

Course Outline

CHEM 1006A - Elementary Chemistry II

Winter 2024

Instructor: Barbara Acheson

Welcome to CHEM 1006 (course code: 10960)

Introduction to solution chemistry, acids and bases, thermodynamics, and kinetics, with emphasis on examples of relevance to the life sciences. For students who lack the prerequisite for CHEM 1002 or who are not intending to take upper year chemistry. Precludes additional credit for CHEM 1000 (no longer offered), CHEM 1002. Prerequisite(s): CHEM 1001 or CHEM 1005. Students must register in lecture, lab and tutorial. All components IN PERSON, not suitable for on-line students.

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: Tuesdays/Thursdays, 6:05PM to 7:25PM, NN 182 (former UC)

Tutorials: Thursdays, 7:35PM to 8:25PM, NN 182 (former UC)

Labs: Location - Steacie 204A

Office Hours

- In general, the best way to reach me will be by e-mail, and I will respond usually within 24 hours: Barbara.Acheson@cunet.carleton.ca
- I will be accessible in person during tutorial hours and also after class
- Alternately, you can also book an appointment with me if you have more questions, or need more help.

Textbook

Recommended: CHEMISTRY–Fourth Canadian Edition by Olmsted, Williams and Burk, published by Wiley

Required: Access Code to WileyPlus* (should still be active for 2023 CHEM1005 students)

Note: The book is available from Carleton's bookstore (as a looseleaf print version) bundled with a WileyPLUS code. The code provides access to an e-version of the book, and to the WileyPLUS homework assignments we will be doing.

Academic 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>.

Some Dates of Interest:

- January 8 – First Day of Classes
- January 19 – Last Day for a Course Change
- Jan 26-29 – Deferred Exam Period
- January 31 – Last Day for Withdrawal with Fee Adjustment
- Feb 1 – Last day to request exam accommodations Paul Menton Centre
- Feb 2-4 – Deferred Exam Period
- Feb 16 – Final Exam Schedule Published
- Feb 19-24 – Winter Break
- March 15 – Last Day for Academic Withdrawal
- March 29 – University Closed
- April 10 – Last Day of Class
- April 13-25 – Final Exam Period

Assessment and Exam Dates

- Midterm Test #1 – **Thursday, February 8th – In person - NN182**
- Midterm Test #2 – **Thursday, March 14th – In person – NN182**
- Final Exam: In person; date and TBD by Examination Services
(The Final Exam Schedule should be released on/near February 16th)
- Assignment #1 – (Chapters 3, 12) – January 26th
- Quiz #1 – January 28th
- Assignment #2 – (Chapter 13) – February 16th
- Quiz #2 – February 16th
- Assignment #3 – (Chapter 9 and 17) -March 10th
- Quiz #3 – March 13
- Assignment #4 – (Chapter 14 and 16) – April 8th
- Quiz #4 – April – 10th
- Bonus Assignments – April 10th (unless otherwise noted in Brightspace)

Grade Breakdown – Grades released on Brightspace

COMPONENT	GRADE VALUE
LABORATORY MARK	30% *
QUIZZES	10% (4 quizzes, worth 2.5% each)
ASSIGNMENTS	10% (4 assignments, worth 2.5% each)
MIDTERM #1	10% **
MIDTERM #2	10% **
FINAL EXAM	30% ***
BONUS ASSIGNMENTS	5% (Special Topics)

*Please note: **ALL** laboratory components 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.

** the weight of the final exam will be increased to 40% in the event that: (1) you miss a midterm exam, or (2) you perform better on the final exams than one of your midterms

***As per university policies, the final exam is a required component of the course. You **MUST** attempt the final exam in order to pass the course

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 January 15th. 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 – all students who have NOT taken the prerequisite course last semester must repeat WHMIS training and Lab Safety Training course modules before the first in person lab).

Due dates for lab components vary by assigned lab group; all due dates will be posted on Brightspace.

Online Quizzes

- There will be four online open book quizzes consisting of multiple choice or short answer questions, which will account for 10% of the final grade.
- Quizzes will be available for 72 hours – but will be timed once started.

Assignments

- There will be an online WileyPLUS assignment corresponding with each of the four lecture topics to be completed online. Each assignment will be equally weighted, totalling 10% of the final grade.
- In addition, bonus marks can be earned with bonus assignments. The bonus assignments are intended to provide opportunities to improve grades with additional learning. Up to 5% in bonus marks may be earned.
- **Late assignments will have a 20% penalty applied to questions submitted after the due dates (exception: Assignment 4 due last day of class)**

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.
- A single page of 8.5 x 11" hand-written personal notes will be permitted at each midterm exam (computer generated, printed or photocopied notes are not acceptable – each student is responsible for preparing their own notes)
- 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)*

Exam Support

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 additional help with study skills.

For science students, consider joining Peer Assisted Study (PASS) [Peer Assisted Study Sessions \(PASS\) - Centre for Student Academic Support \(carleton.ca\)](#) which provides such activities as study groups and practice exams.

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 or solution. Preparing another student's personal exam notes.

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. Remember that Carleton also offers an array of mental health and well-being resources, which can be found on the [Mental Health and Wellness](#) page.

Feeling Sick?

If you feel very sick (e.g., fever, chills, respiratory illness or stomach upset) it is best not to come to class or campus. There is no need to advise me of missed lectures or tutorials due to illness. Keep up with assigned work the best that you can. If, however, you will miss assessed work due to illness, please follow the guidance below.

Need Academic Accommodation or Special Arrangements?

Self-Declaration for Academic Considerations

If you are temporarily unable to meet your academic obligations during the term, due to short term illness (of up to 5 days), or other extraordinary circumstances beyond your control, a Self-Declaration for Academic Considerations form may be filled out and submitted to me.

<https://carleton.ca/registrar/wp-content/uploads/self-declaration.pdf>.

- You will be permitted a maximum of **two** forms per semester,
- They must be submitted **within 48 hours of the missed work**.
- **Cannot be used for final exams**
- If another circumstance occurs and you have already submitted two forms, you will be referred to the registrar, and more documentation may be required to support your accommodation (i.e., doctors note)
- Please note: general stress or heavy workload are NOT circumstances that are supported with this form, as these are considered a normal part of University life.
- The missed work should be completed within 10 days of the original due date.

For more information regarding accommodation types, see please consult the document entitled “University Policies and Resources” posted on this course’s Brightspace page or visit <https://students.carleton.ca/course-outline/>

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 “University Policies and Resources” which is posted on this course’s Brightspace page.

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

Topic 1: Thermodynamics (*Textbook Chapters 3 and 12*)

- Laws of Thermodynamics
- Calorimetry
- Enthalpy, Entropy and Spontaneity

Topic 2: Kinetics (*Textbook Chapter 13*)

- Reaction Mechanisms
- Rates of Reaction
- Rate Laws and Reaction Orders

Topic 3: Solution Chemistry (*Textbook Chapters 9 and 17*)

- Characteristics of solutions
- solubility
- Redox Reactions
- Redox Examples

Topic 4: Acids and Bases (*Textbook Chapters 15 and 16*)

- pH scale
- weak acids and bases
- Buffer Solutions
- Acid-Base Titrations