Chemistry 110
Advanced Inorganic Chemistry - Fall 2016
Lecture: MW 11-12:15pm

Instructor: Dr. Jacqueline Houston
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Course Description: The application of atomic structure, the periodic law, molecular structure and bonding principles, electrochemical principles and other selected models and concepts of theoretical and descriptive inorganic chemistry. Physical and chemical properties of selected elements and inorganic compounds are studied. For a B.S. in chemistry, you must take Chemistry 110L, Inorganic Laboratory, concurrently with the lecture course. Please note, Chem 110L is a Co-requisite.

Pre-requisites: CHEM 125, CHEM 140B (or CHEM 142 with instructor permission). CHEM 140B may be taken concurrently, however, students are encouraged to complete CHEM 140B and CHEM 141 first. Corequisite: CHEM 110L. Units: 3.0.

Text(s): *Required:* Inorganic Chemistry, 3rd Edition, C.E. Housecroft and A.G. Sharpe
Highly Recommended: Inorganic Chemistry Solutions Manual, 3rd Edition, C.E. Housecroft and Sharpe and Inorganic Spectroscopic Methods by A.K Brisdon (Oxford Primer)
Also Recommended: 3 Ring binder for notes and handouts.
Other Useful Texts: Inorganic Chemistry, 4th Edition, G.L Miessler and D.A. Tarr; Advanced Inorganic Chemistry, 6th edition, Cotton, Wilkinson, Murillo and Bochmann; Inorganic Chemistry, J.R. Bowser; Synthesis and Techniques in Inorganic Chemistry, Angelici

Course Objectives:

- To predict the structures, properties, and reactivities of coordination compounds.
- Develop an understanding of atomic structure and bonding models, including molecular orbitals and how these relate to the chemistry of coordination compounds.
- Understand the physical methods (ie spectroscopy) used for structural characterization.
- Understand the role of inorganic chemistry and how it relates to other areas such as biochemistry, environmental chemistry, analytical, organic, and physical chemistry.
- Use of technology for communication, source of information, and molecular modeling.

Problem Sets: Homework will be assigned from both the readings and from lecture material. One problem from the HW set will be graded. Most solutions are available in the Solutions Manual (3rd Edition, C.E. Housecroft). There will be approximately 16 assignments, each worth 5pts. In order to receive the 5pts, you must complete all the assigned problems. Late assignments will not be accepted.

Quizzes: There will be 6 quizzes given at the beginning of class. Each quiz is worth 20pts and you will have 15-20 min to complete the quiz. If you miss a quiz, you will receive a zero for that quiz. No makeup quizzes will be given. If you are late, you will not be given additional time to take the quiz. Material will be taken from the text, homework sets or examples done during lecture.

Exams: There will be 3 exams worth 100pts per exam. Exam material will include topics from homework, lectures and material from the assigned readings in your textbook. The exam dates are listed on the lecture schedule and are firm. There will be no make-up exams allowed. Exceptions will only be made for a legitimate case in which a note from a physician or employer will be required. The final exam will be an ACS standardized exam and will be worth 200pts.

Regrade Requests: All re-grade requests must be made in writing within 1 week. Your attached note must make clear why you think an error exists. Any requests beyond this point will not be considered.

Grade Scale

HW	80pts	90 – 100%	A– / A
Quizzes	120pts	80 – 89%	B– / B+
Exams	300pts	70 – 79%	C– / C+
Final Exam	200pts	69 – 60%	D
Total	**700pts**	<60 %	F

These percentages MAY BE adjusted depending on the class average and/or high score. Assume, however, this class is not curved.

Bonus Points: 20 pts maximum. These bonus points will be given out for participation in class discussions (i.e. answering questions in lecture) or by attending department seminars (Fridays 1-2pm).

Attendance: Attendance is HIGHLY recommended. The course format will consist of lecture, example problems, and in-class exercises. *Lectures will not repeat the content of the assigned readings and will be used to highlight key points, concepts, and applications.* Quizzes and exams will be based upon both the material from class, the readings, and the homework assignments.

Classroom Etiquette: Any student who disrupts the class will be asked to leave. No talking will be permitted unless it concerns class business. Also, repeated tardiness that disrupts the class will not be tolerated. ***The use of cell phones, laptops etc. in the classroom is strictly prohibited.***

How to succeed in this class

- Do example problems. Problem solving is one of the most effective ways to master this material.
- Read the assigned text section the instructor is going to cover each day **before** going to class. The lectures will be more beneficial if you have done some preparation.
- Review your lecture notes after each lecture to make sure you understand the material presented.
- Do not wait until the last minute to do your homework or assignments. If you wait until the last minute, you will not have time to get help.

Academic Honesty: (CHEATING)

Any cheating what so ever will be addressed with zero tolerance. You will receive a non-passing grade in class and a report will be filed with Student Affairs. All graded work (including quizzes, exams, homework, and lab reports) must be your own. Students found copying or assisting other students in copying any graded class assignments will be dealt with according to the University statement on Academic honesty (http://www.csus.edu/admbus/umanual/UMA00150.htm). A student tutorial on plagiarism is also available (http://library.csus.edu/content2.asp?pageID=353).

Students with disabilities: If you have a disability and require accommodations, you need to provide disability documentation to SSWD, Lassen Hall 1008, and (916)278-6955. Please discuss your accommodation needs with me after class or during my office hours early in the semester.

Week	Week of…	Lecture Schedule for Monday	Lecture Schedule for Wednesday
1	Aug 29	1. Intro to Inorganic Chemistry and Electronic Structure (Ch 1.4-1.7)	2. Microstates andTerm Symbols (Refer to Ch 21.6)
2	Sept. 5	**Campus Holiday**	3. Term Symbols Cont'd, Periodic Trends (Ch 21.6 and Ch 1.8-1.10)
3	Sept. 12	4. Some Basic Concepts in Chapter 2 (Ch 2.2,2.4,2.5,2.6,2.8) **Quiz #1 (weeks 1-2)**	5. VB and Molecular Orbital Theory (Ch 2.2, 2.3,2.7 and 5.1-5.2)
4	Sept. 19	6. Finish MO Theory and revisit VB Theory for polyatomics (Ch 2 and little from Ch 5)	7. Symmetry (Ch 4) **End of Exam 1 material.**
5	Sept. 26	8. Symmetry and Group Theory (Ch 4) **Quiz #2 (weeks 3-4)**	**Exam 1 (Material from weeks 1-4)**
6	Oct. 3	9. Symmetry and Group Theory and IR spectroscopy (Ch 4)	10. Intro to Coordination Chemistry: d-block chem (Ch 7.11 and 20.6-20.8 and any Gen Chem text)
7	Oct.10	11. Coordination Chemistry Continued: d-block chem (Ch 21.1 -21.3)	12. Coordination Chemistry Cont'd (Ch 21.3 -21.4)
8	Oct. 17	13. Coordination Chemistry Cont'd (Ch 21.7) **Quiz #3 (weeks 5-7)**	14.Coordination Chemistry (Ch 21.7)
9	Oct. 24	15. Spectroscopy in Inorg. Chem (Handouts)	16. Spectroscopy in Inorg. Chem (Handouts) Cont'd. **End of Exam 2 material.**
10	Oct. 31	17. Inorganic Reaction Mechanisms (Ch 26) **Quiz #4 (weeks 8-9)**	**Exam 2 (Material from weeks 5-9)**
11	Nov. 7	18. Inorganic Reaction Mechanisms (Ch 26)	19. Introduction to Organometallic Chemistry (Ch 24)
12	Nov. 14	20. Introduction to Organometallic Chemistry (Ch 24)	21. Organometallic Chemistry and Catalysis (Ch27) Start Acid-Base Chemistry
13	Nov. 21	22. Acid-Base Chemistry (Ch 7) **Quiz #5 (weeks 10-12)**	23. Chemistry of Solids (Ch 6.1-6.14) **End of Exam 3 material.**
14	Nov. 28	24. Redox Chemistry (Ch 8.1,8.2,8.4, 8.5 and Box 8.2) **Quiz #6 (weeks 13-15) TAKE HOME**	**Exam 3 (Material from weeks 9-14)**
15	Dec.5	25. Main-Group Chemistry and Parallels to Organometallics (Various Chapters)	Review/Discuss Final Exam scheduled for Monday
16	Dec. 12	Final Exam : ***Mon., Dec. 12th, 10:15-12:15pm***	