CHEM 3317: Descriptive Inorganic Chemistry

Fall 2012

Instructor(s): Professor Fred MacDonnell

Office Number: CRB-302

Office Telephone Number: 817-272-2972

Email Address: macdonn@uta.edu
Office Hours: M, W, R 11:00-12:00 noon
Section Information: This is the only section of this course

Time and Place of Class Meetings: T,R 9:30 am - 10:50 am, Science Hall (SH), Room 129

Description of Course Content:

An overview of descriptive main group chemistry, solid state structures and the energetics of ionic, metallic, and covalent solids. There will be an emphasis on where and how the elements and some their more important compounds, in terms of their commercial, biological, and environmental importance, are found, isolated or prepared, and their properties and uses. Fundamental concepts including acid-base chemistry, redox chemistry, thermodynamics, and basic atomic structure and properties will be used to unify these concepts and topics. There will be a special emphasis on the more common or important compounds, in terms of their impact on modern society. Descriptions of how elements are isolated including basic metallurgy will also be covered.

The course will focus on the material drawn from a wide variety of sources, including the class textbook. Notes and handouts will be made available in electronic form.

Student Learning Outcomes:

1) Students will demonstrate knowledge of solid state structures and the differences between covalent, ionic and metallic solids.
2) Students will use and correctly convert between English and Metric system units
3) Students will determine lattice energies using theoretical and experimental data.
4) Students will explain how structural and compositional changes affect the acid strength of common binary and oxoacids.
5) Students will determine the acid-base properties of common oxides.
6) Students will demonstrate knowledge of common atmospheric chemistry as related to the ozone layer and air pollution.
7) Students will explain the various processes used to isolate metals from their common ores.
8) Students will demonstrate knowledge of the common/trade names for a variety of important industrial chemicals and naturally occurring minerals.
9) Students will demonstrate knowledge of periodic trends in atomic size, ionization energy, electronegativity and electron affinity.
10) Students will demonstrate knowledge of the common natural sources of the elements (specifically of H, He, the second and third period main group elements, Sn, Pb and Fe) and will explain how the pure elements are obtained from these sources.
11) Students will demonstrate knowledge of the fundamental structures and properties of common non-metal oxides.

Required Textbooks and Other Course Materials:

The following text "*Descriptive Inorganic Chemistry",* by Rayner-Canham, Fifth Edition ©2010 ISBN-10: 1-4292-1814-2, ISBN-13: 978-1-4292-1814-6 is formally required for the course, however you are free to use earlier editions also as they contain essentially the same information but can be purchased at significantly less cost.

The following supplemental texts also contain a great deal of useful information and are available in the Science and Engineering Library. Again, older editions may be found online for significantly less cost, if you are interested in getting a copy for yourself.

"Chemistry of the Elements" N. N. Greenwood and A. Earnshaw,1984, Pergamon Press, Inc, N.Y.

"Concise Inorganic Chemistry, 5th Ed.", J. D. Lee, Chapman and Hall, NY ISBN 0412788209

Descriptions of major assignments and examinations:
Hour Exams will be given at approximately

EXAMS (Dates and material are tentative)

		GRADING	
Sept 11 - First Hour Exam	17%	90-100	A
Oct 2 - Second Hour Exam	17%	80-89	B
Oct 25 - Third Hour Exam	17%	70 -80	C
Nov 15 - Fourth Hour Exam	17%	55 -69	D
		below 55	F
Homework	5%		
Final Exam			
Thursday, Dec 6 (8:00 – 10:30 am)	27 %		
	100%		

Homework: Students will be assigned homework by email. These will be collected and checked for completeness and spot graded. Homework will constitute 5% of your overall grade.
Homework assignments will be due one class prior to the examination date. i.e. Homework 1 is due the class before exam 1 is given, etc. These due dates will be announced explicitly in class.

Attendance: Students are responsible for all the material assigned and presented in class regardless of their attendance. After the first week of classes, attendance will not be taken. Attendance is expected but not recorded nor is a factor in determining your grade.

Grading: Your grade will be determined by the following factors: Four Hour Exams (17% each); homework (5%); and Final Comprehensive Exam (27%). Your lowest hour exam score will be replaced by the final exam score if it benefits you .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.

Expectations for Out-of-Class Study: It is expected that the majority of your learning and mastery of the material will come from study of the material outside of class. This includes reviewing the notes, reviewing other material (i.e. the textbook and supplemental texts, doing homework, looking up and examining outside reference material (check out the Science Library) and a wide variety of online resources (Google Scholar and Scifinder Scholar). Beyond the time required to attend each class meeting, students enrolled in this course should expect to spend at least an additional 9 hours per week of their own time in course-related activities, including reading required materials, completing assignments, preparing for exams, etc. This should be self-evident but now must be stated explicitly in the syllabus.

Make-up Exams: These will be decided on a case to case basis. In general, students missing an exam will have to substitute their final exam grade for the missed exam. Students missing more than 1 exam will automatically take a ZERO for the additional missed exams.

Grade Grievances: Any appeal of a grade in this course must follow the procedures and deadlines for grade-related grievances as published in the current undergraduate catalog.
http://wweb.uta.edu/catalog/content/general/academic_regulations.aspx#10

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://wweb.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: 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.

Instructors may employ the Honor Code as they see fit in their courses, including (but not limited to) having students acknowledge the honor code as part of an examination or requiring students to incorporate the honor code into any work submitted. Per UT System *Regents' Rule* 50101, §2.2, suspected violations of university's standards for academic integrity (including the Honor Code) will be referred to the Office of Student Conduct. Violators will be disciplined in accordance with University policy, which may result in the student's suspension or expulsion from the University.

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.

Course Schedule.
The dates of the 4 hour exams and the final exam are listed in the examinations section. These dates are tentative and may be moved depending on the extent of material covered. Generally such dates changes are minor, i.e. move to one or two class dates later. *"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"* FMM

Homework assignments will be due one class prior to the examination date. i.e. Homework 1 is due the class before exam 1 is given, etc.