

General Chemistry 1 - CHEM 1001 E

Fall 2025

Instructor: Bob Burk

Lab Coordinator: Mastaneh Azad

Lectures

Lectures take place in 115 SC Tuesdays and Thursdays from 11:30 AM – 1:00 PM.

Tutorials

Tutorials take place in LA C264 on Fridays from 2:30 – 3:30 PM, during which I will solve problems similar to the ones you will find in homework assignments, on the midterm test and on the final exam.

Textbook

The text for the course is "Chemistry" 4th Canadian Edition by Olmsted, Williams and Burk published by Wiley. The book is available from Carleton's bookstore as an e-book bundled with a two-term access code to WileyPlus, a homework management system **you will be using**. Cost is \$153.95 for the e-book version, or \$218.95 for the loose-leaf printed version.

If you buy a used book, or a discounted book elsewhere which does not include an access code, you can then buy access to WileyPlus alone at www.WileyPlus.com. This may however end up being more expensive than buying the package from the bookstore.

Grading

Online Homework via WileyPlus 20%

Midterm Test 30%

Laboratory 20%

Final Exam 30%

To pass the course, you must obtain a total of at least 50.0% in the above four components, AND the lab component must be complete.

The grading scheme in CHEM 1002 E in the second term is slightly different because of different lab requirements.

An incomplete lab component, or a total grade of 49.9% or less = F.

Homework Assignments

Problem assignments will be given regularly via WileyPlus (one assignment per chapter covered). It is your responsibility to check the answers and to take action if you have obviously not understood the latest material. **Those who neglect these assignments do not do well on**

tests and exams, where the stakes are much higher. Evidence from previous years shows that those who scored well on their homework assignments also scored well in the course.

The first homework assignment is a “get to know WileyPlus” assignment but still counts for 2% of your grade. Get it done immediately so you know how to navigate the system when you do the chapters 2-10. Note that I will not cover chapter 1 material in class – I assume you know it already from high school.

These assignments will have due date and times. After the due date you will not receive any further marks for work done. The assignments remain open for you to practice, however.

Midterm Test

The midterm test will be during class time on Thursday October 16.

Laboratory

Details of the laboratory portion of this course can be found on the Brightspace site.

An important detail is that you must complete all activities of the laboratory portion to receive a passing grade in this course.

Communicating With You

You can get any help you need from me by one of the following methods:

1. Visit me during my office hours. I will post office hours on the calendar on Brightspace one week in advance. Make an appointment (via email) if you want extra time.
2. Email me (robert.burk@carleton.ca). In general, all emails received before 10 PM will be answered the same day.

Your TAs, fellow students and other people on campus are also great resources.
But you are paying me to teach you. Use me.

Late and Missed Work Policies

Late Work

Homework is assigned when we begin a new chapter and is due after the last lecture on that chapter. Thus you have plenty of time to do each assignment, and when the due date and time are reached, you will get a grade for whatever you have completed. After that time, you can still work on the problems but will not receive further grades for them.

Missed Work

If you miss a homework assignment, you get zero on it, because you have plenty of time to complete it if you start when it is assigned. If you miss a lab, see the lab coordinator immediately to reschedule it (you cannot pass the lab unless all labs are complete). If you miss the midterm test, contact Bob immediately to see what can be done. If you miss the final exam, you are at the mercy of the University policies on missed exams, and must follow their rules.

Academic Accommodations and Regulations

Carleton is committed to providing academic accessibility for all individuals. You may need special arrangements to meet your academic obligations during the term. The accommodation request processes are outlined on the Academic Accommodations website (<https://students.carleton.ca/course-outline/>).

AI Use in This Course

Students may use AI tools for basic word processing and formatting functions, including:

- Grammar and spell checking (e.g., Grammarly, Microsoft Word Editor)
- Basic formatting and design suggestions (e.g., Microsoft Word's formatting tools, PowerPoint Design editor)

It is not necessary to document the use of AI for the permitted purposes listed above. Using AI for other purposes will be considered an instructional offence, and the penalties are severe, so just don't do it. We are good at what we do and are as familiar with AI as you are!

As our understanding of the uses of AI and its relationship to student work and academic integrity continue to evolve, students are required to discuss their use of AI in any circumstance not described here with the course instructor to ensure it supports the learning goals for the course.

Statement on Academic Integrity

Students are expected to uphold the values of academic integrity, which include fairness, honesty, trust, and responsibility. Examples of actions that compromise these values include but are not limited to plagiarism, accessing unauthorized sites for assignments or tests, unauthorized collaboration on assignments or exams, and using artificial intelligence tools such as ChatGPT when your assessment instructions say it is not permitted.

Misconduct in scholarly activity will not be tolerated and will result in consequences as outlined in Carleton University's Academic Integrity Policy. A list of standard sanctions in the Faculty of Science can be found here.

Additional details about this process can be found on the Faculty of Science Academic Integrity website.

Students are expected to familiarize themselves with and abide by Carleton University's Academic Integrity Policy.

Student Rights and Responsibilities

Students are expected to act responsibly and engage respectfully with other students and members of the Carleton and the broader community. See the [7 Rights and Responsibilities Policy](#) for details regarding the expectations of non-academic behaviour of students. Those who participate with another student in the commission of an infraction of this Policy will also be held liable for their actions.

Student Concerns

If a concern arises regarding this course, your first point of contact is me: Email or drop in during student hours and I will do my best to address your concern. If I am unable to address your concern, the next points of contact are (in this order):

Note: You can also bring your concerns to [Ombuds services](#)



Carleton University maintains and enforces a comprehensive policy on academic integrity. Please click [here](#) and read the policy in detail. It is your responsibility to understand the integrity standards and to abide by them.

Syllabus

The content of CHEM 1001 mirrors that of the first half of the textbook used in the course.

1. Fundamental Concepts of Chemistry – **this material is assumed from high school and is not covered in the course specifically. Review it if necessary.**

Atoms, Molecules, and Compounds
Measurements in Chemistry
Chemical Problem Solving
Counting Atoms: The Mole
Amounts of Compounds
Aqueous Solutions
Writing Chemical Equations
The Stoichiometry of Chemical Reactions
Yields of Chemical Reactions
The Limiting Reactant

2. The Behaviour of Gases

Pressure
Describing Gases
Gas Mixtures

Gas Stoichiometry
Molecular View of Gases
Additional Gas Properties
Non-Ideal (Real) Gases

3. Energy and Its Conservation

Types of Energy
Thermodynamics
Energy Changes in Chemical Reactions
Measuring Energy Changes: Calorimetry
Enthalpy
Energy Sources

4. Atoms and Light

Characteristics of Atoms
Characteristics of Light
Absorption and Emission Spectra
Properties of Electrons
Quantization and Quantum Numbers
Shapes of Atomic Orbitals

5. Atomic Energies and Periodicity

Orbital Energies
Structure of the Periodic Table
Electron Configurations
Periodicity of Atomic Properties
Energetics of Ionic Compounds
Ions and Chemical Periodicity

6. Fundamentals of Chemical Bonding

Overview of Bonding
Lewis Structures
Molecular Shapes: Tetrahedral Systems
Other Molecular Shapes
Properties of Covalent Bonds

7. Theories of Chemical Bonding

Localized Bonds
Hybridization of Atomic Orbitals
Multiple Bonds
Molecular Orbital Theory: Diatomic Molecules
Three-Centre π -Orbitals
Extended π Systems
Band Theory of Solids

8. Effects of Intermolecular Forces

Effects of Intermolecular Forces

Types of Intermolecular Forces

Liquids

Forces in Solids

Order in Solids

Phase Changes

9. Properties of Solutions

The Nature of Solutions

Determinants of Solubility

Characteristics of Aqueous Solutions

Colligative Properties

10. Organic Chemistry – Structure

Hydrocarbons

Aromatic Compounds

Stereochemistry

Stereoisomers

Drawing Molecules in Three Dimensions

Conformations

Enantiomers and Diastereomers

Chirality

The *R/S* System for Naming Chiral Compounds