



COURSE OUTLINE

1. **Course:** CHEM 203, General Chemistry: Change and Equilibrium - Winter 2021

Coordinator(s)

Name	Email	Office	Hours
Dr Yuen-ying Carpenter	yyscarpe@ucalgary.ca (email preferred)	ZOOM	See D2L
Dr Julie Lefebvre	jlefebv@ucalgary.ca	ZOOM	See D2L

Section(s)

Lecture 01: MWF 13:00 - 13:50 - Online

Instructor	Email	Office	Hours
Dr Julie Lefebvre	jlefebv@ucalgary.ca	ZOOM	See D2L

Lecture 02: TR 09:30 - 10:45 - Online

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

Tutorials begin the week of **January 18th, 2021**. *Information about synchronous Zoom meetings will be posted on D2L.*

Laboratory experiments begin the week of **January 25th, 2021**. *Information about synchronous Zoom meetings will be posted on D2L.*

Online Delivery Details:

This course is being offered online in real-time via scheduled meeting times, you are required to be online at the same time.

To help ensure Zoom sessions are private, do not share the Zoom link or password with others, or on any social media platforms. Zoom links and passwords are only intended for students registered in the course. Zoom recordings and materials presented in Zoom, including any teaching materials, must not be shared, distributed or published without the instructor's permission.

This course has a registrar scheduled, synchronous final exam. The writing time is 2 hours + 50% buffer time.

COURSE COMPONENTS

*For clarity: *synchronous* components are *live* whereas *asynchronous* components would be viewed *on-demand*.

Lectures

Synchronous online Zoom lectures will focus on the application of the course concepts. You are expected to attend your assigned lecture section to keep up with course content.

The lectures will be complemented by recommended pre-reading, posted handouts, videos and/or lecture notes. Occasionally, instructors may make a specific lecture date optional - as an open question and answer period following a structured pre-reading or video activity.

Note: While recordings of 'live' Zoom lectures will generally be available via D2L, participating during the 'live' lecture offers significant advantages, including discussion with peers, opportunities for questions, and feedback on your understanding during activities. Please note that there may be a delay of a few days between the date of the lecture and the availability of the recording.

Labs & Tutorials (alternate bi-weekly in the same timeslot)

Mandatory 75 min synchronous online meetings facilitated by your TA during your assigned timeslot. More details on the activities each week will be provided on D2L.

These sessions are *not* recorded in order to encourage open discussion and participation. See Section 4 for details on what to do if you need to miss a scheduled lab or tutorial.

Course Site:

D2L: CHEM 203 L01-(Winter 2021)-General Chemistry: Change and Equilibrium

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

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:

Component(s)	Weight %	Dates
Weekly check-in assignments	15%	See D2L
Laboratory Activities (Experiments 1-5)	25%	See D2L
Term test 1 (<i>synchronous</i>)	10%	Wednesday February 3 from 6:30 - 9 p.m.
Term test 2 (<i>synchronous</i>)	15%	Wednesday March 10 from 6:30 - 9 p.m.
Wrap-up assignment	5%	Due Thursday April 15 at noon
Final exam (<i>synchronous</i>)	30%	(TBD - scheduled by the Registrar)

More detail on your asynchronous assessments

Weekly check-in assignments (5 counted of 8 available assignments)

- Short assignments will be submitted at the start of each week that check your understanding of the material covered in the previous week. **In weeks following each of the 5 scheduled tutorial meetings, the check-in questions will closely resemble the activities from the live tutorial session.** Otherwise, check-ins will focus on the previous week's lecture material. Attending lectures and tutorials is the best way to prepare for these assignments.
- These check-ins will help you build routines in your studying so that you stay on track with material throughout the semester, and so that you can reach out for support or clarification before a bigger assessment like a term test.
- No check-ins are scheduled for the week of either the term test. A detailed schedule of check-in assignment due dates is posted to D2L.
- Although a total of 8 check-in assignments will be offered throughout the term, **only the top 5 submitted check-ins will be counted towards your final grade.** If you need to skip a week for *any* reason, don't worry; you can catch up on the check-in as ungraded practice later.

Laboratory activities (5 multi-part activities)

- Each of the 5 online laboratory experiments will involve three parts: preparing before the lab, attending a synchronous meeting, and submitting a short 'report' or assignment asynchronously afterwards. Details on each of these components and their evaluation will be posted to D2L.

Wrap-up assignment (1 activity)

- Instead of a weekly check-in during the last week of class, you will submit a longer Wrap-up Assignment which helps you reflect on and make connections between all of the material covered in the course.
- You will have at least 1-week to complete this work, but no late submissions will be accepted without prior arrangement with the coordinator (see Section 4).
- Since this assignment is designed to look back on your learning in the course as a whole, it is intended to also support your studying and review for the final exam.

More detail on your synchronous assessments

Accommodations

- Exam durations will be adjusted for SAS students as outlined in their accommodation letter. Extended time accommodations will be calculated from the base writing time of the exam. e.g. For the term tests, a student with a +25% time accommodation from SAS would receive...
 - 100 minutes + 100 x 25% SAS extension + technical buffer time (100 x 50%) = 175 minutes total

- 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, e.g. *different time zones, caregiving responsibilities, ability to secure an appropriate test-taking environment.*
- If you need an accommodation for an assessment, please contact the course coordinator **later than 14 days prior to the date of the assessment** so that alternative arrangements may be made.

Format and timing

- Students **MUST** begin each online exam within the first 30 minutes of the exam window. No one will be permitted to begin the exam after this time.
- Once opened, the exam questions can be answered in any order and you will be allowed to move back and forth within the exam until you officially submit your exam.
- The listed duration of the exam *includes* a built-in buffer of extra time for unexpected technical issues (e.g. temporary loss of internet, computer shut-down etc.).

Term tests 1 and 2

- **Synchronous 2.5 hour** individually-completed, open-book assessments on D2L.
- Each term test is designed to take students no more than 100 min to complete but students will be given a total of 150 min to submit their answers.

Final Exam

- **Synchronous 3 hour** individually-completed, open-book assessment on D2L.
- The final exam is designed to take students no more than 2 hrs to complete but students will be given a total of 3 hrs to submit their answers.
- This timed exam will be scheduled by the registrar.

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 final exam that will be scheduled by the Registrar. [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.

The final exam will be administered using an on-line platform. Per section [G.5](#) of the online Academic Calendar, timed final exams administered using an on-line platform, such as D2L, will be available on the platform where the additional time will be added to the beginning of the registrar scheduled exam. E.g. If an exam is designed for 2 hours and the final exam is scheduled from 9-11am in your student centre, the additional time will be added to the start time of the exam. This means that if the exam has a 1 hour buffer time,

- a synchronous exam would start at 8 am and finish at 11am.

Notes:

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

1. submit no less than three of the five laboratory reports/assignments, *and*
2. achieve a minimum 50% in the laboratory grading, *and*
3. achieve a minimum 50% weighted average on the summative assessments (2 Term Tests, Wrap-up Assignment, and Final Exam).

This means that if a student scores below 50% in either the laboratory component or the summative assessments, then the *maximum* grade they can obtain in CHEM 203 is a D+.

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, then the percentage weight of the legitimately missed assignment could also be pro-rated among the components of the course.

What to do if you have missed a course meeting (lecture, lab, tutorial)

- **Missed synchronous Lecture:** Lecture recordings will be available through D2L (barring technical issues) if you need to miss the occasional scheduled lecture due to illness, family circumstances, or other personal conflict. However, attending synchronously whenever possible will help you keep current with the course topics and engage in discussions that support your learning. If you find that you cannot attend due to recurring scheduling issues (e.g. timezone concerns), we recommend that you make a regular schedule to watch the lecture material, rather than trying to catch up on multiple lectures at once. *Please note that there may be a delay of a few days between the date of the lecture and the availability of the recording.*
- **Missed synchronous Laboratory and/or Tutorial Meeting :** Laboratory and tutorial sessions are not recorded, to encourage open participation and discussion by all students. Priority to attend a make-up laboratory or tutorial meeting at an alternate time will be given to students with legitimate reasons for absence. Absences for other non-legitimate reasons (e.g. vacation, tardiness, lack of preparation, non-essential travel) are not guaranteed any accommodation, and will be handled at the coordinator's discretion. Although participation in the synchronous session offers a significant learning opportunity, all required materials will be posted on D2L; the laboratory assignments and weekly check-ins can hence be completed (despite the absence) before the due date.

What to do if you have missed an assignment deadline or synchronous test

- **Missed Term tests:** There are no deferred term test examinations The percentage weight of a legitimately missed term test examination will be pro-rated among the remaining course examinations.
- **Overdue or missed weekly check-in assignments** will be automatically dropped as the lowest grade(s) in this category, since only the top 5 of 8 check-ins will be counted towards a student's overall grade. If a you are experiencing extenuating circumstances preventing you from completing a *significant* number of check-ins (e.g. extended illness, etc.), reach out to the coordinator to discuss your situation.
- **Overdue or missed laboratory assignments** that could not be submitted within the assigned time window due to extenuating circumstances may be extended or pro-rated towards other lab components at the coordinator's discretion. Contact the lab coordinator as soon as the deadline is passed or before the deadline if possible.
- **Overdue wrap-up assignments** will not be accepted unless you receive approval for an extension from the coordinator *at least* 48-hours in advance of the due date. Extensions may be granted at the coordinator's discretion for *unexpected* extenuating circumstances. Alternately, the weight of this summative assessment may be pro-rated toward the final exam if the extenuating circumstances make an extension unreasonable. Contact the coordinator as soon as possible to discuss options.

5. Scheduled Out-of-Class Activities:

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

Activity	Location	Date and Time	Duration
CHEM 203 Term Test 1	Web-Based	Wednesday, February 3, 2021 at 6:30 pm	2.5 Hours
CHEM 203 Term Test 2	Web-Based	Wednesday, March 10, 2021 at 6:30 pm	2.5 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, Theopold, Langley, Robinson, et al., *Chemistry, 2nd edition*: Open Stax.

Important note about your textbook:

Our recommended text is an open-educational resource, freely available online through the Open Stax website (<https://openstax.org/details/books/chemistry-2e>). You are welcome to (i) refer to the text online, (ii) download the PDF to your own device, or (iii) purchase a print copy through the bookstore.

Recommended practice resources:

Top Hat - Active participation is an important part of your lectures. You are strongly encouraged to participate to the Top Hat activity questions; some questions will be asked during lectures while others will be set as homework to review a lecture or to prepare for an upcoming lecture. Access to Top Hat is free for University of Calgary students. More details will be provided on the first day of lecture.

Technological Requirements:

Specific software that will be used in this course:

- Zoom - for attending lectures/labs/tutorials and office hours.
- Office 365 suite: (Available to ALL UofC students at no additional cost)
 - OneNote - for accessing notes and assignments.
 - Excel - or equivalent software.
 - Word - or equivalent word processor.
 - PDF viewer (e.g. Acrobat Reader, Nitro Reader). Preview or in-browser reader is not sufficient.

Access to a tablet or scanner or free phone app that can save documents/photos is highly recommended.

General university requirements:

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:

All sections will write the same examinations. The questions are based on input from all instructors for the course.

All exams are open-book (resources are allowed), but are to be completed individually by the student.

In the event of major technical issues (e.g. frozen screen, power outage, computer failure, etc.), the student should contact the course coordinator immediately either via email or by joining the Zoom help line (by phone or computer, link posted on D2L):

- If the student is available to re-attempt or continue the timed exam, the start time may be manually reset and the window extended to account for lost time.
- If the technical issue prevents a student from having sufficient time for completion of the exam within the available window, the weight of the missed online assessment would be redistributed in a similar fashion to any other missed online work (see also **Item 4**).

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.

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 www.ucalgary.ca/wellnesscentre or call [403-210-9355](tel: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](tel:403-220-2208). The complete University of Calgary policy on sexual violence can be viewed at (<https://www.ucalgary.ca/policies/files/policies/sexual-violence-policy.pdf>)
- d. **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](#)
[Research Integrity Policy](#)

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

- e. **Academic Accommodation Policy:** Students needing an accommodation because of a disability or medical condition should contact Student Accessibility Services in accordance with the procedure for accommodations for students with disabilities available at [procedure-for-accommodations-for-students-with-disabilities.pdf](#).

Students needing an accommodation in relation to their coursework or to fulfill requirements for a graduate degree, based on a protected ground other than disability, should communicate this need, preferably in writing, to the Associate Head of the Department of Chemistry, Dr. Yuen-Ying Carpenter by email ahugchem@ucalgary.ca or phone 403-220-6908. Religious accommodation requests relating to class, test or exam scheduling or absences must be submitted no later than **14 days** prior to the date in question. See [Section E.4](#) of the University Calendar.

- f. **Freedom of Information and Privacy:** This course is conducted in accordance with the Freedom of Information and Protection of Privacy Act (FOIP). 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.
- g. **Student Union Information:** [VP Academic](#), Phone: [403-220-3911](tel:403-220-3911) Email: suvpaca@ucalgary.ca. SU Faculty Rep., Phone: [403-220-3913](tel:403-220-3913) Email: sciencerep@su.ucalgary.ca. [Student Ombudsman](#), Email: ombuds@ucalgary.ca.
- h. **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.
- i. **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.

13. Laboratory and Tutorial Information

In addition to the Lecture component of the course, students are scheduled for *synchronous online* tutorials and laboratory experiments in alternating weeks. In any given week, all students in the course will perform either a tutorial or a laboratory experiment. **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 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 current online labs may be significantly different from prior in-person labs in this course;
- the material covered in these online 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 contact the Undergraduate Science Center (science.advising@ucalgary.ca) **no later than Monday January 18th, 2021** 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 check-in assignments**.

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 - Jan 05 2021 18:13

Department Approval

Electronically Approved - Jan 06 2021 11:46

Associate Dean's Approval