

Environmental Engineering (BSEnvE)

Bachelor of Science in Environmental Engineering

Environmental Engineers protect the natural environment and the health of people as influenced by the environment. The field began as a part of civil engineering by providing the water supply for municipalities but has grown to encompass a broad view of the interaction of humans with the environment. The environmental engineer applies principles from all of the natural sciences (physics, chemistry, geology, and biology) to understand the natural environment and to build systems that protect that environment. Areas of environmental engineering include air quality, water quality, water resources, and contaminant process engineering.

The environmental engineering student obtains a broad background in mathematics and all the sciences, along with their application to the several areas of environmental engineering. This flexible curriculum allows the student to elect 18 semester hours of approved technical coursework to emphasize the areas of environmental engineering of most interest to the student. In addition, courses in the humanities and social sciences are included.

To excel as an environmental engineer, a student should have an aptitude for mathematics and science, an abiding interest in protecting the natural environment and public health, and the motivation to study and prepare for environmental engineering practice. Environmental engineering graduates of the University may seek a wide variety of employment opportunities with private consulting firms, industry, and government agencies at the local, state, and national levels. Those who plan to pursue graduate work in engineering, or in other professions such as business, medicine, law, or journalism, have an excellent base on which to build.

Program Educational Objectives

Graduates of the environmental engineering program should address environmental engineering problems within a greater societal context. They should:

- Exhibit character and decision-making skills embodying professionalism and ethical behavior
- Apply knowledge, strong reasoning, and quantitative skills to design and implement creative and sustainable solutions
- Engage in lifelong learning to meet evolving engineering challenges facing society
- Exhibit strong communication, critical thinking, interpersonal, and management skills as leaders and contributors in the environmental engineering profession

Portable Computing Devices

Students entering Environmental Engineering are required to have a laptop at their disposal. Laptops do not need to be brought to campus daily, but individual courses may require that a laptop be brought to class or lab sessions. For a list of minimum system requirements, see <https://www.caee.utexas.edu/undergraduate/laptop-requirement>.

Student Outcomes

Graduates of the environmental engineering program should attain the following outcomes:

- An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
- 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
- An ability to communicate effectively with a range of audiences
- 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
- 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
- An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
- An ability to acquire and apply new knowledge as needed, using appropriate learning strategies

Total Hours Required: 125

Plan of Study

The Plan of Study is a suggested four-year course sequence to support academic planning and serves as a helpful guide. Currently enrolled students should meet with their academic advisor to tailor their course selections and timelines to their individual goals and circumstances.

Course	Title	Hours
Year 1		
Semester 1		
EVE 103	First-Year Seminar	1
BIO 311C	Introductory Biology I	3
CH 401	Principles of Chemistry I	4
M 408C	Differential and Integral Calculus	4
RHE 306	Rhetoric and Writing	3
First-Year Signature Course (090)		3
Hours		18
Semester 2		
CH 402	Principles of Chemistry II	4
M 408D	Sequences, Series, and Multivariable Calculus	4
PHY 303K	Engineering Physics I	3
PHY 105M	Laboratory For Physics 302K, 303K, and 317K	1
EVE 302	Foundations of Environmental Engineering	3
Hours		15
Year 2		
Semester 1		
E M 306	Statics	3
M 427J	Differential Equations with Linear Algebra	4
PHY 303L	Engineering Physics II	3
PHY 105N	Laboratory For Physics 302L, 303L, and 317L	1
EVE 310	Sustainable Systems Engineering	3
GOV 310L	American and Texas Government	3
Hours		17
Semester 2		
CH 328M	Organic Chemistry I	3
C E 311K	Introduction to Computer Methods	3
C E 319F	Elementary Mechanics of Fluids	3
E S 333T	Engineering Communication	3
EVE 312	Environmental Engineering and Science	3
Hours		15

Year 3		
Semester 1		
M E 310T	Applied Thermodynamics	3
C E 311S	Probability and Statistics for Civil Engineers	3
C E 356	Elements of Hydraulic Engineering	3
Hours chosen from: EVE course		3
GOV 312L	Issues and Policies in American Government	3
Hours		15
Semester 2		
GEO 303	Introduction to Geology	3
Hours chosen from: EVE course		3
Hours chosen from: EVE course		3
<u>U.S. History (060)</u>		3
<u>Humanities (040)</u>		3
Hours		15
Year 4		
Semester 1		
ARE 323K	Project Management and Economics	3
Hours chosen from: EVE course		3
Hours chosen from: EVE course		3
<u>Social and Behavioral Sciences (080)</u>		3
Mathematics or Science Elective		3
Hours		15
Semester 2		
Hours chosen from: EVE design course		3
Engineering Elective		3
Engineering Elective		3
<u>U.S. History (060)</u>		3
<u>Visual and Performing Arts (050)</u>		3
Hours		15
Total Hours		125

Requirements

All requirements are listed below, starting with the most specialized moving to the most general. Additional requirements may follow the table, so be sure to read the entire page. Some required courses listed below may also satisfy General Education requirements, including Core Curriculum.

Code	Title	Hours
Degree		
EVE 103	First-Year Seminar	1
EVE 302	Foundations of Environmental Engineering	3
EVE 310	Sustainable Systems Engineering	3
EVE 312	Environmental Engineering and Science	3
Approved environmental engineering electives (see course lists)		15
Approved environmental engineering design elective		3
ARE 323K	Project Management and Economics	3
BIO 311C	Introductory Biology I	3
CH 401	Principles of Chemistry I	4
CH 402	Principles of Chemistry II	4
CH 328M	Organic Chemistry I	3
C E 311K	Introduction to Computer Methods	3
C E 311S	Probability and Statistics for Civil Engineers	3
C E 319F	Elementary Mechanics of Fluids	3
C E 356	Elements of Hydraulic Engineering	3
E M 306	Statics	3
GEO 303	Introduction to Geology	3
M 408C	Differential and Integral Calculus	4
M 408D	Sequences, Series, and Multivariable Calculus	4

M 427J	Differential Equations with Linear Algebra	4
PHY 105M	Laboratory For Physics 302K, 303K, and 317K	1
PHY 105N	Laboratory For Physics 302L, 303L, and 317L	1
PHY 303K	Engineering Physics I	3
PHY 303L	Engineering Physics II	3
E S 333T	Engineering Communication	3
Hours chosen from:		3
M E 310T	Applied Thermodynamics	
M E 316T	Thermodynamics	
CH 353	Physical Chemistry I	
Approved mathematics or science elective		3
Approved engineering electives		6
Free electives: Additional coursework to reach total hours required.		
Subtotal		98
General Education		
<u>Remaining Core Curriculum (42 hours total)</u>		27
<u>Foreign Language other than English, Beginning Proficiency</u>		
Subtotal		27
College Requirements - Engineering		
General University Requirements		
Total Hours		125

Additional Requirements and Policies

To ensure that courses used to fulfill the social and behavioral sciences and visual and performing arts requirements of the core curriculum also meet ABET criteria, students should follow the guidance given in ABET Criteria.

Math, science and engineering electives are chosen from a list of approved courses maintained in the undergraduate office.

Technical Electives

Technical electives in environmental engineering are listed in four areas of specialization below. Six semester credit hours must be selected from one of the technical areas along with an approved environmental engineering design elective. Approved environmental engineering design electives are chosen from a list of approved courses maintained in the undergraduate office. The remaining environmental engineering electives can be taken from any area or combination of areas. Courses not listed can be approved by the undergraduate advisor.

Area 1, Climate and Energy

Code	Title	Hours
ARE 346N	Building Environmental Systems	3
ARE 346P	HVAC Design	3
ARE 370	Design of Energy Efficient and Healthy Buildings	3
ARE 371	Energy Simulation in Building Design	3
ARE 372	Modeling of Air and Pollutant Flows in Buildings	3
ARE 377K	Topics in Architectural Engineering	3
C E 369L	Air Pollution Engineering	3
C E 369R	Indoor Air Quality	3
C E 370L	Climate Change Mitigation	3

Area 2, Sustainable Water Systems

Code	Title	Hours
C E 342	Water and Wastewater Treatment Engineering	3
C E 346	Solid Waste Engineering and Management	3
EVE 350	Environmental Chemistry for a Sustainable World	3

Area 3, Water Resources and the Environment

Code	Title	Hours
C E 374K	Hydrology	3
C E 357	Geotechnical Engineering	3
C E 358	Introductory Ocean Engineering	3
C E 374N	Topics in Natural Water Systems Engineering	3
C E 374U	Topics in Urban Water Systems Engineering	3

Area 4, Contaminant Fate and Transport

Code	Title	Hours
CHE 319	Transport Phenomena	3
C E 342	Water and Wastewater Treatment Engineering	3
CHE 322	Thermodynamics	3