



COURSE OUTLINE

1. **Course:** CHEM 502A.1, Research In Chemistry - Fall 2023, Topic: Research In Chemistry I

Coordinator(s)

Name	Email	Phone	Office	Hours
Dr Chang-Chun Ling	ccling@ucalgary.ca	403 220-2768	SB 235	TBA
Dr Darren Derksen	dderksen@ucalgary.ca	403 220-2610	SB 233	Open door, drop in OR make an appointment
Dr George Shimizu	gshimizu@ucalgary.ca	403 220-5347	SB 403	TBA
Dr Gregory Welch	gregory.welch@ucalgary.ca	403 210-7603	EEEL 546	Monday 13:00
Dr Hans Osthoff	hosthoff@ucalgary.ca	403 220-8689	SB 205	W 12-1
Dr Jeffrey Van Humbeck	jeffrey.vanhumbec1@ucalgary.ca	220-3039	SB 229A	TBA
Dr Pierre Kennepohl	pierre.kennepohl@ucalgary.ca	TBA	SB 231	TBA
Dr Roland Roesler	roesler@ucalgary.ca	403 220-5366	SB 339	Mo 14:00 - 15:00; We 14:00 - 15:00.
Dr Simon Trudel	trudels@ucalgary.ca	403 210-7078	SB 417	TBA
Dr. Susana Kimura-Hara	s.kimurahara@ucalgary.ca	n/a	IN CLASS/OFFICE SB 333	Tu/Th 16:45-15:30
Dr. Todd Sutherland	todd.sutherland@ucalgary.ca		SB 220	TBA
Dr Yujun Shi	shiy@ucalgary.ca	403 210-8674	SB 301	TBA

Section(s)

Lab 01 :

Instructor	Email	Phone	Office	Hours
Dr Thomas Back	tgback@ucalgary.ca	403 220-6256	SB 217	TBA

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:

The course involves in-person laboratory work throughout the duration, as well as in-person oral presentations

Course Site:

D2L: CHEM 502A.1 B01-(Fall 2023)-Research In Chemistry

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

Course requirements

This is a 6-credit course to be completed in two consecutive semesters (Fall-Winter or Spring-Summer). Typically, students take this research course during their fourth year (in a 4-year degree) in the Chemistry Honours program and have completed the following chemistry courses: CHEM 201, 203, 311, 315, 351, 353, 371, 373, 471, 431, 433, 453, and BCEM 341, whilst maintaining a GPA of 3.30 (Honours requirement). The BSc Honours in Chemistry recommend course sequence is found [here](#). However, the course is also open to all CHEM majors by permission of the supervisor and department. Inter-department and/or inter-faculty applications are encouraged and will be considered on a case-by-case basis.

Time Commitment

Estimated time commitment is an average of 9 hours per week (on the project as a whole, which can include lab work, reading, writing, etc.), plus the time required to meet with the Supervisor(s) and/or group to discuss progress.

When completed in Fall-Winter semesters, September will primarily involve reading the literature and writing

your literature review and proposal. Active research should commence no later than mid-October. It is common for research experiments to continue over the December holiday break, particularly as the exam period in December often precludes carrying out much research. Whenever you are carrying out laboratory research work, be sure that someone else is present in your lab or in a nearby lab, in case of emergency or accident, and follow all lab safety protocols. Depending on the project, active research should slow down by March, at which point your primary focus should be writing the final report.

This is an Independent Study Project course with only occasional meetings (frequency TBD) on Wednesday's at 4pm. Students are expected to schedule the required amount of time to complete the course into their schedule. Regularly scheduled classes have precedence over any out-of-class activity; therefore, it is the responsibility of each student to coordinate their research work around their scheduled classes.

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):

Consent of the Department.

Note(s):

- a. It is recommended that students have completed the third year of their program in Chemistry, Applied Chemistry. MAY BE REPEATED FOR CREDIT

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
Literature review ¹	10%	Oct 13 2023		
Research Project Meeting ²	20%	Dec 20 2023		
Final written report ³	25%	Apr 09 2024		
Research work ⁴	25%	Apr 09 2024		
Final oral presentation ⁵	20%	Apr 23 2024		

¹ An approximately 10-page (typed, 12-point font, double-spaced with figures) summary that highlights the 'problem being addressed' via a critical assessment of published literature and the relevant research carried out on your topic of interest, as well as a section concerning your goals/objectives/hypotheses and how these relate to past work. In addition, a section that details the methods, approaches and/or techniques that you anticipate using during your research. A pdf of the review/proposal must be emailed to your Supervisor, Committee member and the Course Coordinator by the due date. The evaluation will be based on the following scheme: Background: 4; Objectives/goals/hypotheses: 4; Methods/approaches/techniques: 2.

² Must occur on or before the last day of exams, December 20th, 2023. In December, a meeting scheduled by you, must be held between with your supervisor, your committee member, and course coordinator (if schedule permits) to assess your progress during the first semester. A brief progress report must be given in the form of a 15-20 minute presentation. The format of the presentation can be either a 'chalk talk' style or 'PowerPoint' style, which should be determined in consultation with your supervisor. The presentation should include: the objectives of your project and description of what you have done and observed to date, and a brief description of the work you plan to carry out in the remaining months. Be prepared to discuss your work with your committee members. Assessment will be: Quality and quantity of results: 10; Presentation clarity: 5; Project discussion ability: 5.

³ A written report (email pdf) must be submitted to your supervisor, your committee member, and course coordinator by the last day of classes in the Winter session. The report must be in typed form (double spaced and appropriately indented) and all figures and tables must be clearly and carefully drafted. The report should be written in the style of a paper for a scientific journal in the appropriate discipline, but perhaps be somewhat more detailed. Your supervisor will provide details about the appropriate format you should follow. Common example templates can be accessed from either ACS or RSC publishing "instructions/guidelines for authors". Marks will be lost if it is handed in late (10%/day). Evaluation will be based on: Scholarly presentation: 5; Research results: 10; Interpretation, Discussion, and Appropriate conclusions: 10.

⁴ It is anticipated that your commitment to Chemistry 502 averages to about nine hours per week over the Fall and Winter terms. Students are graded in this component of Chemistry 502 by their supervisor based on the following scheme: time commitment, consistency of effort, safety, independence, initiative, creativity and other contributions to the project and their overall research skills out of 25.

⁵ The oral presentation must be scheduled prior to the final day of the Winter Session Final Examinations period at a time convenient for you and the members of your committee, including the course coordinator, and open to the department unless the work contains confidential information. It is critical that the date for your oral presentation be decided as soon as the winter 2023 final exam schedule is published. The 30-minute presentation will be followed by a discussion period, during which time the supervisory committee can ask about the project to a maximum time of 1 hour (includes presentation and questions). The presentation is to meet with current standards of professionalism, utilizing PowerPoint, or similar, presentation software. Students will be evaluated on the following scheme: Organization of material: 5; Clarity of the presentation: 5; Quality of slides: 5; Handling of questions and discussion: 5.

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 %	90 %	85 %	80%	75%	70 %	65 %	60%	55%	50 %	45 %

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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:**

In the event that a student legitimately fails to submit any online or in-person assessment on time (e.g. due to illness, domestic affliction, 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, or possible exemption and reweighing of components. Absences not reported within 48 hours will not be accommodated. Students may be asked to provide supporting documentation ([Section M.1](#)) for an excused absence, See [FAQ](#).

If an excused absence is approved, options for how the missed assessment is dealt with is at the discretion of the coordinator or course instructor. Some options such as an exemption and pro-rating among the components of the course may not be a viable option based on the design of this course.

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

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

6. **Course Materials:**

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:**

No aids are allowed on tests or examinations.

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

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

There are no mandatory or optional course supplemental fees for this course.

9. **Writing Across The Curriculum Statement:**

For all components of the course, in any written work, the quality of the student's writing (language, spelling, grammar, presentation etc.) can be a factor in the evaluation of the work. See also [Section E.2](#) of the University Calendar.

10. Human Studies Statement:

Students will not participate as subjects or researchers in human studies.

See also [Section E.5](#) of the University Calendar.

11. Reappraisal Of Grades:

A student wishing a reappraisal, should first attempt to review the graded work with the Course coordinator/instructor or department offering the course. Students with sufficient academic grounds may request a reappraisal. Non-academic grounds are not relevant for grade reappraisals. Students should be aware that the grade being reappraised may be raised, lowered or remain the same. See [Section I.3](#) of the University Calendar.

- a. **Term Work:** The student should present their rationale as effectively and as fully as possible to the Course coordinator/instructor within **ten business days** of either being notified about the mark, or of the item's return to the class. If the student is not satisfied with the outcome, the student shall submit the Reappraisal of Graded Term work form to the department in which the course is offered within 2 business days of receiving the decision from the instructor. The Department will arrange for a reappraisal of the work within the next ten business days. The reappraisal will only be considered if the student provides a detailed rationale that outlines where and for what reason an error is suspected. See sections [I.1](#) and [I.2](#) of the University Calendar
- b. **Final Exam:** The student shall submit the request to Enrolment Services. See [Section I.3](#) of the University Calendar.

12. Other Important Information For Students:

- a. **Mental Health** The University of Calgary recognizes the pivotal role that student mental health plays in physical health, social connectedness and academic success, and aspires to create a caring and supportive campus community where individuals can freely talk about mental health and receive supports when needed. We encourage you to explore the mental health resources available throughout the university community, such as counselling, self-help resources, peer support or skills-building available through the SU Wellness Centre (Room 370, MacEwan Student Centre, [Mental Health Services Website](#)) and the Campus Mental Health Strategy website ([Mental Health](#)).
- b. **SU Wellness Services:** For more information, see their [website](#) or call [403-210-9355](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) or phone at [403-220-2208](tel:403-220-2208). The complete University of Calgary policy on sexual violence can be viewed [here](#).
- d. **Student Ombuds Office:** A safe place for all students of the University of Calgary to discuss student related issues, interpersonal conflict, academic and non-academic concerns, and many other problems.
- e. **Student Union Information:** [SU contact](#), Email your SU Science Reps: science1@su.ucalgary.ca, science2@su.ucalgary.ca, science3@su.ucalgary.ca,
- f. **Academic Accommodation Policy:**

It is the student's responsibility to request academic accommodations according to the University policies and procedures listed below. The student accommodation policy can be found at: <https://www.ucalgary.ca/legal-services/sites/default/files/teams/1/Policies-Student-Accommodation-Policy.pdf>

Students needing an accommodation because of a disability or medical condition should communicate this need to Student Accessibility Services in accordance with the Procedure for Accommodations for Students with Disabilities: <https://www.ucalgary.ca/legal-services/sites/default/files/teams/1/Policies-Accommodation-for-Students-with-Disabilities-Procedure.pdf>.

Students needing an accommodation in relation to their coursework or to fulfil requirements for a graduate degree, based on a Protected Ground other than Disability, should communicate this need, by filling out the [Request for Academic Accommodation Form](#) and sending it to Associate Head, Undergraduate by email ahugchem@ucalgary.ca preferably 10 business days before the due date of an assessment or scheduled absence.

- g. **Misconduct:** Academic integrity is the foundation of the development and acquisition of knowledge and is based on values of honesty, trust, responsibility, and respect. We expect members of our community to act with integrity. Research integrity, ethics, and principles of conduct are key to academic integrity. Members of our campus community are required to abide by our institutional [Code of Conduct](#) and promote academic

integrity in upholding the University of Calgary's reputation of excellence. Some examples of academic misconduct include but are not limited to: posting course material to online platforms or file sharing without the course instructor's consent; submitting or presenting work as if it were the student's own work; submitting or presenting work in one course which has also been submitted in another course without the instructor's permission; borrowing experimental values from others without the instructor's approval; falsification/fabrication of experimental values in a report. Please read the following to inform yourself more on academic integrity:

[Student Handbook on Academic Integrity](#)
[Student Academic Misconduct Policy and Procedure](#)
[Faculty of Science Academic Misconduct Process](#)
[Research Integrity Policy](#)

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

- h. **Copyright of Course Materials:** All course materials (including those posted on the course D2L site, a course website, or used in any teaching activity such as (but not limited to) examinations, quizzes, assignments, laboratory manuals, lecture slides or lecture materials and other course notes) are protected by law. These materials are for the sole use of students registered in this course and must not be redistributed. Sharing these materials with anyone else would be a breach of the terms and conditions governing student access to D2L, as well as a violation of the copyright in these materials, and may be pursued as a case of student academic or [non-academic misconduct](#), in addition to any other remedies available at law.
- i. **Freedom of Information and Privacy:** This course is conducted in accordance with the Freedom of Information and Protection of Privacy Act (FOIPP). Students should identify themselves on all written work by placing their name on the front page and their ID number on each subsequent page. For more information, see [Legal Services](#) website.
- j. **Surveys:** At the University of Calgary, feedback through the Universal Student Ratings of Instruction ([USRI](#)) survey and the Faculty of Science Teaching Feedback form provides valuable information to help with evaluating instruction, enhancing learning and teaching, and selecting courses. Your responses make a difference - please participate in these surveys.

Course Outcomes:

- Propose a scientific question and frame the direction of research inquiry in the context of the relevant background and literature by writing a concise proposal.
- Perform research in accordance with appropriate professional norms, such as lab safety and applied relevant training.
- Search for scientific information using a wide range of library skills, properly documented those sources, read scientific papers and identify key concepts.
- Establish advanced time management skills required to plan and complete a research project.
- Perform original research in a specific field of chemistry at an advanced skill level.
- Analyze and interpret scientific results and then communicate to a broad chemistry audience the findings by writing a final thesis in a format appropriate for the specific area of study and delivering an oral or poster presentation.
- Develop an understanding of possible professional career paths including summer research jobs and graduate school, and practice appropriate skills to use for applications, interviews, and networking opportunities.

Approvals Pending