

Syllabus Chem 2120

Fall 2018

Instructor: Raúl Hernández Sánchez

Office: Chevron 1212 (expected to move to Chevron 1113 sometime in September 2018)

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Class: MW 8-9:15am, Eberly Hall 228

Textbook: Inorganic Chemistry 5th Edition. Miessler, Fischer, and Tarr. Pearson.

Lectures are based on material from current scientific literature and various other textbooks, but the Miessler, Fischer, and Tarr textbook will be most central to the topics discussed.

Important dates:

Aug 27th – First day of class

Sep 3rd – Labor Day, no lecture

Oct 15th – Fall break, no lecture

Nov 21st – Thanksgiving Day, no lecture

Dec 5th – Last day of class

Grading:

3 exams*: 250 pts

3 Problem sets: 90 pts

Group project (presentation)**: 100 pts

Individual project (presentation)**: 100 pts

Group contribution/participation: 20 pts

Total: 560 pts

Primary topics:

- Periodicity and quantum mechanical basis of periodic table
- Bonding theory
- Coordination chemistry
- Organometallic chemistry/Catalysis
- Special topics
- Group & individual projects

Office hours: by appointment.

Problem sets:

There will be three problem set assignments given in the semester. These will be collected on the date indicated (in class) and graded for completeness. Late problem sets will be penalized. Answer keys will be posted. I recommend you also work textbook problems independently, although none will be officially assigned. Assignments should be turned in if at all possible even if you cannot attend class. If you have a medical/personal issue that prevents you from attending, please notify me. Graded problem sets will be handed out in class. You are encouraged to work together on problem sets, but you must write up your own answers and indicate on your problem set with whom you worked.

Class structure:

We will be covering multiple topics throughout the semester. Some topics may take more or less time. We will not be following a rigid schedule, and some of the exams may be rescheduled.

Exams:

Although the exams cover specific blocks of material, you can expect to see concepts on the second exam which were covered on the first exam. The final exam is cumulative. ***I will not give make-up exams, but I will consider allowing students to take the exam early, on a case by case basis, provided that there is a legitimate reason.*** *Your lowest exam will be graded on a 50-point scale. Thus, the other two exams will be graded on a 100-point scale each.

Group project:

Groups of 2-3 students will each present a lecture on the research of a modern leader in inorganic chemistry. Details will be distributed in an assignment. *****50 points will be assigned from peer evaluation, the other 50 points will come from my evaluation.***

Individual project:

Each student will identify a current scientific problem or challenge and give a short presentation at the end of the term. Emphasis will be given to problem selection rather than the proposed solution. This means the student will need to *dig deep* and justify why this is a current challenge. More details will be distributed in an assignment. *****50 points will be assigned from peer evaluation, the other 50 points will come from my evaluation.***

Group contribution/participation:

I will observe group interactions and class participation. Attendance is your responsibility, I will not be recording it, but it will be hard for you to get participation points if you do not come to class.

Academic integrity:

Students in the course are expected to comply with the University of Pittsburgh's Policy on Academic Integrity. If you are not aware of the specifics, you may obtain these guidelines from the CAS Dean's Office or on the web at <https://as.pitt.edu/faculty/policies-and-procedures/academic-integrity-code>

Violations of these guidelines can result in a zero for the assignment or failure of the course.

Disability:

If you have a disability for which you are or may be requesting an accommodation, please contact both me and the office of Disability Resources and Services (contact info below) as soon as possible so that we can make any necessary arrangements. The Disability Resources and Services office is located in William Pitt Union, Room 216. Their phone number is (412) 648-7890. They will be able to verify the disability and determine reasonable accommodations for this course.

#	Date	Topic	Reading
1	Aug 27 th	Class overview, atomic structure	Ch. 2 (MFT)
2	Aug 29 th	Simple bonding models	Ch. 3 (MFT)
	Sep 3 rd	<i>Labor Day – no lecture</i>	
3	Sep 5 th	Main group chemistry	Ch. 8 (MFT)
4	Sep 10 th	Main group chemistry	Ch. 8 (MFT)
5	Sep 12 th	Symmetry and Group Theory I	Ch. 4 (MFT)
6	Sep 17 th	Symmetry and Group Theory II	Ch. 4 (MFT)
7	Sep 19 th	Vibrational analysis	Ch. 4.4.2 (MFT)
8	Sep 24 th	Molecular orbitals I (diatomics)	Ch. 5 (MFT)
9	Sep 26 th	Molecular orbitals II (larger molecules) (PSet 1 due in class)	Ch. 5 (MFT)
	Oct 1 st	Exam I	
10	Oct 3 rd	Coordination chemistry	Ch. 9
11	Oct 8 th	Coordination chemistry: bonding (CFT, MOT, LFT)	Ch. 10.2-10.4
12	Oct 10 th	Descent in symmetry and magnetic susceptibility	
	Oct 15 th	<i>Fall Break – no lecture</i>	
13	Oct 17 th	Coordination chemistry: electronic spectra	Ch. 11
14	Oct 22 nd	Coordination chemistry: reactions and mechanisms	Ch. 12
15	Oct 24 th	Organometallic chemistry: introduction, ligands & electron counting (PSet 2 due in class)	Ch. 13
16	Oct 29 th	Organometallic chemistry: reactions	Ch. 14
17	Oct 31 st	Organometallic chemistry: reactions	Ch. 14
18	Nov 5 th	Organometallic chemistry: select reactions	
19	Nov 7 th	Nanoscience-coordination chemistry interface (how to identify a problem)	
	Nov 10 th	<i>Presentations must be uploaded to CourseWeb before midnight</i>	
20	Nov 12 th	Presentations (random selection)	
21	Nov 14 th	Presentations (random selection)	
	Nov 19 th	Presentations (random selection) (PSet 3 due in class)	

	Nov 21 st	<i>Thanksgiving Day – no lecture</i>	
22	Nov 26 th	Exam II	
23	Nov 28 th	Scientific problem presentations (random)	
24	Dec 3 rd	Scientific problem presentations (random)	
	Dec 5 th	Final exam	