

Environmental Engineering (BS)

To see more about what you will learn in this program, visit the Learning Outcomes website (<https://apps.oirp.ncsu.edu/pgas/>)!

Environmental Engineering Degree

The Environmental Engineering curriculum is designed for students interested in environmental protection and sustainability. The curriculum provides students with a foundation in the science and mathematics required to observe, understand, model, and analyze environmental systems, as well as engineering skills to design critical components of society's infrastructure. Upon graduation, students are prepared to work in such areas as water treatment, water resources management, air pollution control, solid waste management, and sustainable energy systems. The curriculum emphasizes the interdisciplinary nature of environmental engineering with courses in engineering, earth, and life sciences, including specialized courses on energy and climate, pollution control, waste management, and water and sanitation in developing countries.

Specific curriculum requirements are available on the Office of Undergraduate Courses and Curricula website (<https://oucc.dasa.ncsu.edu/engineering-COE/>).

Educational Objectives in Environmental Engineering

Within a few years of graduation alumni of the Environmental Engineering program will:

- Function successfully in a professional environment by utilizing and enhancing their technical, critical thinking, communication, and leadership skills.
- Continue learning through graduate or other professional education and obtaining licensure where appropriate.
- Function in team-oriented, multidisciplinary open-ended engineering activities considering the societal, economic, public health, and environmental impacts of engineering decisions, and the professional and ethical responsibilities of environmental engineers.
- Provide mentoring to those under their supervision, and provide leadership in their employment organizations, industry associations, and professional societies.

Plan Requirements

First Year

Fall Semester		Hours
CH 101	Chemistry - A Molecular Science ¹	3
CH 102	General Chemistry Laboratory ¹	1
E 101	Introduction to Engineering & Problem Solving ²	1
E 115	Introduction to Computing Environments	1
ENG 101	Academic Writing and Research ²	4
MA 141	Calculus I ¹	4
Hours		14

Spring Semester

CH 201	Chemistry - A Quantitative Science ²	3
Select one of the following:		3
ARE 201	Introduction to Agricultural & Resource Economics	
ARE 201A	Introduction to Agricultural & Resource Economics	
EC 201	Principles of Microeconomics	
EC 205	Fundamentals of Economics	
MA 241	Calculus II ¹	4
PY 205 & PY 206	Physics for Engineers and Scientists I and Physics for Engineers and Scientists I Laboratory ¹	4
E 102	Engineering in the 21st Century	2
Hours		16

Second Year

Fall Semester

CE 214	Engineering Mechanics-Statics ²	3
CE 250	Introduction to Sustainable Infrastructure ²	3
CHE 205	Chemical Process Principles	4
MA 242	Calculus III	4
CSC 111	Introduction to Computing: Python	3
Hours		17

Spring Semester

BIO 183	Introductory Biology: Cellular and Molecular Biology	4
CE 373	Fundamentals of Environmental Engineering ²	3
SSC 442	Soil and Environmental Biogeochemistry	3
MA 341	Applied Differential Equations I	3
CE 282	Hydraulics	3
Hours		16

Third Year

Fall Semester

CE 378	Environmental Chemistry and Microbiology	4
TDE 220 or GIS 280	Civil Engineering Graphics or Introduction to GIS	3
PY 208	Physics for Engineers and Scientists II	3
PY 209	Physics for Engineers and Scientists II Laboratory	1
ST 370	Probability and Statistics for Engineers	3
COM 110	Public Speaking	3
Hours		17

Spring Semester

CE 381	Hydraulics Systems Measurements Lab	1
CE 383	Hydrology and Urban Water Systems	3
CE 339	Civil Engineering Systems	3
MAE 201	Engineering Thermodynamics I	3
PS 320 or PS 336	U.S. Environmental Law and Politics or Global Environmental Politics	3
Hours		13

Fourth Year**Fall Semester**

CE 476 or CE 479	Air Pollution Control or Air Quality	3
CE 484	Water Supply and Waste Water Systems	3
CE 488	Water Resources Engineering	3
ENE Elective I (p. 2)		3
Hours		12

Spring Semester

CE 477	Principles of Solid Waste Engineering	3
CE 481	Environmental Engineering Project	3
ENE Elective II (p. 2)		3
ENE Elective III (p. 2)		3
Hours		12
Total Hours		117

¹ A grade of C or higher is required.

² A grade of C- or higher is required.

Code	Title	Hours	Counts towards
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GEP Courses

GEP Humanities (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-humanities/)		6	
GEP Health and Exercise Studies (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-health-exercise-studies/)		2	
GEP Interdisciplinary Perspectives (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-interdisciplinary-perspectives/)		3	
GEP U.S. Diversity (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-us-diversity/) (verify requirement)			
GEP Global Knowledge (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-global-knowledge/) (verify requirement)			
Foreign Language Proficiency (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/foreign-language-proficiency/) (verify requirement)			
Total Hours		11	

ENE Elective I

Code	Title	Hours	Counts towards
CE 435	Engineering Geology	3	

CE 476	Air Pollution Control	3
CE 478	Energy and Climate	3
CE 479	Air Quality	3
CE 487	Introduction to Coastal and Ocean Engineering	3
CE 578	Energy and Climate	3
MEA 479	Air Quality	3

ENE Elective II

Code	Title	Hours	Counts towards
CE 435	Engineering Geology	3	
CE 476	Air Pollution Control	3	
CE 478	Energy and Climate	3	
CE 479	Air Quality	3	
CE 499	Undergraduate Research Thesis in Civil, Construction and Environmental Engineering	1-3	
CE 487	Introduction to Coastal and Ocean Engineering	3	
CE 578	Energy and Climate	3	
MEA 479	Air Quality	3	

ENE Elective III

Code	Title	Hours	Counts towards
ARC 521	Daylighting and Passive Energy Systems for Architecture	3	
ARC 522	Building Energy Efficiency & Renewable Energy	3	
ARC 590	Special Topics in Architecture	1-6	
CE 435	Engineering Geology	3	
CE 476	Air Pollution Control	3	
CE 478	Energy and Climate	3	
CE 479	Air Quality	3	

CE 487	Introduction to Coastal and Ocean Engineering	3
CE 578	Energy and Climate	3
MEA 479	Air Quality	3

Semester Sequence

This is a sample.

First Year

Fall Semester		Hours
CH 101	Chemistry - A Molecular Science ¹	3
CH 102	General Chemistry Laboratory ¹	1
E 101	Introduction to Engineering & Problem Solving ^{1,2}	1
E 115	Introduction to Computing Environments ^{1,2}	1
ENG 101	Academic Writing and Research ^{1,2}	4
MA 141	Calculus I ^{1,2}	4
GEP Health and Exercise Studies (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-health-exercise-studies/)		1
Hours		15

Spring Semester

CH 201	Chemistry - A Quantitative Science	3
EC 205	Fundamentals of Economics ¹	3
MA 241	Calculus II ¹	4
PY 205	Physics for Engineers and Scientists I ¹	3
PY 206	Physics for Engineers and Scientists I Laboratory ¹	1
E 102	Engineering in the 21st Century	2
Hours		16

Second Year

Fall Semester		Hours
CE 214	Engineering Mechanics-Statics	3
CE 250	Introduction to Sustainable Infrastructure	3
CHE 205	Chemical Process Principles	4
MA 242	Calculus III	4
CSC 111	Introduction to Computing: Python	3
Hours		17

Spring Semester

BIO 183	Introductory Biology: Cellular and Molecular Biology	4
CE 373	Fundamentals of Environmental Engineering	3
Earth System Chemistry Elective		3
SSC 442	Soil and Environmental Biogeochemistry	
MA 341	Applied Differential Equations I	3
CE 282	Hydraulics	3
GEP Health and Exercise Studies (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-health-exercise-studies/)		1
Hours		17

Third Year

Fall Semester

CE 378	Environmental Chemistry and Microbiology	4
TDE 220	Civil Engineering Graphics or GIS 280	3
PY 208	Physics for Engineers and Scientists II	3
ST 370	Probability and Statistics for Engineers	3
COM 110	Public Speaking	3
PY 209	Physics for Engineers and Scientists II Laboratory	1
Hours		17

Spring Semester

CE 381	Hydraulics Systems Measurements Lab	1
CE 383	Hydrology and Urban Water Systems	3
CE 339	Civil Engineering Systems	3
MAE 201	Engineering Thermodynamics I	3
PS 320	U.S. Environmental Law and Politics or PS 336	3
GEP Requirement (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/)		3
Hours		16

Fourth Year

Fall Semester

CE 488	Water Resources Engineering	3
CE 476	Air Pollution Control or CE 479	3
ENE Elective I (p. 2)		3
CE 484	Water Supply and Waste Water Systems	3
GEP Requirement (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/)		3
Hours		15

Spring Semester

CE 477	Principles of Solid Waste Engineering	3
CE 481	Environmental Engineering Project	3
ENE Elective II (p. 2)		3
ENE Elective III (p. 2)		3
GEP Requirement (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/)		3
Hours		15
Total Hours		128

¹ A grade of C or higher is required.

² A grade of C- or higher is required.

Career Opportunities

Society will always need constructed facilities to live, work, and sustain their lives and environment, and civil, construction, and environmental engineers will always be needed to plan, design, and construct these facilities. Civil, construction, and environmental engineering comprise such diversified fields that graduates have a wide choice in types and locations of employment. Jobs range from federal, state, or municipal agencies to a variety of manufacturing and processing industries, consulting firms or construction companies. The work may be performed partially or wholly in an office or in the field and may be located in a small community, a big city, an industrial center, or even in a foreign country.

Careers in either professional practice or teaching and research are common for many graduates who complete advanced degrees.