






CHM 136H: Introductory Organic Chemistry I

Course Syllabus: Winter 2023

I CONTACTS AND THE TEACHING TEAM

EMAIL chm136h@utoronto.ca Please direct **all** course inquiries to this teaching team email and it will be directed to the appropriate person.




INSTRUCTORS

<p>Professor B. Morra (she/her) Course coordinator, First third instructor.</p> 	<p>Professor K. Quinlan (she/her) First third instructor</p> 
<p>Professor M. Nitz (he/him) Middle third instructor</p> 	<p>Professor S. Browning (he/him) Middle third instructor</p> 
<p>Professor H. Cui (she/her) Last third instructor</p> 	<p>Professor D. Seferos (he/him) Last third instructor</p> 

STUDENT HOURS:

Wednesdays 10:10-11:00 AM and 1:10-2:00 PM, and Fridays 1:10-2:00 PM in Sidney Smith Hall, Room 1083 (100 St. George Street).

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

<p>Dr. M. Morales (he/him) Lab instructor</p> 	<p>Dr. M. Staikova (she/her) Computational lab instructor</p> 	<p>Mr. A. Fernandes (he/him) Course Administrator</p> 
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PRA STUDENT HELP HOURS:

“Wet” Labs Student hours with Dr. Morales

Tuesdays and Thursdays, 3 – 4 pm in LM217
Thursdays, 7:30 - 8:30 pm, virtual,
link will be provided on PRA Quercus tile

Computational Lab Student hours with Dr. Staikova

Virtual, day/time/links will be
provided on PRA Quercus tile

II COURSE OVERVIEW

Welcome to CHM 136H – Introductory Organic Chemistry !! 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", 9th 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_W23_CHM136

Print Option: Search for the print version of the textbook and the solutions manual with this ISBN:**9781305933705** 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. 8th, 7th, 6th) 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

Each week, you will attend three (3) hours of classes and one (1) hour of tutorial to support your learning. In the laboratory, you will complete five (5) experiments over the course of the semester. CHM 136H will introduce the following fundamental organic chemistry concepts:

Week	Main Concepts	Textbook sections	LEC week of	Tutorial week of
1	Shape and drawing; bonding – hybridization	Ch. 1 (except 1.11)	Jan. 9	Jan. 16
2	Bonding – resonance	Ch. 2.1 – 2.6	Jan. 16	Jan. 23
3	Acid-base reactions; naming alkanes	Ch. 2.7 – 2.12 Ch. 3.1 – 3.4 Ch. 4.1	Jan. 23	Jan. 30
4	Conformations	Ch. 3.5 – 3.7 Ch. 4.2 – 4.8	Jan. 30	Feb. 6
5	Stereochemistry	Ch. 5 (except 5.3, 5.4, 5.10, 5.12); Ch. 25.2	Feb. 6	Feb. 13
6	Organic reaction overview; alkene structure, reactivity	Ch. 6.1 (except 6.3, 6.8, 6.11); Ch. 7.1 – 7.6	Feb. 13	Feb. 27
Family Day: February 20 (University closed) and Reading Week: February 21-24				
7	Alkene reactions and synthesis	Ch. 7.7 – 7.11, 8.1 – 8.3	Feb. 27	Mar. 6
Test 1: Tuesday February 28, 6:00-7:30 pm				
8	Alkene reactions and synthesis	Ch. 8.4 – 8.9, 8.12, 8.13	Mar. 6	Mar. 13
9	Organohalides	Ch. 10.1, 10.5 – 10.8	Mar. 13	Mar. 20
10	Nucleophilic substitution reactions	Ch. 11.1 – 11.5	Mar. 20	Mar. 27
11	Elimination reactions; aromaticity	Ch. 11.7– 11.10, 11.12 Ch. 15.1 – 15.5	Mar. 27	Apr. 3
Test 2: Tuesday March 28, 6:00-7:30 pm				
12	IR spectroscopy; alcohol reactions and preparation	Ch. 12.5, 12.6, Ch. 17.1 – 17.7	Apr. 3	video
Final Exam: TBA (during final assessment period; April 11-28)				

**Please note that this schedule and the textbook sections 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. Only materials covered in class, tutorial, and assigned textbook questions will be testable.

In the CHM 136H LEC tile on Quercus, partial lecture notes will be provided. As you attend the 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.

CLASS

All lecture sections (in-person and the evening online class) are designed to be attended live – in class, you will be an active participant in your learning through problem-solving, asking and answering questions and discussions with your peers. Brief class notes will be available on the CHM 136H course website on Quercus ahead of each class. Some of the problems will be done as a class and do not appear in the notes. Be prepared to make notes on the material discussed in class as this is a key component of active learning.

Please attend the LEC section that you are registered for. The rooms are at capacity and there will not be enough seats for students not registered in the section.

Class recordings of the Zoom evening lecture will be provided to all lecture sections for a limited amount of time on the LEC Quercus site. These recordings are intended to help students with unexpected absences – we understand that it may not be possible to attend every class. The recordings are only a partial substitute for the learning that occurs in class, so it is in your best interest to make every effort to attend class. We have found in the past that providing the recordings for the entire semester leads students to procrastinate. Based on this and feedback from past CHM 136 students, **each recording will only be available for 2 weeks after it is posted** to support those with unexpected absences while also encouraging all students to keep up with the course material.

TUTORIALS

Tutorial sessions will meet each week in person starting on the week of January 16, 2023. **It is essential that you have enrolled in a tutorial section through ACORN/ROSI. The location of your tutorial can be found on Acorn.**

The objectives of the CHM 136H tutorial are:

- (i) to re-visit the course content seen in class;
- (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. Additional problems to do prior to each tutorial; and
3. 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 three 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.

PRACTICALS

PRA section codes ending in an *odd* number will begin the week of January 16, 2023 and will run on alternating weeks. PRA sections ending in an *even* number will begin the week of January 23, 2023 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, please send an email to chm136h@utoronto.ca with the subject line "Practical enrollment".

The purpose of the CHM 136 Practicals ('labs') is to introduce you to some of the basic techniques of organic chemistry. The laboratories in CHM 136H include four "wet" organic experiments and one computational experiment. On your CHM136H PRA course tile on Quercus, you will find the schedule for the laboratory experiments this term - one experiment is completed every two weeks. All of the materials for each lab (including quizzes, online laboratory sessions for the computer lab only, and laboratory report submissions) are located in a different module on your CHM136H PRA course tile on Quercus. Each lab module will become available as the course progresses. **You will be required to purchase a lab manual from [Chem Club](#) (located in LM 203).**

The policy for late submissions, reweighting due to missed pieces of academic work, the process for requesting re-grading of course work are all provided on your PRA course tile.

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 in person laboratory session with your Teaching Assistant (TA) and practical group. Each "wet" laboratory finishes with the submission of a written report. For questions about the "wet" laboratories, please send an email to chm136h@utoronto.ca with the subject line "Wet Lab" **and** include the experiment title. Please direct your email to Dr. Morales and always include your full name, student number, and your PRA section.

The computational experiment will be conducted virtually. Please note: the logistics for this experiment differ from the other laboratory experiments. Consult the posted schedule for your Demo Group number to know when you will complete this experiment.

When the computer lab module becomes available on your PRA Quercus page, you will work independently on the lab tasks, performing computations of the substrate properties on WebMO, the Chemistry Department computer server. Each student will use their own user ID and password (details on your PRA Quercus site) and will have their own WebMO directory where the computational jobs will be executed and collected. Students will have about 10 days to finish as many of the required calculations as possible. During this period of time, you can do them at any time. At the end of the period, you will have a one-hour virtual meeting (mandatory) with a teaching assistant to discuss the laboratory topic, potential problems you might have had with the computations, and discuss details of

the computational lab report. The lab report for the computational lab is due two weeks after the virtual meeting with your TA.

The best way to answer your questions and concerns about the computational lab is to attend one of the computational lab student hours. If you are unable to attend these student hours, please send an email to chm136h@utoronto.ca with the subject line "Computation Lab". With every communication regarding the computational lab, please direct it to Dr. Staikova and always include your full name, student number, and your PRA section.

DISCUSSION BOARD

We will be using Piazza, a free platform that facilitates online Q&A discussions. **Information on how to join Piazza can be found on the Home Page of the Quercus CHM 136H LEC course tile.** We highly encourage you to ask your content questions on Piazza where all students can benefit and collaborate on responses to these questions. A member of the teaching team will occasionally monitor the discussion board; however, it is considered a **student-driven learning tool where students are expected to help one another!**

Note that sharing solutions to report sheet, quiz, and TeamUp! questions (through Piazza 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.

IV GRADING SCHEME

Tutorial Group Quizzes (Team Up):	5% (best 8 of 11 count toward your mark)
Practical (labs):	25%
Term Tests:	35% (lower test: 12.5%, higher test: 22.5%)
Test #1: Tuesday February 28, 6:00-7:30 pm	
Test #2: Tuesday March 28, 6:00-7:30 pm	
Final Exam:	35% (TBA, during the April examination period*)

*The actual date of the final exam will be set by the Faculty of Arts & Science between April 11-28, and may occur on a Saturday.

Note: If you have a course conflict with the term tests, you will be given the opportunity to write at a different time if you complete the request by the posted due date.

Tests and exams in CHM 136H will include a mix of multiple-choice and short answer questions.

Students who miss a test must complete the Acorn Absence Declaration AND email chm136h@utoronto.ca with a screenshot of the Acorn Absence Declaration as soon as possible (ideally less than 2 days) and within one week of the absence to get consideration for a missed test. Please note that Acorn only allows students to report their absence up to seven days from the current day, plus two days retroactive, from the date of the missed graded academic work.

Consideration for one missed test will result in the other test accounting for 22.5% of the final mark and the final exam accounting for 47.5% of the final mark. For students missing both term tests the mark for the missing tests will be replaced by the final exam.

V COURSE POLICIES

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

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 and GETTING HELP

- For any course-related communication, please only use chm136h@utoronto.ca. Do not send messages through Quercus.
- For course content questions, please ask during your tutorial, during the weekly student hours or post your question on the course discussion board. **Please keep in mind that email is not the mechanism to receive explanations of course material.**
- Any questions on **laboratory** content can be directed to your TA during regular lab time, asked during the PRA help hours, or posted on the Piazza discussion board.
- **When you e-mail the teaching team at chm136h@utoronto.ca, please include your full name and student number, and your PRA section for lab related questions, making sure to use your UTORONTO email address.** Keep the language and tone of your email professional. Your email will be answered by the appropriate person.
- Most emails will receive a reply within 24 hours of being sent (except on weekends) but keep your expectations reasonable as to the degree of detail that an email reply to your enquiry can realistically provide.
- **Note that the tutorial and practical teaching assistants (TAs) cannot provide any assistance via email.**

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 email the teaching team (chm136h@utoronto.ca) with a screenshot of the Acorn Absence Declaration and what graded work you missed as soon as possible and within one week of your absence to receive consideration for any missed graded work. Please include your full name, student number, LEC and PRA section in your email.**

Please note that Acorn only allows students to report their absence up to seven days from the current day, plus two days retroactive, from the date of the missed graded academic work.

VI TECHNOLOGY REQUIREMENTS

This course, particularly the lab (quiz and report submissions) and tutorial (TeamUP! submissions) 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.

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/>

VII INSTITUTIONAL POLICIES AND SUPPORT

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 laboratory reports:

1. Using someone else's ideas or words without appropriate acknowledgement. **Normally, students will be required to submit their written course work (i.e. lab reports) to the University's plagiarism detection tool, Ouriginal, for a review of textual similarity and detection of possible**

plagiarism. In doing so, students will allow their work 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 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 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/).

COPYRIGHT

If a student wishes to copy or reproduce class presentations, course notes or other similar materials provided by instructors, they 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 the teaching team via email (chm136h@utoronto.ca) **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](#)

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.