

September 7, 2021

**CHM 1258H-F 2021: REACTIONS OF LIGANDS**  
**COURSE SYLLABUS: Fall 2021**

**I CONTACTS**

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**INSTRUCTORS**



**Prof. Robert H. Morris**

[robert.morris@utoronto.ca](mailto:robert.morris@utoronto.ca)

Office: Davenport Labs, room 344, 80 Saint George St.

Student hour: 4-5 pm Mondays

Research: <https://www.chemistry.utoronto.ca/people/directories/all-faculty/robert-morris>



**Prof. Ulrich Fekl**

[ulrich.fekl@utoronto.ca](mailto:ulrich.fekl@utoronto.ca)

Office: DV4045, UTM, Mississauga

Student hours: 4-5 pm Fridays (through Zoom)

Research:

<https://www.chemistry.utoronto.ca/people/directories/all-faculty/ulrich-fekl>

**II COURSE OVERVIEW**

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**COURSE DESCRIPTION:**

- The transformations of some small inorganic and organic molecules coordinated in transition metal complexes will be examined.
- Research that explains the influence of the metal centre(s) and the ancillary ligands on the reactivity of these small molecules will be reviewed.
- Emphasis is placed on reactions found in important catalytic cycles

**STUDENT LEARNING OUTCOMES:**

At the end of the course, successful students will be able to:

1. Recognize how the fundamental principles of inorganic and organic chemistry apply to reactions of small molecules coordinated in transition metal complexes
2. Appreciate how these principles can be used to understand and design catalytic cycles.
3. Understand how reactivity can be reversed from electrophilic to radical to nucleophilic as the ancillary ligands in the metal complex change.
4. Discuss critically current articles on the subject.
5. Organize a small review of a current topic.

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**PREREQUISITE COURSES:**

Strongly recommended: Advanced transition metal chemistry course, organometallic chemistry course

**READINGS:**

Course notes from the QUERCUS website at [CHM1258H F LEC0101 20219:Reactions of Coordinated Ligands \(utoronto.ca\)](https://utoronto.ca/CHM1258H_F_LEC0101_20219:Reactions_of_Coordinated_Ligands)

**III HOW THE COURSE IS ORGANIZED**

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- one class each week (**Wednesday at 10:10-12:00 ET**) starting on September 15, 2021, on Zoom

**Zoom link:** <https://utoronto.zoom.us/j/84643541289>

Meeting ID: 846 4354 1289

**Passcode:** 150679

**COURSE SCHEDULE & RELEVANT SESSIONAL DATES:**

FALL DATES	WEEK	TOPICS (Instructors)
Sept. 15	1	Introduction to CHM1258 (RHM, UF), Zoom
Sept. 22-Oct. 13	2-5	Reactions of dinitrogen, carbonyl and hydride (RHM) <b>Assignment 1 due Oct 13</b>
Oct. 20-Nov.3	6-8	Reactions of carbenes and alkyls, Lewis acid catalysis, oxides and peroxides; (UF)
Nov. 8-12		Fall reading week
Nov. 17-Nov. 24	9-10	Reactions of CO <sub>2</sub> , template reactions (UF) <b>Assignment 2 due Nov 24</b>
Dec. 1	11	Student presentations
Dec. 10-21	12	<b>Final assessment period</b>

**IV EVALUATION/GRADING SCHEME**

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TWO ASSIGNMENTS (due Oct 13, Nov. 24) worth 20% each

PRESENTATION (due Dec. 1) worth 30%

FINAL EXAM worth 30%

**MARK BREAKDOWN**

Assignments: 40% of final grade

Presentation: 30% of final grade

Final exam: 30% of final grade

Total: 100%

## V COURSE POLICIES

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- We will respond to email within 24 h on weekdays.
  - All members of CHM1258 agree to fulfill the University's statement regarding a positive learning environment: *"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. U of T does not condone discrimination or harassment against any persons or communities."*
  - This course, including your participation, will be recorded on video and will be available to students in the course for viewing remotely and after each session. Course videos and materials belong to your instructor, the University, and/or other source depending on the specific facts of each situation, and are protected by copyright. In this course, you are permitted to download session videos and materials for your own academic use, but you should not copy, share, or use them for any other purpose without the explicit permission of the instructor. For questions about recording and use of videos in which you appear please contact your instructor.
  - Deadlines for assignment submissions are given in section III above. 10 % will be deducted daily for late assignments, quizzes and tests.
  - All assignments will be submitted at the QUERCUS website.
  - If you believe that an error has been made in the marking of your work please contact Professor Morris.
  - If you miss classes, assignments or tests for medical reasons please inform Professor Morris immediately by email.
  - No extensions or make-up work will be considered.
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## VI TECHNOLOGY REQUIREMENTS

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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/>

### Using Zoom

Go to <https://utoronto.zoom.us> **Register with your UTORONTO e-mail address for Zoom.**

This is very important – access to Zoom meetings may be restricted to utoronto users, and if you use a different e-mail address for your registration, you will not get access to an online class that has this restriction in place. Be sure to **be logged into Zoom when attending** Zoom meetings (don't just attend as a guest). The Zoom link for your class is listed under (III) above.

Tips for Zoom use:

- In your Zoom profile, add a profile picture, normally a picture of yourself. Both your instructors and your fellow students will remember you better if they can link a face to a name. An online learning experience does not have to be cold and impersonal.
- While you can attend Zoom meetings just using your web browser and the Zoom web site, it is strongly recommended that you download and install the Zoom desktop app. You have

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- more features and a smoother experience.
- If you have a choice, use a desktop computer or laptop and not a cell phone. Zoom on cell phones works poorly. Also, if you have a choice, faster Internet connections will give you a better experience. Often a wired Internet connection is faster than wireless.
  - At the beginning of the meeting, make sure your microphone (bottom left of your screen) is muted. You can turn it on later if needed. You can leave your camera on but be prepared to turn it off if Internet bandwidth is low.

**Notice of Video Recording and Sharing:**

This course, including your participation, will be recorded on video and will be available to students in the course for viewing remotely and after each session. Course videos and materials belong to your instructor(s), the University, and/or other source depending on the specific facts of each situation, and are protected by copyright. In this course, you are permitted to download session videos and materials for your own academic use, but you should not copy, share, or use them for any other purpose without the explicit permission of the instructor. For questions about recording and use of videos in which you appear please contact your instructor.

**General tips for the online learning experience:**

Multitasking. Simply put, multitasking does not work. Avoid unnecessary open tabs on your web browser and unnecessarily open apps. Close e-mail etc. during class time. While you will need a couple of tabs and apps open (say, your course web site and the Zoom App or Bb Collaborate page), have open only what you need (not Facebook).

Advice for students more broadly regarding online learning is available here:

<https://onlinelearning.utoronto.ca/getting-ready-for-online/>

This course requires the use of computers, and of course sometimes things can go wrong when using them. You are responsible for ensuring that you maintain regular backup copies of your files, use antivirus software (if using your own computer), and schedule enough time when completing an assignment to allow for delays due to technical difficulties. Computer viruses, crashed hard drives, broken printers, lost or corrupted files, incompatible file formats, and similar mishaps are common issues when using technology, and are not acceptable grounds for a deadline extension.

## VII INSTITUTIONAL POLICIES AND SUPPORT

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### **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 assignments and laboratory reports:

1. Using someone else's ideas or words without appropriate acknowledgement.
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 assignment.

On tests and exams:

1. Using or possessing unauthorized aids.
2. Looking at someone else's answers during an exam or test.
3. Misrepresenting your identity.

In 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 <https://www.academicintegrity.utoronto.ca/>).

### **Use of plagiarism detection tool**

Normally, students will be required to submit their course essays to the University's plagiarism detection tool for a review of textual similarity and detection of possible plagiarism. In doing so, students will allow their essays 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.

## **COPYRIGHT**

If a student wishes to copy or reproduce lecture presentations, course notes or other similar materials provided by instructors, he or she 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](https://studentlife.utoronto.ca/department/accessibility-services/) (<https://studentlife.utoronto.ca/department/accessibility-services/>) as soon as possible.

## **ADDITIONAL SERVICES and 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](https://studentlife.utoronto.ca/) (<https://studentlife.utoronto.ca/>)
- Full library service through [University of Toronto Libraries](https://onesearch.library.utoronto.ca/) (<https://onesearch.library.utoronto.ca/>)
- Resources on conducting online research through [University Libraries Research](https://onesearch.library.utoronto.ca/research) (<https://onesearch.library.utoronto.ca/research>)
- Resources on academic support from the [Academic Success Centre](https://studentlife.utoronto.ca/department/academic-success/) (<https://studentlife.utoronto.ca/department/academic-success/>)
- Learner support at the [Writing Centre](https://writing.utoronto.ca/) (<https://writing.utoronto.ca/>)
- Information for [Technical Support/Quercus Support](https://q.utoronto.ca/courses/46670/) (<https://q.utoronto.ca/courses/46670/>)
- **Recognized Study Groups (RSG)** at <https://sidneysmithcommons.artsci.utoronto.ca/recognized-study-groups/> are voluntary, peer-led study groups of 3 – 6 students enrolled in the same course. They're available for all A&S courses and are now fully online. In addition to supporting students' study habits and academic success, RSGs also encourage student participants to be socially connected with their peers. Last year, over 2,000 A&S students participated in RSGs for courses spanning all streams and class sizes.
- **Meet to Complete** <https://sidneysmithcommons.artsci.utoronto.ca/meet-to-complete/> are online drop-in study sessions held exclusively for A&S undergrads. Offered multiple times per business day and led by trained A&S student-staff, these study sessions help students to stay motivated and productive by offering daily goal-setting and the opportunity to study alongside their A&S peers.