

# ENVIRONMENTAL ENGINEERING

---

From the NJIT Department of Civil and Environmental Engineering, the Graduate Certificate in Environmental Engineering allows students to focus in Water Quality, Treatment and Infrastructure, Integrated Site Remediation, or Multidisciplinary Environmental Engineering. Environmental Engineers are interested in ways to protect the environment, improve water quality, and are essential in planning, designing and constructing water and wastewater treatment plants, solid waste disposal systems, site remediation approaches and emission control measures.

## Who would be suited to take this program?

Eligible participants are typically employees of major corporations, government agencies, private consulting and construction firms, and universities.

## What will I learn?

- **Physical Processes of Environmental Systems** - Physical processes in various media (open water, porous media) under various hydraulic regimes (laminar and turbulent). Transport by diffusion, convection, and dispersion is considered along with absorption.
- **Environmental Microbiology** - Microbiology of natural and human impacted environment, fundamental microbiology in water treatment engineering, microbial detection methodologies, waterborne disease outbreaks, microbial risk assessment, biotechnologies for renewable energy, and other emerging topics
- **Site Remediation** - Regulations, cleanup standards, remedial investigations, feasibility studies, risk assessment, and safety. Established and innovative cleanup technologies such as incineration, containment, bioremediation, vapor extraction and ground water recovery.
- **Physical and Chemical Treatment** - Physical and chemical operations and processes employed in the treatment of water and wastewater. Gas transfer, coagulation, flocculation, solid-liquid separation, filtration, and disinfection.
- **Biological Treatment** - Principles of evaluation and control of water pollution that describe aerobic treatment processes such as oxidation ponds, trickling filters, and activated sludge; and anaerobic processes, and sludge handling and disposal as well as biodegradability study techniques for various wastes.
- **Environmental Impact Analysis** - Environmental problems, federal and state standards, methodology for developing impact statements, case studies based on recent experience, basis for assessment and decision making.
- **Stormwater Management** - With an emphasis on design practices, you will learn regulatory framework, an overview of structural and non-structural BMPs, groundwater recharge analysis, estimate of runoff, and design of detention basin and drainage systems.
- **Geotechnical Aspects of Solid Waste** - municipal landfill, dredged materials, coal and incinerator ashes, identification and classification of waste materials, geological criteria for siting, laboratory and field testing, design for impoundment and isolation of waste, methods of stability analyses of landfill sites, techniques for stabilizing waste sites, leachate and gas collection and venting systems.
- **Legal Aspects in Environmental Engineering** - Control of air, water, and solid waste pollution by federal, state, and local government statutes and international law. Preparation of environmental impact statements and the right of private citizens to bring suit under federal clean air and water pollution legislation are discussed, as well as limitations on these rights.

## Why study Environmental Engineering at NJIT?

Students will learn to develop sustainable solutions to environmental problems, preparing to work with regional, national and global communities to protect the environment and improve water quality. Jobs in this field are essential in planning, designing and constructing water and wastewater treatment plants, solid waste disposal systems, site remediation approaches and emission control measures.

## Into what industries might holders of this program find employment?

- Federal/State/Local Department of Environmental Protection (e.g., USDEP, NJDEP)
- Private consulting company conducting audits/reviews in environmental science
- Junior Civil Engineer
- Sr. Transportation Engineering Manager
- Hydrologist

## Prerequisites

Applicants should have a bachelor's degree from an accredited institution with some undergraduate background in a related field (environmental engineering, mathematics, etc.).

## Related Degree Programs

All courses in this program related entirely to the NJIT MS in Environmental Engineering (<https://catalog.njit.edu/graduate/newark-college-engineering/civil-environmental/environmental-ms/>).

### What are the Required Courses?

Code	Title	Credits
<b>Core Courses</b>		
Select four (4) of the following:		
ENE 630 ( <a href="http://catalog.njit.edu/search/?P=ENE%20630">http://catalog.njit.edu/search/?P=ENE%20630</a> )	Physical Processes of Env Syst.	
ENE 661 ( <a href="http://catalog.njit.edu/search/?P=ENE%20661">http://catalog.njit.edu/search/?P=ENE%20661</a> )	Environmental Microbiology	
ENE 662 ( <a href="http://catalog.njit.edu/search/?P=ENE%20662">http://catalog.njit.edu/search/?P=ENE%20662</a> )	Site Remediation	
ENE 664 ( <a href="http://catalog.njit.edu/search/?P=ENE%20664">http://catalog.njit.edu/search/?P=ENE%20664</a> )	Physical and Chemical Treatment	
ENE 665 ( <a href="http://catalog.njit.edu/search/?P=ENE%20665">http://catalog.njit.edu/search/?P=ENE%20665</a> )	Biological Treatment	
ENE 671 ( <a href="http://catalog.njit.edu/search/?P=ENE%20671">http://catalog.njit.edu/search/?P=ENE%20671</a> )	Environmental Impact Analysis	
ENE 672 ( <a href="http://catalog.njit.edu/search/?P=ENE%20672">http://catalog.njit.edu/search/?P=ENE%20672</a> )	Stormwater Management	
CE 647 ( <a href="http://catalog.njit.edu/search/?P=CE%20647">http://catalog.njit.edu/search/?P=CE%20647</a> )	Geotechnical Aspects of Solid Waste	
EM 631 ( <a href="http://catalog.njit.edu/search/?P=EM%20631">http://catalog.njit.edu/search/?P=EM%20631</a> )	Legal Aspects in Environmental Engineering	