

Common Course Outline

CHEM 107

Fundamentals of Chemistry

3 Semester Hours

The Community College of Baltimore County

Description

CHEM 107--3 Credits--Fundamentals of Chemistry surveys the concepts of general chemistry. Topics include states of matter, atomic structure, periodic table, bonding, nomenclature, chemical reactions, chemical equations, and quantitative relationships.

3 lecture hours & 1 recitation hour per week

Prerequisites: (ENGL 051 or ESOL 051) and (RDNG 052 or ESOL 054) and MATH 082

Concurrent enrollment in CHEM 108 is highly recommended.

Overall Course Objectives

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

1. apply inorganic and physical chemical principles required for the health sciences, or for continuation in a higher-level chemistry course;
2. apply scientific concepts and methodologies to physical science;
3. make conversions within the metric system as well as from the English system of measurement;
4. explain, orally or in writing, the structure of matter;
5. explain the principles behind chemical bonding;
6. explain the difference between ionic, covalent, and polar covalent bonds;
7. apply basic knowledge of chemical and physical properties and periodic relationships to predict characteristics of specific elements;
8. give the names or formulas of simple inorganic compounds and ions.
9. apply the principles of chemical bonding to predict types of intermolecular forces which are likely to be present in specific substances;
10. explain, orally or in writing, the physical properties of the major classes of liquids and solids in terms of interparticle forces;
11. use mathematics in problem solving;
12. determine the concentrations of acids and bases in solution;
13. perform mass calculations;
14. correctly name compounds;
15. write balanced equations;
16. apply solubility rules to predict outcome of reactions;
17. explain the concepts behind the s, p, d, and f orbitals, and relate them to the Periodic Table;

18. analyze in collaboration with fellow students a chemical technological application from ethical, economic, sociological, and political perspectives; and
19. identify the materials being oxidized and reduced in a reduction-oxidation reaction.

Major Topics

- I. Science vs. Technology
- II. Measurements, Metric System & Chemical Calculations
- III. Atomic and Molecular Weights, Moles & Stoichiometry
- IV. Properties and Calculations of Gases
- V. Properties of Liquids and Solids & Changes in State
- VI. Atomic Structure and the Nucleus
- VII. Atomic Structure: Electrons and Energy Levels
- VIII. Periodic Properties
- IX. Chemical Bonding and Molecular Shapes
- X. Solutions: Properties and Calculations
- XI. Chemical Energetics

Course Requirements

Grading/exams: Grading procedures will be determined by the individual faculty member but will include at least two 1-hour exams and a 2-hour final exam.

Writing: Individual faculty member may decide to assign a term paper to replace one of the 1-hour exams.

Other Course Information

This course with CHEM 108 may be used to fulfill four credits of the General Education requirement in Physical and Biological Sciences.

Individual faculty members may include additional course objectives, major topics and other requirements to the minimum expectations stated in this Course Outline.

Date Revised: 3/10/07