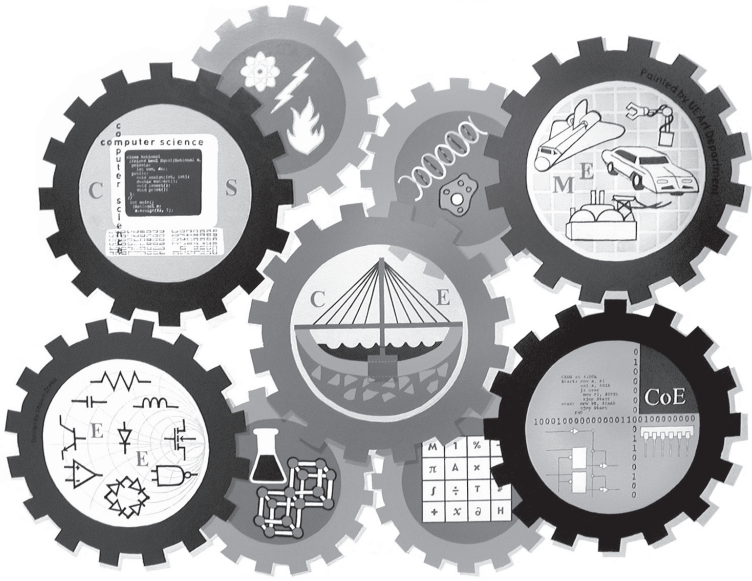


2024-25



*CIVIL ENGINEERING  
GUIDEBOOK*

**UE** University  
of Evansville

*The University of Evansville operates under a nondiscriminatory policy with regard to race, color, creed or religion, national origin, gender, sexual orientation, age, or disability.*

# CIVIL ENGINEERING PROGRAM GUIDEBOOK 2024-25

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## Webpage

[evansville.edu/civil](http://evansville.edu/civil)

The Civil Engineering program at the University of Evansville (UE) is accredited by the Engineering Accreditation Commission (EAC) of ABET, Inc., [abet.org](http://abet.org), telephone 410-347-7700.

*Revised 2024*

# CIVIL ENGINEERING AT THE UNIVERSITY OF EVANSVILLE

Civil engineering is the oldest engineering profession, dedicated to improving the quality of life in a sustainable manner. Community, societal, and environmental needs are met through the planning, design, construction, and maintenance of public and private facilities. Civil engineers apply their technical knowledge and skills to diverse projects including stadiums, buildings, dams, highways, bridges, airports, foundations, storm water management systems, and facilities for environmental remediation and compliance. Civil engineering career opportunities exist in industry, government, and the private sector. Practice areas include design, construction, project management, consulting, research, and teaching.

In accordance with the ABET accreditation criteria, the faculty, in cooperation with the Civil Engineering Advisory Council, have established program educational objectives and outcomes for students majoring in Civil Engineering at the University of Evansville. The purpose of these is to ensure that graduates of the program are adequately prepared to enter the practice of civil engineering. Recognizing that the performance of students and graduates is an important consideration in the evaluation of an institution, a system of ongoing assessment is conducted by the faculty to continuously improve the effectiveness of the program.

## **Civil Engineering Program Educational Objectives and Student Outcomes**

“Graduates” are defined as Civil Engineering alumni within three to five years of graduation.

- Objective 1** Graduates will be actively engaged in a professional career as a civil engineer or pursuing advanced study.
- Objective 2** Graduates will understand professional practice issues and demonstrate a commitment to professional licensure and continuing education.
- Objective 3** Graduates, guided by the principles of sustainable development and global interconnectedness, will understand how civil engineering projects affect society and the environment.

“Students” are defined as Civil Engineering students at the time of graduation from the University of Evansville. Students will develop the following skills:

1. The ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.

2. The 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. The ability to communicate effectively with a range of audiences.
4. The 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. The 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. The ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
7. The ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

The Civil Engineering undergraduate program is designed to provide students with a rigorous, thorough understanding of mathematics, basic sciences, humanities, social sciences, communication skills, and the civil engineering discipline. The curriculum prepares students to meet present and future challenges in the profession and to develop insights into economical, physical, social, and political constraints affecting the engineering decision-making process. Today's engineers must be adept at working in a global marketplace. To assist engineers in meeting that challenge, the University of Evansville provides students with an opportunity for an international study abroad experience at Harlaxton in Grantham, England.

Civil engineers are problem solvers, and the engineering curriculum allows students to develop the skills necessary to identify, formulate, and solve engineering problems. Components of professional and ethical responsibility are incorporated in most civil engineering courses to prepare students for professional practice.

Students are introduced to civil engineering design in the fall of their freshman year in Civil Engineering 101. The small number of freshmen in each section of this course facilitates close interaction with a faculty member who is also the students' advisor. Past freshmen projects include the design of balsa wood bridges and paper columns that are load tested in the laboratory.

After students gain an understanding of fundamental concepts, design education is continued during the junior year through a variety of design projects. Design is heavily emphasized in the Civil Engineering 400-level required and elective courses and is developed through the use

of both individual and team projects. Students use 3-D graphics software in the design process.

All Civil Engineering students are required to take the Fundamentals of Engineering exam. Although passing the exam is not required for graduation, it is the first step toward licensure as a professional engineer.

The University of Evansville is an intermediate size, private university with a strong emphasis on undergraduate education. UE is a liberal arts and sciences university. High-quality education that emphasizes both the liberal arts and specific professional degree programs, such as Engineering, Business, Education, and Nursing, is offered. This emphasis allows Engineering students to obtain a quality, well-rounded education. Engineering faculty interact with their colleagues in humanities, fine arts, social sciences, and other professional schools. The University's size of about 2,100 full-time students and its large variety of degree programs with over 75 options gives it a dynamic combination of close, faculty-student interaction and diversity.

The Civil Engineering curriculum is typical of most EAC-ABET accredited colleges and universities. What differentiates UE's Civil Engineering program from larger university programs is the following:

- Students have the opportunity to study abroad at Harlaxton in England and still complete their Civil Engineering degree in eight semesters.
- Class sizes are small, allowing for close personal contact between students and professors and for design project opportunities.
- The faculty is dedicated to teaching, which gives the program great flexibility. Course content is kept up-to-date, and innovative instruction techniques, such as multidisciplinary team projects, active learning, and problem-based learning, are used in the classroom.
- All Civil Engineering laboratory equipment is dedicated to serving undergraduate engineering students. Labs are taught by professors, not graduate students.
- Emphasis is placed on preparing students to enter the practice of civil engineering upon graduation.
- A personalized co-op program, featuring alternating terms of paid, full-time professional employment and university attendance, is available.
- The University's size and diversity facilitates the ability of engineering students to interact with students and faculty in other programs, thus allowing free intellectual and social interchange.
- Students are mentored to develop a love of learning and discovery that will motivate them to be lifelong learners.

# AREAS OF SPECIALIZATION

Technical electives can be taken in several different areas, including, but not limited to:

- Advanced Pavement Design and Management
- Design of Concrete Structures
- Design of Steel Structures
- Engineering Hydrology
- Environmental Engineering II
- Engineering Economics
- Special Topics in Civil Engineering: Earth Dams, Open Channel Hydraulics, Advanced Transportation Engineering
- Building Information Modeling
- Independent Study in Civil Engineering

In addition to this list, students may choose an elective in Mechanical Engineering.

# INTERNSHIPS

Internships are available as full-time jobs during the summer or as part-time jobs during the school year. Co-op students in Civil Engineering and interns have a wide range of employers to choose from. Employers are located in the immediate Evansville area, in the surrounding region of Indiana, Kentucky, and Illinois, and at various places throughout the country. Some of the companies that have provided professional opportunities for UE Civil Engineering students are listed below:

American Structure Point	Indiana DNR
Lochmueller Group	Indiana DOT
Bowen Engineering Corp.	Morley Architects, Engineers
Burns and McDonnell	Parsons Corporation
CH2M	Patriot Engineering
CHA Consulting	PCI/Skanska
City of Evansville	Stantec
Cives Steel Company	Traylor Brothers
Commonwealth Engineers	US Army Corps of Engineers
City of Indianapolis	US Navy

## Co-Ops

A student may participate in a co-op with careful consideration with the students academic advisor. The co-op program consists of five years at the end of which the student would earn a degree plus a minimum of three terms of experience as a civil engineer. The Center for Career Development will help a student contact employers and set-up interviews. Actual placement in a co-op position is dependent on the outcome of the interview process.

## Bachelor of Science in Civil Engineering

**FALL**

**SPRING**

### FRESHMAN

CHEM 118	Principles of Chemistry	4	MATH 222	Calculus II	4
MATH 221	Calculus I	4	PHYS 210	Calculus Physics I	4
CE 101	Introduction to Civil Engineering	3	CE 224	Construction Management	3
FYS 112	First-Year Seminar	3		General Education Course	3
	Foreign Language 111*	3		Foreign Language 112*	3
		<u>17</u>			<u>17</u>

### SOPHOMORE

ENGR 212	Statics	3	CE 221	Civil Engineering Materials	3
	Science Elective	3-4	ENGR 232	Mechanics of Materials	3
MATH 323	Calculus III	4	MATH 324	Differential Equations	3
CE 183	Surveying	3		Science Elective	3-4
	General Education Course	3		General Education Course	3
HE 100	Gen Ed-Health and Wellness	1			<u>15-16</u>
		<u>17-18</u>			

### JUNIOR

	Engineering Elective	3-4	CE 338	Soil Mechanics and Soil Behavior	3
CE 340	Structural Analysis	3	CE 339	Soil Mechanics Lab	1
ENGR 366	Fluid Mechanics	3	CE 350	Transportation Engineering	3
CE 380	Hydraulics Lab	1	CE 374	Environmental Engineering I	3
ENGR 390	Applied Engineering Mathematics	3		Technical Elective	3
	General Education Course	3		Free Elective	3
		<u>16-17</u>			<u>16</u>

### SENIOR

CE 438	Geotechnical Engineering	3	CE 497	CE Design Project II	3
				Free Elective	3
CE 469	Design of Hydraulic Structures	3		Technical Elective	3
CE 495	CE Design Project I	3		General Education Course	3
	Free Elective	3		General Education Course	3
	Technical Elective	3			<u>15</u>
		<u>15</u>			

\*Note: Only if necessary to meet the University foreign language requirement.



## Harlaxton Option Plan of Study

FALL	SPRING
<b>FRESHMAN</b>	
CHEM 118 Principles of Chemistry	4 MATH 222 Calculus II
MATH 221 Calculus I	4 PHYS 210 Calculus Physics 1
CE 101 Introduction to Civil Engineering	3 CE 224 Construction Management
FYS 112 First Year Seminar	3 ENGR 212 Statics
Foreign Language 111*	Foreign Language 112
3	3
17	17
<b>SOPHOMORE</b>	
BRIT 2XX General Education	3 CE 221 Civil Engineering Materials
Science Elective	3 ENGR 232 Mechanics of Materials
MATH 324 Differential Equations	3 MATH 323 Calculus III
General Education Course	3 Science Elective
General Education Course	3 General Education Course
3	3
15	16
<b>JUNIOR</b>	
CE 340 Engineering Elective	3-4 CE 338 Soil Mechanics and Soil Behavior
ENGR 366 Structural Analysis	3 CE 339 Soil Mechanics Lab
CE 380 Fluid Mechanics	3 CE 350 Transportation Engineering
ENGR 390 Hydraulics Lab	1 CE 374 Environmental Engineering I
CE 183 Applied Engineering Math	3 Technical Elective
Surveying	3 Free Elective
3	3
16-17	16
<b>SENIOR</b>	
CE 438 Geotechnical Engineering	3 CE 497 CE Design Project II
CE 469 Design of Hydraulic Structures	3 Free Elective
CE 495 CE Design Project I	3 Technical Elective
Free Elective	3 General Education Course
Technical Elective	3 General Education Course
HE 100 Gen Ed-Health and Wellness	1
1	15
16	

\*Note: Only if necessary to meet the University foreign language requirement.

# HARLAXTON OPTION

Harlaxton is the University's study abroad center located in the rolling countryside of Grantham, England. Harlaxton is about a one-hour train ride north of London. Engineering students who choose to spend a semester studying at Harlaxton have easy access to England's culture, history, and entertainment.

Harlaxton is housed in a large Victorian manor where about 200 students and faculty live and hold classes. The Manor has a state dining room and a number of historic state rooms where classes are held. Harlaxton also has a soccer field, sports hall, student lounges, and bistro.

Engineering students who wish to study one semester in England are encouraged to do so during the first semester of their sophomore year. At Harlaxton, Engineering students typically take Calculus, British Studies, and general education courses. Harlaxton is on the semester system and all classes earn credit at the University of Evansville in the same way they would if they were taken in Evansville. General education courses can be selected that will count as required courses toward the Civil Engineering degree. Tuition at Harlaxton is the same as tuition at the Evansville campus, and all scholarships and loans may be applied to Harlaxton costs.

Students at Harlaxton are encouraged to travel on weekends. The Manor arranges eight to 10 weekend field trips to locations such as Bath, Wales, London, and Scotland. During some semesters, less frequent but longer trips are arranged to Ireland and the continent.

Harlaxton has resident British faculty as well as visiting faculty from the University of Evansville and other selected campuses in the United States. Likewise, students at Harlaxton come from the Evansville campus and various other universities around the United States.

It is also possible to attend a five-week summer session at Harlaxton and take Independent Study in Civil Engineering (Civil Engineering 498).

## **Harlaxton Costs**

While the tuition at Harlaxton is the same as on the Evansville campus and all scholarships apply to Harlaxton, there are additional costs associated with travel. The typical round trip airfare is \$1,500 and students at Harlaxton will spend up to an additional \$4,000 on weekend trips, souvenirs, and other miscellaneous expenses. Additional expenses should be less during the summer session.

# HONORS PROGRAM – CIVIL ENGINEERING

The Honors Program is open to selected Civil Engineering majors on entrance to the University. Admittance to the Honors Program is determined by the University Honors Committee on the basis of standardized test scores (minimum 1900 SAT or minimum 29 ACT), an essay, and high school unweighted GPA 3.5 or above. The program provides participants with the opportunity to interact with other Honors Program students both socially and academically. Challenging honors courses and other academic events are available for honors students both in general education and in the major. Honors students have special library privileges, are able to register early, and may choose to stay in Powell Residence Hall where honors students are given preference.

In Civil Engineering, honors students must meet the following requirements:

1. Honors students must have a grade point average of 3.5 or better at the time of graduation.
2. Honors students must acquire a total of at least 21 points in the Honors Program made up of the following:

**Coursework** (required; 15 points)

**Alternate Courses** (points vary)

**Honors Project and Research** (required; 3 points)

**Study Abroad (optional; points vary).**

3. Students must participate in the Honors Program each semester.

To learn more about the Honors Program, please visit [evansville.edu/HonorsProgram](http://evansville.edu/HonorsProgram).

## THREE-YEAR DEGREE PROGRAM

At UE, our three-year degree pathways allow you to graduate sooner without sacrificing on renowned, quality education. Each semester is complete with hands-on experiences and one-on-one faculty support.

Learn more about our optional three-year curriculum for Civil Engineering and our four-year option which includes a co-op.

The three-year degree pathway is best suited for students who will earn Calculus I credit before beginning their first fall semester in the Civil Engineering program.



Learn more about our optional three-year degree pathway for **Civil Engineering**.

# STUDENT ORGANIZATIONS

## ASCE Student Chapter

The American Society of Civil Engineers (ASCE) is the oldest national engineering society in the United States. The mission of ASCE is to enhance the quality of life worldwide by advancing professional knowledge and improving the practice of civil engineering in service to humanity. Founded in 1852, ASCE has more than 120,000 members, including over 15,000 student members.

UE students as well as the local chapter have been recognized for accomplishments and achievements. In 2003 and 2008, the student chapter hosted the Great Lakes Regional Conference, and in 2011, they hosted the National Concrete Canoe championship. UE is the smallest school to have hosted this national competition!

The local student chapter participates in a variety of social and technical activities.

- Network with guest speakers from business and industry
- Student chapter meetings
- Construction and industrial tours
- Attend and participate in regional symposium
- Gain leadership skills as an officer in the student chapter
- Scholarship opportunities through ASCE
- Participate in the senior presentation competition at the ASCE Indiana Section meeting in Indianapolis
- Sponsor the regional balsa wood bridge competition
- Technical competitions including concrete cornhole and surveying

UE Civil Engineering seniors won first place in the ASCE state design presentation competition in 2012 and 2014, ahead of design teams from other Indiana universities.

## Society of Women Engineers

The Society of Women Engineers (SWE) is a national organization with student sections on each engineering campus. The section is an interdisciplinary organization with membership spanning all the engineering disciplines and is open to men who are interested in the mission and activities of the group.

The mission of SWE is to encourage women to achieve their full potential in careers as engineers and leaders, to expand the image of the engineering profession as a positive force in improving the quality of life, and to demonstrate the value of diversity.

# Minors

With careful curriculum planning, Civil Engineering students can earn an Engineering Management minor or a Mathematics minor without taking any additional courses. The note in parenthesis following each course shows where the course might fit into the BSCE curriculum plan. UE offers many other minors that may be of interest to students, but these two are popular among Civil Engineering students for their relevance to the discipline.

## **Engineering Management Minor** (18 hours)

ECON 101 Principles of Macroeconomics (general education elective)

or

ECON 102 Principles of Microeconomics  
ENGR 390 Applied Engineering Mathematics (required)  
ENGR 409 Engineering Economy and Decision Making (technical elective)

COMM 380 Intercultural Communication (general education elective)

or

BUS 100 Introduction to Business  
MGT 331 International Business Strategy

or

MGT 377 Organizational Behavior (free elective)  
LSCM 315 Introduction to Logistics and Supply Chain Management (free elective)

## **Mathematics Minor** (20 hours)

ENGR 390 Applied Engineering Mathematics (required)  
MATH 221 Calculus I (required)  
MATH 222 Calculus II (required)  
MATH 323 Calculus III (required)  
MATH 324 Differential Equations (required)  
MATH 3xx 300- or 400-level course in Mathematics (free elective)

# COURSES

For course descriptions, visit [evansville.edu/civil](http://evansville.edu/civil) and select Course Offerings under About Our Program.

CE 101 Introduction to Civil Engineering

CE 183 Surveying

CE 224 Construction Management

CE 221 Civil Engineering Materials

CE 338 Soil Mechanics and Soil Behavior

CE 339 Soil Mechanics Laboratory

CE 340 Structural Analysis

CE 350 Transportation Engineering

CE 374 Environmental Engineering I

CE 380 Hydraulics Laboratory

CE 438 Geotechnical Engineering

CE 441 Design of Steel Structures

CE 442 Design of Concrete Structures

CE 443 Intermediate Structural Analysis

CE 449 Advanced Structural Design

CE 450 Advanced Pavement Design and Management

CE 468 Engineering Hydrology

CE 469 Design of Hydraulic Structures

CE 475 Environmental Engineering II

CE 495 Civil Engineering Design Project I

CE 497 Civil Engineering Design Project II

CE 498 Independent Study in Civil Engineering

CE 499 Special Topics in Civil Engineering

ENGR 212 Statics

ENGR 232 Mechanics of Materials

ENGR 366 Fluid Mechanics

ENGR 390 Applied Engineering Mathematics

ENGR 409 Engineering Economy and Decision Making

# FACULTY AND STAFF

**Tonya Albright**

Administrative Assistant

812-488-2652

ta58@evansville.edu

**Suresh Immanuel, PhD, PE**

Associate Dean and Professor

812-488-2085

ss476@evansville.edu

**Hyunsoung Park, PhD**

Assistant Professor

812-488-2250

hp93@evansville.edu

**Ray Shelton**

Lab Manager

812-488-2292

rs249@evansville.edu

**Brian Swenty, PhD, PE**

Professor

812-488-2661

bs3@evansville.edu

**Megan Voss-Warner, PhD**

Assistant Professor

812-488-2176

mv110@evansville.edu



1800 Lincoln Avenue  
Evansville, Indiana 47722  
[evansville.edu](http://evansville.edu)