DALHOUSIE UNIVERSITY

**Faculty of Science Course Syllabus Dalhousie University**

**Honours & Major Research Project**
**Department of Chemistry**

**CHEM4902 and CHEM4903**
**Fall 2023 and Winter 2024**

*Dalhousie University acknowledges that we are in Mi'kma'ki, the ancestral and unceded territory of the Mi'kmaq People and pays respect to the Indigenous knowledges held by the Mi'kmaq People, and to the wisdom of their Elders past and present. The Mi'kmaq People signed Peace and Friendship Treaties with the Crown, and section 35 of the Constitution Act, 1982 recognizes and affirms Aboriginal and Treaty rights. We are all Treaty people.*

*Dalhousie University also acknowledges the histories, contributions, and legacies of African Nova Scotians, who have been here for over 400 years.*

**Course Coordinator:** Dr. Frances Cozens, Office: Chemistry room 410, Email: frances.cozens@dal.ca.

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The following pages constitute the syllabus for this combined course, CHEM4902 and CHEM4903. Both CHEM4902 and CHEM4903 will follow the contents of this syllabus. You can consider the syllabus to be a contract, which delineates responsibilities and expectations for both the students, the course coordinator and the individual supervisors. You should review the syllabus the first day of classes, refer to it as necessary throughout the term, and contact the course coordinator with any questions and/or concerns you may have. In order to complete CHEM4902 and CHEM4903 satisfactorily, a student must fulfil all the requirements as set down in this course syllabus.

**Course Description**

CHEM4902 and CHEM4903 are required for students in the latter stages of the Honours BSc programs and are elective for students in the Majors BSc program or combined Major BSc programs. Students carry out research projects under the supervision of a faculty member and submit reports and make oral presentations to the Department. The class is split into two terms with a grade of 'IP' being issued for the fall term. The class must be completed as CHEM4902 and CHEM4903 together for 6 credits. The final grade will be given for both terms at the end of the winter term. The fall term is worth 35% of the final mark and the winter term is worth 65% of the final mark. This is because of the slower progress associated with the fall term compared to the winter term in CHEM4902 and CHEM4903 and the more significant final thesis report at the end of the winter term. This class is currently run as a full year class that is split into two terms.

**Course structure**

Experiential learning involving independent research.

**Course Prerequisites**

PREREQUISITES: A minimum GPA of 3.0 is required for this course. Permission of class coordinator and agreement from a chemistry faculty member to carry out the role of supervisor or co-supervisor. Students unable to secure a supervisor will be unable to complete CHEM4902 and CHEM4903.

**Course Objectives/Learning Outcomes**

• Carry out original research in a topic in chemistry under the supervision of a chemistry faculty member.
• Develop the ability to carry out research activities through independent study and participate in the research activities associated with the chemistry project.
• Develop an understanding of a research-based working environment.
• Develop how to prepare and disseminate research results through both written and oral means.
• Communicate the research results through oral presentations and written reports.
• Develop the ability to reference the literature within a written report.
• Like in a conference all project students should be available to attend all student presentations at the end of the fall and winter terms, unless another Dalhousie academic conflict arises.
• All submitted material in this class must be independently created by the student to meet the learning outcomes of the class.

**Course Materials**

- Web of Science Citation Databases (Chemistry search; Dalhousie library)
  http://apps.webofknowledge.com/UA_GeneralSearch_input.do?product=UA&search_mode=GeneralSearch&SID=4CqG4ooiIR25p7YLkk2&preferencesSaved=

- Scifinder Scholar (chemistry search; Dalhousie library)
  https://scifinder.cas.org/scifinder/login

**WHMIS Training course**

All students who will be working in-person within the Department of Chemistry must complete a WHMIS training prior to entering the workplace.

**WHMIS**, or the Workplace Hazardous Materials Information System, is a global harmonized system used to classify and label hazards and regulate handling procedures within industry and academic fields, especially those in science. Regardless of your chosen field of study within science being familiar with WHMIS is a significant asset. As such, the Department of Chemistry requires ALL students participating in their laboratory programs to complete WHMIS 2015 training provided by the Environmental Health and Safety Office. This training course is provided through the Dalhousie College of Continuing Education. Upon completion of your WHMIS 2015 course you will receive a Letter of Completion (as a PDF document) via email from the College of Continuing Education (cceehs@dal.ca). Please email the course coordinator your completion date of your WHMIS training and your certificate when you receive it from CCE. Please ensure that you register and complete the WHMIS course well in advance of the letter submission deadline. After you have received your Letter of Completion, please upload the PDF document to the Brightspace site. Please note a WHMIS certificate is valid for three years.

NOTE: WHMIS training MUST be completed before doing any work in any laboratory at Dalhousie University. The deadline to complete WHMIS training for CHEM4902 students is **Friday, September 8**. If conducting work in-person and WHMIS training is not completed at this time you will no longer be eligible to continue in CHEM4902.

**Laboratory Safety Training course**

All third- and fourth-year students are also required to complete the Laboratory Safety Training course developed by the Environmental Health and Safety Office also provided through the Dalhousie College of Continuing Education.

This online course was designed for all students, staff and faculty at Dalhousie working in laboratories that can potentially be exposed to a variety of hazardous products and processes. It covers the major elements of laboratory safety giving you a strong general foundation to understand the risks associated with working in a laboratory.

According to the DCCE website, the course also addresses safe laboratory practices such as responsibilities; recognition and mitigation of laboratory hazards; working safely with chemicals; the use of engineering controls, administrative controls, and personal protective equipment; and emergency procedures. The deadline to complete the Laboratory Safety course for all CHEM4902 students is **Friday, September 15**.

Just like for the WHMIS Training course, you will receive a Letter of Completion (as a PDF document) via email from the College of Continuing Education (cceehs@dal.ca). After you have received your Letter of Completion, please upload the PDF document to the Brightspace site.

You can access these online courses (WHMIS Training and the Laboratory Safety Training) on the Environmental Health and Safety link here: https://dalu.sharepoint.com/sites/ehs/SitePages/chemical-safety.aspx

**In-Person Research**

All students working at Dalhousie must take care to work carefully, independently and safely at all times. Safety manuals are included in appendix A of the syllabus. Having a thorough understanding of any experiment is needed to conduct research in a safe and professional manner.

**ChatGPT and AI Writing Tools**

Intellectual integrity is vital to an academic community and for fair evaluation of your written reports and final thesis. All written work completed and/or submitted in this course must be your own, completed in accordance with the University's Guidelines on Academic Integrity. The use of generative artificial intelligence tools (genAI) or apps for written components in this course, including tools like ChatGPT and other AI writing or coding assistants, is prohibited. As such, students are not allowed to use advanced automated tools (artificial intelligence or machine learning tools such as ChatGPT or Dall-E 2) on written assessments in CHEM4902 and CHEM4903. Each student is expected to complete each written assessment without substantive assistance from others, including automated tools. Spelling and grammar checking is allowed in CHEM4902 and CHEM4903 and students are all encouraged to spell, and grammar check their reports prior to submission.

**Meetings**

Check-ins (times to be determined) with the research students and course coordinator will occasionally be arranged. Discussion of class content and organization will be discussed.

Weekly meetings should be arranged between the student and supervisor. Participation in the weekly supervisor/student meetings is required. It is the student's responsibility to set up and engage in the weekly meeting with their supervisor.

**Class Calendar**

Class calendars with the important dates for this course for the fall and winter terms have been posted to Brightspace.

## Course assessment and important due dates

**CHEM4902 Fall Grading Scheme:**

WHMIS training completed
*Due Friday, Sept. 8, at 11:59 pm*
Safety course completed
*Due Friday, Sept. 15, at 11:59 pm*
Research Proposal ..... 5%
*Due Monday, Sept. 25, at 11:59 pm*
Supervisor Evaluation 1 ..... 5%
*Distributed between Oct. 10-Oct. 13*
Fall Term Report ..... 10%
*Due Tuesday, Nov. 21, at 11:59 pm*
Oral Presentation & Defence ..... 10%
*The afternoon of Thursday, Nov. 30*
Supervisor Evaluation 2 ..... 5%
*Distributed between Nov. 27-Dec. 1*

**CHEM4903 Winter Grading Scheme:**

Winter Term Report ..... 35%
*Due Tuesday, March 26 at 11:59 pm*
Final Oral Presentation & Defence..... 20%
*The afternoon of Thursday, April 4*
Supervisor Evaluation 3 ..... 10%
*Distributed between Apr. 2 – Apr. 5*

The two oral presentations will be delivered in-person by the student to an audience made up of all members of the Department of Chemistry. All students must present their work in a public setting at the specified time of the oral presentations. All assessments in CHEM4902 and CHEM4903 are utilized for the final grade calculation.

All written components in this course must follow the guidelines provided in Appendix C: Written Reports, Oral Presentations and Their Evaluation. Failure to follow the written outlines provided in Appendix C will result in significant mark deductions.

**Conversion of numerical grades to Final Letter Grades follows the Dalhousie Common Grade Scale**

| | | | |
|---|---|---|---|
| **A+** (90-100) | **B+** (77-79.9) | **C+** (65-69.9) | **D** (50-54.9) |
| **A** (85-89.9) | **B** (73-76.9) | **C** (60-64.9) | **F** (<50) |
| **A-** (80-84.9) | **B-** (70-72.9) | **C-** (55-59.9) | |

**Course Policies**

**Emergencies**

If illness or a significant personal issue prevents you from participating in the oral presentations or otherwise meet a deadline in this class, please submit a student declaration of absence to the course coordinator as per the regulations in the University Calendar. Alternative due dates will be arranged. All components in CHEM4902 and CHEM4903 must be completed to receive letter grade. If appropriately document illness or other special circumstances occur and prevent the completion of the full year research class a grade of 'ILL" will be given for both CHEM4902 and CHEM4903.

**Feedback on Student Assessment**

In the fall term, students will be returned all written forms of assessment, following grading (normally within 3 weeks of submission). Grades for oral presentations will be communicated to the student normally within 3 weeks of their presentation day. This will take the form of an email prepared by the course coordinator and distributed to the student. In the winter term, assessments will be distributed only at the request of the student and will not be communicated unless requested in writing to the course coordinator.

**Student Participation in Oral Presentations**

Students should be available to attend all student presentations in-person at the end of the fall and winter terms, unless another Dalhousie academic conflict arises.

**Communication: Brightspace CHEM4902 and CHEM4903**

The course coordinator will convey relevant information on the course website, as well as by email. It is your responsibility to regularly consult the course website, as well as your Dalhousie email. The CHEM4902 Brightspace site will also be used for both CHEM4902 and CHEM4903 in a given academic year.

**Cancellations**

Weather-related closure of the University implies the cancellation of all courses including this one. Power disruptions may also impact submission of written assessment components, in which case the due date will be moved to next day to accommodate any power or storm-related issues. Power disruptions that compromise the oral presentations may result in the rescheduled dates which have been reserved during the examination period, as set by the Registrar's office.

**Laboratory Safety**

The Chemistry Department recognizes its responsibility to undertake teaching and research activities in a safe and environmentally responsible fashion. Responsibilities of the University, departmental chairs, laboratory supervisors, staff and students are defined in Dalhousie policy manuals made available by the Office of Environmental Health and Safety at http://safety.dal.ca. The Department of Chemistry has adopted additional safety policies, which are appended to this document and are found in Appendix A. The supervisor should review these policies with the student prior to commencing any work in the laboratory.

Recognizing the shared responsibility to uphold a safe working environment, the student should immediately alert the research supervisor, or the course coordinator, if any safety concerns should arise. A student should never conduct any research activity that they are not fully comfortable with performing. If this situation occurs contact your supervisor, course coordinator or departmental chair for further guidance.

**This syllabus has the following appendices which contain significant information regarding the running of CHEM4902 and CHEM4903. These documents have been posted to Brightspace.**

A. Dalhousie Chemistry Safety Policy and Chemical Laboratory Safety Manual
B. Intellectual Honesty
C. Written Reports, Oral Presentations and their Evaluation
D. Evaluation Forms:
    - Supervisor Evaluation Form
    - Research Proposal Evaluation Form
    - CHEM4902 Fall Term Report Evaluation Form
    - CHEM4903 Winter Term Report Evaluation Form

**Student Code of Conduct:** CHEM4902 and CHEM4903 are governed by the Dalhousie University's Student Code of Conduct and all provisions will apply. For more information on the student code of conduct click here: https://cdn.dal.ca/content/dam/dalhousie/pdf/dept/university_secretariat/policy-repository/Code%20of%20Student%20Conduct%20rev%20Sept%202021.pdf

**Mental Health Resources:** There are a variety of mental health resources and supports available for students at www.dal.ca/mentalhealth. If you wish to chat with a mental health professional, same-day counselling appointments are available at the Student Health and Wellness Centre on the 2nd floor of LeMarchant Place. Appointments can be made by calling 902-494-2171 or online at: www.dal.ca/studenthealth/bookonline

# University Policies and Statements

### Recognition of Mi'kmaq Territory

Dalhousie University would like to acknowledge that the University is on Traditional Mi'kmaq Territory. The Elders in Residence program provides students with access to First Nations elders for guidance, counsel, and support. Visit or e-mail the Indigenous Student Centre at 1321 Edward St or elders@dal.ca. Additional information regarding the Indigenous Student Centre can be found at: https://www.dal.ca/campus_life/communities/indigenous.html

### Internationalization

At Dalhousie, 'thinking and acting globally' enhances the quality and impact of education, supporting learning that is "interdisciplinary, cross-cultural, global in reach, and orientated toward solving problems that extend across national borders." Additional internationalization information can be found at: https://www.dal.ca/about-dal/internationalization.html

### Academic Integrity

At Dalhousie University, we are guided in all our work by the values of academic integrity: honesty, trust, fairness, responsibility, and respect. As a student, you are required to demonstrate these values in all the work you do. The University provides policies and procedures that every member of the university community is required to follow to ensure academic integrity. Additional academic integrity information can be found at: https://www.dal.ca/dept/university_secretariat/academic-integrity.html

### Accessibility

The Student Accessibility Centre is Dalhousie's centre of expertise for matters related to student accessibility and accommodation. If there are aspects of the design, instruction, and/or experiences within this course (online or in-person) that result in barriers to your inclusion, please contact the Student Accessibility Centre (https://www.dal.ca/campus_life/academic-support/accessibility.html) for all courses offered by Dalhousie with the exception of Truro. For courses offered by the Faculty of Agriculture, please contact the Student Success Centre in Truro (https://www.dal.ca/about-dal/agricultural-campus/student-success-centre.html)

### Conduct in the Classroom – Culture of Respect

Substantial and constructive dialogue on challenging issues is an important part of academic inquiry and exchange. It requires willingness to listen and tolerance of opposing points of view. Consideration of individual differences and alternative viewpoints is required of all class members, towards each other, towards instructors, and towards guest speakers. While expressions of differing perspectives are welcome and encouraged, the words and language used should remain within acceptable bounds of civility and respect.

**Diversity and Inclusion – Culture of Respect**

Every person at Dalhousie has a right to be respected and safe. We believe inclusiveness is fundamental to education. We stand for equality. Dalhousie is strengthened in our diversity. We are a respectful and inclusive community. We are committed to being a place where everyone feels welcome and supported, which is why our Strategic Direction prioritizes fostering a culture of diversity and inclusiveness (Strategic Priority 5.2). Additional diversity and inclusion information can be found at: http://www.dal.ca/cultureofrespect.html

**Student Code of Conduct**

Everyone at Dalhousie is expected to treat others with dignity and respect. The Code of Student Conduct allows Dalhousie to take disciplinary action if students don't follow this community expectation. When appropriate, violations of the code can be resolved in a reasonable and informal manner - perhaps through a restorative justice process. If an informal resolution can't be reached, or would be inappropriate, procedures exist for formal dispute resolution. The full Code of Student Conduct can be found at: https://www.dal.ca/dept/university_secretariat/policies/student-life/code-of-student-conduct.html

**Fair Dealing Policy**

The Dalhousie University Fair Dealing Policy provides guidance for the limited use of copyright protected material without the risk of infringement and without having to seek the permission of copyright owners. It is intended to provide a balance between the rights of creators and the rights of users at Dalhousie. Additional information regarding the Fair Dealing Policy can be found at: https://www.dal.ca/dept/university_secretariat/policies/academic/fair-dealing-policy-.html

**Originality Checking Software**

The course instructor may use Dalhousie's approved originality checking software and Google to check the originality of any work submitted for credit, in accordance with the Student Submission of Assignments and Use of Originality Checking Software Policy. Students are free, without penalty of grade, to choose an alternative method of attesting to the authenticity of their work and must inform the instructor no later than the last day to add/drop classes of their intent to choose an alternate method. Additional information regarding Originality Checking Software can be found at: https://www.dal.ca/dept/university_secretariat/policies/academic/student-submission-of-assignments-and-use-of-originality-checking-software-policy-.html

**Student Use of Course Materials**

Course materials are designed for use as part of this course at Dalhousie University and are the property of the instructor unless otherwise stated. Third party copyrighted materials (such as books, journal articles, music, videos, etc.) have either been licensed for use in this course or fall under an exception or limitation in Canadian Copyright law. Copying this course material for distribution (e.g. uploading to a commercial third-party website) may lead to a violation of Copyright law.

Faculty of Science

# Student Resources and Support

## University Policies and Programs

Important Dates in the Academic Year (including add/drop dates): http://www.dal.ca/academics/important_dates.html
Classroom Recording Protocol: https://www.dal.ca/dept/university_secretariat/policies/academic/classroom-recording-protocol.html
Dalhousie Grading Practices Policies: https://www.dal.ca/dept/university_secretariat/policies/academic/grading-practices-policy.html
Grade Appeal Process: https://www.dal.ca/campus_life/academic-support/grades-and-student-records/appealing-a-grade.html
Sexualized Violence Policy: https://www.dal.ca/dept/university_secretariat/policies/health-and-safety/sexualized-violence-policy.html
Scent-Free Program: https://www.dal.ca/dept/safety/programs-services/occupational-safety/scent-free.html

### Learning and Support Resources

General Academic Support – Advising (Halifax): https://www.dal.ca/campus_life/academic-support/advising.html
General Academic Support – Advising (Truro): https://www.dal.ca/about-dal/agricultural-campus/ssc/academic-support/advising.html
Student Health & Wellness Centre: https://www.dal.ca/campus_life/health-and-wellness.html
On Track (helps you transition into university, and supports you through your first year at Dalhousie and beyond): https://www.dal.ca/campus_life/academic-support/On-track.html
Indigenous Student Centre: https://www.dal.ca/campus_life/communities/indigenous.html
Indigenous Connection: https://www.dal.ca/about-dal/indigenous-connection.html
Elders-in-Residence (The Elders in Residence program provides students with access to First Nations elders for guidance, counsel, and support. Visit the office in the Indigenous Student Centre or contact the program at elders@dal.ca or 902-494-6803: https://cdn.dal.ca/content/dam/dalhousie/pdf/academics/UG/indigenous-studies/Elder-Protocol-July2018.pdf
Black Student Advising Centre: https://www.dal.ca/campus_life/communities/black-student-advising.html
International Centre: https://www.dal.ca/campus_life/international-centre.html
South House Sexual and Gender Resource Centre: https://southhousehalifax.ca/about/
LGBTQ2SIA+ Collaborative: https://www.dal.ca/dept/vpei/edia/education/community-specific-spaces/LGBTQ2SIA-collaborative.html
Dalhousie Libraries: http://libraries.dal.ca/
Copyright Office: https://libraries.dal.ca/services/copyright-office.html

Dalhousie Student Advocacy Services: https://www.dsu.ca/dsas?rq=student%20advocacy
Dalhousie Ombudsperson: https://www.dal.ca/campus_life/safety-respect/student-rights-and-responsibilities/where-to-get-help/ombudsperson.html
Human Rights and Equity Services: https://www.dal.ca/dept/hres.html
Writing Centre: https://www.dal.ca/campus_life/academic-support/writing-and-study-skills.html
Study Skills/Tutoring: http://www.dal.ca/campus_life/academic-support/study-skills-and-tutoring.html
Faculty of Science Advising Support: https://www.dal.ca/faculty/science/current-students/undergrad-students/degree-planning.html

**Safety**

Biosafety: http://www.dal.ca/dept/safety/programs-services/biosafety.html
Chemical Safety: https://www.dal.ca/dept/safety/programs-services/chemical-safety.html
Radiation Safety: http://www.dal.ca/dept/safety/programs-services/radiation-safety.html
Laser Safety: https://www.dal.ca/dept/safety/programs-services/radiation-safety/laser-safety.html