

Common Course Outline
CHEM 146
Introduction to Organic and Biochemistry
3 Semester Hours

The Community College of Baltimore County

Description

CHEM 146--3 Credits--Introduction to Organic and Biochemistry introduces the chemistry of organic compounds, discusses hydrocarbons & their functional derivatives, stereochemistry, carbohydrates, proteins, lipids & nucleic acids. Completion of CHEM 107, 108, 146 and 147 will satisfy needs of those transferring to institutions that require 8 credits of college chemistry that includes 4 credits of organic & biochemistry.

3 lecture hours & 1 recitation hour per week

Prerequisites: (CHEM 121 and CHEM 122) or (CHEM 107 and CHEM 108).

Concurrent enrollment in CHEM 147 is highly recommended.

Overall Course Objectives

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

1. demonstrate understanding of the general principles of chemical equilibrium;
2. demonstrate mastery of the general principles of kinetics and order of reaction;
3. demonstrate mastery of the concepts of acids and bases and calculation of pH.
4. describe the general properties of hydrocarbons and hydrocarbon derivatives;
5. predict the types of intermolecular forces expected between various types of particles;
6. give IUPAC names to any organic compound having up to 10 carbons in its parent structure;
7. describe the general properties of hydrocarbons and hydrocarbon derivatives and give IUPAC names to any organic compound having up to 10 carbons in its parent structure;
8. classify biological compounds as a carbohydrate, monosaccharide, disaccharide, polysaccharide, fat, lipid, protein or nucleic acid given its structure or visa versa;
9. describe the general properties and reactions of compounds_which have the functional groups, listed above;
10. recognize and classify various stereoisomers given their structure. This includes enantiomers, diastereomers and geometrical isomers;
11. write chemical equations involving the transformation of some functional groups into others;

12. describe the methods used to analyze amino acids and proteins; and
13. describe the biological function of carbohydrates, protein enzymes, lipids and nucleic acids.

Major Topics

- I. Covalent and Ionic Bonding
- II. Interparticle Forces
- III. Concepts of Chemical Equilibrium
- IV. Concepts of Chemical Kinetics
- V. Concepts of Acids and Bases and pH
- VI. Alkanes, Alkenes, Alkynes and Aromatic Hydrocarbons
- VII. Alcohols, Phenols, Ethers, and Organic Halides
- VIII. Aldehydes and Ketones
- IX. Carboxylic Acids and Esters
- X. Carbohydrates
- XI. Amines and Amides
- XII. Lipids
- XIII. Proteins and enzymes
- XIV. Nucleic acids
- XV. DNA, RNA

Course Requirements

Grading/exams: Grading procedures will be determined by the individual faculty member but will include a mix of evaluation instruments (homework, quizzes, exams, or written assignments). A significant portion of the grade will be determined by proctored evaluation.

Writing: The individual faculty member will determine specific writing assignments.

Other Course Information

While it is expected that these topics will be covered, faculty members may include additional topics consistent with department practices.

Date Revised: 4/20/07