Chem 5333 – Spring 2014
Advanced Inorganic Chemistry – Bonding and Structure
TR 10:30 – 11:45 AM, PHSC 120

Instructor: Robert K. Thomson
Assistant Professor, Department of Chemistry & Biochemistry

Office: 3210 Stephenson Life Sciences Research Center
Phone: 405-325-2384
Email: rthomson@ou.edu
Class URL: http://learn.ou.edu

Office Hours: By appointment

Textbooks:

Reserve Materials:


Web Resources:
http://learn.ou.edu
Login with your OUNet ID (OU 4x4) and password, follow the links to Chem 5333. Lecture materials, grades and general communication will occur through this interface.
http://libraries.ou.edu/chemmath
OU ChemMath library for additional texts and resources
http://pubs.acs.org
American Chemical Society, many useful links are available. Examples from the literature will be used when appropriate.
http://www.webelements.com
An interactive periodic table for information of atomic masses, oxidation states, common geometries, etc.

Course Objectives/Description:
Physical methods and concepts applied to organic, inorganic and organometallic systems, including group theory, MO theory, crystal field and ligand field theories, spectroscopy (electronic, NMR, vibrational, EPR), magnetism, reaction kinetics and mechanisms and other special topics will be covered 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.

- Homework Sets (4-6): 250 points
- In Class Participation: 50 points
- Midterm Exam 1 (Late Feb): 200 points
- Midterm Exam 2 (Early Apr): 200 points
- Final Exam (May 5, 8-10 AM): 300 points

Homework:
Problem sets will be assigned throughout the semester. The assigned problems will resemble problems that may be encountered in exams, and are thus important opportunities to practice for the exams.

Examinations:
Three examinations will gauge your knowledge of the course material over the course of the semester. The two midterm examinations will test material that has been covered up until that point, and the final examination will be cumulative.

Class Participation:
There will be instances during the course where group work or student participation will play an important role in the teaching experience. Your overall level of engagement and participation will be worth 5% of the total grade.

Other Policies:
The instructor reserves the right to modify any items contained within the syllabus. This includes, but is not limited to: course content, scheduled dates, and relative percentages of the grade assigned to individual course components.

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 of Oklahoma to excuse any absences 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 (medically justified reasons, official university-sponsored activities, religious holidays, or legally required activities). If the absence for an exam cannot be justified to the satisfaction of the instructor, 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 27, 2014. The last day for an automatic grade of “W” for dropped courses is February 21, 2014. The last day for a grade of “W” or “F” for dropped courses with permission from the Dean is May 2, 2014.

Academic Misconduct:
Students engaging in academic misconduct (including cheating, plagiarism, and other related dishonest activities 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/racial harassment, and discrimination based on physical handicap.
## Tentative Schedule

<table>
<thead>
<tr>
<th>Week</th>
<th>Dates</th>
<th>Topics</th>
<th>Reading</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 1</td>
<td>Jan 14</td>
<td>Organizational Class</td>
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<td></td>
<td>Jan 16</td>
<td>Symmetry</td>
<td>Carter Ch 1</td>
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<tr>
<td>Week 2</td>
<td>Jan 21-23</td>
<td>Symmetry; Group Theory; Point Groups</td>
<td>Carter Ch 1-2</td>
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<tr>
<td>Week 3</td>
<td>Jan 28-30</td>
<td>Group Theory; Matrices; Character Tables</td>
<td>Carter Ch 2-3</td>
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<tr>
<td>Week 4</td>
<td>Feb 4-6</td>
<td>Character Tables; the Decomposition Formula</td>
<td>Carter Ch 3-4</td>
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<td>Week 5</td>
<td>Feb 11-13</td>
<td>MO Theory</td>
<td>Carter Ch 4-5</td>
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<tr>
<td>Week 6</td>
<td>Feb 18-20</td>
<td>MO Theory</td>
<td>Carter Ch 4-5</td>
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<tr>
<td>Week 7</td>
<td>Feb 25-27</td>
<td>Crystal Field Theory; Ligand Field Theory</td>
<td>Supplemental</td>
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<td>Week 8</td>
<td>Mar 4-6</td>
<td>Ligand Field Theory</td>
<td>Supplemental</td>
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<tr>
<td>Week 9</td>
<td>Mar 11-13</td>
<td>General Spectroscopy; Electronic Absorption</td>
<td>Carter Ch 7</td>
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<td>Week 10</td>
<td>Mar 18-20</td>
<td>Spring Break – No Classes</td>
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<tr>
<td>Week 11</td>
<td>Mar 25-27</td>
<td>Electronic Absorption; Vibrational Spectroscopy</td>
<td>Carter Ch 6-7</td>
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<td>Week 12</td>
<td>Apr 1-3</td>
<td>Vibrational Spectroscopy</td>
<td>Carter Ch 6</td>
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<tr>
<td>Week 13</td>
<td>Apr 8-10</td>
<td>NMR/EPR/Magnetism</td>
<td>Supplemental</td>
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<tr>
<td>Week 14</td>
<td>Apr 15-17</td>
<td>NMR/EPR/Magnetism</td>
<td>Supplemental</td>
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<tr>
<td>Week 15</td>
<td>Apr 22-24</td>
<td>Inorganic Kinetics/Reaction Mechanisms</td>
<td>Supplemental</td>
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<tr>
<td>Week 16</td>
<td>Apr 29 - May 1</td>
<td>Inorganic Kinetics/Reaction Mechanisms</td>
<td>Supplemental</td>
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<td>Finals</td>
<td>May 5</td>
<td>Final Exam (8:00 AM)</td>
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