ENVIRONMENTAL ENGINEERING, BACHELOR OF SCIENCE

The Department of Civil and Environmental Engineering offers a complete environmental engineering undergraduate program to students on the Lincoln and Omaha campuses of the University of Nebraska. Curriculum requirements are nearly identical on both campuses. The goal is to prepare students for entry into the environmental engineering profession immediately after graduation or to pursue graduate-level studies.

The general educational objectives of the University of Nebraska–Lincoln environmental engineering undergraduate program are to prepare our graduates so that, with a UNL BS ENVE degree, a few years beyond graduation, alumni will:

- Be employed in environmental engineering or a closely related field and successfully pursue professional licensure; or, graduates will be pursuing an advanced degree in environmental engineering, a closely related field or professional education in engineering, medicine, business, or law.
- Contribute to society and address societal and environmental needs through engagement in professional, community, or service organizations.
- Agree that the environmental engineering program prepared them for success in their careers in terms of knowledge and skillsets as embodied in the program and the Complete Engineer ™ Initiative.

The professional discipline of environmental engineering is defined as the application of engineering principles to improve and maintain the environment for the protection of human health, for the protection of nature's beneficial ecosystems, and for environment-related enhancement of the quality of human life. In all professional endeavors, the environmental engineer must consider ecological effects as well as the social, economic, and political needs of people.

The environmental engineer devises solutions for topics ranging from water and air pollution control and treatment, drinking water supply, wastewater management, solid waste management, public health, water resources management, sustainable design, and industrial ecology. Environmental engineers focus on minimizing the impacts of air, water, and land pollution, minimizing waste production, maximizing the use of renewable energy in environmental systems, and protecting the environment.

Instructional emphasis is placed on fundamental engineering principles derived from mathematics, chemistry, physics, biology, earth science, and engineering science. These subjects provide a sound background for the subsequent introductory courses in environmental engineering, water resources engineering, fate and transport, process design, and sustainable design. Students are introduced to design concepts in the freshman year. Design is incorporated throughout the curriculum that culminates in two senior-level courses, ENVE 401 Environmental Engineering Design I and ENVE 402 Environmental Design II.

Instructional laboratories in that provide experiences with more than one media (water, soil, and air) in environmental engineering provide each student with an opportunity to learn, through individual participation.

Learning Outcomes

Graduates of the environmental engineering program will have:

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 above student outcomes have been approved by the ABET Engineering Area Delegation for use beginning with the 2019-20 academic year, and have been adopted by the faculty of the Department of Civil and Environmental Engineering.

Criteria for Professional Admission to the Environmental Engineering Degree Program

Students are expected to meet minimum college entrance requirements. After being admitted to the college as pre-environmental engineering students, students wishing to pursue a degree in environmental engineering must further be admitted to the degree program. Students who have completed 43 credit hours applicable to their environmental engineering degree are considered for formal admission to the environmental engineering degree program. Transfer students must have at least 12 credit hours of coursework from the University of Nebraska–Lincoln on record before an application will be considered. Students must receive a grade of C or better in the following classes to be professionally admitted to the environmental engineering program:

CHEM 1180 General Chemistry I and CHEM 1184 General Chemistry I Laboratory ;

MATH 1950 Calculus I , MATH 1960 Calculus II , and MATH 2350 Differential Equations ;

CIST 1600 Introduction to Programming Using Practical Scripting ;

PHYS 2110 General Physics I ;

MECH 223 MECH 223 Engineering Statics, and MECH 325 MECH 325 Mechanics of Elastic Bodies or MECH 373 MECH 373 Engineering Dynamics.

PLEASE NOTE

This document represents a SAMPLE 4-year plan for degree completion with this major. Actual course selection and sequence may vary and should be discussed individually with your college or department academic advisor. Advisors also can help you plan other experiences to enrich your undergraduate education such as internships, education abroad, undergraduate research, learning communities, and service learning and community-based learning.

Students must have completed the equivalent of the fourth semester before admission to the environmental engineering program. Transfer students must have all transfer hours accepted before being considered for the degree program.

Course	Title	Credits
First Semester		
ENVE 101	INTRODUCTION TO ENVIRONMENTAL ENGINEERING (This fulfills the ENGR 10 requirement)	3
CHEM 1180	GENERAL CHEMISTRY I	3
CHEM 1184	GENERAL CHEMISTRY I LABORATORY	1
MATH 1950	CALCULUS I	5
ACE 2 Communication	Skills Elective [See note below]	3
	Credits	**15**
Second Semester		
CIST 1600	INTRODUCTION TO PROGRAMMING USING PRACTICAL SCRIPTING	3
CHEM 1190	GENERAL CHEMISTRY II	3
PHYS 2110	GENERAL PHYSICS I - CALCULUS LEVEL	4
MATH 1960	CALCULUS II	4
ACE 1 Writing Elective	[See note below]	3
	Credits	**17**
Third Semeseter		
ENVE 210	FUNDAMENTALS OF ENVIRONMENTAL ENGINEERING	3
MECH 223	ENGINEERING STATICS	3
BIOL 1020	PRINCIPLES OF BIOLOGY	4
MATH 1970	CALCULUS III	4
ACE 5 Humanities Elective	[See note below]	3
ENGR 20	SOPHOMORE ENGINEERING SEMINAR	0
	Credits	**17**
Fourth Semester		
CIVE 321	PRINCIPLES OF ENVIRONMENTAL ENGINEERING	3
MECH 373 or MECH 325	ENGINEERING DYNAMICS or MECHANICS OF ELASTIC BODIES	3
GEOL 1010 or GEOL 1170	ENVIRONMENTAL GEOLOGY or INTRODUCTION TO PHYSICAL GEOLOGY	3
MATH 2350	DIFFERENTIAL EQUATIONS	3
ACE 6 Social Sciences Elective	[See note below]	3
	Credits	**15**
Fifth Semester		
CIVE 310	FLUID MECHANICS	3
ENVE 322	BIOLOGICAL PRINCIPLES OF ENVIRONMENTAL ENGINEERING	2
CIVE 321L	ENVIRONMENTAL ENGINEERING LABORATORY	1
STAT 3800	APPLIED ENGINEERING PROBABILITY AND STATISTICS	3
ACE 7 Arts Elective	[See note below]	3
ACE 8 Ethics Elective	[See note below]	3
	Credits	**15**
Sixth Semester		
ENVE 410	ENVIRONMENTAL FATE AND TRANSPORT	3
CIVE 351	INTRODUCTION TO WATER RESOURCES ENGINEERING	3
CIVE 424 or CHME 4890	SOLID WASTE MANAGEMENT ENGINEERING or AIR POLLUTION, ASSESSMENT AND CONTROL	3
CHEM 2210 & CHEM 2214	FUNDAMENTALS OF ORGANIC CHEMISTRY and FUNDAMENTALS OF ORGANIC CHEMISTRY LABORATORY	5
MECH 200	ENGINEERING THERMODYNAMICS	3
	Credits	**17**
Seventh Semester		
ENVE 430	SUSTAINABLE DESIGN IN ENVIRONMENTAL ENGINEERING	3
CIVE 420	ENVIRONMENTAL ENGINEERING PROCESS DESIGN	3
ENVE 401	ENVIRONMENTAL ENGINEERING DESIGN I	3
ACE 9 Global Awarness and Human Diversity Elective	[See note below]	3
Environmental Engineering Elective		3
Choose one that was not used to fulfill another. requirement		
CIVE 331, CIVE 371, CIVE 419, CIVE 422, CIVE 424, CIVE 425, CIVE 430, CIVE 452, CIVE 454, CIVE 455, CIVE 456, CIVE 458, CIVE 475, CIVE 481		
	Credits	**15**
Eighth Semester		
CIVE 419 or CIVE 452	FLOW SYSTEMS DESIGN or WATER RESOURCES DEVELOPMENT	3
ENVE 402	ENVIRONMENTAL ENGINEERING DESIGN II	3
Environmental Engineering Elective		3
Choose one that was not used to fulfill another requirement		
CIVE 331, CIVE 371, CIVE 419, CIVE 422, CIVE 424, CIVE 425, CIVE 430, CIVE 452, CIVE 454, CIVE 455, CIVE 456, CIVE 458, CIVE 475, CIVE 481		
Technical Electives		5
Work with your advisor to correctly select this elective.		
	Credits	**14**
	Total Credits	**125**

A list of approved ACE courses offered on the Omaha campus can be found here (https://tes.collegesource.com/publicview/TES_publicview03_group_report.aspx?sid=12214&rid=1d4a5187-e01b-4f1f-aaa6-b0040e957167&aid=e4ff42df-9ddc-4416-a5dd-18e971d1c0e4&cgrid=5508).

For more information, call 402-554-2462 or visit www.engineering.unl.edu/civil/ (http://www.engineering.unl.edu/civil/)

Major Requirements

Requirements for the Degree of Bachelor of Science in Environmental Engineering

The BS degree in environmental engineering is offered on both the Lincoln and Omaha campuses. Degree Requirements - 125 hours

Code	Title	Credits
ENVIRONMENTAL ENGINEERING CORE		
ENVE 101	INTRODUCTION TO ENVIRONMENTAL ENGINEERING	3
ENVE 210	FUNDAMENTALS OF ENVIRONMENTAL ENGINEERING	3
ENVE 322	BIOLOGICAL PRINCIPLES OF ENVIRONMENTAL ENGINEERING	2

ENVE 410	ENVIRONMENTAL FATE AND TRANSPORT	3
ENVE 430	SUSTAINABLE DESIGN IN ENVIRONMENTAL ENGINEERING	3
ENVE 401	ENVIRONMENTAL ENGINEERING DESIGN I	3
ENVE 402	ENVIRONMENTAL ENGINEERING DESIGN II	3
Credit Hours Subtotal		20
CIVIL AND ENVIRONMENTAL ENGINEERING		
CIVE 310	FLUID MECHANICS	3
CIVE 321	PRINCIPLES OF ENVIRONMENTAL ENGINEERING	3
CIVE 321L	ENVIRONMENTAL ENGINEERING LABORATORY	1
CIVE 351	INTRODUCTION TO WATER RESOURCES ENGINEERING	3
CIVE 420	ENVIRONMENTAL ENGINEERING PROCESS DESIGN	3
CIVE 419	FLOW SYSTEMS DESIGN	3
or CIVE 452	WATER RESOURCES DEVELOPMENT	
CIVE 424	SOLID WASTE MANAGEMENT ENGINEERING	3
or CHME 4890	AIR POLLUTION, ASSESSMENT AND CONTROL	
Credit Hours Subtotal		19
GENERAL ENGINEERING		
CIST 1600	INTRODUCTION TO PROGRAMMING USING PRACTICAL SCRIPTING	3
MECH 223	ENGINEERING STATICS	3
MECH 325	MECHANICS OF ELASTIC BODIES	3
or MECH 373	ENGINEERING DYNAMICS	
MECH 200	ENGINEERING THERMODYNAMICS	3
ENGR 20	SOPHOMORE ENGINEERING SEMINAR	0
Credit Hours Subtotal		12
ENVIRONMENTAL ENGINEERING ELECTIVES		
Choose a total of six credits of courses not used to satisfy another degree requirement from the following list of courses:		6
CIVE 331	INTRODUCTION TO GEOTECHNICAL ENGINEERING	
CIVE 371	MATERIALS OF CONSTRUCTION	
CIVE 419	Flow Systems Design	
CIVE 422	POLLUTION PREVENTION: PRINCIPLES AND PRACTICES	
CIVE 424	Solid Waste Management Engineering	
CIVE 425	DESIGN OF WATER TREATMENT FACILITIES	
CIVE 430	FUNDAMENTALS OF WATER QUALITY MODELING	
CIVE 452	WATER RESOURCES DEVELOPMENT	
CIVE 454	HYDRAULIC ENGINEERING	
CIVE 455	NONPOINT SOURCE POLLUTION CONTROL ENGINEERING	
CIVE 456	SURFACE WATER HYDROLOGY	
CIVE 458	GROUNDWATER ENGINEERING	
CIVE 475	WATER QUALITY STRATEGY	
CIVE 481	COMPUTATIONAL PROBLEM SOLVING IN CIVIL ENGINEERING	
CHME 4890	AIR POLLUTION, ASSESSMENT AND CONTROL	
Credit Hours Subtotal		6
TECHNICAL ELECTIVES		
Choose a total of six credits from:		6
Any 400-level CIVE course not taken to fulfill another requirement		
Any 200-, 300- or 400-level course in any engineering major not used to fulfill another requirement		
Any 200-, 300- or 400-level course in Biology, Chemistry, Public Administration (including PA 1010), Geology, GEOG 2620, Mathematics, Statistics, or Physics not used to fulfill another requirement.		
Any course in the following list: ACCT 2000, ANTH 3910, ANTH 3920, BIOL 1020, BIOL 1450, BIOL 1750, BIOL 4940, ECON 2200, ENTR 3710, GEOG 1030, (GEOG 3510 and GEOG 3514), GEOL 1170, GEOL 1180, GEOL 1010, MKT 3310 not used to fulfill another requirement.		
Credit Hours Subtotal:		6
SCIENCE		
CHEM 1180 & CHEM 1184	GENERAL CHEMISTRY I and GENERAL CHEMISTRY I LABORATORY	4
CHEM 1190	GENERAL CHEMISTRY II	3
CHEM 2210 & CHEM 2214	FUNDAMENTALS OF ORGANIC CHEMISTRY and FUNDAMENTALS OF ORGANIC CHEMISTRY LABORATORY (The 1 credit for CHEM 2214 can be used as a Technical Elective.)	5
BIOL 1020	PRINCIPLES OF BIOLOGY	4
GEOL 1010	ENVIRONMENTAL GEOLOGY	3
or GEOL 1170	INTRODUCTION TO PHYSICAL GEOLOGY	
PHYS 2110	GENERAL PHYSICS I - CALCULUS LEVEL	4
Credit Hours Subtotal		22
MATHEMATICS		
MATH 1950	CALCULUS I	5
MATH 1960	CALCULUS II	4
MATH 1970	CALCULUS III	4
MATH 2350	DIFFERENTIAL EQUATIONS	3
STAT 3800	APPLIED ENGINEERING PROBABILITY AND STATISTICS	3
Credit Hours Subtotal		19
ACE REQUIREMENTS		
ACE 1: Writing		3
Choose from the list of approved ACE 1 courses [1]		
ACE 2: Communication Skills		3
Choose from the list of approved ACE 2 courses [1]		
ACE 3: Math/Stat Reasoning		
This requirement is satisfied by MATH 1950, MATH 1960, MATH 1970, MATH 2350, or STAT 3800		
ACE 4: Science		
This requirement is satisfied by CHEM 1180, CHEM 1190, PHYS 2110, BIOL 1020, GEOL 1010, or GEOL 1170		
ACE 5: Humanities		3
Choose from the list of approved ACE 5 courses [1]		
ACE 6: Social Sciences		3
Choose from the list of approved ACE 6 courses [1]		
ACE 7: Arts		3
Choose from the list of approved ACE 7 courses [1]		
ACE 8: Ethics		
Choose from the list of approved ACE 8 courses [1]		
ACE 9: Global Awareness and Human Diversity		3

Choose from the list of approved ACE 9 courses [1]	
ACE 10: Capstone Experience	
This requirement is satisfied by ENVE 402	
Credit Hours Subtotal:	21
Total Credit Hours	**125**

[1] A list of approved ACE courses offered on the Omaha campus can be found here (https://tes.collegesource.com/publicview/TES_publicview03_group_report.aspx?sid=12214&rid=1d4a5187-e01b-4f1f-aaa6-b0040e957167&aid=e4ff42df-9ddc-4416-a5dd-18e971d1c0e4&cgrid=5508).