

# Northwest Arkansas Community College

(Science and Mathematics Division)

**Discipline Code**

CHEM

**Course Number**

1104

**Course Title**

College Chemistry I

**Catalog Description**

The first course of a two-semester sequence designed to provide background for further study in such majors as pre-agriculture, pre-professional, pre-science, pre-engineering, or mathematics. The course provides an introduction to the study of inorganic, organic, analytical, and physical chemistry from a more concentrated viewpoint than offered in CHEM 1024. Three hours lecture and three hours laboratory weekly.

**Prerequisites**

Intermediate Algebra (MATH 0103), or higher math or minimum placement score for College Algebra

**Credit Hours**

4 credit hours

**Contact hours**

45 lecture contact hours; 45 lab contact hours

**Load hours**

5 load hours

**Semesters Offered**

Fall, Spring & Summer

**ACTS Equivalent**

CHEM1414 Chemistry I for Science Majors

**Grade Mode**

A-F

**Learning Outcomes**

Students completing this course will:

- Predict the formula or give the name for a molecular compound, ionic compound, and an aqueous acid.
- Demonstrate balancing a chemical equation, classify types of chemical reactions, and solve stoichiometric calculations for quantities of substances used in a reaction.

- Associate a specific element and its location on the periodic table with special classifications of elements, identify how a specific element fits into a general periodic trend, and determine the electron configuration for an element.
- Draw the Lewis structure, predict the electronic and molecular geometry for a molecule, and determine if it is polar or nonpolar.
- Use molar mass to determine moles of a substance, solve for the molarity of a solution, and predict the concentration of a solution after dilution.

## **General Education Outcomes Supported**

- Students develop higher order thinking skills.
- Students improve their mathematical literacy.

## **Standard Practices**

### **Topics list**

- Chemistry: The Study of Change
- Atoms, Molecules, and Ions
- Nuclear Chemistry
- Mass Relationships in Chemical Reactions
- Reactions in Aqueous Solution
- Gases
- Thermochemistry
- Quantum Theory and the Electronic Structure of Atoms
- Periodic Relationships Among the Elements
- Chemical Bonding I: Basic Concepts
- Chemical Bonding II: Molecular Geometry & Hybridization of Atomic Orbitals

### **Learning activities**

- Lab safety orientation and enforcement of safety protocols is the responsibility of each faculty. A standard lab safety PowerPoint will be provided to students for training. Scoring 100% on a mandatory department-provided lab safety quiz is required before students may participate in lab.
- Courses must, at a minimum, cover the core learning outcomes for each topic. Faculty may add to these outcomes but may not omit any of them.
- Laboratory exercises should average between 2-3 hours a week and include pre-laboratory preparation work, hands-on experimentation, and post-laboratory analysis.
- Since developing student higher order thinking skills and mathematical literacy are essential outcomes of this course, all instructors should include learning activities that develop these outcomes in their courses and identify them in course syllabi. Instructors should describe how these activities will be evaluated in their course syllabi and/or reflected in their gradebooks.

### **Assessments**

- Common final exam/end-of-semester questions will be used to assess general education outcomes across all sections.
- Variable methods including, but not limited to, exams, quizzes, and laboratory activities

### **Grading guidelines**

- Lab activities should comprise approximately 25% of the overall grade.

**Revision Date**

April 3, 2021