Prerequisites for 4725: Chem 4701

COVID-19 Note: I do intend to wear a mask in class myself. Indoor masking continues to be an important tool in high risk situations. High-quality masks (N-95 or certified KN-95) will be available to students Fall 2022.

Any and every accommodation will be taken if you are infected with COVID-19 at any time during the semester. Please do not worry about missed exams/classes during your recovery. We will discuss the best course of action to ensure your success in this class once you are better. I also understand that you may have added stress and responsibilities due to the circumstances of COVID-19 so please also know that I care about your success at UMN and will do everything possible to make accommodations.

Modality: This course is scheduled as an in-person course. I intend to hold all class sessions in-person except if situational factors arise, such as personal illness of the instructor, when the class may be held synchronously via Zoom or recorded for later viewing.

Course Goals: By the end of this class, I want you to be able to look at the current literature and be able to reason through how a catalytic cycle involving organometallic intermediates works. My goal is also to have you apply the principles that you learn in this class to your own research both here at UMN as well as in your future career. Additionally, I want you to have the tools to be able to communicate about chemistry with your peers and professors in both written and oral formats. With this in mind the course activities—in-class group work, exams, and assignments—will reflect this. This class is set up to be learning oriented instead of content oriented. What this means is that I will be teaching you how to think critically and learn material with my help and on your own instead of being given a list of content topics that must be covered. We will still learn plenty of content, but it is the application of this content to the current literature and your research that is the most important goal.

Expectations: Our class format will be a mixture of traditional lecture as well as group problem sets in order to build and practice key concepts. This is why you receive a participation grade. In order to earn full credit, come to class prepared to work with your colleagues and present the results of what you all worked on. You can expect me to facilitate these conversations and provide context for them. You will be working on problems in groups because it is proven that students learn more effectively in courses with active learning components. We will be respectful and inclusive of all the voices in the class. Discriminatory behavior or violations of the academic code of conduct will not be tolerated.

Textbooks:
Note: I understand that textbooks can be very expensive and therefore I have copies of both of these books available in my office. The Hartwig book is available online through the UMN Libraries website.

Grading schedule:
4725: 3 written exams (30% each), class participation (10%)
8725: 3 written exams (22.5% each), 1 oral exam (22.5%), class participation (10%)

Important Dates (Subject to change):
October 3rd: Exam 1
November 7th: Exam 2
November 21-30: Oral Exam for 8725 – Note: 20 minute slot outside of class time – Dates subject to change
December 14th: Exam 3
No Final
**Written Exams:** The written exams will have both an individual component (80% per exam) as well as a group component (20% per exam). These are called two-stage exams. The reason for this is that the class will have a lot of group work so the exam will mimic your class period so that when you come to class and work in groups you will be preparing for your exam.

**Oral Exam (individual):** Applicable to 8725 only. The way that many scientific advances are made and new ideas are generated come from casual conversations about papers that we have read or challenges we are having in the lab. Therefore, it was important to practice and learn to speak the language of chemistry. Additionally, to advance to the rank of PhD candidate, you take an Oral Preliminary Exam. We often only practice with our own group to do this, but I am giving you an opportunity to make your OPE less daunting by taking an oral exam with me. The format of this exam will be 20 min and I will assign you a paper from JACS, ACIE, Organometallics, ACS Catalysis, Journal of Organometallic Chemistry, Nature, Science or another comparable journal. You will receive the paper in advance and you will present about the paper and then you and I will have a discussion about the paper as an oral exam. This way you have the opportunity to tell me what you know about a topic, rather than taking a written exam with questions that I came up with. When you receive the paper you will be presenting on, I will give you a grading rubric as well. Note regarding presentation: you will not be graded on your speaking style much like I would not grade you on your handwriting in a written exam. This type of oral exam has been pioneered by Prof. Mark Lautens at the University of Toronto. (J. Chem. Ed. 2012, 89, 1506). He has seen oral exams level the playing field for students who are not good at taking traditional written exams. For students who are prepared, he has seen most grades be higher than on written exams, improving the overall grade for most students.

**Homework:** Homework questions will be provided for your benefit but will not be collected. I urge you to complete them on your own then discuss with a group so that they better prepare you for class participation and real world applications.

**Attendance:** Attendance is highly encouraged as 10% of your grade is for class participation. You do not need to inform me if only 1 class is missed in a week. If two or more classes in a row are missed, I will do my best to accommodate you receiving missed work so please send me an email to let me know. Please also reach out to your fellow classmates to get their perspective on the material you have missed. You will be accommodated if you get COVID-19!

**Extra credit:** There will be no extra credit offered in this course.

**Missed Exam Policy:** There will be three exams and they will be cumulative as the material that you learned in the beginning of the class will be the foundation for the rest of the semester. If you miss an exam, please provide documentation for your excused absence (family emergency, illness, university related travel, etc) and your other two exams will be averaged and that will count as your third exam score. Unless it is a mathematical error (i.e. points were added up incorrectly), if you ask for a re-grade on one exam question, the entire exam will be re-graded. These re-grade requests must be submitted within one week of receiving the exam back.

**Academic Dishonesty:** As defined in the Student Code of Conduct by the Regents of the University of Minnesota at the following URL: http://regents.umn.edu/sites/regents.umn.edu/files/policies/Student_Conduct_Code.pdf Students are strictly responsible for following the code of conduct. Instances of academic dishonesty in my class will be referred to the appropriate university offices. Other violations of the Student Code of Conduct will also be referred. Consequences may include probation, suspension, or expulsion.

**Disability Resource Center:** Along with the University of Minnesota more broadly, I’m committed to providing equitable access to learning opportunities for all students. The Disability Resource Center (DRC) is the campus office that collaborates with students who have disabilities to provide and/or arrange reasonable accommodations. If you have, or think you may have, a disability (e.g., mental health, attentional, learning, chronic health, sensory, or physical), please contact the DRC at 612-626-1333 to arrange a confidential discussion regarding equitable access and reasonable accommodations. If you are registered with the DRC and have a current letter requesting reasonable accommodations, please contact me early in the semester to review how the accommodations will be applied in the course.
**Student Mental Health:** For both graduate and undergraduate students, monitoring mental health is very important. University of Minnesota services are available to assist you with addressing these and other concerns you may be experiencing. You can learn more about the broad range of confidential mental health services available on campus via http://www.mentalhealth.umn.edu/. Please also feel free to talk to me about any concerns that you may have regarding this class and we can work together to come up with a solution.

**Sexual harassment:** Title IX requires that I report any sexual misconduct. This allows a Title IX staff member to reach out to those who have experienced sexual misconduct to provide information about the personal support resources and options for investigation that they can choose to access. You are welcome to talk with me about concerns related to sexual misconduct. You can also or alternately choose to talk with a confidential resource; the University offers victim-advocacy support professionals, health services professionals and counselors that will not share information that they learn about sexual misconduct.

**Equity, Diversity, Equal Opportunity, and Affirmative Action:** The University provides equal access to and opportunity in its programs and facilities, without regard to race, color, creed, religion, national origin, gender, age, marital status, disability, public assistance status, veteran status, sexual orientation, gender identity, or gender expression. For more information, please consult Board of Regents Policy: http://regents.umn.edu/sites/regents.umn.edu/files/policies/Equity_Diversity_EO-AA.pdf.

**Academic Freedom and Responsibility:** for courses that do not involve students in research: Academic freedom is a cornerstone of the University. Within the scope and content of the course as defined by the instructor, it includes the freedom to discuss relevant matters in the classroom. Along with this freedom comes responsibility. Students are encouraged to develop the capacity for critical judgment and to engage in a sustained and independent search for truth. Students are free to take reasoned exception to the views offered in any course of study and to reserve judgment about matters of opinion, but they are responsible for learning the content of any course of study for which they are enrolled. Reports of concerns about academic freedom are taken seriously, and there are individuals and offices available for help. Contact the instructor, the Department Chair, your adviser, the associate dean of the college, or the Vice Provost for Faculty and Academic Affairs in the Office of the Provost.

**Tentative list of topics to be covered** (subject to change at instructor’s discretion without notice)
- Cross coupling
- Polymerization
- Olefin metathesis
- Allylic substitution
- Cross Coupling
- Allylation
- C–H Arylation and Oxidation
- Photoredox Catalysis
- Electrocatalysis

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**For more information and content please visit:** https://policy.umn.edu/education/syllabusrequirements-appa