



Common Course Number: BSC-1005

Course Title: General Education Biology

Catalog Course Description:

This general education biology course covers basic biological concepts, concentrating on selected principles that help explain molecular biology, evolution, genetics, growth, disease, and the problems of humans in the environment. It is designed to stimulate interest in the variety of life that exists on our planet, help students recognize the factors that provide order in this variety, and involve students in the processes of inquiry, observation, and analysis of biological organization in order to give them a foundation for intelligently interpreting and evaluating biological topics.

Credit Hours Breakdown: 3 lecture hours

Prerequisite: None

Co requisite: None

Course Competencies:

Competency 1: The student will understand the nature of science, the scientific method, and the field of biology.

Upon successful completion of this course, the student will demonstrate knowledge of the nature of science and the scientific process by:

- A. Describing and/or illustrating the scientific method as presented in the literature.
- B. Differentiating between science and biology.
- C. Comparing the characteristics of life common to a simple cell and multicellular organisms.

Competency 2: The student will become familiar with the basic principles of matter and energy, and understand how they relate to living organisms.

Upon successful completion of this course, the student will demonstrate knowledge of the nature of matter and energy and how they relate to living organisms by:

- A. Defining energy and matter, and their laws, and explaining how they are used in biological systems.
- B. Explaining the basic structure of atoms and molecules and recognizing examples of covalent, hydrogen, and ionic bonding.
- C. Explaining the importance of water to life and the concept of acidity as well as its expression as pH.
- D. Identifying the four major groups of organic compounds (carbohydrates, lipids, proteins, and nucleic acids) and understanding their functions in living systems.
- E. Describing the roles of enzymes in the synthesis and decomposition of biological compounds.
- F. Describing the processes of photosynthesis and cellular respiration.

Competency 3: The student will become familiar with cell structure and function and their interrelationships.

Upon successful completion of this course, the student will demonstrate knowledge of the nature of cell structure and function by:

- A. Describing the structure of a typical cell and explaining the function of the sub-cellular organelles.
- B. Differentiating between plant and animal cells with respect to structure and function.
- C. Identifying and explaining methods of cell transport such as diffusion, osmosis, and active transport.

Competency 4: *The student will understand the processes of cellular and organismal proliferation.*

Upon successful completion of this course, the student will demonstrate knowledge of the cellular and organismal processes of proliferation by:

- A. Explaining the function and significance of cell division and organismic reproduction.
- B. Comparing and contrasting mitosis and meiosis and describing the significant events that occur in each stage of these processes.
- C. Explaining the principles of heredity, as illustrated by the work of Gregor Mendel, and their application to humans.
- D. Describing the structure of DNA and understand how it functions to control a cell's activity and acts as the molecule of heredity.
- E. Explaining the processes of DNA replication, transcription and translation.

Competency 5: *The Student will understand and appreciate the nature of evolutionary theory.*

Upon successful completion of this course, the student will demonstrate knowledge of the nature of evolutionary theory by:

- A. Explaining the theory of evolution of life on Earth favored by modern scientists.
- B. Describing and explaining Darwin's basic concept of natural selection and how it relates to the theory of evolution.
- C. Listing and explaining the several categories of evidence that support the theory of evolution.
- D. Describing how scientists group living organisms into hierarchical groups based on their shared characteristics, and name and characterize the major systematic taxa.

Competency 6: The student will understand the relationship between organisms and the environment as well as how the environment is affected by population growth and consumption of resources.

Upon successful completion of this course, the student will demonstrate knowledge of interactions between organisms and the environment by:

- A. Identifying and explaining the ways in which the abiotic environment affects living systems.
- B. Describing the factors that control population growth and the mechanisms involved.
- C. Discussing the various relationships existing among individuals and populations in communities.
- D. Explaining the nature of ecosystems with particular reference to their sustainability.
- E. Listing and describe the major biomes of the world.
- F. Discussing the major impact humans have on their environment