COMMON COURSE OUTLINE

Course discipline/number/title: BIOL 1100: Environmental Biology

A. CATALOG DESCRIPTION
1. Credits: 3
2. Hours/Week: 2 Lecture, 2 lab
3. Prerequisites (Course discipline/number): None
4. Other requirements: None
5. MnTC Goals (if any): Goal 3/Natural Sciences, Goal 10/People and the Environment

B. COURSE DESCRIPTION: This is a one-semester course that introduces students to applied aspects of environmental science. It provides students with a broad overview of the scientific and social aspects of human impact on the environment, interrelationships among organisms and their physical environment, and current issues in environmental science. Students will examine humans' role in the natural world, the impact of the growth of the human population, and the increase in humans' technological ability to make changes in the world. Students will be encouraged to explore societal, political, economic and personal value systems with regard to environmental issues.

C. DATE LAST REVISED (Month, year): April, 2019

D. OUTLINE OF MAJOR CONTENT AREAS:
1. Scientific method
   a) Evaluation of scientific studies and claims
   b) Discriminate fact from opinion, hypothesis from theory, and hypothesis from prediction
2. Graphical analysis of data
3. Characteristics, organization, and diversity of life
4. Principles of ecology
5. Evolutionary biology
6. Population dynamics and human population growth
7. Ecosystem services
8. Structure of matter
9. Properties of water
10. Stormwater and waste water management
11. Energy principles
12. Renewable and non-renewable energy
13. Solid waste management
14. Air and water quality
15. Biogeochemical and hydrologic cycles
16. Invasive species
17. Land use
18. Soil

E. LEARNING OUTCOMES (GENERAL): The student will be able to:
1. Identify pseudoscience and demonstrate an understanding of, and apply all aspects of the scientific method.
2. Explain the current issues confronting individuals, communities, societies, nations, and the world regarding environmental issues, including but not limited to: various forms of pollution, rapid global climate change, exploitation of natural resources, invasive organisms, and degradation of water and soil resources.
3. Recommend potential science-based societal and governmental solutions to environmental problems and issues.
4. Assess the environmental consequences of their own actions and subsequently evaluate the environmental impact of positive changes in their own actions.
5. Describe the flow of energy through systems and the biogeochemical cycles of carbon, nitrogen, phosphorus, and water.
6. Explain general principles of ecology and evolutionary theory with an emphasis on natural selection.
7. Identify the major biomes of the Earth and demonstrate an understanding of our planet's vast diversity.

F. LEARNING OUTCOMES (MNTC):

Goal 3/Natural Sciences: The student will be able to:

1. Formulate and test hypotheses by performing laboratory, simulation, or field experiments in at least two of the natural science disciplines. One of these experimental components should develop, in greater depth, student's laboratory experience in the collection of data, it's statistical and graphical analysis, and an appreciation of its sources of error and uncertainty.
2. Communicate their experimental findings, analyses, and interpretations both orally and in writing.
3. Evaluate societal issues from a natural science perspective, ask questions about the evidence presented, and make informed judgments about science-related topics and policies.

Goal 10/People and the Environment: The student will be able to:

1. Explain the basic structure and function of various natural ecosystems and of human adaptive strategies within those systems.
2. Evaluate critically environmental and natural resource issues in light of understandings about interrelationships, ecosystems, and institutions.
3. Propose and assess alternative solutions to environmental problems.
4. Articulate and defend the actions they would take on various environmental issues.

G. METHODS FOR EVALUATION OF STUDENT LEARNING: Methods may include but are not limited to:

1. Lecture and lab assignments and/or quizzes
2. Objective and/or subjective exams
3. Group work/projects/experiments
4. Presentations

H. RCTC CORE OUTCOME(S). This course contributes to meeting the following RCTC Core Outcome(s):

Critical Thinking. Students will think systematically and explore information thoroughly before accepting or formulating a position or conclusion.

I. SPECIAL INFORMATION (if any):

The initial lab session explains and familiarizes the student with general safety hazards and safety equipment in the lab. During the pre-lab discussion, the hazardous characteristics of any materials used during the lab are discussed. In addition, if the lab involves any potentially infectious material, the students will be instructed on the proper use and disposal. The instructor will direct all students to wear necessary protective equipment while working with any hazardous chemicals. A copy of Safety Data Sheets for chemicals used is available online.