete at least 15 credits for the minor.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Minor Courses

- [APEC 1101](#) - Principles of Microeconomics [SOCS, GP] (4.0 cr)
or [ECON 1101](#) - Principles of Microeconomics [SOCS, GP] (4.0 cr)
- [APEC 1102](#) - Principles of Macroeconomics (3.0 cr)
or [ECON 1102](#) - Principles of Macroeconomics (4.0 cr)

Take 9 or more credits(s) from the following:

- APEC 3xxx
- APEC 4xxx
- APEC 5xxx



Twin Cities Campus

Bio-Based Products Engineering Minor

Bioproducts and Biosystems Engineering

College of Food, Agricultural and Natural Resource Sciences

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 14

This program provides students with a strong background in the basic sciences and engineering and their application to manufacturing and end-use applications of materials, chemicals, and energy from renewable resources.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Minor Courses

Take 14 or more credits(s) from the following:

- **BBE 4001** - Chemistry of Biomass and Biomass Conversion to Fuels and Products [ENV] (4.0 cr)
- **BBE 4301** - Applied Surface and Colloid Science (3.0 cr)
- **BBE 4302** - Biodegradation of Bioproducts (3.0 cr)
- **BBE 4303** - Introduction to Bio-based Materials Science (3.0 cr)
- **BBE 4305** - Pulp and Paper Technology (3.0 cr)
- **BBE 4401** - Bioproducts Engineering (3.0 cr)
- **BBE 4404** - Biopolymers and Biocomposites Engineering (3.0 cr)
- **BBE 4502W** - BBE Capstone Design [WI] (4.0 cr)



Twin Cities Campus

Corporate Environmental Management Minor

Bioproducts and Biosystems Engineering

College of Food, Agricultural and Natural Resource Sciences

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 18

The corporate environmental management (CEM) minor is designed to provide students with an excellent opportunity to gain a broad exposure to the strategic, analytical, and managerial processes associated with the environmental impact of companies' and other organizations' products and processes. Completion of the CEM minor enhances students' preparation for graduate school and for entering a career in the growing corporate functions of environmental management and regulatory compliance.

The CEM minor is available to students in good standing in all majors at the University of Minnesota, Twin Cities.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Minor Courses

[ACCT 2050](#) - Introduction to Financial Reporting (4.0 cr)

[ESPM 3603](#) - Environmental Life Cycle Analysis (3.0 cr)

[ESPM 3604](#) - Environmental Management Systems and Strategy (3.0 cr)

[ESPM 5019](#) - Business, Natural Environment, and Global Economy (2.0 cr)

Take 6 or more credits(s) from the following:

- [ESPM 3011W](#) - Ethics in Natural Resources [WI] (3.0 cr)
- [ESPM 3202W](#) - Environmental Conflict Management, Leadership, and Planning [WI] (3.0 cr)
- [ESPM 3241W](#) - Natural Resource and Environmental Policy [SOCS, CIV, WI] (3.0 cr)
- [ESPM 3602](#) - Regulations and Corporate Environmental Management (3.0 cr)
- [ESPM 3605](#) - Recycling: Extending Raw Materials [TS] (3.0 cr)
- [ESPM 3606W](#) - Pollution Prevention: Principles, Technologies, and Practices [WI] (3.0 cr)
- [ESPM 4061W](#) - Water Quality and Natural Resources [WI] (3.0 cr)
- [ESPM 4607](#) - Industrial Biotechnology and the Environment (3.0 cr)
- [ESPM 4608](#) - Bioremediation (3.0 cr)



Twin Cities Campus

Environment and Natural Resources Minor

College of Food, Agri & Natural Resource Sciences

College of Food, Agricultural and Natural Resource Sciences

- **Students will no longer be accepted into this program after Spring 2008. Program requirements below are for current students only.**

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 16

The environment and natural resources minor provides students in programs such as biology, education, journalism, political science, and others with the basic understanding to recognize, evaluate, and develop solutions to a range of environmental problems. Students interested in the minor should contact Student Services in 190 Coffey Hall.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Minor Core

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

- **ESPM 1011** - Issues in the Environment [ENV] (3.0 cr)
- **ESPM 2041** - Natural Resources Consumption and Sustainability [GP] (3.0 cr)
- **FW 2001** - Introduction to Fisheries, Wildlife, and Conservation Biology (3.0 cr)
- **SOIL 2125** - Basic Soil Science [PHYS, ENV] (4.0 cr)
- **BIOL 3407** - Ecology (3.0 cr)
or **EEB 3001** - Ecology and Society [ENV] (3.0 cr)
or **FR 3104** - Forest Ecology (4.0 cr)

Focus for ENR Minor

Environmental Management and Policy

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

- **ESPM 3002** - Colloquium: Exotic Plants and Animals (1.0 cr)
- **ESPM 3011W** - Ethics in Natural Resources [WI] (3.0 cr)
- **ESPM 3021** *(Inactive)*[ENV] (3.0 cr)
- **ESPM 3101** - Conservation of Plant Biodiversity (3.0 cr)
- **ESPM 3202W** - Environmental Conflict Management, Leadership, and Planning [WI] (3.0 cr)
- **ESPM 3211** - Survey, Measurement, and Modeling for Environmental Analysis (3.0 cr)
- **ESPM 3241W** - Natural Resource and Environmental Policy [SOCS, CIV, WI] (3.0 cr)
- **ESPM 3245** - Sustainable Land Use Planning and Policy [ENV] (3.0 cr)
- **ESPM 3261** - Economics and Natural Resources Management [SOCS, ENV] (4.0 cr)
- **ESPM 3601** - Sustainable Housing--Community, Environment, and Technology [TS] (3.0 cr)
- **ESPM 4061W** - Water Quality and Natural Resources [WI] (3.0 cr)
- **ESPM 4195W** *(Inactive)*[WI] (4.0 cr)
- **ESPM 4295W** - GIS in Environmental Science and Management [WI] (4.0 cr)
- **ESPM 4811** - Environmental Interpretation (3.0 cr)
- **ESPM 5601** - Principles of Waste Management (3.0 cr)
- **FR 3131** - Geographical Information Systems (GIS) for Natural Resources [TS] (4.0 cr)

-OR-

Environmental Science

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

- **ESPM 3221** - Soil Conservation and Land-Use Management (3.0 cr)
- **ESPM 3612W** - Soil and Environmental Biology [WI] (3.0 cr)
- **ESPM 4216** - Contaminant Hydrology (2.0 cr)
- **ESPM 4601** - Soils and Pollution (3.0 cr)
- **ESPM 5555** - Wetland Soils (3.0 cr)
- **EEB 4611** - Biogeochemical Processes (3.0 cr)



- ENT 3925 - Insects, Aquatic Habitats, and Pollution (3.0 cr)
- ENT 5241 - Ecological Risk Assessment (3.0 cr)
- FR 3114 - Hydrology and Watershed Management (3.0 cr)
- FR 3131 - Geographical Information Systems (GIS) for Natural Resources [TS] (4.0 cr)
- PLPA 3002 *{Inactive}*(3.0 cr)
- SOIL 3416 - Plant Nutrients in the Environment (3.0 cr)



Twin Cities Campus

Environmental Horticulture Minor

Horticultural Science

College of Food, Agricultural and Natural Resource Sciences

- **Students will no longer be accepted into this program after Fall 2009. Program requirements below are for current students only.**
- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 18

Plants provide many practical and recreational benefits to society--whether it is the food we eat, the parks we play in, or the gardens we enjoy admiring. The horticultural science minor is geared toward students who want to learn more about plants and their many, diverse uses in the landscape. Coursework is flexible and can easily be tailored to specific horticultural interests, including floriculture and nursery production, turfgrass science, landscape design and maintenance, fruit and vegetable production, sustainable and organic production practices, therapeutic horticulture, plant physiology, and genetics. Students wishing to complete a minor in horticultural science should contact the Department of Horticultural Science, 305 Alderman Hall for assistance.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Minor Course

[HORT 1001](#) - Plant Propagation [BIOL] (4.0 cr)

Electives

Students must take at least 14 credits from courses with a HORT designator, of which one horticulture related elective course may be substituted (such as SOIL, PLPA, ENT, and BIOL 3002). At least two HORT courses must be 4xxx or 5xxx. A maximum of 3 credits of HORT 5090 may be applied to the minor. Directed studies may be applied.

Take 14 or more credits(s) from the following:

- HORT 1xxx
- HORT 2xxx
- HORT 3xxx
- Take 2 or more course(s) from the following:
 - HORT 4xxx
 - HORT 5xxx
- Take 0 - 3 credits(s) from the following:
 - [HORT 5090](#) - Directed Studies (1.0 - 6.0 cr)



Twin Cities Campus

Environmental Sciences, Policy and Management Minor

College of Food, Agri & Natural Resource Sciences

College of Food, Agricultural and Natural Resource Sciences

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 16

The environmental sciences, policy and management minor provides students in programs such as biology, education, journalism, political science, and others with the basic understanding to recognize, evaluate, and develop solutions to a range of environmental problems. Students interested in the minor should contact Student Services in 190 Coffey Hall.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Minor Core

Take 2 or more course(s) totaling 6 - 8 credits(s) from the following:

- [ESPM 1011](#) - Issues in the Environment [ENV] (3.0 cr)
- [ESPM 2041](#) - Natural Resources Consumption and Sustainability [GP] (3.0 cr)
- [FW 2001](#) - Introduction to Fisheries, Wildlife, and Conservation Biology (3.0 cr)
- [SOIL 2125](#) - Basic Soil Science [PHYS, ENV] (4.0 cr)
- [BIOL 3407](#) - Ecology (3.0 cr)
or [BIOL 3408W](#) - Ecology [WI] (3.0 cr)
or [EEB 3001](#) - Ecology and Society [ENV] (3.0 cr)
or [FR 3104](#) - Forest Ecology (4.0 cr)

Electives

See your minor adviser for a list of these courses arranged by the following themes: environmental education and communication; environmental management and policy; and environmental and biological sciences. Students may but are not required to take all 10 credits in one thematic area.

NOTE: at least two courses MUST have an ESPM designator.

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

- [ESPM 2401](#) - Environmental Education/Interpretation (3.0 cr)
- [ESPM 3002](#) - Colloquium: Exotic Plants and Animals (1.0 cr)
- [ESPM 3011W](#) - Ethics in Natural Resources [WI] (3.0 cr)
- [ESPM 3101](#) - Conservation of Plant Biodiversity (3.0 cr)
- [ESPM 3108](#) - Ecology of Managed Systems [ENV] (3.0 cr)
- [ESPM 3202W](#) - Environmental Conflict Management, Leadership, and Planning [WI] (3.0 cr)
- [ESPM 3211](#) - Survey, Measurement, and Modeling for Environmental Analysis (3.0 cr)
- [ESPM 3221](#) - Soil Conservation and Land-Use Management (3.0 cr)
- [ESPM 3241W](#) - Natural Resource and Environmental Policy [SOCS, CIV, WI] (3.0 cr)
- [ESPM 3245](#) - Sustainable Land Use Planning and Policy [ENV] (3.0 cr)
- [ESPM 3261](#) - Economics and Natural Resources Management [SOCS, ENV] (4.0 cr)
- [ESPM 3271](#) - Environmental Policy, Law, and Human Behavior [CIV, SOCS] (3.0 cr)
- [ESPM 3575](#) - Wetlands Conservation (3.0 cr)
- [ESPM 3601](#) - Sustainable Housing--Community, Environment, and Technology [TS] (3.0 cr)
- [ESPM 3602](#) - Regulations and Corporate Environmental Management (3.0 cr)
- [ESPM 3603](#) - Environmental Life Cycle Analysis (3.0 cr)
- [ESPM 3604](#) - Environmental Management Systems and Strategy (3.0 cr)
- [ESPM 3605](#) - Recycling: Extending Raw Materials [TS] (3.0 cr)
- [ESPM 3606W](#) - Pollution Prevention: Principles, Technologies, and Practices [WI] (3.0 cr)
- [ESPM 3612W](#) - Soil and Environmental Biology [WI] (3.0 cr)
- [ESPM 4061W](#) - Water Quality and Natural Resources [WI] (3.0 cr)
- [ESPM 4216](#) - Contaminant Hydrology (2.0 cr)
- [ESPM 4256](#) - Natural Resource Law and the Management of Public Lands and Waters (3.0 cr)
- [ESPM 4295W](#) - GIS in Environmental Science and Management [WI] (4.0 cr)
- [ESPM 4601](#) - Soils and Pollution (3.0 cr)
- [ESPM 4607](#) - Industrial Biotechnology and the Environment (3.0 cr)



- [ESPM 4608](#) - Bioremediation (3.0 cr)
- [ESPM 4811](#) - Environmental Interpretation (3.0 cr)
- [ESPM 5601](#) - Principles of Waste Management (3.0 cr)
- [BBE 2201](#) - Renewable Energy and the Environment [TS] (3.0 cr)
- [CI 5537](#) - Principles of Environmental Education (3.0 cr)
- [CI 5747](#) - Global and Environmental Education: Content and Practice (3.0 cr)
- [EEB 3603](#) - Science, Protection, and Management of Aquatic Environments (3.0 cr)
- [EEB 4609W](#) - Ecosystem Ecology [ENV, WI] (3.0 cr)
- [EEB 4611](#) - Biogeochemical Processes (3.0 cr)
- [ENT 3925](#) - Insects, Aquatic Habitats, and Pollution (3.0 cr)
- [ENT 5241](#) - Ecological Risk Assessment (3.0 cr)
- [FR 1101](#) - Dendrology: Identifying Forest Trees and Shrubs (3.0 cr)
- [FR 3114](#) - Hydrology and Watershed Management (3.0 cr)
- [FR 3131](#) - Geographical Information Systems (GIS) for Natural Resources [TS] (4.0 cr)
- [FR 3203](#) - Forest Fire and Disturbance Ecology (3.0 cr)
- [FR 3204](#) - Landscape Ecology and Management (3.0 cr)
- [FR 3218](#) - Measuring and Modeling Forests (3.0 cr)
- [FR 3411](#) - Managing Forest Ecosystems: Silviculture (3.0 cr)
- [FR 5146](#) - Science and Policy of Global Environmental Change (3.0 cr)
- [FW 4102](#) - Principles of Conservation Biology [ENV] (3.0 cr)
- [FW 5411](#) ~~{Inactive}~~(3.0 cr)
- [FW 5604W](#) - Fisheries Ecology and Management [WI] (3.0 cr)
- [HSCI 3244](#) - History of Ecology and Environmentalism [HIS, ENV] (3.0 cr)
- [PBIO 4321](#) - Minnesota Flora (3.0 cr)
- [PBIO 4511](#) - Flowering Plant Diversity (3.0 cr)
- [PHIL 3301](#) - Environmental Ethics [ENV] (4.0 cr)
- [REC 5301](#) - Wilderness and Adventure Education (4.0 cr)
- [SOIL 5555](#) - Wetland Soils (3.0 cr)
- [SUST 3003](#) - Sustainable People, Sustainable Planet [ENV] (3.0 cr)



Twin Cities Campus

Fisheries and Wildlife Minor

Fisheries, Wildlife, and Conservation Biology

College of Food, Agricultural and Natural Resource Sciences

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 16 to 18

The fisheries and wildlife minor enables students in programs such as biology, communications, education, forestry, natural resources, environmental studies, and others to develop an understanding of the principles and practices of fisheries, wildlife, and conservation biology. An overview is provided of fish and wildlife biology and the general principles applied to managing their populations and habitats. Students interested in the minor should contact the CFANS Student Services Office.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Ecology

- [BIOL 3407](#) - Ecology (3.0 cr)
- or [BIOL 3408W](#) - Ecology [WI] (3.0 cr)
- or [FR 3104](#) - Forest Ecology (4.0 cr)
- or Or any other ecology course

Principles of Fisheries, Wildlife and Conservation Biology

- Take 1 or more course(s) totaling 3 or more credits(s) from the following:
- [FW 2001](#) - Introduction to Fisheries, Wildlife, and Conservation Biology (3.0 cr)
 - [FW 2003](#) - Introduction to Marine Biology (3.0 cr)
 - [FW 4102](#) - Principles of Conservation Biology [ENV] (3.0 cr)
 - [FW 4103](#) - Principles of Wildlife Management (3.0 cr)

Human Dimensions

- Take 1 or more course(s) totaling 3 or more credits(s) from the following:
- [SUST 3003](#) - Sustainable People, Sustainable Planet [ENV] (3.0 cr)
 - [ESPM 3011W](#) - Ethics in Natural Resources [WI] (3.0 cr)
 - [ESPM 3202W](#) - Environmental Conflict Management, Leadership, and Planning [WI] (3.0 cr)
 - [ESPM 3241W](#) - Natural Resource and Environmental Policy [SOCS, CIV, WI] (3.0 cr)
 - [ESPM 3245](#) - Sustainable Land Use Planning and Policy [ENV] (3.0 cr)
 - [ESPM 3271](#) - Environmental Policy, Law, and Human Behavior [CIV, SOCS] (3.0 cr)

Taxonomy

- Take 1 or more course(s) totaling 4 or more credits(s) from the following:
- [FW 4101](#) - Herpetology (4.0 cr)
 - [EEB 4129](#) - Mammalogy (4.0 cr)
 - [EEB 4134](#) - Introduction to Ornithology (4.0 cr)
 - [FW 4136](#) - Ichthyology (4.0 cr)

Advanced FW

- Take 1 or more course(s) totaling 3 or more credits(s) from the following:
- [FW 4108](#) - Field Methods in Research and Conservation of Vertebrate Populations (3.0 cr)
 - [FW 5051](#) - Analysis of Populations (4.0 cr)
 - [FW 5601](#) - Fisheries Population Analysis (3.0 cr)
 - [FW 5603W](#) - Habitats and Regulation of Wildlife [WI] (3.0 cr)
 - [FW 5604W](#) - Fisheries Ecology and Management [WI] (3.0 cr)



Twin Cities Campus

Food Science Minor

Food Science & Nutrition

College of Food, Agricultural and Natural Resource Sciences

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 20 to 28

See major description for more information.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Many courses in the minor have prerequisites that do not count towards the 20 credits.

Minor Courses

Take 20 or more credits(s) from the following:

- [BBE 4744](#) - Engineering Principles for Biological Scientists (4.0 cr)
- [FSCN 1102](#) - Food: Safety, Risks, and Technology [CIV] (3.0 cr)
- [FSCN 3102](#) - Introduction to Food Science (3.0 cr)
- [FSCN 4112](#) - Food Chemistry and Functional Foods (3.0 cr)
- [FSCN 4121](#) - Food Microbiology (3.0 cr)
- [FSCN 4122](#) - Food Fermentations and Biotechnology (2.0 cr)
- [FSCN 4131](#) - Food Quality (3.0 cr)
- [FSCN 4312W](#) - Food Analysis [WI] (4.0 cr)
- [FSCN 4332](#) - Food Processing Operations (3.0 cr)
- [FSCN 4349](#) - Food Science Capstone (2.0 cr)



Twin Cities Campus

Forest Resources Minor

Forest Resources

College of Food, Agricultural and Natural Resource Sciences

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 18
- This program requires summer terms.

The forest resources minor helps students in natural resources and other areas gain deeper understanding of the scientific foundations of forestry, the management of forest resources, and the importance of forest resources to society. Students select from an array of courses in forest assessment, forest biology and management, and forest economics and policy. Students may include a three-week, hands-on field session at the Cloquet Forestry Center as part of their minor. Students interested in the minor should contact the CFANS Student Services Office.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

The sequence of courses in the Cloquet Forestry Center may be used either to meet the minor courses requirement or as an elective, but they cannot be used to satisfy both requirements.

Minor Courses

[FR 3104](#) - Forest Ecology (4.0 cr)

[FR 3411](#) - Managing Forest Ecosystems: Silviculture (3.0 cr)

Take one of the following field experiences.

[FR 1101](#) - Dendrology: Identifying Forest Trees and Shrubs (3.0 cr)

or Cloquet Forestry Session

[FR 2101](#) - Identifying Forest Plants (1.0 cr)

with [FR 2102](#) - Northern Forests: Field Ecology (2.0 cr)

with [FR 2104](#) - Measuring Forest Resources (1.0 cr)

Electives

Take 8 or more credits(s) from the following:

•Forest Policy, Management, and Planning

•If student takes the Cloquet Forestry Session, only 7 credits are required.

•Take 3 or more credits(s) from the following:

•[ESPM 3241W](#) - Natural Resource and Environmental Policy [SOCS, CIV, WI] (3.0 cr)

•[ESPM 3261](#) - Economics and Natural Resources Management [SOCS, ENV] (4.0 cr)

•[FR 3471](#) - Forest Planning and Management (3.0 cr)

•[FR 4501](#) - Urban Forest Management: Managing Greenspaces for People (3.0 cr)

•[RRM 4232W](#) - Managing Recreational Lands [WI] (4.0 cr)

•Resource Assessment

•Take 0 or more credits(s) from the following:

•[FR 3131](#) - Geographical Information Systems (GIS) for Natural Resources [TS] (4.0 cr)

•[FR 3218](#) - Measuring and Modeling Forests (3.0 cr)

•[FR 3262](#) - Remote Sensing of Natural Resources and Environment (3.0 cr)

•Management of Vegetation, Wildlife, Water and Soil Resources

•Take 0 or more credits(s) from the following:

•[ESPM 3703](#) - Agroforestry in Watershed Management (3.0 cr)

•[ENT 4251](#) - Forest and Shade Tree Entomology (3.0 cr)

•[FR 3501](#) - Arboriculture: Selection and Maintenance of Trees (3.0 cr)

•[FR 3114](#) - Hydrology and Watershed Management (3.0 cr)

•[FR 3431](#) - Timber Harvesting and Road Planning (2.0 cr)

•[FR 5413](#) - Managing Forest Ecosystems: Silviculture Lab (1.0 cr)

•[PLPA 3003](#) - Diseases of Forest and Shade Trees (3.0 cr)

•Cloquet Forestry Session

•[FR 2101](#) - Identifying Forest Plants (1.0 cr)

with [FR 2102](#) - Northern Forests: Field Ecology (2.0 cr)



with [FR 2104](#) - Measuring Forest Resources (1.0 cr)



Twin Cities Campus

Horticulture Minor

Horticultural Science

College of Food, Agricultural and Natural Resource Sciences

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 18
- --

Plants provide many practical and recreational benefits to society--whether it is the food we eat, the parks we play in, or the gardens we enjoy admiring. The horticulture minor is geared toward students who want to learn more about plants and their many, diverse uses in the landscape. Coursework is flexible and can easily be tailored to specific horticultural interests, including floriculture and nursery production, turfgrass science, landscape design and maintenance, fruit and vegetable production, sustainable and organic production practices, therapeutic horticulture, plant physiology, and genetics. Students wishing to complete a minor in horticulture should contact the Department of Horticultural Science, 305 Alderman Hall for assistance.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Minor Course

[HORT 1001](#) - Plant Propagation [BIOL] (4.0 cr)

Electives

At least 14 credits (6 credits must be taken at UMTC) from courses with a HORT designator, of which one horticulture related elective course may be substituted (such as SOILS, ENT, PLPA, and BIOL). At least two HORT courses must be at the 4XXX or 5XXX level. A maximum of 3 credits of HORT 3090--Directed Studies may be applied.



Twin Cities Campus

Nutrition Minor

Food Science & Nutrition

College of Food, Agricultural and Natural Resource Sciences

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 14 to 16

The nutrition minor gives students a basic understanding of human nutritional needs through three required core courses. Based on the elective courses chosen, students then have the ability to focus in a specific area, such as metabolism or foods.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Some of the courses listed in the minor have prerequisites that do not count toward the 14-16 credits.

Minor Courses

[FSCN 1112](#) - Principles of Nutrition (3.0 cr)

[FSCN 3612](#) - Life Cycle Nutrition (3.0 cr)

[FSCN 4612](#) - Advanced Human Nutrition (4.0 cr)

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

- [FSCN 3614](#) - Nutrition Education and Counseling (3.0 cr)
- [FSCN 3615](#) - Sociocultural Aspects of Food, Nutrition, and Health [GP] (3.0 cr)
- [FSCN 4613](#) - Experimental Nutrition (2.0 cr)
- [FSCN 4614](#) - Community Nutrition [SOCS, DSJ] (3.0 cr)
- [FSCN 4621W](#) - Nutrition and Metabolism [WI] (4.0 cr)
- [FSCN 1102](#) - Food: Safety, Risks, and Technology [CIV] (3.0 cr)
- [FSCN 3102](#) - Introduction to Food Science (3.0 cr)
- [FSCN 5601](#) - Management of Eating Disorders (3.0 cr)



Twin Cities Campus

Recreation Resource Management Minor

Forest Resources

College of Food, Agricultural and Natural Resource Sciences

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 19 to 20

Students may pursue a recreation resource management (RRM) minor in either one of three tracks: resource based tourism (RBT), standard RRM, or international tourism (IT). Students must complete the minor core courses and then choose either the RBT track or the RRM track or the IT track.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Minor Courses

- [ESPM 3245](#) - Sustainable Land Use Planning and Policy [ENV] (3.0 cr)
- [RRM 4232W](#) - Managing Recreational Lands [WI] (4.0 cr)
- [RRM 5259](#) - Visitor Behavior Analysis (3.0 cr)

Recreation Resource Management Options

Recreation Resource Management

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

- [ESPM 3202W](#) - Environmental Conflict Management, Leadership, and Planning [WI] (3.0 cr)
- [ESPM 3241W](#) - Natural Resource and Environmental Policy [SOCS, CIV, WI] (3.0 cr)
- [FR 3104](#) - Forest Ecology (4.0 cr)
- [ESPM 4811](#) - Environmental Interpretation (3.0 cr)
or [REC 5311](#) - Programming Outdoor and Environmental Education (3.0 cr)

-OR-

Resource Based Tourism

- [REC 5191](#) - Adventure Recreation, Tourism, and Eco-Tourism (3.0 cr)
- [RRM 3101](#) - Park and Protected Area Tourism (3.0 cr)
- [RRM 3201](#) - Introduction to Travel and Tourism (3.0 cr)

-OR-

International Tourism Option A/On Campus

- [RRM 3201](#) - Introduction to Travel and Tourism (3.0 cr)
- [RRM 3301](#) - International Tourism (3.0 cr)
- [CFAN 3500](#) - International Field Studies Seminar (1.0 - 3.0 cr)

-OR-

International Tourism Option B/Partner Institute

Nine credits international tourism coursework at partner institute selected in consultation with and approved by minor adviser.



Twin Cities Campus

African American and African Studies Minor

Afr American/African Studies

College of Liberal Arts

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 15

The African American and African Studies (AA&AS) minor integrates the global study of African peoples by teaching students the tools of inquiry from the liberal arts disciplines. The minor is designed to be flexible and to meet the needs of students preparing for careers in both the public and private spheres.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Students may earn a B.A. or a minor in African American and African studies, but not both.

Minor Courses

All courses must have the AFRO designator to count toward the minor.

Take 15 or more credits(s) from the following:

- AFRO 3xxx
- AFRO 4xxx
- AFRO 5xxx



Twin Cities Campus

American Indian Studies Minor

American Indian Studies

College of Liberal Arts

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 18

American Indian Studies is dedicated to advancing awareness and understanding of the histories and contemporary experiences of American Indian people. The program focuses on the native peoples of the United States and Canada, but also draws on the experiences of indigenous peoples from other parts of the world.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Students may earn a B.A. or a minor in American Indian studies, but not both.

Minor Courses

Foundation Course

- [AMIN 1001](#) - American Indian Peoples in the United States [DSJ] (3.0 cr)
- or [AMIN 1002](#) - Indigenous Peoples in Global Perspective [GP] (3.0 cr)
- or [AMIN 1003](#) - American Indians in Minnesota [HIS, DSJ] (3.0 cr)

Electives

Take 15 or more credits(s) from the following:

- AMIN 3xxx
- AMIN 4xxx
- AMIN 5xxx



Twin Cities Campus

American Studies Minor

American Studies

College of Liberal Arts

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 15

American studies is an interdisciplinary and comparative study of the United States as the outcome of migration, labor accumulation, land acquisition, cultural dissemination, the implantation of U.S. laws and policies, and identity formations around gender, sexuality, and race. As an interdisciplinary field, American studies brings the social sciences and humanities together.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Students may earn a B.A. or a minor in American studies, but not both.

Minor Courses

Take 15 or more credits(s) from the following:

- AMST 3xxx
- AMST 4xxx
- AMST 5xxx



Twin Cities Campus

Anthropology Minor

Anthropology

College of Liberal Arts

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 16

Anthropologists study human communities, near and far, past and present, and explore how seemingly unrelated aspects of a society are connected and how societies are linked to one another.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Students may earn a B.A. or a minor in Anthropology, but not both.

Preparatory Courses

[ANTH 1001](#) - Human Evolution [BIOL] (4.0 cr)

or [ANTH 1003W](#) - Understanding Cultures [SOCS, GP, WI] (4.0 cr)

or [ANTH 1005W](#) - Introduction to Cultural Diversity and the World System [SOCS, GP, WI] (4.0 cr)

Minor Courses

Take four 3-credit courses that have a common focus. Any ANTH 3xxx-5xxx course may count toward the minor, including special topics.

Take 4 or more course(s) totaling 12 or more credits(s) from the following:

- ANTH 3xxx
- ANTH 4xxx
- ANTH 5xxx



Twin Cities Campus

Art History Minor

Art History

College of Liberal Arts

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 14

Using a wide variety of methodological approaches, art history faculty help students develop an awareness and knowledge of the visual environments from all periods of history.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Take five courses to complete the minor: four ARTH 3xxx and one ARTH 5xxx. These must include courses from at least two of the three eras: Ancient to ca. 1300; ca. 1300 to 1800; and 1800 to present. Two of the required five courses must also be from different geographic or cultural areas: Europe/North America; South and/or East Asia; Middle East and/or Islamic World; and Latin America. Students are also encouraged to take courses from a variety of instructors to ensure exposure to various approaches and methods. Students may earn a B.A. or a minor in art history, but not both.

Minor Courses

No more than 3 credits of ARTH 3933/5993, ARTH 5994, or ARTH 3975 may count toward the minor. Some courses span across time periods and geographic/cultural areas. Consult the departmental adviser to determine which requirements these courses fulfill.

Take 5 or more course(s) from the following:

- **Era I: Ancient to ca. 1300**
 - Take 0 or more course(s) from the following:
 - **Area: North America and Europe**
 - Take 0 or more course(s) from the following:
 - [ARTH 3008](#) - History of Ancient Art (4.0 cr)
 - [ARTH 3009](#) - Medieval Art [AH] (3.0 cr)
 - [ARTH 3152](#) - Art and Archaeology of Ancient Greece [HIS] (3.0 cr)
 - [ARTH 3162](#) - Roman Art and Archaeology [HIS] (3.0 cr)
 - [ARTH 5108](#) - Greek Architecture (3.0 cr)
 - [ARTH 5112](#) - Archaic and Classical Greek Art (3.0 cr)
 - [ARTH 5172](#) - House, Villa, Tomb: Roman Art in the Private Sphere (3.0 cr)
 - **Area: Middle East and/or Islamic World**
 - Take 0 or more course(s) from the following:
 - [ARTH 3142](#) - Art of Egypt (4.0 cr)
 - **Area: South and/or East Asia**
 - Take 0 or more course(s) from the following:
 - [ARTH 5765](#) - Early Chinese Art (3.0 cr)
 - [ARTH 5775](#) - Formation of Indian Art: 2500 BCE to 300 CE (3.0 cr)
 - [ARTH 5776](#) - Redefining Tradition: Indian Art, 400 to 1300 (3.0 cr)
 - **Era II: ca. 1300 to 1800**
 - Take 0 or more course(s) from the following:
 - **Area: North America and Europe**
 - Take 0 or more course(s) from the following:
 - [ARTH 3309](#) - Renaissance Art in Europe [AH] (3.0 cr)
 - [ARTH 3311](#) - Baroque Art in Seventeenth Century Europe [AH] (3.0 cr)
 - [ARTH 3312](#) - European Art of the Eighteenth Century: Rococo to Revolution (3.0 cr)
 - [ARTH 3315](#) - The Age of Curiosity: Art and Knowledge in Europe, 1500-1800. [AH, TS] (3.0 cr)
 - [ARTH 3335](#) - Baroque Rome: Art and Politics in the Papal Capital [HIS] (3.0 cr)
 - [ARTH 5302](#) - Print Culture in Early Modern Europe (3.0 cr)
 - [ARTH 5324](#) - 15th-Century Painting (3.0 cr)
 - [ARTH 5335](#) - Baroque Rome: Art and Politics in the Papal Capital (3.0 cr)
 - **Era III: 1800 to Present**
 - Take 0 or more course(s) from the following:
 - **Area: North America and Europe**



- Take 0 or more course(s) from the following:
- [ARTH 3005](#) - American Art [AH] (4.0 cr)
- [ARTH 3012](#) - 19th and 20th Century Art (3.0 cr)
- [ARTH 3484](#) - The Art of Picasso and the Modern Movement (4.0 cr)
- [ARTH 5411](#) - Gender and Sexuality in Art Since 1863 (3.0 cr)
- [ARTH 5417](#) - Twentieth Century Theory and Criticism (3.0 cr)
- [ARTH 5454](#) - Design Reform in the Era of Art Nouveau (3.0 cr)
- [ARTH 5546](#) - American Architecture: 1840 to 1914 (3.0 cr)

•**Courses Spanning Across Time Periods and Areas: Consult with adviser.**

- Take 0 or more course(s) from the following:
- [ARTH 1001](#) - Introduction to Art History: Prehistoric to Contemporary [AH] (3.0 cr)
- [ARTH 1002W](#) - Why Art Matters [WI] (4.0 cr)
- [ARTH 1910W](#) - Topics: Freshman Seminar [WI] (3.0 cr)
- [ARTH 1921W](#) - Introduction to Film Study [AH, WI] (4.0 cr)
- [ARTH 3013](#) - Introduction to East Asian Art (3.0 cr)
- [ARTH 3014W](#) - Art of India [AH, GP, WI] (4.0 cr)
- [ARTH 3015W](#) - Art of Islam [AH, GP, WI] (4.0 cr)
- [ARTH 3017](#) - Islamic Culture [AH, GP] (4.0 cr)
- [ARTH 3035](#) - Classical Myth in Western Art (4.0 cr)
- [ARTH 3401](#) - Art Now [AH, CIV] (3.0 cr)
- [ARTH 3422](#) - Off the Wall: History of Graphic Arts in Europe and America in the Modern Age (4.0 cr)
- [ARTH 3464](#) - Art Since 1945 [HIS] (4.0 cr)
- [ARTH 3921W](#) - Art of the Film [AH, WI] (4.0 cr)
- [ARTH 3930](#) - Junior-Senior Seminar (3.0 cr)
- [ARTH 3940](#) - Topics in Art History (1.0 - 4.0 cr)
- [ARTH 3971W](#) - Major Project [WI] (1.0 cr)
- [ARTH 3975](#) - Directed Museum Experience (1.0 - 2.0 cr)
- [ARTH 3993](#) - Directed Study (1.0 - 4.0 cr)
- [ARTH 5301](#) - Visual Culture of the Atlantic World (3.0 cr)
- [ARTH 5325](#) - Art of the Aztec Empire (3.0 cr)
- [ARTH 5413](#) - Alternative Media: Video, Performance, Digital Art (3.0 cr)
- [ARTH 5422](#) - Off the Wall: History of Graphic Arts in Europe and America in the Modern Age (4.0 cr)
- [ARTH 5466](#) - Contemporary Art (3.0 cr)
- [ARTH 5766](#) - Chinese Painting (3.0 cr)
- [ARTH 5777](#) - The Diversity of Traditions: Indian Art 1200 to Present (3.0 cr)
- [ARTH 5781](#) - Age of Empire: The Mughals, Safavids, and Ottomans (3.0 cr)
- [ARTH 5785](#) - Art of Islamic Iran (3.0 cr)
- [ARTH 5940](#) - Topics: Art of the Film (3.0 cr)
- [ARTH 5950](#) - Topics: Art History (3.0 cr)
- [ARTH 5993](#) - Directed Study (1.0 - 4.0 cr)



Twin Cities Campus

Art Minor

Art

College of Liberal Arts

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 20 to 24

The minor introduces students to the creative process and visual thinking required in art.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Note: ARTS 2xxx courses are equivalent to ARTS 1xxx courses. ARTS 2xxx are recommended for those intending to major or minor in Art, or those who have already declared a major or minor in Art. Students may earn no more than one undergraduate degree in the Department of Art: a B.A. or a B.F.A. or a minor.

Concepts in Visual Arts

[ARTS 1001](#) - Concepts in Visual Art (4.0 cr)

Core Courses

Note: ARTS 2xxx are recommended for already-declared majors or minors, or those intending to major or minor.

Take 1 or more course(s) from the following:

- [ARTS 1101](#) - Drawing [AH] (4.0 cr)
- [ARTS 2101](#) - Drawing [AH] (4.0 cr)
- [ARTS 1301](#) - Sculpture [AH] (4.0 cr)
- [ARTS 2301](#) - Sculpture [AH] (4.0 cr)
- [ARTS 1501](#) - Printmaking: Intaglio and Lithography [AH] (4.0 cr)
- [ARTS 2501](#) - Printmaking: Intaglio and Lithography [AH] (4.0 cr)
- [ARTS 1502](#) - Printmaking: Relief, Screen, and Digital Processes [AH] (4.0 cr)
- [ARTS 2502](#) - Printmaking: Relief, Screen, Digital Processes [AH] (4.0 cr)
- [ARTS 1601](#) - Experimental and Media Arts [AH] (4.0 cr)
- [ARTS 2601](#) - Experimental and Media Arts [AH] (4.0 cr)
- [ARTS 1701](#) - Photography [AH] (4.0 cr)
- [ARTS 2701](#) - Photography [AH] (4.0 cr)
- [ARTS 1703](#) - Digital Photography [AH] (4.0 cr)
- [ARTS 2702](#) - Digital Photography [AH] (4.0 cr)
- [ARTS 1801](#) - Ceramics [AH] (4.0 cr)
- [ARTS 2801](#) - Ceramics [AH] (4.0 cr)

Art History

Take 1 or more course(s) from the following:

- [ARTH 3xxx](#)
- [ARTH 4xxx](#)
- [ARTH 5xxx](#)

Electives

Up to one ARTS 1xxx or 2xxx may count.

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

- [ARTS 1xxx](#)
- [ARTS 2xxx](#)
- [ARTS 3xxx](#)
- [ARTS 5xxx](#)



Twin Cities Campus

Asian Languages and Literatures Minor

Asian Languages and Literatures

College of Liberal Arts

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 16 to 22

Asia is an increasingly important part of world politics, economics, and culture. The minor prepares students to interact with the people and cultures of Asia.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Students are required to take 2 semester(s) of Chinese, or Hindi/Urdu, or Japanese, or Korean, or Hmong.

Note: Students must elect a sub-plan based on their language of concentration. Each sub-plan requires a minimum of two courses of the same language at the intermediate level (second year) or above. Students with advanced or native language ability may substitute ALL 3xxx-5xxx literature/culture courses in lieu of the minor language requirement; see departmental adviser for final consent. An overall GPA of 2.00 must be maintained across all minor coursework, and all courses must be taken A-F.

Students may earn a B.A. or a minor in Asian languages and literatures, but not both.

Asian Languages and Literatures (ALL) Courses

Transfer or study abroad credits may NOT be used to fulfill this sub-requirement.

Take 2 or more course(s) totaling 6 or more credits(s) from the following:

- ALL 3xxx
- ALL 4xxx
- ALL 5xxx

Other Minor Courses

Eligible courses that fulfill the 'Other Minor Courses' sub-requirement include ALL 3xxx-5xxx, non-ALL, Asian language at the 3xxx-level or above in the chosen sub-plan, transfer, or study abroad courses related to the minor. See departmental adviser or DUS for final approval. Note: 1xxx-level courses may NOT be counted toward the minor.

Take 1 or more course(s) totaling 3 or more credits(s) from the following:

- ALL 3xxx
- ALL 5xxx

Program Sub-plans

Students are required to complete one of the following sub-plans. (Note for the Twin Cities and Morris campuses: The honors sub-plan does not meet this requirement. Honors students are required to complete one sub-plan plus the honors sub-plan. Please see an adviser if no honors sub-plan is listed for the program.)

Chinese

Chinese Language

Take a minimum of 2 courses (7 credits) of Chinese at the intermediate level or above. These courses must be taken in residence at the University of Minnesota, Twin Cities, campus.

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

- [CHN 1016](#) - Accelerated Intermediate Modern Chinese (5.0 cr)
- [CHN 3021](#) - Intermediate Modern Chinese (5.0 cr)
- [CHN 3022](#) - Intermediate Modern Chinese (5.0 cr)
- [CHN 3031](#) - Advanced Modern Chinese (4.0 cr)
- [CHN 3032](#) - Advanced Modern Chinese (4.0 cr)
- [CHN 4041](#) - Advanced Readings in Modern Chinese (4.0 cr)



- CHN 4042 - Advanced Readings in Modern Chinese (4.0 cr)
- CHN 5040 - Readings in Chinese Texts (3.0 cr)

Japanese

Japanese Language

Take a minimum of 2 courses (7 credits) of Japanese at the intermediate level or above. These courses must be taken in residence at the University of Minnesota, Twin Cities, campus.

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

- JPN 3021 - Intermediate Japanese (5.0 cr)
- JPN 3022 - Intermediate Japanese (5.0 cr)
- JPN 3031 - Third-Year Japanese (4.0 cr)
- JPN 3032 - Third Year Japanese (4.0 cr)
- JPN 4041 - Advanced Japanese Conversation and Composition (4.0 cr)
- JPN 4042 - Advanced Japanese Conversation and Composition (4.0 cr)
- JPN 5040 - Readings in Japanese Texts (3.0 cr)

Korean

Korean Language

Take a minimum of 2 courses (7 credits) of Korean at the intermediate level or above. These courses must be taken in residence at the University of Minnesota, Twin Cities, campus.

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

- KOR 3021 - Intermediate Korean (5.0 cr)
- KOR 3022 - Intermediate Korean (5.0 cr)
- KOR 3031 - Third Year Korean (4.0 cr)
- KOR 3032 - Third Year Korean (4.0 cr)
- KOR 4041 - Advanced Readings in Modern Korean (4.0 cr)
- KOR 4042 - Advanced Readings in Modern Korean (4.0 cr)
- KOR 5140 - Readings in Sino-Korean Texts (3.0 cr)

Hindi-Urdu

Hindi & Urdu Languages

Take a minimum of 2 courses (7 credits) of Hindi-Urdu at the intermediate level or above. These courses must be taken in residence at the University of Minnesota, Twin Cities, campus.

- HNUR 3101 - Intermediate Hindi and Urdu (5.0 cr)
- HNUR 3102 - Intermediate Hindi and Urdu (5.0 cr)
- HNUR 3131 - Advanced Hindi and Urdu (4.0 cr)
- HNDI 4162 - Advanced Hindi (4.0 cr)
- HNDI 5040 - Readings in Hindi/Urdu Texts (3.0 cr)

Hmong

Hmong Language

Take a minimum of 7 courses (7 credits) of Hmong at the intermediate level or above. These courses must be taken in residence at the University of Minnesota, Twin Cities, campus. Note: In order to fulfill this sub-requirement, HMNG 5040 must be taken for at least 3 credits.

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

- HMNG 1016 - Accelerated Intermediate Hmong (5.0 cr)
- HMNG 3021 - Intermediate Hmong (5.0 cr)
- HMNG 3022 - Intermediate Hmong (5.0 cr)
- HMNG 3031 - Advanced Hmong (4.0 cr)
- HMNG 3032 - Advanced Hmong (4.0 cr)
- HMNG 5040 - Readings in Hmong Texts (2.0 - 4.0 cr)



Twin Cities Campus

Astrophysics Minor

Astrophysics, Minnesota Institute for

College of Liberal Arts

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 24

Students in the minor learn the physical principles underlying study of the solar system, stars, galaxy, and universe, as well as the methodology behind observations and conclusions.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Students may complete no more than one degree in the Astrophysics program: a B.A. or a B.S. or a minor.

Math

- [MATH 1271](#) - Calculus I [MATH] (4.0 cr)
or [MATH 1371](#) - CSE Calculus I [MATH] (4.0 cr)
or [MATH 1571H](#) - Honors Calculus I [MATH] (4.0 cr)
- [MATH 1272](#) - Calculus II (4.0 cr)
or [MATH 1372](#) - CSE Calculus II (4.0 cr)
or [MATH 1572H](#) - Honors Calculus II (4.0 cr)

Physics

- [PHYS 1301W](#) - Introductory Physics for Science and Engineering I [PHYS, WI] (4.0 cr)
or [PHYS 1401V](#) - Honors Physics I [PHYS, WI] (4.0 cr)
- [PHYS 1302W](#) - Introductory Physics for Science and Engineering II [PHYS, WI] (4.0 cr)
or [PHYS 1402V](#) - Honors Physics II [PHYS, WI] (4.0 cr)
- [PHYS 2303](#) - Physics III: Physics of Matter (4.0 cr)
or [PHYS 2503](#) - Physics III: Intro to Waves, Optics, and Special Relativity (4.0 cr)
or [PHYS 2403H](#) - Honors Physics III (4.0 cr)

Minor Courses

Students are strongly encouraged to take either AST 1001 or AST 1011H, but neither of these courses is required for the minor.

- [AST 2001](#) - Introduction to Astrophysics (4.0 cr)



Twin Cities Campus

Chemistry Minor

Chemistry

College of Liberal Arts

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 15

Chemistry probes the fundamental concepts of nature and helps us understand the world around us. It deals with all substances at the molecular level: their composition, their properties, and how they are transformed into new substances. Chemistry is a central science of great importance to society. It provides a broad range of opportunities in many specialized fields, including biotechnology, polymer chemistry, environmental chemistry, materials chemistry, and medicine.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Credits from seminars or special topics courses may not be applied toward the minor. A maximum of two credits of directed study may be applied. At least five credits (two courses) must be completed at the University of Minnesota - Twin Cities campus.

Students may complete no more than one degree in the Chemistry program: a B.A. or a B.S. or a minor.

Minor Courses

[CHEM 2301](#) - Organic Chemistry I (3.0 cr)

[CHEM 2302](#) - Organic Chemistry II (3.0 cr)

[CHEM 2311](#) - Organic Lab (4.0 cr)

Take 5 or more credits(s) from the following:

- CHEM 2xxx
- CHEM 3xxx
- CHEM 4xxx
- CHEM 5xxx



Twin Cities Campus

Chicano-Latino Studies Minor

Chicano Studies

College of Liberal Arts

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 18
- This program requires summer terms.

The program focuses on the social, historical, and cultural experience of the Mexican and Latino populations in the United States. Courses in the curriculum examine the culture, literature, and history of Chicana/os and Latina/os in the United States.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Students may earn a B.A. or a minor in Chicano-Latino studies, but not both.

Minor Requirements

Take 18 or more credits(s) from the following:

- CHIC 3xxx
- CHIC 4xxx
- CHIC 5xxx



Twin Cities Campus

Child Psychology Minor

College of Liberal Arts - Adm

College of Liberal Arts

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 20 to 21

Child psychology deals with behavioral development from the prenatal period to maturity in the areas of cognition, ethology, genetics, language, learning, perception, and social behavior.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Students may earn no more than one undergraduate degree in child psychology: a B.A. or a B.S. or a minor. Students may combine the child psychology minor with the B.A. or the B.S. in psychology, but not both.

Foundational Course

[CPSY 3308W](#) - Introduction to Research Methods in Child Psychology [WI] (4.0 cr)

Core Courses

Take 4 courses for 12-13 credits.

[CPSY 4331](#) - Social and Personality Development (3.0 cr)

[CPSY 4343](#) - Cognitive Development (3.0 cr)

Take 1 or more course(s) from the following:

- [CPSY 4303](#) - Adolescent Psychology (3.0 cr)
- [CPSY 4311](#) - Behavioral and Emotional Problems of Children (3.0 cr)
- [CPSY 4313](#) - Disabilities and Development (3.0 cr)
- [CPSY 4334W](#) - Children, Youth in Society [WI] (3.0 cr)
- [CPSY 4336W](#) - Development and Interpersonal Relations [WI] (4.0 cr)

Take 1 or more course(s) from the following:

- [CPSY 4302](#) - Infant Development (3.0 cr)
- [CPSY 4329](#) - Biological Foundations of Development (3.0 cr)
- [CPSY 4341](#) - Perceptual Development (3.0 cr)
- [CPSY 4345](#) - Language Development and Communication (3.0 cr)



Twin Cities Campus

Classical and Near Eastern Archaeology Minor

Classical & Near Eastern Studies

College of Liberal Arts

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 16
- This program requires summer terms.

The minor allows students to concentrate their studies on the material remains from the ancient civilizations of Greece, Rome, Egypt, and Biblical lands from ca. 3000 B.C.E through 650 C.E. The minor includes courses from the Departments of Classical and Near Eastern Studies, Anthropology, Art History, Geography, Geology, and History.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Preparatory Courses

- [CNES 1043](#) - Introduction to Greek and Roman Archaeology (4.0 cr)
- or [CNES 3008](#) - History of Ancient Art (4.0 cr)

Minor Courses

Take at least four courses, with one course each from groups 1-3. The remaining course may be selected from those in groups 1-3 not used to fulfill the three-course requirement, selected courses in anthropology or history, or any 3xxx-5xxx course in CNES or RELA. Course selections are subject to the approval of the director of undergraduate studies.

Take 4 or more course(s) totaling 12 or more credits(s) from the following:

- Take 3 or more course(s) including 3 or more sub-requirements(s) from the following:

- **Group 1 - The Classical World**

- Take 1 or more course(s) from the following:
 - [CNES 5108](#) - Greek Architecture (3.0 cr)
 - [CNES 5172](#) - House, Villa, Tomb: Roman Art in the Private Sphere (3.0 cr)

- **Group 2 - The Near East**

- Take 1 or more course(s) from the following:
 - [CNES 3142](#) - Art of Egypt (4.0 cr)
 - [CNES 3172](#) - Archaeology of Israel (3.0 cr)

- **Group 3 - Field/Lab Work**

- Take 1 or more course(s) from the following:
 - ANTH 4069 *{Inactive}*(3.0 cr)

- **Electives**

- Take 0 - 1 course(s) from the following:
 - [ANTH 3009](#) - Rise of Civilization [HIS] (3.0 cr)
 - [ANTH 3027W](#) - Archaeology of Prehistoric Europe [HIS, WI] (3.0 cr)
 - [ANTH 3028](#) - Introduction to Historical Archaeology (3.0 cr)
 - ANTH 4069 *{Inactive}*(3.0 cr)
 - [ANTH 5027W](#) - Origins of European Civilization [HIS, WI] (3.0 cr)
 - CNES 3xxx
 - CNES 4xxx
 - CNES 5xxx
 - RELA 3xxx
 - RELA 4xxx
 - RELA 5xxx



Twin Cities Campus

Classical Civilization Minor

Classical & Near Eastern Studies

College of Liberal Arts

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 20 to 22
- This program requires summer terms.

This interdisciplinary program encompasses the study of Greek and Roman cultures and their influence on Western civilization, and it encourages study of related or parallel cultures, such as those of Islam and the Indian subcontinent.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Students are required to take 2 semester(s) of Greek or Latin.

Students may earn a B.A. or a minor in classical civilization, but not both.

Language Study

Complete at least one year (or equivalent) of Greek or Latin.

Greek

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

- [GRK 1001](#) - Beginning Classical Greek I (5.0 cr)
- [GRK 1002](#) - Beginning Classical Greek II (5.0 cr)
- [GRK 3003](#) - Intermediate Greek Prose (4.0 cr)
- [GRK 3004](#) - Intermediate Greek Poetry: Homer (4.0 cr)

or Latin

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

- [LAT 1001](#) - Beginning Latin I (5.0 cr)
- [LAT 1002](#) - Beginning Latin II (5.0 cr)
- [LAT 3003](#) - Intermediate Latin Prose (4.0 cr)
- [LAT 3004](#) - Intermediate Latin Poetry: Vergil (4.0 cr)

Minor Courses

Take a total of twelve credits.

One classical language and literature course, chosen with the guidance of a faculty adviser.

One course in classical art history, archaeology, architecture or history chosen with the guidance of a faculty adviser.

One course in classical thought and religion, chosen with the guidance of a faculty adviser.

One course in classical traditions, chosen with the guidance of a faculty adviser.



Twin Cities Campus

Communication Studies Minor

Communication Studies

College of Liberal Arts

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 18

Courses examine human communication, using humanistic and social scientific methods. Fields of study include speechmaking, rhetorical criticism, ethics, and interpersonal, small group, organizational, intercultural, and electronic (broadcasting, cable, satellite, Internet) forms of communication. Students intending to declare a minor must meet with a communication studies adviser in 274 Ford Hall.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Students may earn a B.A. or a minor in communication studies, but not both.

Minor Courses

[COMM 1101](#) - Introduction to Public Speaking [CIV] (3.0 cr)

or [COMM 1313W](#) - Analysis of Argument [WI] (3.0 cr)

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

- [COMM 3211](#) - Introduction to U.S. Electronic Media (3.0 cr)
- [COMM 3401](#) - Introduction to Communication Theory (3.0 cr)
- [COMM 3601](#) - Introduction to Rhetorical Theory [C/PE] (3.0 cr)

Electives

Take 9 or more credits(s) from the following:

- Take no more than 2 course(s) from the following:

- [COMM 3xxx](#)
- Take 1 or more course(s) from the following:
 - [COMM 4xxx](#)
 - [COMM 5xxx](#)



Twin Cities Campus

Computer Science Minor

College of Liberal Arts - Adm

College of Liberal Arts

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 15 to 20

Computer science concerns the study of the hardware, software, and theoretical aspects of high-speed computing devices and the application of these devices to a broad spectrum of scientific, technological, and business problems.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

All minor coursework must be taken A-F. The cumulative GPA for all university CSCI courses must be at least 2.00; this includes CSCI courses not used for the minor. Only computer science courses listed for the major are acceptable to count toward the minor. Students may earn no more than one undergraduate degree in computer science: a B.A. or a B.S. or a minor.

Minor Courses

Take at least five three- or four-credit approved computer science courses. At least three courses must carry the CSCI designator and must be taken at the University of Minnesota - Twin Cities campus. At least one course must be at the 5xxx-level.



Twin Cities Campus

Cultural Studies and Comparative Literature Minor

Cultural Studies & Comparative Literature

College of Liberal Arts

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 18

Courses in the Department of Cultural Studies and Comparative Literature (CSCL) pursue questions and ways of knowing that cross traditional disciplinary boundaries. Students study culture as a set of complex connections and interrelations: between texts and everyday life, ideas and the material world, and discourse and power.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Students may earn a B.A. or a minor in cultural studies and comparative literature, but not both.

Preparatory Courses

[CSCL 1001](#) - Introduction to Cultural Studies: Rhetoric, Power, Desire [AH, DSJ] (4.0 cr)

or [CSCL 1101](#) - Literature [LITR] (4.0 cr)

or [CSCL 1201](#) - Introduction to Cinema and Media Culture [AH] (4.0 cr)

or [CSCL 1301W](#) - Reading Culture: Theory and Practice [AH, WI] (4.0 cr)

or [CSCL 1401W](#) - Reading Literature: Theory and Practice [LITR, WI] (4.0 cr)

or [CSCL 1501W](#) - Reading History: Theory and Practice [HIS, WI] (4.0 cr)

or [CSCL 1921W](#) - Introduction to Film Study [AH, WI] (4.0 cr)

Minor Courses

Take 14 or more credits(s) from the following:

- CSCL 3xxx
- CSCL 4xxx
- CSCL 5xxx



Twin Cities Campus

Danish Minor

German, Scandinavian, & Dutch

College of Liberal Arts

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 16

The minor includes the study of the spoken language, literature, culture, and civilization.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Students are required to take 4 semester(s) of Danish.

The four required semesters of a second language do not factor into the overall length of credits in the minor.

The minor consists of a minimum of 16 credits in 3xxx, 4xxx, and 5xxx courses with no more than one course being directed or independent study. At least one course must be taken in the Scandinavian Program at the University of Minnesota - Twin Cities campus. The program must be approved by the director of undergraduate studies.

Minor Courses

[SCAN 3011W](#) - Readings in Scandinavian Languages [WI] (4.0 cr)

Take 4 or more course(s) totaling 12 or more credits(s) from the following:

- SCAN 3xxx
- SCAN 4xxx
- SCAN 5xxx



Twin Cities Campus

Designing Documents with New and Emerging Technologies Minor

Writing Studies

College of Liberal Arts

- **Students will no longer be accepted into this program after Fall 2007. Program requirements below are for current students only.**
- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 16

The minor focuses on designing effective communication products using both traditional and emerging technologies. Students learn to design written messages using computer technologies; visual messages using photography, digital imaging, and video; and online and Web messages using multimedia, World Wide Web technologies, and streaming audio and video. Message design components include audience analysis and rigorous evaluation of document usability. This minor differs from the technical communication minor by its focus on emerging technologies.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Minor Courses

- [WRIT 3671](#) - Visual Rhetoric and Document Design (3.0 cr)
- [WRIT 3672W](#) - Project Design and Development [WI] (3.0 cr)
- [WRIT 4662W](#) - Writing With Digital Technologies [WI] (4.0 cr)
- [WRIT 4501](#) - Usability and Human Factors in Technical Communication (3.0 cr)
- [WRIT 3257](#) - Scientific and Technical Presentations (3.0 cr)
or WRIT 3401 *{Inactive}*(3.0 cr)



Twin Cities Campus

Earth Sciences Minor

College of Liberal Arts - Adm

College of Liberal Arts

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 18

Earth science is the study of the composition, structure, and history of the Earth and of the processes that operate on and within it, with emphasis on the crust, oceans, and atmosphere.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Students may complete no more than one degree in the Earth Sciences program: a B.A. or a B.S. or a minor.

Minor Courses

[ESCI 1001](#) - Earth and Its Environments [PHYS, ENV] (4.0 cr)

Take 14 or more credits(s) from the following:

- ESCI 2xxx
- ESCI 3xxx
- ESCI 4xxx
- ESCI 5xxx



Twin Cities Campus

Economics Minor

Economics

College of Liberal Arts

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 17 to 35

Economics is a useful minor for students majoring in business, engineering, statistics, computer science, mathematics, and all of the social sciences. Minors are available in six subfields: general, economic theory, econometrics, international trade and development, applied microeconomics and monetary theory. All subfields are designed to complement study in other academic disciplines.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

The minor consists of 17-35 credits of upper-division coursework, dependent on the chosen subfield. This includes a minimum of 3 upper-division ECON courses and supporting work in mathematics and/or statistics, where applicable. At least 9 upper-division ECON credits must be taken in residency at the University of Minnesota - Twin Cities campus.

Students may receive no more than one undergraduate degree from the Department of Economics: a B.A. or a B.S. or a minor.

Program Sub-plans

Students are required to complete one of the following sub-plans. (Note for the Twin Cities and Morris campuses: The honors sub-plan does not meet this requirement. Honors students are required to complete one sub-plan plus the honors sub-plan. Please see an adviser if no honors sub-plan is listed for the program.)

General

Take a total of 17 credits. No substitutions are permitted. All minor coursework must be taken A-F. Only one country/area course may count toward the minor. Successful completion of the courses listed here constitutes satisfaction of the requirements for a minor in general economics.

General Requirements

Calculus

[MATH 1142](#) - Short Calculus [MATH] (4.0 cr)
or [MATH 1271](#) - Calculus I [MATH] (4.0 cr)

Microeconomics

[ECON 3101](#) - Intermediate Microeconomics (4.0 cr)

Electives

Take 3 or more course(s) totaling 9 or more credits(s) from the following:

- ECON 3xxx
- ECON 4xxx

Economic Theory

Take a total of 27-28 credits. No substitutions are permitted. All minor coursework must be taken A-F. Only one country/area course may count toward the minor. Successful completion of the courses listed here constitutes satisfaction of the requirements for a minor in economic theory.

Economic Theory Requirements

[MATH 1271](#) - Calculus I [MATH] (4.0 cr)
[MATH 1272](#) - Calculus II (4.0 cr)
[MATH 2243](#) - Linear Algebra and Differential Equations (4.0 cr)
[MATH 2263](#) - Multivariable Calculus (4.0 cr)
[ECON 3101](#) - Intermediate Microeconomics (4.0 cr)
[ECON 3102](#) - Intermediate Macroeconomics (4.0 cr)

Economics 4xxx-level



[ECON 4109H](#) - Honors Course: Game Theory and Applications (4.0 cr)
or [ECON 4113](#) - Introduction to Mathematical Economics (4.0 cr)
or [ECON 4731](#) - Macroeconomic Policy (3.0 cr)

Econometrics

Take a total of 35 credits. No substitutions are permitted. All minor coursework must be taken A-F. Only one country/area course may count toward the minor. Successful completion of the courses listed here constitutes satisfaction of the requirements for a minor in econometrics.

Econometrics Requirements

[MATH 1271](#) - Calculus I [MATH] (4.0 cr)
[MATH 1272](#) - Calculus II (4.0 cr)
[MATH 2243](#) - Linear Algebra and Differential Equations (4.0 cr)
[ECON 3101](#) - Intermediate Microeconomics (4.0 cr)
[ECON 3102](#) - Intermediate Macroeconomics (4.0 cr)
[ECON 4261](#) - Introduction to Econometrics (4.0 cr)

Theory of Statistics

Take one of the following course pairs:

[STAT 4101](#) - Theory of Statistics I (4.0 cr)
[STAT 4102](#) - Theory of Statistics II (4.0 cr)
or [STAT 5101](#) - Theory of Statistics I (4.0 cr)
[STAT 5102](#) - Theory of Statistics II (4.0 cr)

Directed Study

Take exactly 3 credits(s) from the following:
•[ECON 3993](#) - Directed Studies (1.0 - 3.0 cr)

International Trade and Development

Take a total of 20-23 credits. No substitutions are permitted. All minor coursework must be taken A-F. Only one country/area course may count toward the minor. Successful completion of the courses listed here constitutes satisfaction of the requirements for a minor in international trade and development.

International Trade and Development Requirements

[ECON 3101](#) - Intermediate Microeconomics (4.0 cr)

Calculus

[MATH 1142](#) - Short Calculus [MATH] (4.0 cr)
or [MATH 1271](#) - Calculus I [MATH] (4.0 cr)

Economic Development

[ECON 4301](#) - Economic Development [WI] (3.0 cr)
or [ECON 4331W](#) - Economic Development [WI] (3.0 cr)

Comparative Economic Systems

[ECON 4307](#) - Comparative Economic Systems (3.0 cr)
or [ECON 4337](#) - Comparative Economic Systems (3.0 cr)

International Economics Area of Focus

[ECON 3960](#) - Topics in Economics (3.0 cr)
or [ECON 4311](#) - Economy of Latin America (3.0 cr)
or [ECON 4313](#) - The Russian Economy (3.0 cr)
or [ECON 4315](#) - The Japanese Economy (3.0 cr)
or Study-abroad Course Approved by ECON Director of Undergraduate Studies

International Economics

Take the following course or course pair:

[ECON 4401](#) - International Economics [GP] (3.0 cr)

or Trade & Finance

[ECON 4431W](#) - International Trade [GP, WI] (3.0 cr)
[ECON 4432W](#) - International Finance [WI] (3.0 cr)

Applied Microeconomics

Take a total of 20 credits. No substitutions are permitted. All minor coursework must be taken A-F. Only one country/area course may count toward the minor. Successful completion of the courses listed here constitutes satisfaction of the requirements for a minor in applied microeconomics.

Applied Microeconomics Requirements

[ECON 4211](#) is recommended, but not required.

[ECON 3101](#) - Intermediate Microeconomics (4.0 cr)
[ECON 4531](#) - Labor Economics (3.0 cr)
[ECON 4631](#) - Industrial Organization and Antitrust Policy (3.0 cr)



Additional ECON Major Course

[MATH 1271](#) - Calculus I [MATH] (4.0 cr)

Electives

[ECON 3801](#) - Elements of Public Economics (3.0 cr)

or [ECON 4821](#) - Public Economics (3.0 cr)

or [ECON 4831](#) - Cost-Benefit Analysis (3.0 cr)

Monetary Theory

Take a total of 25 credits. No substitutions are permitted. All minor coursework must be taken A-F. Only one country/area course may count toward the minor. Successful completion of the courses listed here constitutes satisfaction of the requirements for a minor in monetary theory.

Monetary Theory Requirements

[ECON 3101](#) - Intermediate Microeconomics (4.0 cr)

[ECON 3102](#) - Intermediate Macroeconomics (4.0 cr)

[ECON 4731](#) - Macroeconomic Policy (3.0 cr)

[ECON 4751](#) - Financial Economics (3.0 cr)

[STAT 3011](#) - Introduction to Statistical Analysis [MATH] (4.0 cr)

Money and Banking

[ECON 3701](#) - Money and Banking (3.0 cr)

or [ECON 4721](#) - Money and Banking (3.0 cr)

Calculus

[MATH 1142](#) - Short Calculus [MATH] (4.0 cr)

or [MATH 1271](#) - Calculus I [MATH] (4.0 cr)



Twin Cities Campus

English Minor

English Language & Literature

College of Liberal Arts

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 18

Students who minor in English study literature and other forms of verbal expression, literary history and criticism, critical theory, linguistics, and creative writing. Courses offered by the department explore a wide range of discourses written in English--from around the globe, as well as from Britain and America--including poetry, drama, fiction, film, popular culture, and electronic media.

Students begin their studies, ideally in their sophomore year, with the department's methods course (ENGL 3001W), progress to taking Shakespeare (ENGL 3007 or a department-approved Shakespeare in London course), and two surveys in British and American literature (selected from ENGL 3003W, 3004W, 3005W, and 3006W). In addition, students choose at least one English elective course (3 to 4 credits of 3xxx or higher in ENGL, ENGC, or ENGW). The methods course--ENGL 3001W--provides minors with skills in close and critical reading, the background in history and culture, and multiple approaches to literary works that will guide their continued studies. Shakespeare and the British and American literature surveys situate literary works in historical, cultural, and theoretical perspective.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

The equivalent of one course in independent study work may be applied to the minor. Coursework completed elsewhere may be counted toward the minor only with department approval. Students must take at least two of the 3xxx minor courses in the Department of English at the University of Minnesota - Twin Cities campus. Students may earn a B.A. or a minor in English, but not both.

Minor Courses

[ENGL 3001W](#) - Textual Analysis: Methods [WI] (4.0 cr)

[ENGL 3007](#) - Shakespeare [LITR] (3.0 cr)

ENGC 3xxx

or ENGL 3xxx

or ENGL 4xxx

or ENGL 5xxx

or ENGW 3xxx

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

• [ENGL 3003W](#) - Historical Survey of British Literatures I [HIS, WI] (4.0 cr)

• [ENGL 3004W](#) - Historical Survey of British Literatures II [HIS, WI] (4.0 cr)

• [ENGL 3005W](#) - Survey of American Literatures and Cultures I [LITR, DSJ, WI] (4.0 cr)

• [ENGL 3006W](#) - Survey of American Literatures and Cultures II [LITR, DSJ, WI] (4.0 cr)



Twin Cities Campus

Environmental Geosciences Minor

College of Liberal Arts - Adm

College of Liberal Arts

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 18

The minor is offered in cooperation with the Department of Geology and Geophysics.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Students must complete GEO 1001, 1002, 1004, or 3001.

Preparatory Courses

- [ESCI 1001](#) - Earth and Its Environments [PHYS, ENV] (4.0 cr)
- or [ESCI 1002](#) *{Inactive}*(4.0 cr)
- or [ESCI 1011](#) - Volcanoes of the Earth (4.0 cr)
- or [PSTL 1171](#) - Earth Systems and Environments [PHYS, ENV] (4.0 cr)
- or [PSTL 1172](#) *{Inactive}*(4.0 cr)
- or [ESCI 2201](#) - Solid Earth Dynamics (4.0 cr)

Minor Courses

Higher level courses such as GEO 4701, GEO 4631, or GEO 5701 can be substituted with approval from the undergraduate adviser. The adviser may also approve courses from other departments (e.g., ANTH 3041, ECON 3611, GEOG 5441, SOC 4305).

Take 14 or more credits(s) from the following:

- [ESCI 3001](#) - Earth Materials (3.0 cr)
- [ESCI 3002](#) - Climate Change and Human History [ENV] (3.0 cr)
- [ESCI 3003](#) *{Inactive}*(3.0 cr)
- [ESCI 3004](#) - Water and Society (3.0 cr)
- [ESCI 3005](#) - Earth Resources (3.0 cr)
- [ESCI 3006](#) - Planets of the Solar System (3.0 cr)



Twin Cities Campus

Finnish Minor

German, Scandinavian, & Dutch

College of Liberal Arts

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 15

The minor includes the study of the spoken language, literature, culture, and civilization.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Students are required to take 4 semester(s) of Finnish.

The minor consists of a minimum of 15 credits in 3xxx, 4xxx (beyond 4004), and 5xxx courses with no more than one course being a directed or independent study. At least one course must be taken in the Scandinavian program at the University of Minnesota - Twin Cities campus. The program must be approved by the director of undergraduate studies.

Minor Courses

[FIN 3011](#) - Advanced Finnish (3.0 cr)

[FIN 3012](#) - Advanced Finnish (3.0 cr)

Take 3 or more course(s) totaling 9 or more credits(s) from the following:

- FIN 3xxx
- FIN 5xxx
- SCAN 3xxx
- SCAN 4xxx
- SCAN 5xxx



Twin Cities Campus

French Studies Minor

French & Italian

College of Liberal Arts

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 15 to 16

The French studies minor includes the study of French language, and French and Francophone literature, culture and linguistics.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Students are required to take 4 semester(s) of French.

The four required semesters of a second language do not factor into the overall length of credits in the minor.

The minor is fulfilled by completing a minimum of 5 courses and 15 credits. At least 2 upper-division FREN courses must be taken in the Department of French at the University of Minnesota - Twin Cities campus.

Students may earn a B.A. or a minor in French, but not both.

Minor Courses

Take all of the following.

[FREN 3015](#) - Advanced French Grammar and Communication (3.0 cr)

[FREN 3016](#) - Advanced French Composition and Communication (3.0 cr)

[FREN 3101W](#) - Methods in French and Francophone Studies [LITR, WI] (4.0 cr)

Upper-Division French Courses

All courses are worth 3 credits, except FREN 3014 (2 cr). FREN 37xx courses do NOT fulfill the upper-division French courses sub-requirement. Up to one FREN 30xx will count toward the upper-division French courses sub-requirement. Note: most FREN linguistics courses require LING 3001 or FREN 3500 as a prerequisite.

Take 2 or more course(s) totaling 5 or more credits(s) from the following:

- FREN 3xxx
- FREN 4xxx
- FREN 5xxx



Twin Cities Campus

Gender, Women and Sexuality Studies Minor

Gender, Women and Sexuality

College of Liberal Arts

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 18

Gender, women, and sexuality studies offers an interdisciplinary curriculum that looks at issues of gender and sexuality in the United States and around the world, taking into account the intersections and interrelations of generation, economic status, race, geographic location, and other social and historical variables. Gender, women, and sexuality studies also seeks to transform traditional fields of study by incorporating new data, methods, theories, and frameworks developed by feminist scholars.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Students may earn a B.A. or a minor in gender, women and sexuality studies, but not both.

Required Course

Take one of the following courses.

- [GLBT 1001](#) - Introduction to GLBT Studies [DSJ, SOCS] (3.0 cr)
or [GWSS 1002](#) - Politics of Sex [SOCS, DSJ] (3.0 cr)
- [GWSS 1003W](#) - Women Write the World [LITR, GP, WI] (3.0 cr)
- [GWSS 1004](#) - Screening Sex: Visual and Popular Culture [AH] (3.0 cr)
- [GWSS 1005](#) - Engaging Justice [CIV] (3.0 cr)
- [GWSS 1006](#) - Skin, Sex, and Genes [SOCS, TS] (3.0 cr)

Upper-Division Electives

Take 15 or more credits(s) from the following:

- GWSS 3xxx
- GWSS 4xxx
- GWSS 5xxx



Twin Cities Campus

Geography Minor

Geography

College of Liberal Arts

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 14

Geography is an academic and practical field that studies the manner in which human-made places and natural systems interact and change. Geographers study these interactions at all scales: neighborhoods and cities, regions and nations, single or multiple biophysical systems, and even the world as a whole.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Students may complete no more than one degree in geography: a B.A. or a B.S. or a minor.

Minor Courses

Take 14 or more credits(s) from the following:

- GEOG 3xxx
- GEOG 4xxx
- GEOG 5xxx



Twin Cities Campus

German Minor

German, Scandinavian, & Dutch

College of Liberal Arts

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 16

The minor in German includes the study of the spoken language, as well as the literature, philology, and culture of Germany, Austria, and Switzerland.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Students are required to take 4 semester(s) of German.

The four required semesters of a second language do not factor into the overall length of credits in the minor.

The minor consists of a minimum of 16 credits with no more than one course taken as directed or independent study. One 36xx, 46xx, or 56xx course may be used for the minor if substantial work is done in German, as approved by the instructor of the course and by the director of undergraduate studies. At least one course must be taken from the German program at the University of Minnesota - Twin Cities campus. The minor program must be approved by the director of undergraduate studies. Students may earn no more than one undergraduate degree in the German program: a B.A. or a minor.

Minor Core

[GER 3011W](#) - Conversation and Composition [WI] (4.0 cr)

[GER 3104W](#) - Reading and Analysis of German Literature [LITR, WI] (3.0 cr)

Take 9 or more credits(s) from the following:

- GER 3xxx
- GER 4xxx
- GER 5xxx



Twin Cities Campus

Global Studies Minor

Institute for Global Studies

College of Liberal Arts

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 17

The minor offers students the opportunity to study the interrelated processes shaping today's increasingly interdependent world. Students examine political, economic, cultural, and social processes of local communities, nation states, transnational businesses, and social movements across the globe.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

After completing GLOS 3101 and GLOS 3144, students declare a thematic and regional concentration and complete an additional 9 credits, including at least one breadth requirement, one course in a theme, and one course in a region. Students may earn a B.A. or a minor in global studies, but not both.

Minor Courses

[GLOS 3145](#) - Theoretical Approaches to Global Studies (4.0 cr)

[GLOS 3144](#) - Knowledge, Power, and the Politics of Representation in Global Studies (4.0 cr)

Breadth course chosen in consultation with a global studies adviser.

Course in a given theme, chosen in consultation with a global studies adviser.

Course in a specific region, chosen in consultation with a global studies adviser.



Twin Cities Campus

Greek Minor

Classical & Near Eastern Studies

College of Liberal Arts

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 14

The Greek minor allows students who have satisfied the language requirement in Greek to read ancient authors and to expand their knowledge of ancient civilization.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Students may earn a B.A. or a minor in Greek, but not both.

Minor Courses

GRK 3111, 3112, and 5001; and LAT 3100, 3111, 3112, and 5001 may not be used to fulfill this requirement.

Other courses in history, art history, medieval studies, or other appropriate areas may be used with the approval of the director of undergraduate studies.

Take 11 or more credits(s) from the following:

- GRK 3xxx
- GRK 5xxx

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

- CNES 3xxx
- CNES 4xxx
- CNES 5xxx
- GRK 3xxx
- GRK 5xxx
- LAT 3xxx
- LAT 5xxx



Twin Cities Campus

Hebrew Minor

Classical & Near Eastern Studies

College of Liberal Arts

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 14

The Hebrew minor permits students who have satisfied the language requirement with Hebrew to use their knowledge to read sources of antiquity, the middle ages, and the modern period and to add to their knowledge of Hebrew civilization and culture.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Students may earn a B.A. or a minor in Hebrew, but not both.

Minor Courses

Take 11 or more credits(s) from the following:

- HEBR 3xxx

Related Coursework

Take an additional 3 credits of related coursework, which may include courses with the HEBR designator.



Twin Cities Campus

History Minor

History

College of Liberal Arts

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 14

History examines the past, seeking to understand the development and changes in the human experience from its origins to the present. Historians are interested in documenting and interpreting the past from diverse theoretical, ideological, and methodological approaches and at all levels from local history to comparative and global history.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Take a minimum of five history courses. These courses must be in at least two different cultural/geographic areas and taken A-F. Students may count 1xxx-level coursework toward the minor, but at least 14 credits must be at the upper-division level (3xxx or higher). Students may earn a B.A. or a minor in history, but not both.

Minor Courses

Take at least 14 upper-division credits in at least two different cultural/geographic areas.

Take 5 or more course(s) from the following:

- HIST 1xxx
- HIST 3xxx
- HIST 4xxx
- HIST 5xxx



Twin Cities Campus

Internet, Science and Society Minor

Writing Studies

College of Liberal Arts

- **Students will no longer be accepted into this program after Fall 2007. Program requirements below are for current students only.**
- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 18

This minor introduces students to the field of Internet studies and allows them to select from elective courses that focus on an area of interest. Areas of study might include legal or social issues, such as intellectual property on the Internet or ways in which gender stereotypes are both reinforced and modified online; how scientific and technical information is conveyed on the Internet and how the Internet is playing an important role in our ability to share cutting-edge information; or how controversies, such as current debates over genetically modified foods, are played out in cyberspace.

Students should work with the adviser in the Department of Writing Studies. Students must complete at least 18 credits for the minor.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Minor Courses

- WRIT 3401 *{Inactive}*(3.0 cr)
- [WRIT 3577W](#) - Rhetoric, Technology, and the Internet [TS, WI] (3.0 cr)
- [WRIT 3371](#) - Technology, Self, and Society (3.0 cr)

Electives

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

- WRIT 3108 *{Inactive}*[DSJ] (3.0 cr)
- [WRIT 4662W](#) - Writing With Digital Technologies [WI] (4.0 cr)
- [WRIT 4196](#) - Internship in Scientific and Technical Communication (3.0 cr)

Electives

Take 6 credits of approved coursework approved by the Department of Writing Studies.



Twin Cities Campus

Italian Studies Minor

French & Italian

College of Liberal Arts

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 16

The Italian studies undergraduate minor program examines Italian and Italian American literature, culture, society, and history.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Students are required to take 4 semester(s) of Italian.

The four required semesters of a second language do not factor into the overall length of credits in the minor.

Students may earn a B.A. or a minor in Italian studies, but not both.

Minor Courses

With the approval of the Italian studies undergraduate adviser, courses taken through other departments (e.g., art history, English, history, music) may count toward the Italian studies minor when they pertain to Italian studies topics.

[ITAL 3015](#) - Reading, Conversation, and Composition (4.0 cr)

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

- ITAL 3xxx
- ITAL 4xxx
- ITAL 5xxx



Twin Cities Campus

Jewish Studies Minor

Classical & Near Eastern Studies

College of Liberal Arts

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 18 to 25

The Jewish studies minor allows students to develop an additional concentration in the academic study of Jewish culture and civilization throughout history. The minor, which recognizes the diversity and international aspect of the Jewish experience, reinforces any disciplinary specialization and contributes a comparative focus. Students choose from among the full range of JWST courses in Jewish history, Bible, Talmud, rabbinics, Jewish literature, and medieval and modern Jewish studies.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

The minor consists of a minimum of six courses in JWST or other departments approved by the DUS. Up to 10 credits of biblical and/or modern Hebrew courses (3xxx or above) may count toward the minor. Students who wish to take introductory courses (1xxx or 2xxx) of a second language, in addition to four semesters of coursework in a first foreign language may count them toward to minor if relevant to Jewish Studies, and approved by the DUS. This applies to students who have studied modern Hebrew but wish to add biblical Hebrew, or vice versa. Students may earn a B.A. or a minor in Jewish Studies, but not both.

Core Course

- JWST 1034 - Introduction to Jewish History and Civilization [HIS] (3.0 cr)
- or JWST 3034 - Introduction to Jewish History and Civilization [HIS] (3.0 cr)
- or RELS 1034 - Introduction to Jewish History and Civilization [HIS] (3.0 cr)
- or RELS 3034 - Introduction to Jewish History and Civilization [HIS] (3.0 cr)

Minor Courses

Take five courses at the 3xxx-level or above, chosen from two emphasis areas: (1) Jewish History and Culture in the Ancient and Medieval Worlds; (2) Jewish History, Culture, Politics and Society in the Modern World. At least one course must be chosen from each emphasis area.

Jewish History & Culture in the Ancient and Medieval Worlds

Take 1 or more course(s) from the following:

- CNES 3077 *{Inactive}*(3.0 cr)
- CNES 3115 - Midrash: Jewish Biblical Interpretation (3.0 cr)
- CNES 3172 - Archaeology of Israel (3.0 cr)
- CNES 3201 - The Bible: Context and Interpretation [LITR] (3.0 cr)
- CNES 3202 - Prophecy in Ancient Israel (3.0 cr)
- CNES 3204 - The Dead Sea Scrolls (3.0 cr)
- CNES 3502 - Ancient Israel: From Conquest to Exile (3.0 cr)
- CNES 3503 - History and Development of Israelite Religion I (3.0 cr)
- CNES 5115 - Midrash: Jewish Biblical Interpretation (3.0 cr)
- CNES 5204 - The Dead Sea Scrolls (3.0 cr)
- CNES 5251 *{Inactive}*(3.0 cr)
- CNES 5502 - Ancient Israel: From Conquest to Exile (3.0 cr)
- HEBR 3101 - Intermediate Biblical Hebrew I (4.0 cr)
- HEBR 3102 - Intermediate Biblical Hebrew II (4.0 cr)
- HEBR 3300 - Post-Biblical Hebrew: Second Temple Period (3.0 cr)
- HEBR 3400 - Rabbinic Texts (3.0 cr)
- HIST 3502 - Ancient Israel: From Conquest to Exile (3.0 cr)
- HIST 3606 - Christians, Muslims, and Jews in the Middle Ages [HIS, GP] (3.0 cr)
- HIST 3778 - Jews of the Islamic Mediterranean and Christian Europe, 7th-17th Centuries (3.0 cr)
- JWST 3013W *{Inactive}*[WI] (3.0 cr)
- JWST 3083 *{Inactive}*(3.0 cr)
- JWST 3112 *{Inactive}*[AH] (3.0 cr)
- JWST 3115 - Midrash: Jewish Biblical Interpretation (3.0 cr)
- JWST 3201 - The Bible: Context and Interpretation [LITR] (3.0 cr)



- JWST 3204 - Dead Sea Scrolls (3.0 cr)
- JWST 3502 - Ancient Israel: From Conquest to Exile (3.0 cr)
- JWST 3778 - Jews of the Islamic Mediterranean and Christian Europe, 7th-17th Centuries (3.0 cr)
- JWST 5013W *{Inactive}*[WI] (3.0 cr)
- JWST 5112 *{Inactive}*(3.0 cr)
- JWST 5115 - Midrash: Jewish Biblical Interpretation (3.0 cr)
- JWST 5204 - Dead Sea Scrolls (3.0 cr)
- JWST 5513 *{Inactive}*[WI] (3.0 cr)
- RELS 3077 *{Inactive}*(3.0 cr)
- RELS 3078 - Jews of the Islamic Mediterranean and Christian Europe, 7th-17th Centuries (3.0 cr)
- RELS 3083 *{Inactive}*(3.0 cr)
- RELS 3112 *{Inactive}*[AH] (3.0 cr)
- RELS 3201 - The Bible: Context and Interpretation [LITR] (3.0 cr)
- RELS 3204 - Dead Sea Scrolls (3.0 cr)
- RELS 3502 - Ancient Israel: From Conquest to Exile (3.0 cr)
- RELS 3503 - History and Development of Israelite Religion I (3.0 cr)
- RELS 5204 - Dead Sea Scrolls (3.0 cr)
- RELS 5251 *{Inactive}*(3.0 cr)
- RELS 5503 - History and Development of Israelite Religion I (3.0 cr)

Jewish History, Culture, Politics and Society in the Modern World

Take 1 or more course(s) from the following:

- AMST 3116 *{Inactive}*(3.0 cr)
- AMST 3632W - Jewish Women in the United States [HIS, DSJ, WI] (3.0 cr)
- CSCL 3631 - Jewish Writers and Rebels in German, Austrian, and American Culture (3.0 cr)
- GER 3631 - Jewish Writers and Rebels in German, Austrian, and American Culture (3.0 cr)
- HEBR 3011 - Intermediate Hebrew I (5.0 cr)
- HEBR 3012 - Intermediate Hebrew II (5.0 cr)
- HEBR 3090 - Advanced Modern Hebrew (3.0 cr)
- HEBR 5090 - Advanced Modern Hebrew (3.0 cr)
- HIST 3511 - Muslims and Jews: Conflict and Co-existence in the Middle East and North Africa since 1700 [HIS, GP] (3.0 cr)
- HIST 3512 - History of Modern Israel/Palestine: Society, Culture, and Politics [GP] (3.0 cr)
- HIST 3727 - History of the Holocaust (3.0 cr)
- HIST 3727W - History of the Holocaust [WI] (3.0 cr)
- HIST 3775 - History of Jews in Europe and the Atlantic World, from 1700 to Present (3.0 cr)
- JWST 3111 - Too Jewish? The Complex Construction of the Jewish American Psyche in Literature, Art, and Film (3.0 cr)
- JWST 3113 - African American and Jewish American Relations in the United States (3.0 cr)
- JWST 3116 *{Inactive}*(3.0 cr)
- JWST 3315 *{Inactive}*(3.0 cr)
- JWST 3401 - The Art and Architecture of the Jewish People (3.0 cr)
- JWST 3511 - Muslims and Jews: Conflict and Co-existence in the Middle East and North Africa Since 1700 [HIS, GP] (3.0 cr)
- JWST 3512 - History of Modern Israel/Palestine: Society, Culture, and Politics [GP] (3.0 cr)
- JWST 3520 - History of the Holocaust (3.0 cr)
- JWST 3521W - History of the Holocaust [WI] (3.0 cr)
- JWST 3522 - History of the Arab-Israeli Conflict (3.0 cr)
- JWST 3601 - Fleeing Hitler: German and Austrian Filmmakers Between Europe and Hollywood [AH] (3.0 cr)
- JWST 3631 - Jewish Writers and Rebels in German, Austrian, and American Culture (3.0 cr)
- JWST 3632W - Jewish Women in the United States [HIS, DSJ, WI] (3.0 cr)
- JWST 3711 - Intermediate Yiddish I (4.0 cr)
- JWST 3712 - Intermediate Yiddish II (4.0 cr)
- JWST 3721 - Advanced Yiddish I (4.0 cr)
- JWST 3722 - Advanced Yiddish II (4.0 cr)
- JWST 3775 - History of Jews in Europe and the Atlantic World, from 1700 to Present (3.0 cr)
- JWST 3900 - Topics: Jewish Studies (3.0 cr)
- POL 4867W - United States Foreign Policy Toward the Middle East [GP, WI] (4.0 cr)
- POL 4878W - Israeli-Palestinian Situation [GP, WI] (4.0 cr)
- RELS 3520 - History of the Holocaust (3.0 cr)
- RELS 3521W - History of the Holocaust [WI] (3.0 cr)

Electives

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

- AMST 3116 *{Inactive}*(3.0 cr)
- AMST 3632W - Jewish Women in the United States [HIS, DSJ, WI] (3.0 cr)
- CNES 3077 *{Inactive}*(3.0 cr)
- CNES 3115 - Midrash: Jewish Biblical Interpretation (3.0 cr)



- CNES 3172 - Archaeology of Israel (3.0 cr)
- CNES 3201 - The Bible: Context and Interpretation [LITR] (3.0 cr)
- CNES 3202 - Prophecy in Ancient Israel (3.0 cr)
- CNES 3204 - The Dead Sea Scrolls (3.0 cr)
- CNES 3502 - Ancient Israel: From Conquest to Exile (3.0 cr)
- CNES 3503 - History and Development of Israelite Religion I (3.0 cr)
- CNES 5115 - Midrash: Jewish Biblical Interpretation (3.0 cr)
- CNES 5204 - The Dead Sea Scrolls (3.0 cr)
- CNES 5251 *{Inactive}*(3.0 cr)
- CNES 5502 - Ancient Israel: From Conquest to Exile (3.0 cr)
- CACL 3631 - Jewish Writers and Rebels in German, Austrian, and American Culture (3.0 cr)
- GER 3631 - Jewish Writers and Rebels in German, Austrian, and American Culture (3.0 cr)
- HEBR 3011 - Intermediate Hebrew I (5.0 cr)
- HEBR 3012 - Intermediate Hebrew II (5.0 cr)
- HEBR 3090 - Advanced Modern Hebrew (3.0 cr)
- HEBR 3101 - Intermediate Biblical Hebrew I (4.0 cr)
- HEBR 3102 - Intermediate Biblical Hebrew II (4.0 cr)
- HEBR 3300 - Post-Biblical Hebrew: Second Temple Period (3.0 cr)
- HEBR 3400 - Rabbinic Texts (3.0 cr)
- HEBR 5090 - Advanced Modern Hebrew (3.0 cr)
- HIST 3502 - Ancient Israel: From Conquest to Exile (3.0 cr)
- HIST 3511 - Muslims and Jews: Conflict and Co-existence in the Middle East and North Africa since 1700 [HIS, GP] (3.0 cr)
- HIST 3512 - History of Modern Israel/Palestine: Society, Culture, and Politics [GP] (3.0 cr)
- HIST 3606 - Christians, Muslims, and Jews in the Middle Ages [HIS, GP] (3.0 cr)
- HIST 3727 - History of the Holocaust (3.0 cr)
- HIST 3727W - History of the Holocaust [WI] (3.0 cr)
- HIST 3775 - History of Jews in Europe and the Atlantic World, from 1700 to Present (3.0 cr)
- HIST 3778 - Jews of the Islamic Mediterranean and Christian Europe, 7th-17th Centuries (3.0 cr)
- JWST 3013W *{Inactive}*[WI] (3.0 cr)
- JWST 3083 *{Inactive}*(3.0 cr)
- JWST 3111 - Too Jewish? The Complex Construction of the Jewish American Psyche in Literature, Art, and Film (3.0 cr)
- JWST 3112 *{Inactive}*[AH] (3.0 cr)
- JWST 3113 - African American and Jewish American Relations in the United States (3.0 cr)
- JWST 3115 - Midrash: Jewish Biblical Interpretation (3.0 cr)
- JWST 3116 *{Inactive}*(3.0 cr)
- JWST 3201 - The Bible: Context and Interpretation [LITR] (3.0 cr)
- JWST 3204 - Dead Sea Scrolls (3.0 cr)
- JWST 3315 *{Inactive}*(3.0 cr)
- JWST 3401 - The Art and Architecture of the Jewish People (3.0 cr)
- JWST 3502 - Ancient Israel: From Conquest to Exile (3.0 cr)
- JWST 3511 - Muslims and Jews: Conflict and Co-existence in the Middle East and North Africa Since 1700 [HIS, GP] (3.0 cr)
- JWST 3512 - History of Modern Israel/Palestine: Society, Culture, and Politics [GP] (3.0 cr)
- JWST 3520 - History of the Holocaust (3.0 cr)
- JWST 3521W - History of the Holocaust [WI] (3.0 cr)
- JWST 3522 - History of the Arab-Israeli Conflict (3.0 cr)
- JWST 3601 - Fleeing Hitler: German and Austrian Filmmakers Between Europe and Hollywood [AH] (3.0 cr)
- JWST 3631 - Jewish Writers and Rebels in German, Austrian, and American Culture (3.0 cr)
- JWST 3632W - Jewish Women in the United States [HIS, DSJ, WI] (3.0 cr)
- JWST 3711 - Intermediate Yiddish I (4.0 cr)
- JWST 3712 - Intermediate Yiddish II (4.0 cr)
- JWST 3721 - Advanced Yiddish I (4.0 cr)
- JWST 3722 - Advanced Yiddish II (4.0 cr)
- JWST 3775 - History of Jews in Europe and the Atlantic World, from 1700 to Present (3.0 cr)
- JWST 3778 - Jews of the Islamic Mediterranean and Christian Europe, 7th-17th Centuries (3.0 cr)
- JWST 3900 - Topics: Jewish Studies (3.0 cr)
- JWST 5013W *{Inactive}*[WI] (3.0 cr)
- JWST 5112 *{Inactive}*(3.0 cr)
- JWST 5115 - Midrash: Jewish Biblical Interpretation (3.0 cr)
- JWST 5204 - Dead Sea Scrolls (3.0 cr)
- JWST 5513 *{Inactive}*[WI] (3.0 cr)
- POL 4867W - United States Foreign Policy Toward the Middle East [GP, WI] (4.0 cr)
- POL 4878W - Israeli-Palestinian Situation [GP, WI] (4.0 cr)
- RELS 3077 *{Inactive}*(3.0 cr)



- RELS 3078 - Jews of the Islamic Mediterranean and Christian Europe, 7th-17th Centuries (3.0 cr)
- RELS 3083 *{Inactive}*(3.0 cr)
- RELS 3112 *{Inactive}*[AH] (3.0 cr)
- RELS 3201 - The Bible: Context and Interpretation [LITR] (3.0 cr)
- RELS 3204 - Dead Sea Scrolls (3.0 cr)
- RELS 3502 - Ancient Israel: From Conquest to Exile (3.0 cr)
- RELS 3503 - History and Development of Israelite Religion I (3.0 cr)
- RELS 3520 - History of the Holocaust (3.0 cr)
- RELS 3521W - History of the Holocaust [WI] (3.0 cr)
- RELS 5204 - Dead Sea Scrolls (3.0 cr)
- RELS 5251 *{Inactive}*(3.0 cr)
- RELS 5503 - History and Development of Israelite Religion I (3.0 cr)



Twin Cities Campus

Land, Nature and Environmental Values Minor

Writing Studies

College of Liberal Arts

• **Students will no longer be accepted into this program after Spring 2011. Program requirements below are for current students only.**

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 18

This multidisciplinary minor serves students in CLA and other colleges who have an interest in cultural issues relating to the environment. Students are introduced to the historical development, philosophical assumptions, and imaginative expression of the human relationship to nature and are asked to consider implications of issues involving the use of nature. Students choose from a variety of courses relating some aspect of their major field to social, cultural, or historical trends in the larger society, and can include as many as 6 credits of outside electives. For assistance in planning a minor in land, nature, and environmental values, see the minor adviser in the Department of Writing. Students must complete at least 15 credits in approved courses.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Minor Courses

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

- WRIT 3152W - Writing on Issues of Science and Technology [WI] (4.0 cr)
- WRIT 3315 - Writing on Issues of Land and the Environment [AH, DSJ] (3.0 cr)
- WRIT 3302 *{Inactive}* (3.0 cr)
- WRIT 3371 - Technology, Self, and Society (3.0 cr)
- WRIT 3383 *{Inactive}*[ENVT, OH] (3.0 cr)
- WRIT 3404 *{Inactive}*[ENV] (3.0 cr)

Students must write an integrative paper.

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

- WRIT 3291 - Independent Study (1.0 - 3.0 cr)

Electives

Take 5-6 credits of related coursework chosen with an adviser in the Department of Writing Studies.



Twin Cities Campus

Latin Minor

Classical & Near Eastern Studies

College of Liberal Arts

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 14

The minor program permits those who have satisfied Latin language requirement to read Latin authors of antiquity and the Middle Ages and to add to their knowledge of Roman and medieval civilization.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Students may earn a B.A. or a minor in Latin, but not both.

Minor Courses

GRK 3111, GRK 3112, GRK 5001, LAT 3100, LAT 3111, LAT 3112, and LAT 5001 may not be counted toward the minor. Other courses in history, art history, medieval studies, or other appropriate areas may be used with the approval of the director of undergraduate studies.

Take 11 or more credits(s) from the following:

- LAT 3xxx
- LAT 5xxx

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

- CNES 3xxx
- CNES 4xxx
- CNES 5xxx
- GRK 3xxx
- GRK 5xxx
- LAT 3xxx
- LAT 5xxx



Twin Cities Campus

Linguistics Minor

Institute of Linguistics

College of Liberal Arts

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 16

Linguistics is the scientific study of human language. Courses explore the principles governing the structure of natural languages, how languages are acquired by children and adults, the role of language in human cognition and social interaction, and how languages change over time.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

The minor program must be approved by the director of undergraduate studies. Students may earn a B.A. or a minor in linguistics, but not both.

Minor Courses

Note: LING 4201 and LING 5201 cannot both be counted toward the minor. The same rule applies to LING 4302W and LING 5302. Honors students may substitute LING 5201 for LING 4201, and LING 5302 for LING 4302W.

Introduction to Linguistics

- LING 3001 - Introduction to Linguistics [SOCS] (4.0 cr)
- or LING 3001H - Honors: Introduction to Linguistics (4.0 cr)
- or LING 5001 - Introduction to Linguistics (4.0 cr)

Upper-division LING Courses

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

- LING 4002 - Linguistic Analysis (3.0 cr)
- LING 4201 - Syntax I (3.0 cr)
- LING 4302W - Phonology I [WI] (3.0 cr)

LING Electives

No more than 4 credits of LING 1xxx may count toward the minor.

Take 6 or more credits(s) from the following:

- LING 1xxx
- LING 3xxx
- LING 4xxx
- LING 5xxx



Twin Cities Campus

Mass Communication Minor

School of Journalism & Mass Communication

College of Liberal Arts

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 18
- This program requires summer terms.

The minor serves students who wish to study the social, political, economic, and legal aspects of mass communication.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Students may earn a B.A. or a minor in the School of Journalism, but not both.

Minor Courses

[JOUR 3004W](#) - Information for Mass Communication [WI] (3.0 cr)

Context Courses

Take at least one JOUR 4xxx or 5xxx context course.

Take 4 or more course(s) from the following:

- [JOUR 3005](#) - Mass Media Effects [SOCS] (3.0 cr)
- [JOUR 3006](#) - Visual Communication (3.0 cr)
- [JOUR 3007](#) - The Media in American History and Law: Case Studies [HIS] (3.0 cr)
- [JOUR 3201](#) - Principles of Strategic Communication (3.0 cr)
- [JOUR 3551](#) - Economics of New Media [TS] (3.0 cr)
- [JOUR 3552](#) - Internet and Global Society (3.0 cr)
- [JOUR 3614](#) - History of Media Communication [HIS, TS] (3.0 cr)
- [JOUR 3615](#) - History of the Documentary [AH] (3.0 cr)
- [JOUR 3741](#) - People of Color and the Mass Media [DSJ] (3.0 cr)
- [JOUR 3745](#) - Mass Media and Popular Culture [AH, DSJ] (3.0 cr)
- [JOUR 3771](#) - Mass Media Ethics: Moral Reasoning and Case Studies [CIV] (3.0 cr)
- [JOUR 3775](#) - Administrative Law and Regulation for Strategic Communication (3.0 cr)
- [JOUR 3776](#) - Mass Communication Law (3.0 cr)
- [JOUR 3796](#) - Mass Media and Politics (3.0 cr)
- [JOUR 3991](#) - Special Topics in Mass Communication: Context (3.0 cr)
- [JOUR 4272](#) - Interactive Advertising (3.0 cr)
- [JOUR 4274W](#) - Advertising in Society [WI] (3.0 cr)
- [JOUR 4551](#) - New Media and Culture [AH, TS] (3.0 cr)
- [JOUR 4721](#) - Mass Media and U.S. Society [SOCS, DSJ] (3.0 cr)
- [JOUR 4801](#) - Global Communication (3.0 cr)
- [JOUR 4991](#) - Special Topics in Mass Communication: Context (3.0 cr)
- [JOUR 5251](#) - Psychology of Advertising (3.0 cr)
- [JOUR 5501](#) - Communication and Public Opinion (3.0 cr)
- [JOUR 5541](#) - Mass Communication and Public Health (3.0 cr)
- [JOUR 5552](#) - Law of Internet Communications (3.0 cr)
- [JOUR 5601W](#) - History of Journalism [WI] (3.0 cr)
- [JOUR 5606W](#) - Literary Aspects of Journalism [WI] (3.0 cr)
- [JOUR 5615](#) - History of the Documentary (3.0 cr)
- [JOUR 5725](#) - Management of Media Organizations (3.0 cr)
- [JOUR 5777](#) - Contemporary Problems in Freedom of Speech and Press (3.0 cr)
- [JOUR 5991](#) - Special Topics in Mass Communication: Context (3.0 cr)



Twin Cities Campus

Mathematics Minor

College of Liberal Arts - Adm

College of Liberal Arts

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 24 to 28

Students complete all the lower-division requirements in the mathematics major, plus two upper-division electives. See the mathematics major description for information on the utility of a mathematics degree.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Students may earn no more than one undergraduate degree in mathematics: a B.A. or a B.S. or a minor.

Minor Courses

Note: qualified honors students can substitute MATH 3592H & 3593H for MATH 2243/2373/2574H, MATH 2263/2374/2573H, and MATH 2283/3283W. See your UHP adviser for final consent. Those who take the MATH 3592H & 3593H series will need to complete a minimum total of 24 credits for the minor. Those who do not complete this honors series will need to complete a minimum total of 25 credits for the minor.

Calculus I

- [MATH 1271](#) - Calculus I [MATH] (4.0 cr)
- or [MATH 1371](#) - CSE Calculus I [MATH] (4.0 cr)
- or [MATH 1571H](#) - Honors Calculus I [MATH] (4.0 cr)

Calculus II

- [MATH 1272](#) - Calculus II (4.0 cr)
- or [MATH 1372](#) - CSE Calculus II (4.0 cr)
- or [MATH 1572H](#) - Honors Calculus II (4.0 cr)

Linear Algebra & Differential Equations

- [MATH 2243](#) - Linear Algebra and Differential Equations (4.0 cr)
- or [MATH 2373](#) - CSE Linear Algebra and Differential Equations (4.0 cr)
- or [MATH 2574H](#) - Honors Calculus IV (4.0 cr)

Multivariable Calculus

- [MATH 2263](#) - Multivariable Calculus (4.0 cr)
- or [MATH 2374](#) - CSE Multivariable Calculus and Vector Analysis (4.0 cr)
- or [MATH 2573H](#) - Honors Calculus III (4.0 cr)

Sequences, Series, & Foundations

- [MATH 2283](#) - Sequences, Series, and Foundations (3.0 cr)
- or [MATH 3283W](#) - Sequences, Series, and Foundations: Writing Intensive [WI] (4.0 cr)

Electives

Selection of MATH course electives for the minor requires department adviser approval.

MATH 4xxx-5xxx

Take 2 or more course(s) totaling 6 or more credits(s) from the following:

- MATH 4xxx
- MATH 5xxx

or Theory of Statistics

- [STAT 5101](#) - Theory of Statistics I (4.0 cr)
- [STAT 5102](#) - Theory of Statistics II (4.0 cr)



Twin Cities Campus

Music Minor

School of Music

College of Liberal Arts

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 20 to 24

A minor in music is available for students majoring in other fields.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Students may earn a major or a minor in music, but not both.

Music Theory and Ear Training

- [MUS 1501](#) - Theory and Analysis of Tonal Music I (2.0 cr)
- [MUS 1502](#) - Theory and Analysis of Tonal Music II (2.0 cr)
- [MUS 1511](#) - Ear-Training and Sight-Singing I (1.0 cr)
- [MUS 1512](#) - Ear-Training and Sight-Singing II (1.0 cr)

Musicology/Ethnomusicology

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

- [MUS 1801W](#) - Music, Society, and Cultures [AH, GP, WI] (3.0 cr)
- [MUS 3601W](#) - History of Western Music I [WI] (3.0 cr)
- [MUS 3602W](#) - History of Western Music II [WI] (3.0 cr)
- [MUS 3603W](#) - History of Western Music III [WI] (3.0 cr)

Keyboard

For non-keyboard minors, MUS 1155 may be substituted for MUS 1151-1152. Keyboard minors take 1155.

- [MUS 1155](#) - Keyboard Skills I (2.0 cr)
- or [MUS 1151](#) - Piano: Class Lessons I (2.0 cr)
- [MUS 1152](#) - Piano: Class Lessons II (2.0 cr)

Applied Music

Students must take two semesters at 2 credits per term.

Take 4 or more credits(s) from the following:

- [MUSA 1301](#) - Piano: Music Major (2.0 - 4.0 cr)
- [MUSA 1302](#) - Harpsichord: Music Major (2.0 - 4.0 cr)
- [MUSA 1303](#) - Organ: Music Major (2.0 - 4.0 cr)
- [MUSA 1304](#) - Voice: Music Major (2.0 - 4.0 cr)
- [MUSA 1305](#) - Violin: Music Major (2.0 - 4.0 cr)
- [MUSA 1306](#) - Viola: Music Major (2.0 - 4.0 cr)
- [MUSA 1307](#) - Cello: Music Major (2.0 - 4.0 cr)
- [MUSA 1308](#) - Double Bass: Music Major (2.0 - 4.0 cr)
- [MUSA 1309](#) - Flute: Music Major (2.0 - 4.0 cr)
- [MUSA 1311](#) - Oboe: Music Major (2.0 - 4.0 cr)
- [MUSA 1312](#) - Clarinet: Music Major (2.0 - 4.0 cr)
- [MUSA 1313](#) - Saxophone: Music Major (2.0 - 4.0 cr)
- [MUSA 1314](#) - Bassoon: Music Major (2.0 - 4.0 cr)
- [MUSA 1315](#) - French Horn: Music Major (2.0 - 4.0 cr)
- [MUSA 1316](#) - Trumpet: Music Major (2.0 - 4.0 cr)
- [MUSA 1317](#) - Trombone: Music Major (2.0 - 4.0 cr)
- [MUSA 1318](#) - Euphonium: Music Major (2.0 - 4.0 cr)
- [MUSA 1319](#) - Tuba: Music Major (2.0 - 4.0 cr)
- [MUSA 1321](#) - Percussion: Music Major (2.0 - 4.0 cr)
- [MUSA 1322](#) - Harp: Music Major (2.0 - 4.0 cr)
- [MUSA 1323](#) - Guitar: Music Major (2.0 - 4.0 cr)



Ensembles

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

- MUS 3230 - Chorus (1.0 - 2.0 cr)
- MUS 3410 - University Wind Bands (1.0 cr)
- MUS 3420 - Orchestra (1.0 cr)
- MUS 3440 - Chamber Ensemble (1.0 cr)
- MUS 5240 - University Singers (1.0 cr)
- MUS 5280 - Opera Theatre (2.0 cr)



Twin Cities Campus

Norwegian Minor

German, Scandinavian, & Dutch

College of Liberal Arts

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 16

The minor includes the study of the spoken language, literature, culture, and civilization.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Students are required to take 4 semester(s) of Norwegian.

The four required semesters of a second language do not factor into the overall length of credits in the minor.

The minor consists of a minimum of 16 credits in 3xxx, 4xxx, and 5xxx courses with no more than one course being a directed or independent study. At least one course must be taken in the Scandinavian program at the University of Minnesota - Twin Cities campus. The program must be approved by the director of undergraduate studies.

Minor Courses

[SCAN 3011W](#) - Readings in Scandinavian Languages [WI] (4.0 cr)

Take 4 or more course(s) totaling 12 or more credits(s) from the following:

- SCAN 3xxx
- SCAN 4xxx
- SCAN 5xxx



Twin Cities Campus

Philosophy Minor

Philosophy

College of Liberal Arts

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 14

See the major description for more information.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

The minor consists of 14 semester credits (or their equivalent) of PHIL courses at 3xxx or above. At least 8 credits must be taken at the University of Minnesota - Twin Cities campus. Students may earn a B.A. or a minor in philosophy, but not both.

Minor Courses

Take 14 or more credits(s) from the following:

- PHIL 3xxx
- PHIL 4xxx
- PHIL 5xxx



Twin Cities Campus

Physics Minor

School of Physics & Astronomy

College of Liberal Arts

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 37

See the major description for more information.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Physics minors must take all required physics and mathematics courses A-F (except those offered S-N only). Students may earn no more than one degree in the Department of Physics: a B.A. or a B.S. or a minor.

Mathematics

Take 12 credits.

[MATH 1371](#) - CSE Calculus I [MATH] (4.0 cr)

or [MATH 1271](#) - Calculus I [MATH] (4.0 cr)

[MATH 1372](#) - CSE Calculus II (4.0 cr)

or [MATH 1272](#) - Calculus II (4.0 cr)

[MATH 2373](#) - CSE Linear Algebra and Differential Equations (4.0 cr)

or [MATH 2243](#) - Linear Algebra and Differential Equations (4.0 cr)

or **Honors Sequence**

[MATH 1571H](#) - Honors Calculus I [MATH] (4.0 cr)

[MATH 1572H](#) - Honors Calculus II (4.0 cr)

[MATH 2573H](#) - Honors Calculus III (4.0 cr)

Physics Sequence

Take 25 credits.

[PHYS 2201](#) - Introductory Thermodynamics and Statistical Physics (3.0 cr)

Physics I

[PHYS 1301W](#) - Introductory Physics for Science and Engineering I [PHYS, WI] (4.0 cr)

or [PHYS 1401V](#) - Honors Physics I [PHYS, WI] (4.0 cr)

Physics II

[PHYS 1302W](#) - Introductory Physics for Science and Engineering II [PHYS, WI] (4.0 cr)

or [PHYS 1402V](#) - Honors Physics II [PHYS, WI] (4.0 cr)

Physics III

[PHYS 2503](#) - Physics III: Intro to Waves, Optics, and Special Relativity (4.0 cr)

or [PHYS 2403H](#) - Honors Physics III (4.0 cr)

Quantum Physics

[PHYS 2601](#) - Quantum Physics (4.0 cr)

[PHYS 2605](#) - Quantum Physics Laboratory (3.0 cr)

Physics/Astrophysics Elective

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

•PHYS 3xxx

•PHYS 4xxx

•PHYS 5xxx

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

•AST 3xxx

•AST 4xxx

•AST 5xxx



Twin Cities Campus

Political Science Minor

Political Science

College of Liberal Arts

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 16

Political scientists study topics such as the exercise of power and influence; sources and resolution of conflicts; the relation of politics to the economy, culture, and other aspects of society; the adoption and implementation of public policies; and the development of political systems. These topics are studied at all levels, from local communities to the global community.

The scope of the discipline is reflected in the main areas of specialization that make up the undergraduate curriculum: political theory, comparative government and politics, international relations, and American governmental systems and processes.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Complete a minimum of four courses and 16 credits. POL 3070 & POL 4970 do not count toward the minor. Up to 3 credits of POL 3080 may count toward the minor.

Political science minors who major in global studies must complete at least two upper-division courses outside of the comparative government and international relations subfields. Global studies majors must take at least two upper-division courses from political theory or American government.

Students may earn a B.A. or a minor in political science, but not both.

Minor Courses

Take at least one course in two of the four subfields: political theory, American government, comparative government, and international relations.

Take 16 or more credits(s) from the following:

•Lower-Division Courses

- Take 0 or more credits(s) from the following:
- POL 1001 - American Democracy in a Changing World [SOCS] (4.0 cr)
- POL 1001H - Honors Course: American Democracy in a Changing World [SOCS] (4.0 cr)
- POL 1019 - Indigenous Peoples: A Global Perspective [GP] (3.0 cr)
- POL 1025 - Global Politics [SOCS, GP] (4.0 cr)
- POL 1026 - We and They: U.S. Foreign Policy (4.0 cr)
- POL 1054 - Politics of Countries Around the World [SOCS, GP] (4.0 cr)
- POL 1201 - Political Ideas and Ideologies [HIS, CIV] (4.0 cr)
- POL 1234 - Citizen U: Building Tomorrow's Citizens Today (3.0 cr)
- POL 1903 - Freshman Seminar (3.0 cr)
- POL 1904 - Topics: Freshman seminar (3.0 cr)
- POL 1905 - Freshman Seminar (3.0 cr)
- POL 1908W - Topics: Freshman Seminar [WI] (3.0 cr)
- POL 1909W - Topics: Freshman Seminar [WI] (3.0 cr)

•Political Theory

- Take 0 or more credits(s) from the following:
- POL 3210 - Practicum (2.0 cr)
- POL 3225 - American Political Thought [CIV] (3.0 cr)
- POL 3235W - Democracy and Citizenship [CIV, WI] (3.0 cr)
- POL 3251 - Greeks, Romans, and Christians: Ancient and Medieval Political Thought (3.0 - 4.0 cr)
- POL 3252 - Renaissance, Reformation, and Revolution: Early Modern Political Thought [AH, CIV] (3.0 cr)
- POL 4210 - Topics in Political Theory (3.0 cr)
- POL 4253 - Modernity and Its Discontents: Late Modern Political Thought (3.0 - 4.0 cr)
- POL 4275 - Contemporary Political Thought (3.0 cr)

•American Government

- Take 0 or more credits(s) from the following:



- POL 3306 - Presidential Leadership and American Democracy (3.0 cr)
- POL 3308 - Congressional Politics and Institutions [SOCS] (3.0 cr)
- POL 3309 - Justice in America (3.0 cr)
- POL 3310 - Topics in American Politics (3.0 cr)
- POL 3310H - Topics in American Politics (3.0 cr)
- POL 3319 - Education and the American Dream [SOCS, DSJ] (3.0 cr)
- POL 3321 - Issues in American Public Policy (3.0 cr)
- POL 3323 - Political Tolerance in the United States (3.0 - 4.0 cr)
- POL 3325 - U.S. Campaigns and Elections (3.0 cr)
- POL 3701 - American Indian Tribal Governments and Politics (3.0 cr)
- POL 3739 - Politics of Race, Class, and Ethnicity (3.0 cr)
- POL 3752 - Chicano Politics (3.0 cr)
- POL 3766 - Political Psychology of Mass Behavior [SOCS] (3.0 cr)
- POL 3767 - Political Psychology of Elite Behavior [CIV] (3.0 cr)
- POL 3769 - Public Opinion and Voting Behavior [SOCS] (3.0 cr)
- POL 3785 - Persuasion and Political Propaganda (3.0 cr)
- POL 3785H - Persuasion and Political Propaganda (3.0 cr)
- POL 4310 - Topics in American Politics (3.0 cr)
- POL 4315W - State Governments: Laboratories of Democracy [WI] (4.0 cr)
- POL 4322 - Rethinking the Welfare State (3.0 - 4.0 cr)
- POL 4501W - The Supreme Court and Constitutional Interpretation [CIV, WI] (3.0 cr)
- POL 4502W - The Supreme Court, Civil Liberties, and Civil Rights [CIV, WI] (3.0 cr)
- POL 4507 - Law, Sovereignty, and Treaty Rights (3.0 cr)
- POL 4525W - Federal Indian Policy [WI] (3.0 cr)
- POL 4561 - Comparative Legal Systems (3.0 cr)
- POL 4737W - American Political Parties [WI] (4.0 cr)
- POL 4766 - American Political Culture and Values [CIV] (3.0 cr)
- POL 4771 - Racial Attitudes and Intergroup Conflict (3.0 cr)
- POL 4773W - Interest Groups, Social Movements and Politics of Race, Class, and Gender [DSJ, WI] (3.0 cr)
- Comparative Government**
 - Take 0 or more credits(s) from the following:
 - POL 3410 - Topics in Comparative Politics (3.0 cr)
 - POL 3451W - Politics and Society in the New Europe [GP, WI] (3.0 cr)
 - POL 3464 - Politics of Inequality (3.0 cr)
 - POL 3465 - Theories of Political Economy (3.0 cr)
 - POL 3475 - Islamist Politics (3.0 cr)
 - POL 3477 - Political Development [SOCS, GP] (3.0 - 4.0 cr)
 - POL 3479 - Latin American Politics [GP] (3.0 cr)
 - POL 4403W - Comparative Constitutionalism [GP, WI] (3.0 cr)
 - POL 4410 - Topics in Comparative Politics (3.0 cr)
 - POL 4461W - European Government and Politics [GP, WI] (4.0 cr)
 - POL 4463 - The Cuban Revolution Through the Words of Cuban Revolutionaries [GP] (3.0 cr)
 - POL 4465 - Southeast Asian Politics [GP] (3.0 cr)
 - POL 4478W - Contemporary Politics in Africa and the Colonial Legacy [GP, WI] (4.0 cr)
 - POL 4481 - Governments and Markets (3.0 - 4.0 cr)
 - POL 4485 - Human Rights and Democracy in the World [CIV] (3.0 cr)
 - POL 4487 - The Struggle for Democratization and Citizenship (4.0 cr)
 - POL 4489W - Citizens, Consumers, and Corporations [CIV, WI] (3.0 cr)
 - POL 4492 - Law and (In)Justice in Latin America (3.0 cr)
 - POL 4494W - US-Latin American Relations [WI] (3.0 cr)
 - POL 4495 - Politics of Family, Sex, and Children (3.0 cr)
- International Relations**
 - Take 0 or more credits(s) from the following:
 - POL 3810 - Topics in International Relations and Foreign Policy (3.0 cr)
 - POL 3833 - The United States and the Global Economy (3.0 cr)
 - POL 3835 - International Relations [SOCS, GP] (3.0 cr)
 - POL 3872W - Global Environmental Cooperation [WI] (4.0 cr)
 - POL 3873V - Global Citizenship and International Ethics [CIV, WI] (3.0 cr)
 - POL 3873W - Global Citizenship and International Ethics [CIV, WI] (3.0 cr)
 - POL 4810 - Topics in International Politics and Foreign Policy (3.0 cr)
 - POL 4867W - United States Foreign Policy Toward the Middle East [GP, WI] (4.0 cr)
 - POL 4878W - Israeli-Palestinian Situation [GP, WI] (4.0 cr)
 - POL 4883W - Global Governance [WI] (3.0 cr)
 - POL 4885W - International Conflict and Security [GP, WI] (4.0 cr)
 - POL 4887 - Thinking Strategically in International Politics (3.0 cr)



- POL 4889 - Governments and Global Trade and Money (3.0 - 4.0 cr)
- Electives**
- Take 0 or more credits(s) from the following:
- POL 3080 - Faculty-Supervised Individual Internships (3.0 - 13.0 cr)
- POL 3085 - Quantitative Analysis in Political Science [MATH] (4.0 cr)
- POL 5xxx



Twin Cities Campus

Portuguese Studies Minor

Spanish & Portuguese

College of Liberal Arts

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 16

The Portuguese studies minor focuses on literary, cultural, and linguistic studies from Portugal, Brazil, and Lusophone Africa. Students begin with language skills courses. These are followed by analysis skills courses in Hispanic literature, culture, and linguistics. The department encourages minors to study abroad in a Portuguese-speaking area.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Students are required to take 4 semester(s) of Portuguese.

The four required semesters of a second language do not factor into the overall length of credits in the minor.

Students must declare the minor at least one full term before completing minor requirements and are encouraged to declare it as early as possible (preferably during preparatory coursework). Contact the department office for declaration procedures. Students may receive no more than one degree from the Department of Spanish & Portuguese Studies: a B.A. in Spanish Studies, or a B.A. in Spanish & Portuguese Studies, or a minor in Spanish Studies, or a minor in Portuguese Studies.

Minor Courses

[PORT 3003](#) - Portuguese Conversation and Composition (4.0 cr)

Take 4 or more course(s) totaling 12 or more credits(s) from the following:

- PORT 3xxx
- PORT 4xxx
- PORT 5xxx



Twin Cities Campus

Psychology Minor

Psychology

College of Liberal Arts

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 21

The undergraduate minor in psychology offers students an empirical foundation in the discipline, along with the opportunity to construct an area of emphasis.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

No courses without a PSY designator can be used to fulfill minor requirements. Transfer students must complete a minimum of 9 upper-division credits in the Department of Psychology at the University of Minnesota - Twin Cities campus in order to be awarded the minor. Students may earn no more than one undergraduate degree in psychology: a B.A. or a B.S. or a minor. Students may combine the psychology minor with the B.A. or the B.S. in child psychology, but not both.

Preparatory Courses

Students must complete PSY 1001 and PSY 3801 before declaring the minor.

[PSY 1001](#) - Introduction to Psychology [SOCS] (4.0 cr)

[PSY 3801](#) - Introduction to Psychological Measurement and Data Analysis [MATH] (4.0 cr)

[PSY 3001W](#) - Introduction to Research Methods [WI] (4.0 cr)

Electives

Students must take 9 credits of PSY electives. Recommended options for structuring the elective coursework include: 1) sampling from each of the domains; or 2) selection of a focus area, including a 3xxx course followed by advanced coursework in that sub-area of the discipline.

PSY 3xxx

or PSY 4xxx

or PSY 5xxx



Twin Cities Campus

Religious Studies Minor

Classical & Near Eastern Studies

College of Liberal Arts

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 15

The minor in religious studies allows those in other majors to participate in the critical study of religion.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

All minor coursework must be taken A-F. Transfer students must take at least three of the five courses at the University of Minnesota - Twin Cities campus (or with U of M residence credits for study abroad). Final clearance is required prior to graduation. Students may earn a B.A. or a minor in religious studies, but not both.

Minor Courses

Take a minimum of five courses for at least 15 credits. The purpose of the minor is to expose students to a diversity of religious traditions. At least two traditions must be represented among the four electives courses.

Theory and Methods

[RELS 3001W](#) - Theory and Method in Religion: Critical Approaches to the Study of Religion [WI] (3.0 cr)
or Equivalent course to RELS 3001 that is approved by the director of undergraduate studies.

Electives

Take four 3xxx-5xxx courses totaling at least 12 credits in RELS or other DUS-approved designator.



Twin Cities Campus

Russian Minor

Slavic Languages/Literatures

College of Liberal Arts

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 16

Russian is the native language of some 150 million citizens of the Russian Federal Republic and remains the unofficial lingua franca of the former Soviet republics, an indispensable communications tool across all of the Caucasus and Central Asia. The minor in Russian includes the study of the spoken language as well as the literature and culture of Russia.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Students are required to take 2 semester(s) of Russian.

All minor coursework must be taken A-F. Students may earn a B.A. or a minor in Russian, but not both.

Minor Courses

[RUSS 3001](#) - Intermediate Russian I (5.0 cr)

[RUSS 3002](#) - Intermediate Russian II (5.0 cr)

Take 6 or more credits(s) from the following:

- RUSS 3xxx
- RUSS 4xxx
- RUSS 5xxx



Twin Cities Campus

Sociology Minor

Sociology

College of Liberal Arts

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 14 to 16

Sociology examines stability and change in social life by addressing the underlying patterns of social relations in formal organizations, in legal institutions, and in the family, economy, and political arena.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Students may earn no more than one undergraduate degree from the Department of Sociology: a B.A. or B.S. or minor in sociology; or a B.A. or B.S. or minor in sociology of law, criminology, and deviance.

Minor Courses

[SOC 3701](#) - Social Theory (4.0 cr)

[SOC 3801](#) - Sociological Research Methods (4.0 cr)

or [SOC 3811](#) - Basic Social Statistics [MATH] (4.0 cr)

Take 2 or more course(s) totaling 6 or more credits(s) from the following:

- SOC 3xxx
- SOC 4xxx



Twin Cities Campus

Sociology of Law, Criminology, and Deviance Minor

Sociology

College of Liberal Arts

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 16

Sociologists study human social behavior. More specifically, sociology examines how we group ourselves (families, social groups, formal organizations, societies); how we behave in groups (collective action, social change, crime and delinquency); and how characteristics like age, race, social class, and gender affect our relationships with each other and with organizations and institutions.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Transfer students must meet the requirements either through approved coursework completed at their transfer institution or at the University of Minnesota - Twin Cities. At least 6 credits (two courses) for the minor must be taken from the Department of Sociology at the University of Minnesota - Twin Cities campus. Students may earn no more than one undergraduate degree from the Department of Sociology: a B.A. or B.S. or minor in sociology; or a B.A. or B.S. or minor in sociology of law, criminology, and deviance.

Minor Courses

Criminal Justice

SOC 3101 - Introduction to the American Criminal Justice System [SOCS, CIV] (3.0 cr)

or **SOC 3102** - Introduction to Criminal Behavior and Social Control (3.0 cr)

Social Theory or Methodology

SOC 3701 - Social Theory (4.0 cr)

or **SOC 3811** - Basic Social Statistics [MATH] (4.0 cr)

or **SOC 3801** - Sociological Research Methods (4.0 cr)

Electives

Take one upper-division non-criminology sociology course and two 41xx courses chosen from the LCD area of sociology.

Two 41xx courses (6 credits) from LCD area of sociology.

SOC 3xxx-4xxx

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

- SOC 3xxx
- SOC 4xxx



Twin Cities Campus

Spanish Studies Minor

Spanish & Portuguese

College of Liberal Arts

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 16

The Spanish studies minor focuses on Spanish and Latin American literary, cultural, and linguistic studies. Students begin with language skills courses. These are followed by courses in Hispanic literature, culture, and linguistics. Courses with specific skills focus and service-learning components are also available. The department encourages minors to study abroad in a Spanish-speaking area.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Students must declare the minor at least one full term before completing minor requirements and are encouraged to declare it as early as possible. Students may receive no more than one degree from the Department of Spanish & Portuguese Studies: a B.A. in Spanish Studies, or a B.A. in Spanish & Portuguese Studies, or a minor in Spanish Studies, or a minor in Portuguese Studies.

Minor Courses

Two related courses taught in English through any department may count toward the minor elective requirements. Advance written departmental consent and a contract form declaring that all written work will be completed in Spanish must be signed during the first week of the course.

[SPAN 3015](#) - Spanish Composition and Communication (4.0 cr)

Electives

Take 4 or more course(s) totaling 12 or more credits(s) from the following:

- [SPAN 3011](#) - Spanish Communication Skills (4.0 cr)
- [SPAN 3022](#) - Advanced Business Spanish (4.0 cr)
- [SPAN 3044](#) - Advanced Medical Spanish (4.0 cr)
- [SPAN 3104W](#) - Introduction to the Study of Hispanic Literatures [LITR, WI] (3.0 cr)
- [SPAN 3105W](#) - Introduction to the Study of Hispanic Cultures [WI] (3.0 cr)
- [SPAN 3107W](#) - Introduction to the Study of Hispanic Linguistics [WI] (3.0 cr)
- [SPAN 3211](#) - Discourses of Imperial Spain, 1492-1800 (3.0 cr)
- [SPAN 3212](#) - Discourses of Modern and Contemporary Spain, 1800-Present (3.0 cr)
- [SPAN 3221](#) - Latin American Colonial Discourses: Empire and Early Modernity (3.0 cr)
- [SPAN 3222](#) - Discourses of Modern and Contemporary Latin America (3.0 cr)
- [SPAN 3401](#) - Latino Immigration and Community Service [CIV] (3.0 cr)
- [SPAN 3404](#) - Medical Spanish and Community Health Service (3.0 cr)
- [SPAN 3501](#) - Roots of Modern Spain and Latin America (3.0 cr)
- [SPAN 3502](#) - Modern Spain (3.0 cr)
- [SPAN 3510](#) - Issues in Hispanic Cultures (3.0 cr)
- [SPAN 3512](#) - Modern Latin America (3.0 cr)
- [SPAN 3701](#) - Structure of Spanish: Phonology and Phonetics (3.0 cr)
- [SPAN 3702](#) - Structure of Spanish: Morphology and Syntax (3.0 cr)
- [SPAN 3703](#) - Origins and History of Spanish and Portuguese (3.0 cr)
- [SPAN 3704](#) - Sociolinguistics of the Spanish-Speaking World (3.0 cr)
- [SPAN 3705](#) - Semantics and Pragmatics of Spanish (3.0 cr)
- [SPAN 3707](#) - Linguistic Accuracy Through Translation (3.0 cr)
- [SPAN 3730](#) - Topics in Hispanic Linguistics (3.0 cr)
- [SPAN 3800](#) - Film Studies in Spanish (3.0 cr)
- [SPAN 3910](#) - Topics in Spanish Peninsular Literature (3.0 cr)
- [SPAN 3920](#) - Topics in Spanish-American Literature (3.0 cr)
- [PORT 3001](#) - Portuguese for Spanish Speakers (4.0 cr)



Twin Cities Campus

Speech-Language-Hearing Sciences Minor

Speech-Language-Hearing Sciences

College of Liberal Arts

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 14

The minor's curriculum examines the physical, biological, and behavioral foundations of human communication. Courses focus on the study of variation in speech, language, and hearing processes, and apply that knowledge to identifying, preventing, and managing disordered speech, language, and hearing.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

No more than 20 percent of total credits for the minor may be directed study. Students may earn a B.A. or a minor in speech-language-hearing sciences, but not both.

Minor Courses

Students may need instructor permission to take 5xxx courses.

Take 14 or more credits(s) from the following:

- SLHS 3xxx
- SLHS 4xxx
- SLHS 5xxx



Twin Cities Campus

Statistics Minor

Statistics, School of-ADM

College of Liberal Arts

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 14

Statistics is concerned with theories and methods of data collection, tabulation, analysis, and interpretation, and their use in learning from data and making decisions.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Students may earn no more than one undergraduate degree in statistics: a B.A. or a B.S. or a minor.

Minor Courses

At least 2 courses must be taken at the 4xxx-5xxx level.

Take 14 or more credits(s) from the following:

- STAT 3xxx
- STAT 4xxx
- STAT 5xxx



Twin Cities Campus

Studies in Cinema and Media Culture Minor

Cultural Studies & Comparative Literature

College of Liberal Arts

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 18

Studies in cinema and media culture (SCMC) examines cinema by emphasizing its location within the intricate social, historical, and cultural matrix of audiovisual forms and practices.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Students may earn a B.A. or a minor in studies in cinema and media culture, but not both.

Minor Courses

- [ARTH 1921W](#) - Introduction to Film Study [AH, WI] (4.0 cr)
or [CSCL 1201](#) - Introduction to Cinema and Media Culture [AH] (4.0 cr)
or [CSCL 1921W](#) - Introduction to Film Study [AH, WI] (4.0 cr)
or [SCMC 1201](#) - Introduction to Cinema and Media Culture [AH] (4.0 cr)

Electives

Take 14 or more credits(s) from the following:

- [AFRO 3654](#) - African Cinema (4.0 cr)
- [AFRO 3655](#) - African American Cinema [AH, DSJ] (3.0 cr)
- [AFRO 3741](#) - People of Color and the Mass Media (3.0 cr)
- [ALL 1001](#) - Asian Film and Animation (3.0 cr)
- [ALL 3356W](#) - Chinese Film [AH, WI] (3.0 cr)
- [ALL 3456](#) - Japanese Film [GP] (3.0 cr)
- [ALL 3556](#) - Korean Film (3.0 cr)
- [AMIN 3402](#) - American Indians and the Cinema [AH, DSJ] (3.0 cr)
- [AMST 3252W](#) - American Popular Culture and Politics: 1900 to 1940 [HIS, CIV, WI] (4.0 cr)
- [AMST 3253W](#) - American Popular Culture and Politics: 1940 to the Present [HIS, CIV, WI] (4.0 cr)
- [ARTH 1921W](#) - Introduction to Film Study [AH, WI] (4.0 cr)
- [ARTH 3921W](#) - Art of the Film [AH, WI] (4.0 cr)
- [ARTS 3601](#) - New Media: Making Art Interactive (4.0 cr)
- [ARTS 3603](#) - Experimental Video (4.0 cr)
- [ARTS 3703](#) - Photography: Digital Imaging (4.0 cr)
- [ARTS 5610](#) - New Media: Making Art Interactive (4.0 cr)
- [ARTS 5630](#) - Advanced Experimental Video (4.0 cr)
- [COMM 3201](#) - Introduction to Electronic Media Production (3.0 - 4.0 cr)
- [COMM 3204](#) - Advanced Electronic Media Production (4.0 cr)
- [COMM 3211](#) - Introduction to U.S. Electronic Media (3.0 cr)
- [COMM 3231](#) - Reality TV: History, Culture, and Economics (3.0 cr)
- [COMM 3263W](#) - Media Literacy: Decoding Media Images and Messages [WI] (3.0 cr)
- [COMM 4245](#) - Critical Television Studies (3.0 cr)
- [COMM 4263](#) - Feminist Media Studies [DSJ] (3.0 cr)
- [COMM 5211](#) - Critical Media Studies: Theory and Methods (3.0 cr)
- [COMM 5261](#) - Political Economy of Media Culture (3.0 cr)
- [CSCL 1201](#) - Introduction to Cinema and Media Culture [AH] (4.0 cr)
- [CSCL 1921W](#) - Introduction to Film Study [AH, WI] (4.0 cr)
- [CSCL 3115](#) - Cinema and Ideology [AH] (4.0 cr)
- [CSCL 3176](#) - Oppositional Cinemas [GP] (4.0 cr)
- [CSCL 3177](#) - On Television [CIV] (4.0 cr)
- [CSCL 3178W](#) - Documentary Cinema: History and Politics [WI] (4.0 cr)
- [CSCL 3993](#) - Directed Study (1.0 - 3.0 cr)
- [CSCL 4993](#) - Directed Study (1.0 - 3.0 cr)



- CSCL 5411 - Avant-Garde Cinema (4.0 cr)
- CSCL 5993 - Directed Study (1.0 - 3.0 cr)
- ENGL 3040 - Studies in Film (3.0 cr)
- ENGW 5205 - Screenwriting (4.0 cr)
- ENGW 5207 - Screen writing II (4.0 cr)
- FREN 3451 - North African Cinema (3.0 cr)
- FRIT 3802 - Cinema and Realism (3.0 cr)
- GER 1601 - Fleeing Hitler: German and Austrian Filmmakers Between Europe and Hollywood [AH] (3.0 cr)
- GER 3604W - Introduction to German Cinema [AH, GP, WI] (3.0 cr)
- GWSS 3307 - Feminist Film Studies [AH, DSJ] (3.0 cr)
- GWSS 3409W - Asian American Women's Cultural Production [AH, DSJ, WI] (3.0 cr)
- HSCI 4321 - History of Computing [TS, HIS] (3.0 cr)
- JOUR 1001 - Introduction to Mass Communication [SOCS, TS] (3.0 cr)
- JOUR 3614 - History of Media Communication [HIS, TS] (3.0 cr)
- JOUR 3615 - History of the Documentary [AH] (3.0 cr)
- JOUR 3741 - People of Color and the Mass Media [DSJ] (3.0 cr)
- JOUR 3745 - Mass Media and Popular Culture [AH, DSJ] (3.0 cr)
- JOUR 3796 - Mass Media and Politics (3.0 cr)
- JOUR 5615 - History of the Documentary (3.0 cr)
- SCMC 1201 - Introduction to Cinema and Media Culture [AH] (4.0 cr)
- SCMC 3001W - History of Cinema and Media Culture [WI] (4.0 cr)
- SCMC 3201 - Fundamentals of Digital Filmmaking (4.0 cr)
- SCMC 3202 - Intermediate Digital Filmmaking (4.0 cr)
- SCMC 3993 - Directed Study (1.0 - 3.0 cr)
- SCMC 4993 - Directed Study (1.0 - 3.0 cr)
- SCMC 5001 - Critical Debates in the Study of Cinema and Media Culture (4.0 cr)
- SCMC 5002 - Advanced Film Analysis (4.0 cr)
- SCMC 5993 - Directed Study (1.0 - 3.0 cr)
- SPAN 3800 - Film Studies in Spanish (3.0 cr)
- TH 4550 - Video Technology (3.0 cr)
- GEOG 3374W - The City in Film [AH, WI] (4.0 cr)
or GEOG 5374W - The City in Film [WI] (4.0 cr)



Twin Cities Campus

Swedish Minor

German, Scandinavian, & Dutch

College of Liberal Arts

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 16

The minor includes the study of the spoken language, literature, culture, and civilization.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Students are required to take 4 semester(s) of Swedish.

The four required semesters of a second language do not factor into the overall length of credits in the minor.

The minor consists of a minimum of 16 credits in 3xxx, 4xxx, and 5xxx courses with no more than one course being a directed or independent study. At least one course must be taken in the Scandinavian program at the University of Minnesota - Twin Cities campus. The minor program must be approved by the director of undergraduate studies.

Minor Courses

[SCAN 3011W](#) - Readings in Scandinavian Languages [WI] (4.0 cr)

Take 4 or more course(s) totaling 12 or more credits(s) from the following:

- SCAN 3xxx
- SCAN 4xxx
- SCAN 5xxx



Twin Cities Campus

Technical Communication Minor

Writing Studies

College of Liberal Arts

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 16

The minor provides theoretical and practical information about how to communicate complex technical information to various audiences. Students take required courses in oral and written communication and in communication technologies. Additional courses (e.g., visual communication, project management, international communication) are selected to complement students' career plans. For help in planning the minor, contact the major coordinator of the Scientific and Technical Communication Program in the Department of Writing Studies.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Students may earn a B.A. in scientific & technical communication or a minor in technical communication, but not both.

Minor Courses

- [WRIT 3441](#) - Editing, Critique, and Style (3.0 cr)
- [WRIT 3562W](#) - Technical and Professional Writing [WI] (4.0 cr)
- [WRIT 3257](#) - Scientific and Technical Presentations (3.0 cr)
or [WRIT 3671](#) - Visual Rhetoric and Document Design (3.0 cr)

Upper-division Electives

Independent study and internship courses cannot be used to satisfy the WRIT 3xxx-5xxx elective requirement.

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

- WRIT 3xxx
- WRIT 4xxx
- WRIT 5xxx



Twin Cities Campus

Theatre Arts Minor

Theatre Arts & Dance

College of Liberal Arts

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 25

The minor offers study of the art form in both theoretical historical context and the practice of live dramatic performance. Course offerings include theatre history and dramatic literature; acting, movement, and voice; directing; design and technology for scenery, costume, lighting, makeup, and sound; and stage and arts management.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Students may earn a B.A. or a minor in Theatre Arts, but not both.

Minor Courses

Introductory Courses

- [TH 1101W](#) - Introduction to the Theatre [AH, WI] (4.0 cr)
- [TH 1321](#) - Beginning Acting: Fundamentals of Performance (3.0 cr)
- [TH 1322](#) - Creating the Performance (3.0 cr)
- [TH 1501](#) - Introduction to Design and Technology for Live Performance (3.0 cr)

Upper-division Courses

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

- [TH 3171](#) - History of the Theatre: Ancient Greece Through Neo-Classicism (3.0 cr)
- [TH 3172](#) - History of the Theatre: Age of Enlightenment to Present (3.0 cr)
- [TH 4177W](#) - Survey of Dramatic Literature I: Strategic Interpretation [WI] (3.0 cr)
- [TH 4178W](#) - Survey of Dramatic Literature II: Representation and its Effects [WI] (3.0 cr)

Design/Technology

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

- [TH 3521](#) - Introduction to Scenic Design for Theater and Performance (3.0 cr)
- [TH 3531](#) - Introduction to Theatrical Costume Design (3.0 cr)
- [TH 3541](#) - Introduction to Stage Lighting Design (3.0 cr)
- [TH 3571](#) - Introduction to Stage Technology (3.0 cr)



Twin Cities Campus

Urban Studies Minor

College of Liberal Arts - Adm

College of Liberal Arts

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 14

The minor in urban studies focuses on the conceptual and analytical frameworks and specialized skills needed for professions focused on urban change or development.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Students may earn no more than one undergraduate degree in Urban Studies: a B.A. or a B.S. or a minor.

Minor Courses

[URBS 1001W](#) - Introduction to Urban Studies: The Complexity of Metropolitan Life [WI] (3.0 cr)

[URBS 3500](#) - Urban Studies Workshop (3.0 cr)

Electives

Take at least 6 credits of electives. Choose from the following tracks: Urban Form and Society, Cultural Analysis, Political Economy, and Infrastructure and Environment.

Colloquia

Take two semesters of URBS 3201 or URBS 3202 for one credit each semester.

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

- [URBS 3201](#) - Urban Studies Colloquium (1.0 cr)

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

- [URBS 3202](#) - Urban Studies Colloquium (1.0 cr)



Twin Cities Campus

Ecological Engineering Minor

Bioproducts and Biosystems Engineering

College of Science and Engineering

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 18 to 20
- Twin Cities only

Ecological engineering integrates traditional engineering concepts with ecological principles such as resiliency, adaptation, and community dynamics. The ecological engineering minor prepares students to design sustainable systems integrating human activities with the natural environment, including watershed management and enhancement; waste treatment systems; phytoremediation and bioremediation; industrial ecology; constructed and restored wetlands; mitigation of non-point source contamination; and increase of ground water recharge through "low impact" design and other methods.

The minor, offered by faculty in the Department of Bioproducts and Biosystems Engineering and administered through the Institute of Technology, involves courses in bioproducts and biosystems engineering; civil engineering; ecology, evolution, and behavior; environmental sciences, policy and management; forest resources; and geology.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Core Group Courses

Students must take 9 or more credits from the list of courses selecting at least one course in each of the three core areas of ecological sciences, hydrologic sciences, and ecological engineering design. Acceptable courses in each of the core areas are shown below.

Ecological Sciences

At least one course from this subgroup

- [BIOL 3407](#) - Ecology (3.0 cr)
- or [BIOL 3408W](#) - Ecology [WI] (3.0 cr)
- or [BIOL 3807](#) - Ecology (4.0 cr)

Hydrologic Sciences

At least one course from this subgroup

- [CE 4501](#) - Hydrologic Design (4.0 cr)
- or [BBE 5513](#) - Watershed Engineering (3.0 cr)
- or [FR 3114](#) - Hydrology and Watershed Management (3.0 cr)

Ecological Engineering Design

At least one course from this subgroup

- [BBE 4523](#) - Ecological Engineering Design (3.0 cr)
- or [BBE 5523](#) - Ecological Engineering Design (3.0 cr)

Additional Courses

In addition to the core courses, the students must take 9 or more credits from the following list of courses.

- [BBE 3023](#) - Ecological Engineering Principles (3.0 cr)
- or [BBE 4013](#) - Transport in Biological Processes II (3.0 cr)
- or [BBE 4533](#) - Sustainable Waste Management Engineering (3.0 cr)
- or [BBE 5535](#) - Assessment and Diagnosis of Impaired Waters (3.0 cr)
- or [CE 3301](#) - Soil Mechanics I (3.0 cr)
- or [CE 3501](#) - Environmental Engineering [ENV] (3.0 cr)
- or [CE 4351](#) - Groundwater Mechanics (3.0 cr)
- or [CE 4352](#) - Groundwater Modeling (3.0 cr)
- or [CE 4502](#) - Water and Wastewater Treatment (3.0 cr)
- or [CE 4512](#) - Open Channel Hydraulics (4.0 cr)
- or [CE 4561](#) - Solid Hazardous Wastes (3.0 cr)
- or [CE 4562](#) - Environmental Remediation Technology (3.0 cr)
- or [CE 5541](#) - Environmental Water Chemistry (3.0 cr)
- or [CE 5581](#) - Water Resources: Individuals and Institutions (3.0 cr)
- or [EEB 3001](#) - Ecology and Society [ENV] (3.0 cr)
- or [EEB 3603](#) - Science, Protection, and Management of Aquatic Environments (3.0 cr)



or EEB 4014 *{Inactive}*(3.0 cr)
or EEB 4609W - Ecosystem Ecology [ENV, WI] (3.0 cr)
or EEB 4611 - Biogeochemical Processes (3.0 cr)
or EEB 5601 - Limnology (3.0 cr)
or ESPM 3101 - Conservation of Plant Biodiversity (3.0 cr)
or ESPM 3111 - Hydrology and Water Quality Field Methods (3.0 cr)
or ESPM 3245 - Sustainable Land Use Planning and Policy [ENV] (3.0 cr)
or ESPM 3251 - Natural Resources in Sustainable International Development [GP] (3.0 cr)
or ESPM 3603 - Environmental Life Cycle Analysis (3.0 cr)
or ESPM 3604 - Environmental Management Systems and Strategy (3.0 cr)
or ESPM 4216 - Contaminant Hydrology (2.0 cr)
or ESPM 4608 - Bioremediation (3.0 cr)
or ESPM 5111 - Hydrology and Water Quality Field Methods (3.0 cr)
or FR 3104 - Forest Ecology (4.0 cr)
or FR 3204 - Landscape Ecology and Management (3.0 cr)
or FR 5153 - Forest and Wetland Hydrology (3.0 cr)
or ESCI 3005 - Earth Resources (3.0 cr)
or ESCI 4631W *{Inactive}*[WI] (3.0 cr)
or ESCI 5108 *{Inactive}*(3.0 cr)
or ESCI 5205 - Fluid Mechanics in Earth and Environmental Sciences (3.0 cr)
or ESCI 5701 *{Inactive}*(3.0 cr)
or SUST 3003 - Sustainable People, Sustainable Planet [ENV] (3.0 cr)



Twin Cities Campus

Accounting Minor

Accounting

Curtis L. Carlson School of Management

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 12

See major description for more information.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

This minor is only available to students admitted to another degree program in the Carlson School of Management.

Minor Courses

[ACCT 5101](#) - Intermediate Accounting I (4.0 cr)

[ACCT 5102W](#) - Intermediate Accounting II [WI] (4.0 cr)

Take 4 or more credits(s) from the following:

- [ACCT 3201](#) - Intermediate Management Accounting (2.0 cr)
- [ACCT 5135](#) - Fundamentals of Federal Income Tax (4.0 cr)
- [ACCT 5160](#) - Financial Statement Analysis (2.0 cr)
- [ACCT 5180](#) - Consolidations and Advanced Reporting (2.0 cr)
- [ACCT 5310](#) - International Accounting (2.0 cr)



Twin Cities Campus

Actuarial Science Minor

Finance

Curtis L. Carlson School of Management

- **Students will no longer be accepted into this program after Fall 2008. Program requirements below are for current students only.**
- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 15

See major description for more information.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

This minor is only available to students admitted to a degree program in the Carlson School of Management.

Minor Courses

[MATH 4065](#) - Theory of Interest (4.0 cr)

[MATH 5067](#) - Actuarial Mathematics I (4.0 cr)

[MATH 5068](#) - Actuarial Mathematics II (4.0 cr)

Take 4 or more credits(s) from the following:

- [INS 4100](#) - Corporate Risk Management (2.0 cr)
- [INS 4101](#) - Employee Benefits (2.0 cr)
- [INS 4200](#) - Insurance Theory and Practice (2.0 cr)
- [INS 4201](#) - Personal Financial Management (2.0 cr)
- [INS 4202](#) - Personal Financial Planning 2: Tax and Estate Planning Techniques (2.0 cr)



Twin Cities Campus

Entrepreneurial Management Minor

Strategic Management & Organization

Curtis L. Carlson School of Management

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 16

See major description for more information.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

This minor is only available for students pursuing a B.S.B. degree in the Carlson School of Management.

Minor Courses

- [MGMT 3010](#) - Introduction to Entrepreneurship (4.0 cr)
- [MGMT 4008](#) - Entrepreneurial Management (4.0 cr)
- [MGMT 4050](#) - Management of Innovation and Change (2.0 cr)
or [MGMT 4060](#) - Entrepreneurial Perspectives (2.0 cr)
or [MGMT 4170W](#) - New Business Feasibility and Planning [WI] (4.0 cr)
or [MGMT 4171W](#) - Entrepreneurship in Action I [WI] (4.0 cr)

Electives

Choose courses from the list below or courses not chosen above.

Take 4 or more credits(s) from the following:

- [ACCT 3201](#) - Intermediate Management Accounting (2.0 cr)
- [ACCT 5160](#) - Financial Statement Analysis (2.0 cr)
- [BLAW 3058](#) - The Law of Contracts and Agency (4.0 cr)
- [FINA 4221](#) - Principles of Corporate Finance (2.0 cr)
- [FINA 4422](#) - Financial Modeling (2.0 cr)
- [FINA 4622](#) - International Finance (2.0 cr)
- [HRIR 3031](#) - Staffing and Selection: Strategic and Operational Concerns (2.0 cr)
- [HRIR 4100W](#) - Undergraduate HRIR Leadership Capstone [WI] (4.0 cr)
- [IDSC 3202](#) - Analysis and Modeling for Business Systems Development (4.0 cr)
- [INS 4100](#) - Corporate Risk Management (2.0 cr)
- [MGMT 4002](#) - Managerial Psychology (4.0 cr)
- [MGMT 4040](#) - Negotiation Strategies (4.0 cr)
- [MGMT 4080W](#) - Applied Technology Entrepreneurship [WI] (4.0 cr)
- [MGMT 4172](#) - Entrepreneurship in Action II (4.0 cr)
- [MKTG 3010](#) - Marketing Research (4.0 cr)
- [MKTG 4030](#) - Sales Management (4.0 cr)
- [MKTG 4050](#) - Integrated Marketing Communications (4.0 cr)
- [SCO 3041](#) - Project Management (2.0 cr)
- [SCO 3056](#) - Supply Chain Planning and Control (4.0 cr)
- [MGMT 3070](#) - Topics in Management (2.0 - 4.0 cr)



Twin Cities Campus

Finance Minor

Finance

Curtis L. Carlson School of Management

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 12

See major description for more information.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

This minor is only available for students pursuing a B.S.B. in the Carlson School of Management.

Minor Courses

[FINA 4121](#) - Financial Markets and Interest Rates (2.0 cr)

[FINA 4321](#) - Portfolio Management and Performance Evaluation (2.0 cr)

[FINA 4221](#) - Principles of Corporate Finance (2.0 cr)

Electives

Take 6 or more credits(s) from the following:

- [FINA 4422](#) - Financial Modeling (2.0 cr)
- [FINA 4522](#) - Options in Corporate Finance (2.0 cr)
- [FINA 4122](#) - Banking Institutions (2.0 cr)
- [FINA 4621](#) - The Global Economy (Macro) (2.0 cr)
- [FINA 4622](#) - International Finance (2.0 cr)
- [FINA 4523](#) - Derivatives I (2.0 cr)
- [FINA 4920](#) - Topics in Finance (2.0 cr)
- [FINA 4329](#) - Security Analysis Capstone (2.0 cr)
- [FINA 4529](#) - Derivatives II Capstone (2.0 cr)
- [FINA 4242W](#) - Corporate Investment Decisions [WI] (4.0 cr)



Twin Cities Campus

Human Resources and Industrial Relations Minor

Industrial Relations Center

Curtis L. Carlson School of Management

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 12

See major description for more information.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

This minor is only available to students pursuing a B.S.B. degree in the Carlson School of Management and assumes students have completed HRIR 3021.

Minor

Take 3 or more course(s) totaling 6 or more credits(s) from the following:

- [HRIR 3031](#) - Staffing and Selection: Strategic and Operational Concerns (2.0 cr)
- [HRIR 3051](#) - Compensation: Theory and Practice (2.0 cr)
- [HRIR 3041](#) - The Individual in the Organization (2.0 cr)
- [HRIR 3071](#) - Union Organizing and Labor Relations (2.0 cr)

Take 6 or more credits(s) from the following:

- [HRIR 3032](#) - Training and Development (2.0 cr)
- [HRIR 3042](#) - The Individual and Organizational Performance (2.0 cr)
- [HRIR 3072](#) - Collective Bargaining and Dispute Resolution (2.0 cr)
- [HRIR 5022](#) - Managing Diversity (2.0 cr)
- [HRIR 5023](#) - Employment and Labor Law for the HRIR Professional (2.0 cr)
- [HRIR 5025](#) - Comparative and International Human Resources and Industrial Relations (2.0 cr)
- [HRIR 5054](#) - Public Policies on Employee Benefits: Social Safety Nets (2.0 cr)
- [HRIR 5061](#) - Public Policies on Work and Pay (3.0 cr)
- [HRIR 5062](#) - Personnel Economics (2.0 cr)
- [INS 4101](#) - Employee Benefits (2.0 cr)
- [HRIR 5000](#) - Topics in Human Resources and Industrial Relations (2.0 cr)
- [HRIR 4100W](#) - Undergraduate HRIR Leadership Capstone [WI] (4.0 cr)



Twin Cities Campus

International Business Minor

Strategic Management & Organization

Curtis L. Carlson School of Management

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 12 to 16

The international business minor provides students with a vital foundation for success in today's global business environment. It enhances any functional major with a broad understanding of the additional complexity and contingencies required when conducting business across international borders.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

This minor is only available for students admitted to a degree program in the Carlson School of Management.

International Business Foundation

The International Business Foundation courses must be completed at the Carlson School.

MGMT 3040 - Understanding the International Environment of Firms: International Business (2.0 cr)

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

- **MGMT 3900** - International Business Communication [GP] (3.0 cr)
- **ACCT 5310** - International Accounting (2.0 cr)
- **FINA 4621** - The Global Economy (Macro) (2.0 cr)
- **FINA 4622** - International Finance (2.0 cr)
- **HRIR 5025** - Comparative and International Human Resources and Industrial Relations (2.0 cr)
- **MKTG 4080W** - Marketing Strategy [WI] (4.0 cr)
- **IBUS 4090** - Corporate Strategy in Emerging Europe (4.0 cr)
- **IBUS 4082W** - Brand Management [WI] (4.0 cr)
- **IBUS 3010** - Introduction to Entrepreneurship: An International Perspective (4.0 cr)
- **IBUS 4050** - Management of Innovation and Change (4.0 cr)
- **IBUS 4010** - Management of Technology in the Middle East (3.0 cr)
- **IBUS 4080** - Life Sciences in South Africa--An International Business Perspective (4.0 cr)
- **IBUS 3080** - Sustainability and Corporate Social Responsibility in Costa Rica (4.0 cr)

International Environment Breadth

The International Environment Breadth courses may be completed abroad with advising and departmental approval.

International Political Economy Survey course

Take 1 or more course(s) from the following:

- **POL 3410** - Topics in Comparative Politics (3.0 cr)
- **POL 3835** - International Relations [SOCS, GP] (3.0 cr)
- **POL 3872W** - Global Environmental Cooperation [WI] (4.0 cr)
- **POL 4481** - Governments and Markets (3.0 - 4.0 cr)
- **ECON 4401** - International Economics [GP] (3.0 cr)
- **ECON 4307** - Comparative Economic Systems (3.0 cr)
- **APEC 3007** - Applied Macroeconomics: Policy, Trade, and Development [GP] (3.0 cr)
- **APEC 5751** - Global Trade and Policy (3.0 cr)
- **GEOG 3331** - Geography of the World Economy [SOCS, GP] (3.0 cr)
- **GLOS 3415** - Global Institutions of Power: World Bank, International Monetary Fund, and World Trade Organization (3.0 cr)
- **HIST 3419** - History of Capitalism: Uneven Development Since 1500 (3.0 cr)

Sociocultural Survey course

Take 1 or more course(s) from the following:

- **GEOG 3379** - Environment and Development in the Third World [SOCS, ENV] (3.0 cr)
- **GLOS 4802** - Cross-Cultural Perspectives on Work (4.0 cr)
- **GLOS 3602** - Other Worlds: Globalization and Culture (3.0 cr)
- **GLOS 4221** - Globalize This! Understanding Globalization Through Sociology [GP] (3.0 cr)
- **ANTH 3003** - Cultural Anthropology (3.0 cr)
- **ANTH 4031W** - Anthropology and Social Justice [WI] (4.0 cr)



- [ANTH 4053](#) - Economy, Culture, and Critique [SOCS, GP] (3.0 cr)
- [ANTH 4065](#) - The Anthropology of Development (3.0 cr)
- [AMST 4301](#) - Workers and Consumers in the Global Economy [DSJ] (3.0 cr)

International Experience Requirement

An international experience requirement that meets the Carlson School's requirement of all students will fulfill the minor requirement.



Twin Cities Campus

Management Information Systems Minor

Information & Decision Sciences

Curtis L. Carlson School of Management

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 12

The management information systems (MIS) minor prepares students to be leaders in conceptualizing, prescribing, developing, and delivering leading-edge information system applications that support business processes and management decision making. It provides students with an understanding of the functions of information systems in organizations and detailed knowledge of information system analysis, design, and operation.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Minor Requirements

[IDSC 3202](#) - Analysis and Modeling for Business Systems Development (4.0 cr)

Electives

Take 8 or more credits(s) from the following:

- [IDSC 3101](#) - Introduction to Programming (2.0 cr)
- [IDSC 3102](#) - Intermediate Programming (2.0 cr)
- [IDSC 3103](#) - Data Modeling and Databases (2.0 cr)
- [IDSC 3104](#) - Enterprise Systems (2.0 cr)
- [IDSC 4204W](#) - Information Services Management [WI] (4.0 cr)
- [IDSC 4301](#) - Information Systems Capstone Course: A Live Case (2.0 cr)
- [IDSC 4401](#) - Information Security (2.0 cr)
- [IDSC 4411](#) - Accounting Information Systems and IT Governance (2.0 cr)
- [IDSC 4421](#) - Financial Information Systems and Technologies (2.0 cr)
- [IDSC 4431](#) - Advanced Database Design (2.0 cr)
- [IDSC 4441](#) - Electronic Commerce (2.0 cr)
- [IDSC 4444](#) - Business Analytics (2.0 cr)
- [IDSC 4455](#) - Web 2.0: The Business of Social Media (2.0 cr)
- [IDSC 4490](#) - Information Systems Special Topics (2.0 cr)
- [IDSC 4491](#) - Independent Study in Information Systems (1.0 - 4.0 cr)



Twin Cities Campus

Marketing Minor

Marketing

Curtis L. Carlson School of Management

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 12

See major description for more information.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

This minor is only available for students admitted to a degree program in the Carlson School of Management.

Minor Courses

[MKTG 3010](#) - Marketing Research (4.0 cr)

[MKTG 3040](#) - Buyer Behavior (4.0 cr)

Take 4 or more credits(s) from the following:

- [MKTG 4030](#) - Sales Management (4.0 cr)
- [MKTG 4050](#) - Integrated Marketing Communications (4.0 cr)
- [MKTG 4060](#) - Marketing Channels (4.0 cr)
- [MKTG 4080W](#) - Marketing Strategy [WI] (4.0 cr)
- [MKTG 4082W](#) - Brand Management [WI] (4.0 cr)
- [MKTG 4090](#) - Marketing Topics (2.0 - 4.0 cr)



Twin Cities Campus

Operations Minor

Supply Chain & Operations

Curtis L. Carlson School of Management

- **Students will no longer be accepted into this program after Fall 2008. Program requirements below are for current students only.**
- **See supply chain and operations management minor.**
- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 12

Operations management is responsible for supplying the product or service of the organization. The operations area manages the conversion or transformation process that converts inputs into outputs and the vast majority of resources and physical assets, and is primarily responsible for the profitability of most firms. Operations managers make decisions regarding the operations function and its connection with other functions, and plan and control the production system and its interfaces within the organization and with the external environment.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Minor Requirements

OMS 3001 is a prerequisite for other courses in the minor, but does not count toward the minor itself.

[SCO 3001](#) - Introduction to Operations Management (3.0 cr)

[SCO 3056](#) - Supply Chain Planning and Control (4.0 cr)

[SCO 3059](#) - Quality Management and Lean Six Sigma (4.0 cr)

OMS 4081 *(Inactive)*(4.0 cr)



Twin Cities Campus

Risk Management and Insurance Minor

Finance

Curtis L. Carlson School of Management

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 12

See major description for more information.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

This minor is only available to students who are pursuing a B.S.B. degree in the Carlson School or to students who are pursuing an actuarial science emphasis in the math major.

Minor Courses

[INS 4100](#) - Corporate Risk Management (2.0 cr)

[INS 4101](#) - Employee Benefits (2.0 cr)

[INS 4200](#) - Insurance Theory and Practice (2.0 cr)

Electives

Take 6 or more credits(s) from the following:

- [ACCT 5101](#) - Intermediate Accounting I (4.0 cr)
- [BLAW 3058](#) - The Law of Contracts and Agency (4.0 cr)
- [FINA 4121](#) - Financial Markets and Interest Rates (2.0 cr)
- [FINA 4122](#) - Banking Institutions (2.0 cr)
- [FINA 4221](#) - Principles of Corporate Finance (2.0 cr)
- [FINA 4321](#) - Portfolio Management and Performance Evaluation (2.0 cr)
- [FINA 4329](#) - Security Analysis Capstone (2.0 cr)
- [FINA 4422](#) - Financial Modeling (2.0 cr)
- [FINA 4522](#) - Options in Corporate Finance (2.0 cr)
- [FINA 4523](#) - Derivatives I (2.0 cr)
- [FINA 4529](#) - Derivatives II Capstone (2.0 cr)
- [FINA 4621](#) - The Global Economy (Macro) (2.0 cr)
- [FINA 4622](#) - International Finance (2.0 cr)
- [FINA 4242W](#) - Corporate Investment Decisions [WI] (4.0 cr)
- [FINA 4920](#) - Topics in Finance (2.0 cr)
- [HRIR 5054](#) - Public Policies on Employee Benefits: Social Safety Nets (2.0 cr)
- [MATH 4065](#) - Theory of Interest (4.0 cr)
- [MATH 5067](#) - Actuarial Mathematics I (4.0 cr)



Twin Cities Campus

Supply Chain & Operations Management Minor

Supply Chain & Operations

Curtis L. Carlson School of Management

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 12

Supply chain and operations management focuses on process excellence from both intra-organizational and inter-organizational points of view.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Minor Requirements

[SCO 3056](#) - Supply Chain Planning and Control (4.0 cr)

[SCO 3059](#) - Quality Management and Lean Six Sigma (4.0 cr)

Take 2 or more course(s) totaling 4 or more credits(s) from the following:

- [SCO 3041](#) - Project Management (2.0 cr)
- [SCO 3045](#) - Sourcing and Supply Management (2.0 cr)
- [SCO 3048](#) - Transportation and Logistics Management (2.0 cr)
- [SCO 3051](#) - Service Management (2.0 cr)
- [SCO 3061](#) - Lean Thinking (2.0 cr)
- [SCO 3072](#) - Managing Technologies in the Supply Chain (2.0 cr)



Twin Cities Campus

Architecture Minor

School of Architecture

College of Design

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 19

An undergraduate minor in architecture introduces the foundational ideas of the discipline as social, cultural, historic, and environmental constructs.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

A maximum of 9 transfer credits may be used toward the minor. A maximum of three courses taken for a major may also be used toward the minor. Students must earn a C- or better in all minor coursework.

Minor courses

For the undergraduate architecture electives, ARCH 3351 or ARCH 3352 may not be used.

[ARCH 1281](#) - Design Fundamentals I (4.0 cr)

[ARCH 4561](#) - Architecture and Ecology (3.0 cr)

[ARCH 1701](#) - The Designed Environment (3.0 cr)

or [ARCH 3711W](#) - Environmental Design and the Sociocultural Context [WI] (3.0 cr)

or [ARCH 3711V](#) - Honors: Environmental Design and the Sociocultural Context [C/PE, WI] (3.0 cr)

[ARCH 3411W](#) - Architectural History to 1750 [HIS, GP, WI] (3.0 cr)

or [ARCH 3412](#) - Architectural History Since 1750 [HIS, GP] (3.0 cr)

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

- ARCH 3xxx
- ARCH 4xxx



Twin Cities Campus

Housing Studies Minor

DHA Housing Studies

College of Design

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 15

See major description for more information.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Minor Courses

[HSG 2401](#) - Introduction to Housing (3.0 cr)

[HSG 2463](#) - Housing and Community Development (3.0 cr)

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

- [HSG 4461](#) - Housing Development and Management (3.0 cr)
- [HSG 4465](#) - Housing in a Global Perspective (3.0 cr)
- [HSG 3482](#) - Sustainable Housing: Community, Environment, and Technology [TS] (3.0 cr)
- [HSG 5463](#) - Housing Policy (3.0 cr)
- [HSG 4467W](#) - Housing and the Social Environment [WI] (4.0 cr)
- [HSG 5464](#) - Understanding Housing: Assessment and Analysis (3.0 cr)
- [HSG 5481](#) - Promoting Independence in Housing and Community (3.0 cr)
- [HSG 5484](#) - Rural Housing Issues (3.0 cr)



Twin Cities Campus

Landscape Design and Planning Minor

Landscape Architecture

College of Design

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 21

The landscape design and planning minor introduces students to the history, theory, and practice of landscape design and planning at various geographic scales and in diverse settings. Landscape design and planning focuses on the creation of livable communities that sustain ecological function, fulfill human aspirations for community development, public health, and safety, and are artistically evocative and meaningful.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

A maximum of 9 transfer credits may be used for the minor and a maximum of three courses taken for a major degree may also be used toward the minor. A minimum grade of C- is required in all minor coursework.

Required courses

- LA 1401 - The Designed Environment (3.0 cr)
- LA 3001 - Understanding and Creating Landscape Space (3.0 cr)
- LA 3003 - Case Studies in Sustainable Landscape Planning and Design (3.0 cr)
- LA 3413 - Introduction to Landscape Architectural History [HIS, GP] (3.0 cr)

Electives

Take 9 or more credits(s) from the following:

- ARCH 3711W - Environmental Design and the Sociocultural Context [WI] (3.0 cr)
- EEB 3001 - Ecology and Society [ENV] (3.0 cr)
- ESPM 3108 - Ecology of Managed Systems [ENV] (3.0 cr)
- LA 1201 - Learning from the Landscape [AH, DSJ] (3.0 cr)
- LA 1301 - Introduction to Landscape Architecture Drawing [AH] (3.0 cr)
- LA 2301 - Advanced Representation for Environmental Design (3.0 cr)
- LA 2302 - Computer-Aided Representation for Environmental Design (3.0 cr)
- LA 3002 - Informants of Creating Landscape Space (3.0 cr)
- LA 3004 - Regional Landscape Planning (3.0 cr)
- LA 3204 - Holistic Landscape Ecology and Bioregional Practice (3.0 cr)
- LA 3501 - Environmental Design and Its Biological and Physical Context [ENV] (3.0 cr)
- LA 3514 - Making the Mississippi [CIV] (3.0 cr)
- LA 3571 - Landscape Construction: Site Systems and Engineering (3.0 cr)
- LA 4001 - Sustainable Landscape Design and Planning Practices (3.0 cr)
- LA 4002 - Implementation of Sustainable Landscape Design and Planning Practices (3.0 cr)
- LA 4755 - Infrastructure, Natural Systems, and Space of Inhabited Landscapes [TS] (3.0 cr)
- LA 8302 - Professional Practice (3.0 cr)



Twin Cities Campus

Retail Merchandising Minor

DHA Retail Merchandising

College of Design

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2012
- Required credits in this minor: 15 to 17

Minors in retail merchandising are introduced to basic merchandising principles. The minor provides the opportunity to explore several facets of the retail industry, including retail buying, visual merchandising, and multichannel retailing. Outstanding opportunities are provided students to meet minor requirements including travel to domestic and international market centers.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Minor Courses

[RM 1201](#) - Fashion, Ethics, and Consumption [CIV] (3.0 cr)

[RM 2215](#) - Multichannel Retailing (3.0 cr)

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

- [RM 3196](#) - Field Study: National or International (1.0 - 4.0 cr)
- [RM 3242](#) - Retail Buying (3.0 cr)
- [RM 3243](#) - Visual Merchandising (3.0 cr)
- [RM 4117W](#) - Retail Environments and Human Behavior [WI] (3.0 cr)
- [RM 4123](#) - Living in a Consumer Society (3.0 cr)
- [RM 4124](#) - Consumers of Design (3.0 cr)
- [RM 4216](#) - Retail Promotion and Consumer Decision Making (4.0 cr)
- [RM 4217](#) - International Retail Markets [GP] (3.0 cr)
- [RM 4247](#) - Advanced Buying and Sourcing (3.0 cr)