

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

**Community College of Baltimore County**

**Description**

**CHEM 146 - 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:** ACLT 052 or 053; MATH 082; 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: 5/30/19