Bachelor of Science
Environmental Science

INFORMATION

Environmental scientists study the effects of pollutants and toxins on ecosystems and implement ways to restore polluted environments to their natural state. They identify and quantify pollutants, as well as develop procedures for reducing them. The processes of degradation, conservation, recycling, and replenishment are central to an environmental scientist's study and work. They also study various industrial, transportation, and energy production processes, in order to design effective strategies towards minimizing pollution (preventative management). In addition, environmental scientists work in development and management aspects of local communities and cities. They use their skills and knowledge to design and monitor waste disposal sites, safeguard water supplies, and recover contaminated land and water to comply with Federal environmental regulations.
Environmental Science majors at Cleveland State learn the concepts and facts of the modern scientific study of the environment, as well as being trained in current laboratory skills.

CAREER OPPORTUNITIES

Bachelor graduates in Environmental Science can work in a variety of jobs. Bachelor graduates move from entry level positions to more challenging positions by attaining work experience and/or graduate education. Environmental jobs entail both field and office/laboratory work. Government regulations written in the Clean Air Act, Clean Water Act, Endangered Species Act, Historic Preservation Act, and other legislation have created a demand for environmental scientists working in positions to assure or assess compliance. Positions for bachelor graduates are numerous, including: environmental regulation and compliance; ecological risk assessment; remediation and reclamation of contaminated lands; wetland delineation and permitting; air and water quality monitoring; analysis of soil and sediment samples; endangered species management; wildlife and plant surveying; environmental planning for transportation and development projects; mapping vegetation and natural resources; environmental laboratory chemist; wastewater and solid waste management; evaluating public health risks; emissions monitoring; mold remediation; asbestos project manager; lead monitoring; storm water management; Phase I and Phase II environmental site assessments at industrial, commercial, community, and residential sites; subsurface site characterization, including drilling, soil classification, coring and well installations; power facility environmental manager; pesticides monitoring in farming, hazardous and chemical waste disposal and management ; brownfield projects; noise evaluation; GIS specialist, environmental research assistant; and others.

Bachelor graduates also pursue advanced degrees in environmental or related sciences. A masters degree is preferred/required for higher-level, specialization, research, client consultation, and technical positions. Doctoral (Ph.D.) graduates assume university faculty positions, teaching and directing research; direct research in government and other organizations; and work in technical leadership and management positions.

PROGRAM

BACHELOR OF SCIENCE IN ENVIRONMENTAL SCIENCE:
There are five tracks, although students can design their own course of study in consultation with a faculty advisor.

Environmental Biology Track
Environmental Geology Track
Environmental Chemistry Track
Environmental Technology Track
Environmental Planning Track

Engaged learning experiences include outdoor laboratories studying streams and watersheds, independent study and research with nationally recognized CSU faculty, and co-op and internship opportunities. CSU is a Research Experience for Undergraduates site funded by the National Science Foundation (NSF), giving students in-depth research experience in environmental science. Most courses are taught by doctoral faculty. An environmental science minor is available, consisting of 19-20 credit hours of specified environmental and other science courses. Students can also become involved in the Biology, Geology, Environmental Science Student Association or in the Student Environmental Movement. All students receive individual advising.

For more information, contact:

Department of Biological, Geological and Environmental Sciences
Cleveland State University
2100 Euclid Avenue SR 219
Cleveland, OH 44115-2214
Phone: 216.687.2440
Email: bges@csuohio.edu
Website:
http://www.csuohio.edu/sciences/dept/biology/index.html

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Requirements of the College of Science: A minimum of 128 credit hours is required for a Bachelor of Science (B.S.) degree, of which 42 semester credit hours must be earned in 300 and/or 400 level courses. Introduction to University Life (1 credit hour) is required for all newly admitted freshmen (not required for transfer students).

General Education Requirements: All degree-seeking students are required to meet general education requirements. Students are responsible for ensuring that courses chosen satisfy these requirements and are encouraged to consult with their academic advisor. A comprehensive description of the requirements is available online at http://www.csuohio.edu/academic/gened/.

Required Courses for the B.S. in Environmental Science (credit hours in parentheses):

A. Core Courses* (59 credits):

MTH 147 Statistical Concepts with Applications (4) **OR** ANT 305, PSY 311, SOC 354, BIO 540
PHY 221 or 241 College or University Physics I (5)
PHY 470 Environmental Physics (4)
CHM 261/266 General Chemistry I and Lab (5)
CHM 262/267 (or 278) General Chemistry II and Lab (5) **OR**
CHM 272/277 Honors General Chemistry and Lab

TWO of these four planning and policy courses:

ENV 435 Environmental Policy (4)
ENV 441 Environmental Planning (4)
ENV 442 Environmental Finance and Capital Budgeting (4)
CVE 471 Environmental Law, Regulation, and Compliance (3)

BIO 200/201 Introductory Biology I/Lab (5) and II/Lab (4)
BIO 202/203 Introductory Biology II and Lab (4)
GEO 223 Geospatial Concepts & Tools (3) **OR** UST 403
EVS 206 Introduction to Environmental Science (4)
EVS 300/301 Physical Features of Ecosystems and Lab (4)
EVS 302/303 Biological Features of Ecosystems and Lab (4)
EVS 499 Exit Evaluation (0)

ONE of these three capstone courses:

EVS 490 Internship in Environmental Science (4)
EVS 496 Independent Study in Environmental Science (4)
EVS 497 Research in Environmental Science (4)

B. Environmental Focus Tracks (Choose one of the following tracks - 16 credits hours required):

Environmental Biology Track

BIO 300/301 and/or 302/303 Plant or Animal Biology and Lab (4)
BIO 304/305 Population Biology and Evolution and Lab (4)
BIO 416/417 Microbiology and Lab (5)
BIO 420/421 Comparative Vertebrate Anatomy and Lab (4)
BIO 424/425 Principles of Animal Physiology and Lab (4)
BIO 450 Evolutionary Biology (3)
BIO 452 Marine Ecology (3)
BIO 453 Field Experience in Ecology and Conservation (1-6)
BIO 454/455 Ecology and Lab (4)
BIO 471 and/or 473 Summer or Spring Local Flora (4)
BIO 472 and/or 474 Wetland or Stream Ecology (4)
EVS 450 Applied Biology (3)
EVS 454/455 Conservation Biology and Lab (5)
EVS 470/471 Aquatic Ecosystems and Lab (4)

Environmental Technology Track

ESC 203 Statics and Dynamics (4)
ESC 250 Differential Equations for Engineers (3)
ESC 301 Fluid Mechanics (3)
CHE 461 Principles of Air Pollution Control (3)
CVE 211/212 Surveying and Lab (5)
CVE 361 Hydraulic Engineering (3)
CVE 371 Environmental Engineering I (3)
CVE 450 Environmental Technology (3)
CVE 473/474 Environmental Engineering II and Lab (5)
CVE 475 Solid and Hazardous Waste Engineering (4)

***Recommendation:** Although not required, students are urged to take MTH 181 Calculus I and 182 Calculus II for all tracks.

Environmental Geology Track

GEO 230 Natural Resources (3)
GEO 304/305 Mineralogy and Lab (4)
GEO 306/307 Petrology and Lab (4)
GEO 312/313 Sedimentation and Stratigraphy and Lab (4)
GEO 354 Geochemistry (4)
GEO 420/421 Rivers and Watershed of NE Ohio and Lab (4)
GEO 425 Introduction to Geographic Info Systems (4)
GEO 427 Advanced Topics in Geographic Info Systems (4)
GEO 444/445 Hydrogeology and Lab (4)
GEO 460 Geomorphology (4)

Environmental Chemistry Track

CHM 310/315 Survey of Analytical Chemistry and Lab (4)
CHM 311/316 Analytical Chemistry and Lab (6)
CHM 320 Survey of Physical Chemistry (4)
CHM 331/336 and 332/337 Organic Chem I/Lab (6) and II/Lab (6)
CHM 404/406 Environmental Chemistry and Lab (5)

Environmental Planning Track

ECN 202 Principles of Microeconomics (3)
ECN 474 Environmental and Natural Resource Economics (4)
GEO 425 Intro to Geographic Info Systems (4)
GEO 427 Advanced Topics in Geographic Info Systems (4)
UST 300 Economics of Policy Analysis (4)
UST 375 Cities and Planning (4)
UST 434 Introduction to Geographic Information Systems (4)
ENV 440 Environment and Human Affairs (4)
ENV 443 Environmental Regulatory Compliance (4)
MLR 301 Principles of Management (3)

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Cleveland State University
engaged learning
COLLEGE OF SCIENCE ADVISING CENTER
2121 EUCLID AVE., MC 218B
CLEVELAND, OH 44115-2214
(216) 687-9321 • COSADVISING@CSUOHIO.EDU • CSUOHIO.EDU/SCIENCES