BUTTE COLLEGE
COURSE OUTLINE

I. **CATALOG DESCRIPTION**

BIOL 7 - Sustaining Life on Earth **3 Unit(s)**

Prerequisite(s): NONE
Recommended Prep: Reading Level IV; English Level IV; Math Level II
Transfer Status: CSU/UC
51 hours Lecture

This course will introduce students to the structure of earth's ecosystems and to environmental issues, past and present from a biological science perspective. Students will be able to perceive and interpret the relative health of environmental systems, and to connect this to the role of humans in sustaining life on earth. To reach this understanding, students will read classic environmental literature as well as current environmental literature. The course will include discussions, field trips and guest speakers as well as student involvement in a campus or local environmental effort. During this course students will be encouraged to recognize that their lives are dependent upon the environment, and that their personal decisions affect the entire natural world. Graded only.

II. **OBJECTIVES**

Upon successful completion of this course, the student will be able to:

A. Describe the terms "environmental literacy" and "sustainability".
B. Describe the fundamental structure of the natural systems of the earth that support life, including biogeochemical cycles (carbon cycle, nitrogen cycle, etc.).
C. Analyze and discuss the intricate nature of biological systems and how these systems respond to change.
D. Examine the nature of human relationships with the earth in both rural and urban settings, and how these relationships may impact environment, either adversely or beneficially.
E. Identify the current major environmental issues and evaluate how negative environmental impact affects the earth's systems.
F. Describe how scientists study the earth's ecosystems (using the scientific method).
G. Explain how scientific modeling is used to predict what may happen in the future.
H. Examine the fundamental impacts human commerce and attitudes have on the earth's natural systems.
I. Identify at least 2 examples of technological or biotechnological advances that help sustain life on earth.
J. Utilize resources to make environmentally conscious decisions.
K. Identify how humans can shape their lives to sustain the Earth's natural systems.

III. **COURSE CONTENT**

A. **Unit Titles/Suggested Time Schedule**

Lecture

Topics	Hours
1. Defining environmental literacy and sustainability	2.00
2. Earth's systems: biogeochemcial cycles	3.00
3. Earth's geochemcial changes over time	3.00
4. How the earth's atmosphere and seas connect everything on the planet	4.00
5. Life's responses to change: evolution	4.00
6. Human population growth	2.00
7. Environmental impacts due to human activity	6.00

8. Environmental impacts due to human perceptions and attitudes	3.00
9. Studying environmental impact: the scientific method	3.00
10. Predicting the future: scientific modeling basics	3.00
11. Environmental dilemmas: when one solution creates another problem	3.00
12. Management of natural ecosystems for sustainability	3.00
13. Management of "artificial" systems: sustainable agriculture	3.00
14. Configuring the urban lifestyle to sustain life on earth	3.00
15. Technological and biotechnological advances that contribute to sustainability of the earth's ecosystems	3.00
16. The role of groups and individuals in sustaining life on earth	3.00
Total Hours	51.00

IV. METHODS OF INSTRUCTION

A. Lecture
B. Group Discussions
C. Class Activities
D. Discussion
E. Demonstrations
F. Reading Assignments

V. METHODS OF EVALUATION

A. Exams/Tests
B. Quizzes
C. Group Participation
D. Class participation
E. Written Assignments

VI. EXAMPLES OF ASSIGNMENTS

A. Reading Assignments
   1. Read the textbook section discussing the Nitrogen Cycle and be prepared to discuss the implications of fertilizer use along the Mississippi river.
   2. Read the supplied handout on Dihydrogen monoxide. Be prepared for discusson on the questions: 1) Given these concerns, would you knowingly consume a product that has dihydrogen monoxide? 2) If testing were available to measure DHMO content in your blood, would you have it measured? 3) Should the government have regulations regarding your use of DHMO? 4) Would you support a ban on DHMO?

B. Writing Assignments
   1. Read the news article on impact of cats, "BBC Birds Killed by Cats", and the scientific paper that is the basis of the news article "Impact of cat predation on US wildlife". In a 2 page paper, answer the following questions: 1) Examine Figure 1 of the scientific paper. What does this figure represent and how would you interpret it. Why are there gray bars on either side of the median? 2) Do cats have a larger impact on birds or mammals? Support your answer by referencing text or figures from the paper. 3) Compare the information presented in the BBC news article and the actual paper. Identify pros and cons of each.
   2. Write a 1 page paper describing how poverty is related to poor water quality. Present your summary to a small group during the next class.

C. Out-of-Class Assignments
   1. Research logging practices which have negative impacts on the environment. Analyze the

information and write a 2 page paper summarizing your findings. Be prepared to discuss your summary.

2. Watch the movie GASLAND and answer the following questions: 1) How much natural gas capacity exists in the Marcellus Formation (in TCF)? 2) How much natural gas is used annually in the US (in TCF)? 3) Roughly how many homes were shown in the documentary that had contaminated wells? 4) How many houses do you think are near gas wells that were not shown? What questions does this raise? 5) How does this documentary illustrate the dichotomy between “correlation and causation?" Be prepared to share your answers in class.

VII. **RECOMMENDED MATERIALS OF INSTRUCTION**

Textbooks:

A. Cunningham, W., Cunningham, M. Environmental Science: A Global Concern. 13th Edition. McGraw Hill, 2014.

Materials Other Than Textbooks:

A. Excerpts from writings of leading environmental and ecology authors, such as John Muir, Rachel Carson, Aldo Leopold and James Lovelock.

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