

UNIVERSITY OF TORONTO
DEPARTMENT OF CHEMISTRY

CHM 1040H – Spring 2020

Modern Organic Synthesis: Transition Metal Catalysis

Instructors:

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Lectures:

LM158, Wednesdays from 9:10 am – 11:00 am.
First class – January 8 2020
Taylor Section (Part A) January 8, 15, 22, 29
Rousseaux Section (Part B) February 12, 19, 26, March 4
Lautens Section (Part C) March 18, 25, April 1, 8

Student Hours:

M. Taylor: by appointment (mtaylor@chem.utoronto.ca)
S. Rousseaux: by appointment (sophie.rousseau@utoronto.ca)
M. Lautens: TBA

Course Website: <https://q.utoronto.ca/>

It is important that you check the course website periodically for announcements, lecture notes, etc.

Course Description:

CHM1040 will focus on transition metal catalysis in modern organic synthesis. A tentative list of topics will be provided by the individual instructors at the start of their section of the course. Prior familiarity with the basic aspects of standard organic reactions and retrosynthetic analysis is assumed. It may be useful for students to brush up on basic concepts such as oxidation state, electron counting for transition metal complexes, and elementary reaction steps including i) oxidative addition, transmetallation, reductive elimination, migratory insertion, β -X elimination. Students should therefore ensure that they are familiar with material covered in CHM342 and CHM440 (CHM1004) before taking this course. Access to the lecture notes from CHM342 and CHM440 (CHM1004) can be provided upon request.

Marking Scheme:

There will be a test for each part of the course, worth 1/3 of your final grade. Tests will be held in LM158 from 9:10 am – 11:00 am.

Test dates: Part A – February 5, 2020

Part B – March 11, 2020

Part C – April 15, 2020

For students who do not obtain a passing grade (B– average) from the 3 tests, there will be an option to write a 5-page, single-spaced, original research proposal based on a topic from one of the sections of the course. The original research proposal is to include an introduction to the proposed area of research, a discussion of relevant precedent (supported by appropriate literature references), details of the methodology to be used, and a description of the potential outcome and impact of the study. An additional page is allotted for references, which should follow the ACS style guide. The proposal will be evaluated on a pass/fail basis. Students who obtain a passing grade for their research proposal will then receive the grade of B– for the course.

Lecture Notes: If lecture notes have been posted, please print them ahead of class. We would recommend that you *read posted handouts ahead of the associated lectures.*

Required Text: There is no required textbook. The lecture notes and associated readings will form the basis of the course.

A good general reference that outlines the basics of organic reactions and reactivity is:

Clayden, J.; Greeves, N.; Warren, S. *Organic Chemistry*, Oxford University Press **2012**. 2nd Edition

We also recommend the following textbook as a general reference on transition metal catalysis:

Hartwig, J. F. *Organotransition Metal Chemistry*, University Science Books, **2010**.

Periodically, you will be provided with papers to read and you are expected to study these materials ahead of your next class.

Accessibility: The University of Toronto is committed to accessibility. If you require accommodations for a disability, or have any accessibility concerns about the course, the classroom or course materials, please contact Accessibility Services as soon as possible: <http://www.accessibility.utoronto.ca>. Please note that all slides presented during the course are available online at <http://portal.utoronto.ca>.

Academic Integrity: The course will follow University of Toronto policies on academic integrity. See: <http://www.artsci.utoronto.ca/osai/>. Academic integrity is fundamental to learning and scholarship at the University of Toronto. Participating honestly, respectfully, responsibly, and fairly in this academic community ensures that the U of T degree that you earn will be valued as a true indication of your individual academic achievement, and will continue to receive the respect and recognition it deserves. Familiarize yourself with the University of Toronto's *Code of Behaviour on Academic Matters* (www.governingcouncil.utoronto.ca/policies/behaveac.htm). It is the rule book for academic behaviour at the U of T, and you are required to know the rules.