

# Course Outline

## CHEM 1005 - Elementary Chemistry I

Fall 2023

*Instructor:* Barbara Acheson

---

### Welcome to CHEM 1005!

Introduction to stoichiometry, periodicity, gas laws, equilibrium, bonding, and organic chemistry with emphasis on examples of relevance to the life sciences. For students who lack the prerequisite for CHEM 1001 or who are not intending to take upper year chemistry. Precludes additional credit for CHEM 1000 (no longer offered), CHEM 1001 or CHEM 1101.

### Course Objectives

The goal of this course is to provide learners with a general understanding of the fundamental elements of chemistry and provide hands-on experience and training with selected experimental techniques. By the end of this course, learners should have a sufficient grasp of the covered topics to be able to understand discussions of these chemistry topics when they intersect with their own fields of study.

### Indigenous Affirmation

We pay respect to the Algonquin people, who are the traditional guardians of this land. We acknowledge their longstanding relationship with this territory, which remains unceded. We pay respect to all Indigenous people in this region, from all nations across Canada, who call Ottawa home. We acknowledge the traditional knowledge keepers, both young and old. And we honour their leaders: past, present, and future.

### Lecture Hours

*Lectures, Tutorials and Labs to be held in-person*

*Lectures:* Tuesdays and Thursdays, 6:05PM to 7:25PM, Southam Hall 304

*Tutorials:* Thursdays, 7:35PM to 8:25PM, Southam Hall 304

*Labs:* Location - Steacie 204A

## Contact

Email: [Barbara.Acheson@carleton.ca](mailto:Barbara.Acheson@carleton.ca)

If you have questions or wish to speak to me, you can send me an e-mail, make an appointment for a virtual meeting, or approach me after lecture.

Please use your Carleton email account for issues related to the course. Avoid leaving questions/concerns to the last minute as it may take a full day to receive a reply.

*Office Hours: TBD*

(Virtual or in-person Office Hours to be held 17:25 – 20:55 Tue by appointment)

***Check Brightspace often for updates, announcements and course material.***

## Textbook

**Recommended:** CHEMISTRY–Fourth Canadian Edition by Olmsted, Williams and Burk, published by Wiley, with an access code to WileyPlus

The book is available from Carleton’s bookstore (in print or as an e-book)  
(Note: WileyPlus access codes may be purchased separately)

## Dates

A full list of important dates is available on the University Calendar website. Pay particular note to the academic withdrawal dates. Consult the Calendar website for the most updated information: <https://calendar.carleton.ca/academicyear>.

## Assessment Dates

- Midterm Test #1 – Thursday, October 12<sup>th</sup> – In person
- Midterm Test #2 – Tuesday, November 14<sup>th</sup> – In person
- Final Exam: In person; date and time to be scheduled by Examination Services  
(The Final Exam Schedule should be released on/near October 6<sup>th</sup>)

Note: Fall 2023 final exam period is December 10<sup>th</sup> through December 22<sup>nd</sup>, including weekends (defer any travel plans until your exam schedules is known)

## Grade Breakdown

| COMPONENT         | GRADE VALUE                            |
|-------------------|--|
| LABORATORY MARK   | 20% *                                  |
| QUIZZES           | 10% (5 quizzes, worth 2% each)         |
| ASSIGNMENTS       | 20% (5 assignments, worth 4% each)     |
| MIDTERM #1        | 10%**                                  |
| MIDTERM #2        | 10%**                                  |
| FINAL EXAM        | 30%                                    |
| BONUS ASSIGNMENTS | 4% (Adaptive assignments in WileyPlus) |

\*Please note: **ALL** laboratory experiments must be completed in order to pass the course. If the lab grade is “incomplete”, you will receive a course grade of F, regardless of your lecture-based grade.

\*\*If you miss a midterm exam, the weight will be transferred to the final exam; increasing the weight of the final exam to 40%

(Additionally, if you perform better on the final exam than on one of the midterms, the weight of the final exam will be adjusted to 40%, and the lowest midterm mark will be neglected)

**Grades for each component of the course will be released only through Brightspace.**

## Laboratory

The lab portion of this course is separate from the lecture portion. **All components of the lab portion of the course must be completed in order to complete the entire course.** If a lab grade of “incomplete” is given at the end of the term, the resulting course grade is an F, regardless of your grade for the lecture portion.

Labs will begin the week of September 11<sup>th</sup>. Consult the instructions provided by your Lab Coordinator, Mastaneh Azad, on the Brightspace course page (including the tasks that must be completed before your first in-person session).

### Online Quizzes

- There will be six (6) bi-weekly online quizzes consisting of 10 multiple choice or short answer questions, which will account for 10% of the final grade.
- The lowest quiz mark will be dropped, and the remaining 5 will be used to calculate the grade.

### Assignments

- Short assignments will be posted for each topic which can be completed online (through WileyPlus). Each assignment will be equally weighted, totalling 20% of the final grade.
- In addition, bonus marks can be earned with bonus assignments (Adaptive Assignments in WileyPlus). The bonus assignments are intended to provide extra review/studying for midterms or the final exam, and therefore will be due just prior to the assessment. Up to 4% in bonus marks may be earned.
- Due dates for both assignment types are posted with the assignments on Brightspace.

### Practice Questions + Tutorials

- Practice questions from the textbook will be posted on Brightspace each week for you to complete.
- The questions can be reviewed during the tutorial sessions if necessary, along with some additional practice questions

## Midterm Exams

- There will be two in-person midterm tests. The grades for each test will be released approximately two weeks after the test.
- Each test will account for 10% of the final grade. *(Please recall that if a midterm test is missed, the final exam will receive a greater weight)*

Looking for help preparing for midterms? [Student Academic Success Services \(SASS\)](#) at Carleton offers course-targeted study groups and supports and the [Science Student Success Centre \(SSSC\)](#) provides help with study skills.

## Academic Integrity

Collaboration can be highly beneficial to students and can help to facilitate learning within the course. I encourage people to ask questions, learn from one another, and have open discussions about class material. That said, any acts of academic misconduct (i.e., cheating) will not be tolerated and will result in consequences ranging from a grade reduction to expulsion (see *academic integrity violations*).

- Examples of appropriate peer-to-peer sharing in this course includes such things as: identifying the proper formula to use, identifying an incorrect or missing step in a person's work, brainstorming potential reasons behind a concept, suggesting helpful sites and videos for learning a concept, posting your own work showing only a specific step or process for illustrative purposes (note: this is very different from posting your work and solution for others to simply copy)
- Examples of unacceptable peer-to-peer sharing: Posting or sharing the answers, indicating which answers are correct on assignments, sharing links to solutions, posting your own complete work for a question/solution

## Feeling Sick?

If you feel very sick (e.g., fever, chills, stomach upset) do not come to class or campus. [insert here any information about missed lecture/labs, etc.]

## Mental Health

As a University student you may experience a range of mental health challenges that significantly impact your academic success and overall well-being. If you are struggling, please do not hesitate to reach out. I am happy to listen, and/or direct you to resources that might help. In terms of class, if you need extra help or missed a lesson, don't stress! Email me and we will set a time to meet. I'll work with you, I promise. Remember that Carleton also offers an array of mental health and well-being resources, which can be found [here](#).

## Need Accommodations?

If you feel that you may need accommodations for missed work during this course on grounds other than disability (e.g. pregnancy, short-term illness or injury, religious observances, national level or higher school competitive events, or other extraordinary circumstances beyond your control) please consult the document entitled "University Policies and Resources" posted on this course's Brightspace page or visit <https://students.carleton.ca/course-outline/> for more information.

If you need any accommodations related to disability or chronic illness, please contact the Paul Menton centre for further assistance.

## University Policies and Resources

Please familiarize yourself with the additional information provided in the document entitled "University Policies and Resources" which is posted on this course's Brightspace page.

## Syllabus

*Approximate order of topics below, subject to change.*

Topic 1: Measurements and Math in Chemistry (Textbook Chapter 1 and Appendix A)

- Notation
- Error
- Counting and Conversions

Topic 2: Building Blocks for Reactions and Solutions (Textbook Chapter 1)

- Balancing Equations
- Stoichiometry + Yield

Topic 3: Periodicity (Textbook Chapters 4 and 5)

- Light and Atoms
- Electrons and Quantum Numbers
- Atomic Orbitals and Periodic Table
- Atomic Properties

Topic 4: Bonding (Textbook Chapters 6 and 8)

- Lewis Structures
- Geometry + bond properties
- Intermolecular forces

Topic 5: Gases (Textbook Chapter 2)

- Describing Gases
- Stoichiometry
- Ideal and Non-ideal gases

Topic 6: Equilibrium (Textbook Chapter 14)

- Equilibrium Constants
- Shifts in Equilibrium
- Working with Equilibria

Topic 7: Organic Chemistry (Textbook Chapter 10 and 18)

- Hydrocarbons
- Functional Groups
- Reactions
- Macromolecules