CHEM 660: Systematic Inorganic Chemistry
Spring 2016
M/W/F, 12:00-12:50pm, 1003 Malott Hall

Syllabus

Instructor: Dr. James Blakemore, Assistant Professor of Chemistry
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Office hours: Wednesday, 1:00-2:00pm, and other times by appointment

Description from course catalog: A systematic study of the elements and their compounds, emphasizing the relationship between properties of substances and their atomic and molecular structures, and the positions of the elements in the periodic systems. Prerequisite: CHEM 510 or CHEM 530. Satisfies: Natural Science (N).

Instructor's description: CHEM 660 covers fundamental principles of inorganic chemistry, including theoretical topics and experimental data. We will endeavor to understand the role that electronic structure plays in the properties and reactivity of compounds and complexes. Contemporary topics, including catalysis, metals in biology, and materials chemistry, will be discussed as time allows. In general, the course will continue to build a foundation composed of organizing concepts that support higher-level studies in chemistry.

Texts

Required: Shriver, Weller, Overton, Rourke, and Armstrong; *Inorganic Chemistry*, **2014**, 6th edition, W. H. Freeman and Co., ISBN-13: 978-1429299060

Optional: R. H. Crabtree, *The Organometallic Chemistry of the Transition Metals,* **2014**, 6th edition, Wiley, ISBN-13: 978-1118138076

Grading

Midterm Exams (2 x 20%; 100 pts each)
Final Exam (25%; 125 pts)
In-Class Participation (5%; 25 pts)
Periodic Table Quiz (1 x 10%; 50 pts)
Problem Sets (4 x 5%; 25 pts each)
Total: 500 points

Exams: There will be three exams, two midterms and one final. Midterm exams will be administered in the usual class period, and will cover all material presented to-date. The final exam will be administered during the scheduled final-exam period, and will be comprehensive.

Midterm I: Friday, February 26, 2016
Midterm II: Friday, April 15, 2016
Final Exam: Monday May 9, 2016; 10:30 am – 1:00 pm

Periodic Table Quiz: An understanding of the periodic table is among the great achievements in chemistry. Instant recall of the organization of the periodic system vastly accelerates scientific discussion in chemistry, and prepares students for use of chemistry in a variety of settings. Students will be quizzed on the location of all elements in the *s*, *p*, and *d* blocks in an in-class quiz, i.e., a blank chart will be handed out and students will fill in the location of the elements. This quiz is the only class activity on the day it is administered: Friday, February 5, 2016.

Problem Sets: Four will be assigned throughout the semester, based on textbook reading, lecture content, and outside sources that may be required. Your solutions to these problems will be due in class on the specified "due dates." **No late sets will be accepted.** Students are encouraged to work together on solving the problems, including discussion of the problems and their possible solutions. However, do not copy solutions from others.

Lecture Material: Some lectures will emphasize topics not covered in the suggested texts, or discussed in a different context. The time sequence of the presentation of certain topics will develop naturally based on in-class discussions and student questions. Therefore, **it is highly recommended that students attend all lectures and take notes**.

Course website: All students enrolled in CHEM 660 have been granted access to the Blackboard site for this course. Be sure you are able to access this site to view information pertaining to this course, including electronic handouts, problem sets and answer keys, course announcements, important links, etc. You will be prompted for your KU Online ID and password to access these materials. If you have any trouble accessing the course website, contact the instructor immediately.

Course Evaluation

Both the University and the instructor value effective teaching. Although student evaluations are only one component of an effective teaching assessment strategy, they are an important component and must be given due consideration by both students and faculty. Beginning this semester (Spring 2016), the Department of Chemistry will implement **online student evaluation surveys** instead of the current procedures (paper surveys handed out in class).

Surveys will be administered via Blackboard, and are configured such that student anonymity is guaranteed. Students will receive an email from Laura Diede, Associate Director of the KU Center for Online and Distance Learning with instructions for completing the survey in Blackboard. Students can only access the survey once, and reminders will be sent to those who have not completed the survey. **The survey period is Sunday-Sunday of the last week of classes** (ending just before finals week).

A full description of procedures is found in the KU Policy Library at http://policy.ku.edu/provost/student-eval-procedures-for-admin.

Special Needs: The Academic Achievement and Access Center (AAAC) coordinates accommodations and services for all students that are eligible. If you have a disability for which you wish to request accommodations and have not yet contacted the AAAC, please do so as soon as possible. Their office is located in 22 Strong Hall, and the phone number is (785) 864-4064 (V/TTY). Information about their services is available at http://disability.ku.edu. Please contact the instructor privately regarding any accommodations needed in this course.

Materials: Prepared course materials and delivered lectures are the property of the instructor. Video and audio recording of any lecture without instructor's consent is prohibited. On request, the instructor may grant permission for students to record lecture audio; this will be on the condition that the specific individual use the recordings only as a study aid. Unless explicit permission is obtained from the instructor, electronic copies of any course-related materials may not be transmitted or transferred to any other person, regardless of whether or not that individual is enrolled in the course.

Academic Integrity

We expect that all students will maintain the highest standards of personal, academic, and scientific integrity. The study of science is worth little unless findings are reported accurately and proper authorship is attributed.

From the KU Student Handbook:
"The following policy . . . defines a uniform approach to acts of academic misconduct involving students in courses offered by the KU College of Liberal Arts and Sciences (CLAS). Academic integrity requires the honest performance of academic responsibilities by students. Academic responsibilities include, but are not limited to: the preparation of assignments, reports, and term papers; the taking of examinations; and a sincere and conscientious effort by students to abide by the policies set forth by instructors. Any subversion or compromise of academic integrity thus constitutes academic misconduct. Examples of misconduct include (among others) falsification, unauthorized assistance or plagiarism or reports, term papers, research papers, or other written documents; giving or receiving unauthorized aid on examinations; disruption of classes; and the offering of gratuities or favors in return for grades."

See https://college.ku.edu/undergrad/students/policies for more info on this issue, including charges and sanctions.

Any incidents of academic misconduct will be prosecuted to the fullest extent possible within the scope of University policies, as described in the Student Handbook that is available at the website quoted above. At a minimum, this will include receiving zero credit for the work in question for any party involved. Additional penalties may include a grade of "F" for the entire course as well as suspension or expulsion from the University. If you have any questions about what constitutes academic misconduct, please consult with the instructor or the Student Handbook.

Schedule of Proposed Lecture Topics and Course Activities (Tentative!!!)

Week 1:	Lewis structure, hybridization, VSEPR model
Week 2:	Symmetry
Week 3:	Symmetry and character tables
Week 4:	Molecular orbital theory
Week 5:	Bonding and structure of solids
	Exam I
Week 6:	Coordination and types of ligands
Week 7:	Crystal field theory and ligand field theory; magnetism
Week 8:	Electron counting
Week 9:	Organometallic chemistry; compounds and complexes
Week 10:	Reactions of metal complexes; oxidation and reduction
Week 11:	Special ligands and reactions
	Exam II
Week 12:	Catalysis
Week 13:	Reactions
Week 14:	“Metals in Biology” a.k.a. bioinorganic chemistry
Week 15:	Applications of inorganic chemistry