CHM 130
GENERAL, ORGANIC AND BIOCHEMISTRY

COURSE DESCRIPTION:

Prerequisites: RED 080 and Mat 060
Corequistites: NONE

This course provides a survey of basic facts and principles of general, organic, and biochemistry. Topics include measurement, molecular structure, nuclear chemistry, solutions, acid-base chemistry, gas laws, and the structure, properties and reactions of major organic and biological groups. Basic cell structure will be presented. Upon completion, students should be able to demonstrate an understanding of fundamental chemical concepts. *This course has been approved to satisfy the Comprehensive Articulation Agreement for transferability as a premajor and/or elective course requirement.* Course Hours Per Week: Class, 3. Lab, 0. Semester Hours Credit, 3.

LEARNING OUTCOMES:

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

1. Fundamental chemical concepts in general chemistry.
2. Fundamental chemical concepts in organic chemistry.
3. Fundamental concepts of biochemistry.
4. Fundamental concepts of cell structure and cell membranes

OUTLINE OF INSTRUCTION:

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

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

III. Structure of matter
- A. Law of definite bonds
- B. Atomic structure

C. Periodic table
D. Nuclear chemistry

IV. 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. Gas Laws
A. Charles Law
B. Boyles Law
C. Gay-Lussac's Law
D. Graham's Law
E. Dalton's Law
F. Henry's Law

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

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

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

X. Ionization and dissociation

XI. Acids and bases
A. Properties of Arrhenius acid bases
B. Properties of Bronsted-Lowery acids and bases
C. Chemical equilibrium
D. pH
E. Neutralization
F. Buffers
G. Henderson-Hasselbach equation

XII. Organic chemistry
- A. Hydrocarbons
- B. Alcohols
- C. Esters
- D. Amides
- E. Organic acids
- F. Cyclic organic compounds
- G. Heterocyclic organic compounds
- H. Amines

XIII. Biochemistry
- A. Carbohydrates
- B. Lipids
- C. Proteins
- D. Enzymes

XIV. Cell Structure and Function
- A. Function of cell structure
- B. Cell Membranes

REQUIRED TEXTBOOKS and MATERIALS:

Smith, J. G., General, Organic, & Biological Chemistry, New York, McGraw Hill, 2010.

Chemical Education, Lab Packets

STATEMENT FOR STUDENTS WITH DISABILITIES:

Students who require academic accommodations due to any physical, psychological, or learning disability are encouraged to request assistance from a disability services counselor within the first two weeks of class. Likewise, students who potentially require emergency medical attention due to any chronic health condition are encouraged to disclose this information to a disability services counselor within the first two weeks of class. Counselors can be contacted by calling 536-7207, ext. 1413 or by visiting the Student Development Office in the Phail Wynn Jr. Student Services Center, room 1309.