

Chemistry Syllabus

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Psalm 107:23–32

1 Overview

This is an introductory Chemistry class. Our goal is to lay a solid foundation for studying “hard” sciences¹ through high school and college.

We’ll keep Psalm 107:23–32 in mind as we begin to exploring chemistry together. Chemistry can feel a bit overwhelming — a bit like being lost at sea — but those who take risks put themselves in a position to see the wonders of God.

Our goals for this course are:

- to cultivate a love of “hard” sciences, especially chemistry,
- to build good math habits, especially as they pertain to physical sciences, and
- to build a good foundation of skills for problem-solving

2 Contact Information

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¹ As opposed to social sciences like Sociology.

² Cell phone reception in Harvard is terrible...so bias for text over voice.

3 Prerequisites/Corequisites

There will be some overlap with **Physical Science**, don't be discouraged if there's a lot of review to start!

We will use basic algebra a *lot*. We'll go as far as logarithms towards the end of the year. I plan to use class time to review/refresh math topics as we go, so don't let that scare you. If you have finished **Algebra I**, you should be fine. If you haven't yet finished Algebra I *but are willing to put in the effort*, you should be fine.

If you don't understand the math, you need to ask.

4 Course Pace and Class Time

There are 16 modules in the text book, so we will cover one module every two weeks, with some exceptions (see Table ??). *Please plan to have read and/or worked through each module in preparation for class.* We will review the module's material in the class, answering student questions as a priority. If the module is split, then plan to have worked through the first half on the first week, the second half on the second. The pace might be a bit different from what you've done in the past, so give yourself some time to adjust.

At the end of each module are practice problems: I plan to have assigned every problem in the book eventually. You have been warned.

We will have several quizzes through the class to ensure we're all up to date. At the end of each quarter there will be a take-home exam.

There are several labs scheduled for this course. As much as possible, we'll do that labs as homework, but we'll dedicate some class time to learning how to write them up. Some labs will require class time: we'll schedule those as we go.

5 Expectations

This will be a math-heavy class. Come with a **scientific calculator**, a sturdy **three-ring binder**, plenty of **looseleaf paper**, **pencils** and plenty of **erasers**.

Please don't attempt to turn in any work written in ink: this will be a **pencil-only course**.³

I relish questions, especially questions that show you have been listening. Bring plenty of those.

³No one will get everything right the first time: you *will* need to be able to erase your answers.

6 How to Study

You don't study chemistry by reading, you study chemistry by solving problems. If you don't have a pencil, eraser, and calculator, you're not studying chemistry.

Be aware this class requires your active participation.

7 Meeting Times

TRC Classroom 2

8:55 A.M. – 10:20 A.M. Fridays

8 Grading

The goal of grading is to ensure we're making progress as we move forward through chemistry.

9 Topic Schedule

The schedule for the first quarter is given in Table 1. Please note I've included both labs and homework problems in the Q1 schedule.⁴

I have included a weekly break-down of topics for the whole year in Table 2. We'll refine our schedule as we go: I anticipate some topics will take less time to cover than others.

⁴We'll assume the labs are to be done at home and the results brought to class on the listed day. There will be labs to be done in class, but we'll plan on doing the labs at home to start.

Date	Topic & Assignments
2025-08-22	Module 1: Measurement and Units Experiment 1.1 & 1.2 (do at home)
2025-08-29	Module 1: Measurement and Units Experiment 1.4 (do at home) Assignment: p. 36 # 1–10
2025-09-05	Module 2: Energy, Heat, and Temperature Experiment 2.1 (at home)
2025-09-12	Module 2: Energy, Heat, and Temperature Quiz Assignment: p. 68 # 1–10
2025-09-19	Module 3: Atoms and Molecules Experiment 3.2
2025-09-26	Module 3: Atoms and Molecules Assignment: p. 98 # 1–10
2025-10-03	Module 4: Classifying Matter and Its Changes Experiment 4.3 Quiz
2025-10-10	Module 4: Classifying Matter and Its Changes * p. 132 # 1–10 Take-home Quarter 1 Exam
2025-10-17	Fall Break

Table 1: First Quarter Class Schedule

Date	Topic
2025-08-22	Module 1: Measurement and Units
2025-08-29	Module 1: Measurement and Units
2025-09-05	Module 2: Energy, Heat, and Temperature
2025-09-12	Module 2: Energy, Heat, and Temperature
2025-09-19	Module 3: Atoms and Molecules
2025-09-26	Module 3: Atoms and Molecules
2025-10-03	Module 4: Classifying Matter and Its Changes
2025-10-10	Module 4: Classifying Matter and Its Changes *
2025-10-17	Fall Break
2025-10-24	Module 5: Counting Molecules and Atoms in Chemical Equations
2025-10-31	Module 5: Counting Molecules and Atoms in Chemical Equations
2025-11-07	Module 6: Stoichiometry
2025-11-14	Module 6: Stoichiometry
2025-11-21	Module 7: Atomic Structure
2025-12-05	Module 7: Atomic Structure
2025-12-12	Module 8: Molecular Structure
2025-12-19	Module 8: Molecular Structure
2025-12-26	Winter Break
2026-01-02	Winter Break
2026-01-09	Winter Break
2026-01-23	Module 9: Polyatomic Ions and Molecular Geometry
2026-01-30	Module 9: Polyatomic Ions and Molecular Geometry *
2026-02-06	Module 10: Acid/Base Chemistry
2026-02-13	Module 10: Acid/Base Chemistry
2026-02-20	Module 11: The Chemistry of Solutions
2026-02-27	Module 12: The Gas Phase
2026-03-06	Module 13: Thermodynamics
2026-03-13	Module 13: Thermodynamics *
2026-03-20	Spring Break
2026-03-27	Module 14: Kinetics
2026-04-03	Good Friday
2026-04-10	Module 14: Kinetics
2026-04-17	Module 15: Chemical Equilibrium
2026-04-24	Module 15: Chemical Equilibrium
2026-05-01	Module 16: Reduction/Oxidation Reactions
2026-05-08	Final Review

Table 2: (Tentative) Year-long Class Schedule