Lecture Schedule **CHEM 400/600A-0002** Spring Semester 2017

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Required Text: Chapters in **ORGANOMETALLIC CHEMISTRY**, by Spessard & Miessler, Oxford University Press, New York, NY, *3rd Edition*, 2016.

Recommended Additional Text: **ADVANCED INORGANIC CHEMISTRY**, by Cotton & Wilkinson, John Wiley & Sons, Inc., New York, 6th Edition, 1998.

Classes are met every MWF in FW 401 (La Tourette Hall) from 1:00 - 1:50 PM
Office Hours: TTh from 1:00 – 3:00 PM

January 18 - February 20

Part 1: Foundations (Chapters 1-6)

Special emphasis on 18-Electron Rule, Sigma (σ)-, Pi (π)-, and Other Important Ligands.

February 22 – March 01

Part 2: Advanced Topics-1 (Organometallic Reactions; Chapter 7)

Reactions that occur at the Metal Center

March 03 – March 10

Part 3: Advanced Topics-2 (Organometallic Reactions; Chapter 8)

Reactions Involving Modification of Ligands.

NO CLASSES FROM MARCH 13-17 (SPRING BREAK)

March 20 – April 19

Part 4: Advanced Topics-3 (Applications of Organometallic Chemistry; Chapters 9-13)

Synthesis, Structures, Bonding, and Reactivity of Organometallic Compounds including Carboranes and Metallacarboranes, and their Applications in Catalysis.

NO CLASSES FROM APRIL 17-21 (TIME FOR PROPOSAL PREPARATION)

April 24 – May 03

(1) Submission of Research Proposals.

(2) Oral Presentations on the Research Proposals.

GRADING: Each lecture and the proposal will be graded by other graduate students in the class (50% of the Total only) and by the Instructor (50%) independently. To avoid more than ± 10% discrepancy of grading between the students and the instructor, each grading will be monitored (A penalty of 10 points each will be made to the grader if it happens!). Lecture Presentations can either be in PowerPoint, Chalkboard or Transparency media. There are no separate exams in this course. An additional penalty of 10 points will be computed for each missing lecture.

Two Lecture Presentations:	2 x 200 = 400 points
Proposal Writing:	2 x 100 = 200 points
Oral Presentation of Proposal:	2 x 100 = 200 points

TOTAL POINTS = 800 (Letter Grading Scale: 720 = A; 640 = B; 560 = C; 480 = D; <480 = F)

Lecture Presentation Schedule

Chapters 1	Jan 18, 20, 23	*An Overview of Organometallic Chemistry*	Hosmane
Chapter 2	Jan 25, 27, 30	*Fundamentals of Structure and Bonding*	Hosmane
Chapter 3	Feb 01, 03	The *18-Electron Rule*	Hosmane
Chapter 4	Feb 06, 08, 10	*The Carbonyl Ligand*	Hosmane
Chapter 5	Feb 13, 15	*Pi-Ligands*	Hosmane
Chapter 6	Feb 17, 20	*Other Important Ligands*	Hosmane
Chapter 7	Feb 22, 24, 27	*Organometallic Reactions I: Reactions That Occur at the Metal Center*	Brian Muller
Chapter 8	Mar 01, 03, 06	*Organometallic Reactions II: Reactions Involving Modification of Ligands*	Crystal Ferels
Chapter 9	Mar 08, 10, 20	*Homogeneous Catalysis: Use of Transition Metal Complexes in Catalytic Cycles*	Haiping Xu
		NO CLASSES FROM MARCH 13-17 (SPRING BREAK)	
Chapter 10	Mar 22, 24, 27	*Transition Metal-Carbene and -Carbyne Complexes: Structures, Preparation, and Chemistry*	Benjamin Minarick
Chapter 11	Mar 29, 31	*Metathesis and Polymerization Reactions*	Brian Muller
Chapter 12	Apr 03, 05	*Applications of Organometallic Chemistry to Organic Synthesis (12-1 – 12-4)*	Crystal Ferels
Chapter 12	Apr 07, 10	*Applications of Organometallic Chemistry to Organic Synthesis (12-4 – 12-7)*	Haiping Xu
Chapter 13	Apr 12, 14	*Bioorganometllic Chemistry*	Benjamin Minarick

Proposal Submission and Presentation (April 24 –May 03)

Aprl 24	Introduction: Hosmane
Aprl 26	Brian Muller
Aprl 28	Crystal Ferels
May 01	Haiping Xu
May 03	Benjamin Minarick
May 05	**READING DAY – NO CLASSES**

SPECIAL ACCOMMODATION:

Any student who may need an accommodation due to a disability, please make an appointment to see me during my office hours, or when convenient. A letter from Disability Support Services authorizing your accommodations is usually needed before accommodations can be granted.

Grading Guidelines for Lecture Presentation

In-Class Presentation CHEM 400/600A-0002 Spring Semester 2017

Presenter (Name):

Evaluator (Name):

Chapter Topic: Maximum Points: 100

Overall Effectiveness of the Presentation (5 Points Maximum):

Materials/Contents Presented (70 Points):

Structures/Drawings/Figures/Schemes/Tables Used or Shown (5 Points Maximum):

Presentation Media (PowerPoint/Chalk Board/Doc Camera) (5 Points Maximum):

Responses to Questions (15 Points Maximum)

Overall Points (100 Points Maximum):

Date:

Signature:

Critical Comments (if any):

Grading Guidelines for Proposal Evaluation

In the Written Proposal Review, we ask for you to do the following:

- Comment in detail on the quality of the proposal
- Provide an overall rating of the proposal
- Identify the proposal's strengths and weaknesses for each Merit Review Criterion established by the National Science Foundation:

NSF Merit Review Criteria for Proposals

In your review, identify the proposal's strengths and weaknesses for each NSF Merit Review Criterion:

- What is the intellectual merit of the proposed activity?
- What are the broader impacts of the proposed activity?

Below are potential considerations for each criterion. These are only suggestions for evaluation, and not all will apply to any given proposal.

What is the intellectual merit of the proposed activity?

- How important is the proposed activity to advancing knowledge and understanding within its own field or across different fields?
- How well qualified is the proposer (individual or team) to conduct the project? (If appropriate, the reviewer will comment on the quality of prior work.)
- To what extent does the proposed activity suggest and explore creative, original, or potentially transformative concepts?
- How well conceived and organized is the proposed activity?
- Is there sufficient access to resources?

What are the broader impacts of the proposed activity?

- How well does the activity advance discovery and understanding while promoting teaching, training, and learning?
- How well does the proposed activity broaden the participation of underrepresented groups (such as gender, ethnicity, disability, geographic, etc.)?
- To what extent will it enhance the infrastructure for research and education, such as facilities, instrumentation, networks, and partnerships?
- Will the results be disseminated broadly to enhance scientific and technological understanding?
- What may be the benefits of the proposed activity to society?

Provide a summary statement that includes the relative importance of the two criteria in assigning your rating. (You do not have to weigh the criteria equally.)

Guidelines for Proposal Preparation

To Prepare your Proposal Application to The NSF Graduate Research Fellowship Program (GRFP), use the following link:

https://www.fastlane.nsf.gov/NSFHelp/flashhelp/fastlane/FastLane_Help/fastlane_help.htm#fastlane_faqs_introduction.htm

Sample proposal and its written evaluation can be borrowed from Professor Hosmane