Chemistry I – Course Syllabus

School Year: 2025–2026
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Room #: 15

Course Description

Chemistry I is a laboratory-based course that explores the properties of matter and the changes it undergoes. Students will learn how to analyze, model, and predict the behavior of substances in both physical and chemical processes, using real-world phenomena to guide inquiry and experimentation.

Course Goals / Objectives

By the end of this course, students will be able to:

- Describe atomic structure and the periodic table.
- Explain chemical bonding and molecular interactions.
- Perform and interpret results from laboratory investigations.
- Balance chemical equations and perform stoichiometric calculations.
- Analyze energy changes in chemical reactions.
- Apply chemistry concepts to environmental and societal issues, such as climate change.

Units of Study

Unit	Topics Covered
1. Atomic Structure	Nature of matter, atomic models, electron configurations
2. Periodic Table	Organization, periodic trends, element properties
3. Chemical Bonding	Ionic, covalent, metallic bonds, polarity, intermolecular forces
4. Physical Properties of Materials	States of matter, modeling phase changes, comparing compounds, metals & nonmetals
5. Chemical Quantities	Moles, molar relationships, percent composition, empirical formulas, concentrations
6. Chemical Reactions	Modeling chemical reactions, predicting outcomes, reactions in an aqueous solution.
7. Stoichiometry	Quantifying reactants and products, chemical calculations, limiting reagent and percent yield.
8. Thermochemistry	Energy in chemical bonds, enthalpies of formation and reaction, enthalpy in changes of state
9. Behavior of Gases	Properties of gases, gas laws, Ideal gases, gases in Earth's atmosphere
10. Weather and Climate	Earth's surface systems, water and energy in the atmosphere, atmosphere system feedbacks, long & short term climate factors
11. Global Climate Change	Chemistry of Earth's atmosphere, evidence of climate change, anthropogenic carbon emissions, climate models, consequences of climate change, responses to climate change
12. Reaction Rates and Equilibrium	Rates of reaction, progress of chemical reactions, Reversible reactions and equilibrium, free energy and entropy
13. Acid-Base Equilibria	Acids, bases, & salts (strong vs weak), reactions of acids & bases, buffers and equilibria

14. Ocean Acidification	Ocean pH levels, ocean as a carbon sink, the ocean and climate change, consequences of ocean acidification

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Materials Needed

- 1 Spiral Notebook
- Scientific Calculator (Provided)
- Pencils, Erasers, Highlighter
- Laptop (As required)

Grading Breakdown

Category	Weight
Tests & Quizzes	50%
Daily Assignments	50%

Tennessee Science Standards Covered

This course meets the Tennessee Science Standards for Chemistry, including:

- **CHEM1.PS1.1 – PS1.7:** Matter and Its Interactions
- **CHEM1.PS2.1 – PS2.4:** Forces and Motion
- **CHEM1.PS3.1 – PS3.5:** Energy
- **ETS1.1 – ETS1.4:** Engineering Design

(Full standard descriptions available at TDOE Science Standards)

Safety Expectations

- Follow all lab safety rules and procedures.
- Wear goggles and appropriate protective gear during experiments.
- Report all accidents immediately.

Additional Info

- **Academic Integrity:** Cheating and plagiarism will result in disciplinary action. (automatic 0, no re-take, documented, parent informed)