

Environmental Science



Department of Natural Sciences
College of Arts, Sciences, and Letters

The Program

The Environmental Science Program provides students with a strong background in areas of science related to environmental concerns and with an opportunity to study environmental problems from a scientific point of view that integrates biology, chemistry, earth science, and physics.

The program is developed with the philosophy that the best preparation for careers or future study is a strong, broad background in science. This kind of education is especially important in an era when most people will experience many job changes over the course of their careers.

Preparation

A good high school preparation for the environmental science program includes four years of mathematics and English; courses in chemistry, physics, and biology; good written and oral communication skills; and a knowledge of computers.

The Concentration

All environmental science students complete a core of natural science and mathematics courses followed by specialization in one of three environmentally-related fields: biology, chemistry, or earth science. An individualized specialization is also available for students who desire to combine coursework from two or more areas.

Degree-seeking students are required to fulfill the required courses in effect at the time admitted or readmitted to the program. Since these are subject to change, students should see an advisor for current requirements.

Core courses

Introduction to Organismal and Environmental Biology
General Chemistry I and II
Weather and Climate
Physical Geology
Calculus I and 2
Introductory Physics I
Ecology
Quantitative Analysis
Environmental Science
Concepts of Environmentalism
Seminar on Environmental Issues
An advanced Environmental Science course
An advanced Geology course
Research/internship

Earth Science specialization

Introduction to Molecular and Cellular Biology
or Introductory Physics II
Field Methods in Geology

11 or more credit hours selected from:

Introduction to GIS
Land Use Planning and Management
Hazardous Waste Management
Remote Sensing
Oceanography
Geomorphology
Environmental Geology
Energy Resources
Groundwater Hydrology
Advanced GIS Applications
Economic Geography

Environmental Biology specialization

Introduction to Molecular and Cellular Biology

7 or more credit hours selected from:

Aquatic Ecosystems
Field Biology
Population Genetics and Evolution
Additional biology courses to make a total of 12 credit hours.

Environmental Chemistry specialization

Introduction to Molecular and Cellular Biology
or Introductory Physics II
Organic Chemistry I, II
Organic Chemistry Laboratory
Environmental Chemistry
Environmental Chemistry Laboratory

8 or more credit hours selected from:

Introduction to Toxicology
Instrumental Methods of Analysis
Physical Chemistry
Biochemistry
Seminar in Chemistry

Research/internship

All environmental science majors must complete either three credit hours of research under the guidance of a faculty member or a library research/internship experience. Some recent student research projects include:

- Feeding habits of the amphipod *Gammarus*
- Nesting behavior of turtles at night and activity patterns of pelagic-stage loggerhead turtles
- Dioxins and furans in the environment
- Chemical Analysis of River Sediments—Upper Rouge River, Southeast Michigan
- Trends in air quality using geographic information systems
- Applications of global positioning systems (GPS) in environmental science
- What is copper doing in Saginaw Bay?
- Microdistribution of mussels in the River Raisin

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Cooperative Education

The cooperative education program allows students to earn academic credit while being paid a salary by their co-op employer. Students have recently been employed as environmental technicians, chemistry laboratory technicians, and environmental services coordinators. The Department of Natural Sciences also has several co-op positions. Many students in co-op positions receive offers of full-time employment on graduation.

Employment Opportunities

Positions held by environmental science graduates include:

- Environmental scientist, Waste Reduction Systems
- Toxicologist, NSF International
- Project director/Senior scientist, Labat-Anderson, Inc.
- President, Environmental Recycling Technical Services
- Industrial hygienist, BASF Corporation
- Research assistant, University of Colorado
- Physical science technician, Great Lakes Science Center, U.S. Geological Survey
- Vice president, Environmental Management, Huron Valley Steel Corporation
- Environmental engineer, General Motors Corporation
- Staff scientist, Delta Environmental Consultants, Inc.
- Manager, Quality Assurance Unit, ASci Corporation
- Science teacher, Cranbrook Middle School
- Chemist, RTI Laboratories
- Environmentalist, Wayne County Department of Environment
- Supervisor, Gas Chromatography/Industrial Hygiene Department, Clayton Group Services

Faculty

Ali Bazzi, Ph.D., Professor of Chemistry. Electrochemistry; chemical analysis of heavy metals in natural waters.

Anne Danielson-Francois, Ph.D., Assistant Professor of Biology. Evolutionary biology.

Yiwei Deng, Ph.D., Associate Professor of Chemistry. Analytical and environmental chemistry.

Orin G. Gelderloos, Ph.D., Professor of Biology and Environmental Studies. Field biology.

Simona Marincean, Ph.D., Assistant Professor of Chemistry. Green Chemistry.

Donald R. Miller, M.S., Lecturer in Biology. Botany and ecology.

Kent S. Murray, Ph.D., Professor of Geology. Contaminant hydrogeology

Jacob Napieralski, Ph.D., Assistant Professor of Geology. Computerized mapping and geomorphology.

Judy Nesmith, M.S., Lecturer in Biology. Invertebrate zoology; environmental science.

John F. Riebesell, Ph.D., Associate Professor of Biology. Population biology; environmental planning; biogeography.

Robert L. Simpson, Ph.D., Professor of Biology. Freshwater wetland ecology; community and ecosystem dynamics.

David Susko, Ph.D., Assistant Professor of Biology. Plant ecology.

John Thomas, Ph.D., Professor of Biology. Restoration ecology.

Sonia M. Tiquia, Ph.D., Assistant Professor of Biology and Microbiology. Environmental microbiology.

Michael Twiner, M.S., Assistant Professor of Biology, Molecular Toxicology.

For More Information

For more information concerning the environmental science program:

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Environmental science advisor:

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To request an application or obtain more information about admission to the University:

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