

ENVIRONMENTAL SCIENCE M.S.

Degree: Master of Science
<https://www.towson.edu/fcsm/departments/environsci/grad/science/>

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The graduate program in environmental science (ENVS) is an interdisciplinary program with core courses taught by biologists, geologists and chemists. The program seeks to provide students with the ability to collect and evaluate geological, chemical and ecological data associated with creating and resolving solutions to the most pressing environmental issues and problems currently faced by metropolitan areas. The program has a thesis and a non-thesis capstone option, both designed to develop a student's ability to communicate the scientific basis for environmental decisions that impact human health and the environment to a wide audience of potential stakeholders including policy makers and disciplinary scientists.

Students pursuing a thesis will work with a research adviser to develop a scientifically sound project with the ultimate goal being the successful defense of their thesis. The non-thesis students will complete their degree in with the capstone Research Practicum course (ENVS 798) where they will conduct a comprehensive scientific review of the policy and/or regulations governing a current or emerging environmental issue. As part of the requirements for ENVS 798 these students will draft a policy analysis document to be reviewed by an external content expert and make a presentation of their findings to a panel of invited experts and guests.

The students currently enrolled in the program come from a range of backgrounds and disciplines that include those already working in the environmental field, those who are looking to enter the environmental work force or go on for an advanced graduate degree in a related field, and educators seeking to expand their knowledge of environmental sciences in metropolitan areas so they can teach the specialty. Four concentrations were developed within the program, based on workforce needs identified by regional environmental professionals: Biological Resources Management, Water Resources Management and Assessment, Wetlands Assessment and Management, and Environmental Spatial Analysis.

The graduate handbook describes the policies and procedures pertaining to the M.S. degree and graduate certificate in Environmental Science. All required courses in the program and all ENVS-sponsored electives are taught in the late afternoon or evening.

Requirements Admission Requirements

Application deadlines and a full listing of materials required for admission can be found on the website.

Prerequisites for Admission

- A minimum undergraduate GPA of 3.0 for full admission and 2.75 for conditional admission
- Students without an undergraduate degree in a related area (i.e. biology, chemistry, geology, or environmental science) are required to

complete the following courses with a minimum GPA of 2.75 in order to be considered for admission. This should be done in consultation with the Graduate Program Director:

- two terms of introductory biology with laboratory
- two terms of introductory chemistry with laboratory
- one term of statistics or one term of calculus

Degree Requirements

All M.S. students complete 30 units of graduate work. No more than three courses may be at the 500 level. In addition to completing the core courses listed below, all students select their elective courses from among those listed below.

Thesis Option (30 units)

Code	Title	Units
Required Colloquium		
ENVS 600	ENVIRONMENTAL SCIENCE AND SUSTAINABILITY COLLOQUIUM	1
Core Areas		10-11
Select one course from three of the four core areas listed below		
Core Area 1: Environmental Geology		
ENVS 601	TOPICS IN ENVIRONMENTAL GEOLOGY	
ENVS 650	AQUEOUS GEOCHEMISTRY	
Core Area 2: Ecosystem Science		
ENVS 604	ECOSYSTEM ECOLOGY	
Core Area 3: Environmental Chemistry		
ENVS 605	CHEMISTRY OF ENVIRONMENTAL SYSTEMS	
Core Area 4: Environmental Law, Policy, and Education		
BIOL 651	ENVIRONMENTAL AND BIOLOGICAL SCIENCE IN INTEGRATED STEM EDUCATION	
ENVS 582	ENVIRONMENTAL EDUCATION & SERVICE LEARNING IN THE TROPICS	
ENVS 603	ENVIRONMENTAL LAW AND REGULATIONS	
ENVS 611	WATER POLICIES OF THE UNITED STATES	
ENVS 620	ENVIRONMENTAL POLICY AND SUSTAINABLE MANAGEMENT	
ENVS 625	SCIENCE AND POLICY OF THE CHESAPEAKE BAY RESTORATION	
Electives (see list below)		12-13
M.S. Thesis		
ENVS 896	THESIS	6
Total Units		30

Non-Thesis Option (30 units)

Code	Title	Units
Required Colloquium		
ENVS 600	ENVIRONMENTAL SCIENCE AND SUSTAINABILITY COLLOQUIUM (ENVIRONMENTAL SCIENCE & SUSTAINABILITY COLLOQUIUM)	1
Core Areas		14
Select one course from each of the four core areas listed below		

Core Area 1: Environmental Geology		
ENVS 601	TOPICS IN ENVIRONMENTAL GEOLOGY	
ENVS 650	AQUEOUS GEOCHEMISTRY	
Core Area 2: Ecosystem Science		
ENVS 604	ECOSYSTEM ECOLOGY	
Core Area 3: Environmental Chemistry		
ENVS 605	CHEMISTRY OF ENVIRONMENTAL SYSTEMS (CHEMISTRY OF ENVIRONMENTAL SYSTEMS)	
Core Area 4: Environmental Law, Policy, and Education		
BIOL 651	ENVIRONMENTAL AND BIOLOGICAL SCIENCE IN INTEGRATED STEM EDUCATION	
ENVS 582	ENVIRONMENTAL EDUCATION & SERVICE LEARNING IN THE TROPICS	
ENVS 603	ENVIRONMENTAL LAW AND REGULATIONS	
ENVS 611	WATER POLICIES OF THE UNITED STATES	
ENVS 620	ENVIRONMENTAL POLICY AND SUSTAINABLE MANAGEMENT	
ENVS 625	SCIENCE AND POLICY OF THE CHESAPEAKE BAY RESTORATION	
Electives (see list below)		12
Research Practicum		
ENVS 798	RESEARCH PRACTICUM	3
Total Units		30

Electives

All ENVS courses at the 500-level and 600-level are approved electives. Core area courses taken in excess of the minimum requirements for the core areas also qualify as electives. Additional approved electives are shown below.

Code	Title	Units
BIOL 506	LIMNOLOGY	4
BIOL 510	CONSERVATION BIOLOGY	4
BIOL 518	MICROBIOLOGY	4
BIOL 532	VASCULAR PLANT TAXONOMY	4
BIOL 535	PLANT ECOLOGY	4
BIOL 555	FISH BIOLOGY	4
BIOL 556	ORNITHOLOGY	4
BIOL 561	ENTOMOLOGY	4
BIOL 567	HERPETOLOGY	4
BIOL 601	CURRENT TOPICS IN BIOLOGY ¹	3
BIOL 603	DATA ANALYSIS AND INTERPRETATION FOR BIOLOGISTS	3
BIOL 609	COMMUNITY ANALYSIS AND BIOASSESSMENT	3
BIOL 610	POPULATION AND COMMUNITY BIOLOGY	3
BIOL 611	GLOBAL CHANGE BIOLOGY	3
BIOL 619	ENVIRONMENTAL MICROBIOLOGY	3
GEOG 503	SOILS AND VEGETATION	3
GEOG 516	QUANTITATIVE METHODS IN GEOGRAPHY	3
GEOG 523	GIS APPLICATIONS	3
GEOG 557	STUDIES IN NATURAL HAZARDS	3

GEOG 587	ENVIRONMENTAL IMPACT ANALYSIS	3
GEOG 631	ADVANCED REMOTE SENSING: DIGITAL IMAGE PROCESSING AND ANALYSIS	3
GEOG 654	CLIMATE CHANGE: SCIENCE TO POLICY	3
GEOG 672	SPECIAL TOPICS IN HUMAN GEOGRAPHY ¹	3
GEOG 673	HUMAN-ENVIRONMENTAL INTERACTIONS SPECIAL TOPICS ¹	3
GEOL 515	HYDROGEOLOGY	4
MATH 575	MATHEMATICAL MODELS	3
MATH 630	STATISTICS THEORY AND APPLICATIONS FOR TEACHERS	3
MATH 632	COMPUTATIONAL STOCHASTIC MODELING	3
SCIE 652	EARTH-SPACE & PHYSICAL SCIENCE IN INTEGRATED STEM EDUCATION	3

Learning Outcomes

1. Collect and evaluate geological, chemical and ecological data associated with creating and resolving solutions to current (and local) environmental problems.
2. Interpret the legal framework that underlies environmental regulation as it applies to protecting human health and the environment.
3. Apply their knowledge of geological, chemical and ecological processes to environmental data collection, analysis and interpretation in order to propose viable solutions to complex multidisciplinary environmental issues.
4. Find, read and comprehend the primary scientific literature that relates to environmental issues and produce written documents using a scientific format.
5. Communicate clearly, both in writing and orally, to a wide audience (potential stakeholders) the scientific basis for environmental decisions that impact human health and the environment.