

# Chemistry 4891K/6991K: Organometallics

**M,W 11:00-12:15 pm WB 6029**

**Instructor:** Professor Douglas T Genna  
**Office:** 5009 Ward Beecher  
**Office Hours:** M,T,W,Th: 10-10:1045 and by appointment  
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*“Asking a question may lead to a temporary embarrassment, but not asking the question will lead to a permanent embarrassment”*

## General

This course is a survey of organometallic chemistry with a heavy focus on the fundamentals of organometallic complexes including their formation and elementary reaction steps. Towards the end of the semester we will look at applied organometallic chemistry in the fields such as catalysis.

Prerequisite: I will expect you to have a fundamental understanding of basic organic and inorganic chemistry meaning completion of 3719/3720 sequence as well as 3729 or their equivalents.

## Textbooks

Required: The organometallic chemistry of the transition metals by Robert Crabtree. 6<sup>th</sup> Edition. ISBN-13: 978-1118138076

Supplementary: Organotransition Metal Chemistry: From Bonding to Catalysis by John Hartwig. ISBN-13: 978-1891389535

## Grades

The course will be out of a total of 500 points (4991K) and 600 points (6991K).

Exam 1 – 100 pts (9/25/19)

Exam 2 – 100 pts (11/13/19)

Final – 200 pts (12/9/19) 10:30-12:30

Participation – 100 pts

Report (6991K) – 100 pts due 12/9/19 before the start of the final exam

*Participation:* Although this is a swing course I am teaching it as a graduate course, so I expect participation from the class. If you come prepared to class (having read the assigned readings), ask and answer questions, participate in discussions then you will receive the max 100 points. This is an easy 100 points don't waste them.

*Exams:* There will be two in class exams and a final on the above dates and they will be pertinent to the material that we are currently discussing in class. As we get closer to exams more information will be provided.

### **Mandatory Statement of Non-Discrimination from the University:**

Youngstown State University does not discriminate on the basis of race, color, national origin, sex, sexual orientation, gender identity and/or expression, disability, age, religion or veteran/military status in its programs or activities. Please visit [www.ysu.edu/ada-accessibility](http://www.ysu.edu/ada-accessibility) for contact information for persons designated to handle questions about this policy.”

### **Statement for students with disabilities:**

In accordance with University procedures, if you have a documented disability and require accommodations to obtain equal access in this course; please contact me privately to discuss your specific needs. You must be registered with the Center for Student Progress Disability Services, located at 36 West Wood Street, and provide a letter of accommodation to coordinate reasonable accommodations. You can reach CSP Disability Services at 330-941-1372.

### **Academic Misconduct:**

As outlined in *The Student Code of Conduct*, all forms of academic dishonesty are prohibited at Youngstown State. This includes plagiarism, the unauthorized use of tools or notes in taking tests or completing assignments, fabrication of data or information used for an assignment, working with others without permission from the instructor, and more. A student who is believed to have violated the academic integrity policy will meet with the instructor to discuss the allegations. The student may accept responsibility for the violation and any sanctions selected by the instructor, or they have the right to ask for a hearing before a hearing panel. The full Academic Integrity policy can be found in Article III. 1. of *The Student Code of Conduct*, while further information on University procedures for alleged academic integrity violations can be found in Article V.

If you are caught cheating, **you will at least be given an F grade on that particular assignment and perhaps for the entire course. Do not jeopardize your future by cheating.**

*Report (6991K):*

Throughout the course of the semester we will discuss/encounter topics or reactions that we have to either skip or gloss over due to lack of time. The goal of this assignment is for you to cover an organometallic topic of your choosing (see sample topics below) and write a 10-page, single-spaced, paper about it. The 10-page limit does not include references. Note that the maximum page count is 10, although there is no minimum count, I highly suggest that you don't go too short.

Your report will include the following:

- 1) Relevant background information/historical context.
- 2) A discussion on why this particular paper/reaction is important
- 3) The current state-of-the-art
- 4) Analysis of the future outlook of your chosen field/topic

You are not allowed to copy and paste schemes, you have access to chemdraw, so redraw them yourself.

As a written assignment your goal should be to write as a scientist would. Do not use colloquialisms, do not over rely on the first person (especially since the work you are describing is not your own).

I'm allowing you to submit an ungraded rough-draft (See below). I will not read any rough draft submitted past the deadline. I will be highly critical of every aspect of your report so it is highly recommended you take advantage of the rough draft period and make the appropriate corrections.

The due dates for the literature assignments are below:

*Note: I deduct 5 points per day from your final report grade for missing the topic deadline.*

	Due
Topic	10/28/19
Rough Draft	11/20/19
Final Draft	12/9/19

Topics: All topics are first come first served. So if there is a topic you are interested in, I highly recommend you speak to me early about it. I will not allow topics that I feel are similar to another classmate's.

Sample topics:

- 1) Water oxidation
- 2) Hydroformylation
- 3) A specific metalloenzyme
- 4) Nitrogen fixation
- 5) High oxidation state metal complexes
- 6) Metal catalyzed (Insert your favorite reaction)
- 7) Multiple metal complexes