Chemistry 4471B – Transition Metals and Catalysis (Winter 2021)  
Western University  
Department of Chemistry

Instructor: John F Corrigan (“JFC”)

Office: CHB 16 (and Zoom-land)

E-mail: corrigan@uwo.ca

E-mail correspondence can only be considered if it is sent from your @uwo.ca address. Please also include Chem 4471B in your e-mail subject line. I would prefer to discuss chemistry face to face (actually, Zoom to Zoom; see office hours below) and would ask that you contact me by e-mail only for administrative reasons.

Prerequisite(s): Chemistry 3371

A Mandatory Notice from the Registrar: Unless you have either the prerequisites for this course or written special permission from your Dean to enroll in it, you will be removed from this course and it will be deleted from your record. This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites.

Lectures: M-W-F 10:30-11:20 am; a combination of on-line synchronous via OWL (Zoom) and in person (NS-7*)

* The current plan is to begin in-person lectures as of Monday Jan. 25. This date may be pushed back depending on university/provincial guidelines or restrictions in which case synchronous delivery via OWL/Zoom will continue.

Office Hours: Tuesdays 8:30 -9:20 am (via Zoom). If you have a course that conflicts with this time, alternate arrangements can be made.

Course Description
This course will introduce mechanisms and applications of transition-metal catalysts. Fundamental background in structure and bonding of transition metals will lead into the properties of different ligand classes. Common reaction pathways will be covered, including their relationships to structural properties of the metal complex. Knowledge of individual reaction steps will provide the basis to understand and postulate catalytic cycles. Common catalytic transformations and applications will be discussed.

General Course Outline
Chem. 4471 will be composed of three main components, all as related to transition metals: (1) Structure and Bonding; (2) Reactivity; and (3) Catalysis.
Course-Based Learning Outcomes

Upon completion of Chem 4471B, students will be able to:

- Identify and explain different bonding types found in organometallic complexes including those that are relevant to catalysis.
- Sketch and label individual reaction steps that comprise well-known catalytic cycles.
- Justify observed catalytic performance based on known structure and bonding properties of catalyst and intermediates.

Tech. Requirements  Completion of this course will require you to:

- have a reliable/stable Internet connection and a device that meets the system requirements for Zoom. Information about the system requirements are available at the following link: https://support.zoom.us/hc/en-us
- A computer with a working speaker/microphone/webcam
- Participants in this course are not permitted to record the sessions
- In the event that in-person activities cannot take place, access to a printer and the capability of uploading your tests/exam electronically (scanning or taking pictures).
- Tests and examinations in this course *may* have to be conducted using Zoom. You will be required to keep your camera on for the entire session, hold up your student card for identification purposes, and share your screen with the proctor if asked to do so at any time during the exam. The test/exam sessions will not be recorded.
- More information about the use of Zoom for exam invigilation is available in the Online Proctoring Guidelines at the following link: https://www.uwo.ca/univsec/pdf/onlineproctorguidelines.pdf
- *Note -Zoom servers are located outside Canada. If you would prefer to use only your first name or a nickname to login to Zoom, please provide this information to the instructor in advance of the test or examination.

Course Webpage: Students should check OWL (http://owl.uwo.ca) on a regular basis for news and updates. This is the primary method by which information will be disseminated to all students in the class. The missing of critical information due to your failure to check OWL cannot be used as a basis for appeal.

NOTE: You will need to be registered in the course and have a UWO computer account to access this site as well as lectures via Zoom and (possibly) test submission via Gradescope.
Course Materials:
There is no required text for this course although the textbook you used for Chem 3371F is useful. The e-book below is also available through the UWO Library website as a reference.

*The Organometallic Chemistry of the Transition Metals, 6th Ed. R. H. Crabtree (Wiley)*.

Some partial notes will be posted on OWL prior to lecture and will be complemented with in lecture material.

Evaluation
Term Test #1 (75 mins) 20%
Term Test #2* (75 mins) 20%
*Although the focus of this test will be primarily on material following Test #1, you should consider it cumulative
Participation (problem sets & in-class discussion/polls) 8%
Short presentation on catalysis (details to be provided) 7%
Final Exam (3 hours, cumulative, date and time to be announced by Registrar) 45%

Illness and Missing Course Requirements
Students will have up to two (2) opportunities during the regular academic year to use an on-line portal to self-report an absence during the semester, provided the following conditions are met: the absence is no more than 48 hours in duration, and the assessment for which consideration is being sought is worth 30% or less of the student’s final grade. Students are expected to contact their instructors within 24 hours of the end of the period of the self-reported absence, unless noted on the syllabus. Students are not able to use the self-reporting option in the following circumstances:

- for exams scheduled by the Office of the Registrar (e.g. December and April exams)
- absence of a duration greater than 48 hours,
- assessments worth more than 30% of the student’s final grade,
- if a student has already used the self-reporting portal twice during the academic year

If the conditions for a Self-Reported Absence are *not* met, students will need to provide a Student Medical Certificate if the absence is medical, or provide appropriate documentation if there are compassionate grounds for the absence in question. Students are encouraged to contact their Faculty academic counselling office to obtain more information about the relevant documentation.

Students should also note that individual instructors are not permitted to receive documentation directly from a student, whether in support of an application for consideration on medical grounds, or for other reasons. All documentation required for absences that are not covered by the Self-Reported Absence Policy must be submitted to the Academic Counselling office of a student’s Home Faculty.
For policy on Academic Consideration for Student Absences - Undergraduate Students in First Entry Programs, see:  
https://www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic_Consideration_for_absences.pdf  
and for the Student Medical Certificate (SMC), see:  
http://www.uwo.ca/univsec/pdf/academic_policies/appeals/medicalform.pdf

There are no make-up tests. If a test is missed for valid reasons the weighting will be transferred to the final examination.

Religious Accommodation
Students should consult the University's list of recognized religious holidays, and should give reasonable notice in writing, prior to the holiday, to the Instructor and an Academic Counsellor if their course requirements will be affected by a religious observance. Additional information is given in the Western Multicultural Calendar:  

You may also be eligible to write the Special Exam if you are in a “Multiple Exam Situation” (see http://www.registrar.uwo.ca/examinations/exam_schedule.html).

Important Dates:

Jan. 11 – First Day of Lectures  
Feb 5 – Test #1 (Friday Feb 5, 7:00 pm; location TBA)  
Feb 13 – 19 – Spring Reading Week  
Mar 12 – Test #2 (Friday March 12, 7:00 pm; location TBA)  
Mar 29 & 31 – Presentations Mar 29 & 31; slides due Mar 28 by 11:59 pm  
Apr 12 – Last Day of Lectures  
Apr 14 – 30 Final Exam Period (date for 4471B TBA by Registrar)  

Note: A few problem sets will be handed out throughout the term. These will be taken up ca. one week after they are distributed. Participation by registrants is required (see evaluation scheme).

Details on Student Accessibility
Please contact the course instructor if you require material in an alternate format or if you require any other arrangements to make this course more accessible to you. You may also wish to contact Services for Students with Disabilities (SSD) at 519-661-2111 (ext 82147) for any specific question regarding an accommodation.

Electronic Devices
For in person lectures: As a courtesy to your fellow classmates, please leave mobile devices at home or switch them to silent mode before lectures begin. If you use a laptop to take notes, please sit near the back of the classroom in order to minimize disruption to other students. The use of electronic devices (aside from a basic scientific calculator) is prohibited during tests and exams.
Course Attendance
Course attendance is mandatory for Chem 4471. Information missed during unexcused absences will not be the grounds for academic appeal.

Message from the Dean of Science and the Chair of Chemistry
Cheating and Plagiarism
Students must write their essays and assignments in their own words. Whenever a student (or any scientist) takes an idea or passage from another author, they must acknowledge their debt both by using quotation marks where appropriate and by proper referencing such as footnotes or citations.

For all in person tests and exams, it is the policy of the Department of Chemistry that any electronic devices, i.e., cell phones, tablets, cameras, or iPod are strictly prohibited. These devices MUST be left either at home or with the student’s bag/jacket at the front of the room and MUST NOT be at the test/exam desk or in the individual’s pocket. Any student found with one of these prohibited devices will receive a grade of zero on the test or exam. The Department of Chemistry is not responsible for stolen/lost or broken devices.

Plagiarism and cheating is a serious academic offence and will not be tolerated. Any incidents in this regard will be reported immediately to the Department Chair for consideration of disciplinary action as noted in the Western Academic Calendar under "Scholastic Offences".  
http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf

All required papers may be subject to submission for textual similarity review to the commercial plagiarism detection software under license to the University for the detection of plagiarism. All papers submitted will be included as source documents in the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of the service is subject to the licensing agreement, currently between The University of Western Ontario and Turnitin.com.

Support Services
Learning-skills counselors at the Student Development Centre (http://www.sdc.uwo.ca) are ready to help you improve your learning skills. They offer presentations on strategies for improving time management, multiple-choice exam preparation/writing, textbook reading, and more. Individual support is offered throughout the Fall/Winter terms in the drop-in Learning Help Centre, and year-round through individual counselling. Students who are in emotional/mental distress should refer to Mental Health@Western (http://www.health.uwo.ca/mental_health) for a complete list of options about how to obtain help. Additional student-run support services are offered by the USC, http://westernusc.ca/services. The website for Registrarial Services is http://www.registrar.uwo.ca.
Social Media

Twitter
For those who are interested, I encourage you to get involved in the Western Chemistry community by joining us on Twitter: @westernuchem, @WorkentinChem, @Lagugne, @GilroyGroup, @RagonaGroup, @CorriganLab, @jmblacquiere, etc.

Facebook
The department also has a Facebook page, please visit the page to keep up to date with things happening in and outside of the department: https://www.facebook.com/ChemistryatWestern