

COURSE OUTLINE
CHEM-101
General Inorganic Chemistry I
4 Credits
Science Core Course

HOWARD COMMUNITY COLLEGE

Description

Designed mainly for science majors and pre-professional students, this course will enable the student to solve problems and answer questions involving mole concept, gas laws and kinetic theory, stoichiometry and chemical equations, solutions, and atomic structure and electronic arrangement. Independent lab experiments will provide students with data they can appraise, use, and interpret to identify properties and/or unknown chemical substances. Prerequisite: Eligible to enroll in MATH-070. (3 hours lecture, 3 hours lab)

Statement on General Education and Liberal Learning

A liberal education prepares students to lead ethical, productive, and creative lives and to understand how the pursuit of lifelong learning and critical thinking fosters good citizenship. General education courses form the core of a liberal education within the higher education curriculum and provide a coherent intellectual experience for all students by introducing the fundamental concepts and methods of inquiry in the areas of mathematics, the physical and natural sciences, the social sciences, the arts and the humanities, and composition. This course is part of the general education core experience at Howard Community College.

Overall Course Objectives

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

1. Develop an appreciation for scientific inquiry.
2. Interpret chemistry facts and principles.
3. Interpret the data collected in the laboratory as shown by the correct identification of a series of unknown substances.
4. Observe all safety regulations in the laboratory.
5. Write, using data collection and analysis techniques, a complete formal laboratory report.
6. Define the terminology of chemistry including units, name of equipment and vocabulary.
7. Apply problem-solving techniques, such as dimensional analysis, for conversion to the appropriate units.
8. Apply chemistry principles to solve quantitative and qualitative problems.
9. Apply chemical principles in explaining practical chemistry applications.
10. Define the role of chemistry in ones future and the interrelationship of chemistry and other sciences.

Major Topics

- I. Introductory Concepts of Chemistry
 - A. Units of Measurement
 - B. Significant Figures
 - C. Problem-solving by Dimensional Analysis

- II. Atoms, Molecules and Compounds
 - A. Elements
 - B. Atomic Weight
 - C. Periodic Table
 - D. Mole concept
 - E. Molar Mass
 - F. Determination of the Formula of a Compound

- III. Using Chemical Equations in Calculations
 - A. Balancing Chemical Equations
 - B. Weight Relations
 - C. Limiting Reagent
 - D. Molarity

- IV. Gas Laws and Kinetic Theory
 - A. Ideal Gas Law
 - B. Gas Mixtures and Partial Pressure
 - C. Kinetic Molecular Theory
 - D. Nonideal Gases

- V. Atomic and Molecular Structure
 - A. Atomic Structure
 - B. Electron Configurations
 - C. Periodic Trends
 - D. Chemical Bonding
 - E. Molecular Shapes

- VI. Solids, Liquids and Solutions
 - A. Crystalline Solids
 - B. Kinetic Molecular Theory of Liquids
 - C. Phase Diagram
 - D. Acids and Bases
 - E. pH and pOH

- VII. Physical Chemistry
 - A. Colligative Properties of Solutions
 - B. Enthalpy
 - C. Hess's Law

Course Requirements

Grading/exams: Grading procedures will be determined by the individual faculty member but will be calculated on the basis of exams, lab quizzes, lab experiments, and lab notebook.

Writing: Specific writing assignments will be determined by the individual faculty member, but will include lab reports.

Other Course Information

This course is a Science core course, Science elective, and an Arts and Sciences elective.