

# 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.

## Admission Requirements

- 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 and

- one term of statistics or
- one term of calculus

Students are accepted for the fall and spring terms only. The deadline for receipt and verification of applications for both non-thesis and thesis track applicants is November 1 for spring admission and January 15 for fall admission. Admission is granted on a competitive, space-available basis. Thesis track students are strongly encouraged to have contacted prospective thesis advisers prior to applying.

Submit the following additional admission materials by November 1 for Spring admission and April 1 for Fall admission online.

- Narrative letters of recommendation from three individuals in a position to evaluate your academic potential in this field (Email addresses must be entered in the on-line application).
- Personal Statement: A one page statement in which you discuss career goals and how this graduate program will help you to achieve these goals

## Non-immigrant International Students

**Program Enrollment:** F-1 and J-1 students are required to be enrolled full-time. The majority of their classes must be in-person and on campus. See the list of programs that satisfy these requirements, and contact the International Student and Scholars Office with questions.

**Admission Procedures:** See additional information regarding Graduate Admission policies and International Graduate Application online.

\*\*See **Exceptions to Policy** in Graduate Admissions.

## 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 choose a concentration and select their elective courses from among those courses appropriate for that concentration (see below).

### Thesis Option (30 units)

Four core courses, electives appropriate to the concentration (no more than three 500-level courses) and 6 units of ENVS 896.

Code	Title	Units
<b>Required Courses</b>		
ENVS 601	TOPICS IN ENVIRONMENTAL GEOLOGY	4
ENVS 602	ENVIRONMENTAL CHEMISTRY	4
ENVS 603	ENVIRONMENTAL LAW AND REGULATIONS	3
ENVS 604	ECOSYSTEM ECOLOGY	4
Electives (see lists below)		9
<b>M.S. Culmination Course</b>		
ENVS 896	THESIS	6
<b>Total Units</b>		<b>30</b>

### Non-Thesis Option (30 units)

Four core courses, electives appropriate to the concentration (no more than three 500-level courses) and ENVS 798 (which must be completed successfully in the first attempt).

## Required Core

Code	Title	Units
<b>Required Courses</b>		
ENVS 601	TOPICS IN ENVIRONMENTAL GEOLOGY	4
ENVS 602	ENVIRONMENTAL CHEMISTRY	4
ENVS 603	ENVIRONMENTAL LAW AND REGULATIONS	3
ENVS 604	ECOSYSTEM ECOLOGY	4
Electives (see lists below)		12
<b>M.S. Culmination Course</b>		
ENVS 798	RESEARCH PRACTICUM	3
<b>Total Units</b>		<b>30</b>

## Concentrations

In addition to completing the required core, students choose a concentration listed below and select electives from within it. The lists below contain pre-approved courses; students may request approval of a course to be included in their concentration prior to registration for that course (see ENVS graduate handbook for details and approval form).

### Water Resource Management and Assessment

Code	Title	Units
BIOL 506	LIMNOLOGY	4
BIOL 555	FISH BIOLOGY	4
BIOL 601	CURRENT TOPICS IN BIOLOGY <sup>1</sup>	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
BIOL 654	LANDSCAPE ECOLOGY	3
ENVS 630	CONCEPTS OF ENVIRONMENTAL ENGINEERING	3
ENVS 635	WETLANDS IDENTIFICATION, CONSERVATION AND DELINEATION	4
ENVS 640	ECOTOXICOLOGY	3
ENVS 645	FLUVIAL GEOMORPHOLOGY AND HYDROLOGY	4
ENVS 650	AQUEOUS GEOCHEMISTRY	4
GEOG 523	GIS APPLICATIONS	3
GEOG 587	ENVIRONMENTAL IMPACT ANALYSIS	3
GEOG 631	ADVANCED REMOTE SENSING: DIGITAL IMAGE PROCESSING AND ANALYSIS	3
GEOG 672	SPECIAL TOPICS IN HUMAN GEOGRAPHY <sup>1</sup>	3
GEOG 673	HUMAN-ENVIRONMENTAL INTERACTIONS SPECIAL TOPICS <sup>1</sup>	3
MATH 575	MATHEMATICAL MODELS	3
MATH 630	STATISTICS-AN INTEGRATED APPROACH	4
MATH 632	COMPUTATIONAL STOCHASTIC MODELING	3

## Biological Resources Management

Code	Title	Units
BIOL 506	LIMNOLOGY	4
BIOL 510	CONSERVATION BIOLOGY	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 <sup>1</sup>	3
BIOL 603	DATA ANALYSIS AND INTERPRETATION FOR BIOLOGISTS	3
BIOL 610	POPULATION AND COMMUNITY BIOLOGY	3
BIOL 611	GLOBAL CHANGE BIOLOGY	3
ENVS 635	WETLANDS IDENTIFICATION, CONSERVATION AND DELINEATION	4
BIOL 654	LANDSCAPE ECOLOGY	3
ENVS 640	ECOTOXICOLOGY	3
ENVS 645	FLUVIAL GEOMORPHOLOGY AND HYDROLOGY	4
GEOG 503	SOILS AND VEGETATION	3
GEOG 587	ENVIRONMENTAL IMPACT ANALYSIS	3
MATH 575	MATHEMATICAL MODELS	3
MATH 630	STATISTICS-AN INTEGRATED APPROACH	4
MATH 632	COMPUTATIONAL STOCHASTIC MODELING	3

### Wetlands Assessment and Management

Code	Title	Units
BIOL 510	CONSERVATION BIOLOGY	4
BIOL 518	MICROBIOLOGY	4
BIOL 535	PLANT ECOLOGY	4
BIOL 601	CURRENT TOPICS IN BIOLOGY <sup>1</sup>	3
BIOL 603	DATA ANALYSIS AND INTERPRETATION FOR BIOLOGISTS	3
BIOL 609	COMMUNITY ANALYSIS AND BIOASSESSMENT	3
BIOL 611	GLOBAL CHANGE BIOLOGY	3
BIOL 619	ENVIRONMENTAL MICROBIOLOGY	3
BIOL 654	LANDSCAPE ECOLOGY	3
ENVS 630	CONCEPTS OF ENVIRONMENTAL ENGINEERING	3
ENVS 635	WETLANDS IDENTIFICATION, CONSERVATION AND DELINEATION	4
ENVS 645	FLUVIAL GEOMORPHOLOGY AND HYDROLOGY	4
ENVS 650	AQUEOUS GEOCHEMISTRY	4
GEOG 523	GIS APPLICATIONS	3
GEOG 587	ENVIRONMENTAL IMPACT ANALYSIS	3
GEOG 672	SPECIAL TOPICS IN HUMAN GEOGRAPHY <sup>1</sup>	3
GEOG 673	HUMAN-ENVIRONMENTAL INTERACTIONS SPECIAL TOPICS <sup>1</sup>	3
MATH 575	MATHEMATICAL MODELS	3

MATH 630	STATISTICS-AN INTEGRATED APPROACH	4
MATH 632	COMPUTATIONAL STOCHASTIC MODELING	3

### Environmental Spatial Analysis

Code	Title	Units
BIOL 601	CURRENT TOPICS IN BIOLOGY <sup>1</sup>	3
ENVS 635	WETLANDS IDENTIFICATION, CONSERVATION AND DELINEATION	4
ENVS 645	FLUVIAL GEOMORPHOLOGY AND HYDROLOGY	4
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 <sup>1</sup>	3
GEOG 673	HUMAN-ENVIRONMENTAL INTERACTIONS SPECIAL TOPICS <sup>1</sup>	3
GEOL 515	HYDROGEOLOGY	4
MATH 575	MATHEMATICAL MODELS	3
MATH 630	STATISTICS-AN INTEGRATED APPROACH	4
MATH 632	COMPUTATIONAL STOCHASTIC MODELING	3

<sup>1</sup> Courses offered under this number might be appropriate for this concentration. Obtain written approval from the graduate program director *prior* to enrolling using the form found in the ENVS Graduate Handbook.

- Collect and evaluate geological, chemical and ecological data associated with creating and resolving solutions to current (and local) environmental problems.
- Interpret the legal framework that underlies environmental regulation as it applies to protecting human health and the environment.
- 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.
- Find, read and comprehend the primary scientific literature that relates to environmental issues and produce written documents using a scientific format.
- 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.