

Chemistry 411/611 **Inorganic Chemistry (2009)**

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Lecture: M-W-F 11:45-12:40, 1-019 CST

Office Hrs: M-W 4:00-5:00, and by appointment

Credits: 3

Text: (Required) Shriver & Atkins, "Inorganic Chemistry", 4th Edition, Freeman Press
Available at SU bookstore, Orange Bookstore. The solution manual is optional.

(Suggested for CHE611 Students pursuing Inorganic) Huheey, "Inorganic
Chemistry: Principles of Structure and Reactivity" 4th Edition, Harper Collins.

Both Textbooks will be placed on "reserve" at Library.

Description: Inorganic Chemistry covers a number of subtopics that are at the heart of chemical science. These topics include; periodic trends, foundations of bonding theory, the chemistry of metals, alloys, semiconductors, superconductors, and other "solid" compounds, as well as instrumentation and modern application basics.

Since Inorganic Chemistry is a predominantly experimental subject, many of the topics covered dwell from fundamental observations and discoveries made in the laboratory, which pushed chemical technology to unheralded heights in the 20th century. Moreover, these discoveries forms the foundation for much of today's advances in; nanotechnology (such as; synthesis, assembly, processing), energy conversion research (such as; photovoltaics, Li-ion batteries, fuel cells, catalysis), and biotechnology (such as; metal containing therapeutics, drug-delivery, imaging, and detection). These topics include; acid-base & redox chemistry, metal-ligand reactivity, and the chemical synthesis of coordination compounds and other "solid" state materials and interfaces. As well, the inorganic chemist is trained in an array of characterization and instrumental techniques, such as; crystallography, spectroscopy, and microscopy.

However, even though the class seems broad, all of the topics are interconnected, and the student should approach the class by bringing his or her knowledge of a previous chapter to each new chapter. This will greatly enhance the experience, and allow for a more comprehensive understanding as the class progresses. Finally, only towards the end of the semester will a big picture idea of what Inorganic Chemistry is all about be possible, allowing for specialized study/research in future classes.

Prerequisites: CHE 116, 119

Sept 21	**No Classes**	
Sept: 18, 23, 25, 30	Ch #3: <i>Solid State Chemistry</i>	3.2, 3.3, 3.4, 3.6, 3.7, 3.9, 3.12, 3.16,
Sept. 28	**No Classes**	
FRI Oct 2	<u>EXAM #1 (Ch's 1-3)</u>	
Oct: 5, 7, 9	Ch #4: <i>Acids & Bases</i> Ch# 5: <i>Oxidation & Reduction</i>	4.1, 4.2, 4.3, 4.4, 4.11, 4.13, 4.20, 4.21
Oct: 12, 14, 16, 19	Ch #7: <i>Molecular Symmetry</i>	7.1, 7.2, 7.3, 7.4, 7.7, 7.11,
Oct: 21, 23, 26, 28	Ch #8: <i>Intro to Coordination Compounds</i> Ch #18: <i>d-Block Elements</i>	8.1, 8.4, 8.6, 8.7, 18.9, 18.10, 18.12,
FRI Oct 30	<u>EXAM #2 (Ch's 4, 5, 7, 8, 18)</u>	
Nov: 2, 4, 6	Ch #19: <i>d-Metal Complexes</i>	19.1, 19.2, 19.4, 19.9, 19.15, 19.16, 19.18,
Nov: 9, 11, 13 Nov: 16, 18, 20	Ch #20: <i>Coordination Reactions</i> Ch #21: <i>d-Metal Organometallic Chemistry</i>	20.1, 20.2, 20.5, 20.11, 20.13, 20.14 21.1, 21.3, 21.12, 21.13, 21.16, 21.20
Mon. Nov 23	<u>EXAM #3 (Ch's 19, 20, 21)</u>	
Nov. 25-27	**No Classes**	
Nov: 30 Dec: 2	Ch #6: <i>Physical Techniques of Analysis</i>	6.1, 6.2, 6.3, 6.5, 6.8, 6.9, 6.12, 6.14, 6.17,
Dec: 4, 7	Ch #23: <i>Solid-State Materials Chemistry</i>	23.1, 23.2, 23.6, 23.10, 23.19
Dec: 9, 11, 14,	Ch # 24: <i>Nanomaterials, Nanoscience, & Nanotechnology</i>	24.1, 24.2, 24.4, 24.5, 24.8, 24.10, 24.21, 24.27
Dec: 14	Ch #26: <i>Biological Inorganic Chemistry</i>	26.1, 26.2, 26.3, 26.4, 26.5
Dec. 14	Graduate Student Questions Due	
Dec: Exam Week	<u>EXAM #4 (Ch's 6, 23, 24, 26)</u>	<i>*Exam ½ Cumulative*</i>