

University of Windsor
Chemistry and Biochemistry
Chemistry 59-250, Fall Term 2008

Lectures: Tues. and Thurs. 11:30-12:50 am in the Toldo Health Education Centre room 102

Tutorials: Friday 10:00-11:20 am in the Toldo Health Education Centre room 202 (not every week)

Professor: Dr. Charles Macdonald (office: 355 Essex Hall)

Office Hours: Wednesday 3-6 pm or by appointment only

Text: Pearson/Prentice Hall has built a combination textbook for this course. This package includes:

Inorganic Chemistry, 3rd edition by Catherine Housecroft and Alan Sharpe. (**H & S**)

This is a detailed introductory textbook for Inorganic Chemistry (also including Main Group, Transition Metal and Organometallic compounds) that will also be useful for students that will continue to study Chemistry. There is a companion web site for the book found at:

http://wps.pearsoned.co.uk/ema_uk_he_housecroft_inorgchem_3/

This web site has additional information from the book and some practice problems relating to the material in the book.

and chapters 4 and 5 from:

Inorganic Chemistry, 3rd edition by Gary L. Miessler and Donald A. Tarr. (**M & T**)

This very detailed introductory textbook for Inorganic Chemistry was the primary textbook in some previous years and is very useful for students that will continue to study Chemistry. The selected chapters cover symmetry and molecular orbital theory in a more similar manner to the way we will use them.

The textbook is **not mandatory**, however I will assign material to read from these books and I will be posting suggested practice problems from the text. Students with regular access to a textbook and who read it generally do much better in this course than those who do not - the texts contain additional and sometimes helpful information that is not covered in the lectures.

Supplement: Periodicity and the s- and p-Block Elements by N. C. Norman

This is an inexpensive, soft-covered primer with brief explanations of the trends we encounter in the study of Inorganic Chemistry. The primer is not mandatory but it is a cheap book that covers many of the fundamental principles we will examine.

Other sources I will use and that you may find helpful:

First year General Chemistry texts, other introductory Inorganic Chemistry texts (such as those by: Shriver and Atkins; Huheey, Keiter and Keiter; Cotton, Wilkinson and Gaus; etc.) may be useful in your understanding of the topics we will cover; I will place some of the books listed above in the Course Reserve at the Leddy library. I will also provide handouts during class or post notes on my website (**<http://mutuslab.cs.uwindsor.ca/macdonald/teaching.htm>**) for certain topics.

Grading:

The overall grade will be based on two mid-term tests (each 50 minutes long and each worth 25%) and a comprehensive final exam (3 hours long, 50%).

The final letter grade will be determined by the following Senate-approved conversion table:

93-100 = A+	86-92.9 = A	80-85.9 = A-
77-79.9 = B+	73-75.9 = B	70-72.9 = B-
67-69.9 = C+	63-65.9 = C	60-62.9 = C-
57-59.9 = D+	53-55.9 = D	50-52.9 = D-
	35-49.9 = F	0-34.9 = F-

If any scaling of the final grades is required for this course, it will be done using the overall numerical grade for the course and the letter grade for each student will equal or exceed the corresponding letter grade in the table above.

Test Dates: There will be no make-up tests or exams!

Test 1: October 9 - during class time

Test 2: November 13 - during class time

Final Exam: Tuesday, Dec. 16, 12:00 (exam slot 30)

Please note: If you are unable to write a midterm, you must provide me with an acceptable excuse within 12 hours (before or after, by phone message or e-mail) of the proscribed time or you will receive a grade of 0% on that test. If you do not write the final exam, you will receive a grade of 0% for the exam; your grade may only be changed through a formal application for an Aegrotat assessment.

Students caught cheating will receive an automatic grade of 0% on that work, will be reported to the Department and are subject to disciplinary action as proscribed in Senate By-Law 31.

Last Date for Voluntary Withdrawal from Course: November 7

Student evaluation of this class will be conducted during the last two weeks of the term as per the Senate regulations.

The teaching assistant for the class this year is Benjamin Cooper (office:367 Essex Hall)

Course Outline

Primary Goal: Introduction to Chemical Structure and Bonding

We will review some of the fundamental aspects of atomic structure and properties (and periodic trends) before proceeding with the examination of theories of bonding in molecules and the arrangement of ionic solids. These subjects are covered in the first few chapters in the textbook and the supplement.

Atomic structure and atomic properties - H & S Chapters 1, 2 and 8 (M & T Chapters 1 and 2)

Molecular structure and bonding - H & S Chapter 5 (M & T Chapters 3 and 5)

Molecular shape and symmetry - H & S Chapter 4 (M & T Chapter 4)

The structure of ionic solids - H & S Chapter 6 (M & T Chapter 7)

In essence, the major goals of this course are to provide you with an understanding of:

- the reasons underlying the trends in properties observed for the elements in the periodic table
- the reasons why atoms bond to each other and the models we use to describe bonding
- the reasons why molecules have the shapes that they do and the insights that we can gain using symmetry

Overall, this course will provide you with the many of the basic tools you require to understand the structural features, the bonding and certain aspects regarding the reactivity of molecules.

Secondary Information: Chemistry of Selected Main Group Elements

Using examples during the course, we will see how the insight obtained from the topics listed above can be used to understand the structure, bonding and reactivity of selected classes of simple main group elements and their compounds, including: hydrides, halides, and oxides. Aspects of these subjects are found in later chapters of the textbook (H & S Chapters 10-19, M & T Chapter 8) and in the supplement.

Some other topics that will be introduced at various points in the term include:

Photoelectron Spectroscopy

Vibrational Spectroscopy

Nuclear Magnetic Resonance Spectroscopy

Oxidation and Reduction Chemistry

Computational Chemistry

Please note that the description of specific chemical reactivity is not the primary goal of this course as such information is available in later courses. This course is primarily intended to give you the solid foundation of fundamental understanding that is necessary for further studies in the chemical sciences.

Department of Chemistry and Biochemistry at the University of Windsor
Guidelines for Examinations, Assignments and Laboratory Reports

Cheating and Plagiarism

1. During an examination, students must not have in their possession any unauthorized books, notes, or extraneous material, unless permitted by the instructor.
2. All incidents of cheating and plagiarism will be reported by the instructor directly and immediately to the Departmental Head for consideration of disciplinary action as delineated in Senate By-law 31.

Calculators

1. Students may only use calculators approved by the Faculty of Science and/or their instructors. Programmable calculators and calculators with infra-red transmission capability are not permitted.

Absence

1. Attendance of laboratories and mid-term examinations is MANDATORY.
2. Students who miss a mid-term examination or laboratory must provide written documentation to justify an absence. Unexcused absences or incomplete laboratory reports will result in a grade of incomplete, which in turn will result in a grade of incomplete for the course.
3. Such a student should call the departmental office 253-3000 x3521 to report his/her name and the examination missed within 24 hours of the exam.
4. Written documentation justifying the absence must be presented within 48 hours of the examination or as soon as possible.
5. Excuses will not be accepted after a student has taken an examination.

Midterm examination

1. Only examinations written in non-erasable ink will be considered for a grade appeal.
2. All grade appeals must be accompanied with a written rationale for the grade appeal. Requests such as "see question xx" contain insufficient information and will not be considered for a grade appeal.
3. All grade appeals must be made either within five working days after the examination is returned to the class, or by a date designated by the professor.

Laboratory Reports/Assignments

1. Plagiarism is defined in section 2.4.22 of the University Calendar. Students are reminded that copying laboratory reports and assignments constitutes plagiarism. When two or more laboratory reports/assignments containing substantially identical material are submitted, a grade of 0 will be assigned to each student, and the incident will be reported to the Department Head.

Final Examinations

1. A student may inspect his/her own corrected final examination.
2. All posted final grades are unofficial, and non-negotiable.
3. Students who wish a formal appeal of their final examination/grade as described in section 2.6 of the Calendar may complete the appropriate paperwork at the registrar's office. In general, successful appeals will be based solely on academic merit. Grade appeals to satisfy admission or scholarship requirements or other program prerequisites will be rejected.

(These guidelines were approved by the Departmental Council on 19 Dec. 1996; updated Sep. 2003)