



## COURSE OUTLINE

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

Lecture 01 : MWF 12:00 - 13:50 in ST 141

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

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:**

Lectures, laboratories and tutorials will all be offered **in-person**.

Laboratories and tutorials will both start the **week of May 8th**. See Section 3 for more on how these components will be assessed. Please see D2L for a complete schedule and for more details about the laboratories and tutorials.

**D2L will be the primary source of information for the course.** Any changes to the required activities and course delivery will be announced on D2L.

#### **Re-Entry Protocol for Labs and Classrooms:**

To limit the spread of COVID-19 on campus, the University of Calgary has implemented safety measures to ensure the campus is a safe and welcoming space for students, faculty and staff. The most current safety information for campus can be found [here](#).

#### **Course Site:**

D2L: CHEM 203 L01-(Spring 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](mailto: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 Continuing Education - Chemistry 2) and one of Mathematics 30-1 or Mathematics 2 (offered by Continuing Education).

#### **Antirequisite(s):**

Credit for Chemistry 203 and any of 209, 213 or 301 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
Laboratories <sup>1</sup>	25%	Ongoing		
Tutorials (4 out of 5) <sup>2</sup>	20%	Ongoing		
TopHat Homework <sup>3</sup>	5%	Ongoing		
Midterm 1 <sup>4</sup>	10%	May 17 2023 at 12:00 pm (60 Minutes)	in-person	In Class
Midterm 2 <sup>5</sup>	15%	May 31 2023 at 12:00 pm (60 Minutes)	in-person	In Class
Registrar Scheduled Final Exam	25%	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

<sup>1</sup> Labs will begin the week of May 8th and continue weekly. Post lab assignments will be submitted online within 72 hours of completing the in-person lab activity for labs 2-5. A hardcopy of the lab 1 assignment will be submitted at the end of the lab period. Please see D2L for more details, including the complete lab schedule.

<sup>2</sup> Tutorials will start the week of May 8th and continue weekly. Tutorial assessments will be completed in-person and submitted at the end of the tutorial period. One tutorial absence will be excused automatically. If the excused absence is not used, the lowest tutorial grade will be dropped instead. Please see D2L for more details.

<sup>3</sup> TopHat will be used both in-class and as assigned homework. However, this component will be determined from the homework (out-of-class) portion only.

<sup>4</sup> There will not be a deferred midterm exam.

<sup>5</sup> There will not be a deferred midterm exam.

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
<b>Minimum % Required</b>	95.0 %	87.0 %	82.0 %	77.0%	72.0%	66.0 %	62.0 %	58.0%	54.0%	50.0 %	45.0 %

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.

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

1. Attend and submit reports for a minimum of three (3) laboratory exercises.
2. Achieve a minimum 50% average in the laboratory component of the course.
3. Achieve a minimum 50% weighted average in the examinations component (midterms and final exam) of the course.

Therefore, if **ANY** of the above three conditions are not met, a maximum grade of D+ will result.

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:

The university has suspended the requirement for students to provide evidence for absences. Please do not attend medical clinics for medical notes or Commissioners for Oaths for statutory declarations.

In the event that a student legitimately fails to submit any online or in-person assessment on time (e.g. due to

illness 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. Absences not reported within 48 hours will not be accommodated. If an excused absence is approved, one possible arrangement is that the percentage weight of the legitimately missed assignment could also be pro-rated among the components of the course. This option is at the discretion of the coordinator and may not be a viable option based on the design of this course.

## Midterm Exam

**There are no deferred midterm exams.** If you are unable to write your midterm exam during the scheduled exam time, notify the instructor either **10 business days in advance** for *scheduled* absences (such as medical appointments or religious observance), or **within 48h of the missed exam** for emergency absences (such as illness). The weight of the missed exam will be shifted to the final exam.

## Laboratories

For **laboratory experiments** that will be or have been missed, **use the form linked on the course D2L** to notify the instructor of your absence (do not email) either **10 business days in advance** for scheduled absences (such as medical appointments or religious observance), or **within 48h of the missed experiment** for emergency absences. Make-up labs cannot be offered to accommodate out-of-class activities (such as exams) in another course. Please contact the course with the out-of-class activity for accommodation in this case.

Availability of make-up laboratory sessions is limited and access is not guaranteed. If timing allows, and at the discretion of the Coordinator, a make-up session or adjusted report due date may be offered. If these options are not possible, the weight of the missed experiment may be distributed over other lab components (at the instructor's discretion). Lab reports may not be submitted without attending the corresponding in-person laboratory session, except by special written permission of the instructor.

## Tutorials

One absence from a tutorial will be excused automatically when calculating grades at the end of term. If you are experiencing an extenuating circumstance (such as an extended illness) that will cause you to miss more than one graded tutorial, reach out to the Course Coordinator to discuss your situation as early as possible. Any requests for accommodation will be handled on an individual basis, however make-up or deferred tutorial activities will not always be possible.

### 5. Scheduled Out-of-Class Activities:

There are no scheduled out of class activities for this course.

### 6. Course Materials:

The **online textbook** can be found here (free of charge):  
<https://wpsites.ucalgary.ca/chem-textbook/table-of-contents-chem-203/>

**Top Hat** will be used for online practice problems as well as during the lectures to gather student feedback. In-class participation is optional but highly recommended. Out-of-class use of Top Hat to complete asynchronous homework is mandatory. Access to Top Hat is free for University of Calgary students. More details will be provided on the D2L course website.

The **Chemistry 203 Laboratory Manual** will be available online on the D2L course website.

**Other REQUIRED materials** (available from the bookstore):

- lab coat (full/knee length) & safety glasses
- non-programmable scientific calculator (such as Casio FX 260 or equivalent)

### Specific software requirements for this course:

To complete the workshops and lab activities, you will need access to:

- Office 365 suite: (Available to all UofC students at no additional cost)
  - Excel – full version: not iOS, Android, or web version – or equivalent software – for laboratory activities.
  - Word – or equivalent word processor for completing laboratory activities.
- PDF viewer (e.g. Acrobat Reader, Nitro Reader). Preview (on Mac) or in-browser

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:

For any timed assessment, time will be adjusted for SAS students if needed:

- Students who need accommodation for the midterm or final exam must contact the instructor / course coordinator **at least 10 business days before** the scheduled assessment.

As well, accommodations for students facing a significant barrier to writing the assessment during the scheduled time will be done on a case-by-case basis. If any student expects to have difficulty completing a synchronous activity during its scheduled timeslot, please contact the instructor / course coordinator, Dr. Roxanne Jackson (rjjackso@ucalgary.ca) as soon as possible - for ongoing or scheduled conflicts, at least **within 10 business days before** the exam.

All **in-person exams** (including tutorial quizzes, midterm exams and final exam) are closed-book. A Data Sheet will be provided with the exam, a non-programmable scientific calculator and a model kit is permitted. No other aids may be used.

Other course activities may allow additional resources to be used or collaboration in groups. Please read the instructions for each assignment carefully to determine what resources and degree of communication is allowed.

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:

Students will not participate as subjects or researchers in human studies.

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

## 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.

- 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
- Final Exam:** The student shall submit the request to Enrolment Services. See [Section I.3](#) of the University Calendar.

## 12. Other Important Information For Students:

- 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 ([svsa@ucalgary.ca](mailto:svsa@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](mailto:science1@su.ucalgary.ca), [science2@su.ucalgary.ca](mailto:science2@su.ucalgary.ca), [science3@su.ucalgary.ca](mailto: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](mailto: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.

### 13. Laboratory and Tutorial Information

In addition to the Lecture component of the course, students are scheduled *forin-person* tutorials and laboratory experiments every week. **You must attend your assigned tutorial or laboratory time slot**, *unless you have been given permission by the coordinator.*

*Labs.* Students repeating the course within the last three 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 current in-person labs may be significantly different from prior online labs in this course, and these in-person lab skills may benefit your future coursework;
- the material covered in these in-person labs will be integrated into other course assessments; and,
- the lab 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 online course, as well as what access they will (or will not) have to lab materials or feedback as an exempt student.

Students applying for a lab exemption should submit the request form (<https://science.ucalgary.ca/chemistry/current-students/undergraduate/lab-exemptions>) **no later than Friday April 28, 2023** to apply. Students registering in the course after this date should contact the USC as soon as possible if they wish to apply for an exemption.

*Tutorials.* Tutorials allow students to meet and work with other students, both collaborating in small groups on problems and providing peer feedback on individual work. Facilitators from the teaching team will lead the tutorial sessions and offer support during small-group activities. Students will have a chance to check their understanding and receive individual feedback on the tutorial material as part of their **weekly tutorial assessments**.

### 14. 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 as part of Pre-lab 1. 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.

#### 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 - Apr 27 2023 11:10

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**Department Approval**