Chem 5333  Spring 2011
Advanced Inorganic Chemistry – Bonding and Structure
TR 10:30 – 11:45 AM, PHSC 120

Instructor:  Robert P. Houser
Associate Professor, Department of Chemistry & Biochemistry
Office:  2060 Stephenson Life Sciences Research Center
Phone:  325-3551
Email:  houser@ou.edu
URL:  http://learn.ou.edu

Office Hours:  MWF 10:00 AM – 11:45 AM (or by appointment).

Resources:

Textbooks:

Reserve Materials:


Web resources:
http://learn.ou.edu
   login with your OUNet ID (OU 4x4) and your OUNet password, follow the link to Chem 5333.
http://libraries.ou.edu/chemmath
   OU ChemMath Library.
http://pubs.acs.org
   American Chemical Society, many useful links.
http://www.webelements.com
   Interactive periodic table.

Course Objective/Description
Physical methods and concepts applied to inorganic and organometallic systems, including symmetry and group theory, MO theory, crystal field and ligand field theories, spectroscopy (electronic spectroscopy, vibrational spectroscopy, NMR, EPR), magnetism, kinetics and reaction mechanisms, and other special topics as time allows.
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Course Grading:
Final grades will be assigned based on total points accumulated. Maximum possible score is 1000 points.

- 5 homework sets @ 60 points: 300 points
- Mid-term exam I (Feb 24): 200 points
- Mid-term exam II (Apr 7): 200 points
- Final Exam (May 13): 300 points

Homework:
Five problem sets will be assigned periodically throughout the semester. Problems similar to those assigned as homework may appear on the exams, so it will be to your advantage to do the homework and understand the solutions. Answer keys will be posted online.

Examinations:
There will be three examinations given over the course of the semester. The two mid-term exams will cover topics covered up to that point. The final exam will be comprehensive. The specific time and place for the mid-term exams will be announced later.

Other Policies:
There will be NO EXTRA CREDIT in this class. The instructor reserves the right to change any items contained in this syllabus. This includes, but is not limited to: course content, scheduled dates, and fraction(s) of final grade assigned to individual components of the course.

Absences:
Students are responsible for the content of courses in which they are enrolled. Students have a responsibility to inform the instructor prior to absences whenever possible. It is the policy of the University to excuse the absences of students that result from religious observances and to provide without penalty for the rescheduling of examinations and additional required class work that may fall on religious holidays.

Makeups:
No makeup exams will be allowed unless the absence is justified (i.e., medically justified reasons, official university-sponsored activities, religious holidays, or legally required activities). If the absence for an exam cannot be justified to my satisfaction, this will result in a grade of zero for that exam.

Dropping:
The last day for no record of grade for a dropped course is January 31, 2011. The last day for an automatic grade of "W" for dropped courses is February 25, 2011. The last day for a grade of "W" or "F" for dropped courses with permission from the Dean is May 6, 2011.
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Academic misconduct:
   Students engaging in academic misconduct (including cheating, plagiarism, and any other action that may improperly affect evaluation) will be subject to sanctions in accordance with the Norman Campus Academic Misconduct Code. The instructor will recommend a grade of "F" for the course and expulsion from the University for all such violations.

Reasonable Accommodation:
   The University of Oklahoma is committed to providing reasonable accommodation for all students with disabilities. Students with disabilities who require accommodations in this course are requested to speak with the instructor as early in the semester as possible. Students with disabilities must be registered with the Office of Disability Services prior to receiving accommodations in this course. The Office of Disability Services is located in Goddard Health Center, Suite 166, phone 405/325-3852 or TDD only 405/325-4173.

   Each student should acquaint her or his self with the University's codes, policies, and procedures involving academic misconduct, grievances, sexual and ethnic harassment, and discrimination based on physical handicap.
<table>
<thead>
<tr>
<th>Week</th>
<th>Dates</th>
<th>Topics</th>
<th>Reading</th>
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<tbody>
<tr>
<td>Week 1</td>
<td>Jan 18 – 20</td>
<td>Symmetry</td>
<td>Carter Ch 1</td>
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<tr>
<td>Week 2</td>
<td>Jan 25 – 27</td>
<td>Symmetry; Group Theory; Point Groups</td>
<td>Carter Ch 1–2</td>
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<tr>
<td>Week 3</td>
<td>Feb 1 – 3</td>
<td>Group Theory; Matrices; Character Tables</td>
<td>Carter Ch 2–3</td>
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<td>Week 4</td>
<td>Feb 8 – 10</td>
<td>Character Tables; the Decomposition Formula</td>
<td>Carter Ch 3–4</td>
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<td>Week 5</td>
<td>Feb 15 – 17</td>
<td>MO Theory</td>
<td>Carter Ch 4–5</td>
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<td>Week 6</td>
<td>Feb 22</td>
<td>MO Theory (continued)</td>
<td>Carter Ch 4–5</td>
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<td><strong>Feb 24</strong></td>
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<td><strong>Exam I (in class)</strong></td>
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<td>Week 7</td>
<td>March 1 – 3</td>
<td>Crystal Field Theory; Ligand Field Theory</td>
<td>supplemental</td>
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<tr>
<td>Week 8</td>
<td>March 8</td>
<td>Ligand Field Theory</td>
<td>supplemental</td>
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<td><strong>March 10</strong></td>
<td><em>No class – RPH in Washington D.C.</em></td>
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<td><strong>Week 9</strong></td>
<td><strong>March 14 – 18</strong></td>
<td><em>Spring Break–no classes</em></td>
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<td>Week 10</td>
<td>March 22 – 24</td>
<td>General Spectroscopy; Electronic Absorption</td>
<td>Carter Ch 7</td>
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<td>Week 11</td>
<td>March 29 – 31</td>
<td>Electronic Absorption; Vibrational Spectroscopy</td>
<td>Carter Ch 7; Ch 6</td>
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<td>Week 12</td>
<td>April 5</td>
<td>Vibrational Spectroscopy</td>
<td>Carter Ch 6</td>
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<td><strong>April 7</strong></td>
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<td><strong>Exam II (in class)</strong></td>
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<td>Week 13</td>
<td>April 12 – 14</td>
<td>NMR/EPR/Magnetism</td>
<td>supplemental</td>
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<td>Week 14</td>
<td>April 19 – 21</td>
<td>NMR/EPR/Magnetism</td>
<td>supplemental</td>
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<td>Week 15</td>
<td>April 26 – 28</td>
<td>Inorganic Kinetics/Reaction Mechanisms</td>
<td>supplemental</td>
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<td>Week 16</td>
<td>May 3 – 7</td>
<td>Inorganic Kinetics/Reaction Mechanisms</td>
<td>supplemental</td>
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<td><strong>Finals Week May 13</strong></td>
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<td><strong>Final Exam (8:00 AM)</strong></td>
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