Duluth Campus

Civil Engineering B.S.C.E.

UMD-Civil Engineering, Dept of

Swenson College of Science and Engineering

- Program Type: Baccalaureate
- Requirements for this program are current for Fall 2012
- Required credits to graduate with this degree: 136
- Required credits within the major: 124
- This program requires summer terms.
- Degree: Bachelor of Science in Civil Engineering

The B.S.C.E. program integrates topics from chemistry, physics, advanced mathematics, and statistics, geology, and core engineering science to prepare graduates to work professionally in both public and private organizations that design, develop, and construct structures; design, build, and maintain highway systems; and design, operate, and control water resource systems. Graduates are rooted in safe and efficient design skills and show respect for and strive to improve the environment wherever they work.

The program emphasizes four of the core tracks in civil engineering: transportation systems, water resource engineering, structural engineering, and geotechnical engineering. Upper division students are exposed to each of these areas and required to specialize in one by taking additional elective courses.

Civil engineering graduates are qualified for employment in a wide variety of organizations, both public and private, including design, material testing and manufacture, construction, transportation, natural resources development, and energy. Graduates are prepared to begin their first step toward professional registration by taking the FE exam before completing their collegiate degree. They are also well qualified to continue with graduate education in civil engineering or engineering management.

Students in the B.S.C.E. program have the opportunity to put their design and entrepreneurial skills to use in ASCE design competitions, projects sponsored by regional companies, and research projects in the Undergraduate Research Opportunities Program.

Honors Requirement: To graduate with department honors, a student must have a 3.40 GPA, be an active member of Tau Beta Pi or a professional engineering society (ASCE), and be nominated by a department faculty member.

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 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

Students need to apply to the B.S.C.E. upper division program during the second semester of their sophomore year. Those who meet the GPA requirements for admission at the end of their third semester (first semester of sophomore year) will be granted provisional admission to the upper division program pending their successful completion of all courses remaining listed below with a cumulative GPA that meets the required level (2.50).

For information about University of Minnesota admission requirements, visit the Office of Admissions website.

Required prerequisites

Course Admission Requirements (36 cr)

Admission to the upper division B.S.C.E. program is competitive and based on performance in lower division courses and space availability. A C- or better is required in all program courses.

CE 1025 - Introduction to Civil Engineering (1.0 cr)
CE 2017 - Engineering Mechanics: Statics and Mechanics of Materials (5.0 cr)
CHEM 1153 - General Chemistry I [LE CAT, NAT SCI] (4.0 cr)
CHEM 1154 - General Chemistry Lab I [LE CAT, NAT SCI] (1.0 cr)
CS 1121 - Introduction to Programming in Visual BASIC.NET [LE CAT, LOGIC & QR] (3.0 cr)

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MATH 1296 - Calculus I [LE CAT, LOGIC & QR] (5.0 cr)
MATH 1297 - Calculus II [LOGIC & QR] (5.0 cr)
PHYS 2013 - General Physics I [LE CAT, NAT SCI] (4.0 cr)
PHYS 2014 - General Physics Lab I [NAT SCI] (1.0 cr)
WRIT 1120 - College Writing [LE CAT, WRITING] (3.0 cr)
MATH 3280 - Differential Equations with Linear Algebra (4.0 cr)
or MATH 3298 - Calculus III (4.0 cr)

General Requirements

The Board of Regents, on recommendation of the faculty, grants degrees from the University of Minnesota. Requirements for an undergraduate degree from University of Minnesota Duluth include the following:

1. Students must meet all course and credit requirements of the departments and colleges or schools in which they are enrolled including an advanced writing course. Students seeking two degrees must fulfill the requirements of both degrees. However, two degrees cannot be awarded for the same major.
2. Students must complete all requirements of the Liberal Education Program.
3. Students must complete a minimum of 120 semester credits.
4. At least 30 of the last 60 degree credits earned immediately before graduation must be awarded by UMD.
5. Students must complete at least half of their courses at the 3xxx-level and higher at UMD. Study-abroad credits earned through courses taught by UM faculty and at institutions with which UMD has international exchange programs may be used to fulfill this requirement.
6. If a minor is required, students must take at least three upper division credits in their minor field from UMD.
7. The minimum cumulative UM GPA required for graduation will be 2.00 and will include only University of Minnesota coursework. A minimum UM GPA of 2.00 is required in each UMD undergraduate major and minor. No academic unit may impose higher grade point standards to graduate.
8. Diploma, transcripts, and certification will be withheld until all financial obligations to the University have been met.

Program Requirements

B.S.C.E. Major Requirements (39 cr)

CE 3015 - CAD & Engineering Drawing (4.0 cr)
CE 3016 - Surveying (2.0 cr)
CE 3026 - Project Management (3.0 cr)
CE 3027 - Infrastructure Materials (4.0 cr)
CE 3115 - Structural Analysis (3.0 cr)
CE 3225 - Hydraulics and Hydrology (4.0 cr)
CE 3316 - Transportation Engineering (3.0 cr)
CE 3425 *{Inactive}*(3.0 cr)
CE 3426 - Soil Mechanics (4.0 cr)
CE 4255 - Senior Design (4.0 cr)
PHYS 2015 - General Physics II (4.0 cr)
PHYS 2016 - General Physics Lab II (1.0 cr)

Additional B.S.C.E. Requirements (25 cr)

MATH 3280 and MATH 3298 must be completed, whichever course was not taken for admission to the civil engineering program must be taken for the B.S.C.E.
CE 3221 - Fluid Mechanics (3.0 cr)
COMM 1112 - Public Speaking [LE CAT, COMM & LAN] (3.0 cr)
STAT 3411 - Engineering Statistics (3.0 cr)
SW 1210 - Global Issues [LE CAT, SOC SCI, GLOBAL PER] (3.0 cr)
WRIT 31xx (3.0 cr)
ECON 1022 - Principles of Economics: Macro [LE CAT, SOC SCI] (3.0 cr)
or ECON 1023 - Principles of Economics: Micro [LE CAT, SOC SCI] (3.0 cr)
CE 3025 - Environmental Engineering [SUSTAIN] (4.0 cr)
or CHE 2001 - Introduction to Environmental Engineering (3.0 cr)
MATH 3280 - Differential Equations with Linear Algebra (4.0 cr)
or MATH 3298 - Calculus III (4.0 cr)

Civil Engineering Technical and Additional Electives (24 cr)

Choose five courses for 15 credits from the focus groups listed below. At least two courses must be taken from the same focus group. An additional 9 credits of general technical electives must be taken and can be chosen from any course in the Swenson College of

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Information current as of March 29, 2024

Science and Engineering at 2xxx or above (including CE courses not already counted toward the degree). CHEM 1152 or CHEM 1155 and CHEM 1156 can also be used to fulfill a portion of the general technical elective requirement.

Structures Focus Group

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

- CE 4115 - Design of Steel Structures (3.0 cr)
- CE 4126 - Design of Concrete Structures (3.0 cr)
- CE 4128 - Prestressed Concrete Structures (3.0 cr)
- CE 4137 - Advanced Structural Analysis (3.0 cr)
- CE 4515 - Sustainable Design [SUSTAIN] (3.0 cr)
- CE 5115 - Structural Dynamics (3.0 cr)
- CE 5127 - Bridge Analysis and Design (3.0 cr)
- CE 5128 - Prestressed Concrete Structures (3.0 cr)
- CE 5410 *{Inactive}*(3.0 cr)
- CE 5515 - Sustainable Design and Construction (SUSTAIN) (3.0 cr)

-OR-

Water Resources Focus Group

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

- CE 4215 - Hydraulic Design (3.0 cr)
- CE 4226 *{Inactive}*(3.0 cr)
- CE 4237 - Water Quality Engineering (3.0 cr)
- CE 5237 - Water Quality Engineering (3.0 cr)

-OR-

Transportation Engineering Focus Group

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

- CE 4315 - Design of Traffic Systems (3.0 cr)
- CE 4316 - Pavement Analysis and Design (3.0 cr)
- CE 4318 - Pavement Maintenance, Rehabilitation, and Management (3.0 cr)
- CE 4326 - Highway Planning and Design (3.0 cr)
- CE 5027 - Advanced Concrete Materials and Repair (3.0 cr)
- CE 5315 - Design of Traffic Systems (3.0 cr)
- CE 5316 - Pavement Analysis and Design (3.0 cr)
- CE 5317 - Traffic Flow Theory and Modeling (3.0 cr)
- CE 5318 - Pavement Maintenance, Rehabilitation, and Management (3.0 cr)

-OR-

Geotechnical Engineering Focus Group

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

- CE 4415 - Geotechnical Design (3.0 cr)
- CE 4420 *{Inactive}*(3.0 cr)
- CE 4421 *{Inactive}*(3.0 cr)
- CE 4422 - Numerical Modeling in Geotechnical Engineering (3.0 cr)
- CE 4426 - Rock Mechanics (3.0 cr)
- CE 4436 *{Inactive}*(3.0 cr)
- CE 5420 - Advanced Soil Mechanics (3.0 cr)
- CE 5421 *{Inactive}*(3.0 cr)
- CE 5422 - Numerical Modeling in Geotechnical Engineering (3.0 cr)
- CE 5426 - Rock Mechanics (3.0 cr)
- CE 5436 *{Inactive}*(3.0 cr)

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