Miami Dade College

Course Description

BSC1005 | General Education Biology | 3.00 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:

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

Competency 2: The student will learn about the nature of matter and energy and how these relate to living organisms by:

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

Competency 3: The student will learn cell structure and function by:

1. Describing the structure of prokaryotic cells, eukaryotic cells, and viruses
2. Explaining the functions of cellular organelles
3. Differentiating between plant, animal, and prokaryotic cells
4. Explaining transport processes across plasma membranes
5. Identifying the differences between viruses and bacteria and their impact on human health

Competency 4: The student will learn the processes of reproduction and cell division and the basic principles of molecular genetics by:

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

Competency 5: The student will demonstrate an understanding of the evolutionary theory by:

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

Competency 6: The student will demonstrate knowledge of interactions between organisms and their environment by:

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

Learning Outcomes:

- Solve problems using critical and creative thinking and scientific reasoning
- Formulate strategies to locate, evaluate, and apply information
- Describe how natural systems function and recognize the impact of humans on the environment