

BIOLOGY 270
INTRODUCTION TO ENVIRONMENTAL BIOLOGY

BULLETIN INFORMATION

BIOL 270: Introduction to Environmental Biology (3 credit hours)

Course Description:

Basic ecological principles and the impacts of human population growth and technology. Not for major credit.

SAMPLE COURSE OVERVIEW

BIOL 270 is an introductory-level biology course for non-majors. The aim of the course is to provide a basic overview of ecological processes that will generate a basis for understanding modern environmental issues and their importance to contemporary society. BIOL 270 emphasizes the scientific inquiry as a method of understanding the natural world and focuses on the use of experimental design and technology to solve questions of environmental function. Historical and contemporary case studies will be used to illustrate scientific inquiry and environmental issues. Additionally, the importance of biological scientific literacy to understanding and analyzing the impact of contemporary issues such as water supply and quality, energy, world population growth, sustainability, and climate change to human health and welfare will be emphasized.

ITEMIZED LEARNING OUTCOMES

Upon successful completion of Biology 270, students will be able to:

1. Distinguish scientific inquiry from other legitimate methods of inquiry and to recognize the difference between scientifically legitimate inquiry and claims without a sound scientific basis
2. Critically evaluate the merits or failure of scientific hypotheses
3. Apply statistical and quantitative approaches to analyze data
4. Demonstrate an understanding of the major characteristics and processes of ecosystems
5. Demonstrate an understanding of the roles of energy conversion and nutrient recycling in determining the composition, diversity, and distribution of ecological systems
6. Assess the role of opposing evolutionary forces in causing or limiting differentiation among populations
7. Distinguish the processes that control the assembly of species into communities
8. Evaluate the role of biodiversity in contributing to human health and welfare
9. Analyze the consequences of human and societal activities on the composition and diversity of biological communities and ecosystems
10. Assess how human activities alter the provision of ecosystem services to human populations

11. Employ an interdisciplinary perspective to evaluating environmental issues
12. Demonstrate recognition of the role of sound scientific information in informing policy and management issues
13. Assess the long-term consequences of human activities in altering ecosystem composition and services on local, regional and global scales

SAMPLE REQUIRED TEXTS/SUGGESTED READINGS/MATERIALS

1. Miller, G.T. 2012. *Living in the Environment*, 17th ed. Houghton Mifflin Harcourt

SAMPLE ASSIGNMENTS AND/OR EXAMS

1. **Three one-hour exams:** All exams are based almost exclusively on material given in the lectures.
2. **Final Exam:** The final exam is comprehensive.
3. **Quizzes:** Quizzes will cover material from the lecture preceding the quiz and/or that day's assigned reading.

SAMPLE COURSE OUTLINE WITH TIMELINE OF TOPICS, READINGS/ASSIGNMENTS, EXAMS/PROJECTS

- Week 1:** Introduction
- Week 2:** The Structure of Ecosystems / Fundamentals
The Functions of Ecosystems & Biomes
- Week 3:** The Functions of Ecosystems / Biogeochemical Cycles
Ecological Succession & Ecosystem Stability
- Week 4:** Geologic Processes and Earth's Physical Changes
The Regulation of Natural Populations
- Week 5:** Evolution
Review for 1st exam
FIRST HOUR EXAM
- Week 6:** Human Populations
- Week 7:** Food & Soil Resources
Pests, Pesticides & Pest Control
- Week 8:** The Water Cycle, Water Resources, and Water Pollution
Living Resources, Biodiversity, Land Use
- Week 9:** Catch-up and review for 2nd exam
SECOND HOUR EXAM

Cancer and toxicology

Week 10: Climate change and air pollution
Energy Resources/Fossil Fuel & Renewable Energy Resources

Week 11: Nuclear Energy Technology
Nuclear Energy, continued; Sustainability

Week 12: Catch-up and review for 3rd exam
THIRD HOUR EXAM

Week 13: The Chernobyl Nuclear Accident
Nuclear Winter & a Modern History of the Arms Race

Week 14: Solid waste and recycling
Review for final exam

Final Exam according to University exam schedule