

I. CATALOG DESCRIPTION:

- A. Division: Science
Department: Biology
Course ID: BIOL 104
Course Title: Human Ecology
Units: 3
Lecture: 3 hours
Prerequisite: None
- B. Catalog and Schedule Description:
Discussion of the ecological consequences of human resource use and population growth. Emphasis is on earth's life support systems and current environmental problems threatening human health and species survival.

II. NUMBER OF TIMES COURSE MAY BE TAKEN FOR CREDIT: One

III. EXPECTED OUTCOMES FOR STUDENTS:

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

- A. Define and apply basic vocabulary and concepts of ecology at the molecular, cellular, organism, population, and ecosystem levels.
- B. Compare and contrast basic anatomical, physiological, and ecological features of living organisms at the kingdom level of taxonomy.
- C. Evaluate and defend a confidence level in environmental news reports, using principles of scientific method and knowledge of research design.
- D. Compare and contrast differing views of currently controversial issues in environmental science and health topics, and construct a personal viewpoint.
- E. Generate possible solutions to current environmental problems and discuss the pros and cons of these choices.
- F. Analyze ecosystem interactions and draw inferences about potential consequences of human intervention or interference.

IV. CONTENT:

The overall instructional goal is to present a broad biological perspective that will provide students with key facts, concepts, and analytical skills essential to critically evaluate biological information and make informed decisions about current issues affecting human and environmental health.

- A. Environmental science overview
1. Life
 2. The study of life, including the historical foundations of environmental science
 3. A non-scientist's evaluation of new scientific information
 4. Major environmental worldviews and philosophies
- B. Connections in nature -- basics of matter and energy or basis
1. The important biological molecules
 2. The basic structures and functions of cellular life
 3. Organisms, their energy source and their molecular building blocks
 - a. autotrophic and heterotrophic pathways
 - b. energy & nutrient flow through ecosystems
 - c. biogeochemical cycles
- C. Biodiversity overview
1. The different kingdoms of life
 2. Different organisms' contributions to the Earth's life support system
 3. Types of roles in ecosystems
 4. The importance of ecological succession
- D. Population biology
1. Population grow and decline

- 2. The way populations adapt and change
 - 3. Controlling rates of population growth
- E. Wildlands management issues
 - 1. Forests
 - 2. Grasslands
 - 3. Parks and Wildernesses
- F. Wild species
 - 1. The value of wild species
 - 2. An extinction crisis
 - 3. The success of The Endangered Species Act and other wildlife management laws
- G. Human food supply -- feeding our growing population
 - 1. The basic requirements for agriculture
 - 2. The pros and cons of chemical, mechanical, and biotechnologies
 - 3. Sustaining ocean harvest
- H. Toxicology
 - 1. The types of hazards and how they cause biological harm
 - a. chemical pollutants
 - b. radiation
 - c. biological agents
 - 2. Natural selection and pest resistance: are we losing the war
- I. Pollution issues
 - 1. Air pollution
 - a. smog
 - b. global warming
 - c. stratospheric ozone thinning
 - d. other: light, noise, etc.
 - 2. Water pollution
 - a. water supply problems and solutions
 - b. organic pollution and sewage treatment
 - c. chemical pollution sources
 - 3. Solid and hazardous waste
 - a. trash -- or recycled treasure
 - b. disposal options
- J. Energy sources
 - 1. The pros and cons of traditional non-renewable energy sources
 - a. fossil fuels
 - b. nuclear power
 - 2. Technologies that show promise as sustainable energy sources
 - a. solar power (passive, active, photovoltaic)
 - b. solar-hydrogen
 - c. wind, water, and geothermal electrical generation

V. METHODS OF INSTRUCTION:

- A. Lectures supported by audio-visual aids and demonstration material.
- B. Directed discussion and cooperative-learning group activities.
- C. Readings and visual material from textbook and supplementary handouts.
- D. Short answer and essay homework assignments.

VI. TYPICAL ASSIGNMENTS:

- A. Read, outline, and respond to an essay on a current topic related to a lecture. The essay may be from the textbook, popular literature, or scientific journal. Example: "The Most Expensive Fish in the Sea" Discover Magazine, April 1999. Write a one-page single-spaced typed essay that answers to the following questions: 1) What is the basic

life cycle of the blue fin tuna? 2) What methods are scientists using to uncover the mysteries of the tuna's natural behavior? 3) What facts about this organism's life were most surprising or interesting to you? 4) What are the unanswered questions that scientists are trying to answer? 5) What is your personal opinion/reaction to this research? Explain the reasons for your responses.

- B. Watch the video, Rage Over Trees. Write a one-page single-spaced typed essay in which you incorporate discussion of the following: What are the major arguments made by environmentalists who want to protect Opal Creek Valley from logging? What are the major arguments made by the loggers? Did the video seem to present different sides of the controversy fairly? What is your personal conclusion about this issue? Did the video change any of your pre-existing ideas on forest management (create, strengthen, reverse, confuse)?
- C. Read a two-page summary of a California endangered species excerpted from the text, Life on the Edge. On the provided worksheet, list the organism's common name, taxonomic classification, habitat type, and dietary requirements. Summarize the major reasons leading to this organism's being listed as an endangered species. Interview five other students in class to fill in the grid on the back of the worksheet. Mark an X to indicate the causes of endangerment for their organism. Write a one-page essay that includes discussion of the following: What seem to be the primary problems leading to endangerment in California? What solutions can you suggest to protect California endangered species? What obstacles might exist to implementing your suggestions?
- D. Draw a family tree for your family, starting with one set of grandparents. From this single couple, diagram all their children. Then do the same for the next generation, which should include YOU. If there is a fourth generation or fifth, continue the diagram until all existing descendants of that one couple are included. Place an X through any individual who has died.
Write an essay in which you discuss the following: What patterns do you see? Does your family exhibit a trend toward smaller family size in more recent generations? Why or why not? What factors do you think are important in influencing family size? How big is this family? Has this family contributed to population growth?

VII. EVALUATION:

- A. Methods of Evaluation:
1. Participation. Students do 1-5 minute writing responses. These may be brainstorm lists, opinion reactions, problem solving, etc.
Sample: A person from a part of the world where water must be carried in buckets from a well or river travels to the U.S.A. Imagine they visit your home. Write from this person's point of view, describing their reactions to water use here in the U.S.A.
 2. Essays.
Sample 1: Reading journal. Write a paragraph describing your reactions to the assigned reading. This should not be a summary. Select a specific item that interested, angered, or puzzled you.
Sample 2: Write a one-page typed essay that describes how typically despised creatures and habitats (weeds, bugs, bacteria, and swamps) are valuable to humans.
 3. Objective tests.
Sample: Given a population histogram, predict whether the population is undergoing
(a) growth, (b) stability, or (c) decline.
- B. Frequency of Evaluation:
1. 1-3 participation writings per week; or short quizzes per week
 2. 4 essays, roughly one per month; or a term research project
 3. 4 exams

San Bernardino Valley College
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Last Updated:

VIII. TYPICAL TEXT(S):

A. G. Tyler Miller. Sustaining the Earth, 3rd ed., Belmont, California, Wadsworth Publishing Company, 2003.

B. Raven, Berg, & Johnson. Environment, 2nd ed., Fort Worth, Texas, Saunders College Publishing, 1998.

C. Owen & Chiras. Natural Resource Conservation, 6th ed., Upper Saddle River, New Jersey, Prentice-Hall, 2001.

IX. OTHER SUPPLIES REQUIRED OF STUDENTS: None.