

*Instructor:* Dr. Deanna L. Zubris  
*Office:* 300E Mendel Hall  
*Phone:* (610) 519-4874  
*E-mail:* deanna.zubris@villanova.edu  
*Webpage:* <http://www76.homepage.villanova.edu/deanna.zubris/>  
*Office hours:* MW 4:30–5:30 pm and by appointment

*Texts:* *Organometallic Chemistry*, 1<sup>st</sup> Edition, G. O. Spessard; G. L. Miessler, Prentice Hall, 1997. ISBN: 0-13-640178-3

*Lectures:* MW 6:00–7:15 pm, Mendel 258

*Contents:*

Organometallic chemistry plays an increasingly important role in many aspects of modern-day life. Materials science, polymer science, agriculture, and pharmaceuticals all benefit from advances in the field of organometallics. In this course will survey a range of ligands and complexes and examine their bonding, spectroscopic properties, and reactivity. Reaction mechanisms and catalytic cycles will be emphasized. We will discuss topics such as oxidative addition, reductive elimination, hydrogenation, hydroformylation, olefin metathesis, Ziegler-Natta polymerizations, C-C bond coupling, and small molecule activation (as time permits).

*Grading:*

In-class Examinations:	50%
Final Examination:	35%
Final Presentation:	15%
Literature Discussions and Summaries:	<i>extra credit</i>

*General Policies:*

1. There will be two in-class 75-minute exams (Exam I and II) and a final exam during our scheduled final exam period. The dates for the in-class exams are tentatively listed below. If there is a date change for an in-class exam, it will be announced in class and via email (note: if you have a preferred email address that *is not* your Villanova address, please inform me as soon as possible). Exam II will be cumulative, but will concentrate on the material following Exam I. The final exam will also be cumulative, but will concentrate on the latter third of the course. If you anticipate an excused absence for a scheduled exam, please let me know as soon as possible so that alternate arrangements can be made.
2. Problem sets will be distributed periodically throughout the course. While problem sets will not be collected and graded, they are intended to reinforce concepts from class so I suggest that you give them your best effort. These problems will be similar in difficulty and content to the problems on the exams. We will discuss selected problems in class, as time permits. Answer keys will be distributed as PDF files via email.
3. Periodically throughout the semester, a paper from the recent organometallic literature will be distributed in class along with a list of questions to be addressed. We will discuss the paper briefly during the following class period. The assigned questions will be due on the discussion date. You will be evaluated on both your contributions to the discussion and your written submission and will receive an overall grade of (+ +), (+), (✓), or 0.

4. By the end of March, you will choose a current paper from the chemical literature to be the subject of an in-class presentation (note the important dates below). Your presentation will be approximately 20 minutes in length with time afterwards for questions from the audience. Participation in the question/answer session will be considered for extra credit. The presentation must provide pertinent background information and highlight findings from the paper (and related papers, especially if you chose a communication or similarly short paper). The presentation is intended to explain the current research to someone with no prior knowledge in the specific research area. PowerPoint™ slides will be collected and distributed to the whole class; this material may appear on the final exam. I will provide further details regarding these presentations as the course progresses.

*Important dates:*

- First day of this class: Wednesday, January 17
- Exam I: Wednesday, February 14 (tentative)
- Semester Recess (no class): Monday, March 5; Wednesday, March 7
- Submit topic for final presentation: by Monday, April 2
- Exam II: Wednesday, April 4 (tentative)
- Easter Recess (no class): Monday, April 9
- In-class presentations: one per day, April 11, 16, 18, 23, 25, 30 & May 2
- Last day of this class: Wednesday, May 2
- Final Exam: Monday, May 7, 7:00–9:30 pm

*Journals where you'll find organometallic manuscripts:*

- Journal of the American Chemical Society (ACS)
- Angewandte Chemie International Edition
- Accounts of Chemical Research (ACS)
- Chemical Reviews (ACS)
- Chemical Communications
- Chemical and Engineering News (ACS)
- Organometallics (ACS)
- Journal of Organometallic Chemistry
- Organic Letters (ACS)
- Journal of Organic Chemistry (ACS)
- And many others...

*A few textbooks used as general reference in preparation of this course:*

- Atwood, J. D. *Inorganic and Organometallic Reaction Mechanisms*, 2<sup>nd</sup> Edition, Wiley: New York, 1997.
- Crabtree, R. H. *The Organometallic Chemistry of the Transition Metals*, 4<sup>th</sup> Edition, Wiley: New York, 2005.
- Cotton, F. A.; Wilkinson, G.; Murillo, C. A.; Bochmann, M. *Advanced Inorganic Chemistry*, 4<sup>th</sup> Edition, Wiley: New York, 1999.
- Collman, J. P.; Hegedus, L. S.; Norton, J. R.; Finke, R. G. *Principles and Applications of Organotransition Metal Chemistry*, University Science Books: New York, 1994.
- Elschenbroich, Ch.; Salzer, A. *Organometallics: A Concise Introduction*, 2<sup>nd</sup> Edition, VCH: Weinheim, 1992.
- Hegedus, L. S.; *Transition Metals in the Synthesis of Complex Organic Molecules*, 2<sup>nd</sup> Edition, University Science Books: Sausalito, CA, 1999.