B.S. IN CIVIL ENGINEERING

Civil Engineering Curriculum

The Civil Engineering curriculum provides an integrated educational experience in mathematics, basic sciences, humanities, social sciences, engineering sciences, and civil engineering design. The first two years of the Civil Engineering curriculum provide a strong foundation in mathematics, basic sciences, and engineering sciences. During the next two years of the four-year program, the Civil Engineering curriculum integrates engineering sciences with design applications in the areas of structural, environmental, geotechnical, and water resources engineering. The curriculum culminates with a major senior-level design project that includes design applications from the major specialty areas of civil engineering.

Graduate study is offered leading to the degrees of Master of Science and Doctor of Philosophy in Civil Engineering (http://bulletin.miami.edu/graduate-academic-programs/engineering/civil-architectural-environmental-engineering/). For detailed information on graduate studies, see the Graduate Studies Bulletin.

A tabular listing of the course requirements for the degree of Bachelor of Science in Civil Engineering is shown below.

## Curriculum Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tr>
<td><strong>Engineering Courses</strong></td>
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<tr>
<td>CAE 111</td>
<td>Introduction to Engineering I</td>
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<tr>
<td>CAE 115</td>
<td>Introduction to Engineering II (Surveying)</td>
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<td>CAE 210</td>
<td>Mechanics of Solids I</td>
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<td>CAE 310</td>
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<td>CAE 350</td>
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<td>CAE 402</td>
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<td>CAE 403</td>
<td>Senior Design Project I - Engineering Design</td>
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<td>Senior Design Project II - Construction Documents</td>
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<td>CAE 430</td>
<td>Water-Resources Engineering I</td>
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<td>CAE 440</td>
<td>Water Quality Control Systems</td>
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<td>CAE 450</td>
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<td>CAE 470</td>
<td>Foundations and Earth Retaining Systems</td>
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<td>MTH 151</td>
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<td>MTH 162</td>
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<tr>
<td>CHM 153</td>
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<tr>
<td>PHY 221</td>
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<td>PHY 222</td>
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<td>PHY 225</td>
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Additional Required Courses

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<tr>
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<tr>
<td>ENG 105</td>
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<tr>
<td>ENG 107</td>
<td>English Composition II: Science and Technology</td>
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<tr>
<td>GEG 198</td>
<td>Geographic Information System for Engineers</td>
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Arts and Humanities Cognate 9

People and Society Cognate 9

Basic Science Elective 3

Total Credit Hours 127

* "Internships, Practical Training, or other types of practicum are neither required nor optional credit-earning components in the established undergraduate curriculum. Credit earned through these experiences via UMI 305 will not count towards any CAE degree requirements."

Plan of Study

Freshman Year

Fall

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Credit Hours 14

Spring

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<td>CAE 210</td>
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Credit Hours 16

Sophomore Year

Fall

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<td>PHY 225</td>
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<tr>
<td>MTH 211</td>
<td>Calculus III</td>
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<tr>
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Credit Hours 17

Spring

<table>
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<tbody>
<tr>
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<td>MTH 311</td>
<td>Introduction to Ordinary Differential Equations</td>
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<td>CHM 151</td>
<td>Chemistry for Engineers</td>
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<tr>
<td>CHM 153</td>
<td>Chemistry Laboratory for Engineers</td>
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<tr>
<td>Basic Science Elective ²</td>
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Credit Hours 16

Junior Year

Fall

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<tbody>
<tr>
<td>CAE 320</td>
<td>Concrete Structures ¹</td>
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</table>
### Mission

The mission of the Department of Civil, Architectural & Environmental Engineering is to:

- Provide high-quality undergraduate and graduate education in civil, architectural, and environmental engineering to prepare graduates for professional careers and a lifetime of learning;
- Conduct high-quality research to advance the body of knowledge and improve the quality of human life; and
- Serve the engineering profession and society through active involvement in professional organizations and contribution of professional expertise.

### Goals

The educational objectives of the Civil Engineering Program are to have graduates who within the first several years following graduation are either

1. Working as a professional in an area closely related to civil engineering, or
2. Pursuing a graduate or professional degree.

### Student Learning Outcomes

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. An ability to communicate effectively with a range of audiences.
4. 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, economic, environmental, and societal contexts.
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.