

**Faculty of Science Course Syllabus**  
**Department of Chemistry**  
**CHEM 3103**  
**Intermediate Inorganic Chemistry**  
**Fall 2022**

*Dalhousie University is located in Mi'kma'ki, the ancestral and unceded territory of the Mi'kmaq. We are all Treaty people.*

<b>Instructor(s):</b>	Dr. Laura Turculet (lectures) <a href="mailto:laura.turculet@dal.ca">laura.turculet@dal.ca</a>
	Dr. Travis Lundrigan (lab) <a href="mailto:travis.lundrigan@dal.ca">travis.lundrigan@dal.ca</a>
<b>Lectures:</b>	MWF 9:35 - 10:25 am (LSC C244)
<b>Laboratories:</b>	4 hours per week (CHEM 118P)
<b>Course delivery:</b>	In-person
<b>On-line Tools:</b>	*Lecture Brightspace Site* <i>CHEM3103 - Intermediate Inorganic Chem. (Sec 1) - 2022 Fall</i> *Laboratory Brightspace Site* <i>CHEM3103 Intermediate Inorganic Chemistry Lab - 2022 Fall</i> *Microsoft Teams* for software downloads visit <a href="https://libraries.dal.ca/help/software-downloads.html">https://libraries.dal.ca/help/software-downloads.html</a> for IT support visit <a href="https://libraries.dal.ca/help/it-help-desk.html">https://libraries.dal.ca/help/it-help-desk.html</a>
<b>Office Hours (LT):</b>	Tues, Thurs 4:00 - 5:00 pm (Online, MS Teams)
<b>Office Hours (MW):</b>	Wed, Fri 11:00 am - 12:00 pm (In-person, CHEM 112)

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### Course Description

Modern bonding theories are developed using symmetry concepts. These are applied to understanding the molecular structure, reactivity, and spectroscopic properties of inorganic compounds, including coordination (transition metal) compounds and organometallic complexes. The laboratory component will provide experience in the interpretation of spectroscopic data (IR, Raman, UV-Vis, NMR) for the characterization of structural and bonding features in transition metal complexes.

### Course Prerequisites

CHEM 2101.03 Introductory Inorganic Chemistry

### Course Objectives/Learning Outcomes

- Understand basic trends in structure and reactivity of transition metal and organometallic complexes
- Acquire a symmetry-based approach to understanding modern bonding models and spectroscopic properties
- Learn advanced synthetic procedures in the laboratory
- Through laboratory application, become familiar with some advanced characterization techniques for structure determination in solution and in the solid state (infrared and Raman spectroscopy, multinuclear magnetic resonance spectroscopy, magnetic susceptibility, visible spectroscopy)

- Obtain an introductory knowledge of the catalysis of organic reactions using organometallic complexes

### Course Materials

- Inorganic Chemistry, 5th Ed. Miessler, Fischer and Tarr, Pearson, 2014
- Chemistry 3103 Laboratory Manual, 2022 (Dalhousie Bookstore)
- Brightspace Site for lecture and lab (**Note separate pages for lecture and lab components**)

### Course Assessment

Component	Weight (% of final grade)	Date
<i>Laboratory</i> <sup>1</sup>	25	4 h per week, starting Sept. 14/16
<i>Tests</i> (in class)	15	Wed, Sept. 28
	15	Mon, Oct. 24
	15	Wed, Nov. 23
<i>Final exam</i> (3 hours)	30	<i>to be scheduled by Registrar</i>

<sup>1</sup>See Lab Manual for more details; for laboratory report due dates, see **CHEM 3103 Laboratory Schedule**, below

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

A+ (90-100)	B+ (77-79)	C+ (65-69)	D	(50-54)
A (85-89)	B (73-76)	C (60-64)	F	(<50)
A- (80-84)	B- (70-72)	C- (55-59)		

### Other Course Requirements

- **Online Safety Modules:** Chemicals and laboratory equipment can pose serious hazards if they are not treated with an appropriate amount of caution. As a chemistry student, part of your training involves understanding the hazards that are present within a chemistry laboratory and learning the measures that must be taken in order to maximize the safety for you and your peers. You are **REQUIRED** to complete **two online safety modules** (see lab manual for details). These courses will allow you to work safely in all of the third year chemistry labs. They must be completed according to the instructions and deadlines found in the lab manual in order to continue work in the labs.
- **WHMIS (Workplace Hazardous Materials Information System)**
- **Laboratory Safety 2022/2023 Course**

### Course Policies

**Class announcements:** The instructors will post announcements on the lecture/lab Brightspace sites when possible. However, anything stated or announced in lecture is considered to be common knowledge. If you want to be informed on all topics, come to lecture.

**Meeting with the instructors outside of office hours:** Please note that outside of office hours, meeting with the instructors is by appointment only. If you wish to set up a meeting (online), please email the instructor(s), clearly indicating the reason you wish to meet as well as your availability.

**Short-term absence policy:** As of January 1, 2018, the university has adopted a **new policy** regarding short-term absences, as detailed here : [https://www.dal.ca/dept/university\\_secretariat/policies/academic/missed-or-late-academic-requirements-due-to-student-absence.html](https://www.dal.ca/dept/university_secretariat/policies/academic/missed-or-late-academic-requirements-due-to-student-absence.html). In accordance with the new policy, students will no longer submit a sick note or medical certificate in case of a missed academic requirement due to **short-term absence** (defined as “absence of three (3) consecutive days or fewer due to minor physical or mental health conditions, or other extenuating circumstances such as caregiving duties; immediate family illness, injury or death; involvement in an accident; legal proceedings or being a victim of a crime, domestic or intimate partner violence”). Instead, they will:

- (1) notify the instructor by email within 24 h of the missed academic deadline or test
- (2) submit a **Student Declaration of Absence (SDA)** form on-line through the **CHEM3103 lab website** within three (3) calendar days following the last day of absence (NOTE: SDA forms for **both** lab and lecture academic requirements will be **submitted via the lab website**).

Students can use the SDA form **twice** in this course. The submission of the SDA form **does not provide an automatic exemption** from any academic requirements that were missed or late during an absence. Once the form is submitted, course policies will apply regarding procedures for making up the missed academic requirement (see below).

- **Missed term test:** If you miss a term test for any reason, **no make-up will be offered**. Once the SDA form is submitted, the instructor will transfer the points from the missed term test to the final exam.
- **Missed laboratory session:** You are expected to attend the laboratory sessions scheduled for the lab section in which you are registered (see below). Students cannot attend a different laboratory session unless prior arrangements have been made with the instructor. After submission of the SDA form for a short-term absence, it is at the discretion of the instructor as to whether or not the lab can be performed at another time. The **Laboratory Schedule** has space for the makeup of only one laboratory experiment.
- **Late submission of a graded laboratory report sheet:** For each weekday after the posted due date, 10% will be deducted. A submitted SDA form will excuse one day late past the last day of short-term absence (unless alternate arrangements are made with the instructor).

If you miss the **final exam** for any other reason, as per Dalhousie policy, the SDA form does not apply. You must contact Dr. Turculet by email ([laura.turculet@dal.ca](mailto:laura.turculet@dal.ca)) within 24 h of the missed exam for further instructions. Appropriate documentation (e.g., medical certificate indicating dates and duration of illness and a description of the impact it had on your ability to fulfill academic requirements) must be submitted to Dr. Turculet within three (3) calendar days of the missed final exam if you wish to write a make-up. If no appropriate notification and documentation for the absence is provided within the timeframe described above, no make-up will be allowed and you will earn a mark of "zero" for the missed exam component.

Please note that if you are more than 30 minutes late to write a test or exam, it will be considered a missed test/exam.

**Attending your lab section:** You are registered for one of the lab sections below. You must attend the lab section for which you have registered.

- Lab Sections:**    **Section B02** - Wednesday, 1:35-5:25 pm, CHEM 118P (1<sup>st</sup> lab Sept 14)  
                          **Section B01** - Friday, 1:35 - 5:25 pm, CHEM 118P (1<sup>st</sup> lab Sept 16)

**Registering for a different lab section:** Students can change laboratory sections online until 5pm, Friday September 9 (end of 1<sup>st</sup> week of classes).

**Attending a lab day other than the one you are registered for:** You are expected to attend the laboratory sessions scheduled for the lab section in which you are registered (see **Laboratory Schedule** below). Students cannot attend a different laboratory session unless prior arrangements have been made with the instructor at least a week in advance. In case of illness or other circumstances that affect your ability to attend lab, please consult the **Short-term absence policy** (above), and submit a **Student Declaration of Absence (SDA)** form through the lab website within (3) calendar days following the last day of absence. It is at the discretion of the instructor as to whether or not the lab can be performed at another time. The **Laboratory Schedule** has space for the makeup of only one laboratory experiment.

**Personal protective equipment in the laboratory:** No student will be allowed to work in the lab without approved safety glasses, closed toe shoes, and a properly fitting cotton lab coat (sleeves cannot be rolled up). Lab coats and glasses can be purchased in the Dalhousie Bookstore.

**Lab preparation:** For safety reasons, students are expected to come to the lab having completed adequate preparation in advance according to the guidelines stated in the laboratory manual. For this reason students will write a quiz at the beginning of each lab session. The instructor reserves the right to ask any student to leave the laboratory if they are deemed unprepared to conduct the lab in a safe and efficient manner. No make-up session will be provided in these cases.

**End of each lab day:** All labs end strictly at the times posted above. Organized students have ample time to complete experiments and perform clean-up in the allotted time. Students will receive a 10% deduction per minute late leaving lab.

**Laboratory exemptions:** If you have taken this course before, you may apply for a lab exemption. To do so, contact Dr. Lundrigan by email prior to the first day of lab (Sept. 14). Dr. Lundrigan will then seek documentation within the department proving that you passed the lab component previously. Lab exemptions are at the discretion of the instructor and must be applied for. The student should not assume that such an exemption will be granted without applying. Note that lab exemptions will not be granted for students who have not completed an in-person version of the CHEM 3103 laboratory.

**CHEM 3103 Course Content** (subject to modification)

<b>Week 1</b> (Sept 7-9)	<ul style="list-style-type: none"> <li>• Course Overview</li> <li>• Syllabus</li> <li>• Brief Introduction to Transition Metal Chemistry</li> <li>• <b>Start Topic 1: Introduction to Coordination Complexes – Ligands &amp; Structures</b> <b>Reading: Ch 9 but omit Section 9.3.6; Ch 6–Section 6.6 only; Ch 4 (MF&amp;T)</b> <ul style="list-style-type: none"> <li>○ What is a coordination complex?</li> <li>○ Ligands</li> </ul> </li> </ul>
<b>Week 2</b> (Sept 12-16)	<ul style="list-style-type: none"> <li>• Continue Topic 1: Introduction to Coordination Complexes – Ligands &amp; Structures <ul style="list-style-type: none"> <li>○ Ligands</li> <li>○ Hard and soft acids and bases</li> <li>○ Coordination numbers and structures</li> <li>○ Isomerism</li> </ul> </li> </ul>
<b>Week 3</b> (Sept 19-23)	<ul style="list-style-type: none"> <li>• Finish Topic 1: Introduction to Coordination Complexes – Ligands &amp; Structures <ul style="list-style-type: none"> <li>○ Symmetry and Point Groups</li> </ul> </li> </ul>
<b>Week 4</b> (Sept 26-30)	<ul style="list-style-type: none"> <li>• <b>Start Topic 2: Vibrational Spectroscopy</b> <b>Reading: Ch 4–Section 4.4.2 only; Ch13–Section 13.8.1 only (MF&amp;T)</b> <ul style="list-style-type: none"> <li>○ Introduction to Vibrational Spectroscopy</li> <li>○ Representations of Point Groups</li> <li>○ The Symmetry of Normal Vibrations</li> </ul> </li> </ul>
<b>Sept 28</b>	<b>Test 1 (in class)</b>
<b>Week 5</b> (Oct 3-7)	<ul style="list-style-type: none"> <li>• Finish Topic 2: Vibrational Spectroscopy <ul style="list-style-type: none"> <li>○ Stretching Mode Analysis</li> <li>○ Using Vibrational Spectroscopy to Determine Structures</li> </ul> </li> <li>• <b>Start Topic 3: Multinuclear NMR Spectroscopy</b> <b>Reading: provided on Brightspace</b> <ul style="list-style-type: none"> <li>○ NMR active nuclei</li> <li>○ Resonance frequencies and chemical shifts</li> <li>○ Intensities</li> <li>○ Spin-spin coupling</li> <li>○ Introduction to fluxionality</li> </ul> </li> </ul>
<b>Week 6</b> (Oct 10-14)	<ul style="list-style-type: none"> <li>• <b>Start Topic 4: Bonding in Coordination Complexes</b> <b>Reading: Ch 5; Ch 10–Sections 10.1-10.3.2, 10.3.4-10.3.5, 10.4.4-10.4.5, 10.5 (MF&amp;T)</b> <ul style="list-style-type: none"> <li>○ Introduction to Bonding Models</li> <li>○ Review of Molecular Orbital Theory for p-Block Molecules</li> <li>○ Building Up MO Diagrams for Transition Metal Complexes</li> </ul> </li> </ul>
<b>Week 7</b> (Oct 17-21)	<ul style="list-style-type: none"> <li>• Finish Topic 4: Bonding in Coordination Complexes <ul style="list-style-type: none"> <li>○ Ligand Field Considerations</li> <li>○ The Jahn-Teller Effect</li> <li>○ Magnetic Susceptibility</li> </ul> </li> </ul>
<b>Oct 24</b>	<b>Test 2 (in class)</b>
<b>Week 8</b> (Oct 24-28)	<ul style="list-style-type: none"> <li>• <b>Start Topic 5: Electronic Spectra of Coordination Complexes</b> <b>Reading: Ch 11 (MF&amp;T)</b> <ul style="list-style-type: none"> <li>○ Introduction to Electronic Spectra</li> <li>○ Quantum Numbers of Multielectron Atoms</li> </ul> </li> </ul>

	<ul style="list-style-type: none"> <li>○ Energy Level Diagrams</li> <li>○ Determining Delta-o from Spectra</li> <li>○ Electronic Spectra of Tetrahedral Complexes</li> <li>○ Jahn-Teller Effects</li> </ul>
<b>Week 9</b> (Oct 31-Nov 4)	<ul style="list-style-type: none"> <li>• Finish Topic 5: Electronic Spectra of Coordination Complexes               <ul style="list-style-type: none"> <li>○ Charge-Transfer Spectra</li> </ul> </li> <li>• <b>Start Topic 6: Ligand Substitution Reactions</b>  <b>Reading: Ch 12–Sections 12.1-12.4.3, 12.4.5, 12.6-12.7 (MF&amp;T)</b> <ul style="list-style-type: none"> <li>○ Introduction to Reaction Mechanisms</li> <li>○ Rate Laws &amp; Activation Parameters</li> <li>○ Ligand Substitution Reactions in Octahedral Complexes</li> </ul> </li> </ul>
<b>Week 10</b> (Nov 7-11)	<b>Fall Study Break</b>
<b>Week 11</b> (Nov 14-18)	<ul style="list-style-type: none"> <li>• Finish Topic 6: Ligand Substitution Reactions               <ul style="list-style-type: none"> <li>○ Ligand Substitution Reactions in Octahedral Complexes</li> <li>○ Ligand Substitution Reactions in Square Planar Complexes</li> </ul> </li> </ul>
<b>Week 12</b> (Nov 21-25)	<ul style="list-style-type: none"> <li>• <b>Start Topic 7: Organometallic Chemistry</b>  <b>Reading: Ch 13–Sections 13.1-13.5.2, 13.6.1-13.6.3, 13.7-13.8; Ch 14 (MF&amp;T)</b> <ul style="list-style-type: none"> <li>○ Introduction to Organometallic Chemistry</li> <li>○ Electron-counting for Organometallic Complexes</li> <li>○ Carbonyl Complexes</li> <li>○ Hydride Complexes</li> </ul> </li> </ul>
<b>Nov 23</b>	<b>Test 3 (in class)</b>
<b>Week 13</b> (Nov 28-Dec 2)	<ul style="list-style-type: none"> <li>• Continue Topic 7: Organometallic Chemistry               <ul style="list-style-type: none"> <li>○ Phosphine Complexes</li> <li>○ Complexes of Organic Pi-Systems</li> <li>○ Metal-Carbon Single, Double, and Triple Bonds</li> </ul> </li> </ul>
<b>Week 14</b> (Dec 5-7) Note that Tues Dec. 6 will follow a Monday schedule.	<ul style="list-style-type: none"> <li>• Finish Topic 7: Organometallic Chemistry               <ul style="list-style-type: none"> <li>○ Fundamental Reactions of Organometallic Chemistry</li> <li>○ Some Key Catalytic Processes</li> </ul> </li> </ul>
<b>Final Exam Period Dec. 9-20</b>	

**CHEM 3103 Laboratory Schedule (subject to modification)**

<b>Weekly Laboratory Schedule (any updates will be provided on Brightspace)</b>	
<b>Week 1</b> (Sept 7-9)	No labs – confirm your lab section and lab day
<b>Week 2</b> (Sept 14-16)	<ul style="list-style-type: none"> <li>Locker check-in and safety maps.</li> <li><b>Experiment 1:</b> Some Chemistry and Vibrational Spectroscopy of Molybdenum Carbonyl Complexes</li> </ul>
<b>Week 3</b> (Sept 21-23)	<b>Experiment 1:</b> continued
<b>Week 4</b> (Sept 28-30)	<b>No labs due to Truth and Reconciliation Day (Sept 30)</b>
<b>Week 5</b> (Oct 5-7)	<ul style="list-style-type: none"> <li><b>Experiment 2:</b> Complexes of <math>\pi</math>-Bonding Arene Ligands</li> <li>Pass in Experiment 1 Report Sheets during your lab session</li> </ul>
<b>Week 6</b> (Oct 12-14)	<ul style="list-style-type: none"> <li><b>Experiment 3:</b> Redox Chemistry of Cr(II)/Cr(III)</li> <li>Pass in Experiment 2 Report Sheets during your lab session</li> </ul>
<b>Week 7</b> (Oct. 19-21)	<ul style="list-style-type: none"> <li><b>Experiment 4:</b> Synthesis and Visible Spectra of Octahedral Cr(III) Complexes</li> <li>Pass in Experiment 3 Report Sheets during your lab session</li> </ul>
<b>Week 8</b> (Oct 26-28)	<ul style="list-style-type: none"> <li><b>Experiment 4:</b> continued</li> </ul>
<b>Week 9</b> (Nov 2-4)	<ul style="list-style-type: none"> <li><b>Experiment 5:</b> Geometric Variability of Four-Coordinate Ni(II) Complexes</li> <li>Pass in Experiment 4 Report Sheets during your lab session</li> </ul>
<b>Week 10</b> (Nov 9-11)	<b>No labs (study week)</b>
<b>Week 11</b> (Nov 16-18)	<b>Experiment 5:</b> continued (magnetic susceptibility, UV/vis)
<b>Week 12</b> (Nov 23-25)	<ul style="list-style-type: none"> <li><b>Experiment 6:</b> Synthesis and Spectroscopic Characterization of Some Complexes of Ruthenium</li> <li>Pass in Experiment 5 Report Sheets during your lab session</li> <li>Locker check-out (unless you are doing a make-up lab)</li> </ul>
<b>Week 13</b> (Nov 30 – Dec 2)	<ul style="list-style-type: none"> <li><b>Make-up Lab</b></li> <li>Everyone to pass in Experiment 6 Report Sheets by 5pm (place in drop box outside the lab door)</li> <li>Locker Check-out</li> </ul>
<b>Week 14</b> (Dec 6)	<b>Make-up lab Report Sheets due</b> 5pm Tuesday Dec 6 (place in drop box outside lab door)

**Laboratory Grading Scheme**

See page 3 of the Lab Manual for more details. Below is a breakdown of point values, totaling 566 points. The points earned out of 566 will be converted to a percentage of your total grade for the course as stated in the syllabus. Explanations for each row category are given below the table.

<b>Component</b>	<b>Points Earned</b>
Laboratory Notebook (10 pts per experiment)	60
Lab Quiz (10 pts per experiment)	60
Samples (10 pts per experiment)	60
Laboratory Report Sheets:	
Experiment 1	81
Experiment 2	48
Experiment 3	42
Experiment 4	52
Experiment 5	99
Experiment 6	64
<b>Total</b>	<b>566</b>

## University Policies and Statements

**This course is governed by the academic rules and regulations set forth in the University Calendar and by Senate**

### **Academic Integrity**

At Dalhousie University, we are guided in all of our work by the values of academic integrity: honesty, trust, fairness, responsibility and respect (The Center for Academic Integrity, Duke University, 1999). As a student, you are required to demonstrate these values in all of 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.

**Information:** [https://www.dal.ca/dept/university\\_secretariat/academic-integrity.html](https://www.dal.ca/dept/university_secretariat/academic-integrity.html)

### **Accessibility**

The Advising and Access Services Centre is Dalhousie's centre of expertise for student accessibility and accommodation. The advising team works with students who request accommodation as a result of a disability, religious obligation, or any barrier related to any other characteristic protected under Human Rights legislation (Canada and Nova Scotia).

**Information:** [https://www.dal.ca/campus\\_life/academic-support/accessibility.html](https://www.dal.ca/campus_life/academic-support/accessibility.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.

**Code:** [https://www.dal.ca/dept/university\\_secretariat/policies/student-life/code-of-student-conduct.html](https://www.dal.ca/dept/university_secretariat/policies/student-life/code-of-student-conduct.html)

### **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

**Statement:** <http://www.dal.ca/cultureofrespect.html>

### **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 (1321 Edward St) ([elders@dal.ca](mailto:elders@dal.ca)).

**Information:** [https://www.dal.ca/campus\\_life/communities/indigenous.html](https://www.dal.ca/campus_life/communities/indigenous.html)

**Important Dates** in the Academic Year (including add/drop dates)

[https://www.dal.ca/academics/important\\_dates.html](https://www.dal.ca/academics/important_dates.html)

### **University Grading Practices**

[https://www.dal.ca/dept/university\\_secretariat/policies/academic/grading-practices-policy.html](https://www.dal.ca/dept/university_secretariat/policies/academic/grading-practices-policy.html)

## Student Resources and Support

### Advising

**General Advising:** [https://www.dal.ca/campus\\_life/academic-support/advising.html](https://www.dal.ca/campus_life/academic-support/advising.html)

**Science Program Advisors:** <https://www.dal.ca/faculty/science/current-students/academic-advising.html>

**Indigenous Student Centre:** [https://www.dal.ca/campus\\_life/communities/indigenous.html](https://www.dal.ca/campus_life/communities/indigenous.html)

**Black Advising Centre:** [https://www.dal.ca/campus\\_life/communities/black-student-advising.html](https://www.dal.ca/campus_life/communities/black-student-advising.html)

**International Centre:** [https://www.dal.ca/campus\\_life/international-centre/current-students.html](https://www.dal.ca/campus_life/international-centre/current-students.html)

### Academic supports

**Library:** <https://libraries.dal.ca/>

**Writing Centre:** [https://www.dal.ca/campus\\_life/academic-support/writing-and-study-skills.html](https://www.dal.ca/campus_life/academic-support/writing-and-study-skills.html)

**Studying for Success:** [https://www.dal.ca/campus\\_life/academic-support/study-skills-and-tutoring.html](https://www.dal.ca/campus_life/academic-support/study-skills-and-tutoring.html)

**Copyright Office:** <https://libraries.dal.ca/services/copyright-office.html>

**Fair Dealing Guidelines:** <https://libraries.dal.ca/services/copyright-office/fair-dealing.html>

### Other supports and services

**Student Health & Wellness Centre:** [https://www.dal.ca/campus\\_life/health-and-wellness/services-support/student-health-and-wellness.html](https://www.dal.ca/campus_life/health-and-wellness/services-support/student-health-and-wellness.html)

**Student Advocacy:** <https://dsu.ca/dsas>

**Ombudsperson:** [https://www.dal.ca/campus\\_life/safety-respect/student-rights-and-responsibilities/where-to-get-help/ombudsperson.html](https://www.dal.ca/campus_life/safety-respect/student-rights-and-responsibilities/where-to-get-help/ombudsperson.html)

### Safety

**Biosafety:** <https://www.dal.ca/dept/safety/programs-services/biosafety.html>

**Chemical Safety:** <https://www.dal.ca/dept/safety/programs-services/chemical-safety.html>

**Radiation Safety:** <https://www.dal.ca/dept/safety/programs-services/radiation-safety.html>

**Scent-Free Program:** <https://www.dal.ca/dept/safety/programs-services/occupational-safety/scent-free.html>

**Dalhousie COVID-19 information and updates:** <https://www.dal.ca/covid-19-information-and-updates.html>