Biology (BIOL) 1513 Introduction to Environmental Studies with Lab (4 Units) CSU: UC

Advisory: Eligibility for English 1000 and Reading 1005 or Math 1050, or 1 year of high school algebra, strongly recommended.

Total Hours: 48 hours lecture, 48 hours lab (96 total hours)

Catalog Description: This is an interdisciplinary introduction to ecology through the study of contemporary environmental problems of renewable and nonrenewable resources. The socioeconomic and political concerns of resource shortages, pollution, conservation, and management will be discussed. Field trips are required to certain local points of geological interest. The student may opt to receive credit in only one of the following courses: Biology 1503 or Biology 1513.

Type of Class/Course: Degree Credit


Additional Required Materials: None

Course Objectives:

By the end of the course, a successful student will be able to

1. demonstrate an understanding of the relationship between ecosystems, population and pollutants,
2. employ the principles of the scientific method to investigate environmental situation,
3. express a fundamental comprehension of ecological principles and sustainability by citing examples, and
4. analyze and interpret quantitative data and visual representations of data.

Course Scope and Content (Lecture):

Unit I  Introducing Environmental Science and Sustainability
A. Human Impacts on the Environment
B. Population, Resources, and the Environment
C. Sustainability
D. Environmental Science
E. Addressing Environmental Problems

Unit II  Environmental Laws Economics and Ethics
A. Environmental History of the United States
B. U.S. Environmental Legislation and Justice
C. Economics and the Environment
D. Environmental Ethics, Values, and Worldviews

Unit III  Ecosystems
A. Ecosystems and the Physical Environment
B. Ecosystems and Living Organisms
C. Major Ecosystems of the World

Unit IV Human Health and Environmental Toxicology
A. The Human Population
B. The Urban World

Unit V  Energy Consumption
A. Fossil Fuels
B. Renewable Energy and Nuclear Power

Unit VI Resources
A. Water Resources
B. Soil Resources
C. Biological Resources
D. Land Resources
E. Food Resources

Unit VII Human Impacts on the Environment
A. Air Pollution
B. Global Climate Change
C. Water Pollution
D. Solid and Hazardous Waste

Course Scope and Content (Laboratory)

Unit I Basic Laboratory Skills
A. Lab Safety/Use of Laboratory Equipment
B. Scientific Unit Conversions

Unit II Ecosystems
A. Ecosystem and Energy
   a. Photosynthesis and Respiration Measures
   b. Desert Adaptations in Plants and Animals
   c. Field trip, north- versus south-facing slopes
B. Ecosystems and Biological Resources
   a. Field trip to Wind Wolves Preserve

Unit III Human Health and Environmental Toxicology
A. Agricultural pollution lab and/or field trip
B. McCormick Biological, environmental impact statements

Unit IV Energy Consumption
A. Renewable Energy, Solar Panel Field Trip

Unit V Resources
A. Water, Southwest Water Management District Field Trip, Lake Isabella Dam Field Trip  
B. Land Resources, Plant identification/organs lab, Sequoia National Forest Field Trip  
C. Food Resources, Your Place in the Food Chain Activity  
D. Soil Microbiology Lab  

Unit VI  Human Impacts on the Environment  
A. Personal Impact Analysis  
B. Water Pollution and Biodiversity, Lake Buena Vista Field Trip  
C. Solid and Hazardous Waste, Ex-Mining Site on Lake Isabella Field Trip  

Unit VII  Current Research in Environmental Science  
A. Oral Presentations  

Learning Activities Required Outside of Class:  
The students in this class will spend a minimum of 8 hours per week outside of the regular class time doing the following:  

1. Studying  
2. Answering questions  
3. Completing required reading  
4. Written work  

Methods of Instruction:  

1. Lectures and demonstrations given by instructors  
2. Assigned readings from texts and selected references  
3. Guest lecturers on specific topics  
4. Discussion by students  
5. Videos  
6. Field Trips  
7. Investigation into the Scientific Literature  

Methods of Evaluation:  

1. Substantial writing assignments, including:  
   a. essay exams  
   b. term or other papers  
2. Computational or non-computational problem-solving demonstrations, including:  
   a. exams  
   b. quizzes  
   c. homework assignments  
3. Other examinations, including:  
   a. multiple choice items  
   b. matching items  
4. Oral Presentations  
   a. Current Research in Environmental Science
Laboratory Category: Extensive Laboratory

Pre delivery criteria: All of the following criteria are met by this lab.

1. Curriculum development for each lab.
2. Published schedule of individual laboratory activities.
3. Published laboratory activity objectives.
4. Published methods of evaluation.
5. Supervision of equipment maintenance, laboratory setup, and acquisition of lab materials and supplies.

During laboratory activity of the laboratory: All of the following criteria are met by this lab.

1. Instructor is physically present in lab when students are performing lab activities.
2. Instructor is responsible for active facilitation of laboratory learning.
3. Instructor is responsible for active delivery of curriculum.
4. Instructor is required for safety and mentoring of lab activities.
5. Instructor is responsible for presentation of significant evaluation.

Post laboratory activity of the laboratory: All of the following criteria are met by this lab.

1. Instructor is responsible for personal evaluation of significant student outcomes (lab exercises, exams, practicals, notebooks, portfolios, etc.) that become a component of the student grade that cover the majority of lab exercises performed during the course.
2. Instructor is responsible for supervision of laboratory cleanup of equipment and materials.

Supplemental Data:

<table>
<thead>
<tr>
<th>TOP Code:</th>
<th>030200: Environmental Studies</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAM Priority Code:</td>
<td>E: Non-Occupational</td>
</tr>
<tr>
<td>Distance Education:</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Funding Agency:</td>
<td>Y: Not Applicable(funds not used)</td>
</tr>
<tr>
<td>Program Status:</td>
<td>1: Program Applicable</td>
</tr>
<tr>
<td>Noncredit Category:</td>
<td>Y: Not Applicable, Credit Course</td>
</tr>
<tr>
<td>Special Class Status:</td>
<td>N: Course is not a special class</td>
</tr>
<tr>
<td>Basic Skills Status:</td>
<td>N: Course is not a basic skills course</td>
</tr>
<tr>
<td>-------------------------</td>
<td>----------------------------------------</td>
</tr>
<tr>
<td>Prior to College Level:</td>
<td>Y: Not applicable</td>
</tr>
<tr>
<td>Cooperative Work Experience:</td>
<td>N: Is not part of a cooperative work experience education program</td>
</tr>
<tr>
<td>Eligible for Credit by Exam:</td>
<td>NO</td>
</tr>
<tr>
<td>Eligible for Pass/No Pass:</td>
<td>C: Pass/No Pass</td>
</tr>
<tr>
<td>Taft College General Education:</td>
<td>CSB1: CSU Area B1</td>
</tr>
<tr>
<td></td>
<td>IG5A: IGETC Area 5A</td>
</tr>
<tr>
<td></td>
<td>LNS: Local GE Natural Science</td>
</tr>
</tbody>
</table>