

Common Course Number: BSC-1005-L

Course Title: General Education Biology Lab

Catalog Course Description:

This course provides a basic understanding of the biological systems and developing of primary skills required at the laboratory settings.

Credit Hours Breakdown: 1 credit

Prerequisite: None

Co requisite: None

Course Competencies:

Competency 1: The Sciences of Biology

Upon successful completion of this course, the student will have knowledge of selected principles and ideas in the biological sciences including:

- 1.1 The existence of the different branches of Biology: Biochemistry, Cytology, Histology, Botany, Zoology, Anatomy and Physiology, Ecology.
- 1.2 Selected advances in biological sciences and their practical applications in today's world.
- 1.3 The role of humans in Biosphere
- 1.4 The influence of human populations on plant and animal communities.

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Competency 2: Chemical organization of biological organisms

Upon successful completion of this course, the student will be having an understanding of:

- 2.1 the structure of specified large organic and small inorganic molecules.
- 2.2 the principles of Osmosis and Diffusion
- 2.3 Applications of Osmosis and Diffusion to cells in the real world
- 2.4 The physical and chemical properties of water.

Competency 3: Introductory Microscopy

Upon successful completion of this course, the student will be able to demonstrate:

- 3.1 Knowledge of the basic parts of the compound microscope.
- 3.2 Ability to use correctly the compound Microscope (including care and storage).
- 3.3 Knowledge of the parts of the Stereoscope.
- 3.4 Ability to use correctly the Stereoscope.
- 3.5 Knowledge of the principles of advanced techniques of microscopy, such as, dark-field and phase microscopy, and Scanning and Transmission Electron Microscopy.

Competency 4: Cells and Tissues

Upon successful completion of this course, the student will understand the differences between plant and animal cells, to recognize cellular organelles, and explain their function by:

- 4.1 Identifying the major cellular organelles.
- 4.2 Explaining how substances move into and out of cells.
- 4.3 Understanding and identifying the stages of mitosis and meiosis.
- 4.4 Identifying the four basic tissue types that comprise the human body: epithelial, connective, muscle, and nervous tissues.

Competency 5: Introduction to the Botany

Upon successful completion of this course, the student will have a knowledge of plant taxonomy, and be able to identify the major parts of the plants by the:

- 5.1 Identification of angiosperms.
- 5.2 Knowledge of the characteristics of Dicots and Monocots
- 5.3 Identification and knowledge of the structure and function of the parts of the flowering plants (including leaves, flowers, stems and roots)

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Competency 6: Introduction to the Energy resources in Biosphere

Upon successful completion of this course, the student will be able to understand the origin of energy on the planet Earth, and importance of the Photosynthesis.

- 6.1 Understanding the role of the chlorophyll and other photopigments in the process of photosynthesis.
- 6.3 Knowledge “Light” (light dependent) and “Dark” (light independent) reactions of Photosynthesis
- 6.4 Introduction to principles of spectrophotometry and paper chromatography
- 6.4 Introduction to the visible spectrum.
- 6.7. Demonstration of ability to analyze and graph scientific data.

Competency 7: Introduction to Zoology

Upon successful completion of this course, the student will have a knowledge of animal taxonomy, with special emphasis of the Phylum Arthropoda:

- 7.1 Knowledge of levels of classification
- 7.2 Knowledge of the characteristics of the classes of the phylum Arthropoda
- 7.3 Knowledge of selected adaptations including: protective coloration and mimicry
- 7.3 Knowledge of the economic importance of arthropods to mankind.

Competency 8: Introduction to Ecology

Upon successful completion of this course, the student will be able to understand the function and importance of biological communities, and demonstrate:

- 8.1 Acquaintance with native and exotic species of local importance.
- 8.2 Describe the characteristics of invasive exotics, and means for their control.
- 8.3 Ability to critically observe and describe different species as specified by the instructor.
- 8.4 An understanding the interdependence species.
- 8.4 An understanding of the concepts of food chains, food webs, and energy pyramids.

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Competency 9: Introduction to Human Anatomy and Physiology

Upon successful completion of this course, the student will be able to understand the basic structure and function of the Circulatory, Nervous and Reproductive Systems, and demonstrate knowledge of the principles of:

- 9.1 Blood circulation, and the electrical activity of the heart.
- 9.2 Respiration and lung volumes.
- 9.3 Sensation and acquaintance with the organs of special senses – cutaneous receptors, olfaction, taste, vision, hearing and equilibrium.
- 9.4 Reproduction and the stages of early development

Competency 10: Genetic Principles and Patterns

Upon successful completion of this course, the student will be able to understand principals of inheritance, and demonstrate the ability to analyze:

- 10.1 Monohybrid cross.
- 10.2 Dihybrid cross.
- 10.3 Patterns of inheritance of Sex-linked traits.
- 10.4 Patterns of autosomal inheritance.
- 10.5 Inheritance of the proteins associated with the blood typing.

Students will demonstrate knowledge of modern genetics by:

- 10.6 Describing the Human Genome Project
- 10.7 Discussing current interest in biotechnology
- 10.8 Discussing the social, scientific and ethical issues associated with genomic research.

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