Chem 5330 – Spring 2016
Advanced Inorganic Chemistry – Spectroscopic Methods of Analysis
TR 10:00 – 11:15 AM, SLSRC 2410

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:
A. C. Fisher "Electrode Dynamics," Oxford Chemistry Primers
Alan K. Brisdon "Inorganic Spectroscopic Methods," Oxford Chemistry Primers
A. F. Orchard "Magnetochemistry," Oxford Chemistry Primers
Jonathan A. Iggo "NMR Spectroscopy in inorganic Chemistry," Oxford Chemistry Primers

Reserve Materials:

Web Resources:
http://learn.ou.edu
Login with your OUNet ID (OU 4x4) and password, follow the links to Chem 5330. 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:
The course will cover physical/spectroscopic methods and concepts applied to organic, inorganic and organometallic systems, including group theory, MO theory, crystal field and ligand field theories, spectroscopy (vibrational, electronic, nuclear magnetic resonance, electron paramagnetic resonance), magnetism, Mössbauer and X-ray absorption spectroscopy, as well as X-ray diffraction and cyclic voltammetry.

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Course Grading:
The course is divided into 3 modules, and final grades will be assigned based on total points accumulated. Maximum possible score is 1000 points.

In Class Participation: 100 points
In Class Quizzes (Approx # 10): 100 points
Module Exam 1 (Mid February): 200 points
Module Exam 2 (Late March): 200 points
Module Exam 3 (May 13, 8-10 AM): 200 points
Term Paper: 200 points

In Class Participation:
Much of the material in the course is mathematical and requires methodical analysis. As such, class time will be dedicated to working on problems, with assigned problems due at the beginning of class. Participation in solving problems is expected, and will contribute to your grade.

In Class Quizzes:
Short quizzes will be administered in class periodically to ensure that you are keeping up with the course material. These will not be announced, but they will not be "pop" quizzes in that you will know the topic of examination ahead of time.

Examinations:
Each of the three modules will have an exam associated with it that will count for 20% of the course. These three examinations will gauge your knowledge of the course material, and will not be cumulative and will only examine the material from the module being instructed. However, please note that some of the subject material from module 1 will be critical to the success of modules 2 and 3, and it will be assumed that you have sufficiently mastered this material as needed to study the material in modules 2 and 3.

Term Paper:
The goal of this course is to provide you with a comprehensive understanding of the key methods of characterizing inorganic and organometallic compounds. As such, you will be required to synthesize the ideas and characterization methods described in this course, and expound upon how they would be utilized in your doctoral research.
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 Feb 1st. The last day for an automatic grade of "W" for dropped courses is Apr 1st. The last day for a grade of "W" or "F" for dropped courses with permission from the Dean is May 6th.

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.
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<td>Symmetry Elements/Operations</td>
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<td>Term Symbols and Splitting</td>
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<td>Orgel &amp; Tanabe Sugano Diagrams / Electronic Spectroscopy</td>
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<td>Week 10</td>
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<td>Mar 29-31</td>
<td>Magnetism</td>
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<td>NMR Spectroscopy</td>
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<td>X-ray/neutron diffraction / X-ray absorption spectroscopy</td>
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<td>Finals</td>
<td>May 13</td>
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