



COURSE OUTLINE

1. **Course:** CHEM 203, General Chemistry: Change and Equilibrium - Winter 2022

Lecture 01 : MWF 13:00 - 13:50 in ST 140

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

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

Instructor	Email	Phone	Office	Hours
Dr. Julie Lefebvre	jlefebv@ucalgary.ca (email preferred)		EEEL 237C	TBA

Coordinator(s)

Name	Email	Phone	Office	Hours
Dr. Julie Lefebvre	jlefebv@ucalgary.ca (email preferred)		EEEL 237C	TBA

Tutorials begin the week of **January 17th, 2022**.

Laboratory experiments begin the week of **January 24th, 2022**.

To account for any necessary transition to remote learning in the winter 2022 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:

Course Components

Lectures will be offered in-person; they will not be recorded and won't be available for viewing at a different time. Some 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.

Labs will be offered in-person on a biweekly basis. Post-lab assignments will be submitted online within 3-7 days of completing the in-person lab activity. Consult your student center and D2L for the complete lab schedule and more details about the due dates.

Please contact the lab coordinator if you have lab related questions: Dr. Roxanne Jackson, rjjackso@ucalgary.ca

Tutorials will be offered in-person on a biweekly basis. During the tutorials, you will work in groups and apply the concepts learned in lecture. Tutorial activities will prepare you for the online weekly check-in assignments. Consult D2L for the complete schedule. *Your tutorial time slot will be listed in your Student Center as a 75-minute component which overlaps with your 2h-50 minute lab component (Bxx) - the schedule on D2L will outline which weeks are tutorials instead of labs.*

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 W2022 - 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
Lab Component ¹	25%	Ongoing		
Weekly Check-in Assignments ²	20%	Ongoing		
Midterm	20%	Mar 01 2022 at 07:00 pm (2 Hours)	in-person	See D2L for room assignment
Wrap-up Assignment ³	5%	Apr 12 2022		
Registrar Scheduled Final Exam	30%	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 5 labs, taking place bi-weekly. See D2L for additional details on the grading and elements of each laboratory activity.

² These short assignments will be submitted at the start of each week. In weeks following each of the 5 scheduled tutorials, the check-in questions will closely resemble the activities from the 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. 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.

³ 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).

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:

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 (Midterm, 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+.

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.

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

- **Missed lecture:** if you need to miss the occasional scheduled lecture due to illness, family circumstances, or other personal conflict, you will need to complete your lecture notes by reading the textbook.
- **Missed Laboratory:** If you missed your scheduled in-person laboratory, you need to contact the lab coordinator as soon as possible using the form posted on D2L. Priority to attend a make-up laboratory 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.
- **Missed Tutorial:** It is not possible to attend a make-up tutorial. Although participation in the tutorial session offers a significant learning opportunity, all required materials will be posted on D2L; the 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 Midterm:** There are no deferred midterm examinations The percentage weight of a legitimately missed midterm 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 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
Midterm Exam	TBA	Tuesday, March 2, 2021 at 7:00 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:

Important note about your textbook:

We will be using an adapted version of the textbook by Paul Flowers, Klaus Theopold, Richard Langley, William R. Robinson: Chemistry 2e, OpenStax (2020). This book has been adapted to fit the specific needs of CHEM 203.

Free access to the adapted version via this link: <https://wpsites.ucalgary.ca/chem-textbook/table-of-contents-chem-203/>.

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:

- 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 individually-written, closed-book examinations (no resources allowed). During exams, students are allowed to bring only pencils, pens, erasers, their ID card and a non-programmable calculator (recommended calculator is the CASIO fx-260 solar). If in doubt, check your calculator with your instructor prior to the examination (*the programmable TI calculators are not acceptable*).

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

8. **Approved Mandatory And Optional Course Supplemental Fees:**

Laboratory Breakage Fees and Locker Check-out: The Department of Chemistry has a laboratory glassware breakage fee. At the start of the course, each student is assigned a locker and checks-in to establish that they have a complete set of usable glassware. By signing for check-in, a student agrees that they are now responsible for the glassware until check out. Any equipment that is missing, unusable or has been replaced during the semester will be charged to the student. All students, even those who withdraw early from the course must check out of the laboratory before the last day of lectures (April 12, 2022). Any student who fails to check out before the last day of lectures for the term will be assessed a charge of \$30.00. If this fee is not paid by the posted deadline, university services (registration, transcripts, etc.) may be withheld.

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 (syasa@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/legal-services/sites/default/files/teams/1/Policies-Sexual-and-Gender-Based-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:**

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 Dr. Yuen-Ying Carpenter by email yyscarpe@ucalgary.ca preferably 10 business days before the due date of an assessment or scheduled absence.

f. **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.

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 in-person* 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 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 contact the Undergraduate Science Center (science.advising@ucalgary.ca) **no later than Monday January 17th, 2022** 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 10 2022 18:12

Department Approval

Electronically Approved - Jan 10 2022 20:22

Associate Dean's Approval