

ENVIRONMENTAL SCIENCES

Environmental Sciences

College of Science, Engineering & Technology
Department of Biological Sciences
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Environmental science is an applied science designed to study those factors that impact our environment. Major areas of environmental concern include, but are not limited to, water (surface and ground water) quality, air quality, and solid and hazardous waste issues. This program is designed to encourage students to use the resources of all the colleges of Minnesota State Mankato. The program is oriented toward developing the individual for leadership positions in industry, government, and public concern groups, as well as providing a foundation for individual community involvement as an informed citizen.

Admission to Major is granted by the department. Admission requirements are:

- 32 earned credit hours including BIOL 105 and BIOL 106 with a grade of "C" in both the BIOL 105 and BIOL 106 plus a minimum cumulative GPA of 2.00.

ENVIRONMENTAL SCIENCE BS

Recommended General Education Courses

ENVR 101 Perspectives in Environmental Science (4)

Required General Education Courses (11-13 credits)

BIOL 105 General Biology I (4)
MATH 112 College Algebra (4) **OR**
MATH 113 Trigonometry (3) **OR**
MATH 115 Precalculus Mathematics (4) **OR**
MATH 121 Calculus I (4)
CHEM 106 Introduction to Chemistry (3) **OR**
CHEM 201 General Chemistry I (5)

Required Support Courses (8 credits)

CHEM 111 Chemistry of Life Processes (5) **OR**
CHEM 202 General Chemistry II (5)
HLTH 475 Biostatistics (3)
STAT 154 Elementary Statistics (3) **OR**

Required for Major (Core, 24 credits)

BIOL 106 General Biology II (4)
BIOL 215 General Ecology (4)
BIOL 410 Global Change Biology (3)
ENVR 440 Environmental Regulations (3)
ENVR 450 Environmental Pollution and Control (3)
ENVR 460 Analysis of Pollutants (3)
ENVR 470 Environmental Assessment (3)
ENVR 498 Internship (1-6) **OR**
ENVR 480 Senior Research (1-6)

PLUS two courses from one of the following areas:

Aquatic Ecology:

BIOL 402 Stream Ecology (4)
BIOL 404 Wetlands (4)
BIOL 405 Fisheries Biology (3)
BIOL 432 Lake Ecology (4)

Vertebrate Ecology:

BIOL 405 Fisheries Biology (3)
BIOL 408 Vertebrate Ecology (4)
BIOL 409 Advanced Field Ecology (4)
BIOL 412 Soil Ecology (4)
BIOL 316 Animal Diversity (3)
BIOL 431 Comparative Animal Physiology (3)
BIOL 436 Animal Behavior (4)

Ecology:

BIOL 316 Animal Diversity (3)
BIOL 403 Conservation Biology (3)
BIOL 405 Fisheries Biology (3)
BIOL 412 Soil Ecology (4)
BIOL 421 Entomology (3)
BIOL 443 Plant Ecology (4)

Plant Science:

BIOL 217 Plant Science (4)
BIOL 412 Soil Ecology (4)
BIOL 441 Plant Physiology (4)
BIOL 442 Flora of Minnesota (4)
BIOL 443 Plant Ecology (4)
BIOL 445 Economic Botany (4)

Toxicology:

BIOL 460 Introduction to Toxicology (3)
BIOL 461 Environmental Toxicology (4)
BIOL 464 Methods of Applied Toxicology (3)
BIOL 465 Applied Toxicology Project (3)
BIOL 467 Industrial Hygiene (3)

Microbiology:

BIOL 270 Microbiology (4)
BIOL 420 Diagnostic Parasitology (3)
BIOL 475 Medical Microbiology (4)
BIOL 476 Microbial Physiology and Genetics (5)
BIOL 478 Food Microbiology and Sanitation (4)

*SELECT ONE MINOR FROM THE LIST BELOW:

Chemistry, Geography, Urban & Regional Studies, Geology, Political Science, Business Administration (note lap-top computer required in business courses), Anthropology, Mass Communication, Law Enforcement, Technical Writing, Recreation, Parks and Leisure or other minors with the written approval of Environmental Science Coordinator.

*UPPER LEVEL ELECTIVES IN EACH MINOR MUST BE APPROVED IN WRITING BY THE ENVIRONMENTAL SCIENCE COORDINATOR.

SELECT (with written approval of the Environmental Science Coordinator)

Two 300-400 level courses (not in major or minor) from one of the following areas: Geography, Urban and Regional Studies; Political Science, Business (note: lap-top computer required for many business courses), Economics or Recreation, Parks and Leisure.

A Maximum of 15 credits from ENVR Core Course requirements can be applied towards another major. A Maximum of 8 credits from the ENVR Core Courses can be applied towards another minor.

ENVIRONMENTAL SCIENCES MINOR

Required Core (14-20 credits)

ENVR 101 Perspectives in Environmental Science (4)
ENVR 440 Environmental Regulations (3)
ENVR 470 Environmental Assessment (3)

Select one (1) of the following:

ENVR 450 Pollution and Control (3)*
ENVR 460 Analysis of Pollutants (4)

*Requires 1 year of chemistry which can be satisfied with CHEM 106 and CHEM 111 OR CHEM 201 and CHEM 202

POLICIES/INFORMATION

P/N Grading Policy. All courses leading to a major or a minor in environmental sciences must be taken for letter grades.

Refer to the College regarding required advising for students on academic probation.

GPA Policy. A minimum grade of “C” is required in all courses applied to the Environmental Sciences BS degree.

Several scholarships in the Department of Biological Sciences are available for entering freshmen and currently enrolled Minnesota State Mankato students who meet the requirements. Application deadline is March 1 of each year.

COURSE DESCRIPTIONS

ENVR 101 (4) Perspectives in Environmental Science

This course is designed to introduce students to the complex field of environmental science. Reading assignments, lectures, discussions and other class assignments will introduce students to the structure and functions of ecosystems, the concept of sustainability, issues in environmental protection with an emphasis on global commons, the interrelationships between environment, culture, government and economics and what individuals or groups can do to influence environmental policy/rules.

Fall, Spring
GE-8, GE-10

ENVR 440 (3) Environmental Regulations

This is a lecture course introducing students to major federal environmental laws and regulations. Discussions include the cause(s) that prompted the enactment of various environmental legislation as well as intent and implementation of the legislation. Both Federal and State of MN environmental statutes will be discussed.

Fall

ENVR 450 (3) Environmental Pollution & Control

This is a lecture course that introduces students to sources and controls for pollutants in air, water, and soils including hazardous waste. Chemical and biological mechanisms that are important in nature and used to control/treat various types of pollutants are emphasized. Strongly recommended that this course be taken immediately after completing 1 year of Chemistry.

Pre: 1 year CHEM
Fall

ENVR 460 (4) Analysis of Pollutants

The purpose of this lecture/lab class is to introduce students to standard practices and procedures used in sampling and analysis of environmental matrices and to develop an environmental research project. Standard quality control/quality assurance procedures per EPA are emphasized.

Spring

ENVR 470 (3) Environmental Assessment

Introduces students to National Environmental Policy Act and requirements for Environmental Impact Statements and Environmental Assessment Worksheets. Phase I Environmental Assessment of land and buildings, an international perspective on environmental assessments, and economic and social impact assessment are discussed.

Pre: ENVR 440
Spring

ENVR 480 (1-6) Senior Research

Participate in an independent research project with advisory support and with a focus on the student’s career objectives.

Fall, Spring

ENVR 483 (1-2) Environmental Science Seminar

A seminar course that involves a critical evaluation of an area in Environmental Science. Topics vary from year to year. Students are usually required to make a presentation to the class.

ALT

ENVR 491 (1-2) In-Service

Fall, Spring

ENVR 498 (1-6) Internship

Only three credits can be counted toward major. Experience in applied Environmental Sciences according to a prearranged training program.

Fall, Spring

ENVR 499 (1-6) Individual Study

Individual Research Project.

Fall, Spring