CHEM 5005 – Organometallic Chemistry  
Instructor: Graham Dobereiner  
Wed 5:30PM-8:00PM, Beury 415  
Office hours by appointment (Beury 342)  
Spring 2018 (3 credit hours)  
(215) 204-3185 - dob@temple.edu

Prerequisites:
None. An introductory inorganic chemistry course is recommended but not required.

Readings:

Course Description:
CHEM 5005 is a survey of organotransition metal chemistry. The course will provide a foundation for structural and mechanistic understanding of metal complexes. These fundamental topics will be put in a contemporary context by exploring applications in organic chemistry and polymer chemistry.

Course Goals:
By the end of the course, students should be able to:
- Identify typical ligand types and assign oxidation states using electron counting
- Demonstrate familiarity with reaction steps common for organotransition metal complexes (oxidative addition, reductive elimination, etc).
- Use experimental data to propose a mechanism
- Recognize well-known catalysts for industrial and organic synthetic applications

Grading:
10% Participation  
20% Pre-Class Assignments (via Canvas; due 9PM Tuesdays)  
20% Midterm Exam  
20% Research Project/Presentation  
30% Final Exam  

Late assignments will not be accepted unless a deadline extension has been requested BEFORE the stated due date. There will be no makeup exams offered.

End-of-chapter problem sets in Crabtree are not required but are highly recommended. The instructor will provide feedback on any submitted problem sets and/or discuss at office hours (by appointment).
### Class Calendar and Associated Readings:

**January 17** *Crabtree 1*
- Metal-Ligand Interactions in Transition Metals

**January 24** *Crabtree 2*
- What Sets Organometallics Apart?

**January 31** *Crabtree, 3, 4*
- Organometallics: Many, Many Kinds of Ligands

**February 7** *Crabtree 5, 11*
- Many, Many Kinds of Ligands, Part II

**February 14** *Crabtree 4, 6*
- Mechanism I: Substitution and Concerted Oxidative Addition

**February 21** *Crabtree 6*
- Mechanism II: Oxidative Addition (continued) and Reductive Elimination

**February 28**
- **Midterm Exam**

**March 7**
- **(Spring Break)**

**March 14** *Crabtree 7, 8*
- Mechanism III: Insertion, Elimination, and Addition Reactions

**March 21** *Crabtree 9*
- Homogeneous Catalysis

**March 28** *Kinetics Packet*
- Kinetics

**April 4** *Crabtree 10, 15*
- Characterization Techniques

**April 11**
- Polymerization and multi-ton organometallic chemistry

**April 18, April 25**
- Research Presentations

| Final Exam: May 9, 5:45-7:45PM, Beury 415 |
**Disability disclosure statement:**
Any student who has a need for accommodation based on the impact of a documented disability, including special accommodations for access to technology resources and electronic instructional materials required for the course, should contact me privately to discuss the specific situation by the end of the second week of classes or as soon as practical. If you have not done so already, please contact Disability Resources and Services (DRS) at 215-204-1280 in 100 Ritter Annex to learn more about the resources available to you. I will work with DRS to coordinate reasonable accommodations for all students with documented disabilities.

**Statement of Student and Faculty Academic Rights and Responsibilities:**
Freedom to teach and freedom to learn are inseparable facets of academic freedom. The University has a policy on Student and Faculty and Academic Rights and Responsibilities (Policy #03.70.02) which can be accessed through the following link:
http://policies.temple.edu/getdoc.asp?policy_no=03.70.02