

ENVIRONMENTAL ENGINEERING, MINOR

Requirements for a minor may be completed at any campus location offering the specified courses for the minor. Students may not change from a campus that offers their major to a campus that does not offer their major for the purpose of completing a minor.

Program Description

This minor is designed to provide students in engineering, science, and other majors with a comprehensive study of environmental issues and the skills necessary to solve problems associated with environmental pollution.

What is Environmental Engineering?

The challenges in our modern society are complex and multi-faceted, demanding solutions across a wide range of disciplines. Environmental engineers have long recognized the need for convergence across disciplines to find sustainable solutions to water and climate issues that have broad societal importance. Penn State's Environmental Engineering Minor is an interdisciplinary program administered by the Department of Civil and Environmental Engineering. This minor is designed to provide students in engineering, science, and other majors with a comprehensive study of environmental issues and the skills necessary to solve problems associated with environmental pollution and climate change. A certificate is awarded to students who complete the requirements of the minor.

You Might Like This Program If...

Environmental engineers use principles from engineering, chemistry, biology, and geology to solve environmental problems. Relevant issues include water treatment and remediation, waste disposal, air pollution, and energy production. Students enrolled in the minor may select from a suite of classes that develop the fundamental skills needed to address these problems. Multiple courses not listed in the requirements section can be approved to count towards the minor through the course substitution request system.

Entrance to Minor

For entrance into the minor, students must be at least fifth-semester standing and have completed:

Code	Title	Credits
CHEM 110	Chemical Principles I	3
MATH 141	Calculus with Analytic Geometry II	4
PHYS 211	General Physics: Mechanics	4

Program Requirements

Requirement	Credits
Requirements for the Minor	18

The minor consists of 18 credits, at least 6 of which must be at the 400 level.

Requirements for the Minor

2 credits of engineering design are included.

A grade of C or better is required for all courses in the minor, as specified by Senate Policy 59-10 (<https://senate.psu.edu/policies-and-rules-for-undergraduate-students/59-00-minors-and-certificates/#59-10>). In addition, at least six credits of the minor must be unique from the prescribed courses required by a student's major(s).

Code	Title	Credits
Prescribed Courses		
<i>Prescribed Courses: Require a grade of C or better</i>		
CE 370	Introduction to Environmental Engineering	3
Additional Courses		
<i>Additional Courses: Require a grade of C or better</i>		
<i>Chemistry and Biological Sciences</i>		
Select one of the following:		3
BE 308	Engineering Elements of Biochemistry and Microbiology	
CE 479	Environmental Microbiology for Engineers	
CHEM 202	Fundamentals of Organic Chemistry I	
CHEM 210	Organic Chemistry I	
<i>Process Engineering</i>		
Select 0-3 credits of the following:		0-3
BE 302	Heat and Mass Transfer in Biological Systems	
CHE 210	Introduction to Material Balances	
EGEE 302	Principles of Energy Engineering	
MNPR 301	Elements of Mineral Processing	
NUCE 430	Design Principles of Reactor Systems	
<i>Applied Fluid Mechanics</i>		
Select one of the following:		3
AERSP 308	Mechanics of Fluids	
BE 467	Design of Stormwater and Erosion Control Facilities	
CE 371	Water and Wastewater Treatment	
CE 462	Open Channel Hydraulics	
CHE 330	Process Fluid Mechanics	
EME 303	Fluid Mechanics in Energy and Mineral Engineering	
ME 320	Fluid Flow	
METEO 454	Introduction to Micrometeorology	
NUCE 431W	Nuclear Reactor Core Design Synthesis	
<i>Environmental Sciences and Design</i>		
Select 6-9 credits of the following:		6-9
BE 468	Microbiological Engineering	
BE 477	Land-Based Waste Disposal	
CE 472W	Environmental Engineering Capstone Design	
CE 475	Water Quality Chemistry	
CE 476	Solid and Hazardous Wastes	
CHEM 402	Environment Chemistry: Atmosphere	
EGEE/ME 430	Introduction to Combustion	
EGEE 470	Air Pollutants from Combustion Sources	
ENVSE 408	Contaminant Hydrology	
ENVSE 427	Pollution Control in the Process Industries	
ERM 411	Legal Aspects of Resource Management	
ERM 412	Resource Systems Analysis	
ERM 413W	Case Studies in Ecosystem Management	

ERM 447	Stream Restoration
ERM 450	Wetland Science and Sustainability
FSC 431	The Chemistry of Fuels
GEOSC 452	Hydrogeology
ME 405	Indoor Air Quality Engineering
ME 433	Fundamentals of Air Pollution
NUCE 405	Nuclear and Radiochemistry
NUCE 420	Radiological Safety
NUCE 428	Radioactive Waste Control
SOILS 420	Remediation of Contaminated Soils

Academic Advising

The objectives of the university's academic advising program are to help advisees identify and achieve their academic goals, to promote their intellectual discovery, and to encourage students to take advantage of both in-and out-of class educational opportunities in order that they become self-directed learners and decision makers.

Both advisers and advisees share responsibility for making the advising relationship succeed. By encouraging their advisees to become engaged in their education, to meet their educational goals, and to develop the habit of learning, advisers assume a significant educational role. The advisee's unit of enrollment will provide each advisee with a primary academic adviser, the information needed to plan the chosen program of study, and referrals to other specialized resources.

READ SENATE POLICY 32-00: ADVISING POLICY (<https://senate.psu.edu/policies-and-rules-for-undergraduate-students/32-00-advising-policy/>)

University Park

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Career Paths

If your goals are to enter industry or academia students who complete a minor can apply for a wide range of graduate school programs and jobs focused on engineering and sustainability to solve the world's problems. Environmental engineers often work in interdisciplinary collaborative groups with other fields such as chemists, biologists or geoscientists-increasing the importance of course work preparation.

Careers

Environmental engineers help create sustainable solutions to problems faced in society. Examples include the renovation of the current aging and energy-intensive water infrastructure as well as solutions and adaption to changes in climate. Careers can include environmental consulting, sustainability officers, water resource and air quality engineers, and environmental compliance officers.

Opportunities for Graduate Studies

Students will take courses from multiple disciplines to provide the adequate depth and breadth so that they can pursue graduate studies. Here at Penn State we offer multiple advanced degrees, including a MEng (no thesis, typically 1 to 1.5 years to complete), MS (~ 2 years

to complete), and PhD (~ 5 years to complete) in Environmental Engineering.

MORE INFORMATION ABOUT OPPORTUNITIES FOR GRADUATE STUDIES (<https://www.cee.psu.edu/academics/graduate/>)

Contact

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