

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

**First Year Chemistry Coordinator – Dr. Angela Crane**



Email: [chemlect@dal.ca](mailto:chemlect@dal.ca)

Phone: 902-494-6143

Office: Chemistry 1052

**First Year Chemistry Lecturer – Dr. Rory Chisholm**



**Chem 1011/1021 Section 01**

**Time:** 12:35 pm – 2:25 pm

**Location:** Dunn 117, Sir James Dunn Building

**First Year Chemistry Concept Room**

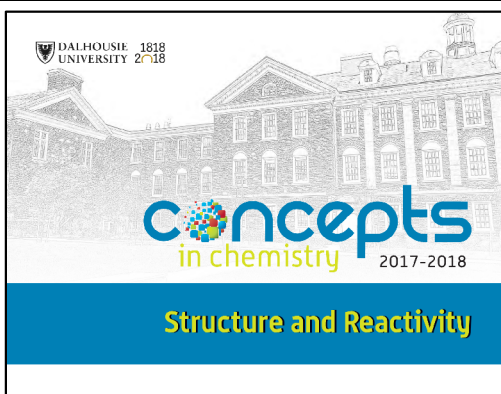


**Dr. Marc Whalen (May 7-11)**



**Dr. Josh Bates (May 14-29)**

**Required Materials**



**Textbook**

Concepts in Chemistry:  
Structure and Reactivity (2017-18 Ed.)

Available at the Dalhousie Bookstore (\$67.65)

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](mailto:chemlab@dal.ca)

Phone: 902-494-2440

Office: Chemistry 108

**Labs****Location:**Basement of the Chemistry Building  
Room 100-108P**Summer 2018 Lab Schedule:**The lab schedule is posted on  
Brightspace and can be found in the  
calendar on pages 3 and 10 of the  
syllabus.**Labs Begin:**Wednesday, May 9<sup>th</sup>, 2018**Lab Instructors**

Dr. Jennifer MacDonald



Dr. Gianna Aleman

**Required Materials: Mandatory for All Labs****Lab Manual**

Available from the Dalhousie Bookstore (\$13.75)

**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
	May 7	May 8	May 9	May 10	May 11
Resource Centre Assist.		10 am – 12 pm 4 – 5 pm	4 – 5 pm	10 am – 12 pm 4 – 5 pm	10 am – 12 pm 4 – 5 pm
Concept Room	3 – 5 pm	3 – 4 pm	3 – 4 pm	3 – 4 pm	3 – 4 pm
Lectures	Self-studies A1/A2/A3 T1: Atomic Structure	T1: Atomic Structure	T2: Electron Config	T3: Periodic Trends	T4: Bonding T12: MO Theory
Tests & Quizzes					Quiz #1 covers Self-studies A1/A2/A3 T1, T2 and T3
Lect. CAPA due			Review Assign due at 11:30pm		Pre-Test 1 Assign due at 11:30pm
Labs	No Lab	No Lab	Exp. 1 A/B: 9–10:30 am C: 10:30 am–12 pm	Exp. 2 A/B: 9 am–12 pm	Exp. 2 C: 9 am–12 pm
Labs Due	See page 10 of the syllabus				
Impt. Dates			Last Day to Add/Drop		Last day to Drop w/o “W”
	May 14	May 15	May 16	May 17	May 18
Resource Centre Assist.	4 – 5 pm	4 – 5 pm	10 am – 12 pm 4 – 5 pm	10 am – 12 pm 4 – 5 pm	4 – 5 pm
Concept Room	3 – 4 pm	3 – 4 pm	3 – 4 pm	3 – 4 pm	3 – 4 pm
Lectures	T12: MO Theory T5: Lewis Structures	T5: Lewis Structures	T6: VSEPR	T11: Valence Bond	T7: Polarity
Tests & Quizzes		Test #1 9 am – 11:30 am Dunn 117			Quiz #2 Covers T4, T12, T5, T6, T11
Lect. CAPA due					Pre-Test 2 Assign due at 11:30pm
Labs	Exp. 3 A/B: 9–10:30 am C: 10:30 am–12 pm	No Lab	Exp. 4 A/B: 9 am–12 pm	Exp. 4 C: 9 am–12 pm	Exp. 5 A/B: 9–10:30 am C: 10:30 am–12 pm
Labs Due	See page 10 of the syllabus				
Impt. Dates					Last day to Drop w/ “W”
	May 21	May 22	May 23	May 24	May 25
Resource Centre Assist.	<b>Victoria Day – University Closed</b>	4 – 5 pm	10 am – 12 pm 4 – 5 pm	10 am – 12 pm 4 – 5 pm	4 – 5 pm
Concept Room		3 – 4 pm	3 – 4 pm	3 – 4 pm	3 – 4 pm
Lectures		T8: Quant Acid/Base	T8: Quant Acid/Base T9: Qual Acid/Base	T9: Qual Acid/Base T10: Buffers	T10: Buffers
Tests & Quizzes		Test #2 9 am – 11:30 am Dunn 117			Quiz #3 Covers T7, T8, T9
Lect. CAPA due					Pre-Final Assign due at 11:30pm
Labs		No Lab	Exp. 6 A/B: 9 am–12 pm	Exp. 6 C: 9 am–12 pm	Exp. 7 A/B: 9-10:30 am C: 10:30 am-12 pm
Labs Due		See page 10 of the syllabus			
	May 28	May 29			
Resource Centre Assist.	10 am – 12 pm	<b>Final Exam, 9 am – 12 pm, Ondaatje Auditorium, McCain Building</b>			
Concept Room	3 – 5 pm				
Lectures	Wrap-up and Review				
Lect. CAPA due	Homework folders due 12 pm (noon)				
Labs	No Lab				
Labs Due	See page 10 of the syllabus				

Grading Scheme		Important Notes
Component	Weight	
CAPA Homework (Top 50% count)	2.5%	1. In order to obtain a passing grade in Chem 1011/1021, you must meet all of the following criteria: <ul style="list-style-type: none"> <li>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).</li> <li>Obtain at least a grade of 7.5/15 on the lab component of the course.</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. If you miss a test/exam, please follow the missed test/exam policy outlined on page 7. 3. Under emergency circumstances that have a serious impact on the delivery of this class, there may be a need to alter the syllabus.
Lect. CAPA Assignments (4 Assignments)	7.5% <i>Review: 1.5%</i> <i>Pre-Test/Exam: 2% each</i>	
In-class quizzes (Best 2 of 3 count)	5%	
Laboratory	15%	
Test 1 May 15, 2018 9 – 11:30 am	30% <i>20% for best test 10% for other test</i>	
Test 2 May 22, 2018 9 – 11:30 am		
Final Exam May 29, 2018 9 am – 12 pm	40%	
<b>Total</b>	<b>100%</b>	

**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
<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.

**Lecture Component**
**CAPA Homework Problems (2.5%)**

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 2.5% of the final grade**. All homework to be graded must be completed by **12pm (noon) on Monday, May 28<sup>th</sup>, 2018**. "Student Declaration of Absence" forms cannot be applied to the course homework, as the homework is an ongoing full-term activity.

**CAPA Assignments (7.5%)**

Assignment	Topic(s)	Due Date (11:30pm)	Grade Weight
Review Assignment	SSA1, SSA2, SSA3,	Wed., May 9	1.5%
Pre-Test 1 Assignment	T1, T2, T3	Fri., May 11	2%
Pre-Test 2 Assignment	T4, T12, T5, T6, T11	Fri., May 18	2%
Pre-Final Exam Assignment	T8, T9, T10	Fri., May 25	2%

There are 4 online assignments consisting of **test-like** questions. The content and weight of each assignment is listed in the table to the left. All assignments are open for completion effective May 7<sup>th</sup>, 2018.

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 to email the First Year Team for assistance.

**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., May 11
2	Fri., May 18
3	Fri., May 25

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

Your final grade will be based on the **best 2 out of 3 quizzes**.

In-class quizzes will occur at the beginning of the lecture and last 20 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 1 quiz is 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 1011/1021 Midterm Tests** will occur on:

**Test 1:**

Tuesday, May 15<sup>th</sup>, 2018, 9:00 – 11:30 am (covers Self-Studies and Topics 1–3)

**Test 2:**

Tuesday, May 22<sup>th</sup>, 2018, 9:00 – 11:30 am (covers Topics 4–6 and 11 – 12)

The **Chem 1011/1021 Final Exam** will be:

Tuesday, May 29<sup>th</sup>, 2018, 9:00 am – 12:00 pm (covers Self-Studies and Topics 1 – 12)

The format of the **TESTS** will be:

9:00 – 10:00 am: Individual Test (**Mandatory**)

10:30 – 11:30 am: 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 ([chemlect@dal.ca](mailto:chemlect@dal.ca)) **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 deadline:**

Email conflicts to [chemlect@dal.ca](mailto:chemlect@dal.ca) by **Thursday, May 10th, 2018** at 11:30 pm.

**Test 2 conflict deadline:**

Email conflicts to [chemlect@dal.ca](mailto:chemlect@dal.ca) by **Thursday, May 17th, 2018** at 11:30 pm.

**Final Exam conflict deadline:**

Email conflicts to [chemlect@dal.ca](mailto:chemlect@dal.ca) by **Thursday, May 24th, 2018** at 11:30 pm.

**Missed Tests:** If you miss a test, you must contact the First Year Chemistry Coordinator ([chemlect@dal.ca](mailto:chemlect@dal.ca)) **within 72 hours** of the missed test and submit a completed "Student Declaration of Absence" form, which can be found on Brightspace. Once this form is received, 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](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 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](mailto:chemlab@dal.ca). **You must pass the lab component of the course (7.5/15) in order to pass Chem 1011/1021.**

### 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–2018 Summer 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 May 13<sup>th</sup>, 2018.**

### 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 page 12–13 of the syllabus for more information about point values and due dates. Written reports **must be completed in ink.**

### Laboratory Assessment

The laboratory portion of this course is worth 15 percent of the final grade. See the table on page 10 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 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 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. 1	Exp. 2	Exp. 3	Exp. 4	Exp. 5	Exp. 6	Exp. 7	Total Points	Total (/15)
Pre	2	2	2	2	2	2	2	14	2
Post	4	10	5.5	10	9	12	7.5	58	13

**You must pass the lab component of the course (7.5/15) in order to pass Chem 1011/1021.**

**Laboratory Schedule**

Sect.	Exp. 1	Exp. 2	Exp. 3	Exp. 4	Exp. 5	Exp. 6	Exp. 7
A/B	Wed., May 9 9–10:30 am	Thurs., May 10 9 am–12 pm	Mon., May 14 9–10:30 am	Wed., May 16 9 am–12 pm	Fri., May 18 9–10:30 am	Wed., May 23 9 am–12 pm	Fri., May 25 9–10:30 am
C	Wed., May 9 10:30 am–12 pm	Fri., May 11 9 am–12pm	Mon., May 14 10:30 am–12 pm	Thurs., May 17 9 am–12 pm	Fri., May 18 10:30 am–12 pm	Thurs., May 24 9 am–12 pm	Fri., May 25 10:30 am–12 pm

**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. 1	Exp. 2	Exp. 3	Exp. 4	Exp. 5	Exp. 6	Exp. 7
A/B	Pre	May 9, 8:55am	May 10, 8:55am	May 14, 8:55am	May 16, 8:55am	May 18, 8:55am	May 23, 8:55am	May 25, 8:55am
	Post	May 10, 9:00am	May 10, 12:00pm	May 16, 9:00am	May 18, 9:00am	May 18, 10:30am	May 28, 12:30pm	May 25, 10:30am
C	Pre	May 9, 10:25am	May 11, 8:55am	May 14, 10:25am	May 17, 8:55am	May 18, 10:25am	May 24, 8:55am	May 25, 10:25am
	Post	May 11, 9:00am	May 11, 12:00pm	May 17, 9:00am	May 18, 10:30am	May 18, 12:00pm	May 28, 12:30pm	May 25, 12:00pm

**The Chemistry Safety Module must be completed by 11:30 pm May 13<sup>th</sup>, 2018.**

**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. C)

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 be advised of the last possible opportunity to make-up a lab located in the table on page 11 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!

**Final Due Dates for Make-ups and Late Work Submissions:**

Exp.	Last Opportunity for Make-up Lab		Late Work Submission Deadline*
	Group A/B	Group C	ALL Groups
1	May 10	May 10	May 14 <b>before</b> 9:00am
2	May 11	May 14	<i>In-lab submission only</i>
3	May 16	May 16	May 18 <b>before</b> 9:00am
4	May 17	May 18	May 23 <b>before</b> 9:00am
5	May 23	May 23	<i>In-lab submission only</i>
6	May 24	May 25	May 28 <b>before</b> 12:30pm
7	May 25	May 25	<i>In-lab submission only</i>
*NOTE: Late work may only be submitted electronically via Brightspace.			

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 11.

**IMPORTANT NOTES:**

Pre-lab deadlines remain as scheduled in the syllabus regardless of make-up arrangements.

ALL make-up and late post-lab submissions must be submitted electronically via Brightspace (details for submitting electronic assignments are outlined below and have been posted on the Chem 1011/1021 Lab Brightspace site).

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.

**How to Submit a Make-Up Post-Lab or Late Post-Lab Via Brightspace Dropbox**

1. Complete your post lab report on the grade sheet provided in the lab manual
2. Scan your report to a PDF
3. Click "Content" in the Lab Brightspace Course
4. Click "Make-up and Late Post-Lab Dropbox" from the contents list at the left
5. Find your lab section
6. Click on the appropriate post-lab submission link
7. Click Upload
8. Locate the file you wish to submit on your computer
9. Click submit
10. You will receive a confirmation email from Brightspace to confirm receipt of your submission

### General Lab Questions/Inquiries

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

#### Subject line

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

#### Body of your message

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 enrolls in Chem 1011/1021 in May 2018 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: Fall 2018, Summer 2019, and Fall 2019. 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](mailto: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 or graduate student TAs (Resource Centre Assistants) who can assist you with CAPA assignments, pre-lab and post-lab questions. **Please refer to page 3 for the Concept Room and Resource Centre schedule.**

### The Concept Room: Lecture Support



Dr. Marc Whalen (May 7-11)



Dr. Josh Bates (May 14-29)

**Opens: Monday, May 7<sup>th</sup>, 2018    Location: Basement of the Chemistry Building**

### 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:**


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*.

**Learning Outcomes:**

- Describe the subatomic composition of atoms, ions and isotopes.
- Calculate spectroscopic quantities in relation to electronic transitions.
- Write electronic configurations of atoms and ions and relate to the structure of the Periodic Table.
- Interpret quantum numbers in terms of orbital shape and the electronic structure and properties of atoms.
- Predict atomic and ionic properties based on electron configurations.
- Draw and interpret molecular orbital diagrams for simple diatomic molecules.
- Draw Lewis dot structures for atoms, molecules, and ions.
- Describe the types of bonds in chemical compounds (ionic, covalent, multiple,  $\sigma$ ,  $\pi$ ).
- Predict molecular geometry, shape, bond order, polarity and hybridization based on Lewis structures.
- Classify different types of intermolecular interactions.
- Draw resonance structures, perspective drawings, hybrid orbital shapes, and hybrid orbital diagrams based on Lewis structures.
- Perform calculations related to solution concentration in various units.
- Describe the characteristics of aqueous solutions.
- Write molecular and net ionic equations for simple reactions in aqueous solution.
- Classify chemical substances as acids and bases in various ways (strong, weak, conjugate, amphoteric, polyfunctional, Brønsted, Lewis).
- Write reactions and equilibrium constant expressions for weak acids and bases.
- Perform calculations (pH, concentration, etc.) relevant to acids and bases and their mixtures (buffers, titrations) at a foundational level.
- Predict the relative strengths of acids and bases based on equilibrium constants and structural characteristics.

**Course Content:**
**Self Study A1:  
Introductory Concepts in Chemistry**

- The Vocabulary of Chemistry
- Element Names and Symbols
- Cations, Anions and Regions of the Periodic Table
- Naming Inorganic Compounds (Nomenclature)
- Fundamental Units of Measurement for Chemistry
- Accuracy and Precision
- Significant Figures
- Multiple Measurements: Averages and Standard Deviations
- Logarithms/Mathematics and Chemistry
- Solving Problems Using Dimensional Analysis
- Molecules, Molecular Formulae, Molecular Mass and Formula Mass
- The Mole, Avogadro's Number and Molar Mass
- Empirical Formula and Mass Percent

**Self Study A2:  
Chemical Reactions and Stoichiometry**

- Writing Chemical Equations
- Procedure for Balancing Chemical Equations
- Stoichiometry and Mass
- Determining the Limiting Reagent
- Actual, Theoretical, and Percent Yield
- Elemental Analysis and Empirical Formula

**Self Study A3:  
Quantitative Description of Aqueous  
Solutions**

- General Characteristics of Aqueous Solutions
- Solution Concentration
- Mass Percent
- Mole Fraction
- Molarity
- Dilution
- Reactions Involving Aqueous Solutions

<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: 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 6: 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 7: 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 8: 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 9: 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 10: Applications of Acid-Base Equilibria: 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>Topic 11: 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 p 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 12: 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 13: Coordination Chemistry</b>	<ul style="list-style-type: none"> <li>• Lewis Acids and Bases</li> <li>• Complex Ions and Transition Metal Coordination Compounds</li> <li>• Ligands and Oxidation Numbers of the Central Metal</li> <li>• Electron Counting in Transition Metal Complexes</li> <li>• Coordination Geometries of Complex Ions</li> <li>• Bonding and Electronic Structure of Transition Metal Complexes</li> <li>• Magnetic Properties of Transition Metal Complexes</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 – 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](mailto:elders@dal.ca)).

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

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

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

### **University Grading Practices**

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



## Student Resources and Support

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>