



## COURSE OUTLINE

### 1. **Course:** CHEM 209, General Chemistry For Engineers - Winter 2021

#### **Coordinator(s)**

Name	Email	Phone	Office	Hours
Dr. Amanda Musgrove	amanda.musgrove@ucalgary.ca	403 220-2745	SA 144F	TBA (see D2L)
Dr. Roxanne Jackson	rjjackso@ucalgary.ca	403 220-8797	SA 258	Please see D2L

#### **Section(s)**

Lecture 01: TR 12:30 - 13:45 - Online

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

Lecture 02: TR 08:00 - 09:15 - Online

Instructor	Email	Phone	Office	Hours
Dr. Amanda Musgrove	amanda.musgrove@ucalgary.ca	403 220-2745	SA 144F	TBA (see D2L)

Lecture 03: MWF 12:00 - 12:50 - Online

Instructor	Email	Phone	Office	Hours
Dr. Jing Li	li22@ucalgary.ca	403 220-8797	SA 258	Please see D2L

**Online Communication:** Please allow up to **two business days** for replies to email and other online communications. Responses can be expected during business hours of 8 AM - 6 PM on weekdays. Neither TAs nor the instructors are regularly available outside these business hours. Please use Piazza for maximum visibility of non-personal questions during "off hours".

Tutorials begin the week of **January 18, 2020 (all tutorial sections)**. Labs begin the week of January 18, 2020, **with the even-numbered lab sections**. Information about these synchronous Zoom sessions will be posted to 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.

All course components are offered online.

#### **Laboratory and Tutorial Sessions:**

All laboratory and tutorial sessions feature group-work and as such must be completed synchronously (all registered students attend at the same time). Tutorials are **every week** - see your Student Centre to confirm the time at which you are registered. Laboratories run on alternating weeks (schedule is also available through the Student Centre or in the Laboratories section of the course D2L page).

#### **Lectures:**

Lectures will be offered using a hybrid model: some course content will be presented as pre-recorded (asynchronous) videos, and class time will be used for live (synchronous) problem review and Q&A. Attendance at the synchronous class sections is optional, but **the sessions will not be recorded**. All problems done during these sessions will be available through the course site.

#### **Exams:**

Midterm and final exams are scheduled outside of class time, but are written synchronously - the whole class will

write during the scheduled time window.

If you need time-shift accommodations for any of the synchronous components, contact the course coordinator, Dr. Amanda Musgrove ([amanda.musgrove@ucalgary.ca](mailto:amanda.musgrove@ucalgary.ca)) as soon as possible:

- For recurring course components: notice is required before **January 18th or within 2 days of registering in the course**, whichever is later.
- For exams or emergent situations during term: notice is required **minimum 10 business days** before the scheduled activity or exam date.

### Course Site:

D2L: CHEM 209 L01-(Winter 2021)-General Chemistry For Engineers

**Piazza (Q&A site):** <https://piazza.com/ucalgary.ca/winter2021/chem209>

**TopHat:** Each lecture section will have a TopHat site for homework and in-class questions. Course codes will be shared via the main D2L site.

**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 209 and any of 201, 203, 211, 213 and 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)	Weighting %	Date(s)	Note	Mode
<b>TopHat Homework (10 Grades)</b>	5	Weekly throughout term		Asynchronous
<b>Tutorial Activities (5 Grades)</b>	25	Most weeks throughout term	See Syllabus for detailed schedule. Up to two absences from the 7 total activities will be excused automatically*.	Synchronous
<b>Laboratory Activities (5 reports)</b>	25	Biweekly throughout term	See Syllabus for detailed schedule.	Synchronous/Asynchronous
<b>Midterms (2 exams)</b>	20	February 10: 7 - 8:30 p.m. March 24: 7 - 8:30 p.m.	Two exams, each worth 10%. Each is a 1 hour exam + 30 min "buffer time"	Synchronous
<b>Final Exam (1 exam)</b>	25	TBD	Scheduled by the Registrar during the Apr. exam period. 2 hr exam + 1h "buffer time".	Synchronous

\* If a student does not use both excused tutorial absences, the lowest tutorial grade(s) will be dropped to a total of 2 excused tutorials.

For any synchronous assessment, time will be adjusted for SAS students if needed (see Section 7 for additional details). 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 any student expects to have difficulty completing a synchronous activity during its scheduled timeslot, please contact the course coordinator, Dr. Amanda Musgrove ([amanda.musgrove@ucalgary.ca](mailto:amanda.musgrove@ucalgary.ca)) as soon as possible:

- For recurring course components, notice is required before **January 18th or within 2 days of registering in the course**, whichever is later.
- For exams or emergent situations during term, notice is required **minimum 10 business days** before the scheduled activity or exam date.

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>	92.0 %	86.0 %	82.0 %	78.0%	74.0%	70.0 %	66.0 %	62.0%	58.0%	54.0 %	50.0 %

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. **Due to the scheduling of the final exams, the additional time will be added to the end of the registrar scheduled synchronous exam to support students. This way, your exam schedule accurately reflects the start time of the exam for any synchronous exams. E.g. If a synchronous 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 end time of the synchronous exam. This means that if the exam has a 1 hour buffer time, a synchronous exam would start at 9 am and finish at 12pm. - updated April 6, 2021**

In order to achieve the prerequisite requirements (i.e., C-), a student must meet ALL of the following requirements:

1. Attend AND submit reports for a minimum of 3 of the 5 laboratory exercises **and**
2. Achieve a minimum 50% in the laboratory component **and**
3. Achieve a minimum 50% in the tutorial component **and**
4. Achieve a minimum 50% weighted average on the examinations (Midterms and Final).

#### 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.

There are **no deferred midterms**, however some accommodations may be made for time zone adjustment and technological issues in submission. If you are unable to write either midterm exam during the scheduled time, notify the instructor either 10 business days in advance for scheduled absences or course conflicts, or within 48h of the missed exam for emergency absences so that alternate arrangements can be made. If it is not possible to complete the exam within the exam writing window, the weight of the missed exam will be shifted to the final exam.

For **tutorial or laboratory exercises** that will be or have been missed, use the form linked on the course D2L (do not email) to notify the Coordinator of your absence. Unless there is an extenuating circumstance, the default behaviour for a missed tutorial is to apply one of the two excused absences. If there is an extenuating circumstance, a make-up session or adjusted due date may be scheduled, at the discretion of the Coordinator, and if timing allows. Lab reports may not be submitted without attending the corresponding synchronous laboratory session, unless by special written permission of the lab coordinator.

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

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

Activity	Location	Date and Time	Duration
Midterm 1	WEB-BASED	Wednesday, February 10, 2021 at 7:00 pm	90 Minutes
Midterm 2	WEB-BASED	Wednesday, March 24, 2021 at 7:00 pm	90 Minutes

**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.

Each midterm is designed to be written in 1 hour, but an additional 30-minutes "buffer time" has been included to account for possible technical issues.

If your conflict is between a CHEM 209 lab or tutorial and another class' exam, *contact the course with the out of class exam first*. It may not be possible to make alternate arrangements for scheduled class activities.

## 6. Course Materials:

### Recommended Textbook:

Flowers, Theopold, Langley, and Robinson: *OpenStax Chemistry 2e* (2020)  
<https://openstax.org/details/books/chemistry-2e>

### Specific to this course:

- This course uses in-class discussions and group work. Use of a camera and microphone during Zoom sessions will be beneficial.
- Zoom - for attending lecture and office hours. Required for completing the Laboratory and Tutorial activities.
- Office 365 suite: (Available to students at no additional cost)
  - **OneNote** - for accessing notes and assignments.
  - **Excel** - full version: not iOS, Android, or web version - or equivalent software - for laboratory activities.
  - **Word** - or equivalent word processor for completing laboratory activities.
- **PDF viewer** (e.g. Acrobat Reader, Nitro Reader). Preview (on Mac) or in-browser reader is not sufficient.
- A **scanner or phone app** that can save documents/photos as PDF (e.g. OneDrive app).

### 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:

Midterm and final exams are "open-notes". Reference to your course notes, textbook (electronic or paper edition), and authorized online resources only will be allowed - use of all other websites, online or offline resources during these exams is prohibited. A detailed list of allowed resources will be posted to the course D2L at least one week prior to each exam. All exams are to be completed individually by the student submitting the exam. All sections will write the same examinations. The questions are based on input from all course instructors.

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

Exams include additional "buffer time" to allow for time to scan and submit required documents and to accommodate minor technological issues. All documents and quizzes must be uploaded, saved, and submitted **before the end of the posted exam time**. Any quiz attempts still in-progress at the end of the exam time will be manually submitted with whatever answers have been saved. In the event of a major technological issue that lasts longer than the allotted exam buffer time and prevents timely completion of the exam, contact the course coordinator ([amanda.musgrove@ucalgary.ca](mailto:amanda.musgrove@ucalgary.ca)) as soon as possible. An extended time or deferral of the grade across other course components may be possible.

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

- Any student with academic accommodations must be registered with Student Accessibility Services (see Section 12(e) below) and have reviewed their accommodations as described on the SAS documents with the course coordinator within the first 15 days of the semester or at least 10 business days before any scheduled activity for which accommodations are required. An email confirming mutual understanding of the accommodations will suffice.
- For exams requiring a length accommodation, the extra time will be calculated from the base time of the exam. For example, the midterm is a 60 min exam with 30 min "buffer", for a total of 90 min. A student with a 25% time accommodation would receive  $60 + (60 \times 25\%) + 30 = 105$  min as their adjusted length. This time will generally be added to the **start** of the exam time - i.e. starting the exam before the rest of the class - unless this results in a conflict with the student's registered class or exam schedule.

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 any student expects to have difficulty completing a synchronous activity during its scheduled timeslot, please contact the course coordinator, Dr. Amanda Musgrove ([amanda.musgrove@ucalgary.ca](mailto:amanda.musgrove@ucalgary.ca)) as soon as possible:

- For recurring course components, at minimum before **January 18th or within 2 days of registering in the course**, whichever is later.
- For exams or emergent situations during term, notice is required **minimum 10 business days** before the scheduled activity or exam date.

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 [www.ucalgary.ca/wellnesscentre](http://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 ([svsa@ucalgary.ca](mailto:svsa@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](mailto:ahugchem@ucalgary.ca) or phone [403-220-6908](tel: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 (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](mailto:suvpaca@ucalgary.ca). SU Faculty Rep., Phone: [403-220-3913](tel:403-220-3913) Email: [sciencerep@su.ucalgary.ca](mailto:sciencerep@su.ucalgary.ca). [Student Ombudsman](#), Email: [ombuds@ucalgary.ca](mailto: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. **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 new online labs in Fall 2020 may be significantly different from prior 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](mailto: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.

**Course Outcomes:**

- Identify factors that affect reaction rate, depict reaction rate with symbols, and explain rates at the molecular level
- Identify factors that affect reaction extent, depict reaction extent with symbols, and explain extent at the molecular level
- Recognize how different reactions behave for key examples of acids & bases, solubility, electrochemistry
- Connect atomic and chemical properties with the electronic structure of atoms, molecules, and ions and between these species
- Develop an appreciation for why these aspects of chemistry are important to engineers
- Apply good laboratory practice

Electronically Approved - Apr 06 2021 16:02

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**Department Approval**

Electronically Approved - Apr 06 2021 16:27

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**Associate Dean's Approval**