

Discipline: Agriculture	Sub-discipline: Forestry/Natural Resources
General Course Title: <b>Environmental Science</b>	Min. Units: <b>3 Semester</b>
Proposed Suffix: <b>L</b>	
<p>Course Description:</p> <p>This course is an introduction to the conservation or wise use of natural resources and incorporates discussions about the complex relationships of man and the environment. Students will learn about the diverse agencies that manage our resources along with their history and philosophies. Each of the major natural resources such as water, air, energy, forests, wildlife, agriculture, and soils will be covered and students will learn about the environmental policy and laws that govern use of these resources. An emphasis is placed on the practical components of Environmental Science as it relates to social and economic aspects of conservation. Laboratory recommended.</p>	
Required Prerequisites or Co-Requisites <sup>1</sup>	
Advisories/Recommended Preparation <sup>2</sup>	
<p>Course Objectives: <i>At the conclusion of this course, the student should be able to:</i></p> <ul style="list-style-type: none"> <li>• Examine basic ecological principles.</li> <li>• Distinguish among the various types of natural resources and how they are used.</li> <li>• Evaluate the effects of our human population upon the earth's resources.</li> <li>• Assess the various reasons for protecting and maintaining biodiversity.</li> <li>• Evaluate different management practices used to maintain forest ecosystems and wildlife resources.</li> <li>• Evaluate the various resource agencies and their management philosophies.</li> <li>• Assess the role that parks, national forests, and wilderness play in our society.</li> <li>• Distinguish among the various causes of soil erosion.</li> <li>• Evaluate and discuss the sources of air and water pollution along with some of the solutions to those problems.</li> <li>• Investigate how alternative energy sources can be used to meet future demand.</li> <li>• Evaluate environmental policies and their effectiveness in resources conservation.</li> </ul>	
<p>Course Content:</p> <ol style="list-style-type: none"> <li>1. Understanding our environment <ol style="list-style-type: none"> <li>a. Scientific design and hypotheses</li> <li>b. Role of critical thinking</li> <li>c. History of conservation and environmentalism</li> <li>d. Human dimensions of environmental science</li> </ol> </li> <li>2. Principles of ecology <ol style="list-style-type: none"> <li>a. What is matter and energy</li> <li>b. Photosynthesis</li> <li>c. Role of sunlight</li> <li>d. Food chains, food webs, trophic levels and ecological pyramids</li> <li>e. Biogeochemical cycles</li> </ol> </li> </ol>	
<p><b>Environmental Science</b> <b>(Content Continued)</b></p>	

<sup>1</sup> Prerequisite or co-requisite course need to be validated at the CCC level in accordance with Title 5 regulations; co-requisites for CCCs are the linked courses that must be taken at the same time as the primary or target course.

<sup>2</sup> Advisories or recommended preparation will not require validation but are recommendations to be considered by the student prior to enrolling.

3. Populations, communities, and species interactions
  - a. Limiting factors
  - b. Evolution
    - i. Natural selection and adaptation
    - ii. Speciation
  - c. Taxonomy
  - d. Ecological niche
  - e. Species interactions
  - f. Population dynamics
  - g. Community properties
  - h. Ecological succession
4. Biomes and Biodiversity
  - a. What are biomes?
  - b. Biodiversity
    - i. Benefits
    - ii. Threats to biodiversity
    - iii. Human caused reductions in biodiversity
  - c. Endangered species management
5. Conservation of forests, rangelands, parks, and nature preserves
  - a. World forests
  - b. Rangelands
  - c. Parks and nature preserves
  - d. Wildlife management
  - e. Wilderness
  - f. Wildlife refuges
  - g. World parks and preserves
6. Food and agriculture
  - a. Food and nutrition
  - b. Major sources of food
  - c. Soils
  - d. Erosion
  - e. Genetic engineering and GMO's
  - f. Pesticide resistance
  - g. Sustainable agriculture
7. Environmental health and toxicology
  - a. Environmental health
  - b. Toxicology
  - c. Movement, fate, and distribution of toxins
  - d. Measuring toxicity
  - e. Risk assessment

**Environmental Science  
(Content Continued)**

8. Climate and air pollution
  - a. The atmosphere
  - b. Climate change

- c. Air pollution
- d. Ozone depletion
- e. Acid rain
- f. Effects of air pollution on human health
- g. Controlling air pollution
- h. Clean air legislation

9. Water resources and pollution

- a. Water compartments
- b. Water availability and use
- c. Water shortages
- d. Water management and conservation
- e. Water pollution
- f. Pollution control
- g. Water legislation

10. Solid and hazardous waste

- a. Waste stream
- b. Disposal methods
- c. Shrinking the waste stream
- d. Hazardous and toxic waste
- e. Bioremediation

11. Energy

- a. Energy sources and uses
- b. Fossil fuels
- c. Nuclear power
- d. Energy conservation
- e. Solar energy
- f. Fuel cells
- g. Biomass
- h. Energy from the earth's forces
- i. Our future

12. Environmental science and policy

- a. Making decisions
- b. Environmental education
- c. Environmental policy
- d. Environmental law
- e. Dispute resolution
- f. Citizen participation
- g. Collective action

**Environmental Science  
(Content Continued)**

13. Human populations

- a. Population growth
- b. Limits to growth: opposing viewpoints
  - i. Ecologists vs. economists
- c. Human demography
- d. Demographic transition

e. Family planning and fertility control f. The future of human populations	
Laboratory Activities: Individual Laboratory Activities are designed to support course objectives.	
Methods of Evaluation: Lecture Comprehensive Quizzes and Exams Written Critical Thinking Scenarios Problem Analysis and Solution Research and Term Papers	Methods of Evaluation: Laboratory Laboratory Skill Validation by Observation Laboratory Reports Laboratory Research Projects and Reports Laboratory Skill Practicum Exams
Typical Textbooks, Manuals, or Other Support Materials <u>Environmental Science, 6<sup>th</sup> ed.</u> , Cunningham & Saigo, McGraw-Hill <u>Environmental Science</u> , Cunningham & Cunningham, McGraw-Hill <u>Sustaining the Earth, 5<sup>th</sup> ed.</u> , Miller, Tyler G. Jr., <u>Environmental Science, 8<sup>th</sup> ed.</u> , Enger & Smith, McGraw-Hill <u>Living in the Environment, 1<sup>st</sup> ed.</u> Miller, Wadsworth publishing, <u>Natural Resources Conservation, 7<sup>th</sup> ed.</u> , Chiras, Owen, Reginold, Prentice-Hall	
Other Resources:	
<b>Topic</b> Energy Fisheries Forestry Global Warming GMO's  Hydrogen Populations	<b>DVDs/Videos:</b> "Energy" by Meridian Education corp. #'s 5357 & 5356 "Salmon on the Run" by PBS series "NOVA" "Forest Wars" by Summit Films Inc. 1996 "Global Warming" TV program narrated by Tom Brokaw "High-tech foods" by Films for the Humanities and Sciences. <a href="http://www.films.com">www.films.com</a> PBS series Scientific American hosted by Alan Alda "Dodging Doomsday" by Films for the Humanities and Sciences. <a href="http://www.films.com">www.films.com</a>
<b>Statewide Articulation: Currently articulated to universities as specific equivalent by individual community colleges, additional statewide course equivalency articulation currently underway, also currently transfers as lower division elective</b>	
FDRG Lead Signature:	Date:
Mark E. Bender, PhD CSU Stanislaus	
[For Office Use Only]	<b>Internal Tracking Number</b>