Miami Dade College

Course Description

BSC1050 | Biology & Environment | 3 credits

This course provides students with an understanding and appreciation of how the natural world functions, how human attitudes and actions alter nature systems, creating environmental problems, and how sustainable approaches may resolve these problems.

Course Competencies

Competency 1:

The student will understand the nature, scope, and rationale of environmental science by:

- Define environmental science and explain its relationship to other natural and social scientific disciplines.
- Describe the rationale of environmental science, i.e., the set of reasons why it is necessary to have a discipline that seeks to discover constructive solutions to the problems that arise from the impact of human activities on the environment.
- Identify the array of important environmental problems that humans currently face and analyze their interrelationships.
- Describe non-sustainable and sustainable worldviews and their relationship to environmental science.

Learning Outcomes:

- Communication
- Critical Thinking
- Aesthetic/Creative Activities
- Environmental Responsibility
- Ethical Issues
- Cultural/Global Perspective
- Information Literacy.

Competency 2:

The student will demonstrate comprehension of the structure and functioning of the natural world by:

- Identify the various ecological levels of organization of the biosphere.
- Understand how matter and energy flow within and among ecosystems.
- Define the components of the earth's resource base, including air, water, soils, forest, species diversity,
- minerals, and energy sources.
- Identify the abiotic factors that determine the nature of ecosystems. Understand that these factors can and do change and that populations either adapt to these changes or suffer extinction.
- Explain the nature of genetic variability, how individuals possessing genes that confer fitness in a given environment successfully reproduce while others may not, and how this process of natural selection produces organisms that are adapted to particular environments.
- Recognize the balance between biotic potential and environmental resistance and how these factors affect population dynamics.
- Understand and appreciate the nature and benefits of biodiversity.
- Recognize that as organisms grow and reproduce, they may modify their environment, making it amenable to other species, therefore causing a gradual change in the composition of species found within ecosystems.

Learning Outcomes:

- Communication
- Critical Thinking
- Aesthetic/Creative Activities

- Environmental Responsibility
- Ethical Issues
- Cultural/Global Perspective
- Information Literacy.

Competency 3:
The student will understand and appreciate how human attitudes and actions impact the natural world to create environmental issues and problems by:

- Identify and analyze various human-centered and biocentric worldviews.
- Analyze the relationship between these worldviews and the ethical decisions made by society that impact the environment.
- Evaluate the consequences of sustainable and no sustainable actions.

Learning Outcomes:

- Communication
- Critical Thinking
- Aesthetic/Creative Activities
- Environmental Responsibility
- Ethical Issues
- Cultural/Global Perspective
- Information Literacy

Competency 4:
The student will comprehend the role that overpopulation, overconsumption, and pollution have played in the depletion of natural resources by:

- Describing the basic parameters of human population dynamics, including birth rate, death rate, annual growth rate, percent growth rate, doubling time, fertility rate, and population density.
- Describe the historical human population growth curve, relating periods of exponential growth to human
- activities.
- Explaining how exponential growth of human populations has impacted the earth's resources.
- Identifying the natural resources that have been depleted by humans and explain the plethora of environmental problems that have resulted from this exploitation.
- Identify which resource bases have been polluted by human misuse.

Learning Outcomes:

- Communication
- Critical Thinking
- Aesthetic/Creative Activities
- Environmental Responsibility
- Ethical Issues
- Cultural/Global Perspective
- Information Literacy

Competency 5:
The student will understand how natural processes respond to disturbances of human origin. by:

- Explaining how human activities (including energy production, transportation, and industry) have resulted in major atmospheric disturbances, such as ozone depletion, global warming, acid rain, and deteriorating air quality.

- Explaining how human activities (including sewage disposal, agriculture, industry, and mining) have resulted in major disturbances of the hydrosphere, such as cultural eutrophication, hazardous chemical pollution, spread of waterborne disease, and excessive depletion of water reserves.
- Explaining how human activities (including mining, solid waste disposal, agriculture, and urbanization) have resulted in major disturbances of the lithosphere, such as erosion, nutrient depletion, desertification, and food shortages.
- Explaining how human activities (including agriculture, urbanization, introduction of exotic species, energy production and consumption, and political and economic disturbances) have resulted in loss of biodiversity and the deterioration of the health of living organisms at the genetic, species, and ecosystem levels.

Learning Outcomes:

- Communication
- Critical Thinking
- Aesthetic/Creative Activities
- Environmental Responsibility
- Ethical Issues
- Cultural/Global Perspective
- Information Literacy.

Competency 6:

The student will demonstrate comprehension of the principles of sustainable management that may alleviate environmental problems. by:

- Define sustainable use of resources and identify the benefits of managing ecosystems in a holistic, sustainable manner.
- Identify sustainable methods of transportation, energy production, and industrial manufacturing that do not add to atmospheric environmental problems, such as ozone depletion, global warming, and acid rain.
- Identify sustainable methods of sewage disposal, agriculture, industry, and mining that do not degrade the hydrosphere.
- Identify sustainable methods of managing the lithosphere in fields such as agricultural production, ecological restoration, and solid waste management.
- Identify sustainable methods of managing human activities (such as agriculture, urbanization, introduction of exotic species, energy production and consumption, and political and economic disturbances) that do not result in loss of planetary biodiversity.

Learning Outcomes:

- Communication
- Critical Thinking
- Aesthetic/Creative Activities
- Environmental Responsibility
- Ethical Issues
- Cultural/Global Perspective
- Information Literacy.