Twin Cities Campus

Geoengineering B.GeoE.

CSENG Civil, Envrn & Geo-Eng (CEGE)

College of Science and Engineering

- Program Type: Baccalaureate
- Requirements for this program are current for Spring 2018
- Required credits to graduate with this degree: 125
- Required credits within the major: 104 to 107
- This program requires summer terms.
- Degree: Bachelor of Geoengineering

The mission of the geoengineering 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 three objectives of our geoengineering program are that the graduates of the geoengineering program will:

1. practice technical proficiency and adaptability, and participate in life-long learning to meet the challenges facing the profession in civil engineering/geoengineering industries, government agencies, academia, or other careers;

2. exhibit strong communication, interpersonal, and management skills as leaders and team members in their profession;

3. realize their role as ethical professionals that protect and sustain human health, welfare, and the environment.

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 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.

Required prerequisites

Mathematics

MATH 1371 - CSE Calculus I [MATH] (4.0 cr)
or MATH 1271 - Calculus I [MATH] (4.0 cr)
or MATH 1571H - Honors Calculus I [MATH] (4.0 cr)
MATH 1372 - CSE Calculus II (4.0 cr)
or MATH 1272 - Calculus II (4.0 cr)
or MATH 1572H - Honors Calculus II (4.0 cr)
MATH 2374 - CSE Multivariable Calculus and Vector Analysis (4.0 cr)
or MATH 2263 - Multivariable Calculus (4.0 cr)
or MATH 2573H - Honors Calculus III (4.0 cr)
MATH 2574H - Honors Calculus IV (4.0 cr)

Mechanics

AEM 2011 - Statics (3.0 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)

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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

Earth Sciences
ESCI 2201 - Solid Earth Dynamics (4.0 cr)
ESCI 2301 - Mineralogy (3.0 cr)
ESCI 3891 - Field Methods (2.0 cr)
ESCI 4501 - Structural Geology (3.0 cr)
ESCI 2302 - Petrology (3.0 cr)
or ESCI 2203 - Earth Surface Dynamics (4.0 cr)
Field Geology
ESCI 3911 - Introductory Field Geology (4.0 cr)
or ESCI 4971W - Field Hydrogeology [WI] (4.0 cr)

Engineering
AEM 3031 - Deformable Body Mechanics (3.0 cr)
CEGE 3101 - Computer Applications I (3.0 cr)
CEGE 3102 - Uncertainty and Decision Analysis (3.0 cr)
CEGE 3301 - Soil Mechanics I (3.0 cr)
CEGE 3501 - Introduction to Environmental Engineering [ENV] (3.0 cr)
CEGE 3502 - Fluid Mechanics (4.0 cr)
CEGE 4104W - Capstone Design for Geoengineering [WI] (4.0 cr)
CEGE 4121 - Computer Applications II (3.0 cr)
CEGE 4311 - Rock Mechanics (4.0 cr)
CEGE 4351 - Groundwater Mechanics (3.0 cr)
Dynamics or Substitute
AEM 2012 - Dynamics (3.0 cr)
or CHEM 2301 - Organic Chemistry I (3.0 cr)
or CSCI 1113 - Introduction to C/C++ Programming for Scientists and Engineers (4.0 cr)
or EE 2001 *{Inactive}*(3.0 cr)
or MATS 2001 - Introduction to the Science of Engineering Materials (3.0 cr)
or ME 3331 - Thermodynamics (3.0 cr)

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)

GeoE Technical Electives
Take 14 or more credit(s) including exactly 3 sub-requirements(s) from the following:
ESCI
Take 1 or more course(s) totaling 3 or more credit(s) from the following:
•ESCI 4xxx
•ESCI 5xxx
•**GeoE Core Electives**
Take exactly 1 course(s) including exactly 0 sub-requirements(s) from the following:
•CEGE 4301 - Soil Mechanics II (3.0 cr)
•CEGE 4501 - Hydrologic Design (4.0 cr)
•CEGE 4502 - Water and Wastewater Treatment (3.0 cr)
•**GeoE Technical Electives**
Take 8 or more credit(s) from the following:
•AEM 4xxx
•AEM 5xxx
•AST 4xxx
•AST 5xxx

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Information current as of March 29, 2024

- BBE 4xxx
- BBE 5xxx
- BMEN 4xxx
- CEGE 3402 - Civil Engineering Materials (3.0 cr)
- CEGE 4xxx
- CEGE 4xxx
- CEGE 5xxx
- CHEM 4xxx
- CHEM 5xxx
- CHEN 4xxx
- CHEN 5xxx
- CMPE 4xxx
- CMPE 5xxx
- CSCI 4xxx
- CSCI 5xxx
- EE 4xxx
- EEB 3407 - Ecology (3.0 cr)
- EEB 4xxx
- EEB 5601 - Limnology (3.0 cr)
- ESCI 4xxx
- ESCI 5xxx
- ESPM 5605 - Recycling: Extending Raw Materials Supplies (3.0 cr)
- FNRM 3131 - Geographical Information Systems (GIS) for Natural Resources [TS] (4.0 cr)
- GEOG 3523 *{Inactive}*(3.0 cr)
- GEOG 3531 - Numerical Spatial Analysis (4.0 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)
- IE 4xxx
- IE 5xxx
- MATH 4xxx
- MATH 5xxx
- MATS 4xxx
- MATS 5xxx
- ME 4xxx
- ME 5xxx
- MICB 3301 - Biology of Microorganisms (5.0 cr)
- PA 4200 - Urban and Regional Planning (3.0 cr)
- PA 5013 - Law and Urban Land Use (1.5 cr)
- PA 5204 *{Inactive}*(3.0 cr)
- PA 5213 - Introduction to Site Planning (3.0 cr)
- PHYS 4xxx
- PHYS 5xxx
- STAT 4xxx
- STAT 5xxx

Upper Division Writing Intensive within the major

Students are required to take one upper division writing intensive course within the major. If that requirement has not been satisfied within the core major requirements, students must choose one course from the following list. Some of these courses may also fulfill other major requirements.

Take 0 - 1 course(s) from the following:

- CEGE 3402 - Civil Engineering Materials (3.0 cr)
- ESCI 4971W - Field Hydrogeology [WI] (4.0 cr)
- CEGE 4104W - Capstone Design for Geoengineering [WI] (4.0 cr)

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