Mission Statement

The mission of the Civil and Environmental Engineering Department is to provide high-quality, state-of-the-art educational and research programs. The Department strives for excellence in its academic programs, its research endeavors, and its university, community and professional service activities. The program is designed to prepare graduates for success in their immediate, as well as long-term, professional careers as practitioners, for obtaining a professional license, and for pursuing advanced studies and lifelong learning.

Program Educational Objectives

The graduates of the Civil and Environmental Engineering Program, in their early careers, will be expected to:

1. apply their knowledge and skills as effective, productive civil engineers within private corporations, engineering consulting firms, as well as local, state and federal government agencies in the design of contemporary civil engineering systems and processes
2. work and communicate effectively with others on multidisciplinary teams to develop practical, technically sound, cost-effective solutions to complex and diverse civil engineering problems
3. build upon the fundamental knowledge gained in the undergraduate program of study, allowing analysis and design in alternative and innovative conditions
4. engage in the profession in an ethical and responsible manner
5. exhibit leadership skills
6. become and remain active members within professional and technical societies

Student Outcomes

Graduates of the Civil and Environmental Engineering Department will demonstrate the following skills and attributes when they receive their B.S. degrees:

a) apply knowledge of mathematics, science and engineering to solve civil engineering problems
b) design and conduct experiments; collect and interpret data
c) design a civil engineering system, component or process to meet specific needs
d) collaborate and communicate on multi-disciplinary teams
e) identify, formulate and solve civil engineering problems
f) demonstrate understanding of ethical and professional responsibility of a civil engineer
g) communicate effectively in oral and written form
h) demonstrate understanding of global and societal issues as they pertain to civil engineering
i) explain the importance of life-long learning and continuing education
j) demonstrate knowledge of contemporary issues
k) demonstrate proficiency in using modern engineering tools in the practice of civil engineering
l) explain the aspects of professional practice issues relevant to the civil engineering profession (include principles of sustainability in design; explain basic concepts in project management, business, public policy, and leadership; analyze issues in professional ethics; and explain the importance of professional licensure)

The civil engineering curriculum has been designed to provide a broad education in the basic sciences, mathematics, and engineering sciences, civil engineering analysis and design, and their application to civil engineering practice. The courses in civil engineering may be considered as an array of groups, each representing an area of concern to contemporary society and industry. Technical electives may be selected from one of these major areas according to the student’s particular interest or may be chosen from several areas in order to broaden one’s knowledge. A student who contemplates continuing study at the graduate level should seek the advice of his/her faculty counselor in the selection of elective courses. Realizing the social implications of the practice of civil engineering, the program provides for the development of a background in economics, the social sciences, humanities, communication skills, ethics, and related non-technical areas.

Admission Requirements: Admission is contingent upon satisfaction of the general undergraduate admission requirements of the University (http://bulletins.wayne.edu/undergraduate/general-information/admission) and the bachelor of science programs in the College of Engineering (http://bulletins.wayne.edu/undergraduate/college-engineering/bs).

Candidates for the Bachelor of Science degree must complete 123-126 credits of coursework, including the General Education (http://bulletins.wayne.edu/undergraduate/college-engineering/academic-regulations) requirements. All course work must be completed in accordance with the academic procedures of the University (http://bulletins.wayne.edu/undergraduate/college-engineering/academic-regulations) and the College of Engineering (http://bulletins.wayne.edu/undergraduate/college-engineering/academic-regulations) governing undergraduate scholarship and degrees. Non-engineering entries, cited below by subject rather than individual course number, indicate courses to be selected in fulfillment of the University General Education Requirements. The degree requirements shown in the curriculum below are in effect as of the publication date of this bulletin. Students should consult their advisors for verification of current requirements.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>MAT 2010</td>
<td>Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>CHM 1225</td>
<td>General Chemistry I for Engineers</td>
<td>3</td>
</tr>
<tr>
<td>CHM 1230</td>
<td>General Chemistry I Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>BE 1200</td>
<td>Basic Engineering I: Design in Engineering</td>
<td>3</td>
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<tr>
<td>ENG 1020</td>
<td>Introductory College Writing</td>
<td>3</td>
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<tr>
<td>MAT 2020</td>
<td>Calculus II</td>
<td>4</td>
</tr>
<tr>
<td>PHY 2175</td>
<td>University Physics for Engineers I</td>
<td>4</td>
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</tbody>
</table>
BE 1500
Introduction to Programming and Computation for Engineers

ECO 2010 or ECO 2020
Principles of Microeconomics or Principle of Macroeconomics

Civic Literacy (CIV) course

Second Year course

First Semester
MAT 2030
Calculus III

PHY 2185
University Physics for Engineers II

BE 2100
Basic Engineering III: Probability and Statistics in Engineering

CE 2410
Statics (ME 2410)

Credits 18

Second Semester
MAT 2150
Differential Equations and Matrix Algebra

CE 2420
Elementary Mechanics of Materials

CE 3450
Civil Engineering Materials

ENG 3050
Technical Communication I: Reports

Physical Science Elective

Credits 14

Third Year course

First Semester
CE 3250
Applied Fluid Mechanics

CE 4400
Structural Analysis

CE 4510
Introduction to Geotechnical Engineering

CE 4850
Engineering Economy

Credits 15

Second Semester
CE 4210
Introduction to Environmental Engineering

CE 4410
Steel Design

CE 4600
Transportation Engineering

PHI 1120
Professional Ethics

Credits 15

Fourth Year

First Semester
CE 4240
Environmental Engineering Design

CE 4420
Reinforced Concrete Design

CE 4640
Transportation Design

CE Technical Elective

CE Design Elective

Credits 15-16

Second Semester
CE 4995
Senior Design Project

CE Technical Elective

CE Design Elective

ENG 3060
Technical Communication II: Presentation

Global Learning (GL) course

Credits 15-16

Total Credits 123-126

1 Students may select from BIO 1050, BIO 1510 or GEL 1010 to meet the Physical Science elective requirement.

Technical Electives: Civil Engineering students are required to complete at least six credits in technical electives. Applicable courses include CE 3010, CE 3070, any CE course at the 5000 or 6000 level, or other courses approved by the undergraduate program coordinator.

Design Electives: Students are required to complete two courses from:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CE 5230</td>
<td>Water Supply and Wastewater Engineering</td>
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<tr>
<td>CE 5410</td>
<td>Energy, Emissions, Environment (E3) Design</td>
<td>4</td>
</tr>
<tr>
<td>CE 5510</td>
<td>Geotechnical Engineering I</td>
<td>4</td>
</tr>
<tr>
<td>CE 5520</td>
<td>Geotechnical Engineering II</td>
<td>3</td>
</tr>
<tr>
<td>CE 5610</td>
<td>Highway Design</td>
<td>3</td>
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<tr>
<td>CE 6130</td>
<td>Open Channel Hydraulics</td>
<td>3</td>
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<tr>
<td>CE 6150</td>
<td>Hydrologic Analysis and Design</td>
<td>4</td>
</tr>
<tr>
<td>CE 6190</td>
<td>Groundwater</td>
<td>3</td>
</tr>
<tr>
<td>CE 6340</td>
<td>Bridge Design and Evaluation</td>
<td>3</td>
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<tr>
<td>CE 6370</td>
<td>Advanced Reinforced Concrete Design</td>
<td>4</td>
</tr>
<tr>
<td>CE 6410</td>
<td>Advanced Steel Design</td>
<td>4</td>
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<tr>
<td>CE 6580</td>
<td>Geoenvironmental Engineering I</td>
<td>4</td>
</tr>
<tr>
<td>CE 6660</td>
<td>Pavement Management Systems: Principles and Practices</td>
<td>4</td>
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</tbody>
</table>

Other courses with approval of the undergraduate program coordinator.