

# Common Course Outline

## CHEM 121

### General Chemistry I

3 Semester Hours

## The Community College of Baltimore County

### Description

**CHEM 121--3 Credits--General Chemistry I** includes the study of atomic structure, nomenclature, chemical reactions & equations, stoichiometry, thermochemistry, chemical bonds & structures; typically taken by science, health professional & engineering majors. 3 lecture hours & 1 recitation hour per week. Concurrent enrollment in CHEM 122 highly recommended.

Prerequisites: 1) Minimum grades of C in CHEM 107 and 108 or a passing score on the Chemistry Placement Test; 2) (ENGL 051 or ESOL 051) and (RDNG 052 or ESOL 054) and MATH 083.

### Overall Course Objectives

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

1. describe the process of science including the scientific method;
2. review and apply the rules to names or formulas of inorganic compounds and ions;
3. review and expand the knowledge of formulas and nomenclature to construct and balance chemical equations and make quantitative mass-to-mass conversions;
4. apply the mole concept to solve problems involving stoichiometry;
5. apply what has been learned to solve problems involving concentration and dilution of aqueous solutions and concerning precipitation, acid/base and redox reactions;
6. describe the physical behavior of gases, gas laws and kinetic molecular theory of gases;
7. apply what has been learned to solve problems dealing with the first law of thermodynamics, Hess's law of summation, and enthalpies of formation and reaction;
8. describe the electronic structure of atoms and the organization of the periodic table;
9. determine the structure of simple covalent molecules and polyatomic ions using Lewis structures;
10. apply VSEPR theory and orbital hybridization to determine molecular geometry;
11. apply principles of chemical bonding to predict types of intermolecular forces which are likely to be present in specific substances; and
12. describe the many ways that chemistry has an impact on the individual, society, and the biotic and abiotic environment using specific examples.

## **Major Topics**

- I. Nomenclature - Atoms, Ions, Compounds
- II. Stoichiometry
- III. Reactions in Solution: Classification including Redox and non-Redox
- IV. Physical Behavior of Gases & Kinetic Molecular Theory
- V. Thermochemistry
- VI. Atomic and Electronic Structure & the Periodic Table
- VII. Bonding Theories: VSEPR, Hybridization & Molecular Orbital
- VIII. Chemical Bonding - Ionic, Covalent & Intermolecular Bonds
- IX. Molecular Structures

## **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**

This course may be used to fulfill 3 credits of General Education requirements in Physical and Biological Sciences.

Faculty members may include additional topics consistent with department practices.

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