



ENVIRONMENTAL SCIENCE — BIOL 1110

A. Course Description

- **Credits:** 3.00
- **Lecture Hours/Week:** 3.00
- **Lab Hours/Week:** 0.00
- **OJT Hours/Week:** 0
- **Prerequisites:** None
- **Corequisites:** None
- **MnTC Goals:**
 - 03 – Natural Science
 - 10 – People/Environment

This course emphasizes the unique impact humans and industry have on our environment. It addresses the demands placed on the biosphere by the exploitation of natural resources and energy, the creation of pollution and the disposal of waste. This course is interdisciplinary, combining concepts from the natural and physical sciences (e.g. biology, chemistry, ecology, geology, physics) with the social sciences (e.g. economics, politics, ethics, history) to present an understanding of how wise stewardship of earth's resources can result in the long-term sustainability of our shared environment. Meets MnTC Goal 3 and MnTC Goal 10

B. Course Effective Dates: 2/24/00 – Present

C. Outline of Major Content Areas

1. 1. Scientific method and terminology
2. 2. Biosphere: a. Species, population and community ecology b. Human population growth c. Biogeochemical cycles d. Laws of matter and energy
3. 3. Natural resources and energy a. Physical, chemical, and biological approaches to matter and energy b. Energy policy c. National and international legislation for protecting resources d. Ethical perspectives on natural resource use
4. 4. Pollution and waste a. Air pollution b. Water pollution c. Impacts to human health from air, water, and food
5. 5. Stewardship a. Invasive species and loss of biodiversity b. Demand on resources in developed and developing nations c. Land use
6. 6. Sustainability a. Sustainable management of natural resources b. Ecological footprint c. Economic perspectives on the environment

D. Learning Outcomes

1. Describe the relationship between humans with industry in their environment.
2. Explain major components of Earth's environmental systems and how these systems can support and perpetuate a diversity of life through wise stewardship
3. Characterize parameters that relate to population ecology, the demands that population growth have on natural resources and the consequences that result from unregulated growth and consumption.
4. Identify renewable and nonrenewable natural resources that are critical for today's society, how our planet's natural resources are being utilized and how future management of natural resources can lead to long-term sustainability
5. Recognize the role and responsibility that we have as individuals to protect and restore natural resources for future generations and how, through education and active participation each of us can be a catalyst for change.

E. Minnesota Transfer Curriculum Goal Area(s) and Competencies

Goal 03 — Natural Science

- Demonstrate understanding of scientific theories.
- Formulate and test hypotheses by performing laboratory, simulation, or field experiments in at least two of the natural science disciplines. One of these experimental components should develop, in greater depth, students' laboratory experience in the collection of data, its statistical and graphical analysis, and an appreciation of its sources of error and uncertainty.
- Communicate their experimental findings, analyses, and interpretations both orally and in writing.
- Evaluate societal issues from a natural science perspective, ask questions about the evidence presented, and make informed judgments about science-related topics and policies.

Goal 10 — People/Environment

- Explain the basic structure and function of various natural ecosystems and of human adaptive strategies within those systems.
- Discern patterns and interrelationships of bio-physical and socio-cultural systems.
- Describe the basic institutional arrangements (social, legal, political, economic, religious) that are evolving to deal with environmental and natural resource challenges.
- Evaluate critically environmental and natural resource issues in light of understandings about interrelationships, ecosystems, and institutions.
- Propose and assess alternative solutions to environmental problems.
- Articulate and defend the actions they would take on various environmental issues.

F. Learner Outcomes Assessment

As noted on course syllabus

G. Special Information

None noted

