

# ENVIRONMENTAL ENGINEERING, MINOR

Environmental engineers play particularly pivotal roles as professionals who bridge the gap between understanding complex scientific concepts and helping to formulate public policies that affect the environment. Environmental engineering has become an important aspect of engineering practice in most engineering fields, and the discipline spans the professional spectrum from the private sector through governmental agencies to academia. An undergraduate minor in environmental engineering allows engineering students to pursue an interest in this field and to incorporate aspects of environmental engineering into careers in other engineering disciplines.

Students in any undergraduate major in the Whiting School of Engineering are eligible for admission to the environmental engineering minor program. Students will work with an advisor in the Department of Environmental Health and Engineering to develop a program that meets the requirements for the minor and is consistent with the educational requirements of their major field of engineering study.

## Program Requirements

Requirements of the EE minor program consist of:

- a set of required core science and mathematics courses, already common to civil and chemical engineering majors;
- three required courses in environmental engineering (total of 10 credits); and
- three elective courses (total of 9 credits): one taken at the freshman or sophomore level, the second taken at the junior or senior level, plus one additional elective course.

### Core Courses (EE Minor)

Advanced placement credits and/or equivalent courses in other schools or departments are acceptable, subject to advisor approval.

Code	Title	Credits
AS.110.108	Calculus I (Physical Sciences & Engineering)	
AS.110.109	Calculus II (For Physical Sciences and Engineering)	
AS.110.202	Calculus III	
or AS.110.211	Honors Multivariable Calculus	
EN.553.291	Linear Algebra and Differential Equations	
AS.030.101	Introductory Chemistry I	
AS.030.102	Introductory Chemistry II	
AS.030.105	Introductory Chemistry Laboratory I	
AS.030.106	Introductory Chemistry Laboratory II	
AS.171.101	General Physics: Physical Science Major I	
or AS.171.106	General Physics for Physical Sciences Majors (AL)	
AS.173.111	General Physics Laboratory I	
AS.173.112	General Physics Laboratory II	

### Required Courses (EE Minor)

A total of 19 credits are required in addition to the previously specified core.

Code	Title	Credits
EN.570.303	Environmental Engineering Principles and Applications	3
EN.570.304	Environmental Engineering Laboratory	4
EN.570.305	Environmental Health and Engineering Systems Design	4

**Total Credits** 11

### Elective Courses

(Total of 9 credits). One course from each of two groups is required, plus one additional course (3 total required minor electives). Double counting of these courses with specified required courses in the student's major is not allowed. Substitution for one required course may be possible under special circumstances, with the explicit approval of the environmental engineering minor advisor. Additional course electives are possible but require the approval of the environmental engineering minor advisor.

Code	Title	Credits
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#### Group A

Select one introductory course at the freshman and sophomore level:<sup>1</sup>

AS.020.151	General Biology I
AS.270.220	The Dynamic Earth: An Introduction to Geology
EN.570.108	Introduction to Environmental Engineering and Design
EN.570.201	Environmental Biology and Ecology
EN.570.239	Environmental Engineering Chemistry - Current and Emerging Topics
EN.570.350	Environmental Hazards and Health Risks

#### Group B

Select one engineering science course at the junior and senior level:<sup>1</sup>

AS.030.205	Introductory Organic Chemistry I
AS.030.301	Physical Chemistry I
EN.540.301	Kinetic Processes
EN.540.303	Transport Phenomena I
EN.570.353	Hydrology
EN.570.442	Environmental and Analytical Organic Chemistry
EN.570.443	Aquatic and Biofluid Chemistry
EN.570.445	Physical and Chemical Processes I
EN.570.490	Solid Waste Engineering and Management
EN.570.491	Hazardous Waste Engineering and Management

<sup>1</sup> Engineering science courses that are developed for juniors and seniors and also introductory graduate-level courses. One course is required.

For further information, contact Dr. Harihar Rajaram, EE Minor Coordinator, 410-516-5421, hrajara1@jhu.edu, or Natalie Van Horn, Senior Academic Program Coordinator, nvanhor2@jhu.edu.