UNDERGRADUATE PROGRAM

Required courses in the following program of study may have prerequisites. Reference the course description section for clarification.

BACHELOR OF SCIENCE (BS)

Student Learning Outcomes—students will:

• develop an integrated knowledge of major concepts in the area of environmental sciences and an understanding of fundamental roles that biology, chemistry, and geology play in environmental science;

• demonstrate knowledge of the interrelationships among the physical and biological components of ecosystems;

• use epistemologically sound quantitative techniques for the analysis of biotic and abiotic samples and systems;

• demonstrate effective oral, graphical, and written communication skills as related to the environmental sciences;

• develop sufficient preparation in the environmental sciences to successfully compete in a graduate or professional program, or to realize employment in an environmental sciences-related career.

ENVIRONMENTAL SCIENCE MAJOR

Environmental Science is an interdisciplinary field that combines physical, chemical and biological sciences with social, political and economic understanding needed to study the environment and address environmental problems. The Environmental Science program integrates classroom work in biology, chemistry, geology and social sciences (economics and planning) with extensive field, lab and research experience. All students take a core of Environmental Science courses complemented by a concentration in one of the three core sciences (biology, chemistry, and geology). Motivated students have the opportunity to obtain a double major in both Environmental Science and social sciences (economics and planning) with extensive field, lab and research experience. Graduates leave Eastern with the necessary professional and technical skills for employment in the environmental profession or entry into graduate or professional school.

Major Requirements for Environmental Science

All Environmental Science students must take a junior year (ENVS 300) and a final senior year environmental seminar (ENVS 400). After declaring environmental science as a major each student should meet with an advisor as soon as possible. Students should start the program with the necessary mathematics background to enter into the calculus or statistics sequence (i.e. MATH 141 or equivalent). It is recommended that students take ENVS 100, BIOL 171–173, CHEM 151–153 and GEO 120 and GEO 121 within the first two years. Students must maintain an overall GPA 2.25 to remain in the program.

Environmental Science Required Core (81–84 credits)
BIOL 171 Biology I (5)
BIOL 172 Biology II (5)

BS Minor

ENVIRONMENTAL BIOLOGY

Environmental Science Required Core (81–84 credits)

Required General Biological Knowledge (30 credits)

Choose one of the following
BIOL 301 Microbiology (5)
BIOL 302 Botany (5)
BIOL 303 Invertebrate Zoology (5)
BIOL 304 Vertebrate Zoology (5)

Capstone
BIOL 490 Capstone (5)

Electives—20 credits of upper division electives with advisor’s consent.

Minimum total credits for above emphasis 111 credits

ENVIRONMENTAL CHEMISTRY

Environmental Science Required Core (81–84 credits)

Required General Chemistry Courses
CHEM 304 Quantitative Analysis (6)
CHEM 319 Modern Inorganic Chemistry (4)
CHEM 351 Organic Chemistry (4)
CHEM 352 Organic Chemistry (4)
CHEM 372 Organic Chemistry Lab I (3)
CHEM 491 Senior Thesis (4)

Chemistry Elective—choose one
CHEM 353 Organic Chemistry (3)
and CHEM 373 Organic Chemistry Lab II (3)
CHEM 480 Biochemistry (5)

Minimum total credits for above emphasis 111 credits

ENVIRONMENTAL GEOLOGY

Environmental Science Required Core (81–84 credits)

Required Geology Courses
GEOL 122 Historical Geology (5)
GEOL 311 Earth Materials (4)
GEOL 360 Geologic Hazards (4)
GEOL 411 Sedimentology and Stratigraphy (4)
GEOL 462 Principles of Geochemistry (5)
or GEOL 466 (4) Isotopic Tracers in the Environment
GEOL 475 Engineering Geology of Soils: Introduction to Geotechnical Engineering (4)

Capstone
GEOL 490A Senior Capstone: Water and the West: Water Resource Engineering in Arid Lands (4)
or ENVS 490 Capstone Environmental Geochemistry (5)
or GEOL 490B Capstone Environmental Geochemistry (5)

Electives
4 credits of upper division electives with advisor’s consent.

Minimum total credits for above emphasis 115 credits
ENVIRONMENTAL SCIENCE MINOR

Required Courses (30 credits)
- BIOL 171 Biology I (5)
- BIOL 172 Biology II (5)
- CHEM 121 Chemistry and its Role in Society (5)
- ENVS 100 Introduction to Environmental Science (5)
- GEOL 120 Physical Geology–The Solid Earth (5)
- GEOL 121 Physical Geology–Surficial Processes (5)

Elective (4–5 credits)
One elective course (4–5) at the 200-level or above in either BIOL, CHEM or GEOL subject to approval by advisor or program director

Total minimum credits for above minor 34 credits

Environmental Science Courses

Terms offered: fall, winter, spring, summer (FWSU). If no terms are indicated, check with the department or EagleNET.

ENVS 100 Introduction to Environmental Science (5)
Prerequisites: CPLA, ENGL and MATH clearance.
Satisfies: GECR for natural sciences, environmental science.
This course is an introductory exploration of environmental science that emphasizes a scientific approach toward understanding contemporary human interaction with the natural environment. The structure, function and interrelationships of terrestrial, aquatic and atmospheric systems are treated through the application of biological, chemical and geological principles. This course includes a weekly laboratory that uses basic quantitative techniques for collecting and analyzing data from environmental systems.

ENVS 300 Environmental Science Junior Seminar (1)
Prerequisite: ENVS 100 and admission to Environmental Science program.
The purpose of this seminar course is to expose students to a variety of potential careers in the environmental sciences.

ENVS 323 GIS Environmental Sciences (3)
Cross-listed: GEOG 323.
Prerequisite: CPLA 101 or CPLA 120.
Introduction to Geographic Information Systems (GIS) with an emphasis on its applications in the environmental sciences. Course includes hands-on GIS work in the lab. This course satisfies an option for the Certificate in GIS.

ENVS 400 Environmental Science Senior Seminar (1)
Prerequisite: ENVS 300 and junior or senior standing.
Through reading current literature, discussion and writing, students integrate knowledge of chemistry, biology and geology with current environmental issues.

ENVS 490 Capstone: Environmental Geochemistry (5)
Cross-listed: GEOL 490B.
Prerequisite: CHEM 152 or permission of instructor.
Satisfies: senior capstone university graduation requirement.
Application of principles of geochemistry to environmental problems, including air and water pollution, water-rock interactions, weathering and soil formation. Origin, distribution and transport of inorganic contaminants in air, water, soils, sediments and plants. The behavior of trace elements in near surface environments.

The film of tomorrow will not be directed by civil servants of the camera, but by artists for whom shooting a film constitutes a wonderful and thrilling adventure. —François Truffaut (1932–1984)