

Faculty of Science Course Syllabus
Department of Chemistry**CHEM 1012/1022 - Concepts in Chemistry: Energy and Equilibrium**

Welcome to Chemistry 1012/1022! As this course has a high enrollment (over 1000 students per term!) and is taught by several instructors and a team of teaching assistants we have put together a comprehensive course syllabus that will address any question you may have throughout the term. A course syllabus is meant to act as a guide, but also serves as a contract between you and your instructors, for you to set your expectations of the course and prepare yourself accordingly for the semester. Just as our course enrollment is quite large and diverse, so is our syllabus: therefore, please make use of the following table of contents (with links) when navigating the course syllabus and reviewing the course due dates and policies. We hope you have an enjoyable experience in First Year Chemistry and look forward to having a productive semester.

Table of Contents (TOC)

Who to Contact? First Year Chemistry Coordinators	3
First Year Chemistry Lecturers	3
Required Materials for Lecture	4
Important Academic Dates	5
Lecture Schedule	6
Course Assessment	7
Dalhousie Common Grading Scheme	7
WHMIS Safety Course	8
Lecture CAPA	8
<i>Syllabus Module</i>	9
<i>Homework Folders</i>	9
<i>Assignments</i>	9
In-Class Quizzes	10
<i>Dates and Content</i>	10
<i>In-Class Quiz Procedure</i>	10
<i>Allowed Materials for In-Class Quizzes</i>	10
<i>Missed In-Class Quiz Policy</i>	10
Midterm Examinations	11
<i>Dates, Content and Location</i>	11
<i>Midterm Examination Procedure</i>	11
<i>Allowed Materials for Midterm Examinations</i>	12
<i>Midterm Examination Conflict Policy</i>	12
<i>Missed Midterm Examination Policy</i>	12
<i>Midterm Examination Cancellation Policy</i>	12
Final Examination	13
<i>Date, Content and Location</i>	13
<i>Final Examination Procedure</i>	13
<i>Allowed Materials for Final Examinations</i>	13
<i>Final Examination Conflict Policy</i>	13
<i>Missed Final Examination Policy</i>	14
<i>Final Examination Cancellation Policy</i>	14

Laboratory Information	14
First Year Chemistry Laboratory Instructors	15
Required Materials for Lab	16
Laboratory Format, Expectations and Policies	17
<i>Before Your Experiment</i>	17
<i>During Your Experiment</i>	17
<i>After Your Experiment</i>	17
Laboratory Schedule	18
Multiple Modes of Completion for Experiment 14	18
Laboratory Assessment	19
<i>Laboratory Pre-Lab and Post-Lab Grading Scheme</i>	19
Laboratory CAPA	19
<i>Safety Module</i>	19
<i>Pre-Lab Assignments</i>	20
<i>Preparedness</i>	20
Post-Lab Reports	20
<i>Time Management</i>	21
Missed Labs and Make-up Experiments	21
<i>Final Dates for Make-up Experiments and Late Work Submissions</i>	22
<i>Lab Cancellation Policy</i>	22
Laboratory Exemptions	22
Student Resources for First Year Chemistry	23
<i>Brightspace Course Sites</i>	23
<i>Resource Centre and Concept Room</i>	23
<i>The Concept Room and Chemistry Resource Centre Schedule</i>	23
<i>The Concept Room Staff</i>	23
<i>Topic Workshops</i>	24
<i>Studying for Success Workshops</i>	24
<i>Midterm and Final Examination Review Sessions</i>	25
Academic Integrity in First Year Chemistry	25
Course Overview	26
<i>Course Description</i>	26
<i>Course Objectives and Goals</i>	26
<i>Course Learning Outcomes</i>	26
<i>Course Content</i>	27
University Policies and Statements	30
<i>Accessibility</i>	30
<i>Academic Integrity</i>	30
<i>Student Code of Conduct</i>	30
<i>Diversity and Inclusion</i>	30
<i>Recognition of Mi'kmaq Territory</i>	30
Student Resources and Support	31
<i>Advising</i>	31
<i>Academic Supports</i>	31
<i>Other Supports and Services</i>	31
<i>Safety</i>	31
<i>Scent-Free Program</i>	31

Who to Contact? First Year Chemistry Coordinators

If you have questions about Chem 1012/1022 please do not hesitate to contact one of the First Year Chemistry Coordinators. The best way to contact the First Year Chemistry Coordinators is by **email**. When emailing a course coordinator, please use your **Dalhousie email account** for all course correspondence. Please allow up to **3 business days** for a response and note that emails sent in the evening or on weekends may not be seen until the next business day.

For inquiries about the **Laboratory** portion of the course, please contact:

Dr. Jennifer MacDonald
First Year Chemistry Lab Coordinator



Email: chemlab@dal.ca

Phone: 902-494-2440

Office: Chemistry 108

For **all other inquiries** regarding the course, please contact:

Dr. Angela Crane
First Year Chemistry Course Coordinator



Email: chemlect@dal.ca

Phone: 902-494-6143

Office: Chemistry 1052

First Year Chemistry Lecturers

Please note that differing sections have differing lecturers. Please refer to the sections written on the right to determine who your lecturer is.

Dr. Angela Crane



Section: Chem 1012-01

Time: 9:35 am – 10:25 am

Location: Ondaatje Auditorium, McCain Building

Section: Chem 1012-02

Time: 10:35 am – 11:25 am

Location: Ondaatje Auditorium, McCain Building

Dr. Mita Dasog



Section: Chem 1022-02

Time: 10:35 am – 11:25 am

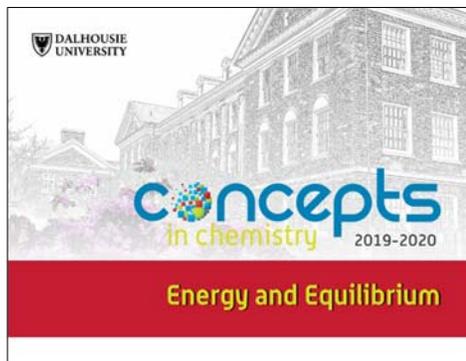
Location: Scotiabank Auditorium, McCain Building

Section: Chem 1022-01

Time: 11:35 am – 12:25 pm

Location: Scotiabank Auditorium, McCain Building

Required Materials for Lecture



Course Book

Concepts in Chemistry:
Energy and Equilibrium (2019–20 Ed.)

Available at the Dalhousie Bookstore (\$81.13 + tax)

This course book serves as both a custom textbook and workbook for the course, therefore it is important to have a new book that has not been already annotated with notes.

It is **STRONGLY RECOMMENDED** that you bring your textbook to class with you.



CASIO fx-991ES PLUS C

Non-programmable Calculator

Only 2 calculators are permitted in Chem 1012/1022.

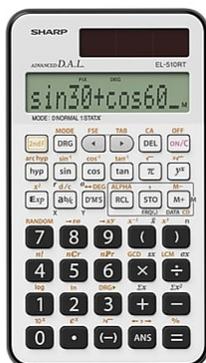
It is required that students registered in engineering and physics have the **CASIO fx-991ES PLUS C**.

It is required that all other science students have the a **SHARP EL-510 series calculator** (the current model is the SHARP EL-510RTB, but older models such as the SHARP EL-510RNB will be accepted).

Both calculators are available at the Dalhousie Bookstore:

CASIO fx-991ES PLUS C (\$24.95 + tax)

SHARP EL-510RTB (\$15.95 + tax)



SHARP EL-510RTB

Important Academic Dates

Several important academic dates are set by Dalhousie University that are important for students to be aware of. A summary of this semester's dates is found below.

Monday, January 6, 2020	First day of classes
Friday, January 17, 2020	Last day to add/drop winter term courses
Friday, January 31, 2020	Last day to drop winter term courses <i>without a W</i>
Friday, February 7, 2020	Munro Day: <i>University Closed</i>
Monday, February 17, 2020	NS Heritage Day: <i>University Closed</i>
Tuesday, February 18, 2020 to Friday, February 21, 2020	Winter Study Break: <i>No classes, University open</i>
Monday, March 9, 2020	Last day to drop winter term courses <i>with a W</i>
Monday, April 6, 2020	Last day of classes: <i>Follows the Friday class schedule</i>
Wednesday, April 8, 2020 to Friday, April 24, 2020	Exam Period: <i>Do not book travel until after your exam schedule has been released and confirmed</i>
Friday, April 10, 2020	Good Friday: <i>University Closed</i>

For a more detailed list of Important Academic Dates in the Academic Year, please refer to:
https://www.dal.ca/academics/important_dates.html

Lecture Schedule

The topic schedule for lectures is tentative. Every effort to remain on schedule will be made, however there may be some fluctuation.

Day of the week	Date	Topic(s) Covered
Monday	Jan. 6	Introduction and Syllabus Overview
Wednesday	Jan. 8	Review of Self-Study B2: Gases
Friday	Jan. 10	Topic 14: Chemical Equilibria
Monday	Jan. 13	
Wednesday	Jan. 15	
Friday	Jan. 17	Topic 15: First Law of Thermodynamics
Monday	Jan. 20	
Wednesday	Jan. 22	
Friday	Jan. 24	
Monday	Jan. 27	Topic 16: Hess' Law
Wednesday	Jan. 29	
Friday	Jan. 31	Topic 17: Defining the Second Law of Thermodynamics: Entropy
Monday	Feb. 3	
Wednesday	Feb. 5	Topic 18: Gibb's Energy
Friday	Feb. 7	<i>No Classes</i>
Monday	Feb. 10	Topic 18: Gibbs Energy
Wednesday	Feb. 12	Topic 19: Phase Equilibria and Partitioning of Compounds
Friday	Feb. 14	
Monday	Feb. 17	
Wednesday	Feb. 19	<i>No Classes</i>
Friday	Feb. 21	Review of Self-Study B3: Reduction-Oxidation (Redox) Reactions
Monday	Feb. 24	
Wednesday	Feb. 26	Topic 20: Electrochemistry
Friday	Feb. 28	
Monday	Mar. 2	
Wednesday	Mar. 4	Topic 21: Alkanes, Cycloalkanes and Functional Groups
Friday	Mar. 6	
Monday	Mar. 9	
Wednesday	Mar. 11	
Friday	Mar. 13	Topic 22: Spectroscopy
Monday	Mar. 16	Topic 23: Introduction to Chemical Reactions
Wednesday	Mar. 18	
Friday	Mar. 20	
Monday	Mar. 23	Topic 24: Rates of Chemical Reactions
Wednesday	Mar. 25	
Friday	Mar. 27	Topic 25: Reaction Mechanisms
Monday	Mar. 30	
Wednesday	Apr. 1	
Friday	Apr. 3	Topic 26: Polymers
Monday	Apr. 6	Wrap-up and Review

Course Assessment

Grading Scheme		Important Notes
Component	Weight	
WHMIS Safety Course	3%	1. In order to obtain a passing grade in Chem 1012/1022, you must meet all of the following criteria: <ul style="list-style-type: none"> • Obtain at least a grade of 40/80 on the lecture component of the course. (<i>Syllabus Module and WHMIS Course Excluded</i>) • Obtain at least a grade of 7.5/15 on the laboratory component of the course. (<i>Safety Module Excluded</i>) • Obtain at least a total combined grade of 50/100. Students who do not meet these criteria will not receive a passing grade in Chem 1012/1022. 2. No additional assessments (extra credit assignments or supplementary exam retakes) will be given. Final grades will be calculated based on the assessments laid out in this syllabus only. 3. Under emergency circumstances that have a serious impact on the delivery of this class, there may be a need to alter the syllabus.
Lecture CAPA	6%	
In-class quizzes	5%	
Midterm Examinations	30%	
Final Examination	40%	
Laboratory	16%	
Total	100%	

Dalhousie Common Grading Scheme

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)	

Grade	Definition
A+ A A-	Excellent: Considerable evidence of original thinking; demonstrated outstanding capacity to analyze and synthesize; outstanding grasp of subject matter; evidence of extensive knowledge base.
B+ B B-	Good: Evidence of grasp of subject matter, some evidence of critical capacity and analytical ability; reasonable understanding of relevant issues; evidence of familiarity with the literature
C+ C C-	Satisfactory: Evidence of some understanding of the subject matter; ability to develop solutions to simple problems; benefitting from his/her university experience.
D	Marginal Pass: Evidence of minimally acceptable familiarity with subject matter, critical and analytical skills (except in programs where a minimum grade of 'C' is required).
F	Inadequate: Insufficient evidence of understanding of the subject matter; weakness in critical and analytical skills; limited or irrelevant use of the literature.

For more information about Dalhousie University's Grading Practices, please refer to:

https://www.dal.ca/dept/university_secretariat/policies/academic/grading-practices-policy.html

WHMIS Safety Course

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 and engineering. Regardless of your chosen field of study within science and engineering beyond first year, being familiar with WHMIS is a significant asset. As such, it is required that **ALL students in first year chemistry** enrol in and complete the Dalhousie University WHMIS Safety course provided by the Dalhousie Environmental Health and Safety Office offered through the College of Continuing Education. As this course is substantial in nature, **completion of the course will be worth 3% of your final grade**. Instructions for how to register for the course **Lab Brightspace Site under the content area "Required Safety Training."** Please ensure that you register and complete the WHMIS course well in advance of deadline (**February 23, 2020 at 11:30 pm**). WHMIS Course completions will be verified with the College of Continuing Education by the First Year Chemistry Team. Students that have completed the WHMIS course in the Fall 2019 term will have their WHMIS grade transferred to the Chem 1012/1022 course.

NOTE: Please ensure that you retain a copy of your WHMIS letter of completion for your records. If you take any further chemistry courses at Dalhousie or work in a chemistry research lab, you will be required to provide your proof of WHMIS training.

In addition, some content from the WHMIS course will be tested on the 1st Midterm examination and the Final examination. More information about what material will be covered on the midterm/final exam will be announced in class and on the Lecture Brightspace Site.

Lecture CAPA

All lecture assignments will be hosted on the online learning platform, CAPA, which can be accessed by going to <https://capa2.its.dal.ca/>. Please use the following instructions when logging into CAPA for the first time:

1. Go to <https://capa2.its.dal.ca/> and click "Forgot password?"
2. Input your LON-CAPA username (your NetID using **lowercase** letters, example: aa123456) and your Dalhousie e-mail address in LON-CAPA (your NetID@dal.ca, example: aa123456@dal.ca) and press "Proceed".
3. Check your Dalhousie e-mail. An email will be sent from LON-CAPA helpdesk containing a password reset link. Click this link.
4. Once again, input your LON-CAPA username (NetID, lowercase), your Dalhousie e-mail address (NetID@dal.ca) and set/confirm a password and click "Save".
5. You will get a confirmation page and email for the reset of your password. Next click "Go to the login page".
6. From now on you will be able to login as normal with your LON-CAPA username (NetID, lowercase) and the password you created.
7. If you have issues logging into CAPA please email help@conceptsinchemistry.ca

If you are having trouble with the CAPA assignments, please visit the *Concept* Room or Chemistry Resource Centre. More information about these resources can be found on pages 23 of the syllabus.

Syllabus Module

The syllabus module is a short assignment designed to help you become familiar with the course syllabus and course policies. The syllabus module **must be fully completed by 11:30 pm on Monday, January 20**. Completion of the syllabus module (receiving a grade of 43/45) by this date is **worth 1% of the final grade**. Each student will have 99 tries per question to achieve this grade. Any syllabus modules completed after the due date will not be graded, and partially complete syllabus modules will receive a grade of zero (0).

“Student Declaration of Absence” forms cannot be applied to the syllabus module, as the module is open and available to students for more than 3 days.

Homework Folders

For each topic covered in the Concepts in Chemistry textbook, additional homework problems have been posted on CAPA. These questions are ranging in difficulty and are meant to be used as a tool for preparing students for midterms and exams. Students are required to complete a **minimum of 50% of the homework questions on CAPA** (receiving a minimum grade of 166/332 in CAPA for the homework folders) throughout the term **worth 1% of the final grade**. Each student will have 99 tries per question to achieve this grade. All homework to be graded must be completed by **11:30 pm on Monday, April 6**.

“Student Declaration of Absence” forms cannot be applied to the course homework, as the homework is an ongoing full-term activity.

Assignments

There are 4 online assignments each consisting of exam-like questions. Each assignment is **worth 1%** of the final grade and the content of each assignment is listed in the table below. All assignments are open for completion effective Monday, January 6 at the latest.

You will be given **13 tries at each question**. The first 3 tries will be for full marks. For each subsequent try, 10% of the questions points value will be deducted.

“Student Declaration of Absence” forms cannot be applied to the assignments, as the assignments are open and available to students for more than 3 days.

All CAPA assignments are due **11:30 pm** on the dates listed in the following table.

Assignment	Due Date	Content
Review	Fri., Jan. 17	Self-Study B1
Pre-Midterm 1	Fri., Jan. 17	Self-Study B2 & Topic 14 & WHMIS
Pre-Midterm 2	Fri., Feb. 14	Topics 15 – 18
Pre-Final Exam	Mon., Apr. 6	Self-Study B3 & Topics 19 – 26

In-Class Quizzes

Dates and Content

There are 7 in-class quizzes, based on the material learned in the previous lectures. In-class quizzes will occur at the beginning of lecture on the quiz dates. Please arrive on time to lecture on those dates as no extra time, or make-up quizzes will be given. Students must attend their registered section on quiz days, unless pre-arrangements have been made with the First Year Chemistry Coordinator.

Your final grade will be based on the **best 5 out of 7 quizzes**.

Quiz #	Quiz Date	Quiz Content	Quiz #	Quiz Date	Quiz Content
1	Fri., Jan. 17	Self-Study B2 & Topic 14	5	Fri., Mar. 20	Topics 21, 22 and 23
2	Fri., Jan. 31	Topics 15	6	Fri., Mar. 27	Topic 24
3	Fri., Feb. 14	Topics 16, 17 and 18	7	Mon., Apr. 6	Topics 25 and 26
4	Fri., Mar. 6	Self-Study B3 & Topics 19 and 20			

In-Class Quiz Procedure

Each quiz will contain exam-like questions and there will be multiple versions of each quiz. Our in-class quizzes will be graded based on a bubble answer page. All answers must be bubbled in on the answer page within the allotted time for the in-class quiz, no extra time for bubbling is given. **Only those answers submitted on the bubble page will be graded.**

Each quiz will last 15 minutes and are in the form of a think-pair-share. In the first 10 minutes, students will work on the quiz individually and independently, simulating an exam-like environment. At the 10-minute mark, students will use the remaining 5 minutes to discuss the quiz questions with their neighbours before submitting one quiz per student at the end of the 15 minutes.

At the 15-minute mark, students will be asked to “stop writing and hand you quiz to the nearest aisle.” If the quizzes have not made it to the end of an aisle when the invigilator is there to pick it up, the quiz will be **considered late work and will receive a grade of 0.**

Allowed Materials for In-Class Quizzes

All constants, equations and a periodic table will be provided to you when writing each in-class quiz. A copy of this Data Sheet will be available on Brightspace at the beginning of term.

You will be allowed to bring the following items into an in-class quiz.

- *Dark Pen (blue or black ink) or dark pencil.*
- *An approved non-programmable calculator (SHARP EL-510 series/CASIO fx-991ES PLUS C).*

NO additional resources are permitted in the in-class quizzes.

Missed In-Class Quiz Policy

There are no make-up quizzes or extra time given for students who arrive late for the quiz. “Student Declaration of Absence” forms cannot be applied to a quiz, as two (2) quizzes are already being dropped.

Midterm Examinations

Dates, Content and Location

The Chem 1012/1022 Midterm Examinations will occur on:

Midterm Exam 1:

Wednesday, January 22, 2020, 6:00 – 8:15 pm (covers Self-Study B2 and Topic 14 and WHMIS)

Midterm Exam 2:

Wednesday, February 26, 2020, 6:00 – 8:15 pm (covers Topics 15–18)

Specific locations for the midterm exams will be posted on Brightspace (in the “Grades” section) a minimum of 7 days prior to the midterm exam.

The final midterm exam grade (out of 30) will be calculated such that each student’s better midterm will be worth 20%, with the lower midterm being worth only 10%.

Midterm Examination Procedure

The format of the **MIDTERM EXAMS** will be:

6:00 – 7:00 pm: Individual midterm (**Mandatory**)

7:15 – 8:15 pm: Group midterm (*Optional, but strongly suggested*)

Our midterm examinations will have multiple versions and will be graded based on a bubble answer page. All answers must be bubbled in on the answer page within the allotted time for the midterm examination, no extra time for bubbling is given. **Only those answers submitted on the bubble page will be graded.**

For those students choosing to complete a group midterm, your overall midterm grade will be calculated based on both the individual and group midterms. The weighting of the individual midterm grade versus the group midterm grade will be based on the better grade calculated using one of the 2 following grading rubrics:

1. A combined weighting of 90% individual grade and 10% group grade.
2. Adding an up to an additional 1 bonus mark to the individual grade based on the group grade mark.

In this way, the group midterm will count towards every student’s grade in a way to give them a maximum grade benefit. This means writing the group midterm can only **IMPROVE** upon your overall midterm grade. Writing a group midterm has many advantages besides an increase in grade, such as discussing chemistry with your peers, learning from your mistakes immediately after writing a midterm, clearing up misconceptions you may have had, and an overall reduction in midterm anxiety. The group midterm is optional but students are strongly encouraged to participate in this activity.

Groups of 3 students will be pre-assigned by the First Year Chemistry Team. See the “Grades” section on Brightspace for your Group number the Monday before each midterm exam.

Allowed Materials for Midterm Examinations

All constants, equations and a periodic table will be provided to you when writing each midterm exam. A copy of this Data Sheet will be available on Brightspace at the beginning of term.

You will be allowed to bring the following items into a midterm examination.

- *Dark Pen (blue or black ink) or dark pencil.*
- *An approved non-programmable calculator (SHARP EL-510 series/CASIO fx-991ES PLUS C).*

NO additional resources are permitted in the midterm examinations.

Midterm Examination Conflict Policy

If you have a conflict with a midterm exam, you must contact the First Year Chemistry Coordinator by filling out the “Midterm Conflict Registration” form found on Brightspace **before the deadlines listed below**. The make-up date for students with midterm exam conflicts will be the Friday evening following the regularly scheduled midterm exam date. After each conflict registration deadline has passed, you will be notified of the exact time and location of the make-up midterm exam. Conflicts include, but are not limited to, direct overlap of the chemistry midterm exam with another test/exam or another class you are registered for. All internal conflicts are checked. Students are to make every effort to resolve external conflicts, such as those with work and volunteer schedules.

Midterm 1 conflict form link and deadline:

Complete the form located at <https://tinyurl.com/DalChemWinterMidterm1>
by **Wednesday, January 15, 2020** at 11:30 pm.

Midterm 2 conflict form link and deadline:

Complete the form located at <https://tinyurl.com/DalChemWinterMidterm2>
by **Wednesday, February 12, 2020** at 11:30 pm.

Missed Midterm Examination Policy

If you miss a midterm exam, you must complete the First Year Chemistry “Student Declaration of Absence” (SDA) online form located at <https://tinyurl.com/DalChemSDAWinter> **within 72 hours** of the missed midterm. At this time, students will have the opportunity to apply for a make-up midterm exam to occur on the Friday evening following the regularly scheduled midterm exam. In the case that a make-up midterm exam is not written, the weight of the midterm exam that was missed will be 10% and transferred to the final exam. If both midterm exams are missed, and two “Student Declaration of Absence” forms are submitted, a 70% final exam will result, as all midterm exam weight will shift to the final exam.

Midterm Examination Cancellation Policy

In the event that a midterm examination is cancelled due to snow, power outage, or other such event beyond the First Year Chemistry Teaching Team’s control, the midterm exam date will shift to the following Friday, and the make-up midterm exam will shift to the following Monday. Any shifted midterm exams will occur in the evening as originally scheduled, though the exact time and location may be altered. In the event of a cancellation, please pay close attention to your Dalhousie Email Account and the Brightspace Lecture Site Announcements for the most up to date information.

Final Examination

Date, Content and Location

The Chem 1012/1022 Final Exam will be scheduled early February by the Registrar's Office. Information about the Final Exam will be announced in class and on Brightspace as soon as it is available. ***Please refrain from booking any travel until the exam schedule has been released.***

Specific locations for the final exam will be posted on Brightspace (in the "Grades" section) a minimum of 7 days prior to the exam.

Final Examination Procedure

The final exam will be an **individual assessment only** and last **3 hours** long. The final exam is **cumulative** and covers **ALL** material in the course: Self-studies B2–B3, Topics 14–26 and WHMIS.

Our final examination will be graded based on a bubble answer page. All answers must be bubbled in on the answer page within the allotted time for the final examination, no extra time for bubbling is given. **Only those answers submitted on the bubble page will be graded.**

Allowed Materials for Final Examinations

All constants, equations and a periodic table will be provided to you when writing the final exam. A copy of this Data Sheet will be available on Brightspace at the beginning of term.

You will be allowed to bring the following items into a final examination.

- *Dark Pen (blue or black ink) or dark pencil.*
- *An approved non-programmable calculator (SHARP EL-510 series/CASIO fx-991ES PLUS C).*

NO additional resources are permitted in the final examination.

Final Examination Conflict Policy

If you have a conflict with a final exam, you must contact the First Year Chemistry Coordinator by filling out the "Final Exam Conflict Registration" form found on Brightspace **before the deadline listed below.** The make-up date for students with final exam conflicts will be determined based on student availability. After the conflict registration deadline has passed, you will be notified of the exact time and location of the make-up final exam. Conflicts include, but are not limited to, direct overlap of the chemistry final exam with another exam or if you have 3 final exams within a 24 hour period. All internal Dalhousie conflicts are checked. External conflicts, such as those involving varsity sports and travel, will require supporting documentation. The deadline for submission of conflicts with the final exam is listed below:

Final Exam conflict form link and deadline:

Complete the form located at <https://tinyurl.com/DalChemWinterFinal>
by **Friday, March 20, 2020** at 11:30 pm.

Missed Final Examination Policy

If you miss a final exam, you must contact the First Year Chemistry Coordinator by email (chemlect@dal.ca) ***immediately***. Appropriate documents (such as a medical certificate) must be submitted to the First Year Chemistry Coordinator, so that you will be eligible for a final exam accommodation. "Student Declaration of Absence" forms cannot be used during the exam period. Medical documents/certificates must indicate the dates and duration of the illness, and when possible should describe the impact it had on the student's ability to fulfill academic requirements and should include any other information the physician considers relevant and appropriate. Medical documents/certificates must be received within 7 days of the missed exam, otherwise no accommodation will be made.

Final Examination Cancellation Policy

In the event that a final examination is cancelled due to snow, power outage, or other such event beyond the First Year Chemistry Teaching Team's control, the final examination will be rescheduled by the Registrar's Office. In the event of a cancellation, please pay close attention to your Dalhousie Email Account and the Brightspace Lecture Site Announcements for the most up to date information.

Laboratory Information



Location:

Basement of the Chemistry Building
Room 100-108P

Winter 2020 Lab Schedule:

The lab schedule is posted on the Lab Brightspace site and can be found on page 18 of the syllabus.

Labs Begin:

Monday, January 13, 2020

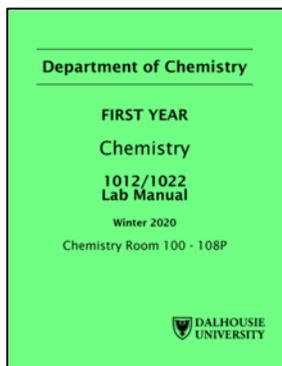
Contacting Your Lab Instructor:

The laboratory instructor team communicates with students through one common email address: chemlab@dal.ca. Please include your lab section in the email subject line.

First Year Chemistry Laboratory Instructors

Please note that differing laboratory sections have differing laboratory instructors. Refer to the sections written on the right to determine who your laboratory instructor is. Please note that lab sections/instructors may change, and for the most up-to-date list of instructors and sections, please refer to the Lab Brightspace Page.

Dr. Jennifer MacDonald**Sections:** B05, B06, B15, B16, B51, B52, B55, B56**Dr. Joshua Bates****Sections:** B17, B18, B57, B58**Dr. Mark Wall****Sections:** B11, B12, B13, B14**Michael Charlton****Sections:** B01, B02, B03, B04, B07, B08, B53, B54**Joseph Tassone****Sections:** B09, B10

Required Materials for Lab**Lab Manual**

Available at the Dalhousie Bookstore (\$24.40 + tax)

**Hardcover Lab Notebook**

Available at the Dalhousie Bookstore (\$7.95 + tax)

**Safety Glasses**Must be stamped with standards numbers of:
CSA-Z94-3 or ANSI Z87

Available at the Dalhousie Bookstore

Safety Glasses (PYRAMEX, \$4.95 + tax)

"OR"

Safety Glasses For Over Glasses (3M, \$5.95 + tax)**Knee-length Lab Coats (100% cotton)**

Available at the Dalhousie Bookstore (\$24.95 + tax)

Laboratory Format, Expectations and Policies

You will complete seven lab sessions this term. Some experiments run for 1.5 hours while others run for 3 hours. Please be sure to check your experiment start time in the course syllabus (page 18) as it may differ from the start time noted on your DalOnline class schedule. Before leaving your first lab period, make sure that you understand your lab schedule.

Experimental work must be completed during the scheduled time for your particular section.
Attendance is mandatory.

Before Your Experiment

You are expected to read the experiment, prepare your hard-covered notebook, and complete the pre-lab questions on CAPA. There are optional practice questions in your lab manual.

A hard-covered notebook is required for this course. The notebook is a permanent record of your work; therefore, all entries must be written in ink and only on the right hand page. Prior to each lab period, your notebook must be prepared with:

- Date
- Title of Experiment
- Data Tables and Observations from Raw Data Sheet. *If the experiment does not have a Raw Data Sheet, please use the Grade Sheet in your lab manual as a guide to prepare your lab notebook.*

During Your Experiment

Each laboratory period begins with a lab lecture and/or video. New techniques are demonstrated and safety considerations discussed. During this time, a teaching assistant will check and initial your notebook for the above entries and pick up laboratory reports that are due that day.

During the experiment, **all data must be recorded in ink** in your notebook. Erasers or liquid paper are not permitted. Simply cross out errors, which are part of the scientific process.

After completing the experiment, you must have the data in your notebook initialed again by the instructor or teaching assistant. If the experiment requires the submission of a Raw Data Sheet, your instructor or teaching assistant will initial this sheet at the same time as your data in your notebook. **Only the initialed data from the Raw Data Sheet may be used to complete your post-lab report.** Ensure your glassware and lab bench are left clean and neat.

After Your Experiment

There will be a post-lab report (the Grade Sheet found in the lab manual). For more information about post-lab point values and due dates, please refer to the tables on page 19 and 20 of the syllabus, respectively. Written reports **must be completed in dark pen (blue or black ink).**

Laboratory Schedule

The exact laboratory schedule will be different for each student depending on their laboratory section. Please refer to the detailed table below for this schedule. Please find **your lab section** and highlight the row to find **your laboratory experiment schedule**.

Sect.	Day	Exp. 8 & 9	Exp. 10	Exp. 11	Exp. 12 & 13	Exp. 14*	Exp. 15	Exp. 16
B01	Mon.	Jan. 13 1:30–3:00pm	Jan. 20 1:30–3:00pm	Jan. 27 1:30–4:30pm	Feb. 10 1:30–4:30pm	Mar. 2 1:30–3:00pm	Mar. 9 1:30–3:00pm	Mar. 23 1:30–4:30pm
B02	Mon.	Jan. 13 3:00–4:30pm	Jan. 20 3:00–4:30pm	Feb. 3 1:30–4:30pm	Feb. 24 1:30–4:30pm	Mar. 2 3:00–4:30pm	Mar. 9 3:00–4:30pm	Mar. 30 1:30–4:30pm
B03	Mon.	Jan. 13 2:30–4:00pm	Jan. 20 2:30–4:00pm	Jan. 27 2:30–5:30pm	Feb. 10 2:30–5:30pm	Mar. 2 2:30–4:00pm	Mar. 9 2:30–4:00pm	Mar. 23 2:30–5:30pm
B04	Mon.	Jan. 13 4:00–5:30pm	Jan. 20 4:00–5:30pm	Feb. 3 2:30–5:30pm	Feb. 24 2:30–5:30pm	Mar. 2 4:00–5:30pm	Mar. 9 4:00–5:30pm	Mar. 30 2:30–5:30pm
B05	Tues.	Jan. 14 8:30–10:00am	Jan. 21 8:30–10:00am	Jan. 28 8:30–11:30am	Feb. 11 8:30–11:30am	Mar. 3 8:30–10:00am	Mar. 10 8:30–10:00am	Mar. 24 8:30–11:30am
B06	Tues.	Jan. 14 10:00–11:30am	Jan. 21 10:00–11:30am	Feb. 4 8:30–11:30am	Feb. 25 8:30–11:30am	Mar. 3 10:00–11:30am	Mar. 10 10:00–11:30am	Mar. 31 8:30–11:30am
B07	Tues.	Jan. 14 2:30–4:00pm	Jan. 21 2:30–4:00pm	Jan. 28 2:30–5:30pm	Feb. 11 2:30–5:30pm	Mar. 3 2:30–4:00pm	Mar. 10 2:30–4:00pm	Mar. 24 2:30–5:30pm
B08	Tues.	Jan. 14 4:00–5:30pm	Jan. 21 4:00–5:30pm	Feb. 4 2:30–5:30pm	Feb. 25 2:30–5:30pm	Mar. 3 4:00–5:30pm	Mar. 10 4:00–5:30pm	Mar. 31 2:30–5:30pm
B09/B10	Wed.	Jan. 15 10:30am–12:00pm	Jan. 22 10:30am–12:00pm	Jan. 29 10:30am–1:30pm	Feb. 12 10:30am–1:30pm	Mar. 4 10:30am–12:00pm	Mar. 11 10:30am–12:00pm	Mar. 25 10:30am–1:30pm
B11	Wed.	Jan. 15 1:30–3:00pm	Jan. 22 1:30–3:00pm	Jan. 29 1:30–4:30pm	Feb. 12 1:30–4:30pm	Mar. 4 1:30–3:00pm	Mar. 11 1:30–3:00pm	Mar. 25 1:30–4:30pm
B12	Wed.	Jan. 15 3:00–4:30pm	Jan. 22 3:00–4:30pm	Feb. 5 1:30–4:30pm	Feb. 26 1:30–4:30pm	Mar. 4 3:00–4:30pm	Mar. 11 3:00–4:30pm	Apr. 1 1:30–4:30pm
B13	Wed.	Jan. 15 2:30–4:00pm	Jan. 22 2:30–4:00pm	Jan. 29 2:30–5:30pm	Feb. 12 2:30–5:30pm	Mar. 4 2:30–4:00pm	Mar. 11 2:30–4:00pm	Mar. 25 2:30–5:30pm
B14	Wed.	Jan. 15 4:00–5:30pm	Jan. 22 4:00–5:30pm	Feb. 5 2:30–5:30pm	Feb. 26 2:30–5:30pm	Mar. 4 4:00–5:30pm	Mar. 11 4:00–5:30pm	Apr. 1 2:30–5:30pm
B15	Thurs.	Jan. 16 8:30–10:00am	Jan. 23 8:30–10:00am	Jan. 30 8:30–11:30am	Feb. 13 8:30–11:30am	Mar. 5 8:30–10:00am	Mar. 12 8:30–10:00am	Mar. 26 8:30–11:30am
B16	Thurs.	Jan. 16 10:00–11:30am	Jan. 23 10:00–11:30am	Feb. 6 8:30–11:30am	Feb. 27 8:30–11:30am	Mar. 5 10:00–11:30am	Mar. 12 10:00–11:30am	Apr. 2 8:30–11:30am
B17	Thurs.	Jan. 16 2:30–4:00pm	Jan. 23 2:30–4:00pm	Jan. 30 2:30–5:30pm	Feb. 13 2:30–5:30pm	Mar. 5 2:30–4:00pm	Mar. 12 2:30–4:00pm	Mar. 26 2:30–5:30pm
B18	Thurs.	Jan. 16 4:00–5:30pm	Jan. 23 4:00–5:30pm	Feb. 6 2:30–5:30pm	Feb. 27 2:30–5:30pm	Mar. 5 4:00–5:30pm	Mar. 12 4:00–5:30pm	Apr. 2 2:30–5:30pm
B51	Tues.	Jan. 14 10:00–11:30am	Jan. 21 10:00–11:30am	Jan. 28 10:00am–1:00pm	Feb. 11 10:00am–1:00pm	Mar. 3 10:00–11:30am	Mar. 10 10:00–11:30am	Mar. 24 10:00am–1:00pm
B52	Tues.	Jan. 14 11:30am–1:00pm	Jan. 21 11:30am–1:00pm	Feb. 4 10:00am–1:00pm	Feb. 25 10:00am–1:00pm	Mar. 3 11:30am–1:00pm	Mar. 10 11:30am–1:00pm	Mar. 31 10:00am–1:00pm
B53	Tues.	Jan. 14 1:00–2:30pm	Jan. 21 1:00–2:30pm	Jan. 28 1:00–4:00pm	Feb. 11 1:00–4:00pm	Mar. 3 1:00–2:30pm	Mar. 10 1:00–2:30pm	Mar. 24 1:00–4:00pm
B54	Tues.	Jan. 14 2:30–4:00pm	Jan. 21 2:30–4:00pm	Feb. 4 1:00–4:00pm	Feb. 25 1:00–4:00pm	Mar. 3 2:30–4:00pm	Mar. 10 2:30–4:00pm	Mar. 31 1:00–4:00pm
B55	Thurs.	Jan. 16 10:00–11:30am	Jan. 23 10:00–11:30am	Jan. 30 10:00am–1:00pm	Feb. 13 10:00am–1:00pm	Mar. 5 10:00–11:30am	Mar. 12 10:00–11:30am	Mar. 26 10:00am–1:00pm
B56	Thurs.	Jan. 16 11:30am–1:00pm	Jan. 23 11:30am–1:00pm	Feb. 6 10:00am–1:00pm	Feb. 27 10:00am–1:00pm	Mar. 5 11:30am–1:00pm	Mar. 12 11:30am–1:00pm	Apr. 2 10:00am–1:00pm
B57	Thurs.	Jan. 16 1:00–2:30pm	Jan. 23 1:00–2:30pm	Jan. 30 1:00–4:00pm	Feb. 13 1:00–4:00pm	Mar. 5 1:00–2:30pm	Mar. 12 1:00–2:30pm	Mar. 26 1:00–4:00pm
B58	Thurs.	Jan. 16 2:30–4:00pm	Jan. 23 2:30–4:00pm	Feb. 6 1:00–4:00pm	Feb. 27 1:00–4:00pm	Mar. 5 2:30–4:00pm	Mar. 12 2:30–4:00pm	Apr. 2 1:00–4:00pm

*Opening and closing dates for the virtual version of Experiment 14 are posted on Brightspace.

Multiple Modes of Completion for Experiment 14

This experiment will be offered as an in-person laboratory experiment and as an online virtual experiment. You will have the opportunity to choose which mode of completion works best for you (in-person only, online only, or both in-person and online). The post lab report will be the same for either version of the experiment.

Following the completion of your chosen Experiment 14 session, please watch your Dalhousie Email for an invitation to provide feedback on the mode(s) of completion you chose!

Laboratory Assessment

Lab Grading Scheme		Important Notes
Component	Weight	The laboratory portion of this course is worth 16% of the final grade. All experiments have a pre-lab component as well as a report. A completed lab consists of: <ul style="list-style-type: none"> • Preparation of the notebook prior to the laboratory period; • Completion of experimental work, recording data, and having notebook initialed; • Submitting in appropriate pre-lab assignments, Raw Data Sheets, and post-lab assignments. All reports must be your individual work. <p><i>You must pass the lab component of the course (7.5/15) in order to pass Chem 1012/1022. The Safety Module & Map are not included in this criteria; however, they must be completed to be eligible to participate in the lab program.</i></p>
CAPA Safety Module & Map	1%	
CAPA Pre-Labs	2%	
Preparedness	1%	
Post-Lab Reports	11%	
Time Management	1%	
Total	16%	

Laboratory Pre-Lab and Post-Lab Grading Scheme

Lab	Exp. 8	Exp. 9	Exp. 10	Exp. 11	Exp. 12	Exp. 13	Exp. 14	Exp. 15	Exp. 16	Total Points	Total (/13)
Pre	2	2	2	2	2	2	2	2	2	18	2
Post	5	5	14	13	7	6	9.5	7	8+2(pre-lab)	76.5	11

Laboratory CAPA

All pre-lab assignments will be hosted on the online learning platform, CAPA, which can be accessed by going to <https://capa2.its.dal.ca/>. Please refer to the instructions on page 8 of the syllabus when logging into CAPA for the first time.

Safety Module

Chemicals and lab 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 lab and learning the measures that must be taken in order to maximize your safety and the safety of your peers. **As part of your lab assignment, you are REQUIRED to complete a Chemistry Safety Module. Students who do not successfully complete this requirement will not be allowed to perform experiments in any Dalhousie undergraduate chemistry lab. If you have completed the Safety Module in Fall 2019, your grade will be transferred to your Chem 1012/1022 course.** Successful completion of the Safety Module includes reading the General Safety Statement on Brightspace, obtaining a perfect mark (i.e. 100%) on the Safety Module (located in CAPA on the First Year Chemistry Labs–2020 Winter site), completing the lab map during your first time in lab, and submitting your responses on CAPA. After completion of these requirements you should feel comfortable working in a chemistry lab and have the tools you need to promote a safe lab environment.

The Chemistry Safety Module must be completed by 11:30 pm January 12, 2020.

Pre-Lab Assignments

The online pre-lab assignments have been developed to help you prepare for the lab. We encourage you to start early to ensure you are able to get help with the questions that cause you difficulty. CAPA pre-labs are due **5 minutes before your regularly scheduled lab** (lab schedule on page 18). For example, if a student is in lab section B01 and has a lab session beginning on January 13, 2020 at 1:30 PM, their pre-lab would be due on January 13, 2020 at 1:25 PM. The deadline for each pre-lab assignment will be strictly adhered to, **NO EXCEPTIONS**. *If for any reason you have made alternate arrangements for your lab session, your pre-lab deadline will remain the same, 5 minutes before your regularly scheduled lab (page 18).*

You will be given **13 tries at each question**. The first 3 tries will be for full marks. For each subsequent try, 10% of the questions points value will be deducted.

Preparedness

When working in the lab it is important and expected that you arrive prepared for your session to ensure that you are a supportive and safe member of your lab group. For each laboratory experiment, students will be graded on their preparedness for the experiment. Preparedness includes completing the pre-lab assignment on CAPA as well as arriving to the lab with their laboratory notebook prepared for the experiment (as outlined on page 17). Student preparedness is **worth 1% of the overall lab grade**. A student who is unprepared 3 or more times during term will not be awarded this grade.

Post-Lab Reports

A detailed table of all post-lab due dates is to follow. Please find **your lab section** and highlight the row to find **your post-lab due date schedule**.

Sect.	Exp. 8 & 9	Exp. 10	Exp. 11	Exp. 12 & 13	Exp. 14*	Exp. 15	Exp. 16
B01	Jan. 20, 1:30pm	Jan. 27, 1:30pm	Feb. 10, 1:30pm	Mar. 2, 1:30pm	Mar. 9, 1:30pm	Mar. 23, 1:30pm	Mar. 23, 4:30pm
B02	Jan. 20, 3:00pm	Feb. 3, 1:30pm	Feb. 24, 1:30pm	Mar. 2, 3:00pm	Mar. 9, 3:00pm	Mar. 30, 1:30pm	Mar. 30, 4:30pm
B03	Jan. 20, 2:30pm	Jan. 27, 2:30pm	Feb. 10, 2:30pm	Mar. 2, 2:30pm	Mar. 9, 2:30pm	Mar. 23, 2:30pm	Mar. 23, 5:30pm
B04	Jan. 20, 4:00pm	Feb. 3, 2:30pm	Feb. 24, 2:30pm	Mar. 2, 4:00pm	Mar. 9, 4:00pm	Mar. 30, 2:30pm	Mar. 30, 5:30pm
B05	Jan. 21, 8:30am	Jan. 28, 8:30am	Feb. 11, 8:30am	Mar. 3, 8:30am	Mar. 10, 8:30am	Mar. 24, 8:30am	Mar. 24, 11:30am
B06	Jan. 21, 10:00am	Feb. 4, 8:30am	Feb. 25, 8:30am	Mar. 3, 10:00am	Mar. 10, 10:00am	Mar. 31, 8:30am	Mar. 31, 11:30am
B07	Jan. 21, 2:30pm	Jan. 28, 2:30pm	Feb. 11, 2:30pm	Mar. 3, 2:30pm	Mar. 10, 2:30pm	Mar. 24, 2:30pm	Mar. 24, 5:30pm
B08	Jan. 21, 4:00pm	Feb. 4, 2:30pm	Feb. 25, 2:30pm	Mar. 3, 4:00pm	Mar. 10, 4:00pm	Mar. 31, 2:30pm	Mar. 31, 5:30pm
B09/B10	Jan. 22, 10:30am	Jan. 29, 10:30am	Feb. 12, 10:30am	Mar. 4, 10:30am	Mar. 11, 10:30am	Mar. 25, 10:30am	Mar. 25, 1:30pm
B11	Jan. 22, 1:30pm	Jan. 29, 1:30pm	Feb. 12, 1:30pm	Mar. 4, 1:30pm	Mar. 11, 1:30pm	Mar. 25, 1:30pm	Mar. 25, 4:30pm
B12	Jan. 22, 3:00pm	Feb. 5, 1:30pm	Feb. 26, 1:30pm	Mar. 4, 3:00pm	Mar. 11, 3:00pm	Apr. 1, 1:30pm	Apr. 1, 4:30pm
B13	Jan. 22, 2:30pm	Jan. 29, 2:30pm	Feb. 12, 2:30pm	Mar. 4, 2:30pm	Mar. 11, 2:30pm	Mar. 25, 2:30pm	Mar. 25, 5:30pm
B14	Jan. 22, 4:00pm	Feb. 5, 2:30pm	Feb. 26, 2:30pm	Mar. 4, 4:00pm	Mar. 11, 4:00pm	Apr. 1, 2:30pm	Apr. 1, 5:30pm
B15	Jan. 23, 8:30am	Jan. 30, 8:30am	Feb. 13, 8:30am	Mar. 5, 8:30am	Mar. 12, 8:30am	Mar. 26, 8:30am	Mar. 26, 11:30am
B16	Jan. 23, 10:00am	Feb. 6, 8:30am	Feb. 27, 8:30am	Mar. 5, 10:00am	Mar. 12, 10:00am	Apr. 2, 8:30am	Apr. 2, 11:30am
B17	Jan. 23, 2:30pm	Jan. 30, 2:30pm	Feb. 13, 2:30pm	Mar. 5, 2:30pm	Mar. 12, 2:30pm	Mar. 26, 2:30pm	Mar. 26, 5:30pm
B18	Jan. 23, 4:00pm	Feb. 6, 2:30pm	Feb. 27, 2:30pm	Mar. 5, 4:00pm	Mar. 12, 4:00pm	Apr. 2, 2:30pm	Apr. 2, 5:30pm
B51	Jan. 21, 10:00am	Jan. 28, 10:00am	Feb. 11, 10:00am	Mar. 3, 10:00am	Mar. 10, 10:00am	Mar. 24, 10:00am	Mar. 24, 1:00pm
B52	Jan. 21, 11:30am	Feb. 4, 10:00am	Feb. 25, 10:00am	Mar. 3, 11:30am	Mar. 10, 11:30am	Mar. 31, 10:00am	Mar. 31, 1:00pm
B53	Jan. 21, 1:00pm	Jan. 28, 1:00pm	Feb. 11, 1:00pm	Mar. 3, 1:00pm	Mar. 10, 1:00pm	Mar. 24, 1:00pm	Mar. 24, 4:00pm
B54	Jan. 21, 2:30pm	Feb. 4, 1:00pm	Feb. 25, 1:00pm	Mar. 3, 2:30pm	Mar. 10, 2:30pm	Mar. 31, 1:00pm	Mar. 31, 4:00pm
B55	Jan. 23, 10:00am	Jan. 30, 10:00am	Feb. 13, 10:00am	Mar. 5, 10:00am	Mar. 12, 10:00am	Mar. 26, 10:00am	Mar. 26, 1:00pm
B56	Jan. 23, 11:30am	Feb. 6, 10:00am	Feb. 27, 10:00am	Mar. 5, 11:30am	Mar. 12, 11:30am	Apr. 2, 10:00am	Apr. 2, 1:00pm
B57	Jan. 23, 1:00pm	Jan. 30, 1:00pm	Feb. 13, 1:00pm	Mar. 5, 1:00pm	Mar. 12, 1:00pm	Mar. 26, 1:00pm	Mar. 26, 4:00pm
B58	Jan. 23, 2:30pm	Feb. 6, 1:00pm	Feb. 27, 1:00pm	Mar. 5, 2:30pm	Mar. 12, 2:30pm	Apr. 2, 1:00pm	Apr. 2, 4:00pm

*Due dates for the virtual Experiment 14 are posted on Brightspace.

Time Management

Besides arriving to the laboratory experiments on time, we expect students to manage their time outside of lab accordingly, such that their post-lab reports are submitted on time. Therefore, effective time management is **worth 1% of the overall lab grade**. We do realize that occasionally a student may submit a post-lab report late, therefore students with a maximum of 1 late report will still receive the time management grade. Post-lab reports submitted after the scheduled due dates (outlined in the table on page 20) will be accepted, but marked late, **if and only if** the post-lab report is submitted **BEFORE** the Late Work Submission Deadline. Late work is not accepted after the Late Work Submission Deadline as marked reports will be returned to students in their lab sessions. The table of Late Work Submission Deadlines can be found on page 22 of the syllabus.

Missed Labs and Make-up Experiments

If you miss a lab, **you must email your lab instructor (chemlab@dal.ca) within 24 hours** of the missed lab to schedule a make-up experiment. Failure to do so may result in a grade of 0 for the missed lab.

Your email must include:

Subject line:

1. course number
2. lab section (e.g. B01)

Body of your message:

1. your name:
2. student ID (B00#):
3. course number and lab section:
4. experiment(s) missed:
5. your availability (please refer to the last opportunity for make-up lab table on page 22 of the syllabus):

This process filters your message to the correct instructor automatically (based on section in the subject line) which allows us to help you faster!

A few notes about make-up experiments:

1. No student will be admitted to the lab for a make-up experiment without prior instructor permission.
2. No student will be allowed to do a make-up after posted deadlines on page 22.
3. No report will be accepted after the late submission deadlines posted in the table on page 22.

The lab instructor will then email you a letter of permission to do a make-up experiment at an agreed-upon time and assign a due date for your post-lab report. When you arrive to your make-up experiment you must present yourself to the instructor to be assigned a temporary locker space.

Final Dates for Make-up Experiments and Late Work Submissions

Exp.	Last Opportunity for Make-up Lab		Late Work Submission Deadline
	Group A	Group B	All Groups
8 & 9	Jan. 23	Jan. 23	Mon., Jan. 27, before 1:30pm
10	Jan. 30	Jan. 30	Mon., Feb. 10, before 1:30pm
11	Feb. 6	Feb. 13	Mon., Mar. 2, before 1:30pm
12 & 13	Feb. 27	Mar. 5	Mon., Mar. 9, before 1:30pm
14	Mar. 12	Mar. 12	Mon., Mar. 23, before 1:30pm
15	Mar. 26	Mar. 26	Fri., Apr. 3, before 1:30pm
16	Apr. 2	Apr. 2	<i>In-lab submission only</i>

Please ensure that you know what group you are in (based on your lab section) to adhere to the above deadlines.

Group A: B01, B03, B05, B07, B09/B10, B11, B13, B15, B17, B51, B53, B55, B57

Group B: B02, B04, B06, B08, B12, B14, B16, B18, B52, B54, B56, B58

Lab Cancellation Policy

In the event that a lab session is cancelled due to snow, power outage, or other such event beyond the First Year Chemistry Teaching Team's control, please pay close attention to your Dalhousie Email Account and the Brightspace Laboratory Site Announcements for the most up to date information.

Laboratory Exemptions

Lab exemptions will be granted to those who have already completed the course (with a letter grade of A–F), have a grade of 40% (32/80) or higher on the lecture component, **and** have a lab grade of 67% (10/15) or better on the lab component of the course.

Lab grades for lab exemption carry forward if the student repeats the course within a 24 month period of the original start date. For example, if a student enrolls in Chem 1012/1022 in Winter 2020 and completes the course with a grade of F, has 45% (36/80) on the lecture component, **and** a lab score greater than 67% (10/15) the student would qualify for lab exemption in the following terms: Summer 2020, Winter 2021, and Summer 2021. After the 24 month window has passed the student will be required to retake the lab component when repeating the course.

Labs exemptions will not automatically be granted. You must contact the first year lab coordinator (chemlab@dal.ca) in order to apply for a lab exemption.

Student Resources for First Year Chemistry
Brightspace Course Sites

We post a number of resources on the Brightspace Lab and Lecture sites. We strongly recommend that you review these sites and familiarize yourself with the content. The resources on these sites are intended to support your learning as the term progresses. Some of these resources include pre-lab videos, online video tutorials for lab reports and material, schedules, contact information, and much more! We also recommend that you refer to the sites on a regular basis. Important information such as grades and exam locations will be posted as they become available.

Resource Centre and Concept Room

The **Concept Room** is staffed by members of the First Year Chemistry team who are available to answer lecture content and CAPA assignment questions. The Resource Centre is staffed by advanced undergraduate students (Resource Centre Assistants; **RCAs**) and lab instructors/senior teaching assistants (Lab Support Assistants; **LSAs**) who can assist you with CAPA assignments, pre-lab and post-lab questions.

The Concept Room and Chemistry Resource Centre Schedule

	Monday	Tuesday	Wednesday	Thursday	Friday
10:00 – 11:00am	Lab Support	<i>Concept Room</i> (M. Whalen)			Lab Support
11:00am – 12:00pm	Resource Centre Assist.	Resource Centre Assist.	Lab Support	Lab Support	<i>Concept Room</i> (M. Wall)
12:00 – 1:00pm					
1:00 – 2:00pm	<i>Concept Room</i> (M. Dasog)	Lab Support	Resource Centre Assist.	<i>Concept Room</i> (R. Karaballi)	Resource Centre Assist.
2:00 – 3:00pm					
3:00 – 4:00pm	Resource Centre Assist.	<i>Concept Room</i> (A. Crane)	Resource Centre Assist.		
4:00 – 5:00pm	Resource Centre Assist.				

**Concept Room and Resource Centre opens: Tuesday, January 7, 2020
closes: Monday, April 6, 2020**

The Concept Room Staff

**Dr. Angela
Crane**



**Dr. Mita
Dasog**



**Dr. Mark
Wall**



**Dr. Marc
Whalen**



**Reem
Karaballi**



Topic Workshops

**Dr. Mark
Stradiotto**



Dr. Mark Stradiotto will be hosting weekly, per topic workshops to **better support students who are struggling** with the material. These workshops are optional and will review lecture material. No new material will be covered during this time.

These workshops will be interactive, giving students a chance to try the questions on their own or in a small group before having the solutions presented.

The workshops will run on ***Mondays from 12:30-1:30 pm in the Sir James Dunn Building, Room 117.*** Please sign up for a tutorial on the Lecture Brightspace Site by 11:30 pm the previous day (Sunday) so that enough handouts will be printed. Students who do not sign up in advance are still welcome to join these workshops, but note that there may not be enough hand-outs for everyone in this case. These handouts will later be available to the whole class for those who cannot attend.

The questions covered in the workshops are skills based - specifically covering the problem-solving skills required to be successful in the course.

The full workshop schedule and registration/sign-up links can be found below and on Lecture Brightspace Site, in the content area called "Topic Workshops." Note that you will need to log in with your netID and password to submit the registration form.

Workshop	Date	Content	Registration Link
1	Mon., Jan. 13	Self-Study B2	https://www.tinyurl.com/DalChemWinter-WS1
2	Mon., Jan. 20	Topic 14	https://www.tinyurl.com/DalChemWinter-WS2
3	Mon., Jan. 27	Topic 15	https://www.tinyurl.com/DalChemWinter-WS3
4	Mon., Feb. 3	Topic 16	https://www.tinyurl.com/DalChemWinter-WS4
5	Mon., Feb. 10	Topic 17	https://www.tinyurl.com/DalChemWinter-WS5
–	Mon., Feb. 17	<i>No Workshop – Winter Study Break</i>	
6	Mon., Feb. 24	Topic 18	https://www.tinyurl.com/DalChemWinter-WS6
7	Mon., Mar. 2	Topic 19	https://www.tinyurl.com/DalChemWinter-WS7
8	Mon., Mar. 9	Self-Study B3 & Topic 20	https://www.tinyurl.com/DalChemWinter-WS8
9	Mon., Mar. 16	Topic 21	https://www.tinyurl.com/DalChemWinter-WS9
10	Mon., Mar. 23	Topic 22 & 23	https://www.tinyurl.com/DalChemWinter-WS10
11	Mon., Mar. 30	Topic 24	https://www.tinyurl.com/DalChemWinter-WS11
12	Mon., Apr. 6	Topic 25 & 26	https://www.tinyurl.com/DalChemWinter-WS12

Studying for Success Workshops

Chemistry specific Studying for Success workshops will be held prior to each midterm and the final examination. These workshops are **optional** and will focus on preparing you for upcoming evaluations through the use of study plans, time management skills, and study tips specific to the chemistry course content. Details about these workshops, including how to sign up will be announced on Brightspace in the "Studying for Success" content area, and in class.

Midterm and Final Examination Review Sessions

An **optional** structured review session will be held prior to each midterm exam and the final exam. For each review session a selection of questions will be provided and worked through by a member of the First Year Chemistry team. Questions will be posted before the review session on Brightspace and full-worked solutions will be posted after the review session is complete. Details of dates, times, and locations of the review sessions are listed below.

	Date	Time	Location
Midterm 1	Mon., Jan. 20, 2020	7–9:30 pm	Ondaatje Hall, McCain Building
Midterm 2	Mon., Feb. 24, 2020	7–9:30 pm	Ondaatje Hall, McCain Building
Final Exam	Tues., Apr. 7, 2020	10 am–1 pm	Ondaatje Hall, McCain Building

Academic Integrity in First Year Chemistry

Conducting yourself with academic integrity (AI) is an important and serious part of upholding the reputation and standards of Dalhousie University as a recognized academic leader both nationwide and globally. While students must complete their own work individually, students are reminded that there is help available in The *Concept* Room and Chemistry Resource Centre. When considering upholding high standards of academic integrity within First Year Chemistry please consider the following.

In Lecture: All individual examinations are to be completed by each student ***independently***. Cheating or collaboration on these assessments is considered an AI offense. In cases of cheating/collaboration on these assessments, aiding another student in committing an offense is also punishable. In addition, all in-class quizzes and examinations are to be completed with only the materials provided, no extra resources (notes/books, cell phones, laptops/tablets) are permitted. The use of unauthorized materials during an assessment is considered an AI offense.

Submitted assessments suspected of any AI offense will be investigated, with penalties for confirmed offenses typically being receiving 0 on that assessment and a deduction of 5% from the final course grade for in-class quizzes or a deduction of 15% from the final course grade for midterm. AI offenses on a final exam are extremely serious and could result in course failure.

In Lab: In some experiments, you may be expected to work with a partner in the lab. In such cases, you will share a common set of experimental data and observations. Whether the lab was performed individually or in partners, any subsequent work submitted for grading must be completed individually. This includes, but not limited to, data analysis (such as calculations and graphs) and discussions (such as answers to questions and conclusions).

Submitted work suspected of any AI offense (including copying, falsification of data, or unauthorized collaboration) will be investigated, with penalties for confirmed offenses typically being a 0 on the lab report and a 5% deduction from the final course grade.

Course Overview

Course Description

Credit Hours: 3

The principles of thermodynamics and kinetics are used to explain chemical reactivity and the principles of organic chemistry are used to develop an understanding of organic synthesis.

Special topics include electrochemistry, spectroscopy, chirality, polymers, and the chemistry of living systems to illustrate the relevance of chemistry in everyday life.

PRE-REQUISITE: CHEM 1011.03, CHEM 1021.03 or equivalent

COORDINATORS: A. Crane, J. MacDonald

FORMAT: Lecture | Lab

LECTURE HOURS PER WEEK: 3

LAB HOURS PER WEEK: 3

EXCLUSIONS: Credit will be given for only one of the following combinations:

CHEM 1011.03/1012.03 or CHEM 1021.03/1022.03

Course Objectives and Goals

Our primary objective for First Year Chemistry is to offer you a comprehensive and relevant course on the fundamental concepts in chemistry. Our focus is on using problem solving techniques which are applicable and transferrable to all fields of science and engineering and are not limited to just the chemistry lens used in this course. We aim to help students build good independent study habits, time management skills, group collaborations and foster critical thinking in the sciences. By exemplifying the role of chemistry in our daily lives and in an interdisciplinary way, we hope that our students gain an appreciation for chemistry, regardless of their end academic goals.

Course Learning Outcomes

- State the name or chemical formula for common chemical species.
- Demonstrate problem solving skills in the context of chemistry.
- Draw organic molecules using multiple representations and use curly arrow mechanisms to show reaction transformations.
- Apply spectroscopic theories to determine chemical structure from spectra.
- Practice proper laboratory techniques including pipetting, spectroscopy, and separations (centrifuging and column chromatography), while maintaining safety standards in the context of a chemical laboratory.
- Record laboratory observations and data in an organized and logical manner.
- Analyze and interpret observations and data to arrive at experiment conclusions.
- Report laboratory observations and data in an organized and logical manner.
- Manage time appropriately through preparing before laboratory sessions and submitting post lab work on-time.
- Develop an experimental plan (with support of pre-lab assignment) to identify unknown samples.

Course Content

Self Study B1: Foundations in Chemistry	<ul style="list-style-type: none"> • Vocabulary of Chemistry • Naming Inorganic Compounds • Significant Figures • Light • Lewis Structures & VSEPR Theory • pH of Weak Acids and Weak Bases • Henderson-Hasselbalch Equation
Self Study B2: Gases	<ul style="list-style-type: none"> • The Mercury Barometer and Pressure • The Ideal Gas Law • Density of Gases • Dalton's Law of Partial Pressures • Real Gases • Compare and contrast ideal and real gas behavior • Calculate quantities using the ideal gas law for simple systems, changes in conditions, and the density of gases • Calculate quantities using Dalton's Law of partial pressures for mixtures of gases and gas phase reactions
Self Study B3: Reduction-Oxidation (Redox) Reactions	<ul style="list-style-type: none"> • The Fundamentals of Redox Reactions • Assigning Oxidation Numbers • Balancing Redox Reactions in Acidic Solution • Balancing Redox Reactions in Basic Solution • Assign oxidation numbers to elements, molecules and molecular ions • Balance redox reactions in acidic and basic solutions • Identify oxidation and reduction processes
Topic 14: Chemical Equilibria	<ul style="list-style-type: none"> • The Equilibrium and Reaction Quotient Expressions • The Equilibrium Constant • Quantitative Data from the Equilibrium Expression • Relationship between the Equilibrium Constant and Gibbs Energy • Le Châtelier's Principle Gibbs Energy Change under Non-Standard Conditions • Apply the concepts of chemical equilibria to gas phase reactions • Relate the reaction quotient to the equilibrium constant to determine how the reaction will establish equilibrium • Calculate equilibrium quantities using initial conditions and the equilibrium constant • Calculate Gibbs Energy under standard and nonstandard conditions • Apply Le Chatelier's Principle to predict the effect of perturbing an equilibrium
Topic 15: First Law of Thermodynamics	<ul style="list-style-type: none"> • Kinetic Energy and Potential Energy • System and Surroundings • Specific Heat Capacity and Heat Capacity and Calorimetry • Heat and Temperature • Work and Volume • First Law of Thermodynamics: Heat and Work • State Functions • Enthalpy • Heating, Cooling and Enthalpies of Phase Changes • Explain the transfer of energy from a chemical perspective • Use heat capacity and specific heat capacity to explain how heat is transferred between the system and surroundings • Apply heat and work calculations to calculating the change in internal energy for a system • Distinguish between a reversible and an irreversible process for work • Describe a state function • Describe the relationship between enthalpy, heat and the reaction conditions (constant volume or constant pressure) • Distinguish between the different types of phase changes and relate the enthalpy changes to these processes • Apply heat calculations to calorimetry to explain the experimental determination of heat transfer

Topic 16: Hess's Law	<ul style="list-style-type: none"> • Standard State and Standard Enthalpy Change • Thermochemical Equations and Enthalpy Diagrams • Hess's Law • Standard Enthalpy of Formation • Bond Enthalpies and Enthalpy of Reaction • Enthalpy Changes for Biological Processes • Calculate reaction enthalpies and enthalpy changes using Hess's Law • Calculate reaction enthalpies using standard enthalpies of formation • Estimate reaction enthalpies using bond enthalpies • Relate reaction enthalpies to the corresponding balanced chemical equations, reactant/product quantities and standard types of reactions (including formation, combustion and phase changes)
Topic 17: Defining the Second Law of Thermodynamics: Entropy	<ul style="list-style-type: none"> • Entropy • Predicting Entropy Changes • Second Law of Thermodynamics • Third Law of Thermodynamics and ΔS°_{rx} • Define spontaneous processes and relate them to the concept of Entropy • Distinguish the entropy of the universe from the entropy of the system using the second law of thermodynamics • Calculate entropy changes in physical and chemical processes using the third law of thermodynamics • Predict the sign of entropy changes for physical and chemical processes
Topic 18: Gibbs Energy	<ul style="list-style-type: none"> • Gibbs Energy • Gibbs Energy and Temperature • Calculating ΔG • Relate Gibbs Energy to the Entropy of the Universe • Assess the Gibbs Energy Dependence on Enthalpy, Entropy and temperature. • Relate the properties of state functions to Gibbs Energy • Relate Gibbs Energy to work
Topic 19: Phase Equilibria and Partitioning of Compounds	<ul style="list-style-type: none"> • Liquid-Gas Phase Equilibria • Phase Diagrams • Liquid-Gas Two Component Mixtures • Multiple Component Mixtures • Partitioning of Compounds • Chromatography • Combine Gibbs energy calculations and gas phase equilibrium to describe liquid-gas phase equilibria for one component systems • Use phase diagrams to explain the temperature and pressure dependence on phases • Use Raoult's Law to describe the liquid-gas phase equilibria for two component systems • Apply the concept of polarity and intermolecular interactions to partitioning of a substance between two different solvents/substrates (K_{ow} and chromatography)
Topic 20: Electrochemistry	<ul style="list-style-type: none"> • Electrochemical Cells • Standard Half-Cell Potentials and Standard Cell Potentials • Calculations of Standard Cell Potentials • Cell Potentials, Gibbs Energies and Spontaneity • Cell Potentials under Non-Standard Conditions • Construct a simple electrochemical cell • Calculate cell potentials under standard and non-standard conditions for an electrochemical cell • Calculate Gibbs energy for an electrochemical cell under standard and non-standard conditions

Topic 21: Alkanes, Cycloalkanes and Functional Groups	<ul style="list-style-type: none"> Saturated Hydrocarbons Cycloalkanes Functional Groups in Organic Chemistry Rules for Systematic Naming of Hydrocarbon Compounds Alkenes, Alkynes and Aromatics Alcohols and Ethers Aldehydes and Ketones Carboxylic Acids and Esters Amines and Amides Chirality Apply systematic naming of organic compounds (name to structure and structure to name) with one functional group Distinguish between a functional group and a substituent Identify chiral centers (carbon only) Distinguish between chiral and achiral compounds
Topic 22: Spectroscopy	<ul style="list-style-type: none"> Ultraviolet and Visible (UV/Vis) Spectroscopy Infrared Spectroscopy (IR) Nuclear Magnetic Resonance (NMR) Spectroscopy Chemical Equivalence and Non-Equivalence Calculate quantities using Beer's Law Interpret infrared spectra for simple organic molecules Interpret ¹³C NMR spectra for simple organic molecules
Topic 23: Introduction to Chemical Reactions	<ul style="list-style-type: none"> Reactions of Organic Compounds SN₂ Substitution Reactions Addition Reactions of Lithium Reagents Diels-Alder Reactions Predict products and draw curly arrow mechanisms for SN₂, Diels Alder and Alkyl Addition reactions
Topic 24: Rates of Chemical Reactions	<ul style="list-style-type: none"> Average Rate of Reaction Instantaneous Rate of Reaction Integrated Rate Laws for First & Second Order Reactions Half-Life for First Order Reactions Radioactive Decay Calculate quantities associated with the average rate of reaction Determine the rate law for a reaction using experimental data Calculate quantities associated with the first and second order integrated rate laws Apply the concepts of radioactive decay to first order processes
Topic 25: Reaction Mechanisms	<ul style="list-style-type: none"> Mechanisms of Reactions Temperature and the Rate of Reaction Catalysis Sketch a simple reaction coordinate diagram Calculate quantities associated with the temperature dependence of rate constants (Arrhenius equation) Describe the effect of a catalyst on a reaction coordinate diagram and activation energy Differentiate between homogeneous and heterogeneous catalysis
Topic 26: Polymers	<ul style="list-style-type: none"> Monomers and Polymers Addition Polymerization (Radical) and Step Growth Polymerization (Condensation) Identify the monomer(s) used to make a polymer Draw the polymer made from a given monomer(s) Physical Properties of Polymers
Laboratory:	<ul style="list-style-type: none"> Exp. 8 – Determination of the Atomic Mass of Magnesium Exp. 9 – Using Solubilities to Identify 8 Unknown Solutions Exp. 10 – Thermochemistry and the Heat of Reaction Exp. 11 – Spectroscopic Determination of Copper in a Complex Exp. 12 – A Series of Reactions Involving Copper Exp. 13 – Partitioning and Spectroscopic Identification of Food Dyes Exp. 14 – A Clock Reaction Exp. 15 – Organic Qualitative Analysis Exp. 16 – Identification of Six Household Projects

University Policies and Statements

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

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

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

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.

Information: https://www.dal.ca/dept/university_secretariat/policies/student-life/code-of-student-conduct.html

Diversity and Inclusion

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

Information: <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).

Information: https://www.dal.ca/campus_life/communities/indigenous.html

Student Resources and Support

The following campus services are available to help students develop skills in library research, scientific writing, and effective study habits. The services are available to all Dalhousie students and, unless noted otherwise, are free.

Advising

General Advising 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

Black Advising Centre: https://www.dal.ca/campus_life/communities/black-student-advising.html

International Centre: 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

Studying for Success: 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

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

Safety

Research Lab Safety:

https://www.dal.ca/content/dam/dalhousie/pdf/dept/safety/lab_policy_manual_2007.pdf

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>