CIVIL ENGINEERING, CO-OP OPTION, BS

Bachelor of Science in Civil Engineering with Co-op (430005BS)

This option of the undergraduate program in Civil Engineering includes a cooperative education component.

Civil Engineers plan, design, build, and operate the infrastructure of modern society. This includes highways, bridges, buildings, power plants, industrial facilities, tunnels, seaports, airports, offshore structures and almost anything else needed as the basis of modern life. Civil engineers are also vigorously engaged in environmental activities, particularly creating safe water supplies and transporting it to where it is needed, collecting and treating wastewaters, cleanup of environmental problems, and insuring the safe disposal of solid wastes.

To achieve the high level of professional competence needed, an extensive study of mathematics, mechanics (both solids and fluids), engineering materials, structural design and environmental reactions is required. The civil engineering sub-topics that utilize these fundamentals are environmental, geotechnical, hydraulic, structural, and transportation engineering. The civil engineering curriculum at the University of Akron insures a firm grounding in all these sub-topic areas, while allowing a specialization, if desired, in the environmental, geotechnical, transportation, and structural areas. Engineering design problems are incorporated into courses in each area. The senior capstone design course presents a problem involving one, or possibly all, of these areas in the design of complex systems.

Most civil engineering graduates work for design consultants, construction companies, or governmental agencies. Others work for industrial firms and utilities. Many civil engineers own their own businesses.

The Civil Engineering program is accredited by the Engineering Accreditation Commission of ABET, www.abet.org (http://www.abet.org/). The program educational objectives (PEOs) for the Civil Engineering program are that, within a few years after graduation, our Civil Engineering graduates:

- successfully and accurately complete Civil Engineering projects as part of a team, on time and within budget, in an ethical and professional manner, and using modern engineering tools/software
- an ability to communicate effectively with written, oral, and visual means in both technical and non-technical settings
- professional service as evidenced by participation in a professional society and/or educational outreach activities
- engage in lifelong learning as evidenced by participation in continuing education courses, workshops, graduate courses, and by pursuing professional licensure
- a basic knowledge of the business of engineering including how the private and public sector operate separately and collectively

The curriculum is designed to emphasize the fundamentals which place the graduate in a strong position to pursue further education, formally or informally, and to begin a career in any of the above areas. To meet the curriculum requirements specified by the American Society of Civil Engineers (ASCE), the civil engineering program will prepare students to meet the following student outcomes at the time of graduation:

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

The following information has official approval of the Department of Civil Engineering and The College of Engineering and Polymer Science, but is intended only as a supplemental guide. Official degree requirements are established at the time of transfer and admission to the degree-granting college. Students should refer to the Degree Progress Report (DPR) which is definitive for graduation requirements. Completion of this degree within the identified time frame below is contingent upon many factors, including but not limited to: class availability, total number of required credits, work schedule, finances, family, course drops/withdrawals, successfully passing courses, prerequisites, among others. The transfer process is completed through an appointment with your academic advisor.

1st Year

<table>
<thead>
<tr>
<th>Fall Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>3150:151</td>
<td>Principles of Chemistry I ¹</td>
</tr>
<tr>
<td>3150:152</td>
<td>Principles of Chemistry I Laboratory</td>
</tr>
<tr>
<td>3300:111</td>
<td>English Composition I  ²</td>
</tr>
<tr>
<td>3450:221</td>
<td>Analytic Geometry-Calculus I ¹</td>
</tr>
<tr>
<td>4300:101</td>
<td>Introduction to Civil Engineering Fundamentals</td>
</tr>
<tr>
<td></td>
<td>General Education or Honors Distribution ⁴</td>
</tr>
<tr>
<td></td>
<td>Hours</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Spring Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>3150:153</td>
<td>Principles of Chemistry II ¹</td>
</tr>
<tr>
<td>3450:222</td>
<td>Analytic Geometry-Calculus II ¹</td>
</tr>
<tr>
<td>4300:102</td>
<td>Tools for Civil Engineering</td>
</tr>
<tr>
<td>3300:122</td>
<td>Second Writing Course  ³</td>
</tr>
<tr>
<td></td>
<td>General Education or Honor Distribution ⁴</td>
</tr>
<tr>
<td></td>
<td>Hours</td>
</tr>
</tbody>
</table>
### 2nd Year

**Fall Semester**
- 2980:101 Basic Surveying or Geographic Information Systems
- 3450:223 Analytic Geometry-Calculus III
- 3650:291 Elementary Classical Physics I
- 4300:201 Statics
- General Education or Honors Distribution

**Spring Semester**
- 3450:335 Introduction to Ordinary Differential Equations
- 3650:292 Elementary Classical Physics II
- 4300:202 Introduction to Mechanics of Solids
- 4300:321 Introduction to Environmental Engineering
- 4600:203 Dynamics

**Summer Semester**
- 4100:300 Cooperative Education Work Period (Possible)

### 3rd Year

**Fall Semester**
- 4300:306 Theory of Structures
- 4300:313 Soil Mechanics
- 4300:323 Water Supply & Pollution Control
- 4600:310 Fluid Mechanics I
- General Education or Honors Distribution
- CE Technical/Professional Requirement

**Spring Semester**
- 4100:301 Cooperative Education Work Period

**Summer Semester**
- 4600:305 Thermal Science
- 4300:xxx 4300 class from 4th year Spring (optional)

### 4th Year

**Fall Semester**
- 4100:302 Cooperative Education Work Period

**Spring Semester**
- 4300:314 Foundation Design
- 4300:341 Hydraulic Engineering
- 4300:361 Transportation Engineering
- 4300:380 Engineering Materials Laboratory
- 4300:401 Steel Design
- General Education or Honors Distribution

**Summer Semester**
- 4100:403 Cooperative Education Work Period

### 5th Year

**Fall Semester**
- 4300:403 Reinforced Concrete Design
- 4400:307 Basic Electrical Engineering
- CE Technical/Professional Requirement
- CE Technical/Professional Requirement
- CE Technical/Professional Requirement

**Spring Semester**
- 4300:471 Construction Administration
- 4300:490 Senior Design in Civil Engineering
- CE Technical/Professional Requirement
- General Education or Honors Distribution
- General Electives

**Summer Semester**
- 4100:403 Cooperative Education Work Period

---

1. Honors sections may be available; check the schedule of classes.
2. The Civil Engineering Department recommends that English Composition I be used to satisfy writing course requirement but other choices are available. See the General Education Program for details.
3. Check General Education Program or Honors Distribution to find courses that satisfy the second writing course requirement.
4. Credit hours shown for General Education or Honors Distribution are general guidelines only. These courses should be chosen in accordance with the appropriate General Education curriculum guide (for non-honors students) or Honors Distribution (for honors students). Honors students must also ensure that their course selections meet additional requirements not shown on this curriculum guide.