

**BIOL 2406**  
**Environmental Biology**

**Western Texas College**

- I. Basic Course Information
  - A. Lecture—Principles of environmental systems and ecology, including biogeochemical cycles, energy transformations, abiotic interactions, symbiotic relationships, natural resources and their management, lifestyle analysis, evolutionary trends, hazards and risks, and approaches to ecological research.
  - B. Lab—the required laboratory activities will reinforce the lecture material.
  - C. Any required prerequisites: Co-requisite of Math 1314 or its equivalent.
  - D. Required grade for enrolling in the next course in this sequence: None
- II. Student Learning Outcomes
  - A. Apply scientific reasoning to investigate questions and utilize scientific tools such as microscopes and laboratory equipment to collect and analyze data.
  - B. Use critical thinking and scientific problem-solving to make informed decisions in the laboratory.
  - C. Communicate effectively the results of scientific investigations.
  - D. Explain the structure and impact of biogeochemical cycles.
  - E. Describe energy transformations across trophic levels.
  - F. Illustrate abiotic/biotic interactions and symbiotic relationships.
  - G. Identify various types of natural resources, human impact on these resources, and common resource management practices.
  - H. Quantify and analyze the impact of lifestyle on the environment.
    - I. Depict evolutionary trends and adaptations to environmental changes.
    - J. Describe environmental hazards and risks and the social and economic ramifications.
  - K. Describe ecological and statistical techniques and approaches used in the study of environmental biology.
- III. Testing Requirements
  - A. The Chapter Test and Final exam must be proctored by an approved testing organization. (Ask your instructor for more details.)
  - B. Students are NOT allowed to use their book or notes of any kind while taking their proctored tests and exam.
  - C. All Chapter Tests and the comprehensive Lab and Lecture Final Exams are timed.
- IV. Course Requirements
  - A. 10 multiple-choice quizzes
  - B. 4 current science article write-ups and associated class discussion
  - C. 10 total lab assignments
  - D. 3 non-cumulative multiple-choice chapter exams
  - E. 1 cumulative multiple-choice final exam
- V. Information on Books and Other Course Materials

- A. Required Book: *Environmental Science 15th Edition* by Miller and Spoolman ISBN 978-1-305-09044-6
  - B. Other: Lab materials are provided by the instructor
- VI. Grading Breakdown:
- Articles.....15%
  - Quizzes.....10%
  - Lab.....30%
  - Chapter Tests.....25%
  - Final Exam.....20%
- VII. Other Policies, Procedures and important dates. Please refer to the WTC [Catalog](#) for the following
- A. Campus Calendar
  - B. Final exam schedule
  - C. How to drop a class
  - D. Withdrawal information
  - E. Student Conduct/Academic Integrity
  - F. Students with disabilities
- VIII. Course Content

<b>Chapters Covered</b>	<b>Sections Covered</b>
1 – Environmental Problems, Their Causes, and Sustainability	Principles of sustainability, ecological footprints, causes of environmental problems, sustainability
2 – Science, Matter, Energy, and Systems	Function of science, matter and energy, environmental systems
3 – Ecosystems: What Are They and How Do They Work	Life-supporting systems of Earth, components of ecosystems, matter and ecosystems, scientific study of ecosystems
4 – Biodiversity and Evolution	Biodiversity, role of species, changes in biodiversity over time, factors affecting biodiversity
5 – Species Interactions, Ecological Succession, and Population Control	Species interaction, ecosystem responses to changing environments, limits on population growth
6 – The Human Population and Urbanization	Carrying capacity, human population growth, age structures, attempts to slow population growth, problems with urbanization, impacts of transportation, sustainable urbanization

7 – Climate and Biodiversity	Factors influencing climate, terrestrial ecosystems, marine ecosystems, freshwater ecosystems
8 – Sustaining Biodiversity: Saving Species and Ecosystem Services	Human impacts on loss of species, wild species sustainability, accelerated species extinction
9 – Sustaining Biodiversity: Saving Ecosystem and Ecosystem Services	Threats to forest ecosystems, forest sustainability, grassland sustainability, ecosystem approach to sustainability, aquatic biodiversity sustainability
10 – Food Production and the Environment	Food security, food production, environmental problems of food production, pest control, improving food security, sustainable food production
11 – Water Resources and Water Pollution	Water resources, sources of freshwater, sustainable water use, water pollution
12 – Geology and Nonrenewable Mineral Resources	Earth's geologic processes, nonrenewable mineral resources, sustainable mineral use, geological hazards
13 – Energy Resources	Net energy, advantages and disadvantages of using fossil fuels, advantages and disadvantages of using nuclear power, energy efficiency, advantages and disadvantages of renewables, energy sustainability
14 – Environmental Hazards and Human Health	Human environmental health hazards, biological hazards, chemical hazards, risk assessment
15 – Air Pollution, Climate Change, and Ozone Depletion	Composition of the atmosphere, causes of air pollution, solutions to air pollution, climate change on Earth
16 – Solid and Hazardous Waste	Problems related to solid and hazardous waste, solutions to solid waste, sustainable waste handling, impacts on humans
17 – Environmental Economics, Politics, and Worldviews	Biospheres and economic systems, economic solutions to environmental

	problems, environmental worldviews, human sustainability
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Last Modified: August 23, 2016