Miami Dade College

Course Description

BSC1005 | General Education Biology | 3 credits

This course applies the scientific method to critically examine and explain the natural world including but not limited to cells, organisms, genetics, evolution, ecology, and behavior. Student learning outcomes: students will evaluate data regarding validity; students will read and interpret a variety of scientific data; students will describe the natural world; and students will articulate and practice the scientific method.

Course Competencies

Competency 1:

The student will learn of the nature of science and the scientific process by:

- Defining science and biology.
- Differentiating between science and pseudoscience.
- Discussing the characteristics of life.
- Employing the scientific method to understand biological issues in our society and make scientifically informed decisions.

Learning Outcomes

- Critical thinking
- Information Literacy
- Social Responsibility

Competency 2:

The student will learn about the nature of matter and energy, and how these relate to living organisms by:

- Explaining how biological systems transform energy and matter.
- Explaining atomic structure and chemical bonding.
- Identifying the four major groups of biological molecules, their functions in living systems, and their relation to human health.
- Defining metabolism
- Describing the roles of enzymes in metabolism and how they relate to human health.
- Examining the natural energy transforming processes of photosynthesis and cellular respiration.

Learning Outcomes

- Critical thinking

Competency 3:

The student will learn cell structure and function by:

- Describing the structure of prokaryotic cells, eukaryotic cells, and viruses.
- Explaining the functions of cellular organelles.
- Differentiating between plant, animal, and prokaryotic cells.

- Explaining transport processes across plasma membranes.
- Identifying the differences between viruses and bacteria and their impact on human health.

Learning Outcomes

- Critical thinking

Competency 4:

The student will learn the processes of reproduction and cell division and the basic principles of molecular genetics by:

- Explaining the function and relevancy of reproduction, highlighting the differences between asexual and sexual forms.
- Explaining the different roles of cell division, such as growth, repair, and the production of gametes.
- Evaluating mitosis and meiosis as processes that contribute to the continuity and diversity of life.
- Identify how errors in mitosis and meiosis can lead to abnormal conditions, highlighting cancer.
- Examining the principles of heredity, both Mendelian and non-Mendelian.
- Explaining the processes of DNA replication, gene expression, and their applications in biotechnology.

Learning Outcomes

- Critical thinking
- Ethical Issues

Competency 5:

The student will demonstrate understanding of the evolutionary theory by:

- Explaining the theory of evolution and modern synthesis.
- Explaining the evidence that supports the theory of evolution.
- Describing how scientists classify living organisms.

Learning Outcomes

- Critical thinking

Competency 6:

The student will demonstrate knowledge of interactions between organisms and their environment by:

- Explaining how abiotic factors affect organisms and their environment.
- Describing the factors and mechanisms that control population growth.
- Discussing the various relationships existing among organisms in communities.
- Discussing ecosystem processes.
- Describing the major biomes on Earth.
- Discussing the global impact of human activities on the environment and biodiversity.
- Discussing practices and strategies for achieving sustainability.

Learning Outcomes

- Critical thinking

- Environmental Responsibility
- Ethical Issues
- Social Responsibility