

# CHM 094 Basic Biological Chemistry

## COURSE DESCRIPTION:

Prerequisites: DMA 010, DMA 020, DMA 030, and DMA 040, or MAT 003, or MAT 121, or MAT 171, or satisfactory score on placement test.

Corequisites: None

This course introduces the chemistry important to biological processes. Emphasis is on the aspects of general, organic, and biological chemistry that apply to biological systems and processes. Upon completion, students should be able to demonstrate an understanding of the basic biological chemistry necessary for success in college-level biology courses. Laboratory work reinforces the principles discussed in lecture.

Course Hours Per Week: Class, 3. Lab, 2. Semester Hours Credit, 4.

## LEARNING OUTCOMES:

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

1. Explain fundamental chemical concepts in general chemistry.
2. Explain fundamental chemical concepts in organic chemistry.
3. Explain fundamental concepts of biochemistry.
4. Demonstrate laboratory skills in areas of safety and measurement.

## OUTLINE OF INSTRUCTION:

- I. General Chemistry
  - A. Measurement
    1. Metric system
    2. Density and specific gravity
    3. Temperature scales
    4. Unit conversions
  - B. Properties of matter
    1. States of matter
    2. Physical and chemical properties/changes
    3. Mixtures
  - C. Structure of matter
    1. Atomic structures
    2. Periodic table
  - D. Chemical bonding
    1. Types of bonds
    2. Ions and molecules; ionic and covalent compounds
    3. Chemical formulas and bonding
    4. Bond polarity and compound polarity
    5. Molar mass and moles
    6. Chemical equations
  - E. Solutions
    1. Electrolytes
    2. Solutions, colloids, and suspensions

- 3. Concentration
    - 4. Osmosis
  - F. Acid-base chemistry
    - 1. Basic definition of acids and bases
    - 2. The pH scale
    - 3. Conceptual understanding of buffers
    - 4. Gases
- II. Organic Chemistry
  - A. Functional groups
    - 1. Alkanes/alkenes/alkynes and cyclic hydrocarbons
    - 2. Alcohols and ethers
    - 3. Aldehydes and ketones
    - 4. Carboxylic acids and esters
    - 5. Amines and Amides
- III. Biological chemistry that applies to biological systems and processes
  - A. Biological molecules
    - 1. Lipids
    - 2. Carbohydrates
    - 3. Nucleic acids (DNA and RNA)
    - 4. Amino acids (Proteins and enzymes)
  - B. Metabolic reactions and respiration
  - C. DNA replication, transcription, and translation
  - D. Cells and cell structures (very basic understanding)

**REQUIRED TEXTBOOK AND MATERIAL:**

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