

## Ecology

Text:	<u>Environmental Science</u> , Karen Arms (1996); Holt, Rinehart and Winston.
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Supplemental Materials:	Videos and Eden.
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Course Description:	Ecology is a semester course that was developed to allow students to learn about the interrelationships that occur between living organisms and the physical environment. Ecology students will take advantage of the school's 200-acre nature area known as Eden to witness ecological principles first hand.
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Methods of Evaluation:	Evaluation is based on tests, labs, periodic quizzes and homework assignments.
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Course Objectives:	<p>At the end of each of the following chapters, students should be able to:</p> <p><u>Chapter 1.</u></p> <ol style="list-style-type: none"><li>1. Describe the three categories into which most environmental problems fall.</li><li>2. Define population crisis and consumption crisis and explain how each contributes to environmental problems.</li><li>3. Distinguish between renewable and nonrenewable resources.</li><li>4. Describe the scientific method.</li></ol> <p><u>Chapter 2.</u></p> <ol style="list-style-type: none"><li>1. Distinguish between the biotic and abiotic factors in an ecosystem.</li><li>2. Distinguish between a habitat and a niche.</li><li>3. Explain the five major types of symbiosis and be able to give examples of each.</li><li>4. Explain the process of evolution by natural selection.</li><li>5. Explain the concepts of adaptation, coevolution and extinction.</li></ol> <p><u>Chapter 3.</u></p> <ol style="list-style-type: none"><li>1. Describe the role of producers and consumers and illustrate those roles using a trophic pyramid.</li><li>2. Discuss the transfer of energy from the sun to the consumers.</li><li>3. Describe the water, carbon and nitrogen cycles and explain how humans affect them.</li><li>4. Describe primary and secondary succession.</li><li>5. Explain how soil is formed.</li></ol> <p><u>Chapter 4.</u></p> <ol style="list-style-type: none"><li>1. Define biome.</li><li>2. Compare and contrast the world's forest biomes.</li><li>3. Describe the grassland, desert and tundra biomes.</li></ol>
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<p>Course Objectives (Cont.):</p>	<ol style="list-style-type: none"> <li>4. Compare and contrast the world's freshwater biomes.</li> <li>5. Compare and contrast the world's saltwater biomes.</li> </ol> <p><u>Chapter 5.</u></p> <ol style="list-style-type: none"> <li>1. Describe the main sources of fresh water and explain why it is such a valuable resource.</li> <li>2. Compare and contrast point and nonpoint pollution.</li> <li>3. Compare and contrast groundwater with surface water pollution.</li> <li>4. Classify the types of water pollutants.</li> <li>5. Discuss the causes and effects of ocean pollution.</li> </ol> <p><u>Chapter 6.</u></p> <ol style="list-style-type: none"> <li>1. Name and describe the major causes of air pollution.</li> <li>2. Distinguish between primary and secondary air pollution, and how thermal inversions affect pollution.</li> <li>3. Discuss the health effects of air pollution.</li> <li>4. Explain the cause of indoor air pollution and how it can be prevented.</li> <li>5. Explain what causes acid precipitation and describe how different countries are working together to find a solution.</li> </ol> <p><u>Chapter 7.</u></p> <ol style="list-style-type: none"> <li>1. Explain the role of the atmosphere in maintaining life on Earth and describe how the atmosphere is structured in layers.</li> <li>2. Explain how different regions of the world have different climates.</li> <li>3. Explain what causes the seasons.</li> <li>4. Discuss the greenhouse effect and what might happen if the Earth's climate continues to warm.</li> <li>5. Describe the ozone layer and what might occur if the ozone layer becomes damaged.</li> </ol> <p><u>Chapter 8.</u></p> <ol style="list-style-type: none"> <li>1. Define suburban sprawl and explain why it is considered a problem.</li> <li>2. Describe the usefulness of non-urban lands to humans.</li> <li>3. Discuss sustainability as it applies to logging, ranching and mining activities.</li> <li>4. Discuss the advantages and disadvantages of using public land for multiple uses.</li> </ol> <p><u>Chapter 9.</u></p> <ol style="list-style-type: none"> <li>1. Explain why providing adequate food for all of the world's people is difficult.</li> <li>2. Describe the advantages and disadvantages of the green revolution.</li> <li>3. Describe fertile soil and describe methods to prevent soil erosion.</li> <li>4. Discuss low-input and conventional farming.</li> <li>5. Compare and contrast pesticides with pesticide alternatives.</li> </ol>
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<p>Course Objectives (Cont.):</p>	<p><u>Chapter 10.</u></p> <ol style="list-style-type: none"><li>1. Explain why it is important to preserve biodiversity and how humans are causing extinctions.</li><li>2. Describe the main provisions of the Endangered Species Act.</li><li>3. Discuss the methods being employed to help save species.</li><li>4. Explain the advantages of protecting entire ecosystems rather than individual species.</li></ol> <p><u>Chapter 11.</u></p> <ol style="list-style-type: none"><li>1. Explain how fossil fuels are used to produce electricity.</li><li>2. Distinguish between renewable and nonrenewable resources.</li><li>3. Describe the operation of a nuclear power plant and explain the advantages and disadvantages of nuclear energy.</li><li>4. Describe several alternative energy sources.</li></ol>
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