

Advanced Organic Chemistry Laboratory Course

CHMD92

This document contains important information and should be kept in a safe place where you can refer to it throughout the semester.

Welcome to the CHMD92H3: This lab course will build on your previously learned organic chemistry lab skills and expose you to some of the modern synthetic methods required to carry out original research. The course will consist of two, six-hour labs per week and will be divided into units, each spanning several lab periods. Through these short research projects, you will be exposed to aspects of green chemistry, organometallic chemistry and catalysis, as well as the art of multistep synthesis pertaining to the chemistry of pharmaceutically active agents and naturally occurring substances.

Labs:

Tue. 10 am to 4 pm, SW159
Thu. 10 am to 4 pm, SW159

Instructors:

Dr. Effie Sauer – first six weeks (May 11th to June 17th)
esauer@utsc.utoronto.ca (416) 287-7209, SW506E or S155B

Dr. Lana Mikhaylichenko – last six weeks (June 22nd – July 29th)
mikhay@utsc.utoronto.ca (416) 287-7207, SW633A

Office Hours:

Effie: Wed. 3:00 – 5:00 pm (until June 16th)
Lana: Wed. 3:00 – 5:00 pm (starting on June 23rd)

Course Website:

This course will maintain a webspace through Blackboard. All course documents will be posted here, including pre-lab assignments, synthetic procedures and references. Please be sure to check this webspace regularly.

Lab Manual:

There is no lab manual for this course. Required documents will be posted on Blackboard throughout the semester.

Textbook:

There is no required text for this course; however, the following book is recommended and is on reserve in the library:
Microscale Organic Laboratory with Multistep and Multiscale Synthesis, Dana W. Mayo, Ronald M. Pike, David C. Forbes., 5th ed., Wiley

Recommended Websites:

The following websites may be of use to you while preparing for new experiments and writing your reports:

- Virtual Textbook of Organic Chemistry
<http://www.cem.msu.edu/~reusch/VirtualText/intro1.htm>
- Interactive Tutorials
<http://www.cem.msu.edu/~reusch/VirtualText/Questions/problems.htm>
- Access to free copy of ChemDraw – a chemistry drawing software
<http://www.chem.utoronto.ca/library/reg.php>
- Proton chemical shifts
<http://www.chem.wisc.edu/areas/reich/handouts/nmr-h/hdata.htm>
- Not Voodoo – a site devoted to demystifying the organic chemistry techniques
<http://chem.chem.rochester.edu/~nvd/>

Lab Schedule (subject to change):

Lab #	Date	Lab Topic
1	May-11	Introduction to the course; library assignment
2	May-13	Green Chemistry Module: Exploring green alternatives to a traditional bromination reaction.
3	May-18	
4	May-20	
5	May-25	
6	May-27	Porphyrin Catalysis Module: Synthesis of iron porphyrin catalysts and their epoxidation reactions.
7	June-1	
8	June-3	
9	June-8	
10	June-10	
11	June-15	
12	June-17	
13	June-22	Synthesis of eight-carbon alarm pheromone from two species of ant
14	June-24	
15	June-29	Synthesis of 2-pyridinethione and its alkylated derivatives
16	July-1	
17	July-6	Synthesis of different thieno[2,3- <i>b</i>]pyridine derivatives
18	July-8	
19	July-13	Synthesis of 2-chloro-4,6-disubstituted sym-triazine derivatives and quaternary salt
20	July-15	
21	July-20	
22	July-22	Synthesis of connected 1,3,5-triazin-1,2,3-triazol derivatives
23	July-27	
24	July-29	Presentations

Method of Evaluation:

	Percentage of final grade	Comments
Lab Performance	30%	Includes pre-lab assignments, notebooks, products, performance in the lab
Lab Reports	60%	Four reports, each worth 15%
Oral presentation	10%	Location and time TBA

Learning Outcomes:

By the end of this course, you should be able to:

- Plan and execute both single step and multistep organic syntheses following procedures published in the primary literature.
- Analyze practical data and write accurate and complete scientific reports disseminating their findings.
- Use the vocabulary of organic chemicals, reactions and techniques found in modern chemistry labs.
- Troubleshoot practical mistakes and propose solutions to problems encountered during an experiment.
- Carry out modern laboratory techniques such as: setting up reactions under an inert atmosphere, determining reaction yields using an internal standard.
- Analyze spectroscopic data for both known and unknown organic structures, including mixtures of substances.

Accessibility:

Students with diverse learning styles and needs are welcome in this course. In particular, if you have a disability/health consideration that may require accommodations, please feel free to approach me and/or the AccessAbility Services Office as soon as possible. I will work with you and AccessAbility Services to ensure you can achieve your learning goals in this course. Enquiries are confidential. The UTSC AccessAbility Services staff (located in S302) are available by appointment to assess specific needs, provide referrals and arrange appropriate accommodations (416)287-7560 or ability@utsc.utoronto.ca.

Academic Integrity Statement:

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 outlines the behaviours that constitute academic dishonesty and the processes for addressing academic offences (for details, see <http://www.governingcouncil.utoronto.ca/policies/behaveac.htm>). Potential offences include, but are not limited to:

- **Papers and Assignments:** Using someone else's ideas or words without appropriate acknowledgement; submitting your own work in more than one course without the permission of the instructor(s); making up sources or facts; obtaining or providing unauthorized assistance on any assignment.

- **Academic Work:** Falsifying institutional documents or grades. Falsifying or altering any documentation required by the University, including (but not limited to) doctor's notes.

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 http://www.utoronto.ca/academicintegrity/resourcesfor_students.html).

H1N1 Statement:

Students are advised to consult the university's preparedness site (<http://www.preparedness.utoronto.ca>) for information and regular updates regarding procedures relating to H1N1 planning and individual student responsibilities.

*We are looking forward to meeting you and working with you
this summer!*

