CHM 094  
BASIC BIOLOGICAL CHEMISTRY

COURSE DESCRIPTION:

Prerequisites: DMA 010, DMA 020, DMA 030, and DMA 040, or MAT 121, or MAT 171, or satisfactory score on placement test  
Corequisites: DMA 040, or MAT 060 and MAT 070, or satisfactory score on placement test

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 completion of this course, the student will demonstrate basic knowledge in the following:

a. Fundamental chemical concepts in inorganic chemistry.
b. Fundamental chemical concepts in organic chemistry.
c. Fundamental concepts of biochemistry.

OUTLINE OF INSTRUCTION:

I. Measurement in chemistry  
   A. Metric system  
   B. Density and specific gravity  
   C. Temperature scales

I. Properties of matter  
   A. States of matter  
   B. Physical and chemical changes  
   C. Physical and chemical properties  
   D. Mixtures  
   E. Elements  
   F. Compounds

I. Structure of matter  
   A. Law of definite bonds  
   B. Atomic structure  
   C. Periodic table
I. Chemical bonding
   A. Types of chemical bonding
   B. Writing formulas for compounds
   C. Naming compounds
   D. Formula weights
   E. Chemical mole

V. Chemical equations
   A. Types of equations
   B. Balancing equations

VI. Oxygen
   A. Physical and chemical properties
   B. Ozone
   C. Oxidation-reduction reactions

VII. Water
   A. Chemical and physical properties
   B. Hydrogen bonding

VIII. Solutions
   A. Properties of true solutions
   B. Properties of colloidal solutions
   C. Properties of suspensions
   D. Concentration

VIII. Ionization and dissociation

IX. Acids and bases
   A. Properties of Arrhenius acid bases
   B. Properties of Brønsted-Lowry acids and bases
   C. Chemical equilibrium
   D. pH
   E. Neutralization
   F. Buffers
   G. Henderson-Hasselback equation

XI. Organic chemistry
   A. Hydrocarbons
   B. Alcohols
   C. Esters
   D. Ethers
   E. Organic acids
   F. Cyclic organic compounds
   G. Heterocyclic organic compounds
XII. Biochemistry
   A. Carbohydrates
   B. Lipids
   C. Proteins
   D. Enzymes

REQUIRED TEXTBOOKS AND MATERIALS:

To be selected by the Instructor/Discipline Chair.