

# Department of Civil and Environmental Engineering

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Civil and Environmental Engineers plans, designs, and supervises construction of almost every facility essential to modern life. Roads, bridges, buildings, water supply and waste disposal systems, transit systems, airfields, dams and irrigation projects are examples of the creative efforts of Civil and Environmental Engineers. The field of Civil and Environmental Engineering offers limitless employment opportunities that range from high-tech computer-aided design to hands-on field engineering. Civil and Environmental Engineers find rewarding careers in government, military, industry or private practice to meet the challenges of pollution control, energy, transportation, housing and other problems that face modern society.

The mission of the Department of Civil and Environmental Engineering is to proactively utilize teaching, research, and service to educate baccalaureate, masters, and doctoral students so they can become competent, dynamic, and ethical engineers of the future. To complement the classroom experience, students are encouraged to reinforce instruction by participating in cooperative education programs, assisting faculty with research, or becoming involved in professional societies. Students are expected to develop an appreciation for life-long learning and pursue professional engineering licensure. The ultimate goal is to prepare students to be future leaders who will positively impact their profession and society.

Furthermore, students should become prepared to combine research and classroom experiences to solve complex interdisciplinary problems. The overall goal of the program is to challenge students to study and innovatively solve the global sustainability challenges that they encounter. Finally, faculty, students, and staff will be engaged in professional organizations, campus committees, consultancy, student organizations, and continuing education. Through these service activities, the department will be a reliable professional resource for the University, alumni, and society.

The educational objectives of the Department of Civil and Environmental Engineering are to enable graduates to achieve career and professional accomplishments that include:

1. Demonstrate a broad knowledge of principles and fundamentals of civil engineering and their application, through their successfully practice as professional civil engineers, their pursuit of graduate or professional degrees, or their engagement in other professional careers that involve the application of the engineering method.
2. Achieve success in the multidisciplinary environment of the 21st century, and demonstrate their ability to adapt to emerging and evolving technologies, social conditions, professional standards, and career opportunities, by attaining leadership, managerial, administrative, supervisory, or other positions of responsibility within their organization.
3. Demonstrate an understanding and appreciation of the ethical, societal and professional responsibilities of a civil engineer, through professional registration and active membership in professional organizations.
4. Demonstrate an appreciation for lifelong learning and for the value of continuing professional development in maintaining their professional competence, through participation in graduate and continuing education activities.

The department offers a Bachelor of Science in Civil Engineering. For those interested in Environmental Engineering, the department offers an Environmental Engineering concentration within the Bachelor of Science in Civil Engineering. The civil engineering degree program is accredited by the Engineering Accreditation Commission of ABET, <http://www.abet.org>.

## General Education Requirements

### English Composition

EN 1103	English Composition I	3
or EN 1163	Accelerated Composition I	
EN 1113	English Composition II	3
or EN 1173	Accelerated Composition II	

### Mathematics

See Major Core

### Science

See Major Core

### Humanities

See General Education courses 6

### Fine Arts

See General Education courses 3

### Social/Behavioral Sciences

See General Education courses 6

### Major Core

**Math and Basic Science**

MA 1713	Calculus I	3
MA 1723	Calculus II	3
MA 2733	Calculus III	3
MA 2743	Calculus IV	3
MA 3253	Differential Equations I	3
CH 1213	Chemistry I	3
CH 1211	Investigations in Chemistry I	1
CH 1223	Chemistry II	3
CH 1221	Investigations in Chemistry II	1
PH 2213	Physics I	3

**Engineering Topics**

EG 1143	Graphic Communication	3
IE 3913	Engineering Economy I	3
ST 3123	Introduction to Statistical Inference	3
ME 3513	Thermodynamics I	3
EM 2413	Engineering Mechanics I	3
EM 2433	Engineering Mechanics II	3
EM 3213	Mechanics of Materials	3
EM 3313	Fluid Mechanics	3
CE 1001	Introduction to Civil Engineering	1
CE 2213	Surveying	3
CE 2803	Environmental Engineering Issues	3
CE 3113	Transportation Engineering	3
CE 3311	Construction Materials Lab	1
CE 3313	Construction Materials	3
CE 3411	Soil Mechanics Laboratory	1
CE 3413	Soil Mechanics	3
CE 3501	Water Resource Engineering Lab	1
CE 3503	Water Resource Engineering	3
CE 3603	Structural Mechanics	3
CE 3801	Environmental Engineering and Water Resources Engineering Lab	1
CE 3823	Environmental Engineering	3
CE 4903	Civil Engineering Comprehensive	3

**Oral Communication Requirement**

Fulfilled in GE 3513 and various CE courses

**Writing Requirement**

GE 3513	Technical Writing	3
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**Computer Literacy**

Fulfilled in various Engineering Topics courses

Basic Science Elective <sup>1</sup>		3
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**Civil Engineering Electives** 12

Choose one course from four of the following six lists:

## List A

CE 4513	Engineering Hydrology
CE 4523	Open Channel Hydraulics
CE 4863	Water and Wastewater Engineering
CE 4883	Engineered Environmental Systems

## List B

CE 4963	Steel Structures I
CE 4973	Concrete Structures I

## List C

CE 4133	Geometric Design of Highways	
CE 4143	Traffic Engineering	
List D		
CE 4103	Pavement Design	
List E		
CE 4433	Foundations	
List F		
CE 4703	Construction Engineering and Management	
<b>Additional Civil Engineering Electives</b>		<b>6</b>
Any CE course, except CE 4233 or CE 4243, not applied to another curriculum requirement.		
<b>Technical Elective</b>		
GR 4303	Principles of GIS	3
<b>Total Hours</b>		<b>130</b>
<b>Environmental Engineering Concentration Electives (in place of Civil Engineering Electives above)</b>		
Environmental Engineering Concentration Electives	Choose two of the following:	12
<b>List A:</b>		
CE 4513	Engineering Hydrology	
CE 4523	Open Channel Hydraulics	
CE 4883	Engineered Environmental Systems	
CE 4863	Water and Wastewater Engineering	
Choose one course from two of the following five lists:		
<b>List B:</b>		
CE 4953	Concrete and Steel Structures	
<b>List C:</b>		
CE 4133	Geometric Design of Highways	
CE 4143	Traffic Engineering	
<b>List D:</b>		
CE 4103	Pavement Design	
<b>List E:</b>		
CE 4433	Foundations	
<b>List F:</b>		
CE 4703	Construction Engineering and Management	
Environmental Engineering Concentration Basic Science Elective <sup>2</sup>		3
Restricted Environmental Engineering Concentration Electives <sup>3</sup>		3
Environmental Engineering Concentration Technical Electives <sup>4</sup>		3
<b>Total hours</b>		<b>130</b>

<sup>1</sup> Civil Engineering Basic Science Electives: GG 4153, GG 4433, GG 4503

<sup>2</sup> Environmental Engineering Concentration Basic Science Electives: BIO 1123, BIO 1134, BIO 1144, BIO 3304, GG 4523, GG 4613, GG 4623

<sup>3</sup> Restricted Environmental Engineering Concentration Electives: CE 4000, CE 4513, CE 4523, CE 4533, CE 4563

<sup>4</sup> Environmental Engineering Concentration Technical Electives: ABE 4313, ABE 4803, ABE 4844, BIO 3304, BIO 4324, BL 4263, CHE 4613, GG 4613, GR 4303