

**UK Department of Chemistry**  
**CHE 610: Chemistry of the Transition Metals, Spring 2012**  
**Course Description and Syllabus**

**Meeting Times:** TR 8:00-9:15 a.m.  
**Classroom:** CP-103  
**Instructor:** Beth S. Guiton, CP-148C  
**Office Hours:** Thursdays 9:15 a.m. - 12:15 p.m, by appointment.

**Course Description:**

A detailed treatment of the chemistry of the transition elements, lanthanides and actinides, including the structure of coordination complexes, bonding, reaction mechanisms and preparations. Prereq: CHE 510.

**Required Texts:**

1. *d-Block Chemistry* (Oxford Chemistry Primers 27), M. J. Winter; Oxford University Press (1994).
2. *Introduction to Crystallography*, D. Sands; Dover Science Books, (1993).
3. *The Mechanisms of Reactions at Transition Metal Sites* (Oxford Chemistry Primers 10), R. A. Henderson; Oxford University Press (1994).
4. *Solid State Chemistry: An Introduction, 3rd Edition*, L. E. Smart and E. A. Moore; Taylor and Francis (2005).

**Optional Texts:**

1. *Physical Methods for Chemists, 2nd Edition*, R. S. Drago; Surfside Scientific Publishers (1992)
2. *Basic Solid State Chemistry, 2nd Edition*, A. R. West; Wiley (1999)
3. *Space Groups for Solid State Scientists, Second Edition*, G. Burns and A. M. Glazer; Academic Press (1990).
4. *Transition Metal Oxides: An Introduction to their Electronic Structure and Properties*, P. A. Cox; Oxford University Press (1992)
5. *The Heavier d-Block Metals*, (Oxford Chemistry Primers 73), C. E. Housecroft; Oxford University Press (1999).

**Optional Visualization Aids:**

Advanced Molecular Model Set for General and Organic Chemistry, LLC Mega Molecules (~\$20)  
Polyhedral Model Kit, Institute for Chemical Education (~\$95)  
CrystalMaker software suite (available in Dr. Parkin's x-ray diffraction facility)

**Course Coverage:** The course will introduce the major features of the transition metals, divided into two parts. Part I will discuss the structure, bonding, reaction mechanisms, and characterization techniques of transition metal complexes, following material from Winter, Sands (Ch. 2), Henderson, and supplemented by Drago. Part II will discuss transition metal containing solids, including the elemental metals, and ionic solids, following material from Sands and Smart and Moore.

**CHE 610 home page:** [http://www.chem.uky.edu/research/guiton/che610\\_S12.php](http://www.chem.uky.edu/research/guiton/che610_S12.php)

**Examinations:**

Two examinations will be given: a midterm on March 1, 2012 (8-9:15 a.m.), and a Final on May 3, 2012 (8-10 a.m.). Unless announced otherwise in class the midterm will examine Part I of the course, and the final will examine Part II. Any student with a legitimate conflict with an exam time must inform me in writing, according to university regulations posted online by the Office of the Registrar. (<http://www.uky.edu/Registrar/bulletinCurrent/toc2.htm>).

**Problem Sets:**

Problem sets will be assigned on Tuesdays and due the following Tuesday at the beginning of class. Late assignments (up to one week) will receive half credit.

**Grading:**

Midterm examination:	30%
Final examination:	50%
Problem sets:	20%

Grades will be assigned according to the following tentative scheme. Ranges may be lowered but will not be raised. A: 85-100%; B: 75-84%; C: 60-74%; D: 50-59% (undergraduates only)

**Attendance:**

Attendance is not explicitly graded but will be taken at the beginning of each class.

**Important Dates:**

Midterm examination:	Thursday March 1, 8:00 - 9:15 a.m.
Spring break:	March 12-16
Last problem set due:	April 24
Last day of classes:	April 27
Final examination:	Thursday, May 3, 8:00 – 10:00 a.m.

**Academic Integrity:**

Homework should be viewed as original pieces of work to convey that you understand the rationale for solving the problems. You may confer with others on various techniques and ask for help, but it is up to you to illustrate your understanding. Verbatim copying of someone else's homework will not be tolerated. The minimum penalty for cheating on this course is a grade of E.

**Excused Absences:**

An excused absence must be documented in writing. Excused absences from exams or quizzes should be given to me (the instructor) prior to the exam or quiz. A make-up exam or quiz will be given to the student within a few days of the missed exam or quiz. The University allows excused absences for the following:

- Illness of the student or serious illness of a member of the student's immediate family.
- The death of a member of the student's immediate family.
- Trips for members of student organizations sponsored by an academic unit, trips for university classes, and trips for participation in intercollegiate athletic events.
- Major religious holidays. This must be notified to the instructor no later than the last day for adding classes.
- Any other circumstance which the instructor finds reasonable cause for nonattendance.

**Course Evaluations:**

Course evaluations are an important component of the Department's instructional program. Time will be allotted during class towards the end of the semester to complete the evaluation of the course and the instructor.

**Letter of Accommodation:**

If you have a documented disability that requires academic accommodations, please see me as soon as possible during scheduled office hours. In order to receive accommodations in this course, you must provide me with a **Letter of Accommodation** from the Disability Resource Center (Room 2, Alumni Gym, 257-2754, [jkarnes@uky.edu](mailto:jkarnes@uky.edu)) for coordination of campus disability services available to students with disabilities.