

**Faculty of Science Course Syllabus  
Department of Chemistry****CHEM 1011/1021 - Concepts in Chemistry: Structure and Reactivity**

Welcome to Chemistry 1011/1021! 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.

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**Who to Contact? First Year Chemistry Coordinators**

If you have questions about Chem 1011/1021 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](mailto: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](mailto: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 1011-01 & Chem 1021-01

**Time:** 8:35 am – 9:25 am

**Location:** MacMechan Auditorium, Killam Library

**Section:** Chem 1011-04 & Chem 1021-02

**Time:** 9:35 am – 10:25 am

**Location:** MacMechan Auditorium, Killam Library

**Dr. Heather Andreas**



**Section:** Chem 1011-02

**Time:** 9:35 am – 10:25 am

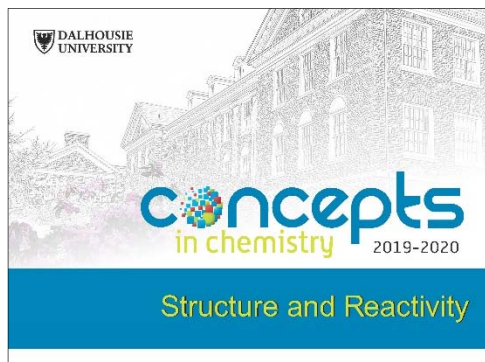
**Location:** Ondaatje Hall, McCain Building

**Section:** Chem 1011-03 & Chem 1021-03

**Time:** 10:35 am – 11:25 am

**Location:** Ondaatje Hall, McCain Building

**Required Materials for Lecture**



**Course Book**

Concepts in Chemistry:  
Structure and Reactivity (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 1011/1021.

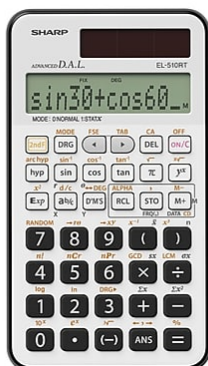
It is required that students registered in engineering and physics have the **CASIO fx-991ES PLUS C**.

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.

<b>Monday, September 2, 2019</b>	Labour Day: <i>University Closed</i>
<b>Tuesday, September 3, 2019</b>	First day of classes
<b>Wednesday, September 18, 2019</b>	Last day to add/drop fall term courses
<b>Wednesday, October 2, 2019</b>	Last day to drop fall term courses <i>without a W</i>
<b>Monday, October 14, 2019</b>	Canadian Thanksgiving Day: <i>University Closed</i>
<b>Thursday, October 31, 2019</b>	Last day to drop fall term courses <i>with a W</i>
<b>Monday, November 11, 2019</b>	Remembrance Day: <i>University Closed</i>
<b>Tuesday, November 12, 2019 to Friday, November 15, 2019</b>	Fall Study Break: <i>No classes, University open</i>
<b>Tuesday, December 3, 2019</b>	Last day of classes: <i>Follows the Monday class schedule</i>
<b>Thursday, December 5, 2019 to Sunday, December 15, 2019</b>	Exam Period: <i>Do not book travel until after your exam schedule has been released and confirmed</i>
<b>Wednesday, December 25, 2019 to Tuesday, December 31, 2019</b>	<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](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	Sept. 2	<i>No Classes</i>
Wednesday	Sept. 4	Introduction to Chemistry and Syllabus Overview
Friday	Sept. 6	Review of Self-Study A2
Monday	Sept. 9	Review of Self-Study A3
Wednesday	Sept. 11	Topic 1: Atomic Structure
Friday	Sept. 13	
Monday	Sept. 16	
Wednesday	Sept. 18	
Friday	Sept. 20	Topic 2: Electron Configurations and the Periodic Table
Monday	Sept. 23	
Wednesday	Sept. 25	Topic 3: Periodic Properties and Trends
Friday	Sept. 27	
Monday	Sept. 30	Topic 4: An Introduction to Chemical Bonding Topic 5: Molecular Orbital Theory
Wednesday	Oct. 2	Topic 5: Molecular Orbital Theory
Friday	Oct. 4	
Monday	Oct. 7	
Wednesday	Oct. 9	Topic 6: Lewis Structures
Friday	Oct. 11	
Monday	Oct. 14	<i>No Classes</i>
Wednesday	Oct. 16	Topic 6: Lewis Structures
Friday	Oct. 18	
Monday	Oct. 21	Topic 7: VSEPR Theory
Wednesday	Oct. 23	
Friday	Oct. 25	Topic 8: Valence Bond (Hybridization) Theory
Monday	Oct. 28	
Wednesday	Oct. 30	Topic 9: Polarity and Intermolecular Forces
Friday	Nov. 1	
Monday	Nov. 4	Topic 10: Qualitative Acid and Base Theory
Wednesday	Nov. 6	
Friday	Nov. 8	
Monday	Nov. 11	<i>No Classes</i>
Wednesday	Nov. 13	
Friday	Nov. 15	
Monday	Nov. 18	Topic 11: Quantitative Acid and Base Calculations
Wednesday	Nov. 20	
Friday	Nov. 22	
Monday	Nov. 25	Topic 12: Acid/Base Buffer Solutions
Wednesday	Nov. 27	
Friday	Nov. 29	
Monday	Dec. 2	Course Wrap-Up
Tuesday	Dec. 3	Final Exam Review

Course Assessment		
Grading Scheme		Important Notes
Component	Weight	
WHMIS Safety Course	3%	1. In order to obtain a passing grade in Chem 1011/1021, you must meet <b>all</b> of the following criteria: <ul style="list-style-type: none"> <li>• Obtain at least a grade of 40/80 on the lecture component of the course. (<i>Syllabus Module and WHMIS Course Excluded</i>)</li> <li>• Obtain at least a grade of 7.5/15 on the laboratory component of the course. (<i>Safety Module Excluded</i>)</li> <li>• Obtain at least a total combined grade of 50/100.</li> </ul> Students who do not meet these criteria will not receive a passing grade in Chem 1011/1021. 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%	
<b>Total</b>	<b>100%</b>	

**Dalhousie Common Grading Scheme**

Conversion of numerical grades to Final Letter Grades follows the

**Dalhousie Common Grade Scale**

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

Grade	Definition
<b>A+</b> <b>A</b> <b>A–</b>	<b>Excellent:</b> 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> <b>B</b> <b>B–</b>	<b>Good:</b> 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
<b>C+</b> <b>C</b> <b>C–</b>	<b>Satisfactory:</b> Evidence of some understanding of the subject matter; ability to develop solutions to simple problems; benefitting from his/her university experience.
<b>D</b>	<b>Marginal Pass:</b> Evidence of minimally acceptable familiarity with subject matter, critical and analytical skills (except in programs where a minimum grade of 'C' is required).
<b>F</b>	<b>Inadequate:</b> 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](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**. In order to be awarded the 3% an authentic letter of completion must be uploaded into the WHMIS Submission Quiz. Instructions for how to register for the course and upload your letter of completion can be found on the **Lab Brightspace Site under the content area "Required Safety Training."** Please ensure that you register and complete the WHMIS course well in advance of the letter submission deadline (**September 29, 2019 at 11:30 pm**). WHMIS letters of completion submitted to the First Year Chemistry Team will be verified with the College of Continuing Education.

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

“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 Tuesday, September 3 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., Sept. 20	Self-Study A1
Pre-Midterm 1	Fri., Sept. 20	Self-Study A2 – A3, Topics 1
Pre-Midterm 2	Fri., Oct. 18	Topics 2 – 6
Pre-Final Exam	Tues., Dec. 3	Topics 7 – 12

## **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
1	Fri., Sept. 13	Self-Studies A1 – A3
2	Fri., Sept. 20	Topic 1
3	Fri., Oct. 4	Topics 2, 3 and 4
4	Fri., Oct. 18	Topics 5 and 6
5	Fri., Nov. 1	Topics 7 and 8
6	Fri., Nov. 22	Topics 9 and 10
7	Tues., Dec. 3	Topics 11 and 12

### **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 8 minutes, students will work on the quiz individually and independently, simulating an exam-like environment. At the 8-minute mark, students will use the remaining 7 minutes to discuss the quiz questions with their neighbours before submitting one quiz per student at the end of the 15 minutes.

### **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 1011/1021 Midterm Examinations will occur on:

#### **Midterm Exam 1:**

Wednesday, September 25, 2019, 6:00 – 8:15 pm (covers Self-Studies A2 and A3 and Topic 1)

#### **Midterm Exam 2:**

Wednesday, October 23, 2019, 6:00 – 8:15 pm (covers WHMIS and Topics 2–6)

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.

### 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 midterm grade will be calculated based on both the individual and group midterms. The weighting of your overall midterm grade will be 90% individual and 10% group provided that the individual midterm grade is greater than 0% AND the group midterm grade is better than the individual midterm grade. Otherwise the individual midterm grade will count for 100% of your midterm grade.

Writing the group midterm can only **IMPROVE** upon your individual midterm grade. Writing a group midterm has many advantages besides a potential 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.

Group numbers will be assigned to all students: See the "Grades" section on Brightspace.

### 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 Dalhousie conflicts are checked. External conflicts, such as those involving varsity sports and travel, may require supporting documentation. Students are to make every effort to resolve all other conflicts, such as those with work and volunteer schedules. The deadlines for submission of conflicts for each midterm exam are listed below:

#### **Midterm 1 conflict form link and deadline:**

Complete the form located at <https://tinyurl.com/DalChemFallMidterm1>  
by **Wednesday, September 18, 2019** at 11:30 pm.

#### **Midterm 2 conflict form link and deadline:**

Complete the form located at <https://tinyurl.com/DalChemFallMidterm2>  
by **Wednesday, October 16, 2019** 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/DalChemSDAFall> **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. Applications to the make-up midterm exam may not be accommodated due to limited space in the make-up midterm exam rooms, or for scheduling reasons. 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 slightly based on room booking. 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 1011/1021 Final Exam will be scheduled early October 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 A2–A3, Topics 1–12 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/DalChemFallFinal>

by **Monday, November 18, 2019** 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](mailto: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

#### **Fall 2019 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, September 9, 2019

#### **Contacting Your Lab Instructor:**

The laboratory instructor team communicates with students through one common email address: [chemlab@dal.ca](mailto: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, B09, B10, B15, B16, B19, B20, B51, B52, B55, B56, B59

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**Dr. Joshua Bates**

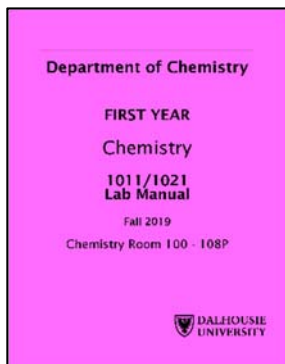
**Sections:** B01, B02, B03, B04, B07, B08, B17, B18, B53, B54, B57, B58

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**Dr. Mark Wall**

**Sections:** B11, B12, B13, B14

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**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. 1	Exp. 2	Exp. 3	Exp. 4	Exp. 5	Exp. 6	Exp. 7
B01	Mon.	Sept. 9 1:30–3pm	Sept. 16 1:30–4:30pm	Sept. 30 1:30–3pm	Oct. 7 1:30–4:30pm	Oct. 28 1:30–3pm	Nov. 4 1:30–4:30pm	Nov. 25 1:30–3pm
B02	Mon.	Sept. 9 3–4:30pm	Sept. 23 1:30–4:30pm	Sept. 30 3–4:30pm	Oct. 21 1:30–4:30pm	Oct. 28 3–4:30pm	Nov. 18 1:30–4:30pm	Nov. 25 3–4:30pm
B03	Mon.	Sept. 9 2:30–4pm	Sept. 16 2:30–5:30pm	Sept. 30 2:30–4pm	Oct. 7 2:30–5:30pm	Oct. 28 2:30–4pm	Nov. 4 2:30–5:30pm	Nov. 25 2:30–4pm
B04	Mon.	Sept. 9 4–5:30pm	Sept. 23 2:30–5:30pm	Sept. 30 4–5:30pm	Oct. 21 2:30–5:30pm	Oct. 28 4–5:30pm	Nov. 18 2:30–5:30pm	Nov. 25 4–5:30pm
B05	Tues.	Sept. 10 8:30–10am	Sept. 17 8:30–11:30am	Oct. 1 8:30–10am	Oct. 8 8:30–11:30am	Oct. 29 8:30–10am	Nov. 5 8:30–11:30am	Nov. 26 8:30–10am
B06	Tues.	Sept. 10 10–11:30am	Sept. 24 8:30–11:30am	Oct. 1 10–11:30am	Oct. 22 8:30–11:30am	Oct. 29 10–11:30am	Nov. 19 8:30–11:30am	Nov. 26 10–11:30am
B07	Tues.	Sept. 10 2:30–4pm	Sept. 17 2:30–5:30pm	Oct. 1 2:30–4pm	Oct. 8 2:30–5:30pm	Oct. 29 2:30–4pm	Nov. 5 2:30–5:30pm	Nov. 26 2:30–4pm
B08	Tues.	Sept. 10 4–5:30pm	Sept. 24 2:30–5:30pm	Oct. 1 4–5:30pm	Oct. 22 2:30–5:30pm	Oct. 29 4–5:30pm	Nov. 19 2:30–5:30pm	Nov. 26 4–5:30pm
B09	Wed.	Sept. 11 10:30am–12pm	Sept. 18 10:30am–1:30pm	Oct. 2 10:30am–12pm	Oct. 9 10:30am–1:30pm	Oct. 30 10:30am–12pm	Nov. 6 10:30am–1:30pm	Nov. 27 10:30am–12pm
B10	Wed.	Sept. 11 12–1:30pm	Sept. 25 10:30am–1:30pm	Oct. 2 12–1:30pm	Oct. 23 10:30am–1:30pm	Oct. 30 12–1:30pm	Nov. 20 10:30am–1:30pm	Nov. 27 12–1:30pm
B11	Wed.	Sept. 11 1:30–3pm	Sept. 18 1:30–4:30pm	Oct. 2 1:30–3pm	Oct. 9 1:30–4:30pm	Oct. 30 1:30–3pm	Nov. 6 1:30–4:30pm	Nov. 27 1:30–3pm
B12	Wed.	Sept. 11 3–4:30pm	Sept. 25 1:30–4:30pm	Oct. 2 3–4:30pm	Oct. 23 1:30–4:30pm	Oct. 30 3–4:30pm	Nov. 20 1:30–4:30pm	Nov. 27 3–4:30pm
B13	Wed.	Sept. 11 2:30–4pm	Sept. 18 2:30–5:30pm	Oct. 2 2:30–4pm	Oct. 9 2:30–5:30pm	Oct. 30 2:30–4pm	Nov. 6 2:30–5:30pm	Nov. 27 2:30–4pm
B14	Wed.	Sept. 11 4–5:30pm	Sept. 25 2:30–5:30pm	Oct. 2 4–5:30pm	Oct. 23 2:30–5:30pm	Oct. 30 4–5:30pm	Nov. 20 2:30–5:30pm	Nov. 27 4–5:30pm
B15	Thurs.	Sept. 12 8:30–10am	Sept. 19 8:30–11:30am	Oct. 3 8:30–10am	Oct. 10 8:30–11:30am	Oct. 31 8:30–10am	Nov. 7 8:30–11:30am	Nov. 28 8:30–10am
B16	Thurs.	Sept. 12 10–11:30am	Sept. 26 8:30–11:30am	Oct. 3 10–11:30am	Oct. 24 8:30–11:30am	Oct. 31 10–11:30am	Nov. 21 8:30–11:30am	Nov. 28 10–11:30am
B17	Thurs.	Sept. 12 2:30–4pm	Sept. 19 2:30–5:30pm	Oct. 3 2:30–4pm	Oct. 10 2:30–5:30pm	Oct. 31 2:30–4pm	Nov. 7 2:30–5:30pm	Nov. 28 2:30–4pm
B18	Thurs.	Sept. 12 4–5:30pm	Sept. 26 2:30–5:30pm	Oct. 3 4–5:30pm	Oct. 24 2:30–5:30pm	Oct. 31 4–5:30pm	Nov. 21 2:30–5:30pm	Nov. 28 4–5:30pm
B19	Fri.	Sept. 13 1:30–3pm	Sept. 20 1:30–4:30pm	Oct. 4 1:30–3pm	Oct. 11 1:30–4:30pm	Nov. 1 1:30–3pm	Nov. 8 1:30–4:30pm	Nov. 29 1:30–3pm
B20	Fri.	Sept. 13 3–4:30pm	Sept. 27 1:30–4:30pm	Oct. 4 3–4:30pm	Oct. 25 1:30–4:30pm	Nov. 1 3–4:30pm	Nov. 22 1:30–4:30pm	Nov. 29 3–4:30pm
B51	Tues.	Sept. 10 10–11:30am	Sept. 17 10am–1pm	Oct. 1 10–11:30am	<b>Oct. 15 10am–1pm</b>	Oct. 29 10–11:30am	Nov. 5 10am–1pm	Nov. 26 10–11:30am
B52	Tues.	Sept. 10 11:30am–1pm	Sept. 24 10am–1pm	Oct. 1 11:30am–1pm	Oct. 22 10am–1pm	Oct. 29 11:30am–1pm	Nov. 19 10am–1pm	Nov. 26 11:30am–1pm
B53	Tues.	Sept. 10 1–2:30pm	Sept. 17 1–4pm	Oct. 1 1–2:30pm	<b>Oct. 15 1–4pm</b>	Oct. 29 1–2:30pm	Nov. 5 1–4pm	Nov. 26 1–2:30pm
B54	Tues.	Sept. 10 2:30–4pm	Sept. 24 1–4pm	Oct. 1 2:30–4pm	Oct. 22 1–4pm	Oct. 29 2:30–4pm	Nov. 19 1–4pm	Nov. 26 2:30–4pm
B55	Thurs.	Sept. 12 10–11:30am	Sept. 19 10am–1pm	Oct. 3 10–11:30am	Oct. 10 10am–1pm	Oct. 31 10–11:30am	Nov. 7 10am–1pm	Nov. 28 10–11:30am
B56	Thurs.	Sept. 12 11:30am–1pm	Sept. 26 10am–1pm	Oct. 3 11:30am–1pm	Oct. 24 10am–1pm	Oct. 31 11:30am–1pm	Nov. 21 10am–1pm	Nov. 28 11:30am–1pm
B57	Thurs.	Sept. 12 1–2:30pm	Sept. 19 1–4pm	Oct. 3 1–2:30pm	Oct. 10 1–4pm	Oct. 31 1–2:30pm	Nov. 7 1–4pm	Nov. 28 1–2:30pm
B58	Thurs.	Sept. 12 2:30–4pm	Sept. 26 1–4pm	Oct. 3 2:30–4pm	Oct. 24 1–4pm	Oct. 31 2:30–4pm	Nov. 21 1–4pm	Nov. 28 2:30–4pm
B59	Fri.	Sept. 13 2:30–4pm	Sept. 20 2:30–5:30pm	Oct. 4 2:30–4pm	Oct. 11 2:30–5:30pm	Nov. 1 2:30–4pm	Nov. 8 2:30–5:30pm	Nov. 29 2:30–4pm

**Laboratory Assessment**

Lab Grading Scheme		Important Notes
<b>Component</b>	<b>Weight</b>	The laboratory portion of this course is <b>worth 16%</b> 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"> <li>• Preparation of the notebook prior to the laboratory period;</li> <li>• Completion of experimental work, recording data, and having notebook initialed;</li> <li>• Submitting in appropriate pre-lab assignments, Raw Data Sheets, and post-lab assignments. All reports must be your individual work.</li> </ul> <p><b><i>You must pass the lab component of the course (7.5/15) in order to pass Chem 1011/1021. The Safety Module &amp; Map are not included in this criteria; however, they must be completed to be eligible to participate in the lab program.</i></b></p>
CAPA Safety Module & Map	1%	
CAPA Pre-Labs	2%	
Preparedness	1%	
Post-Lab Reports	11%	
Time Management	1%	
<b>Total</b>	<b>16%</b>	

**Laboratory Pre-Lab and Post-Lab Grading Scheme**

Lab	Exp. 1	Exp. 2	Exp. 3	Exp. 4	Exp. 5	Exp. 6	Exp. 7	Total Points	Total (/13)
<b>Pre</b>	2	2	2	2	2	2	2	14	2
<b>Post</b>	4.5	10	5.5	10	9	12	8	59	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.** 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–2019 Fall 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 September 22, 2019.**

## 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 September 9, 2019 at 1:30 PM, their pre-lab would due on September 9, 2019 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. 1	Exp. 2	Exp. 3	Exp. 4	Exp. 5	Exp. 6	Exp. 7
B01	Sept. 16, 1:30pm	Sept. 16, 4:30pm	Oct. 7, 1:30pm	Oct. 28, 1:30pm	Oct. 28, 3:00pm	Nov. 25, 1:30pm	Nov. 25, 3:00pm
B02	Sept. 23, 1:30pm	Sept. 23, 4:30pm	Oct. 21, 1:30pm	Oct. 28, 3:00pm	Oct. 28, 4:30pm	Nov. 25, 3:00pm	Nov. 25, 4:30pm
B03	Sept. 16, 2:30pm	Sept. 16, 5:30pm	Oct. 7, 2:30pm	Oct. 28, 2:30pm	Oct. 28, 4:00pm	Nov. 25, 2:30pm	Nov. 25, 4:00pm
B04	Sept. 23, 2:30pm	Sept. 23, 5:30pm	Oct. 21, 2:30pm	Oct. 28, 4:00pm	Oct. 28, 5:30pm	Nov. 25, 4:00pm	Nov. 25, 5:30pm
B05	Sept. 17, 8:30am	Sept. 17, 11:30am	Oct. 8, 8:30am	Oct. 29, 8:30am	Oct. 29, 10:00am	Nov. 26, 8:30am	Nov. 26, 10:00am
B06	Sept. 24, 8:30am	Sept. 24, 11:30am	Oct. 22, 8:30am	Oct. 29, 10:00am	Oct. 29, 11:30am	Nov. 26, 10:00am	Nov. 26, 11:30am
B07	Sept. 17, 2:30pm	Sept. 17, 5:30pm	Oct. 8, 2:30pm	Oct. 29, 2:30pm	Oct. 29, 4:00pm	Nov. 26, 2:30pm	Nov. 26, 4:00pm
B08	Sept. 24, 2:30pm	Sept. 24, 5:30pm	Oct. 22, 2:30pm	Oct. 29, 4:00pm	Oct. 29, 5:30pm	Nov. 26, 4:00pm	Nov. 26, 5:30pm
B09	Sept. 18, 10:30am	Sept. 18, 1:30pm	Oct. 9, 10:30am	Oct. 30, 10:30am	Oct. 30, 12:00pm	Nov. 27, 10:30am	Nov. 27, 12:00pm
B10	Sept. 25, 10:30am	Sept. 25, 1:30pm	Oct. 23, 10:30am	Oct. 30, 12:00pm	Oct. 30, 1:30pm	Nov. 27, 12:00pm	Nov. 27, 1:30pm
B11	Sept. 18, 1:30pm	Sept. 18, 4:30pm	Oct. 9, 1:30pm	Oct. 30, 1:30pm	Oct. 30, 3:00pm	Nov. 27, 1:30pm	Nov. 27, 3:00pm
B12	Sept. 25, 1:30pm	Sept. 25, 4:30pm	Oct. 23, 1:30pm	Oct. 30, 3:00pm	Oct. 30, 4:30pm	Nov. 27, 3:00pm	Nov. 27, 4:30pm
B13	Sept. 18, 2:30pm	Sept. 18, 5:30pm	Oct. 9, 2:30pm	Oct. 30, 2:30pm	Oct. 30, 4:00pm	Nov. 27, 2:30pm	Nov. 27, 4:00pm
B14	Sept. 25, 2:30pm	Sept. 25, 5:30pm	Oct. 23, 2:30pm	Oct. 30, 4:00pm	Oct. 30, 5:30pm	Nov. 27, 4:00pm	Nov. 27, 5:30pm
B15	Sept. 19, 8:30am	Sept. 19, 11:30am	Oct. 10, 8:30am	Oct. 31, 8:30am	Oct. 31, 10:00am	Nov. 28, 8:30am	Nov. 28, 10:00am
B16	Sept. 26, 8:30am	Sept. 26, 11:30am	Oct. 24, 8:30am	Oct. 31, 10:00am	Oct. 31, 11:30am	Nov. 28, 10:00am	Nov. 28, 11:30am
B17	Sept. 19, 2:30pm	Sept. 19, 5:30pm	Oct. 10, 2:30pm	Oct. 31, 2:30pm	Oct. 31, 4:00pm	Nov. 28, 2:30pm	Nov. 28, 4:00pm
B18	Sept. 26, 2:30pm	Sept. 26, 5:30pm	Oct. 24, 2:30pm	Oct. 31, 4:00pm	Oct. 31, 5:30pm	Nov. 28, 4:00pm	Nov. 28, 5:30pm
B19	Sept. 20, 1:30pm	Sept. 20, 4:30pm	Oct. 11, 1:30pm	Nov. 1, 1:30pm	Nov. 1, 3:00pm	Nov. 29, 1:30pm	Nov. 29, 3:00pm
B20	Sept. 27, 1:30pm	Sept. 27, 4:30pm	Oct. 25, 1:30pm	Nov. 1, 3:00pm	Nov. 1, 4:30pm	Nov. 29, 3:00pm	Nov. 29, 4:30pm
B51	Sept. 17, 10:00am	Sept. 17, 1:00pm	Oct. 15, 10:00am	Oct. 29, 10:00am	Oct. 29, 11:30am	Nov. 26, 10:00am	Nov. 26, 11:30am
B52	Sept. 24, 10:00am	Sept. 24, 1:00pm	Oct. 22, 10:00am	Oct. 29, 11:30am	Oct. 29, 1:00pm	Nov. 26, 11:30am	Nov. 26, 1:00pm
B53	Sept. 17, 1:00pm	Sept. 17, 4:00pm	Oct. 15, 1:00pm	Oct. 29, 1:00pm	Oct. 29, 2:30pm	Nov. 26, 1:00pm	Nov. 26, 2:30pm
B54	Sept. 24, 1:00pm	Sept. 24, 4:00pm	Oct. 22, 1:00pm	Oct. 29, 2:30pm	Oct. 29, 4:00pm	Nov. 26, 2:30pm	Nov. 26, 4:00pm
B55	Sept. 19, 10:00am	Sept. 19, 1:00pm	Oct. 10, 10:00am	Oct. 31, 10:00am	Oct. 31, 11:30am	Nov. 28, 10:00am	Nov. 28, 11:30am
B56	Sept. 26, 10:00am	Sept. 26, 1:00pm	Oct. 24, 10:00am	Oct. 31, 11:30am	Oct. 31, 1:00pm	Nov. 28, 11:30am	Nov. 28, 1:00pm
B57	Sept. 19, 1:00pm	Sept. 19, 4:00pm	Oct. 10, 1:00pm	Oct. 31, 1:00pm	Oct. 31, 2:30pm	Nov. 28, 1:00pm	Nov. 28, 2:30pm
B58	Sept. 26, 1:00pm	Sept. 26, 4:00pm	Oct. 24, 1:00pm	Oct. 31, 2:30pm	Oct. 31, 4:00pm	Nov. 28, 2:30pm	Nov. 28, 4:00pm
B59	Sept. 20, 2:30pm	Sept. 20, 5:30pm	Oct. 11, 2:30pm	Nov. 1, 2:30pm	Nov. 1, 4:00pm	Nov. 29, 2:30pm	Nov. 29, 4:00pm

### 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
1	Sept. 27	Sept. 27	Mon., Sept. 30, <b>before</b> 1:30pm
2	Sept. 27	Oct. 4	<i>In-lab submission only</i>
3	Oct. 11	Oct. 11	Mon., Oct. 28, <b>before</b> 1:30pm
4	Oct. 25	Nov. 1	Mon., Nov. 4, <b>before</b> 1:30pm
5	Nov. 8	Nov. 8	<i>In-lab submission only</i>
6	Nov. 22	Nov. 29	Mon., Dec. 2, <b>before</b> 1:30pm
7	Nov. 29	Nov. 29	<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, B11, B13, B15, B17, B19, B51, B53, B55, B57, B59

**Group B:** B02, B04, B06, B08, B10, B12, B14, B16, B18, B20, 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 1011/1021 in Fall 2019 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, Fall 2020, 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	Resource Centre Assist.	Lab Support	Lab Support	Lab Support
11:00am – 12:00pm		Resource Centre Assist.			Concept Room (M. Stradiotto)
12:00 – 1:00pm	Concept Room (H. Andreas)		Lab Support	Resource Centre Assist.	
1:00 – 2:00pm		Resource Centre Assist.			Concept Room (A. Crane)
2:00 – 3:00pm	Resource Centre Assist.		Resource Centre Assist.	Resource Centre Assist.	
3:00 – 4:00pm		Resource Centre Assist.			Resource Centre Assist.
4:00 – 5:00pm	Resource Centre Assist.		Resource Centre Assist.	Resource Centre Assist.	

**Concept Room and Resource Centre opens: Thursday, September 5, 2019**  
**closes: Tuesday, December 3, 2019**

***The Concept Room Staff***

Dr. Angela Crane



Dr. Heather Andreas



Dr. Joshua Bates



Dr. Marc Whalen



Dr. Mark Stradiotto



## 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 Life Sciences Centre, Room 240.*** 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., Sept. 9	Self-Studies A1 – A3	<a href="https://www.tinyurl.com/DalChemFall-WS1">https://www.tinyurl.com/DalChemFall-WS1</a>
2	Mon., Sept. 16	Topic 1	<a href="https://www.tinyurl.com/DalChemFall-WS2">https://www.tinyurl.com/DalChemFall-WS2</a>
3	Mon., Sept. 23	Topic 1 & 2	<a href="https://www.tinyurl.com/DalChemFall-WS3">https://www.tinyurl.com/DalChemFall-WS3</a>
4	Mon., Sept. 30	Topic 3 & 4	<a href="https://www.tinyurl.com/DalChemFall-WS4">https://www.tinyurl.com/DalChemFall-WS4</a>
5	Mon., Oct. 7	Topic 5	<a href="https://www.tinyurl.com/DalChemFall-WS5">https://www.tinyurl.com/DalChemFall-WS5</a>
–	Mon., Oct. 14	<i>No Workshop – Thanksgiving Day – University Closed</i>	
6	Mon., Oct. 21	Topic 6 & 7	<a href="https://www.tinyurl.com/DalChemFall-WS6">https://www.tinyurl.com/DalChemFall-WS6</a>
7	Mon., Oct. 28	Topic 8	<a href="https://www.tinyurl.com/DalChemFall-WS7">https://www.tinyurl.com/DalChemFall-WS7</a>
8	Mon., Nov. 4	Topic 9	<a href="https://www.tinyurl.com/DalChemFall-WS8">https://www.tinyurl.com/DalChemFall-WS8</a>
–	Mon., Nov. 11	<i>No Workshop – Remembrance Day – University Closed</i>	
9	Mon., Nov. 18	Topic 10	<a href="https://www.tinyurl.com/DalChemFall-WS9">https://www.tinyurl.com/DalChemFall-WS9</a>
10	Mon., Nov. 25	Topic 11	<a href="https://www.tinyurl.com/DalChemFall-WS10">https://www.tinyurl.com/DalChemFall-WS10</a>
11	Mon., Dec. 2	Topic 12	<a href="https://www.tinyurl.com/DalChemFall-WS11">https://www.tinyurl.com/DalChemFall-WS11</a>

## 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
<b>Midterm 1</b>	Mon., Sept. 23, 2019	7–9pm	Ondaatje Hall, McCain Building
<b>Midterm 2</b>	Mon., Oct. 21, 2019	7–9pm	Ondaatje Hall, McCain Building
<b>Final Exam</b>	Wed., Dec. 4, 2019	10am–12pm	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 electronic structures of atoms and molecules are used to explain the reactivity and properties of chemicals. Topics include atomic structure, bonding models, structure and shape of molecules and ions, and acid/base chemistry.

It is recommended that students have Nova Scotia grade 12 chemistry or equivalent before taking this course.

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 orbitals and molecules using atomic and bonding theories.
- Predict, compare and explain properties of atoms and molecules using electronic and energetic arguments.
- Practice proper laboratory techniques including pipetting, titrating, and centrifuging, while maintaining safety standards in the context of a chemical laboratory.
- Analyze and interpret observations and data to arrive at experiment conclusions.
- Report laboratory observations and data in an organized and logical manner.

### Course Content

**Self Study A1:  
Mathematics in Chemistry**

- Accuracy and Precision
- Significant Figures
- Multiple Measurements: Averages and Standard Deviations
- Logarithms/Mathematics and Chemistry
- Solving Problems Using Dimensional Analysis

<b>Self Study A2: Introduction to Chemistry</b>	<ul style="list-style-type: none"> <li>• Element Names and Symbols</li> <li>• Cations, Anions and Regions of the Periodic Table</li> <li>• Naming Inorganic Compounds (Nomenclature)</li> <li>• Fundamental Units of Measurement for Chemistry</li> <li>• Molecules, Molecular Formulae, Molecular Mass and Formula Mass</li> <li>• The Mole, Avogadro's Number and Molar Mass</li> <li>• Empirical Formula and Mass Percent</li> <li>• Writing Chemical Equations</li> <li>• Procedure for Balancing Chemical Equations</li> <li>• Stoichiometry and Mass</li> <li>• Determining the Limiting Reagent</li> <li>• Actual, Theoretical, and Percent Yield</li> </ul>
<b>Self Study A3: Quantitative Description of Aqueous Solutions</b>	<ul style="list-style-type: none"> <li>• General Characteristics of Aqueous Solutions</li> <li>• Solution Concentration</li> <li>• Mass Percent</li> <li>• Mole Fraction</li> <li>• Molarity</li> <li>• Dilution</li> <li>• Reactions Involving Aqueous Solutions</li> </ul>
<b>Topic 1: Atomic Structure</b>	<ul style="list-style-type: none"> <li>• Subatomic Particles</li> <li>• Mass Number, Isotopes, and Average Atomic Mass</li> <li>• Electromagnetic Radiation: A Useful Probe of Atomic Structure</li> <li>• Atomic Line Spectra and the Bohr Model</li> <li>• Quantum Mechanics</li> <li>• Shapes of Atomic Orbitals</li> </ul>
<b>Topic 2: The Periodic Table</b>	<ul style="list-style-type: none"> <li>• Pauli Exclusion Principle and Hund's Rule</li> <li>• Relative Energies of Atomic Orbitals</li> <li>• Electron Configurations</li> <li>• Valence and Core Electrons</li> <li>• The Periodic Table and Electron Configurations</li> </ul>
<b>Topic 3: Periodic Properties of the Elements</b>	<ul style="list-style-type: none"> <li>• Effective Nuclear Charge</li> <li>• Atomic Size</li> <li>• The Size of Ions</li> <li>• Ionization Energy</li> <li>• Electron Affinity</li> <li>• Electronegativity</li> <li>• Solid State Properties: Metals, Metalloids, and Non-Metals</li> </ul>
<b>Topic 4: Chemical Bonding</b>	<ul style="list-style-type: none"> <li>• Electrostatic Interactions and Ionic Bonding</li> <li>• Covalent Bonding</li> </ul>
<b>Topic 5: Molecular Orbital Theory</b>	<ul style="list-style-type: none"> <li>• Delocalized Electron Model</li> <li>• Molecular Orbital Diagram for Dihydrogen</li> <li>• Second Row Diatomic Molecules</li> </ul>
<b>Topic 6: The Lewis Bonding Model</b>	<ul style="list-style-type: none"> <li>• Lewis Structures</li> <li>• Procedure for Drawing Lewis Structures (Method 1)</li> <li>• Procedure for Drawing Lewis Structures (Method 2)</li> <li>• Lewis Structures for Structural Isomers</li> <li>• Resonance, Energy Equivalent Structures, and "Curly Arrows"</li> <li>• Limitations of the Lewis Bonding Model</li> </ul>
<b>Topic 7: Molecular Structure and the VSEPR Model</b>	<ul style="list-style-type: none"> <li>• The Principles of the VSEPR Model</li> <li>• Procedure for Predicting Molecular Shape</li> </ul>
<b>Topic 8: Valence Bond Theory (Hybridization)</b>	<ul style="list-style-type: none"> <li>• <math>\sigma</math> Bonds (Sigma Bonds)</li> <li>• Hybridizing Atomic Orbitals to Make <math>\sigma</math> Bonds</li> <li>• Unhybridized <math>p</math> Orbitals and <math>\pi</math> Bonds (Pi Bonds)</li> <li>• Hybridization in Compounds Containing Heavy Metals</li> <li>• Compounds Involving Lone Pairs in Hybrid Orbitals</li> </ul>
<b>Topic 9: Bond Polarity and Molecular Polarity</b>	<ul style="list-style-type: none"> <li>• Electronegativity and Bond Polarity</li> <li>• Molecular Polarity and Dipole Moment</li> <li>• Non-covalent Intermolecular and Inter-ion Interactions</li> </ul>
<b>Topic 10: Qualitative View of Acid-Base Equilibria in Aqueous Solution</b>	<ul style="list-style-type: none"> <li>• Strong Acids and Bases</li> <li>• Weak Acids and Weak Bases</li> <li>• The Equilibrium Constant</li> <li>• Auto-dissociation of Water</li> <li>• <math>pK_a</math> and <math>pK_b</math></li> <li>• Polyprotic Acids</li> <li>• Structural Influences on the Magnitude of <math>pK_a</math> or <math>pK_b</math></li> </ul>
<b>Topic 11: Quantitative Acid-Base Chemistry in Aqueous Solution</b>	<ul style="list-style-type: none"> <li>• pH and pOH</li> <li>• Acid-Base Reactions</li> <li>• Titrations Involving Strong Acids and Strong Bases</li> <li>• Determining the pH for Solutions of Weak Acids and Weak Bases</li> <li>• Solutions of Acidic and Basic Salts</li> </ul>

<b>Topic 12:</b> <b>Applications of Acid-Base Equilibria:</b> <b>Buffer Solutions</b>	<ul style="list-style-type: none"><li>• Buffer Solutions from a Weak Acid and Its Conjugate Base</li><li>• Henderson-Hasselbalch Equation</li><li>• Buffering Action</li><li>• Buffer Solutions from Weak Acids (Bases) and Strong Bases (Acids)</li><li>• Preparation of Buffer Solutions of a Desired pH</li></ul>
<b>Laboratory Experiments:</b>	<ul style="list-style-type: none"><li>• Exp. 1 – Relative Solubilities &amp; Limiting Reagents</li><li>• Exp. 2 – Qualitative Identification of the Cations</li><li>• Exp. 3 – Using indicators to Distinguish Acids, Bases, and Salts</li><li>• Exp. 4 – Laboratory Techniques</li><li>• Exp. 5 – Bonding Theories and Molecular Models</li><li>• Exp. 6 – Acid/Base Titrations</li><li>• Exp. 7 – Investigating <math>pK_a</math> of Weak Acid, Buffer Preparation, and Buffer Capacity</li></ul>

## 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](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](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](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](mailto:elders@dal.ca)).

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

**Research Lab Safety:**

[https://www.dal.ca/content/dam/dalhousie/pdf/dept/safety/lab\\_policy\\_manual\\_2007.pdf](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>