

CHEM 4318: Advanced Inorganic Chemistry Spring 2014

Instructor: Brad S. Pierce

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Office Hours: MW 10 -11:30 am, or by appointment

Time and Place of Class Meetings: MWF 9:00 - 10:50 AM (Science Hall 205)

Description of Course Content. This course presents an overview of the physical/theoretical aspects relating to transition metal and main group chemistry, reactivity, and bonding. Particular emphasis will be placed on the use of group theory in molecular orbitals and interpretation of spectroscopy. Additionally, the relevance to metal centers in catalysis, biochemistry, and materials will be discussed.

Student Learning Outcomes. Upon successful completion of this course students should be able to effectively apply the theoretical concepts (group theory, molecular orbital, and ligand field theory) to predict molecular properties, reactivities, and spectroscopic behavior or inorganic centers. It is expected that students apply these theoretical concepts to solve '*real-world*' problems relevant to inorganic chemistry. Since course examinations are designed to strengthen comprehension by independent thinking and problem solving, it is encouraged that students to seek outside reference materials from the library and scientific literature.

Required Textbook:

Inorganic Chemistry, 5th Ed, Gary L. Miessler; Paul J. Fischer, and Donald A Tarr; Prentice Hall, ISBN-10: 0-321-81105-4

Supplemental Texts:

- (1) *Chemical Applications of Group Theory*, F. Albert Cotton (any edition).
- (2) *Symmetry and Spectroscopy: an introduction to vibrational and electronic spectroscopy*, Daniel C. Harris and Michael D. Bertolucci; Dover
- (3) *Physical Methods for Chemists*, 2nd Ed. Russell Drago, Saunders College Publishing

MAJOR ASSIGNMENTS AND EXAMINATIONS

Homework and In-class assignments. Throughout the semester, problem sets will be assigned to the students. The purpose of these problem sets is to prepare students for the types of questions that will be asked on quizzes and exams. These exercises will not be graded. Instead, they will be collected and full marks will be given for completed *attempts* at solving *all* of the problems assigned. Homework will be due in class on the assigned due date. Late homework will be deducted 10% per day that it is late. Students are encouraged to form study groups to work on problem sets together, although each student must turn in their own assignment.

Pop quizzes. Quizzes will be administered throughout the semester **AT RANDOM INTERVALS** at the beginning of class. Students who arrive late will not be given extra time to complete the quiz. Approximately 20-30 minutes of class time will be devoted to taking the quiz. The lowest quiz score will be dropped. Quiz questions will resemble those problems covered as examples in the lecture, as well as those which appear on the problem sets and will appear on midterm exams.

Exams. Two in-class exams will be scheduled to assess student knowledge. One exam will be given at the end of the first half of the course and the second will be given near the end of the course. A **comprehensive final examination** will be given during final exam week. Students will be responsible for all of the material covered in the course on the final examination. **Any student with a 95% or higher following Exam 2 will be exempt from taking the cumulative final exam.**

2013 Course Schedule.

As the instructor for this course, I reserve the right to adjust this schedule in any way that serves the educational needs of the students enrolled in this course. –Brad S. Pierce

Jan 13	•	First day of classes
Jan 14-17	•	Late Registration
Jan 20	•	Martin Luther King Jr. Day Holiday
Jan 29	•	Census Date
Feb 24	•	EXAM 1
March 10-14		Spring Vacation
March 28	•	Last day to drop classes
April 25	•	EXAM 2
May 2	•	Last Day of Classes
May 3-9	•	Final Exams (CHEM 4318 final date TBA)

Grade Assignment.

Problem Sets (Homework)	100 pts.
Pop quizzes	100 pts.
Take-home Exams (2 x 100 pts.)	200 pts.
Final Exam (Cumulative)	200 pts.
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Total	600 pts.

Students are expected to keep track of their performance throughout the semester and seek guidance from available sources (including the instructor) if their performance drops below satisfactory levels.

Attendance. Students are responsible for all the material assigned and presented in class regardless of attendance. Quizzes and Exams will NOT be rescheduled without PRIOR (at least 2-days) approval by the instructor. ONLY in instances of a valid medical or family emergency will make-up Quiz/Exams be administered without prior approval. **Habitual tardiness will not be tolerated;** this behavior is distracting and disrespectful to everyone in the class. For the purposes of this course, tardiness is defined by being 7-minutes (or more) late to a lecture. Each student will be allowed 3-late days, after which the instructor reserves the right to deduct 10-points from the student's overall score (per event). **No excuses will be accepted.**

OTHER REQUIREMENTS

Expectations for Out-of-Class Study. Beyond the time required to attend each class meeting, students enrolled in this course should expect to spend at least an additional 10 hours per week of their own time in course-related activities, including reading required materials, completing assignments, preparing for exams, etc.

Drop Policy. Students may drop or swap (adding and dropping a class concurrently) classes through self-service in MyMav from the beginning of the registration period through the late registration period. After the late registration period, students must see their academic advisor to drop a class or withdraw. Undeclared students must see an advisor in the University Advising Center. Drops can continue through a point two-thirds of the way through the term or session. It is the student's responsibility to officially withdraw if they do not plan to attend after registering. **Students will not be automatically dropped for non-attendance.** Repayment of certain types of financial aid administered through the University may be required as the result of dropping classes or withdrawing. For more information, contact the Office of Financial Aid and Scholarships (<http://www.uta.edu/ses/fao>).

Americans with Disabilities Act. The University of Texas at Arlington is on record as being committed to both the spirit and letter of all federal equal opportunity legislation, including the *Americans with Disabilities Act (ADA)*. All instructors at UT Arlington are required by law to provide "reasonable accommodations" to students with disabilities, so as not to discriminate on the basis of that disability. Any student requiring an accommodation for this course must provide the instructor with official documentation in the form of a letter certified by the staff in the Office for Students with Disabilities, University Hall 102. Only those students who have officially documented a need for an accommodation will have their request honored. Information regarding diagnostic criteria and policies for obtaining disability-based academic accommodations can be found at www.uta.edu/disability or by calling the Office for Students with Disabilities at (817) 272-3364.

Academic Integrity. Academic dishonesty of **ANY** kind will not be tolerated. Without exception, ALL offenses will result in immediate course failure and referral to the UT Arlington Board of Student Affairs for disciplinary action. All students enrolled in this course are expected to adhere to the UT Arlington Honor Code:

I pledge, on my honor, to uphold UT Arlington's tradition of academic integrity, a tradition that values hard work and honest effort in the pursuit of academic excellence.

I promise that I will submit only work that I personally create or contribute to group collaborations, and I will appropriately reference any work from other sources. I will follow the highest standards of integrity and uphold the spirit of the Honor Code.

Student Support Services. UT Arlington provides a variety of resources and programs designed to help students develop academic skills, deal with personal situations, and better understand concepts and information related to their courses. Resources include tutoring, major-based learning centers, developmental education, advising and mentoring, personal counseling, and federally funded programs. For individualized referrals, students may visit the reception desk at University College (Ransom Hall), call the Maverick Resource Hotline at 817-272-6107, send a message to resources@uta.edu, or view the information at www.uta.edu/resources.

Electronic Communication. UT Arlington has adopted MavMail as its official means to communicate with students about important deadlines and events, as well as to transact university-related business regarding financial aid, tuition, grades, graduation, etc. All students are assigned a MavMail account and are responsible for checking the inbox regularly. There is no additional charge to students for using this account, which remains active even after graduation. Information about activating and using MavMail is available at <http://www.uta.edu/oit/cs/email/mavmail.php>.

Student Feedback Survey. At the end of each term, students enrolled in classes categorized as lecture, seminar, or laboratory shall be directed to complete a Student Feedback Survey (SFS). Instructions on how to access the SFS for this course will be sent directly to each student through MavMail approximately 10 days before the end of the term. Each student's feedback enters the SFS database anonymously and is aggregated with that of other students enrolled in the course. UT Arlington's effort to solicit, gather, tabulate, and publish student feedback is required by state law; students are strongly urged to participate. For more information, visit <http://www.uta.edu/sfs>.

Final Review Week. A period of five class days prior to the first day of final examinations in the long sessions shall be designated as Final Review Week. The purpose of this week is to allow students sufficient time to prepare for final examinations. During this week, there shall be no scheduled activities such as required field trips or performances; and no instructor shall assign any themes, research problems or exercises of similar scope that have a completion date during or following this week *unless specified in the class syllabus*. During Final Review Week, an instructor shall not give any examinations constituting 10% or more of the final grade, except makeup tests and laboratory examinations. In addition, no instructor shall give any portion of the final examination during Final Review Week. During this week, classes are held as scheduled. In addition, instructors are not required to limit content to topics that have been previously covered; they may introduce new concepts as appropriate.
