CHM 247H: Introductory Organic Chemistry II

Course Syllabus: Fall 2017

Description: Reactions of organic compounds. Principles of mechanism, synthesis, and spectroscopy, continuing from CHM136/138. This course is recommended for students in life and health science programs that involve a small amount of chemistry.

Instructors

Prof. Sophie Rousseaux (sroussea@chem.utoronto.ca, 416-978-4198) – *September 7 to November 16 (excluding September 27-28)*

Prof. Andrei Yudin (ayudin@chem.utoronto.ca, 416-946-5042) – *September 27-28 and November 22 to December 6*

Lab Instructor

Prof. Cecilia Kutas Chisu (ckutas@chem.utoronto.ca, 416-978-8796)

Tutor

Frank Lee (flee@chem.utoronto.ca)

Office Hours

Prof. Rousseaux: Wednesdays and Thursdays from 5-6 pm (September 7 – November 16, excluding September 27-28) in DB 475 (access through the chemistry library). Also available by appointment.

Prof. Yudin: Wednesdays and Thursdays from 5-6 pm (September 27-28 and November 22 – December 6) in DB 362. Also available by appointment.

Prof. Chisu: Wednesdays and Thursdays from 2:30-4:30 pm in LM 217a. Also available by appointment.

Course Times and Locations

Lecture:	Wednesdays (alternating with lab, see schedule for details), 6-9 pm, LM 162 Thursdays, 7-9 pm, LM 162
Tutorials:	Thursdays, 6-7 pm, LM 162 – starts on September 14th; last tutorial will be on *Wednesday* December 6th, 6-7 pm before the final lecture.
Laboratory:	Wednesdays (alternating with lecture, see schedule for details), 6:30-10 pm, LM 217

Course Website

Important information including course lecture notes, laboratory information, exam information and announcements will be posted on the course website on Portal (http://portal.utoronto.ca). Please check it regularly and often.

Course Textbook

John McMurry, *Organic Chemistry*, 8th or 9th editions, (Cengage Learning)
Solutions Manual (optional), Molecular Model Kit (optional)

Marking Scheme

Course Component	*Date and Time*	*Location*	*Content*	*Weight*
Laboratory	Wednesdays (alternating with lecture days)	LM 217	Please see lab manual	25%
Term Test 1	October 12th, 6:30-7:30 pm	EX 310 EX 320	All lecture content covered prior to term test 1. More information will be provided in class.	15 or 20%*
Term Test 2	November 16th, 6:30-7:30 pm	EX 310 EX 320	All lecture content covered prior to term test 2, with an emphasis on material covered after term test 1. More information will be provided in class.	15 or 20%*
Final Examination	TBA	TBA	All lecture and lab material	40%

* Note: Term test 1 + term test 2 together comprise 35%; the better test will count for 20%

Laboratory (*25% of final mark*) – a hard copy of your hand written lab report is due **at the beginning of lecture on the next Wednesday following the lab. Reports received after the start of lecture will be deemed late by 1 day.**
***N.B**. Late report penalty is 20% per day. Completed reports submitted after marked work has been returned to the class will not be accepted.*

Drop Date – Nov. 6 (Last day to drop F section code courses from academic record and GPA)
Fall Reading Week – November 6-10

Missed Labs: With only one lab section, make-up labs will not be possible. Please make every effort to attend lab as scheduled and advise Prof. Chisu [ckutas@chem.utoronto.ca] ***immediately*** if you have to miss a lab.

Missed Tests: *If you must miss one test* for reasons beyond your control (e.g. serious illness or medical emergency), please submit a valid medical certificate to Prof. Rousseaux within 1 week of the missed test. The certificate must be dated on or before the date of the scheduled test, and must state that in the doctor's opinion you were too ill to write the test. In this event the term test you *do* write will count for 20% and your final exam will count for 55%.
If you miss both term tests, you are strongly advised to drop the course, because it is unrealistic to expect that you will do well on a final exam worth 75% when you have no experience writing CHM 247 tests and no term mark to speak of.

Accessibility Accommodations: Students registered with Accessibility Services may write tests and exams under the Service's supervision. However, report deadlines must be strictly met. Students who have problems completing the report, should arrange for an appointment to get extra help from Prof. Chisu, to get it done on time. Please note that completed assignments will not be accepted once marked work has been returned to the rest of the class.

Test Re-marking Policy: Marked tests will be accepted for re-evaluation within the deadlines specified during the term, if a signed remark request form is attached.

On-line Communication Policy: Please send e-mail only from your utoronto.ca account and do not use attachments. Identify yourself as a CHM 247 student, giving your full name, student number and lab group number.
Please be aware that chemistry can be discussed much more effectively in person, so limit your e-mail correspondence to administrative matters. Also, please note that this is official business correspondence and use proper salutations, appropriate language, etc.

Lecture Outline

Week	Dates	Topic & Chapter reference
1	Sept. 7	Introductory course information Infrared (IR) Spectroscopy (chapter 12)
2	Sept. 13-14	*start* Nuclear Magnetic Resonance (NMR) spectroscopy (chapter 13)
3	Sept. 21	*finish* Nuclear Magnetic Resonance (NMR) spectroscopy (chapter 13)
4	Sept. 27-28	Chemistry of alkynes (chapter 9) Concepts of organic synthesis and retrosynthetic analysis (chapter 9) *start* Aromatic Substitution reactions (chapter 16)
5	Oct. 5	Electrophilic and Nucleophilic Aromatic Substitution reactions (chapter 16) Chemistry of alcohols and phenols (chapter 17)
6	Oct. 11-12	***** Class will start at 7:30 pm on October 11** Review class prior to Term Test 1 **Term Test 1 Thursday October 12, 6:30-7:30 p.m. in EX 310/320**
7	Oct. 18-19	***** Class will start at 7:30 pm on October 18** Chemistry of ethers, epoxides and thiols (chapter 18) *start* Chemistry of aldehydes and ketones (chapter 19)
8	Oct. 25-26	*finish* Chemistry of aldehydes and ketones (chapter 19) *start* Chemistry of carboxylic acids, nitriles and derivatives (chapter 20 and 21)
9	Nov. 2	*finish* Chemistry of carboxylic acids, nitriles and derivatives (chapter 20 and 21) Review class prior to Term Test 2
10	Nov. 6-10	**Reading Week – *no classes***
11	Nov. 16	**Term Test 2 Thursday November 16, 6:30-7:30 p.m. in EX 310/320**
12	Nov. 22-23	Enols, α-substitution, malonic ester and acetoacetic ester synthesis (chapter 22) *start* Carbonyl condensation reactions (chapter 23)
13	Nov. 30	*finish* Carbonyl condensation reactions (chapter 23) *start* Chemistry of amines (chapter 24)
14	Dec. 6	*finish* Chemistry of amines (chapter 24) Review class prior to final exam
Final Examination Period is December 9-20. Date, time and location of the final exam TBA		

****Please Note:** Important review material from first year organic chemistry (CHM136/138/151) will be provided as recorded lecture content and readings posted on Portal for the following topics:

- Alkene chemistry (chapters 7-8)
- Organohalides and substitution/elimination reactions (chapters 10-11)
- The concept of aromaticity (chapter 15)
- Select alcohol reactivity (chapter 17)

This review material may be tested as it closely pertains to the material taught during lecture. More information on this content will be provided during the first lecture.

Laboratory Outline

Please see the laboratory tab on Portal and the CHM247HF laboratory manual for more information on the laboratory, your demonstrator group number and the detailed experiment schedule.

Experiment	**Date**
Lab 1 – Safety review, Soap Preparation & Testing	September 20
Lab 2 – Alkene Preparation & Spectroscopy Workshop (IR & ^{1}H NMR)	October 4
Lab 3 – Computational Study of Dibenzalacetone Stability	October 11 *or* 18 ** see Portal for details
Lab 4 – Vanillin Reduction	November 1
Lab 5 – Preparation of Esters	November 15
Lab 6 – Dibenzalacetone Preparation and Unknown Analysis	November 29

Academic Integrity

The University of Toronto treats cases of academic misconduct very seriously. Academic integrity is a fundamental value of learning and scholarship at the UofT. Participating honestly, respectfully, responsibly, and fairly in this academic community ensures that your UofT degree is valued and respected as a true signifier of your individual academic achievement.

The University of Toronto's Code of Behaviour on Academic Matters (http://www.artsci.utoronto.ca/osai/The-rules/code/the-code-of-behaviour-on-academic-matters) outlines the behaviours that constitute academic misconduct, the processes for addressing academic offences, and the penalties that may be imposed. You are expected to be familiar with the contents of this document. Potential offences include, but are not limited to, obtaining or providing unauthorized assistance on any assignment (including laboratory reports), submitting an altered test for re-grading, and cheating on tests.