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Required Text: Chapters in **ORGANOMETALLIC CHEMISTRY**, by Spessard & Miessler, Oxford University Press, New York, NY, *2nd Edition*, 2010.

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 201 (La Tourette Hall) from 9:00 - 9:50 AM
Office Hours: MWF from 10:00 – 11:00 AM*

August 23 - September 20

Part 1: Foundations (Chapters 1-6)

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

September 22 – September 24

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

Reactions that occur at the Metal Center

September 27 – September 29

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

Reactions Involving Modification of Ligands.

October 01 – November 10

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

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

NO CLASSES FROM OCTOBER 18-27 (TIME FOR PROPOSAL PREPARATION)

November 12 – December 03

- (1) Submission of Research Proposals.
- (2) Oral Presentations on the Research Proposals.

NOVEMBER 24 – 28 THANKSGIVING BREAK

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. In order to avoid more than $\pm 5\%$ discrepancy of grading between the students and the instructor, each grading will be monitored (A penalty of 5 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 5 points will be computed for each missing lecture.

Two Lecture Presentations: $2 \times 200 = 400$ points

Proposal Writing: $2 \times 100 = 200$ points

Oral Presentation: $2 \times 100 = 200$ points

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

Lecture Presentation Schedule

Chapters 1	Aug 23, 25, 27	<i>An Overview of Organometallic Chemistry</i>	Hosmane
Chapter 2	Aug 30, Oct 29	<i>Fundamentals of Structure and Bonding</i>	Robert Heideman
Chapter 3	Sept 01, 03	<i>The 18-Electron Rule</i>	Amy Dalby
Chapter 4	Sept 08, 10	<i>The Carbonyl Ligand</i>	Ken Boblak
Chapter 5	Sept 13, 15	<i>Pi-Ligands</i>	Robert Guinn
Chapter 6	Sept 17, 20	<i>Other Important Ligands</i>	Yuheng Liang
Chapter 7	Sept 22, 24	<i>Organometallic Reactions I: Reactions That Occur at the Metal Center</i>	Austin Gille
Chapter 8	Sept 27, 29	<i>Organometallic Reactions II: Reactions Involving Modification of Ligands</i>	R. Reddy Naredla
Chapter 9	Oct 01, 04	<i>Homogeneous Catalysis: Use of Transition Metal Complexes in Catalytic Cycles</i>	Nicole Potts
Chapter 10	Oct 06, 08	<i>Transition Metal-Carbene and -Carbyne Complexes: Structures, Preparation, and Chemistry</i>	Erum Raja
Chapter 11	Oct 11, 13	<i>Metathesis and Polymerization Reactions</i>	Daniel Renfus
Chapter 12	Oct 15, Nov 01	<i>Applications of Organometallic Chemistry to Organic Synthesis-Part I (12-1 & 12-2)</i>	Robert Stockley
Chapter 12	Nov 03, 05	<i>Applications of Organometallic Chemistry to Organic Synthesis-Part II (12-3 - 12-5)</i>	Glen Svenningsen
Chapter 13	Nov 08, 10	<i>Isolobal Groups and Cluster Compounds</i>	Matthew Zielinski

Proposal Submission and Presentation (Nov 10 –Dec 3)

Nov. 12	Intro by Hosmane and Robert Heideman
Nov. 15	Amy Dalby and Ken Boblak
Nov. 17	Robert Guinn and Yuheng Liang
Nov. 19	Austin Gille and R. Reddy Naredla
Nov. 22	Nicole Potts and Erum Raja
Dec. 01	Daniel Renfus and Robert Stockley
Dec. 03	Glen Svenningsen and Matthew Zielinski

Grading Guidelines for Lecture Presentation

In-Class Presentation

CHEM 400/600A-0001

Fall Semester 2010

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