DALHOUSIE UNIVERSITY

Winter 2019

Faculty of Science Course Syllabus
Department of Chemistry

CHEM 1012/1022

Concepts in Chemistry: Energy and Equilibrium

First Year Chemistry Coordinator

Dr. Angela Crane

Email: chemlect@dal.ca

Please use your Dalhousie email account for all course correspondence. Allow up to 3 business days for a response. Emails sent in the evening or on weekends may not be seen until the next business day.

Phone: 902−494−6143

Office: Chemistry 1052

First Year Chemistry Lecturers

Dr. Aaron Kelly

Jan 7-Feb 15

Dr. Saurabh Chitnis

Feb 25-Apr 8

Chem 1022 (Sections 01)
Time: 8:35 am – 9:25 am
Location: Scotiabank Auditorium, McCain Building

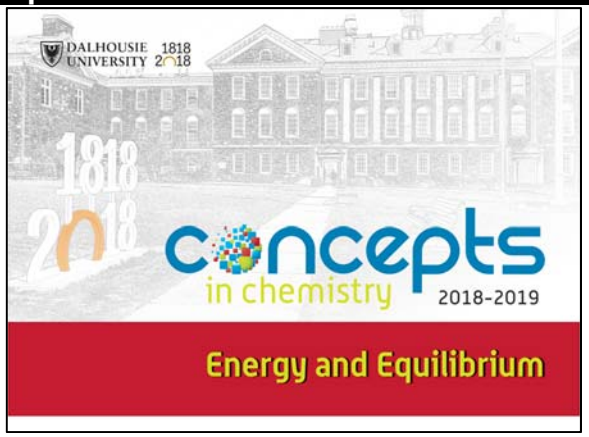
Chem 1022 (Section 02)
Time: 9:35 am – 10:25 am
Location: Scotiabank Auditorium, McCain Building

Dr. Angela Crane

Chem 1012 (Section 01)
Time: 9:35 am – 10:25 am
Location: Ondaatje Hall, McCain Building

Chem 1012 (Sections 02)
Time: 10:35 am – 11:25 am
Location: Ondaatje Hall, McCain Building

Required Materials



Textbook
Concepts in Chemistry:
energy and Equilibrium (2018−19 Ed.)

Available at the Dalhousie Bookstore ($73.15)

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

First Year Chemistry Lab Coordinator

Dr. Jennifer MacDonald

Email: chemlab@dal.ca

Please use your Dalhousie email account for all course correspondence. Allow up to 3 business days for a response. Emails sent in the evening or on weekends may not be seen until the next business day.

Phone: 902−494−2440

Office: Chemistry 108

Labs

Location:
Basement of the Chemistry Building
Room 100−108P

Winter 2019 Lab Schedule:
The lab schedule is posted on Brightspace and can be found in the calendar on pages 3−5 and 12−13 of the syllabus.

Labs Begin:
Monday, January 14th, 2019

Lab Instructors

Dr. Jennifer MacDonald

Dr. Gianna Aleman

Dr. Joshua Bates

Dr. Mark Wall

Required Materials: Mandatory for All Labs

Lab Manual
Available from the Dalhousie Bookstore ($22.00)

Hardcover Lab Notebook
Available from the Dalhousie Bookstore (~$6.95)

Safety Glasses
Must be stamped with standards numbers of:
CSA−Z94−3 or ANSI Z87
Available from the Dalhousie Bookstore (~$4.95)

Knee−length Lab Coats (100% cotton)
Available from the Dalhousie Bookstore (~$19.95 − 24.95)

Important Dates

Note: Topic schedule for lectures is tentative. Test, exam, quiz, and due dates/deadlines are fixed.

	Monday	Tuesday	Wednesday	Thursday	Friday
	January 7	***January 8***	***January 9***	***January 10***	***January 11***
Resource Centre Assist.	RC open for study, but no RCAs for help; RCAs start January 8th	12–1:30pm 3–5pm	1–3pm	2–5pm	1–5pm
RC Lab Support		1:30–3pm	10am–1pm	10am–12:30pm	10-11:30am
***Concept* Room**	1:30–3:30pm	10am–12pm	3–5pm	12–2pm	11am–1pm
Lectures	Intro		SSB2: Gases & T14: Equilibrium		T14: Equilibrium
Labs	No Lab				
Labs Due	Safety Module				
	January 14	***January 15***	***January 16***	***January 17***	***January 18***
Resource Centre Assist.	11:30am–1:30pm 3:30–5pm	12–1:30pm 3–5pm	1–3pm	2–5pm	1–5pm
RC Lab Support	10–11:30am	1:30–3pm	10am–1pm	10am–12:30pm	10-11:30am
***Concept* Room**	1:30–3:30pm	10am–12pm	3–5pm	12–2pm	11am–1pm
Lectures	T14: Equilibrium		T14: Equilibrium		T15: First Law
Quizzes					Quiz 1: SSB2 and T14
Labs	Exp. 8 & 9: Group A & B				
Labs Due					
Impt. Deadlines					Last day to add/drop
	January 21	***January 22***	***January 23***	***January 24***	***January 25***
Resource Centre Assist.	11:30am–1:30pm 3:30–5pm	12–1:30pm 3–5pm	1–3pm	2–5pm	1–5pm
RC Lab Support	10–11:30am	1:30–3pm	10am–1pm	10am–12:30pm	10-11:30am
***Concept* Room**	1:30–3:30pm	10am–12pm	3–5pm	12–2pm	11am–1pm
Lectures	T15: First Law		T15: First Law		T15: First Law
Quizzes					Quiz 2: T14 and T15
Lect. CAPA due	Syllabus Module*				
Labs	Exp. 10: Group A & B				
Labs Due	Exp. 8 & 9: Group A & B				
	January 28	***January 29***	***January 30***	***January 31***	***February 1***
Resource Centre Assist.	11:30am–1:30pm 3:30–5pm	12–1:30pm 3–5pm	1–3pm	2–5pm	**Munro Day** ***University Closed***
RC Lab Support	10–11:30am	1:30–3pm	10am–1pm	10am–12:30pm	
***Concept* Room**	1:30–3:30pm	10am–12pm	3–5pm	12–2pm	
Lectures	T16: Hess's Law		T16: Hess's Law		
Lect. CAPA due				Review Assign. 11:30pm	
Labs	Exp. 11: Group A				
Labs Due	Exp. 10: Group A				
Impt. Deadlines	Last Date to Submit Exp. 8 & 9 BEFORE 1:30 PM				
	February 4	***February 5***	***February 6***	***February 7***	***February 8***
Resource Centre Assist.	11:30am–1:30pm 3:30–5pm	12–1:30pm 3–5pm	1–3pm	2–5pm	1–5pm
RC Lab Support	10–11:30am	1:30–3pm	10am–1pm	10am–12:30pm	10-11:30am
***Concept* Room**	1:30–3:30pm	10am–12pm	3–5pm	12–2pm	11am–1pm
Lectures	T17: Entropy		T17: Entropy		T18: Gibb's
SfS		4-5:30pm LSC240		4-5:30pm LSC240	
Quizzes					Quiz 3: T16, T17
Lect. CAPA due					Pre-Test 1 Assign. 11:30pm
Labs	Exp. 11: Group B				
Labs Due	Exp. 10: Group B				
Impt. Deadlines	Last Day to drop w/o W				

	February 11	***February 12***	***February 13***	***February 14***	***February 15***
Resource Centre Assist.	11:30am–1:30pm 3:30–5pm	12–1:30pm 3–5pm	1–3pm	2–5pm	1–5pm
RC Lab Support	10–11:30am	1:30–3pm	10am–1pm	10am–12:30pm	10-11:30am
***Concept* Room**	1:30–3:30pm	10am–12pm	3–5pm	12–2pm	11am–1pm
Lectures	T18: Gibb's		T19: Partitioning		T19: Partitioning
Review Sessions & SfS	Review Session: 7–9pm, Ondaatje				
Tests			Test 1: SSB2, T14, T15, T16, T17		
Labs	Exp. 12 & 13: Group A				
Labs Due	Exp. 11: Group A				
Impt. Deadlines	Last Date to Submit Exp. 10 BEFORE 1:30 PM				
	February 18	***February 19***	***February 20***	***February 21***	***February 22***
Resource Centre Assist.	RC open for study, but no RCAs for help; Study Break Week				
RC Lab Support	RC open for study, but no RCAs for help; Study Break Week				
***Concept* Room**	1–2pm	1–2pm	1–2pm	1–2pm	1–2pm
Lectures	No Lectures; Study Break Week				
Labs	No Labs; Study Break Week				
Labs Due	No Labs Due; Study Break Week				
	February 25	***February 26***	***February 27***	***February 28***	***March 1***
Resource Centre Assist.	11:30am–1:30pm 3:30–5pm	12–1:30pm 3–5pm	1–3pm	2–5pm	1–5pm
RC Lab Support	10–11:30am	1:30–3pm	10am–1pm	10am–12:30pm	10-11:30am
***Concept* Room**	1:30–3:30pm	10am–12pm	3–5pm	12–2pm	11am–1pm
Lectures	T20: Electrochem		T20: Electrochem		T20: Electrochem
Quizzes					Quiz 4: T18, T19
Lect. CAPA due					
Labs	Exp. 12 & 13: Group B				
Labs Due	Exp. 11: Group B				
	March 4	***March 5***	***March 6***	***March 7***	***March 8***
Resource Centre Assist.	11:30am–1:30pm 3:30–5pm	12–1:30pm 3–5pm	1–3pm	2–5pm	1–5pm
RC Lab Support	10–11:30am	1:30–3pm	10am–1pm	10am–12:30pm	10-11:30am
***Concept* Room**	1:30–3:30pm	10am–12pm	3–5pm	12–2pm	11am–1pm
Lectures	T21: Organic		T21: Organic		T21: Organic
Labs	Exp. 14: Group A & B				
Labs Due	Exp. 12 & 13: Group A & B				
Impt. Deadlines	Last Date to Submit Exp. 11 BEFORE 1:30 PM				
	March 11	***March 12***	***March 13***	***March 14***	***March 15***
Resource Centre Assist.	11:30am–1:30pm 3:30–5pm	12–1:30pm 3–5pm	1–3pm	2–5pm	1–5pm
RC Lab Support	10–11:30am	1:30–3pm	10am–1pm	10am–12:30pm	10-11:30am
***Concept* Room**	1:30–3:30pm	10am–12pm	3–5pm	12–2pm	11am–1pm
Lectures	T21: Organic		T22: Spectroscopy		T22: Spectroscopy
SfS		4-5:30pm LSC240		4-5:30pm LSC240	
Quizzes					Quiz 5: T20, T21
Lect. CAPA due					Pre-Test 2 Assign. 11:30pm
Labs	Exp. 15: Group A & B				
Labs Due	Exp. 14: Group A & B				
Impt. Deadlines	Last day to drop w/ W Last Date to Submit Exp. 12 & 13 BEFORE 1:30 PM				

	March 18	***March 19***	***March 20***	***March 21***	***March 22***
Resource Centre Assist.	11:30am–1:30pm 3:30–5pm	12–1:30pm 3–5pm	1–3pm	2–5pm	1–5pm
RC Lab Support	10–11:30am	1:30–3pm	10am–1pm	10am–12:30pm	10-11:30am
***Concept* Room**	1:30–3:30pm	10am–12pm	3–5pm	12–2pm	11am–1pm
Lectures	T23: Organic Rxns		T23: Organic Rxns		T24: Rates of Rxns
Review Sessions	Review Session: 7–9pm, Ondaatje				
Tests			Test 2: SSB3, T18, T19, T20, T21		
Labs	No Labs				
Labs Due	No Labs Due				
	March 25	***March 26***	***March 27***	***March 28***	***March 29***
Resource Centre Assist.	11:30am–1:30pm 3:30–5pm	12–1:30pm 3–5pm	1–3pm	2–5pm	1–5pm
RC Lab Support	10–11:30am	1:30–3pm	10am–1pm	10am–12:30pm	10-11:30am
***Concept* Room**	1:30–3:30pm	10am–12pm	3–5pm	12–2pm	11am–1pm
Lectures	T24: Rates of Rxns		T24: Rates of Rxns		T25: Mechanisms
Quizzes					Quiz 6: T22, T23, T24
Labs	Exp. 16: Group A				
Labs Due	Exp. 15: Group A				
Impt. Deadlines	Last Date to Submit Exp. 14 BEFORE 1:30 PM				
	April 1	***April 2***	***April 3***	***April 4***	***April 5***
Resource Centre Assist.	11:30am–1:30pm 3:30–5pm	12–1:30pm 3–5pm	1–3pm	2–5pm	1–5pm
RC Lab Support	10–11:30am	1:30–3pm	10am–1pm	10am–12:30pm	10-11:30am
***Concept* Room**	1:30–3:30pm	10am–12pm	3–5pm	12–2pm	11am–1pm
Lectures	T25: Mechanisms		T26: Polymers		T26: Polymers
SfS				4-5:30pm LSC240	4-5:30pm LSC240
Labs	Exp. 16: Group B				
Labs Due	Exp. 15: Group B				
Impt. Deadlines					Last Date to Submit Exp. 15 BEFORE 1:30 PM
	April 8	***April 9***			
Resource Centre Assist.	11:30am–1:30pm 3:30–5pm	No RC; classes over	***The Winter Exam Period is from April 10th to 26th, 2019, inclusive. The exact date, time, and location of the Chemistry 1012/1022 Final Exam will be announced in class and on Brightspace as soon as it has been scheduled and confirmed (approximately mid−February).***		
Resource Centre Lab	10–11:30am				
***Concept* Room**	1:30–3:30pm	No Concept Room			
Lectures	Review	Classes over			
Review Sessions & SfS		Review Session: 10am–12pm, Ondaatje			
Tests & Quizzes	Quiz 7: T24, T25, T26				
Lect. CAPA due	Pre-Final Assign. & Homework; 11:30pm				
Labs	No Lab				
Labs Due	No Lab Submissions Accepted.				

∗ Completion of CAPA Syllabus Module is required for all students. This module covers how to use this syllabus document, as well as identifying academic integrity cases that are specific to our chemistry course. No grades are assigned to this module, however failure to complete the syllabus module may result in grades being withheld from posting on Brightspace.

Course Assessment

Grading Scheme

Component	Weight
CAPA Homework (Top 50% count)	2%
Lect. CAPA Assignments (4 Assignments)	8% *2% each*
In−class quizzes (Best 5 of 7 count)	5%
Laboratory	15%
Test 1 Feb. 13, 2019 6:30−8:45 pm	30% *20% for best test, 10% for other test*
Test 2 Mar. 20, 2019 6:30−8:45 pm	
Final Exam	40%
Total	**100%**

Important Notes

1. In order to obtain a passing grade in Chem 1012/1022, you must meet all of the following criteria:
   - Obtain at least a grade of 35/70 on the testing component of the course (i.e., on the combined test and final exam grades).
   - Obtain at least a grade of 7.5/15 on the lab component of the course.
   - 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. If you miss a test/exam, please follow the missed test/exam policy outlined on page 9.
3. 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.
4. Under emergency circumstances that have a serious impact on the delivery of this class, there may be a need to alter the syllabus.

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.

Lecture Component

CAPA Homework Problems (2%)

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 tests and exams. Students are required to complete a **minimum of 50% of the homework questions on CAPA** throughout the term **worth 2% of the final grade**. All homework to be graded must be completed by **11:30 pm on Monday, April 8th, 2019**. "Student Declaration of Absence" forms cannot be applied to the course homework, as the homework is an ongoing full-term activity.

CAPA Assignments (8%)

Assignment	Topic(s)	Due Date 11:30pm
Review Assignment	Self-Study B1	Thurs., Jan. 31
Pre−Test 1 Assignment	Self-Study B2, T14, T15, T16, T17	Fri., Feb. 8
Pre−Test 2 Assignment	Self-Study B3, T18, T19, T20, T21	Fri., Mar. 15
Pre-Final Exam Assignment	T22, T23, T24, T25, T26	Mon., Apr. 8

There are 4 online assignments each consisting of ***test−like*** questions. Each assignment is **worth 2%** and the content of each assignment is listed in the table to the left. All assignments are open for completion effective January 7th, 2019. "Student Declaration of Absence" forms cannot be applied to course assignments, as the assignments are open for longer than 3 days.

For help with CAPA questions please visit the Resource Centre or *Concept* Room. In addition, you may press "Send Feedback" at the bottom of the page for the specific CAPA question.

Note: You will be given **three tries at each question** to obtain your desired grade for most questions. You will only be given only **one** try for True/False questions. **The deadline for each assignment will be strictly adhered to, NO EXCEPTIONS.**

In−class Quizzes (5%)

Quiz #	Quiz Date
1	Fri., Jan. 18
2	Fri., Jan. 25
3	Fri., Feb. 8
4	Fri., Mar. 1
5	Fri., Mar. 15
6	Fri., Mar. 29
7	Mon., Apr. 8

There are 7 in−class quizzes, based on the material learned in the ***previous lectures*** (see calendar on pages 3-5 for topics).

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

In−class quizzes will occur at the beginning of the lecture and last 10 minutes. Each quiz will contain ***test−like*** questions. These questions may be multiple choice or free−response. ***Only those answers submitted on the bubble page will be graded.***

Please be on−time to class on quiz days. 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.

Allowed Materials for In−class Quizzes:

- ***Dark Pen (blue or black ink) or dark pencil***.
- ***Non−programmable calculator*****:** programmable calculators or any other electronic devices are not permitted during quizzes, tests, or exam.

All constants and equations, and a periodic table will be provided to you when writing each quiz. **NO additional resources are permitted in the in−class quizzes.**

Tests and Exams (30% Tests, 40% Exam)

The **Chem 1012/1022 Midterm Tests** will occur on:

Test 1:
Wednesday, February 13th, 2019, 6:30 – 8:45 pm (covers Self−Study B2 and Topics 14−17)

Test 2:
Wednesday, March 20th, 2019, 6:30 – 8:45 pm (covers Self−Study B3 and Topics 18−21)

The **Chem 1012/1022 Final Exam** will be scheduled mid−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.***

The final exam covers ***ALL material*** (Self-studies B2−B3 and Topics 14−26) and will be ***3 hours*** in length.

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

The format of the **TESTS** will be:
6:30 − 7:30 pm: Individual Test (**Mandatory**)
7:45 − 8:45 pm: Group Test (*Optional, but strongly suggested*)

For those students choosing to complete a group test, your test grade will be calculated based on both the individual and group tests. The weighting of your overall test grade will be 90% individual and 10% group provided that the individual test grade is greater than 0% AND the group test grade is better than the individual test grade. Otherwise the individual test grade will count for 100% of your test grade.

Writing the group test can only **IMPROVE** upon your individual test grade. Writing a group test has many advantages besides a potential increase in grade, such as discussing chemistry with your peers, learning from your mistakes immediately after writing a test, clearing up misconceptions you may have had, and an overall reduction in test anxiety. The group test 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.

The format of the **FINAL EXAM** will be an ***individual assessment only.***

All tests and exams consist of multiple choice or free−response questions. ***Only those answers submitted on the bubble page will be graded.***

Allowed Materials for Tests and Exams:

- ***Dark Pen (blue or black ink) or dark pencil***.
- ***Non−programmable calculator*****:** programmable calculators or any other electronic devices are not permitted during quizzes, tests, or exam.

All constants and equations, and a periodic table will be provided to you when writing each test/exam. A copy of this Data Sheet will be available on Brightspace at the beginning of term. **NO additional resources are permitted in the midterm tests and exam.**

Test/Exam Conflicts: If you have a conflict with a test or final exam, you must contact the First Year Chemistry Coordinator by filling out the "Test Conflict Registration" form found on Brightspace **before the deadlines listed below.** After each deadline, you will be notified of your alternative test or exam writing time and location. Conflicts include, but are not limited to, direct overlap of the chemistry test/exam with another test/exam or another class you are registered for. All internal Dalhousie conflicts are checked. External conflicts will 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 test and exam are listed below:

***Test 1 conflict form link and deadline**:*
Complete the form located at **https://tinyurl.com/DalChemTest1Winter**
by **Wednesday, February 6th, 2019** at 11:30 pm.
***Test 2 conflict form link and deadline**:*
Complete the form located at **https://tinyurl.com/DalChemTest2Winter**
by **Wednesday, March 13th, 2019** at 11:30 pm.
***Final Exam conflict form link and deadline**:*
Complete the form located at **https://tinyurl.com/DalChemFinalWinter**
by **Monday, March 25th, 2019** at 11:30 pm.

Missed Tests: If you miss a test, 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 test. At this time students will have the opportunity to apply for a make-up test to occur on the Friday evening following the regularly scheduled test. Applications to the make-up tests may not be accommodated due to limited space in the make-up test rooms. In the case that a make-up test is not written, the weight of the test that was missed will be 10% and transferred to the final exam. If both tests are missed, and two "Student Declaration of Absence" forms are submitted, a 70% final exam will result, as all testing component weight will shift to the final exam.

Missed Final Exam: If you miss a final exam, you must contact the First Year Chemistry Coordinator (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 an 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.

Academic Integrity: All in−class quizzes, individual tests, and final examinations are to be completed by each student ***independently***. In cases of cheating or collaboration on these assessments, aiding another student in committing an offense is also punishable. **Submitted assessments suspected of any academic integrity (AI) offense will be investigated, with penalties for confirmed offenses typically being a deduction of 5% from the final course grade for in−class quizzes or a deduction of 15% from the final course grade for test. AI offenses on a final exam are extremely serious and could result in course failure.**
While students must complete their own work individually, students are reminded that there is help available in The *Concept* Room and Chemistry Resource Centre.

Laboratory Component

The lab instructors are responsible for making all decisions concerning the running and grading of the labs. Queries concerning the laboratories should be directed to them by emailing chemlab@dal.ca. ***You must pass the lab component of the course (7.5/15) in order to pass Chem 1012/1022.***

Student Safety in the Undergraduate Laboratories

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 in your lab manual, obtaining a perfect mark (i.e. 100%) on the Safety Module (located in CAPA on the First Year Chemistry Labs−2019 Winter site), and completing the lab map during your first time in lab. 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 13th, 2019. If you completed the Chemistry Safety Module as part of Chem 1011/1021 during the Fall 2018 term, your score will be transferred to your Chem 1012/1022 course.

Laboratory Format, Expectations, and Policies

Experimental work must be completed during the scheduled time for your particular section. Attendance is mandatory. Before leaving your first lab period, make sure that you understand your Lab Schedule (posted on Brightspace).

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 report (the Grade Sheet found in the lab manual). Refer to the tables on pages 12−13 of the syllabus for more information about point values and due dates. Written reports **must be completed in dark pen (blue or black ink).**

Laboratory Assessment

The laboratory portion of this course is **worth 15%** of the final grade. See the table on page 12 of the syllabus for the point value of each experiment. All experiments have a pre−lab component as well as a report. A completed lab consists of:

- 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.

Failure to complete any **one** of the above will result in loss of the value of the experiment.

CAPA Pre−Lab Assignments: The online pre−lab assignments have been developed to help you prepare for the lab. CAPA pre−labs are due 5 minutes before your scheduled lab. **The deadline for each pre-lab assignment will be strictly adhered to, NO EXCEPTIONS.** We encourage you to start early to ensure you are able to get help with the questions that cause you difficulty. We have done our best to ensure that the questions are free from errors. However, if you feel there is an error you can apply for a grade adjustment by selecting the "Send Feedback" at the bottom of the page for the specific CAPA question. Make sure you explain why you feel your grade should be adjusted before sending your message.

Preparedness: You are expected to come to lab prepared. If you are unprepared (*i.e.* did not attempt to complete CAPA pre−lab questions and/or did not properly prepare your lab notebook) it will be recorded. **If you are marked unprepared three or more times you will receive a 0.5 mark reduction in your overall lab grade at the end of the term.**

Late work: Will not be accepted after the posted deadlines. **One late submission will be allowed without penalty. If you have more than one late submission you will receive a 0.5 mark reduction in your overall lab grade, per additional late submission, at the end of the term.**

Laboratory Grading Scheme

Lab	Exp. 8	Exp. 9	Exp. 10	Exp. 11	Exp. 12	Exp. 13	Exp. 14	Exp. 15	Exp. 16	Total Points	Total (/15)
Pre	2	2	2	2	2	2	2	2	2	18	2
Post	5	5	14	13	7	6	9	7	8+2(pre-lab)	76	13
You must pass the lab component of the course (7.5/15) in order to pass Chem 1012/1022.											

Laboratory Schedule

Sect.	Day	Exp. 8 & 9	Exp. 10	Exp. 11	Exp. 12 & 13	Exp. 14	Exp. 15	Exp. 16
B01	Mon.	Jan. 14 1:30–3:00pm	Jan. 21 1:30–3:00pm	Jan. 28 1:30–4:30pm	Feb. 11 1:30–4:30pm	Mar. 4 1:30–3:00pm	Mar. 11 1:30–3:00pm	Mar. 25 1:30–4:30pm
B02	Mon.	Jan. 14 3:00–4:30pm	Jan. 21 3:00–4:30pm	Feb. 4 1:30–4:30pm	Feb. 25 1:30–4:30pm	Mar. 4 3:00–4:30pm	Mar. 11 3:00–4:30pm	Apr. 1 1:30–4:30pm
B03	Mon.	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. 4 2:30–4:00pm	Mar. 11 2:30–4:00pm	Mar. 25 2:30–5:30pm
B04	Mon.	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. 4 4:00–5:30pm	Mar. 11 4:00–5:30pm	Apr. 1 2:30–5:30pm
B05	Tues.	Jan. 15 8:30–10:00am	Jan. 22 8:30–10:00am	Jan. 29 8:30–11:30am	Feb. 12 8:30–11:30am	Mar. 5 8:30–10:00am	Mar. 12 8:30–10:00am	Mar. 26 8:30–11:30am
B06	Tues.	Jan. 15 10:00–11:30am	Jan. 22 10:00–11:30am	Feb. 5 8:30–11:30am	Feb. 26 8:30–11:30am	Mar. 5 10:00–11:30am	Mar. 12 10:00–11:30am	Apr. 2 8:30–11:30am
B07	Tues.	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. 5 2:30–4:00pm	Mar. 12 2:30–4:00pm	Mar. 26 2:30–5:30pm
B08	Tues.	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. 5 4:00–5:30pm	Mar. 12 4:00–5:30pm	Apr. 2 2:30–5:30pm
B09/B10	Wed.	Jan. 16 10:30am–12:00pm	Jan. 23 10:30am–12:00pm	Jan. 30 10:30am–1:30pm	Feb. 13 10:30am–1:30pm	Mar. 6 10:30am–12:00pm	Mar. 13 10:30am–12:00pm	Mar. 27 10:30am–1:30pm
B11	Wed.	Jan. 16 1:30–3:00pm	Jan. 23 1:30–3:00pm	Jan. 30 1:30–4:30pm	Feb. 13 1:30–4:30pm	Mar. 6 1:30–3:00pm	Mar. 13 1:30–3:00pm	Mar. 27 1:30–4:30pm
B12	Wed.	Jan. 16 3:00–4:30pm	Jan. 23 3:00–4:30pm	Feb. 6 1:30–4:30pm	Feb. 27 1:30–4:30pm	Mar. 6 3:00–4:30pm	Mar. 13 3:00–4:30pm	Apr. 3 1:30–4:30pm
B13	Wed.	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. 6 2:30–4:00pm	Mar. 13 2:30–4:00pm	Mar. 27 2:30–5:30pm
B14	Wed.	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. 6 4:00–5:30pm	Mar. 13 4:00–5:30pm	Apr. 3 2:30–5:30pm
B15	Thurs.	Jan. 17 8:30–10:00am	Jan. 24 8:30–10:00am	Jan. 31 8:30–11:30am	Feb. 14 8:30–11:30am	Mar. 7 8:30–10:00am	Mar. 14 8:30–10:00am	Mar. 28 8:30–11:30am
B16	Thurs.	Jan. 17 10:00–11:30am	Jan. 24 10:00–11:30am	Feb. 7 8:30–11:30am	Feb. 28 8:30–11:30am	Mar. 7 10:00–11:30am	Mar. 14 10:00–11:30am	Apr. 4 8:30–11:30am
B17	Thurs.	Jan. 17 2:30–4:00pm	Jan. 24 2:30–4:00pm	Jan. 31 2:30–5:30pm	Feb. 14 2:30–5:30pm	Mar. 7 2:30–4:00pm	Mar. 14 2:30–4:00pm	Mar. 28 2:30–5:30pm
B18	Thurs.	Jan. 17 4:00–5:30pm	Jan. 24 4:00–5:30pm	Feb. 7 2:30–5:30pm	Feb. 28 2:30–5:30pm	Mar. 7 4:00–5:30pm	Mar. 14 4:00–5:30pm	Apr. 4 2:30–5:30pm
B51	Tues.	Jan. 15 10:00–11:30am	Jan. 22 10:00–11:30am	Jan. 29 10:00am–1:00pm	Feb. 12 10:00am–1:00pm	Mar. 5 10:00–11:30am	Mar. 12 10:00–11:30am	Mar. 26 10:00am–1:00pm
B52	Tues.	Jan. 15 11:30am–1:00pm	Jan. 22 11:30am–1:00pm	Feb. 5 10:00am–1:00pm	Feb. 26 10:00am–1:00pm	Mar. 5 11:30am–1:00pm	Mar. 12 11:30am–1:00pm	Apr. 2 10:00am–1:00pm
B53	Tues.	Jan. 15 1:00–2:30pm	Jan. 22 1:00–2:30pm	Jan. 29 1:00–4:00pm	Feb. 12 1:00–4:00pm	Mar. 5 1:00–2:30pm	Mar. 12 1:00–2:30pm	Mar. 26 1:00–4:00pm
B54	Tues.	Jan. 15 2:30–4:00pm	Jan. 22 2:30–4:00pm	Feb. 5 1:00–4:00pm	Feb. 26 1:00–4:00pm	Mar. 5 2:30–4:00pm	Mar. 12 2:30–4:00pm	Apr. 2 1:00–4:00pm
B55	Thurs.	Jan. 17 10:00–11:30am	Jan. 24 10:00–11:30am	Jan. 31 10:00am–1:00pm	Feb. 14 10:00am–1:00pm	Mar. 7 10:00–11:30am	Mar. 14 10:00–11:30am	Mar. 28 10:00am–1:00pm
B56	Thurs.	Jan. 17 11:30am–1:00pm	Jan. 24 11:30am–1:00pm	Feb. 7 10:00am–1:00pm	Feb. 28 10:00am–1:00pm	Mar. 7 11:30am–1:00pm	Mar. 14 11:30am–1:00pm	Apr. 4 10:00am–1:00pm
B57	Thurs.	Jan. 17 1:00–2:30pm	Jan. 24 1:00–2:30pm	Jan. 31 1:00–4:00pm	Feb. 14 1:00–4:00pm	Mar. 7 1:00–2:30pm	Mar. 14 1:00–2:30pm	Mar. 28 1:00–4:00pm
B58	Thurs.	Jan. 17 2:30–4:00pm	Jan. 24 2:30–4:00pm	Feb. 7 1:00–4:00pm	Feb. 28 1:00–4:00pm	Mar. 7 2:30–4:00pm	Mar. 14 2:30–4:00pm	Apr. 4 1:00–4:00pm

Pre−Lab and Post−Lab Due Dates

This table shows ***ALL*** pre−lab and post−lab deadlines. Find ***YOUR lab section*** and highlight the row to find ***YOUR*** deadline schedule.

Sect.	Lab	Exp. 8 & 9	Exp. 10	Exp. 11	Exp. 12 & 13	Exp. 14	Exp. 15	Exp. 16
B01	Pre	Jan. 14, 1:25pm	Jan. 21, 1:25pm	Jan. 28, 1:25pm	Feb. 11, 1:25pm	Mar. 4, 1:25pm	Mar. 11, 1:25pm	Mar. 25, 1:25pm
	Post	Jan. 21, 1:30pm	Jan. 28, 1:30pm	Feb. 11, 1:30pm	Mar. 4, 1:30pm	Mar. 11, 1:30pm	Mar. 25, 1:30pm	Mar. 25, 4:30pm
B02	Pre	Jan. 14, 2:55pm	Jan. 21, 2:55pm	Feb. 4, 1:25pm	Feb. 25, 1:25pm	Mar. 4, 2:55pm	Mar. 11, 2:55pm	Apr. 1, 1:25pm
	Post	Jan. 21, 3:00pm	Feb. 4, 1:30pm	Feb. 25, 1:30pm	Mar. 4, 3:00pm	Mar. 11, 3:00pm	Apr. 1, 1:30pm	Apr. 1, 4:30pm
B03	Pre	Jan. 14, 2:25pm	Jan. 21, 2:25pm	Jan. 28, 2:25pm	Feb. 11, 2:25pm	Mar. 4, 2:25pm	Mar. 11, 2:25pm	Mar. 25, 2:25pm
	Post	Jan. 21, 2:30pm	Jan. 28, 2:30pm	Feb. 11, 2:30pm	Mar. 4, 2:30pm	Mar. 11, 2:30pm	Mar. 25, 2:30pm	Mar. 25, 5:30pm
B04	Pre	Jan. 14, 3:55pm	Jan. 21, 3:55pm	Feb. 4, 2:25pm	Feb. 25, 2:25pm	Mar. 4, 3:55pm	Mar. 11, 3:55pm	Apr. 1, 2:25pm
	Post	Jan. 21, 4:00pm	Feb. 4, 2:30pm	Feb. 25, 2:30pm	Mar. 4, 4:00pm	Mar. 11, 4:00pm	Apr. 1, 2:30pm	Apr. 1, 5:30pm
B05	Pre	Jan. 15, 8:25am	Jan. 22, 8:25am	Jan. 29, 8:25am	Feb. 12, 8:25am	Mar. 5, 8:25am	Mar. 12, 8:25am	Mar. 26, 8:25am
	Post	Jan. 22, 8:30am	Jan. 29, 8:30am	Feb. 12, 8:30am	Mar. 5, 8:30am	Mar. 12, 8:30am	Mar. 26, 8:30am	Mar. 26, 11:30am
B06	Pre	Jan. 15, 9:55am	Jan. 22, 9:55am	Feb. 5, 8:25am	Feb. 26, 8:25am	Mar. 5, 9:55am	Mar. 12, 9:55am	Apr. 2, 8:25am
	Post	Jan. 22, 10:00am	Feb. 5, 8:30am	Feb. 26, 8:30am	Mar. 5, 10:00am	Mar. 12, 10:00am	Apr. 2, 8:30am	Apr. 2, 11:30am
B07	Pre	Jan. 15, 2:25pm	Jan. 22, 2:25pm	Jan. 29 2:25pm	Feb. 12. 2:25pm	Mar. 5, 2:25pm	Mar. 12, 2:25pm	Mar. 26 2:25pm
	Post	Jan. 22, 2:30pm	Jan. 29, 2:30pm	Feb. 12, 2:30pm	Mar. 5, 2:30pm	Mar. 12, 2:30pm	Mar. 26, 2:30pm	Mar. 26, 5:30pm
B08	Pre	Jan. 15, 3:55pm	Jan. 22, 3:55pm	Feb. 5, 2:25pm	Feb. 26, 2:25pm	Mar. 5, 3:55pm	Mar. 12, 3:55pm	Apr. 2, 2:25pm
	Post	Jan. 22, 4:00pm	Feb. 5, 2:30pm	Feb. 26, 2:30pm	Mar. 5, 4:00pm	Mar. 12, 4:00pm	Apr. 2, 2:30pm	Apr. 2, 5:30pm
B09/B10	Pre	Jan. 16, 10:25am	Jan. 23, 10:25am	Jan. 30, 10:25am	Feb. 13, 10:25am	Mar. 6, 10:25am	Mar. 13, 10:25am	Mar. 27, 10:25am
	Post	Jan. 23, 10:30am	Jan. 30, 10:30am	Feb. 13, 10:30am	Mar. 6, 10:30am	Mar. 13, 10:30am	Mar. 27, 10:30am	Mar. 27, 1:30pm
B11	Pre	Jan. 16, 1:25pm	Jan. 23, 1:25pm	Jan. 30, 1:25pm	Feb. 13, 1:25pm	Mar. 6, 1:25pm	Mar. 13, 1:25pm	Mar. 27, 1:25pm
	Post	Jan. 23, 1:30pm	Jan. 30, 1:30pm	Feb. 13, 1:30pm	Mar. 6, 1:30pm	Mar. 13, 1:30pm	Mar. 27, 1:30pm	Mar. 27, 4:30pm
B12	Pre	Jan. 16, 2:55pm	Jan. 23, 2:55pm	Feb. 6, 1:25pm	Feb. 27, 1:25pm	Mar. 6, 2:55pm	Mar. 13, 2:55pm	Apr. 3, 1:25pm
	Post	Jan. 23, 3:00pm	Feb. 6, 1:30pm	Feb. 27, 1:30pm	Mar. 6, 3:00pm	Mar. 13, 3:00pm	Apr. 3, 1:30pm	Apr. 3, 4:30pm
B13	Pre	Jan. 16, 2:25pm	Jan. 23, 2:25pm	Jan. 30, 2:25pm	Feb. 13, 2:25pm	Mar. 6, 2:25pm	Mar. 13, 2:25pm	Mar. 27, 2:25pm
	Post	Jan. 23, 2:30pm	Jan. 30, 2:30pm	Feb. 13, 2:30pm	Mar. 6, 2:30pm	Mar. 13, 2:30pm	Mar. 27, 2:30pm	Mar. 27, 5:30pm
B14	Pre	Jan. 16, 3:55pm	Jan. 23, 3:55pm	Feb. 6, 2:25pm	Feb. 27, 2:25pm	Mar. 6, 3:55pm	Mar. 13, 3:55pm	Apr. 3, 2:25pm
	Post	Jan. 23, 4:00pm	Feb. 6, 2:30pm	Feb. 27, 2:30pm	Mar. 6, 4:00pm	Mar. 13, 4:00pm	Apr. 3, 2:30pm	Apr. 3, 5:30pm
B15	Pre	Jan. 17, 8:25am	Jan. 24, 8:25am	Jan. 31, 8:25am	Feb. 14, 8:25am	Mar. 7, 8:25am	Mar. 14, 8:25am	Mar. 28, 8:25am
	Post	Jan. 24, 8:30am	Jan. 31, 8:30am	Feb. 14, 8:30am	Mar. 7, 8:30am	Mar. 14, 8:30am	Mar. 28, 8:30am	Mar. 28, 11:30am
B16	Pre	Jan. 17, 9:55am	Jan. 24, 9:55am	Feb. 7, 8:25am	Feb. 28, 8:25am	Mar. 7, 9:55am	Mar. 14, 9:55am	Apr. 4, 8:25am
	Post	Jan. 24, 10:00am	Feb. 7, 8:30am	Feb. 28, 8:30am	Mar. 7, 10:00am	Mar. 14, 10:00am	Apr. 4, 8:30am	Apr. 4, 11:30am
B17	Pre	Jan. 17, 2:25pm	Jan. 24, 2:25pm	Jan. 31, 2:25pm	Feb. 14, 2:25pm	Mar. 7, 2:25pm	Mar. 14, 2:25pm	Mar. 28, 2:25pm
	Post	Jan. 24, 2:30pm	Jan. 31, 2:30pm	Feb. 14, 2:30pm	Mar. 7, 2:30pm	Mar. 14, 2:30pm	Mar. 28, 2:30pm	Mar. 28, 5:30pm
B18	Pre	Jan. 17, 3:55pm	Jan. 24, 3:55pm	Feb. 7, 2:25pm	Feb. 28, 2:25pm	Mar. 7, 3:55pm	Mar. 14, 3:55pm	Apr. 4, 2:25pm
	Post	Jan. 24, 4:00pm	Feb. 7, 2:30pm	Feb. 28, 2:30pm	Mar. 7, 4:00pm	Mar. 14, 4:00pm	Apr. 4, 2:30pm	Apr. 4, 5:30pm
B51	Pre	Jan. 15, 9:55am	Jan. 22, 9:55am	Jan. 29, 9:55am	Feb. 12, 9:55am	Mar. 5, 9:55am	Mar. 12, 9:55am	Mar. 26, 9:55am
	Post	Jan. 22, 10:00am	Jan. 29, 10:00am	Feb. 12, 10:00am	Mar. 5, 10:00am	Mar. 12, 10:00am	Mar. 26, 10:00am	Mar. 26, 1:00pm
B52	Pre	Jan. 15, 11:25am	Jan. 22, 11:25am	Feb. 5, 9:55am	Feb. 26, 9:55am	Mar. 5, 11:25am	Mar. 12, 11:25am	Apr. 2, 9:55am
	Post	Jan. 22, 11:30am	Feb. 5, 10:00am	Feb. 26, 10:00am	Mar. 5, 11:30am	Mar. 12, 11:30am	Apr. 2, 10:00am	Apr. 2, 1:00pm
B53	Pre	Jan. 15, 12:55pm	Jan. 22, 12:55pm	Jan. 29, 12:55pm	Feb. 12, 12:55pm	Mar. 5, 12:55pm	Mar. 12, 12:55pm	Mar. 26, 12:55pm
	Post	Jan. 22, 1:00pm	Jan. 29, 1:00pm	Feb. 12, 1:00pm	Mar. 5, 1:00pm	Mar. 12, 1:00pm	Mar. 26, 1:00pm	Mar. 26, 4:00pm
B54	Pre	Jan. 15, 2:25pm	Jan. 22, 2:25pm	Feb. 5, 12:55pm	Feb. 26, 12:55pm	Mar. 5, 2:25pm	Mar. 12, 2:25pm	Apr. 2, 12:55pm
	Post	Jan. 22, 2:30pm	Feb. 5, 1:00pm	Feb. 26, 1:00pm	Mar. 5, 2:30pm	Mar. 12, 2:30pm	Apr. 2, 1:00pm	Apr. 2, 4:00pm
B55	Pre	Jan. 17, 9:55am	Jan. 24, 9:55am	Jan. 31, 9:55am	Feb. 14, 9:55am	Mar. 7, 9:55am	Mar. 14, 9:55am	Mar. 28, 9:55am
	Post	Jan. 24, 10:00am	Jan. 31, 10:00am	Feb. 14, 10:00am	Mar. 7, 10:00am	Mar. 14, 10:00am	Mar. 28, 10:00am	Mar. 28, 1:00pm
B56	Pre	Jan. 17, 11:25am	Jan. 24, 11:25am	Feb. 7, 9:55am	Feb. 28, 9:55am	Mar. 7, 11:25am	Mar. 14, 11:25am	Apr. 4, 9:55am
	Post	Jan. 24, 11:30am	Feb. 7, 10:00am	Feb. 28, 10:00am	Mar. 7, 11:30am	Mar. 14, 11:30am	Apr. 4, 10:00am	Apr. 4, 1:00pm
B57	Pre	Jan. 17, 12:55pm	Jan. 24, 12:55pm	Jan. 31, 12:55pm	Feb. 14, 12:55pm	Mar. 7, 12:55pm	Mar. 14, 12:55pm	Mar. 28, 12:55pm
	Post	Jan. 24, 1:00pm	Jan. 31, 1:00pm	Feb. 14, 1:00pm	Mar. 7, 1:00pm	Mar. 14, 1:00pm	Mar. 28, 1:00pm	Mar. 28, 4:00pm
B58	Pre	Jan. 17, 2:25pm	Jan. 24, 2:25pm	Feb. 7, 12:55pm	Feb. 28, 12:55pm	Mar. 7, 2:25pm	Mar. 14, 2:25pm	Apr. 4, 12:55pm
	Post	Jan. 24, 2:30pm	Feb. 7, 1:00pm	Feb. 28, 1:00pm	Mar. 7, 2:30pm	Mar. 14, 2:30pm	Apr. 4, 1:00pm	Apr. 4, 4:00pm

The Chemistry Safety Module must be completed by 11:30 pm January 13th, 2019.

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 will 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 below on page 14 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!

	Last Opportunity for Make−up Lab		Late Work Submission Deadline
Exp.	**Group A**	**Group B**	**Group A/B**
8 & 9	Jan. 24	Jan. 24	Mon., Jan. 28, **before** 1:30pm
10	Jan. 31	Jan. 31	Mon., Feb. 11, **before** 1:30pm
11	Feb. 7	Feb. 14	Mon., Mar. 4, **before** 1:30pm
12 & 13	Feb. 28	Mar. 7	Mon., Mar. 11, **before** 1:30pm
14	Mar. 14	Mar. 14	Mon., Mar. 25, **before** 1:30pm
15	Mar. 28	Mar. 28	Fri., Apr. 5, **before** 1:30pm
16	Apr. 4	Apr. 4	*In−lab submission only*

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 (to the left).
3. No report will be accepted after the late submission deadlines posted in the table on page 14.

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, B19, B51, B53, B55, B57
Group B: B02, B04, B06, B08, B12, B14, B16, B18, B20, B52, B54, B56, B58

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. All experiments completed as a make-up will have an alternate post-lab submission deadline (except in-lab submissions, these deadlines are not extended): the post-lab will be due one week from the date of experiment completion or before the last day/time to submit, whichever comes first. If this deadline falls on a holiday/study break and you are not on campus, please submit an electronic copy of your report (photos or scan) via chemlab@dal.ca before the deadline and submit the original copy of the report when you are back on campus.

NOTE: Pre-lab deadlines remain as posted in the table on page 13 regardless of make-up arrangements.

General Lab Questions/Inquiries

Direct all lab related inquiries to chemlab@dal.ca. To ensure you receive assistance in a timely manner you must include the following information in your message:

Subject line	Body of your message
1. course number 2. lab section (*e.g.* B01)	1. your name: 2. student ID (B00#): 3. course number and lab section: 4. your question/inquiry:

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

Academic Integrity

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 academic integrity (AI) offense (including copying 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.

While students must complete their own work individually, students are reminded that there is help available in The *Concept* Room and Chemistry Resource Centre.

Lab 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% or higher on the lecture component, ***and*** have a lab grade of 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 enrols in Chem 1012/1022 in Winter 2019 and completes the course with a grade of F, has 45% (38/85) on the lecture component, ***and*** a lab score greater than 10/15 the student would qualify for lab exemption in the following terms: Summer 2019, Winter 2020, and Summer 2020. After the 24 month window has passed the student will be required to retake the lab component when repeating the course. You must contact the first year lab coordinator (chemlab@dal.ca) in order to apply for a lab exemption. **Labs exemptions will not automatically be granted.**

Student Resources

Brightspace Lab and Lecture Sites

We post a number of resources on the Brightspace Lab and Lecture sites. We strongly recommend that you review these sites. 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 test locations will be posted as they become available.

The *Concept* Room and Chemistry Resource Centre

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) and lab instructors/senior teaching assistants (Resource Centre Lab Support) who can assist you with CAPA assignments, pre−lab and post−lab questions.

The *Concept* Room: Lecture Support

Dr. Angela Crane

Dr. Aaron Kelly

Dr. Saurabh Chitnis

Dr. Joshua Bates

Dr. Mark Stradiotto

Landon Getz

The *Concept* Room and Chemistry Resource Centre Schedule

	Monday	Tuesday	Wednesday	Thursday	Friday
10:00 − 11:00am	Lab Support	*Concept* Room (J. Bates)	Lab Support	Lab Support	Lab Support
11:00am − 12:00pm	Resource Centre Assistant				*Concept* Room (A. Kelly/ S. Chitnis)
12:00 − 1:00pm		Resource Centre Assistant		*Concept* Room (L. Getz)	
1:00 − 2:00pm	*Concept* Room (M. Stradiotto)	Lab Support	Resource Centre Assistant		Resource Centre Assistant
2:00 − 3:00pm				Resource Centre Assistant	
3:00 − 4:00pm	Resource Centre Assistant	Resource Centre Assistant	*Concept* Room (A. Crane)		
4:00 − 5:00pm					

Opens: Monday, January 7th, 2019 Closes: Monday, April 8th, 2019

Location: Basement of the Chemistry Building

Studying for Success (SfS) Workshops

Chemistry specific studying for success workshops will be held prior to each test 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 signing up for these workshops will be announced in class and on Brightspace. The workshop details will be posted on Brightspace and announced in class.

Structured Review Sessions

Prior to each test and the final exam an **optional** structured review session will be held. 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
Test 1	Mon., February 11, 2019	7–9pm	Ondaatje Hall, McCain Building
Test 2	Mon., March 18, 2019	7–9pm	Ondaatje Hall, McCain Building
Final Exam	Tues., April 9, 2019	10am–12pm	Ondaatje Hall, McCain Building

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.

PREREQUISITE: CHEM 1011.03, CHEM 1021.03 or equivalent

COORDINATORS: A. Crane, J. MacDonald

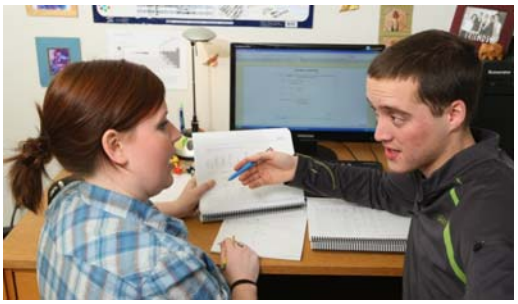
FORMAT: Lecture| Lab

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:



Our primary objective for First Year Chemistry is to offer you a comprehensive and relevant course on the fundamental concepts in chemistry.

We offer a number of resources to support your studies including a customized textbook that will be used during the lectures, online video tutorials and extra help from a first year team member in the Chemistry *Concept* Room.

Course Content and Learning Outcomes

Self Study B1: Foundations in Chemistry	• 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	• 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	• 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	• The Equilibrium and Reaction Quotient Expressions • The Equilibrium Constant • Quantitative Data from the Equilibrium Expression • Relationship between the Equilibrium Constant and Gibbs Energy • Le Chatelier'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**	• 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: **Standard Reaction Enthalpies and Hess's Law**	• 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: **Entropy: Second and Third Laws of Thermodynamics**	• Entropy • Predicting Entropy Changes • Second Law of Thermodynamics • Third Law of Thermodynamics and ΔS^{o}_{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**	• 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**	• 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**	• 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**	• Saturated Hydrocarbons • Cycloalkanes • Functional Groups in Organic Chemistry • Rules for Systematic Naming of Hydrocarbon Compounds • Alkenes, Alkynes and Aromatics • Alcohols and Ethers
Topic 21: **Alkanes, Cycloalkanes and Functional Groups *continued..***	• 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**	• 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 ^{13}C NMR spectra for simple organic molecules
Topic 23: **Introduction to Chemical Reactions**	• Reactions of Organic Compounds • S_N2 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**	• Average Rate of Reaction • Instantaneous Rate of Reaction • Rate Law • Integrated Rate Laws for First Order Reactions • Half-Life for First Order Reactions • Integrated Rate Law for Second 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 and Catalysis**	• 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: **Synthetic Polymers**	• Monomers and Polymers • Size of Polymers • Physical Properties of 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)
Topic 27: **Proteins and Peptides; Biopolymers of Amino Acids**	• Amino Acids • Peptides and Proteins • Protein Structure • Enzyme Catalysis

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 – Culture of Respect

Every person at Dalhousie has a right to be respected and safe. We believe inclusiveness is fundamental to education. We stand for equality. Dalhousie is strengthened in our diversity. We are a respectful and inclusive community. We are committed to being a place where everyone feels welcome and supported, which is why our Strategic Direction prioritizes fostering a culture of diversity and inclusiveness
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

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

https://www.dal.ca/academics/important_dates.html

University Grading Practices

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