



COURSE OUTLINE

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

Coordinator(s)

Name	Email	Phone	Office	Hours
James Stevenson	TBA	TBA	TBA	TBA
Dr Nicole Sandblom	nicole.sandblom@ucalgary.ca	403 210-9816	SA 144J	TBA
Dr. Peter Kusalik	pkusalik@ucalgary.ca	(email preferred)	SB 331	by appointment

Section(s)

Lecture 01 : MWF 11:00 - 11:50 in MFH 162

Instructor	Email	Phone	Office	Hours
James Stevenson	TBA	TBA	TBA	TBA

Lecture 02 : TR 09:30 - 10:45 in ST 140

Instructor	Email	Phone	Office	Hours
Dr. Peter Kusalik	pkusalik@ucalgary.ca	(email preferred)	SB 331	by appointment

Email: email inquiries must be sent from University of Calgary accounts and the subject line must start with CHEM 203. We will respond to email inquiries about the course within 24 hours except on weekends and holidays.

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:

All lectures will be in-person during the scheduled class times and attendance is expected. Further details about lectures for each section (structure and content) will be provided during the first class meeting and on D2L.

Labs:

All labs will be delivered in-person. Students are required to attend their scheduled lab section as the lab component is integral to the design of the course and its learning outcomes. Further details about labs will be provided during the first class meeting, on D2L, and in the lab manual (posted on D2L). See also section 13.

Tutorials:

All tutorials will be delivered in-person. Students are expected to attend their scheduled tutorial section as the tutorial component is integral to the design of the course and its learning outcomes. During tutorials students will receive help in working through set of questions focused on building understanding of course material and problem solving skills. Further details about tutorials will be provided during the first class meeting and on D2L. See also section 13.

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&L02 (Winter 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 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
Tutorials ¹	10%	Ongoing		
Laboratory ²	25%	Ongoing		
Lecture Activities ³	5%	Ongoing		
Midterm ⁴	25%	Mar 10 2023 at 06:30 pm (2 Hours)	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 There will be 5 tutorials during the term, each worth 2%. These will occur during the weeks of Jan. 23-27, Feb. 6-10, Feb. 27-Mar. 3, Mar. 13-17, and Mar. 27-31.

² There will be 5 labs during the term, each worth 5%. These will occur during the weeks of Jan. 30-Feb. 3, Feb. 13-17, Mar. 6-10, Mar. 20-24, and Apr. 3-7.

³ These will be activities throughout the term associated with lectures (for example, Top Hat questions given during class). Further details will be provided during class.

⁴ note that there will not be a makeup or deferred midterm (see also section 4)

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	95.0 %	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.

Notes:

Students will be expected at every stage to understand the material covered in all components of the course. The

midterm and final exams are comprehensive, examining all material taught until the date of the respective exam. Further details of coverage will be provided in class and on D2L prior to each exam.

In order to obtain a grade of C- or higher, a student must meet the following requirements: (1) achieve a minimum 50% average in the laboratory component and have attended and completed a minimum of 3 labs, and (2) achieve a minimum 50% weighted average on the Midterm and Final examinations. If conditions (1) and (2) are not both satisfied, then the maximum course letter grade a student can obtain in CHEM 203 is a D+.

It is will not be possible to alter the course component weightings for individual students.

The University of Calgary offers a [flexible grade option](https://science.ucalgary.ca/current-students/undergraduate/program-advising/flexible-grading-option-cg-grade), 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 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.

Any absences must be promptly reported as follows:

- for labs : lab coordinator
- for tutorials : course coordinator
- for exams : course coordinator.

If a student's absence is approved, the student may be allowed to complete a lab or tutorial at another time if this can be reasonably arranged, or if this can not be arranged the weights of the remaining labs or tutorials may be adjusted. These options are at the discretion of the coordinator. Absences not reported within 48 hours will not be accommodated. It should be note that students must complete 3 labs (see section 3).

If an absence is not approved, the contribution of that specific component item in the final course grade will be zero.

Students who miss the midterm exam and have their absence approved will have the corresponding percentage weight transferred to the final exam.

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

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

Activity	Location	Date and Time	Duration
Midterm Exam	On Campus, Room TBD	Friday, March 10, 2023 at 6:30 pm	2 Hours

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.

6. **Course Materials:**

Recommended Textbook(s):

Flowers, *Chemistry 2E (Open Educational Resource)*: Open Stax.

The textbook that will be used this semester is found here: <https://openstax.org/details/books/chemistry-2e>
Please note that this textbook is an open-educational resource, freely available online.

Required: Chemistry 203 Laboratory Manual (available online from the course website on D2L)

Students should have safety glasses and a lab coat to wear in the undergraduate lab.

Top Hat may be used for some classroom activities and is free for University of Calgary students. If you are unable to participate in the Tophat questions please contact your instructor about alternatives. Further details will be provided on the first day of class and on D2L.

Students may be able to better participate in tutorials if they can bring an electronic device such as a laptop or tablet so that they can use Excel themselves during the tutorial session. Excel is free for University of Calgary students.

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:**

Midterm and Final Exams: These exams are to be completed individually. These exams are 'closed book' - no resources will be allowed other than your non-programmable calculator and a model kit. Note that model kits are allowed but are not expected to provide insight for answering exam questions. The exams will require the use of a non-programmable calculator; we recommend using the same calculator during other course activities (tutorials and labs) so that you can easily operate your calculator prior to the exams. Additional information will be posted on D2L prior to the exam to give you details about the data and formulas that will be provided to you as part of your exam.

Any student with academic accommodations must be registered with Student Accessibility Services (see Section 12(e) below), and must identify themselves to the course coordinator as soon as possible, and no later than 7 days before any assessment for which they are seeking accommodation.

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.

- 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.

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 (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, 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.

13. Laboratory and Tutorial Information

In addition to the Lecture component of the course, students are scheduled for a Tutorial and a Lab Component. You must attend your assigned tutorial and laboratory time slots unless you have been given permission (e.g. from the course and/or laboratory coordinator) to do otherwise.

Laboratory activities

The first of five in-person Labs will begin Jan. 30-Feb. 3. The room location and time can be found via your Student Centre. The lab manual can be found on the course D2L site and you must read the appropriate portions of this laboratory manual prior to attending any of your scheduled lab periods. You should also complete the Academic Integrity quiz - for bonus marks - during the week of Jan. 16-20.

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 and information on how to access it can be found on the course D2L site. Time is allotted for you to complete it during your scheduled lab timeslot during the week of Jan. 16-20. You may complete this course on any computer. The Safety Course must be completed before the first laboratory experiment, and students who have not completed the Safety Course will not be allowed admission to the laboratories. 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.

Breakage: Intentional breakage of lab equipment will be reported to the Student Conduct Office. <https://www.ucalgary.ca/student-services/student-conduct>

Lab exemptions. Students who previously completed labs in-person and are 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 be exempted from the lab should be aware that:

- the labs in Winter 2023 may be significantly different from prior labs in this course;
- the material covered in labs will be integrated into other course assessments;
- students will still be evaluated on other course components, including tutorials; 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 the lab 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 applying for a lab exemption must contact the Undergraduate Science Center (science.advising@ucalgary.ca) **no later than Wednesday January 11th, 2023**. Students who register in the course after this date should contact the USC as soon as possible if they wish to apply for an exemption.

Note: Online labs completed in 2020-2021 are not eligible for use as a lab exemption in the in-person Winter 2023 term.

Tutorials

Tutorial activities will begin the week of Jan. 23-27. The room location and time can be found via your Student Centre. As part of each of the 5 tutorials, there will be a set of tutorial questions to be completed on D2L and based on the exercises worked on during tutorial. These questions function as a check-in every tutorial

week, and are all 'open-book' and allow the use of all course resources (e.g. D2L, course textbook, lecture notes, etc.). You are expected to have attended tutorial, where help will be provided on answering similar questions, prior to attempting your question set. Further details about tutorials will be posted in D2L.

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 - Jan 05 2023 23:33

Department Approval

Electronically Approved - Jan 06 2023 13:42

Associate Dean's Approval