

**ADVANCED INORGANIC CHEMISTRY**  
**CHEMISTRY 340/441**  
**SPRING 2009**

**Instructor:** Dr. Richard Holz

Office: 125 Flanner Hall

**Lectures:** TTh 8:30-9:45 AM in DH 440.

**Office Hours:** TTh 1:00-2:00 PM or by prior arrangement.

**Text book:** The required text is "Inorganic Chemistry: Principles of Structure and Reactivity" 4th Ed., James Huheey, Harper-Collins, 1993.

**Course content:** The material covered in this course and approximate dates are given in the course outline. Some sections in certain chapters will be skipped or may be covered out of order. You will not be responsible for material that is not covered in class. The prerequisites for this course are Chem. 301.

**Problem sets:** You should work all of the assigned problems at the end of each chapter. You should also work as many additional problems at the end of the chapters as you need to grasp the concept. You will also be responsible for the example problems in each chapter. These problem sets will not be collected; however, if you have not worked a sufficient number of the assigned problems and cannot work them without help, the exams will seem difficult.

**Exams:** Two 90 minute exams will be held on Thursday's at the normal class times. Exams will be composed of problems that are similar to those worked in class, the book example problems, and those assigned at the end of each chapter. There will be *no* make-up exams. If you have a major problem (a written medical excuse, etc.) and you absolutely *must* miss an exam please see me *in advance*, if possible, to discuss your situation. The final examination, which is comprehensive, is scheduled for **Saturday, May 2, at 9:00 AM**. It is official university policy that unless you have three examinations on this day, you must take the final exam at this time. Permission to take the final exam at another time for any other reason must be obtained from the Dean of the College of Arts and Science.

**Grading:** Grades will be assigned according to the results of two one hour exams and a two hour final examination.

Exam I	100 pts.
Exam II	100 pts.
Comprehensive Final Exam	200 pts.
<b>Total</b>	<b>400 pts.</b>

Grading will be assigned as follows: A = 90%, B = 80%, C = 70%, D = 60%.

**Course Withdrawal:** Anyone may withdraw from Chem. 340/441 with a "W" grade through Monday, March 23<sup>rd</sup>.

**General Information:** In accordance with the Americans with Disabilities Act, reasonable accommodations will be provided for all persons with disabilities in order to ensure equal participation in Chem. 340-441. In cooperation with the Services for Students with Disabilities, reasonable accommodation will be provided for students with disabilities. Please meet with the instructor during the first week of class to make arrangements.

### Chemistry 340-441 Course Outline

Monday	Tuesday	Wednesday	Thursday	Friday
Jan. 12	Jan. 13 Classes Begin CH 1: What is Inorganic Chemistry CH 2: The Structure of an Atom <b>Problems:</b> 2.1, 2.2, 2.3, 2.4, 2.7, 2.8, 2.10, 2.11, 2.12, 2.14, 2.16, 2.17, 2.19, 2.20, 2.23, 2.24.	Jan. 14	Jan. 15 CH 2: The Structure of an Atom	Jan. 16
Jan. 19 Martin Luther King Day  No Classes	Jan. 20 CH 2: The Structure of an Atom CH 3: Symmetry and Group Theory <b>Problems:</b> 3.1, 3.2, 3.3, 3.9, 3.10, 3.11, 3.15, 3.18, 3.20, 3.28, 3.29	Jan. 21	Jan. 22 CH 3: Symmetry and Group Theory	Jan. 23
Jan. 26	Jan. 27 CH 3: Symmetry and Group Theory	Jan. 28	Jan. 29 CH 3: Symmetry and Group Theory	Jan. 30
Feb. 2	Feb. 3 CH 3: Symmetry and Group Theory CH 4: Bonding Models in Inorganic Chemistry 1. Ionic Bonds <b>Problems:</b> 4.1, 4.2, 4.5, 4.9, 4.10, 4.18.	Feb. 4	Feb. 5 CH 4: Bonding Models in Inorganic Chemistry 1. Ionic Bonds	Feb. 6
Feb. 9	Feb. 10 CH 4: Bonding Models in Inorganic Chemistry 1. Ionic Bonds CH 5: Bonding Models in Inorganic Chemistry 2. The Covalent Bond <b>Problems:</b> 5.1, 5.3, 5.5, 5.7, 5.8, 5.10, 5.12, 5.18, 5.19, 5.22, 5.24.	Feb. 11	Feb. 12 CH 5: Bonding Models in Inorganic Chemistry 2. The Covalent Bond	Feb. 13
Feb. 16	Feb. 17 CH 5: Bonding Models in Inorganic Chemistry 2. The Covalent Bond	Feb. 18	Feb. 19 CH 5: Bonding Models in Inorganic Chemistry 2. The Covalent Bond	Feb. 20
Feb. 23	Feb. 24 CH 5: Bonding Models in Inorganic Chemistry 2. The Covalent Bond <b>EXAM I-Review</b>	Feb. 25	Feb. 26 <b>EXAM I (CH 1-5)</b>	Feb. 27
March 2 Spring Break	March 3 Spring Break	March 4 Spring Break	March 5 Spring Break	March 6 Spring Break
March 9	March 19 CH 6: The Structure and Reactivity of Molecules <b>Problems:</b> 6.2, 6.3, 6.5, 6.8, 6.13, 6.20, 6.26, 6.28.	March 11	March 12 CH 6: The Structure and Reactivity of Molecules	March 13
March 16	March 17 CH 6: The Structure and Reactivity of Molecules	March 18	March 19 CH 9: Acid-Base Chemistry <b>Problems:</b> 9.1, 9.2, 9.3, 9.4, 9.10, 9.11, 9.13, 9.18, 9.19, 9.22, 9.25, 9.29, 9.33.	March 20

<b>March 23</b>	<b>March 24</b> CH 9: Acid-Base Chemistry	<b>March 25</b>	<b>March 26</b> CH 9: Acid-Base Chemistry CH: 11 Coordination Chemistry: Bonding, Spectra, Magnetism <b>Problems:</b> 11.3, 11.5, 11.7, 11.9, 11.10, 11.11, 11.12, 11.15, 11.20, 11.21, 11.23, 11.27, 11.32.	<b>March 27</b>
<b>March 30</b>	<b>March 31</b> No Class	<b>April 1</b>	<b>April 2</b> CH: 11 Coordination Chemistry: Bonding, Spectra, Magnetism	<b>April 3</b>
<b>April 6</b>	<b>April 7</b> CH: 11 Coordination Chemistry: Bonding, Spectra, Magnetism	<b>April 8</b>	<b>April 9</b> CH: 11 Coordination Chemistry: Bonding, Spectra, Magnetism CH: 12 Coordination Chemistry: Structure <b>Problems:</b> 12.1, 12.5, 12.9, 12.10, 12.12, 12.13, 12.15, 12.22, 12.24.	<b>April 10</b> Easter Break No Class
<b>April 13</b> Easter Break No Class	<b>April 14</b> CH: 12 Coordination Chemistry: Structure	<b>April 15</b>	<b>April 16</b> <b>EXAM II</b> CH 6, 9, 11-12	<b>April 17</b>
<b>April 20</b>	<b>April 21</b> CH 13: Coordination Chemistry: Reactions, Kinetics, and Mechanisms <b>Problems:</b> 13.1, 13.2, 13.3, 13.6, 13.9, 13.10, 13.12, 13.19, 13.22.	<b>April 22</b>	<b>April 23</b> CH 13: Coordination Chemistry: Reactions, Kinetics, and Mechanisms	<b>April 24</b> Last Day of Classes
				<b>Saturday</b> <b>May 2</b> <b>Final Exam</b> 9:00 to 11:00 AM CH 1-6, 9, 11-13.

## Learning Objectives

General course learning objectives include:

1. Integrate skills involving scientific methodology.
2. Use evidence to support a claim.
3. Analyze key facts as outlined during the course.
4. Compare and contrast the vocabulary of inorganic chemistry.
5. Ability to analyze chemical and physical properties of inorganic molecules.
6. Be able to distinguish chemical and physical properties of inorganic molecules based on structure and bonding.
7. Relate structure and bonding to function.
8. Provide macroscopic and microscopic descriptions of inorganic reaction mechanisms.
9. Get an A in the course!