Chemistry 2

SCIH032063

Credits: 0.5 units / 5 hours | NCAA Approved

Course Description

Students continue their study of the principles and procedures in chemistry. They focus on chemical bonding, water and solutions, reaction rates and equilibrium, acids, bases and salts, oxidation-reduction reactions and carbon compounds.

NOTE: To complete this course entirely online (without Mail Processing), students will need access to a scanner. Specific instructions on how to submit projects electronically are given in the online course management system. This course contains hands-on labs and multimedia activities to provide an in-depth investigation into the subjects presented.

Graded Assessments

6 Unit Evaluations; 3 Projects; 3 Proctored Progress Tests; 6 Teacher Connect Activities

Course Objectives

When you have completed the materials in this course, you should be able to:

1. Identify and explain the interactions between water molecules.
2. Distinguish between different ions found in solutions.
3. Understand the flow of energy and the chemical and physical properties involved.
4. Describe and identify the rates of chemical reactions and their equilibriums.
5. Identify the different ways chemists define acids, bases, and salts.
6. Identify and describe oxidation-reduction reactions.
7. Explain and identify the electrochemical process.
8. Identify and describe hydrocarbons and isomers.
9. Classify organic compounds.
10. Identify the general form of alcohols, ethers, amines, carbonyl compounds, and polymers.
11. Identify and explain the structure of cells.
12. Diagram the basic structure of an amino acid.
13. Identify the physical property that distinguishes lipids from carbohydrates and proteins.
14. Describe how chemical properties are part of the structure and function of DNA.
15. Describe the relationship of ATP and ADP to cellular energy.
16. Distinguish between catabolism and anabolism.
17. Explain how an unstable atomic nucleus releases energy.

18. Describe the three main components of radiation.
19. Solve problems that involve half-lives of nuclear decay reactions.
20. Describe what takes place in a nuclear chain reaction.
21. Distinguish between the processes and application of fission and fusion.

Course Outline

Unit 1 Water and Solutions

Teacher Connect 1
Lesson 1: Water and Aqueous Systems
Lesson 2: Solutions
Unit 1 Evaluation
Project 1

Unit 2 Matter and Energy

Lesson 3: Thermochemistry
Lesson 4: Reaction Rates and Equilibrium
Unit 2 Evaluation
Teacher Connect 2
Project 2
Review for Progress Test 1

Unit 3 Reactions

Lesson 5: Acids, Bases, and Salts
Unit 3 Evaluation
Teacher Connect 3
Project 2

Unit 4 Electrons in Reactions

Lesson 6: Oxidation-Reduction Reactions
Lesson 7: Electrochemistry
Unit 4 Evaluation
Teacher Connect 4
Review for Progress Test 2

Unit 5 Carbon Chemistry

Lesson 8: Hydrocarbon Compounds
Lesson 9: Functional Groups
Unit 5 Evaluation
Teacher Connect 5
Project 3

Unit 6

Lesson 10: The Chemistry of Life

Lesson 11: Nuclear Chemistry

Unit 6 Evaluation

Teacher Connect 6

Review for Progress Test 3

Required Textbook and Materials

(available through Follett virtual bookstore at https://www.bkstr.com/nebraskahighschoolstore)

Textbook: *Pearson Chemistry* (ISBN: 9781323205914)

Chemistry 2 SCIH032063 (printed course content). This print syllabus is **optional** for this course.

Additional Items Needed for Labs, Not Included in Above Kit:
The lab experiments in this course are designed so that they may be successfully completed using the items listed. If you do not have access to the exact items on this list, you may substitute comparable items in the experiments. Suggested household and other common materials necessary to complete the labs in this course are:

- 4 medicine dropper (clean)
- shallow dish
- safety goggles
- glass vial, small paper cup, or ice cube tray
- calculator to perform mathematical calculations (TI-30 scientific calculator or similar model)
- pencil
- paper
- paper clip
- rubber band, approximately 5 cm in diameter
- water
- vegetable oil (any brand)
- liquid dish detergent (any brand)
- baking soda
- cornstarch
- stirring rod or spoon
- distilled water or tap water
- flashlight
- masking tape
- teaspoon
- set of measuring spoons
- cup
- 3 glass jars with parallel sides (Mason jars)

- stainer
- approximately 1/3 of a head of fresh red cabbage
- cooking container for boiling cabbage
- various household chemicals with acid/base properties. (A short, but not complete list is: vinegar, pickle juice, orange juice, clear soda, cream of tartar, antacid, ammonia-based cleaner, baking soda, etc.)
- 22 large marsh 22 large marshmallows, 52 small marshmallows and 70 toothpicks OR
- 22 large Styrofoam balls, 52 small Styrofoam balls and 70 toothpicks