CIVIL ENGINEERING MAJOR  
(B.S)

https://ceps.unh.edu/civil-environmental-engineering/program/bs/civil-engineering-major

Description

Matriculating students should have strong aptitudes in mathematics and science along with imagination, spatial and graphic abilities, communication skills, and creativity. Students then follow a four-year program that conforms to the guidelines of, and is accredited by the Engineering Accreditation Commission of ABET, the global accreditor of college and university programs in applied and natural science, computing, engineering and engineering technology. ABET accreditation assures that programs meet standards to produce graduates ready to enter critical technical fields that are leading the way in innovation and emerging technologies, and anticipating the welfare and safety needs of the public.

The first two years of the program provide the necessary technical knowledge in mathematics, chemistry, and physics, while introducing and developing problem-solving techniques in eight courses tailored to civil engineering students. The junior year provides courses in each of the civil engineering sub-disciplines, providing students with skills in each and allowing students to determine which they wish to pursue further. The senior year is flexible, allowing students to choose where to focus attention by selecting from more than forty elective courses in civil and environmental engineering.

The required curriculum includes seven writing-intensive courses, thereby not only satisfying, but exceeding, the University’s writing requirement. (See University Academic Requirements.)

Additional opportunities exist for study abroad, cognates, minors, and dual majors, a three-year accelerated track, and early admission into two masters of science degree programs.

Requirements

More than half of the major’s total credits and nearly all of the senior-level courses are elected by the student. Of these, there are Discovery Program electives required by the University and other electives required by the department in order to satisfy departmental objectives and accreditation requirements.

The Discovery Program is described in University Academic Requirements. Courses required by the BSCIVE program fulfill Discovery requirements in Inquiry and Environment, Technology, and Society; Writing Skills; Quantitative Reasoning; Physical Sciences and Discovery Lab; and Capstone.

To graduate with a bachelor of science in civil engineering, a student must achieve the following: 129 or more credits, credit for the civil engineering program's major and elective courses, satisfaction of the University's Discovery Program requirements, satisfaction of the University's writing-intensive course requirements, a cumulative grade-point average of 2.0 or better for all courses, and a cumulative grade-point average of 2.0 or better in all CEE courses.
To transfer into the BSCIVE program, only CEE 600-level and CEE 700-level classes with a grade of C- or better may be transferred in.

BSCIVE majors wishing to participate in domestic or international exchange programs must achieve a cumulative grade-point average of 2.50 or better in all CEE courses taken to date at the time of application to the exchange program.

To begin taking the required CEE 600-level courses in the junior year, students must meet the following requirements:

1. MATH 425, PHYS 407, CHEM 403 or CHEM 405, CEE 500 or ME 525, and CEE 501 or ME 526 must have been completed with passing grades.
2. The student must have a grade-point average of 2.00 or greater in all CEE courses.
3. The student must have a grade-point average of 2.00 or greater in MATH 425, PHYS 407, CHEM 403 or CHEM 405, CEE 500 or ME 525, and CEE 501 or ME 526.
4. The student must have a grade-point average of 2.00 or greater in CEE 500 or ME 525 and CEE 501 or ME 526.

### Degree Plan

#### Course

<table>
<thead>
<tr>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td><strong>First Year</strong></td>
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<tr>
<td><strong>Fall</strong></td>
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<tr>
<td>CEE 400</td>
<td>Introduction to Civil Engineering</td>
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<tr>
<td>CEE 520</td>
<td>Environmental Pollution and Protection: A Global Context</td>
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<tr>
<td>MATH 418</td>
<td>Analysis and Applications of Functions (if necessary, 0-4 credits)</td>
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<tr>
<td>Elective AutoCAD&lt;sup&gt;3&lt;/sup&gt;</td>
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<tr>
<td>Elective Discovery Program requirement&lt;sup&gt;1&lt;/sup&gt;</td>
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<tr>
<td><strong>Credits</strong></td>
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<tr>
<td><strong>Spring</strong></td>
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<tr>
<td>MATH 425</td>
<td>Calculus I</td>
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<tr>
<td>PHYS 407</td>
<td>General Physics I</td>
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<tr>
<td>Elective Spatial Metrics&lt;sup&gt;3&lt;/sup&gt;</td>
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<tr>
<td>ENGL 401</td>
<td>First-Year Writing</td>
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<td><strong>Credits</strong></td>
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<td><strong>Second Year</strong></td>
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<tr>
<td><strong>Fall</strong></td>
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<tr>
<td>CEE 500</td>
<td>Statics for Civil Engineers</td>
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<tr>
<td>MATH 426</td>
<td>Calculus II</td>
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<tr>
<td>PHYS 408</td>
<td>General Physics II</td>
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<tr>
<td>Elective Technical Writing&lt;sup&gt;3&lt;/sup&gt;</td>
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<tr>
<td>Elective Discovery Program requirement&lt;sup&gt;1&lt;/sup&gt;</td>
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<tr>
<td><strong>Credits</strong></td>
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<tr>
<td><strong>Spring</strong></td>
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<tr>
<td>CEE 501</td>
<td>Strength of Materials</td>
</tr>
<tr>
<td>CEE 502</td>
<td>Project Engineering</td>
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<tr>
<td>CHEM 405</td>
<td>Chemical Principles for Engineers</td>
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</tbody>
</table>
MATH 527  Differential Equations with Linear Algebra  4
Elective Discovery Program requirement  4
Credits  18

Third Year
Fall
CEE 635  Engineering Materials  4
CEE 650  Fluid Mechanics  4
CEE 680  Classical Structural Analysis  3
Elective Discovery Program requirement  1  4
Credits  15

Spring
CEE 620  Fundamental Aspects of Environmental Engineering  4
CEE 665  Soil Mechanics  4
Elective Statistics  3  4
Elective Discovery Program requirement  1  4
Credits  16

Fourth Year
Fall
CEE 797  Introduction to Project Planning and Design  2
Elective Project-Based Design Elective  3  4
Elective Area Elective 2  3  3
Elective Civil Engineering  3  3
Elective Discovery Program requirement  1  4
Credits  16

Spring
CEE 798  Project Planning and Design  2
Elective Area Elective 3  3
Elective Area Elective 4  3  3
Elective Civil Engineering  3  3
Elective Senior Technical Elective  3  3
Elective Senior Technical Elective  3  3
Credits  14

Total Credits  129

1 A course satisfying one each of the Discovery Program categories of Biological Science, Humanities, Fine and Performing Arts, Historical Perspectives, Social Science and World Cultures, preferably taken in this order. The Discovery Social Science elective must be selected from CEP 415, CSL #401, ECON 401, ECON 402, ECON 444, EREC 411, GEG 582, GEOG 584, or POLT 402.
2 Satisfies capstone requirement for Discovery.
3 Approved list available in the CEE office.

• To be able to locate, assess, and compile data, and to conduct experiments to gather data, and analyze and interpret data using engineering judgement to draw conclusions.
• To have an ability to acquire and apply new knowledge, techniques, skills, and software necessary for engineering practice.
• To be able to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, use project management skills to establish goals, plan tasks, and meet objectives.
• To be able to effectively communicate and support ideas in documents and presentations to a range of audiences.
• To be able to apply principles of mathematics, science, and engineering to identify, formulate, and solve complex engineering problems.
• To have been prepared for the Fundamentals of Engineering examination and understand the importance of professional licensure.
• To have an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, social, economic, public policy, and environmental issues.
• To recognize the roles and responsibilities of public institutions, private organization, and businesses in project development, management, and regulatory compliance.
• To be able to apply engineering design to produce solutions [5] that meet specified needs with consideration of public health, safety, and welfare as well as global, cultural, social, environmental, and economic factors.

[4] A "working knowledge" is defined as understanding and being able to apply a sub-discipline in analysis and design as demonstrated by successful completion of two or more courses with a substantial focus in at least four sub-disciplines.
[5] "Solutions" consists of systems, components, or processes that may consider risk, uncertainty, sustainability, life-cycle principles, and environmental impacts.

Student Learning Outcomes

BSCIVE Program Student Outcomes[3]

(What students are expected to know and be able to do by the time of graduation.)

• To have obtained a working knowledge[4] in the civil engineering areas of environmental, geotechnical, structural, sustainability, transportation, and water resources.