NorthWest Arkansas Community College
Division of Science & Mathematics

CHEM 1024 Basic Chemistry

Catalog Description: A one-semester introductory course covering general inorganic, organic and biochemical concepts. The course is relevant for non-science majors and fulfils the science with lab general education requirement. Because of the breadth of the topics, this course may be appropriate for students in technical programs where a one semester chemistry course is required.

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

Credit hours/ Contact hours/ Load hours: 4/ 6/ 5

Target Audience/Transferability: Designed for general education for non-science major students, this course may meet the needs of students entering allied health fields, education, or other programs. Students should consult the transfer institution and specific department to confirm transferability of this course.

Student Learning Outcomes: Students completing this course will:

- Use dimensional analysis and algebra to solve scientific problems.
- Formulate the quantitative composition of compounds and apply knowledge of nomenclature to chemical formulas. Balance chemical equations and calculate quantitative relations from the equations.
- Explain the periodic law and properties of atoms and describe the manner in which atoms bond to form compounds.
- Describe the properties of solutions and calculate the concentrations of given solutions.
- Distinguish the general classes of organic compounds in terms of functional groups, and demonstrate knowledge of nomenclature and basic reactions of organic compounds.
- Demonstrate proper laboratory techniques while collecting experimental data and perform necessary calculations to aid in interpretation of data.

Required Text(s):

- Timberlake, Chemistry: An Introduction to General, Organic and Biological Chemistry, 10th Edition, 2009
- Timberlake, Chemistry: Essential Laboratory Manual, An Introduction to General, Organic, and Biological Chemistry, 9th Edition, 2006

Required Equipment: Scientific Calculator

Topics:

- Scientific Method and Measurements
- Energy and states of Matter
- Atoms and Elements & the Periodic table

- Compounds and their Bonds
- Chemical Reactions and Quantities
- Gases
- Solutions
- Acids and Bases
- Introduction to Organic: Alkanes
- Unsaturated Hydrocarbons
- Overview of Organic Chemistry
- Recognizing functional groups
- Naming and drawing structures
- Reactions
- Carbohydrates (Biochemical)

Optional Topics

- Nuclear Radiation (Inorganic)
- Lipids (Biochemical)
- Amino Acids, Proteins, and Enzymes (Biochemical)

Required Instructional Activities: This course includes a required laboratory component.

- **Sample Laboratory Experiments:**
  - Measurements and Significant Figures
  - Density and Specific Gravity
  - Compounds and their Formulas
  - Chemical Reactions and Equations
  - Moles and Chemical Formulas
  - Testing for Cations and Anions
  - Solutions
  - Solutions, Colloids and Suspensions
  - Acids and Bases
  - Properties and Structures of Alkanes
  - Carbohydrates