BIO 111 General Biology I

COURSE DESCRIPTION:

Prerequisites: DRE-097, or ENG 002; DMA-010, DMA-020, DMA-030, DMA-040, DMA 050 or MAT-003 Tier 2
Corequisites: None

This course introduces the principles and concepts of biology. Emphasis is placed on basic biological chemistry, molecular and cellular biology, metabolism and energy transformation, genetics, evolution, and other related topics. Upon completion, students should be able to demonstrate understanding of life at the molecular and cellular levels. *This course has been approved for transfer under the Comprehensive Articulation Agreement as a general education course in Natural Science.*
Course Hours Per Week: Class, 3. Lab, 3. Semester Hours Credit, 4.

LEARNING OUTCOMES:

Upon completing requirements for this course, the student will be able to:

1. Conduct hypothesis testing, experimental design, and critical analysis of data.
2. Explain structure-function relationships in biomolecules and cellular organization.
3. Explain central dogma processes shaping biological traits and heritable characteristics.
4. Describe relationships between matter, chemical changes, energy, and organization.
5. Analyze population genetics, natural selection, and phylogeny.

OUTLINE OF INSTRUCTION:

I. Basic biological chemistry
   - A. Matter and bonding
   - B. Properties of water
   - C. pH and buffers
   - D. Biological molecules (carbohydrates, lipids, nucleic acids, amino acids)

II. Molecular and cellular biology
   - A. Prokaryotic vs. eukaryotic cells
   - B. Membranes of the cell and organelles
   - C. Cellular organization
   - D. Cellular transport
   - E. Cell signaling
   - F. Mitosis
   - G. DNA replication, transcription, and translation

III. Metabolism and energy transformation
   - A. Enzymes and enzymatic reactions/metabolism
   - B. Energy and ATP
   - C. Aerobic and anaerobic respiration
   - D. Photosynthesis

IV. Genetics
   - A. Mendelian genetics and exceptions to Mendelian genetics
   - B. Sex Linkage
   - C. Meiosis
   - D. Mutation and genetic change

V. Evolution
    A. Origin of life and phylogeny
    B. Natural selection and other mechanisms of evolution
    C. Variation and speciation
    D. Population genetics
VI. Other Related Topics
    A. Biotechnology
    B. Scientific method, experimentation, and data analysis

REQUIRED TEXTBOOK AND MATERIAL:

The textbook and other instructional material will be determined by the instructor.