

Environmental Geosciences

Environmental Geosciences Program

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Overview

Environmental Geosciences is an interdisciplinary curriculum integrating physical, chemical and biological aspects of the environment and environmental systems. There remains a huge demand for scientists with quantitative, interdisciplinary training in environmental geosciences to address, mitigate, and manage a multitude of complex environmental problems facing society. The Interdisciplinary Program in Environmental Geosciences curriculum is specially designed to prepare students for leadership positions across a broad range of environmental fields and professions, and it currently has three specialization tracks: Ecology & the Environment, Water & the Environment, and Environmental Monitoring & Analysis. Environmental Geoscience graduates will have a solid foundation in biological, physical, and natural sciences, mathematics and statistics, and analytic and geospatial techniques, as well as the specialized training necessary for integrated analysis of environmental systems.

About our Degrees

The BS in Environmental Geosciences is an interdisciplinary degree program offered by the College of Arts and Sciences. This curriculum is specially designed to prepare students for leadership positions across a broad range of environmental fields. The degree program is based on courses offered by the departments of Biological Sciences, Chemistry, Geography, Geology, Philosophy, and Civil, Structural and Environmental Engineering and it currently has three specialization tracks: Ecology & the Environment, Water & the Environment, and Environmental Monitoring & Analysis. Environmental Geoscience graduates will have a solid foundation in biological, physical, and natural sciences, mathematics and statistics, and analytic and geospatial techniques, as well as the specialized training necessary for integrated analysis of environmental systems.

About our Courses

The degree program is based on courses offered by the departments of Biological Sciences, Chemistry, Geography, Geology, Philosophy, and Civil, Structural and Environmental Engineering

About our Faculty

Because of the interdisciplinary nature of this program, students will take classes from and interact with faculty from a number of departments on campus. Through this the students are exposed to a range of research projects and have the opportunity to conduct independent research in these labs.

Transfer Policy

The University has articulation agreements with several local colleges. Students should consult with the advisement office at their present college for more details. The College of Arts and Sciences Student Advisement and Services Office at UB also may be consulted. To request a transfer of credit for a course not listed at either advisement office, submit a request to the Director of Undergraduate Studies along with a course description from the college catalog and a course syllabus.

Extracurricular Activities

Environmental Geosciences

Students are encouraged to participate in the Undergraduate Environmental Geoscience Club. Details can be found on the Environmental Geoscience website www.envsci.buffalo.edu.)

Practical Experience and Special Academic Opportunities

Environmental research at UB is conducted on a wide array of topics and includes faculty modeling the movement of pollutants in aquifers in Western New York through to examining the ability of reef corals to respond to global climate change, and faculty research sites extend from western New York to the tropics to the Greenland icecap.

These and many similar projects provide undergraduates in Environmental Geosciences opportunities to learn about and participate in research.

Career Information and Further Study

Environmental Sciences is an interdisciplinary curriculum integrating physical, chemical and biological aspects of the environment and environmental systems. There remains a huge demand for scientists with quantitative, interdisciplinary training in environmental geosciences to address, mitigate, and manage a multitude of complex environmental problems facing society.

This program will prepare students for graduate school or for entry level positions in environmental consulting firms, non-governmental organizations and governmental environmental agencies. Career tracks include a wide range of positions in sustainable resource management, restoration, monitoring and mitigation among others.

Degree Options

Double or Joint majors. Students interested in double or joint majors are encouraged to contact the Director of Undergraduate Studies in the relevant departments.

Concentrations. There are no formal concentrations in the Environmental Geosciences degree program, but students are encouraged to select one of several tracks that are designed to provide students with a background in a single aspect of environmental sciences, enabling students to more readily compete in the job market or attend graduate school.

Degrees Offered

Undergraduate: BS

Environmental Geosciences - B.S.

Acceptance Criteria

Admission to the program is contingent on completion of the prerequisites with a grade of C or better and a 2.0 minimum GPA.

Students must have a minimum 2.33 GPA in courses required for the major to graduate with an Environmental Geosciences degree.

Prerequisites

[GLY 101-GLY 102](#) or [GEO 101-GEO 106](#)
[BIO 200](#) or equivalent

Required Courses

Core Science Courses

[CHE 101-102](#) or [CHE 105-CHE 106](#) or [CHE 107-CHE 108](#)
[PHY 101-PHY 102](#) or [PHY 107-PHY 108](#)

Core Math Courses

[MTH 121-MTH 122](#) or [MTH 141-MTH 142](#)

Core Environmental Courses

Environmental Geosciences

[CIE 340](#) Environmental Engineering
[GEO 211](#) Univariate Statistics in Geography
[GEO 481](#) GIS
[GLY 309](#) Ecology
[GLY 462](#) Environmental Geochemistry
[PHI 334](#) Environmental Ethics

Senior Capstone Course

[GEO 470](#) Integrated Environmental Management

Elective Requirements

6 courses from the list of electives; 3 must be at the 400-level and no more than 3 per department.

1 elective must focus on field methods and data collection.

Independent Study or Honors can be counted toward specialization with approval of the Undergraduate Studies Committee, but no more than 3 credits of Independent Study or Honors may be used for elective requirements.

Summary

Total required credit hours for the major: 77

See **Baccalaureate Degree Requirements** for general education and remaining university requirements.

Recommended Sequence of Program Requirements

FIRST YEAR

Fall [BIO 200](#), [GLY 101](#) OR [GEO 101](#), [CHE 101](#)

Spring [GLY 102](#) OR [GEO 106](#), [CHE 102](#)

SECOND YEAR

Fall [MTH 121](#), [PHY 101](#)

Spring [MTH 122](#), [PHY 102](#)

NOTE: The timing for taking [PHY 101-102](#), [CHE 101-CHE 102](#) and [MTH 121-MTH 122](#) is flexible, but these courses should be completed by the end of the second year.

THIRD YEAR

Fall [GEO 481](#), [GEO 211](#), [GLY 309](#), [GLY 310](#) OR [GLY 412](#) OR [GEO 350](#)

Spring [CIE 340](#), [PHI 334](#), ENV electives

NOTE: [GLY 309](#) and [GLY 310](#) or [GEO 350](#) may be taken in the second year as well.

FOURTH YEAR

ENV electives, [GLY 462](#), [GEO 470](#)

Electives and Course Groupings

Specialization Tracks

The specialization tracks are designed to provide students with a background in a single aspect of environmental sciences, enabling students to more readily compete in the job market or attend graduate school. Each track requires a minimum of 4 courses from a given track plus 2 additional electives (6 total); 3 of the 6 must be at the 400 level and no more than 3 courses of the 6 can be taken from a single department. The tracks given below are intended only as examples and are subject to future revision as new courses are added to the curriculum. *Students are not required to select a specialization track.*

Ecology and the Environment

[GLY 310](#) Ecological Methods

[GLY 409](#) Advanced Ecology

[GLY 411](#) Marine Ecology

[GLY 412](#) Field Course in Tropical Marine Ecology

[BIO 456](#) Evolutionary Genetics

[BIO 458](#) Molecular Ecology

[GEO 356](#) Forest Ecology

[GEO 445](#) Restoration Ecology

[SSC 441](#) Wildlife and Wildlands Management

[CIE 441](#) Ecological Engineering

Water and the Environment

[GLY 414](#) Hydrogeology

[GLY 419](#) Environmental Geophysics

[GEO 345](#) Water Resources

[GEO 449](#) Fluvial Geomorphology

Environmental Geosciences

Environmental Monitoring and Analysis

[CHE 349](#) Physical Chemistry for Life Sciences
[CHE 413- CHE 414](#) Instrument Analysis and Lab
[CHE 470](#) Analytical Chemistry of Pollution
[GLY 310](#) Ecological Methods
[GLY 419](#) Environmental Geophysics
[GLY 465](#) Environmental Remote Sensing
[GEO 350](#) Field and Laboratory Techniques

Environmental Science Electives

[BIO 369](#) The Biology of Microbes
[BIO 456](#) Evolutionary Genetics
[BIO 458](#) Molecular Ecology
[BIO 497](#) Dept. Honors thesis/project
[BIO 498](#) Undergraduate Research
[BIO 499](#) Independent Study
[CIE 441](#) Ecological Engineering
[GEO 345](#) Water Resources
[GEO 347](#) Climatic Geomorphology
[GEO 350](#) Landform Field and Laboratory Techniques*
[GEO 352](#) Introduction to Soils
[GEO 356](#) Forest Ecology
[GEO 444](#) Advanced Earth System Science
[GEO 445](#) Restoration Ecology
[GEO 449](#) Fluvial Geomorphology
[GEO 483](#) Remote Sensing
[GEO 499](#) Independent Study
[GLY 310](#) Ecological Methods*
[GLY 312](#) Surface Processes and Hydrology I
[GLY 313](#) Surface Processes and Hydrology II
[GLY 409](#) Advanced Ecology
[GLY 411](#) Marine Ecology
[GLY 412](#) Field Course in Tropical Marine Ecology*
[GLY 414](#) Hydrogeology
[GLY 419](#) Environmental Geophysics
[GLY 453](#) Quaternary Dating and Paleoclimate
[GLY 463](#) Advanced Environmental Hydrogeology I
[GLY 464](#) Advanced Environmental Hydrogeology II
[GLY 465](#) Environmental and Geological Remote Sensing
[GLY 477](#) Environmental Fluid Transport
[GLY 499](#) Independent Study
[SSC 441](#) Wildlife and Wildlands Management

*[GEO 350](#), [GLY 310](#) or [GLY 412](#) will satisfy the field methods and data collection elective requirement.