Chem 4002: Advanced Inorganic Chemistry  
CRN: 24552  
Lecture: MWF: 8:00 am - 8:50 am - Beury 415  
Recitation: F: 10:00 am-10:50 am - Beury 415

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Office: BE 350  
Office Hours: M: 9:00 -11:00 am

Pearson publishing, 2015.  
Class handouts will be an essential supplement to the text.

Course Evaluation: There will be evaluated homework exercises, recitation quizzes and class presentations in addition to two 50 minute in-class exams and a final exam. All exams will be given in room BE 415.

Course Outline

1) Review of foundational topics in Inorganic Chemistry: Survey of elemental and atomic species (periodic table), structure and bonding models for ionic, molecular and metallic species (chapters 1-3,5,7), thermodynamic terms and bond energetics (handouts), main group binary compounds of H, O, and Cl (chapter 8), symmetry elements and operations, assignment of point groups, character tables and group theory (chapters 4,5). (8 classes)

2) Application of group theory to valence bond and molecular orbital descriptions of covalent bonding. Derivation and interpretation of MO diagrams and the use of photoelectron spectra in determining the ionization energies for molecular orbitals (chapter 5 and handouts, 5 classes).

3) Applications of group theory in deriving and interpreting the electronic and vibronic states in main group and transition metal species. Electronic and vibronic spectra in the study of the structure and bonding in chemical species (handouts, 6 classes).

4) Magnetic behavior of d and f transition metal species (4 classes; chapters 10,11).

5) Mechanisms for reactions of transition metal complexes (4 classes, chapter 12).

6) Organometallic structures, classes of reactions and mechanisms, and applications in catalysis (8 classes, chapters 13,14).

7) Isolobal bonding model and Wade’s rules for clusters as unifying concepts for understanding the structures and bonding in main group and transition metal compounds (6 classes, chapter 15).
Tentative Exam Schedule

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<thead>
<tr>
<th>Exam</th>
<th>Date</th>
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<tbody>
<tr>
<td>Exam I</td>
<td>Wednesday March 1</td>
<td>8:00am-8:50am</td>
<td>Beury 415</td>
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<tr>
<td>Exam II</td>
<td>Wednesday April 19</td>
<td>8:00am-8:50am</td>
<td>Beury 415</td>
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<tr>
<td>Final Exam</td>
<td>Wednesday May 10</td>
<td>8:00am-10:00am</td>
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Chem 4002 will not meet on 3/13, 3/15, 3/17 (Spring break)