

Chemistry 16:160: 471/571
ADVANCED INORGANIC CHEMISTRY
Syllabus & Schedule of Lectures

Fall 2016

Schedule	Mondays + Wednesdays, 5:00-6:20 pm, Wright-Reiman (Chemistry) Building, Room 260.
Instructors	Charles Dismukes (WL-113, 5-1489; 5-6786, dismukes@rci.rutgers.edu) Tewodros (Teddy) Asefa (CBE-138, 5-2970, tasefa@rci.rutgers.edu)
Course Content	Survey of inorganic chemistry, including electronic structures of atomic, molecular and crystal systems, symmetry and chemical bonding, VB and MO theory, ligand field theory, simple solids, acids-bases, donor-acceptors, stereochemistry, coordination chemistry, and catalysis.
Textbook	"Inorganic Chemistry", 4 th Ed., 2011, G. L. Miessler and D. A. Tarr
Other Readings	<i>"Electronic Structure and Properties of Transition Metal Compounds. Introduction to the Theory"</i> 2010 Second Ed., by I. B. Bersuker; <i>Solid State Chemistry: An Introduction</i> , 2005, Third Ed., by L. Smart. Articles from the primary literature will be assigned and made available.
Lecture Notes	Lecture notes will be posted on the course website. Access will be provided to all students enrolled in the course on Sakai
Homework	Problems will be selected from the textbook and from other sources and will be discussed in class. Homework will be recorded by content completed, but will not be graded.
Office Hours	By appointment and Wednesdays 1-2 pm; Asefa and Dismukes
Proposal	Each student is expected to write and defend a research proposal in a current topic in an area of inorganic chemistry. You will also serve as referee for another proposal. See "Guidelines" for detailed information.
Exams	Two exams. The exams will be given during the regular lecture schedule. The dates and time are listed in the "Tentative Schedule".
Grading Policy	There will be no make-up exams. Late reports or problems lose 50%/day. Mid-term Exams (2) 2 x 35% Proposal, Reviewer Report and Presentation 20% Homework 10% <hr/> Total 100%

(Tentative Schedule, Fall 2015)

(Subject to minor changes depending on the discussion times some lectures may take and additional explanation in class they may need by popular request of students. Inclement weather sometimes forces class closures throughout the University).

Class	Date	Ch. M&T	Problem Set	Topic
1	Sep 7	2		Atomic Structure
2	Sep 12	3		Simple Bonding Theory
3	Sep 14	4+		Molecular Orbitals; X-Ray photoemission Spectroscopy (XPS)
4	Sep 19	7		XPS and Energy Band Structure
5	Sep 21	7+		The Crystalline Solid State and Solid State Chemistry
6	Sep 26	7+ L. Smart		"
7	Sep 28	8		Main Group Chemistry
8	Oct 3	8		"
9	Oct 5	8+		"
10	Oct 10	13		Organometallic Chemistry
11	Oct 12	13+		"
12	Oct 17	13		Parallels Between Main Group and Organometallic Chemistry
13	Oct 19	4+	1	Symmetry, Group Theory
14	Oct 24	6	2	Acids-Bases
15	Oct 26	6+	2	Donor-Acceptor Chemistry
16	Oct 31	9	2	Stereochemistry
17	Nov 2	Exam 1		Covering lectures 1-12
18	Nov 7	9+	3	TM Complexes : Stereochemistry
19	Nov 9	10	4	Bonding : Experimental Evidence
20	Nov 14	10+	4	Ligand Field Theory
21	Nov 16	Bersuker 6	5	Bonding Theories
22	Nov 21	Bersuker 6	5	Electronic Structure of TM Complexes
23	Nov 23			<i>Friday Classes Will be Held on this Day (As per Rutgers' Rule)</i>
24	Nov 28	12	6	Inorganic Reaction Mechanisms
25	Nov 30	14	6	Catalysis by TM Complexes
26	Dec. 5	14	7	Catalysis by TM Complexes
27	Dec 7	Exam 2		Covering lectures 13-25
28	Dec 12			Student Proposal Presentations
29	Dec 14			Student Proposal Presentations

+ indicates possible supplemental readings (Study Guides)

Other assigned readings to be covered in class:

: Wilfred F. van Gunsteren, The Seven Sins in Academic Behavior in the Natural Sciences, Angew Chemie Int. Ed. [Volume 52, Issue 1](#), 3 DEC 2012.