straighterline

Syllabus

CHEM101L | **General Chemistry Lab**

Course Text

Custom Lab Kit–Sold Separately

This course requires lab kit LP-5370-CK-01 from Science Interactive for $138 (plus shipping).

Course Description

This lab-only course is designed as a standalone addition to the General Chemistry course. Students will complete at home laboratory experiments, track and record results and take lab-based assessments to meet the lab requirement. The labs are provided by Science Interactive, a leading provider of at home lab kits and supplemental online materials. This course will give the student a solid foundation for further study into laboratory sciences.

Learning Outcomes

After completing this course, students will be able to:

1. Describe the steps of the scientific method and their application in experimentation.
2. Define chemical terminology including atoms, molecules, elements, and compounds.
3. Construct Lewis structures and apply the VSEPR model to predict molecular geometry.
4. Calculate quantities in chemical reactions using stoichiometry.
5. Convert between mass, moles, atoms, and molecules using the mole concept.
6. Apply gas laws to explain the behavior of gases in different conditions.
7. Identify patterns in the periodic table and classify elements based on their properties.
8. Classify substances by their physical states and explain their behavior.
9. Solve problems using scientific notation, unit conversions, and formulas.
10. Interpret data using graphs, equations, and laboratory observations.

Course Prerequisites

There are no prerequisites to take General Chemistry Lab, though we highly recommend previous or concurrent enrollment in General Chemistry (CHEM101).

Academic Integrity Statement

Academic integrity is the pursuit of scholarly activity in an honest, truthful and responsible manner. Violations of academic integrity include, but are not limited to, plagiarism, cheating, fabrication and academic misconduct. Failure to comply with the Academic Integrity Policy can result in a failure and/or zero on the

attempted assignment/examination, a removal from the course, disqualification to enroll in future courses, and/or revocation of an academic transcript.

Course Completion Policy

In order for a course to be considered complete, **all required coursework must be attempted, submitted, and graded.** Required coursework consists of graded assignments. Any Academic Integrity Policy violations may prevent a course from being considered complete.

Assessment Types

StraighterLine courses may include any combination of the assessment types described below. Review the descriptions to learn about each type, then review the Course Evaluation Criteria to understand how your learning will be measured in this course.

Benchmarks

Benchmarks test your mastery of course concepts. You have 3 attempts, and your highest score counts.
Note: Cumulative Benchmarks (final exams) only allow 1 attempt.

Capstones

Capstones are project-based assessments that help you apply concepts to real-world scenarios. You have 2 attempts, and your highest score counts.

Checkpoints

Checkpoints are quick knowledge checks on important course concepts. All are open-book, and most have 1-3 attempts.

AI Use-Case Policies

StraighterLine Capstone assessments operate under one of three AI Use-Case Policies. These designations are selected intentionally to support learners in developing digital literacy, ethical reasoning, and authentic communication skills. Each model requires students to engage meaningfully with the course outcomes while adhering to academic standards.

Independent Work Requirement: Capstones with this designation must be completed independently without using AI tools. The goal is for learners to showcase their own understanding and skills without AI assistance. Students are expected to generate and submit original work developed solely through their own reasoning and effort.

AI-Assisted Planning Option: Capstones with this designation may allow AI tools to support brainstorming and assessment planning. If allowed, students will be asked to document any AI assistance by noting how it informed their work. Documentation must be included within the assignment or in a designated reflection field. Examples include describing how an AI tool helped organize an outline, generate ideas, or surface sources for further exploration.

AI-Integration Requirement: Capstones with this designation require AI tools as part of the learning process. Students will be asked to reflect upon their AI interactions and AI contributions to the assessment. Reflections must include which tools were used, how they were used, and what insights students gained from the process. This promotes transparency, ethical use, and metacognitive skill-building.

Course Evaluation Criteria

Your score provides a percentage score and letter grade for each course. A passing percentage is 70% or higher.

There are a total of 1000 points in the course:

Assessment	Points	Learning Outcomes
Checkpoint 1: Getting Started	2	N/a
Checkpoint 2: Lab Safety	2	N/a
Checkpoint 3: Lab Kit Inventory	2	N/a
Capstone 1: Molecular Modeling and Lewis Structures	142	2, 3
Capstone 2: Stoichiometry of a Precipitation Reaction	142	2, 4, 5
Capstone 3: The Mole: Conversions, Mass Determination, and Hydrates	142	2, 5, 9
Capstone 4: Ideal Gas Law	142	6, 8, 9
Capstone 5: Introduction to the Periodic Table	142	2, 7
Capstone 6: The Scientific Method	142	1, 10
Capstone 7: Math and Graphing Prep	142	9, 10
Total	**1000**	

Course Roadmap

This roadmap provides an overview of the checkpoints and lessons covered in this course.

Checkpoint 1: Getting Started

- The Science Interactive Cloud
- Exploration, Experimentation, and Evaluation
- Science Interactive Resources

Checkpoint 2: Lab Safety

- Safety guidelines for using Science Interactive lab kits
- Terms associated with common laboratory safety equipment

Checkpoint 3: Lab Kit Inventory

- Kit contents list
- Reviewing your Science Interactive kit

Capstone 1: Molecular Modeling and Lewis Structures

- Allotropes, valence electrons, and lone pairs

- Duet rule and octet rule
- Lewis structures
- Valence shell electron pair repulsion (VSEPR) model

Capstone 2: Stoichiometry of a Precipitation Reaction

- Parts of a chemical reaction, including the reactants and products
- Defining characteristics of a precipitation reaction
- Stoichiometry
- Importance of accurate calculations
- How the molar quantity of a substance is related to its molecular weight
- Molar quantity of various substances
- How hydrated compounds influence precipitation reactions

Capstone 3: The Mole: Conversions, Mass Determination, and Hydrates

- The concept of a mole
- Atomic mass, molecular mass, and molar mass.
- Conversion between mass, moles, atoms, and molecules
- Name hydrates by the number of moles of water held in a compound

Capstone 4: Ideal Gas Law

- Solids, liquids, and gases
- Ideal gas law
- Charles Law
- Avogadro's Law
- Gay-Lussac's Law
- Boyle's law using PV=k
- How data on force (kg•m/s2; N), mass (kg), and area (m2) can be used to calculate pressure (N/m2; Pa) in a closed system

Capstone 5: Introduction to the Periodic Table

- Origin of the periodic table
- Organization of the periodic table
- Period, group, metal, nonmetal, metalloid, and transition metal
- Proper format for symbols of elements

Capstone 6: The Scientific Method

- Steps of the scientific method
- Hypothesis, independent variable, dependent variable, and control
- Qualitative versus quantitative data

Capstone 7: Math and Graphing Prep

- Scientific notation
- Unit conversions
- Unknown variables in equations
- How graphs are used to illustrate and interpret data

Related Courses

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