

Northwest Arkansas Community College

(Science and Mathematics Division)

Discipline Code

CHEM

Course Number

1124

Course Title

College Chemistry II

Catalog Description

The continuation of Chemistry 1104 with lab. Emphasis is on introductory qualitative analysis. There are three hours of lecture and three hours of lab weekly.

Prerequisites

CHEM 1104 with a grade of C or better (or equivalent).

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

CHEM1424 Chemistry II for Science Majors

Grade Mode

A-F

Learning Outcomes

Students completing this course will:

- Explain how the molecular geometry and overall polarity affect intermolecular forces and physical properties of liquids.
- Explain the relationships and laws that govern chemical reactions including chemical kinetics and rate laws.
- Discuss different types of equilibrium reactions (gas, acid-base, solubility), the meaning of the equilibrium constant, and the factors that disrupt a system at equilibrium.

- Define acids and bases and apply the concepts of pH, ionization, and buffer action to acid-base equilibria.
- Demonstrate proper techniques in the laboratory, utilize appropriate instrumentation, collect data, construct graphs and interpret outcomes.

General Education Outcomes Supported

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

Standard Practices

Topics list

- Intermolecular Forces
- Physical Properties of Solutions
- Chemical Kinetics/Mechanisms of Chemical Reactions
- Chemical Equilibria
- Acid/Base Chemistry
- Acid/Base Equilibria and Solubility Equilibria
- Entropy, Free Energy, and Equilibrium (Thermodynamics)
- Electrochemistry and Oxidation-Reduction Reactions

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

- The final exam is a standardized national College Chemistry II exam prepared by the American Chemical Society. The exam covers the General Education Outcomes and all chemistry Topics presented.
- Results will be used as part of the college's process to assess mastery of the general education outcomes.

Grading guidelines

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

Revision Date

April 3, 2021