



## COURSE OUTLINE

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

Lecture 01 : MWF 14:00 - 15:50 in ENE 241

Instructor	Email	Phone	Office	Hours
Dr Bronwen Wheatley	bmmwheat@ucalgary.ca	403 220-8077	SA 144C	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:**

CHEM 203 this Spring is an in-person course, with lectures, labs, and tutorials designed to be attended on-campus.

#### **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 2022)-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 (x 5) <sup>1</sup>	25%	Ongoing		
Top Hat <sup>2</sup>	5%	Ongoing		
Tutorials (x 5) <sup>3</sup>	10%	Ongoing		
Wednesday In-Class Quiz #1 (GROUP) <sup>4</sup>	6%	May 11 2022		
Wednesday In-Class Quiz #2 (GROUP)	6%	May 18 2022		
Wednesday In-Class Quiz #3 (TWO-STAGE) <sup>5</sup>	8%	May 25 2022		
Wednesday In-Class Quiz #4 (GROUP)	6%	Jun 01 2022		
Wednesday In-Class Quiz #5 (GROUP)	6%	Jun 08 2022		
Registrar Scheduled Final Exam	28%	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> Laboratories take place weekly during your scheduled lab section time, starting in May 10 and 11. Your grade for each lab will be calculated based on both any short pre-lab activities that are held (D2L) and submission of an activity at the end of the lab period (on paper) or post-lab report (D2L). See D2L for complete details.

<sup>2</sup> Top Hat will be used for a variety of in-class and out-of-class questions throughout the term.

<sup>3</sup> Tutorials take place weekly in the your scheduled timeslot, starting the week of May 4 (excluding May 19 and 20). You will be graded on work completed during your tutorial session, so attendance is critical. See D2L for complete details.

<sup>4</sup> Each in-class GROUP quiz will take approximately 1-hour of regular class time. Each will be completed in assigned student groups, and all members of the group who are present in-person will receive the same score.

<sup>5</sup> To ensure you receive individual feedback on your progress and help prepare you for the individually-written final exam, Quiz #3 will be a two-stage exam, composed of both a GROUP portion and an INDIVIDUAL portion. Your score will be determined from the combined weight of both parts of this quiz.

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 be awarded an overall letter grade of C- (pre-requisite pass) or better, students must:

- attend and submit a minimum of three of five lab reports/assignments, **and**
- achieve a minimum of 50% in the lab component of the course, **and**
- achieve a minimum of 50% on the average of the two timed examinations that include an individual component (i.e. Quiz 3 and the final exam).

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

#### 4. Missed Components Of Term Work:

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.

All arrangements for missed work will be at the discretion of the course instructor. Attendance at your scheduled lab and tutorial sections is a critical part of the course.

- If you have a planned/scheduled absence due to extenuating personal circumstances (e.g. a caregiving responsibility or appointment), please contact your instructor as soon as possible in advance of the week you will miss your lab or tutorial to discuss your options.
- If you have an unexpected absence (e.g. family emergency, illness, COVID-test result), please contact your instructor within 48-hours of your missed tutorial or lab to discuss your options.

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

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

TopHat might be used to collect responses throughout the semester. This online tool is free for all students and are not dependent on prior access.

## 6. Course Materials:

The textbook that will be used this semester is found here:

<https://wpsites.ucalgary.ca/chem-textbook/table-of-contents-chem-203/>

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

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:

### Wednesday In-Class Quizzes:

- These five quizzes are all 'open-book' and allow the use of all course resources (e.g. D2L, course textbook, lecture notes, etc.).
- Each of the group quizzes (#1, 2, 4, and 5) and the group portion of the two-stage quiz (#3) will be completed in assigned groups. You are expected to discuss and come to consensus on your answers as a whole group; communication with anyone *outside* your assigned group is not permitted.
- The individual portion of the two-stage quiz (#3) must be completed individually.

### Final exam:

- The final exam is to be completed individually.
- The final exam is '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 the exam questions.*
- The final exam will require the use of a non-programmable calculator; we recommend using the same calculator during other course activities (group quizzes, tutorials, labs) so that you are comfortable with your calculator prior to the final exam.
- 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.

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 (June 16, 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:**

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 ([syva@ucalgary.ca](mailto:syva@ucalgary.ca)) or phone at [403-220-2208](#). The complete University of Calgary policy on sexual violence can be viewed [here](#).
- 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](#)  
[Faculty of Science Academic Misconduct Process](#)  
[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](mailto: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:** [SU contact](#), Email SU Science Rep: [sciencerep1@su.ucalgary.ca](mailto:sciencerep1@su.ucalgary.ca), [Student Ombudsman](#)

**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 exemptions.** 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,

- online labs offered in some previous semesters may be significantly different from current labs in this course;
- the material covered in the Spring 2022 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](mailto:science.advising@ucalgary.ca)) **no later than Monday May 9th** to apply.

**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 and information on how to access it can be found on the course D2L site. The Safety Course must be completed before the first laboratory experiment. It is not required for the check-in activity. Students who do

not complete the Safety Course will be denied admission to the laboratories. While it will not count directly to the final grade, the material is considered to be part of the course and is therefore appropriate for inclusion into laboratory pre-labs and exams. Students who have previously completed the Chemistry Safety Course at the University of Calgary in the past five years are NOT required to repeat it

**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 - May 08 2022 22:21

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**Department Approval**