



COURSE OUTLINE

1. **Course:** CHEM 203, General Chemistry: Change and Equilibrium - Fall 2023

Coordinator(s)

Name	Email	Phone	Office	Hours
Dr. Amanda Musgrove	amanda.musgrove@ucalgary.ca	--	SA 144F	By appointment: http://ow.ly/Lh4F50HeFPn

Section(s)

Lecture 01 : MWF 13:00 - 13:50 in ENA 201

Instructor	Email	Phone	Office	Hours
Dr. Roxanne Jackson	rjjackso@ucalgary.ca	403 220-8797	SA 258	Please see D2L

Lecture 02 : TR 08:00 - 09:15 in ENG 60

Instructor	Email	Phone	Office	Hours
Dr Yuen-ying Carpenter	yyscarpe@ucalgary.ca (email preferred)		EEEL 237B	See D2L

Lab Coordinator

Name	Email	Phone	Office	Hours
Dr. Roxanne Jackson	rjjackso@ucalgary.ca	--	--	TBA: See D2L

Contact Information:

Students must use only their University of Calgary email (@ucalgary.ca) for all course inquiries. Messages sent from personal accounts can be lost in spam filters.

The course instructional team will make a best effort to respond **within 2 business days** to all inquiries. Messages sent on an evening, weekend, or holiday will receive a response as soon as possible, during regular business hours (9-5, M-F).

To account for any necessary transition to remote learning for the current semester, courses with in-person lectures, labs, or tutorials may be shifted to remote delivery for a certain period of time. In addition, adjustments may be made to the modality and format of assessments and deadlines, as well as to other course components and/or requirements, so that all coursework tasks are in line with the necessary and evolving health precautions for all involved (students and staff).

In Person Delivery Details:

All course components are in-person for this class. **Lectures** are not recorded or streamed online unless at the discretion of the instructor for an individual class day. All examinable course content is available online through D2L and the online textbook.

Tutorials and **laboratories** include graded work that will be completed during the scheduled class time. Ability to provide make-up times or excused absences for these components is limited. Contact the coordinator via the absence form as soon as possible - ideally in advance - if you must miss a scheduled activity. See also the *Missed Components of Term Work* section below for specific policies.

Course Site:

D2L: CHEM 203 (Fall 2023)-General Chemistry: Change and Equilibrium

Note: Students must use their U of C account for all course correspondence.

Equity Diversity & Inclusion:

The University of Calgary is committed to creating an equitable, diverse and inclusive campus, and condemns harm and discrimination of any form. We value all persons regardless of their race, gender, ethnicity, age, LGBTQIA2S+ identity and expression, disability, religion, spirituality, and socioeconomic status. The Faculty of Science strives to extend these values in every aspect of our courses, research, and teachings to better promote academic excellence and foster belonging for all.

The Chemistry EDI Committee acknowledges there are persistent barriers that prevent such accessibility and hinder our progress towards EDI. Our representatives (faculty, postdocs, graduate and undergraduate students) are committed to addressing any concerns and work towards proactive solutions that enact necessary change within the department. To submit anonymous questions, comments or concerns regarding EDI related issues, please reach out to our Associate Head EDI, Belinda Heyne (bjmheyne@ucalgary.ca)

2. **Requisites:**

See section [3.5.C](#) in the Faculty of Science section of the online Calendar.

Prerequisite(s):

Chemistry 30 or 212 (or Continuing Education - Chemistry 2) and one of Mathematics 30-1, 212 or Mathematics 2 (offered by Continuing Education).

Antirequisite(s):

Credit for Chemistry 203 and any of 209, 213, 301 or Engineering 204 will not be allowed.

3. **Grading:**

The University policy on grading and related matters is described in [F.1](#) and [F.2](#) of the online University Calendar.

In determining the overall grade in the course the following weights will be used:

Course Component	Weight	Due Date (duration for exams)	Modality for exams	Location for exams
Tutorial Assessments ¹	24%	Ongoing		
Laboratories ²	16%	Ongoing		
Midterm	25%	Nov 01 2023 at 07:00 pm (90 Minutes)	in-person	TBD
Registrar Scheduled Final Exam	35%	Will be available when the final exam schedule is released by the Registrar	in person	Will be available when the final exam schedule is released by the Registrar

¹ Biweekly; completed in-class during tutorials. Grade is calculated based on the highest FOUR (4) of five total assessments.

² Biweekly. Reports submitted during or after lab (see D2L for instructions. Grade is based on FOUR (4) pre-lab quizzes [1% each] and the highest FOUR (4) of five total lab reports [3% each].

Each piece of work (reports, assignments, quizzes, midterm exam(s) or final examination) submitted by the student will be assigned a grade. The student's grade for each component listed above will be combined with the indicated weights to produce an overall percentage for the course, which will be used to determine the course letter grade.

The conversion between a percentage grade and letter grade is as follows.

	A+	A	A-	B+	B	B-	C+	C	C-	D+	D
Minimum % Required	95 %	90 %	85 %	80%	76%	72 %	68 %	64%	60%	55 %	50 %

This course will have a Registrar Scheduled Final exam that will be delivered in-person and on campus. [The Final Examination Schedule](#) will be published by the Registrar's Office approximately one month after the start of the term. The final exam for this course will be designed to be completed within 2 hours.

Study Participation Bonus:

During the term, you will be invited to participate in a series of surveys administered by the research team from the Canadian Consortium of Science Equity Scholars (CCSES). This study is external to the course, and your participation is entirely optional. Full details and informed consent information will be posted to the course D2L.

As an incentive to participate in this study, students will be given up to a 1% (total) bonus to their overall course grade, applied after the course total has been calculated following the weightings above. This total will be prorated based on the number of surveys submitted of the total (up to 3 surveys). The study team will share the list of participants with the course coordinator for the purposes of applying this bonus. No survey responses are included with this list. Any survey data shared with the instructional team will be held until after grades are finalized and all survey results shared are presented in an anonymous and/or aggregate form (e.g. average values).

Grade Limiting Statement:

In order to achieve the prerequisite requirements (i.e. C- grade) for further Science courses, a student must meet ALL of the following requirements:

1. Perform and submit no less than THREE of the five graded laboratory experiments (Lab 1 - Lab 5)
AND
2. Achieve a minimum 50% grade on the laboratory component overall
AND
3. Achieve a minimum 50% weighted average in the examinations (midterm and final)
OR
Achieve a grade of 50% or higher on the final exam.

The University of Calgary offers a [flexible grade option](#), Credit Granted (CG) to support student's breadth of learning and student wellness. Faculty units may have additional requirements or restrictions for the use of the CG grade at the faculty, degree or program level. To see the full list of Faculty of Science courses where CG is not eligible, please visit the following website: <https://science.ucalgary.ca/current-students/undergraduate/program-advising/flexible-grading-option-cg-grade>

4. Missed Components Of Term Work:

In the event that a student legitimately fails to submit any online or in-person assessment on time (e.g. due to illness, domestic affliction, etc...), please contact the course coordinator, or the course instructor if this course does not have a coordinator to arrange for a re-adjustment of a submission date, or possible exemption and reweighing of components. Absences not reported within 48 hours will not be accommodated. Students may be asked to provide supporting documentation ([Section M.1](#)) for an excused absence, See [FAQ](#).

If an excused absence is approved, options for how the missed assessment is dealt with is at the discretion of the coordinator or course instructor. Some options such as an exemption and pro-rating among the components of the course may not be a viable option based on the design of this course.

Laboratories

Ability to provide make-up labs is limited. If you will miss a laboratory session, fill out the absence form (on D2L) as early as possible (minimum 14 days in advance for a scheduled absence; within 48 hours of the missed lab for an emergency or illness). Placement in a make-up section is at the discretion of the lab coordinator and limited by room capacity. To allow equal access, a maximum of one make-up lab per student will typically be allowed.

A first absence will generally be accounted for by the standard grade policy of taking the highest 4 of the 5 graded labs. If a second experiment is (or will be) missed, contact the lab coordinator immediately (via the absence form on D2L) to determine what accommodations are possible.

Tutorials

Because of scheduling and room-size limitations, there are **no make-up tutorial activities**. Students who have missed their tutorial cannot attend another tutorial section except by permission of the coordinator and under extenuating circumstances. If you will miss a tutorial activity, fill out the absence form (on D2L) as early as possible (minimum 14 days in advance for a scheduled absence; within 48 hours of the missed tutorial for an emergency or illness). Non reported absences will be automatically assigned a score of 0 when the assignment is graded for the class.

Accommodations for absences from tutorial are handled on a case-by-case basis by consultation with the course coordinator. Use the absence reporting form on D2L.

Exams

There is **no deferred midterm** exam. If you are unable to write your midterm exam, fill out the absence form (on D2L) as early as possible (minimum 14 days in advance for a scheduled absence; within 48 hours of the missed exam for an emergency or illness). Absences that were not reported via this form will be automatically assigned a score of 0 when the exam is graded for the class. Accommodation for a missed midterm is handled on a case-by-case basis by consultation with the course coordinator.

If you have a **course conflict** with the out-of-class exam, notify the course coordinator (via the absence form on D2L). If possible, an alternate writing time *on the same day as the scheduled exam* will be arranged. Other arrangements when an alternate time is not possible are handled on a case by case basis by the course coordinator.

5. Scheduled Out-of-Class Activities:

The following out of class activities are scheduled for this course.

Activity	Location	Date and Time	Duration
Midterm	TBD	Wednesday, November 1, 2023 at 7:00 pm	90 Minutes

REGULARLY SCHEDULED CLASSES HAVE PRECEDENCE OVER ANY OUT-OF-CLASS-TIME-ACTIVITY. If you have a conflict with the out-of-class-time-activity, please contact your course coordinator/instructor no later than **14 days prior** to the date of the out-of-class activity so that alternative arrangements may be made.

REGULARLY SCHEDULED CLASSES HAVE PRECEDENCE OVER ANY OUT-OF-CLASS-TIME ACTIVITY.

If you have a conflict with another course and your CHEM 203 midterm, contact the CHEM 203 course coordinator (via the absences form on D2L) at least 14 days in advance of the exam to make alternate arrangements.

If you have a conflict with your CHEM 203 lab, tutorial, or lecture and the exam (or other activity) for another course, contact *the instructor or coordinator of the other course* that has the out-of-class-time activity. CHEM 203 cannot accommodate make-ups or absences for other classes' activities.

6. Course Materials:

Recommended learning resource:

This course uses a freely available, online open educational resource (OER) as a textbook. It is available at:

<https://chem-textbook.ucalgary.ca>

Students can use alternate textbooks, but it is their responsibility to determine appropriate readings and practice questions if they are not using the recommended resource.

Other required materials:

Available from the campus bookstore, or any available retailer.

- Lab coat (full length / knee length)
- Safety glasses or goggles - CSA approved, with side shields
- Non-programmable scientific calculator (Casio FX260, FX300, or similar)

TopHat may be used for some classroom activities and is free for University of Calgary students. Participation in TopHat activities requires either a SMS-capable phone, smartphone + TopHat app, or device that can access the TopHat website. TopHat activities in CHEM 203 do not contribute towards the course grade.

In order to successfully engage in their learning experiences at the University of Calgary, students taking online, remote and blended courses are required to have reliable access to the following technology:

- A computer with a supported operating system, as well as the latest security, and malware updates;
- A current and updated web browser;
- Webcam/Camera (built-in or external);
- Microphone and speaker (built-in or external), or headset with microphone;
- Current antivirus and/or firewall software enabled;
- Stable internet connection.

For more information please refer to the UofC [ELearning](#) online website.

7. Examination Policy:

Tutorial activities and quizzes:

All tutorial activities and quizzes are completed in-person and during scheduled class time.

Some tutorial activities involve group work. These activities are open-book, and collaboration in groups is allowed. Please read the instructions for each assignment carefully to determine what resources and degree of communication is allowed.

Quizzes during tutorial are closed-book and are to be written individually by the student identified on the quiz. A non-programmable scientific calculator may be used. No other resources or notes may be used.

Lab activities and quizzes:

All prelab quizzes are completed before the start of your lab on D2L. Please read the instructions for each assignment carefully to determine what resources and degree of communication is allowed.

All lab activities are completed in-person and during your scheduled lab time. Worksheet reports may be due at the end of the lab period or may have an extended deadline, depending on the activity. Please read instructions on D2L about submitting worksheet reports and their due dates for *each* lab activity.

Midterm and final exams:

Midterm and final examinations are completed in-person and individually by the student identified on the exam. Exams are closed-book. A non-programmable scientific calculator may be used. No other resources or notes may be used. A data sheet is provided as part of the exam.

Academic accommodations and exams:

Any student with academic accommodations must be registered with Student Accessibility Services (see Section 12(f) below), and have reviewed their accommodations as described on the SAS documents with the course coordinator **within the first 15 days of the semester or at least 10 business days before any scheduled activity** for which accommodations are required. An email confirming mutual understanding of the accommodations will suffice.

Students who wish to use the Exam Centre for writing exams or quizzes are responsible for booking their own writing times.

Students should also read the Calendar, [Section G](#), on Examinations.

8. Approved Mandatory And Optional Course Supplemental Fees:

There are no mandatory or optional course supplemental fees for this course.

9. Writing Across The Curriculum Statement:

For all components of the course, in any written work, the quality of the student's writing (language, spelling, grammar, presentation etc.) can be a factor in the evaluation of the work. See also Section [E.2](#) of the University Calendar.

10. Human Studies Statement:

If you agree, your course work may be used for research purposes. Your responses will remain anonymous and confidential. Grouped data (no individual responses) may be used in academic presentations and publications. Participation in such research is voluntary and will not influence grades in this course. Students' signed consent forms will be withheld from instructors until after final grades are submitted. More information will be provided at the time student participation is requested.

See also [Section E.5](#) of the University Calendar.

Students will be invited to participate in surveys as part of the surveys administered by the research team from the Canadian Consortium of Science Equity Scholars (CCSES). This study is external to the course, and participation is entirely optional. Full details and informed consent information will be posted to the course D2L.

11. Reappraisal Of Grades:

A student wishing a reappraisal, should first attempt to review the graded work with the Course coordinator/instructor or department offering the course. Students with sufficient academic grounds may request

a reappraisal. Non-academic grounds are not relevant for grade reappraisals. Students should be aware that the grade being reappraised may be raised, lowered or remain the same. See [Section I.3](#) of the University Calendar.

- a. **Term Work:** The student should present their rationale as effectively and as fully as possible to the Course coordinator/instructor within **ten business days** of either being notified about the mark, or of the item's return to the class. If the student is not satisfied with the outcome, the student shall submit the Reappraisal of Graded Term work [form](#) to the department in which the course is offered within 2 business days of receiving the decision from the instructor. The Department will arrange for a reappraisal of the work within the next ten business days. The reappraisal will only be considered if the student provides a detailed rationale that outlines where and for what reason an error is suspected. See sections [I.1](#) and [I.2](#) of the University Calendar
- b. **Final Exam:** The student shall submit the request to Enrolment Services. See [Section I.3](#) of the University Calendar.

See the course D2L for procedures and required information for reappraisal of term work (lab reports, tutorial quizzes, or midterm exam).

12. Other Important Information For Students:

- a. **Mental Health** The University of Calgary recognizes the pivotal role that student mental health plays in physical health, social connectedness and academic success, and aspires to create a caring and supportive campus community where individuals can freely talk about mental health and receive supports when needed. We encourage you to explore the mental health resources available throughout the university community, such as counselling, self-help resources, peer support or skills-building available through the SU Wellness Centre (Room 370, MacEwan Student Centre, [Mental Health Services Website](#)) and the Campus Mental Health Strategy website ([Mental Health](#)).
- b. **SU Wellness Services:** For more information, see their [website](#) or call [403-210-9355](#).
- c. **Sexual Violence:** The Sexual Violence Support Advocate, Carla Bertsch, can provide confidential support and information regarding sexual violence to all members of the university community. Carla can be reached by email (syva@ucalgary.ca) or phone at [403-220-2208](#). The complete University of Calgary policy on sexual violence can be viewed [here](#).
- d. **Student Ombuds Office:** A safe place for all students of the University of Calgary to discuss student related issues, interpersonal conflict, academic and non-academic concerns, and many other problems.
- e. **Student Union Information:** [SU contact](#), Email your SU Science Reps: science1@su.ucalgary.ca, science2@su.ucalgary.ca, science3@su.ucalgary.ca,
- f. **Academic Accommodation Policy:**

It is the student's responsibility to request academic accommodations according to the University policies and procedures listed below. The student accommodation policy can be found at: <https://www.ucalgary.ca/legal-services/sites/default/files/teams/1/Policies-Student-Accommodation-Policy.pdf>

Students needing an accommodation because of a disability or medical condition should communicate this need to Student Accessibility Services in accordance with the Procedure for Accommodations for Students with Disabilities: <https://www.ucalgary.ca/legal-services/sites/default/files/teams/1/Policies-Accommodation-for-Students-with-Disabilities-Procedure.pdf>.

Students needing an accommodation in relation to their coursework or to fulfil requirements for a graduate degree, based on a Protected Ground other than Disability, should communicate this need, by filling out the [Request for Academic Accommodation Form](#) and sending it to Associate Head, Undergraduate by email ahugchem@ucalgary.ca preferably 10 business days before the due date of an assessment or scheduled absence.

- g. **Misconduct:** Academic integrity is the foundation of the development and acquisition of knowledge and is based on values of honesty, trust, responsibility, and respect. We expect members of our community to act with integrity. Research integrity, ethics, and principles of conduct are key to academic integrity. Members of our campus community are required to abide by our institutional [Code of Conduct](#) and promote academic integrity in upholding the University of Calgary's reputation of excellence. Some examples of academic misconduct include but are not limited to: posting course material to online platforms or file sharing without the course instructor's consent; submitting or presenting work as if it were the student's own work; submitting or presenting work in one course which has also been submitted in another course without the instructor's permission; borrowing experimental values from others without the instructor's approval; falsification/fabrication of experimental values in a report. Please read the following to inform yourself more on academic integrity:

[Student Handbook on Academic Integrity](#)
[Student Academic Misconduct Policy](#) and [Procedure](#)
[Faculty of Science Academic Misconduct Process](#)
[Research Integrity Policy](#)

Additional information is available on the [Student Success Centre Academic Integrity page](#)

- h. **Copyright of Course Materials:** All course materials (including those posted on the course D2L site, a course website, or used in any teaching activity such as (but not limited to) examinations, quizzes, assignments, laboratory manuals, lecture slides or lecture materials and other course notes) are protected by law. These materials are for the sole use of students registered in this course and must not be redistributed. Sharing these materials with anyone else would be a breach of the terms and conditions governing student access to D2L, as well as a violation of the copyright in these materials, and may be pursued as a case of student academic or [non-academic misconduct](#), in addition to any other remedies available at law.
- i. **Freedom of Information and Privacy:** This course is conducted in accordance with the Freedom of Information and Protection of Privacy Act (FOIPP). Students should identify themselves on all written work by placing their name on the front page and their ID number on each subsequent page. For more information, see [Legal Services](#) website.
- j. **Surveys:** At the University of Calgary, feedback through the Universal Student Ratings of Instruction ([USRI](#)) survey and the Faculty of Science Teaching Feedback form provides valuable information to help with evaluating instruction, enhancing learning and teaching, and selecting courses. Your responses make a difference - please participate in these surveys.

Laboratory Component of the Course

In-person laboratory activities begin the week of **September 25**.

You must attend only the laboratory section in which you are registered, unless you have been given written permission by the coordinator to attend a different section.

It is mandatory that students wear a lab coat and safety glasses at all times when working in the lab, as well as wearing appropriate clothing. Anyone not following these or other safety protocols will not be permitted to enter the lab or conduct experiments. Instructions and safety regulations are in the lab manual and laboratory safety training materials (see below). The course D2L site includes details on how to prepare for the labs and how each lab will be assessed.

Teaching assistants begin each lab with a review of safety precautions promptly at the scheduled lab start time. If students arrive late and miss the safety briefing (typically, after the first 5 minutes), they will not be permitted to enter the lab or conduct experiments. See the lab manual and instructions on D2L for details.

Laboratory Safety Course

All undergraduate students taking chemistry laboratories are required to complete an introductory course (approx. 50 minutes) on laboratory safety. This course is presented in an online format. The Safety Course must be completed before the first laboratory experiment. Students who do not complete the safety lessons will subsequently be denied admission to the laboratories. While it will not count directly to the final grade, the material is considered to be part of the course and is therefore appropriate for inclusion into laboratory pre-labs and exams. Students who have previously completed the Chemistry Safety Course at the University of Calgary in the past five years are NOT required to repeat it.

Laboratory Exemptions

Students who previously completed labs in-person and are repeating the course within the last two years can be exempted from the Laboratory Component of the course if a grade of 75% or higher was obtained on the lab portion. Students choosing to exempt from the lab should be aware that:

- The labs in Fall 2023 may be significantly different from prior labs in this course.
- The material covered in these labs will be integrated into other course assessments.
- Students will still be evaluated on other course components, including tutorials.
- The lab component grade achieved on the previous attempt will be carried forward.

Prior to applying for an exemption, students are encouraged to connect with their course instructor or coordinator to better understand the risks and benefits in their specific course, as well as what access they will (or will not) have to lab materials or feedback as an exempt student. Students can apply for an exemption to the laboratory component at <https://science.ucalgary.ca/usc-lab-exemption-application>. Students joining the course after the deadline of **August 29, 2023** should contact the USC as soon as possible if they wish to apply for an extension.

Note: Online labs completed at any time are not eligible for use as a lab exemption in the in-person Winter 2023 term.

Course Outcomes:

- Use the kinetic molecular theory for ideal gases as a model to explain relationships between temperature, kinetic energy, and reactivity
- Apply principles of chemical equilibria to predict the extent of aqueous chemical changes, including acid/base reactions, dissociation of ionic species, and redox reactions in electrochemical cells
- Identify factors that affect reaction rate, depict reaction rate with graphs and symbols, and explain rates at the molecular level
- Identify the thermodynamic enthalpy and entropy changes associated with a chemical reaction to determine which chemical reactions may or may not occur spontaneously, and describe how to alter that spontaneity.
- Use chemical equations and empirical measurements to solve quantitative problems relating to kinetic, thermodynamic and equilibrium principles
- Communicate the results of chemical changes in terms of observable macroscopic outcomes, molecular-scale models/representations, and mathematical equations. Communicate experimental results with appropriate precision of language and measurement.

Electronically Approved - Aug 24 2023 14:08

Department Approval

Electronically Approved - Aug 28 2023 12:19

Associate Dean's Approval