







**CHM 136H: Introductory Organic Chemistry I**  
**Course Syllabus: Winter 2022**

**THE TEACHING TEAM**

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<p><b>Professor B. Morra (she/her)</b> Course coordinator, First third instructor. <a href="mailto:barb.morra@utoronto.ca">barb.morra@utoronto.ca</a></p> 	<p><b>Professor K. Quinlan (she/her)</b> First third instructor <a href="mailto:kristine.quinlan@utoronto.ca">kristine.quinlan@utoronto.ca</a></p> 
<p><b>Professor M. Nitz (he/him)</b> Middle third instructor <a href="mailto:mark.nitz@utoronto.ca">mark.nitz@utoronto.ca</a></p> 	<p><b>Professor S. Browning (he/him)</b> Middle third instructor <a href="mailto:cs.browning@utoronto.ca">cs.browning@utoronto.ca</a></p> 
<p><b>Professor A. Yudin (he/him)</b> Last third instructor <a href="mailto:andrei.yudin@utoronto.ca">andrei.yudin@utoronto.ca</a></p> 	<p><b>Professor D. Seferos (he/him)</b> Last third instructor <a href="mailto:dwight.seferos@utoronto.ca">dwight.seferos@utoronto.ca</a></p> 

**STUDENT HOURS (via Zoom):**

**Mondays 1-2 PM, Wednesdays 10-11 AM and 1-2 PM, and Thursdays 5-6 PM**

\*All times are ET

These student hours will give you the opportunity to discuss the course content with your instructors and other students.

**Dr. S. Chulliparambil (she/her)**  
Course administrator  
[susha.chulliparambil@utoronto.ca](mailto:susha.chulliparambil@utoronto.ca)



**Dr. M. Morales (he/him)**  
Organic chemistry lab instructor  
[marvin.morales@utoronto.ca](mailto:marvin.morales@utoronto.ca)



**Dr. M. Staikova (she/her)**  
Computational lab instructor  
[mima.staikova@utoronto.ca](mailto:mima.staikova@utoronto.ca)



#### **PRA (lab) STUDENT HOURS (via Zoom):**

**“Wet” Labs Student hours  
with Dr. Morales**  
(except March 1 and 3):  
Tuesdays, 3:00 – 4:00 pm  
Thursdays, 3:00 – 4:00 pm  
Thursdays, 9:00 – 10:00 pm

**Computational Lab Student hours  
with Dr. Staikova**  
Fridays, 9:00 – 10:00 am  
On the following dates:  
February 11, 18, 25, and March 4

## **II COURSE OVERVIEW**

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**Welcome to CHM 136H – Introductory Organic Chemistry II!** CHM 136H provides an introduction to the fundamental principles of structure, bonding and reactivity of organic molecules. It is designed for students who intend to follow a science program, primarily in the Life or Health Sciences. CHM135H is a prerequisite for this course. We believe that CHM 136H, along with CHM 135H, will prepare you well for other chemistry and life-science courses in later years. CHM 135H and CHM 136H are the recommended courses for those applying for entry into professional programs. CHM 135H and CHM 136H are also acceptable for admission to any of the undergraduate programs offered by the Department of Chemistry.

## STUDENT LEARNING OUTCOMES

By the end of CHM 136H, students should be able to:

- understand the relationship between molecular shape and current bonding models in organic chemistry;
- recognize the central role of molecular structure, including stereochemistry, in chemical properties, reactivity and reaction outcomes;
- apply the organic mechanism model to determine reaction pathways;
- identify patterns of reactivity of the alkene, alkyl halide or alcohol functional groups; and
- propose effective routes for the transformations of organic molecules bearing the above functional groups as either reactants or products;
- identify the principles of lab safety;
- understand the relationships between molecules and how they affect solubility;
- learn a variety of purification techniques (e.g., recrystallization, extraction, distillation);
- identify unknown compounds using melting point analysis;
- obtain and use computational chemistry calculations to enhance the understanding of conformational analysis.

## TEXTBOOK and OTHER RESOURCES

The course textbook is "Organic Chemistry", 9<sup>th</sup> Edition by John McMurry, which is accompanied by a Student Solutions Manual. These two items are available in print or digital format through the [U of T Bookstore](#) at reduced cost:

*Digital Option:* Instructions for purchasing and registering the digital textbook and solutions manual are outlined here: [https://www.cengage.com/coursepages/UofT\\_W22\\_CHM136](https://www.cengage.com/coursepages/UofT_W22_CHM136).

*Print Option:* Search for the print version of the textbook and the solutions manual with this ISBN: 9781305816138 from the bookstore.

*\*This information and links are also available on the CHM 136H LEC Quercus site.*

Please note that previous editions of the course textbook (e.g. 8<sup>th</sup>, 7<sup>th</sup>, 6<sup>th</sup>) are NOT supported in CHM 136H.

The purchase of a molecular model kit is also **strongly** recommended. These are available for purchase from [ChemClub](#) and other vendors online.

### III HOW THE COURSE IS ORGANIZED

**CHM 136H (Winter 2022) is offered exclusively online, so there are no in-person activities.**

Each week, you will attend live (synchronous) classes and tutorial sessions. In lieu of in-person laboratories, you will complete five virtual experiments and meet synchronously five times to discuss those experiments over the course of the semester. There will be online student hours for both the class (LEC) and practical (PRA) content to support your learning.

You will join each synchronous session (class, tutorial, lab, student hours) in Zoom, which can be accessed through your CHM 136H LEC or PRA course tile in Quercus.

CHM 136H will introduce the following fundamental organic chemistry concepts:

Week	Main Concepts	Textbook sections	Synch LEC week of	Tutorial week of
1	Shape and drawing; bonding – hybridization	Ch. 1 (except 1.11)	Jan. 10	Jan. 17
2	Bonding – resonance	Ch. 2.1 – 2.6	Jan. 17	Jan. 24
3	Acid-base reactions; naming alkanes	Ch. 2.7 – 2.12 Ch. 3.1 – 3.4 Ch. 4.1	Jan. 24	Jan. 31
4	Conformations	Ch. 3.5 – 3.7 Ch. 4.2 – 4.8	Jan. 31	Feb. 7
5	Stereochemistry	Ch. 5 (except 5.3, 5.4, 5.10, 5.12); Ch. 25-2	Feb. 7	Feb. 14
<b>Test 1: Tuesday February 8, 7-8 pm EST</b>				
6	Organic reaction overview; alkene structure, reactivity	Ch. 6.1 (except 6.3, 6.8, 6.11); Ch. 7	Feb. 14	Feb. 28
<b>Family Day: February 21 (University closed) and Reading Week: February 21-25</b>				
7	Alkene reactions and synthesis	Ch. 8.1 – 8.4, 8.12, 8.13	Feb. 28	Mar. 7
8	Alkene reactions and synthesis	Ch. 8.5 – 8.9	Mar. 7	Mar. 14
<b>Test 2: Tuesday March 8, 7-8 pm EST</b>				
9	Organohalides	Ch. 10.1, 10.5 – 10.8	Mar. 14	Mar. 21
10	Nucleophilic substitution reactions	Ch. 11.1 – 11.5	Mar. 21	Mar. 28
11	Elimination reactions; aromaticity	Ch. 11.7– 11.10, 11.12 Ch. 15.1 – 15.5	Mar. 28	Apr. 4
<b>Test 3: Tuesday March 29, 7-8 pm EDT</b>				
12	IR spectroscopy; alcohol reactions and preparation	Ch. 12.5, 12.6, Ch. 17.1 – 17.7	Apr. 4	<b>video</b>
<b>Test 4: TBA (during final assessment period; April 11-29)</b>				

\*\*Please note that this schedule and the textbook readings are approximate. There may be material that is covered in class that is not discussed in the textbook, while some topics covered in the textbook may not be discussed in class. Materials covered in class, tutorial, and assigned textbook questions will be testable.

**In your CHM 136H LEC section tile on Quercus, partial lecture notes will be provided.** As you attend the synchronous lectures, you should annotate these incomplete notes with your own notes and explanations. Any questions you have about lecture content can be asked during lecture, during student hours, or on the discussion board (see below). Student hours, as outlined on page 1, are designed to give you the opportunity to informally ask questions about the course content with your CHM 136H instructors.

## **DISCUSSION BOARD**

In addition to student hours, we will be using **Ed Discussion**, a free platform that facilitates online Q&A discussions. **Information on how to join Ed Discussion can be found on the Home Page of your Quercus CHM 136H LEC course tile.** We highly encourage you to ask your content questions on Ed where all students can benefit and collaborate on responses to these questions. The teaching team will be monitoring the discussion board and providing input as needed, although we expect students to help each other.

Note that sharing solutions to report sheet, quiz, and TeamUp! questions (through Ed Discussion or through other means) is in violation of **University of Toronto's Code of Behaviour on Academic Matters** (see Academic Integrity section of syllabus) and will be treated accordingly.

## **TUTORIALS**

Tutorial sessions will meet each week synchronously starting on the week of January 17, 2022. **It is essential that you have enrolled in a tutorial section through ACORN/ROSI.**

The objectives of the CHM 136H tutorial are:

- (i) to re-visit the course content seen in synchronous classes;
- (ii) to solve organic chemistry problems in smaller groups and with your Teaching Assistant; and
- (iii) to give you an opportunity to ask questions in a smaller group environment. These smaller tutorial sessions will also provide a chance to meet your peers and build a community within the large course.

In your CHM 136H TUT course tile in Quercus, you will find the following information:

1. A schedule of weekly assigned textbook problems;
2. A tutorial discussion board to meet your peers;
3. Links to your synchronous tutorial sessions via Zoom; and
4. Links to TeamUp! group quizzes

**The TeamUp! group quizzes will be completed during tutorial and only your best 8 of 11 TeamUp! scores will count towards your final grade.** There will be no make-up TeamUp! quizzes. Dropping the lowest two scores will account for any necessary absences.

Before coming to your tutorial each week, prepare for them by completing that week's assigned textbook questions: **active student participation in problem-solving is linked to success in learning organic chemistry.** During your weekly tutorial sessions, your Teaching Assistant will discuss any questions that you may have concerning the assigned exercises and assist you in understanding the important course concepts.

Organic chemistry is an area of science that relies on problem-solving. **Practice** in problem-solving is necessary to master the material and be successful on the course assessments. The practice you will get in your tutorials (as well as the assigned textbook problems) will provide you an important opportunity for self-assessment and help you in keeping up with the course materials. You are the best judge of your own learning (provided you are honest with yourself).

## PRACTICALS

PRA section codes ending in an *odd* number will begin the week of January 17, 2022 and will run on alternating weeks. PRA sections ending in an *even* number will begin the week of January 24, 2022 and run on alternating weeks.

Please note: **It is essential that you have enrolled in a practical section through ACORN/ROSI.** If you have not yet enrolled in a PRA section, do so immediately. If the window on ACORN has closed, contact Dr. M. Morales ([marvin.morales@utoronto.ca](mailto:marvin.morales@utoronto.ca)).

The purpose of the CHM 136 Practicals ('labs') is to introduce you to some of the basic techniques of organic chemistry. Though online laboratories cannot provide a direct hands-on experience, they can teach invaluable lessons about practical work and safety and provide you with a good sense of what to expect in an actual laboratory setting.

The laboratories in CHM 136H include four "wet" organic experiments and one computational experiment. On your CHM 136H PRA course tile on Quercus, you will find the schedule of CHM 136 laboratory experiments for this term - one experiment is completed every two weeks. All of the materials, quizzes, online laboratory sessions and laboratory reports for each "wet" lab and for the computational lab are located in a different module on your CHM 136H PRA course tile on Quercus. Each lab module will become available as the course progresses.

Each "wet" experiment begins with reading the assigned materials, watching the relevant videos, answering pre-laboratory questions and completing a quiz. This must be completed **before** your synchronous discussion session via Zoom with your laboratory Teaching Assistant (TA) and practical group, where you will discuss the experiment and prepare for completing your written report for the experiment. Each "wet" laboratory finishes with the submission of a written report. For questions about the "wet" laboratories, contact Dr. M. Morales ([marvin.morales@utoronto.ca](mailto:marvin.morales@utoronto.ca)).

The logistics for the *computational experiment* differs from the "wet" labs. This lab will be performed during the weeks of February 14 – 18, and February 28 – March 4. The Reading week is in between. The module for this lab will *become available 10 days* in advance of the virtual meeting with your practical group and teaching assistants. You will work independently through the experiment **before** the meeting and finish the pre-lab quiz two days before your virtual session. For questions and concerns about the computational lab, contact Dr. M. Staikova at [mima.staikova@utoronto.ca](mailto:mima.staikova@utoronto.ca).

More details are available on your CHM 136H PRA course tile on Quercus, including how to access practical student hours via Zoom (i.e. synchronous Q&A sessions to discuss the practical content with CHM 136H lab instructors and other students). All Zoom links to the synchronous practical sessions and practical student hours are available on the CHM 136H PRA course tile.

## IV GRADING SCHEME

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<b>Tutorial Group Quizzes (Team Up):</b>	5% (best 8 of 11 count toward your mark)
<b>Practical:</b>	30%
<b>Test 1:</b> Tuesday February 8, 7-8 pm EST:	18%*
<b>Test 2:</b> Tuesday March 8, 7-8 pm EST:	18%*
<b>Test 3:</b> Tuesday March 29, 7-8 pm EDT:	18%*
<b>Test 4:</b> (during final assessment period, date TBD):	18%*

\*The lowest of the four test scores will be weighted at 11%, such that the four tests will account for 65% of the final course grade.

All tests in CHM 136H will be online, cumulative, multiple choice assessments.

**Note:** if you have a course conflict with the tests or you are writing in a time zone that makes it challenging to write at the test time, you will be given the opportunity to write at a different time. Please email Susha Chulliparambil, the CHM 136H course administrator, as soon as possible to make arrangements.

For students missing one test for a valid reason, the missed test mark will be calculated based on performance on the other three tests and class average of the other tests. For students missing two or more tests for valid reasons the mark for the missing tests will be replaced by a cumulative, two-hour assessment to be written during the April final assessment period.

**IMPORTANT:** If an unexpected technical issue occurs with a university system (e.g. Quercus services, network outage) that affects availability or functionality, it may be necessary to revise the timing or weighting of the tests.

## V COURSE POLICIES

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Each member of this course is expected to maintain a:

- 1) professional and respectful attitude during all course activities, including classes, laboratories, tutorials, and other online activities.
- 2) personal calendar/schedule/organizer to ensure that all course activities are completed, and due dates are met.
- 3) collection of notes recorded independently based on concepts covered in course activities (students registered with Accessibility Services requiring a class note-taker will have access to this accommodation)
- 4) familiarity with the university policy on Academic Integrity

### COURSE ENVIRONMENT

The University of Toronto is committed to equity, human rights and respect for diversity. All members of the learning environment in this course should strive to create an atmosphere of mutual respect where all members of our community can express themselves, engage with each other, and respect one another's differences. The CHM 136H Teaching team will neither condone nor tolerate behaviour

that undermines the dignity or self-esteem of any individual in this course and we wish to be alerted to any attempt to create an intimidating or hostile environment. It is our collective responsibility to create a space that is inclusive and welcomes discussion. Discrimination, harassment, and hate speech will not be tolerated. If you have any questions, comments, or concerns, we encourage you to reach out to the staff in our Equity Offices.

## E-MAIL

**If you have a question for a member of the teaching team, please contact the correct person, based on the guidance provided below. Please e-mail only one member of the teaching team.** We will forward the e-mail to the correct person if necessary. Please use your UTORID email address, include your full name and student number and identify yourself as a CHM 136H student. Keep the language and tone of your email professional. **Please do not email your Practical or Tutorial Teaching Assistants.** Most emails will receive a reply within 48 hours of being sent (except on weekends). Please keep your expectations reasonable as to the degree of detail that an email reply to your enquiry can realistically provide.

- **Non-academic questions/concerns:** including test conflicts, illness and academic accommodations, please email Susha Chulliparambil, the CHM 136H course administrator.
- **Course content questions:** please reserve your questions and ask them during tutorial, during the online student hours with instructors, or post your questions on the CHM 136H discussion board. *Please keep in mind that email is not the mechanism to receive explanations of course material.*
- **Practical-related concerns:** please ask your questions during your Practical synchronous session or during Practical student hours with Dr. Morales (wet labs) or Dr. Staikova (computational lab).
- **Other course concerns:** please email Dr. Morra, the course coordinator.

## PRIVACY POLICY

Parts of this course, including your participation, will be recorded on video and will be available to students in the course for viewing remotely and after each session.

## ABSENCES

Students who are absent from class for any reason (e.g., COVID, other illness or injury, family situation) and who require consideration for missed academic work should report their absence through the **online absence declaration**. The declaration is available on ACORN under the Profile and Settings menu. You must also **contact Susha Chulliparambil, the Course Administrator, as soon as possible and within one week** of your absence to receive consideration for any missed work.

## VI TECHNOLOGY REQUIREMENTS

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Specific guidance from the U of T Vice-Provost, Students regarding student technology requirements is available here: <https://www.viceprovoststudents.utoronto.ca/covid-19/tech-requirements-online-learning/>

Advice for students more broadly regarding online learning is available here: <https://onlinelearning.utoronto.ca/getting-ready-for-online/>



This course requires the use of computers, and technical issues are possible. When working on an assignment, students are responsible for scheduling enough time to allow for reasonable delays due to technical difficulties to be overcome, so such issues will not be acceptable grounds for deadline extension. Particularly, maintaining an up-to-date, independent backup copy of your work is strongly recommended to guard against e.g. hard-drive failures, corrupted files, lost computers, etc. We encourage you to spend a moment at the start of the semester to make a plan for what you would do if you lost access to the computer that you primarily intend to use, which will help ensure that you are prepared for this unlikely possibility.

## VII INSTITUTIONAL POLICIES AND SUPPORT

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### ACADEMIC INTEGRITY

Academic integrity is essential to the pursuit of learning and scholarship in a university, and to ensuring that a degree from the University of Toronto is a strong signal of each student's individual academic achievement. As a result, the University treats cases of cheating and plagiarism very seriously. The University of Toronto's Code of Behaviour on Academic Matters (<https://governingcouncil.utoronto.ca/secretariat/policies/code-behaviour-academic-matters-july-1-2019>) outlines the behaviours that constitute academic dishonesty and the processes for addressing academic offences. Potential offences include, but are not limited to:

In virtual laboratory reports:

1. Using someone else's ideas or words without appropriate acknowledgement. **Normally, students will be required to submit their course essays to the University's plagiarism detection tool, Original, for a review of textual similarity and detection of possible plagiarism. In doing so, students will allow their essays to be included as source documents in the tool's reference database, where they will be used solely for the purpose of detecting plagiarism. The terms that apply to the University's use of this tool are described on the Centre for Teaching Support & Innovation web site (<https://uoft.me/pdt-faq>).**
2. Submitting your own work in more than one course without the permission of the instructor.
3. Making up sources or facts.
4. Obtaining or providing unauthorized assistance on any report. **Please note that the use of websites (such as Chegg.com or the course discussion board) to post virtual laboratory report material/questions or to post/access answers to questions is an academic offence under the University of Toronto's Code of Behaviour on Academic Matters. Alleged instances of this nature are forwarded to the Faculty of Arts & Science Student Academic Integrity office.**

On quizzes and term tests:

1. Using or possessing unauthorized aids. **Please note that the use of websites (such as Chegg.com or the course discussion board) to post quiz/term test questions or to post/access answers to questions is an academic offence under the University of Toronto's Code of Behaviour on Academic Matters. Alleged instances of this nature are forwarded to the Faculty of Arts & Science Student Academic Integrity office.**
2. Looking at someone else's answers or collaborating/discussing answers during a quiz or term test.
3. Misrepresenting your identity.

In general academic work:

1. Falsifying institutional documents or grades.
2. Falsifying or altering any documentation required by the University.

All suspected cases of academic dishonesty will be investigated following procedures outlined in the Code of Behaviour on Academic Matters. If you have questions or concerns about what constitutes appropriate academic behaviour or appropriate research and citation methods, you are expected to seek out additional information on academic integrity from your instructor or from other institutional resources (see [www.academicintegrity.utoronto.ca/](http://www.academicintegrity.utoronto.ca/)).

## **COPYRIGHT**

If a student wishes to copy or reproduce class presentations, course notes or other similar materials provided by instructors, he or she must obtain the instructor's written consent beforehand.

Otherwise, all such reproduction is an infringement of copyright and is absolutely prohibited. More information regarding this is available here: <https://teaching.utoronto.ca/ed-tech/audio-video/copyright-considerations/>

## **ACCESSIBILITY NEEDS**

Students with diverse learning styles and needs are welcome in this course. The University of Toronto is committed to accessibility: if you require accommodations for a disability, or have any other accessibility concerns about the course, please contact [Accessibility Services](#) as soon as possible.

## **ACCOMMODATIONS FOR RELIGIOUS OBSERVANCES**

Following the University's policies, reasonable accommodations will be made for students who observe religious holy days that coincide with the due date/time of an assignment, tutorial, class or laboratory session. Students must inform Susha Chulliparambil, the CHM 136H course administrator, **before** the session/assignment date to arrange accommodations.

## **ADDITIONAL SERVICES & SUPPORT**

The following are some important links to help you with academic and/or technical service and support:

- General student services and resources at [Student Life](#)
- Full library service through [University of Toronto Libraries](#)
- Resources on conducting online research through [University Libraries Research](#)
- Resources on academic support from the [Academic Success Centre](#)
- Learner support at the [Writing Centre](#)
- Information for technical support in Quercus can be found on the left hand column under "Help", then "Quercus Support Resources".

## **ACKNOWLEDGEMENT OF TRADITIONAL LANDS**

We wish to acknowledge this land on which the University of Toronto operates. For thousands of years, it has been the traditional land of the Huron-Wendat, the Seneca and, most recently, the Mississaugas of the Credit River. Today, this meeting place is still the home to many Indigenous people from across Turtle Island and we are grateful to have the opportunity to work on this land.