

# ENVIRONMENTAL ENGINEERING AND SCIENCE, MASTER OF SCIENCE

The degree and certificates offered under this program emphasize the fundamental concepts of physics, chemistry, biology, and geology as applied in the context of environmental issues, with less emphasis on design and management.

## Admission Requirements

Applicants (degree seeking and special student) must meet the general requirements for admission to graduate study, as outlined in the Admission Requirements (<https://e-catalogue.jhu.edu/engineering/engineering-professionals/admission-requirements/>) section. The applicant's prior education must include:

1. successful completion of one year of college-level calculus, and
2. successful completion of college-level courses in physics, chemistry, biology, geology, statistics, and differential equations is strongly recommended.

Applicants whose prior education does not include the prerequisites listed above may still enroll under provisional status, followed by full admission status once they have completed the missing prerequisites. Missing prerequisites may be completed with Johns Hopkins Engineering or at another regionally accredited institution. Admitted students typically have earned a grade point average of at least 3.0 on a 4.0 scale (B or above) in their undergraduate studies. Transcripts from all college studies must be submitted. When reviewing an application, the candidate's academic and professional background will be considered.

Ten courses must be completed within five years. The curriculum consists of five courses from the Environmental Engineering and Science program and five electives.

Electives may be selected from any of the three environmental areas of study: Environmental Engineering (<https://e-catalogue.jhu.edu/engineering/engineering-professionals/environmental-engineering-science-management-programs/environmental-engineering-master/#requirementstext>), Environmental Engineering and Science (p. 1), or Environmental Planning and Management (<https://e-catalogue.jhu.edu/engineering/engineering-professionals/environmental-engineering-science-management-programs/environmental-planning-management-master-science/#requirementstext>), subject to prerequisite restrictions. Only one C-range grade (C+, C, or C-) can count toward the master's degree.

Any deviation from this program, including transfer of courses and any other requisites specified in the student's admission letter, will not be approved by the program chair.

## Courses

Code	Title	Credits
<b>Required Course (Students with an undergraduate degree in Environmental Engineering are exempt from this requirement.)</b>		
EN.575.604	Principles of Environmental Engineering <sup>1</sup>	3
<b>Environmental Engineering and Science</b>		
Select a minimum of five from the following:		

EN.575.601	Fluid Mechanics	3
EN.575.615	Ecology	3
EN.575.619	Principles of Toxicology, Risk Assessment & Management	3
EN.575.626	Hydrogeology	3
EN.575.629	Modeling Contaminant Migration through Multimedia Systems	3
EN.575.643	Chemistry of Aqueous Systems	3
EN.575.645	Environmental Microbiology	3
EN.575.704	Applied Statistical Analysis and Design of Experiments for Environmental Applications	3
EN.575.708	Open Channel Hydraulics	3
EN.575.713	Field Methods in Habitat Analysis and Wetland Delineation	3
EN.575.716	Principles of Estuarine Environment: The Chesapeake Bay Science and Management	3
EN.575.717	Hydrology	3
EN.575.727	Environmental Monitoring and Sampling	3
EN.575.728	Sediment Transport and River Mechanics	3
EN.575.730	Geomorphic and Ecologic Foundations of Stream Restoration	3
EN.575.743	Atmospheric Chemistry	3
EN.575.744	Environmental Chemistry	3
EN.575.763	Nanotechnology and the Environment: Applications and Implications	3
EN.575.801	Independent Project	3

<sup>1</sup> All students in the Environmental Engineering, Science, and Management Programs who do not possess an undergraduate degree in Environmental Engineering must take EN.575.604 Principles of Environmental Engineering as one of their required courses.

## Electives

Code	Title	Credits
Select up to five of the following electives:		
EN.575.604	Principles of Environmental Engineering	3
EN.575.605	Principles of Water and Wastewater Treatment	3
EN.575.606	Water Supply and Wastewater Collection	3
EN.575.607	Radioactive Waste Management	3
EN.575.608	Optimization Methods for Public Decision Making	3
EN.575.611	Economic Foundations for Public Decision Making	3
EN.575.620	Solid Waste Engineering & Management	3
EN.575.623	Industrial Processes and Pollution Prevention	3
EN.575.628	Business Law For Engineers	3
EN.575.635	Environmental Law for Engineers & Scientists	3
EN.575.637	Environmental Impact Assessment	3
EN.575.640	Geographic Information Systems (GIS) and Remote Sensing for Environmental Applications	3
EN.575.658	Natural Disaster Risk Modeling	3
EN.575.703	Environmental Biotechnology	3
EN.575.706	Biological Processes for Water & Wastewater Treatment	3
EN.575.707	Environmental Compliance Management	3
EN.575.710	Financing Environmental Projects	3

EN.575.711	Climate Change and Global Environmental Sustainability	3
EN.575.714	Water Resources Management	3
EN.575.715	Environmental Contaminant Dispersion and Transport	3
EN.575.721	Air Quality Control Technologies	3
EN.575.722	Principles of Air Quality Management	3
EN.575.723	Environmental Sustainability and Next Generation Buildings	3
EN.575.731	Water Resources Planning	3
EN.575.732	Energy Technologies for Solving Environmental Challenges	3
EN.575.733	Energy and the Environment	3
EN.575.734	Smart Growth Strategies for Sustainable Cities	3
EN.575.735	Energy Policy and Planning Modeling	3
EN.575.736	Designing for Sustainability: Applying a Decision Framework	3
EN.575.737	Environmental Security with Applied Decision Analysis Tools	3
EN.575.738	Transportation, Innovation, and Climate Change	3
EN.575.741	Membrane Filtration Systems and Applications in Water and Wastewater Treatment	3
EN.575.742	Hazardous Waste Engineering and Management	3
EN.575.745	Physical and Chemical Processes for Water and Wastewater Treatment	3
EN.575.746	Water and Wastewater Treatment Plant Design	3
EN.575.747	Environmental Project Management	3
EN.575.749	Water Quality of Rivers, Lakes, and Estuaries	3
EN.575.750	Environmental Policy Needs in Developing Countries	3
EN.575.751	Environmental Justice, Climate, and Health Equity	3
EN.575.752	Environmental Decision-Making: Climate, Energy, Indigenous Populations, and Accessibility	3
EN.575.753	Communication of Environmental Information and Stakeholder Engagement	3
EN.575.759	Environmental Policy Analysis	3
EN.575.761	Measurement and Pseudo-measurement in the Environmental Arena	3
EN.575.771	Data Analytics in Environmental Health and Engineering	3

Please refer to the course schedule ([ep.jhu.edu/schedule](https://apps.ep.jhu.edu/schedule) (<https://apps.ep.jhu.edu/schedule/search/>)) published each term for exact dates, times, locations, fees, and instructors.