

**The University of Western Ontario
Department of Chemistry**

Chemistry 271A – Structure and Bonding in Inorganic Chemistry (Course Outline)

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Lectures: Mon., Wed. and Fri. 11:30 – 12:30 in the Spencer Engineering Building Room 2200 (SEB 2200).

Tutorials: Scheduled as needed.

Laboratory: All laboratories will be held in The Chemistry Building Rm. 074 and will alternate with Chem 273A.

You should be registered for ONE of the following laboratory sections:

Tuesday 0930 – 1230 **or** 1430 – 1730

Wednesday 1430 – 1730

Thursday 0930 – 1230

Course Webpage: <http://instruct.uwo.ca/chemistry/271a-001>
You will need your UWO login and password to access this site.

Office Hours: Tuesday 1300 to 1430 **and** Thursday 0930 – 1100 **or** by appointment only.

Required Text

Shriver and Atkins Inorganic Chemistry, 4th Edition (Atkins, Overton, Rourke, Weller, Armstrong, Salvador, Hagerman, Spiro, Stiefel) and Solutions Manual (Optional). This book is available at the UWO Bookstore on campus.

Note: This text will be required for Chem 281G and Chem 371A, thus you should expect to get substantial use out of the book.

Required Materials

Laboratory Manual: Laboratory Experiments in inorganic Chemistry. This is required and can be purchased from the UWO Campus Bookstore.

Safety glasses are required at all times when working in the laboratory. Students who normally wear prescription glasses must wear safety glasses or goggles over their regular glasses. A lab coat is also required.

NOTE: Contact lenses are NOT allowed.

A hardcover laboratory notebook is needed for recording all data and observations in the laboratory. Your notebook from a different (but not concurrent) chemistry laboratory, if only partially used, will be suitable.

Prerequisites: Chemistry 020 with a minimum mark of 60% or Chemistry 023 with a minimum mark of 70%.

Antirequisite(s): Chemistry 211a/b, the former Chemistry 251.

Evaluation

Term Test 25%
(Friday October 19, 2007 1900 – 2100 Health Sciences Building Rm. 35 (HSB 35))

In-class quizzes 10 x 2% = 20% (Best 10 out of 11)**
(Will be held on Fridays)

Laboratory 15%

Final Exam 40%
(Cumulative)

**This may have to be modified. Please remind Prof. Ragogna to tell you why.

NOTE: To pass chemistry 271A it is necessary to obtain a passing grade on the laboratory component and the combined marks from the term tests quizzes, essay and final examination. If a quiz or midterm is missed for **valid reasons**, the weight will be transferred to the final examination.

There are NO alternate quiz/midterm tests.

It is the policy of The Department of Chemistry that when a student takes a test or examination, they have deemed themselves fit to do so. Claims of distress or medical issues *after the fact* will not be considered for the basis of a grade appeal.

Cheating and Plagiarism

Students must write their essays and assignments in their own words! Whenever a student (or any scientist) takes an idea or passage from another author, they must acknowledge their debt both by using quotation marks where appropriate and by proper referencing such as footnotes or citations.

During tests and examinations, students must not have any unauthorized books, notes or extraneous materials, unless permitted by the instructor.

Plagiarism and cheating is a serious academic offence and will not be tolerated. Any incidents in this regard will be reported immediately to the Department Chair for consideration of disciplinary action as noted in the Western Academic Calendar under “Scholastic Offences”.

Examinations and Course Attendance

A student is entitled to be examined in courses in which registration is maintained, subject to the following limitations:

A student may be debarred from writing the final examination for failure to maintain satisfactory academic standing throughout the year.

Any student who, in the opinion of the instructor, is absent too frequently from class or laboratory periods in any course, will be reported to the Dean of the Faculty offering the course (after due warning has been given). On the recommendation of the department concerned, and with the permission of the Dean of that Faculty, the student will be debarred from taking the regular examination in the course. The Dean of the Faculty offering the course will communicate that decision to the Dean of the Faculty of Registration.”

Full Details can be found on the world wide web at:

[http://www.westerncalendar.uwo.ca/western/web/2007\(new\)/EXAMINATIONS_301729.html](http://www.westerncalendar.uwo.ca/western/web/2007(new)/EXAMINATIONS_301729.html)

Course Objectives

All students are expected, as a result of laboratory experiments and associated reading, to know the concepts and theories used to understand the trends of the periodic table, describe the chemistry of the main group elements in Groups 1, 2 and 13 with an understanding of bonding models such as Lewis, VSEPR and valence bond theory. Understanding simple molecular orbital theory for diatomic molecules will be obtained. Selected examples illustrating the chemistry of the elements in Group 1, 2 and 13 will be discussed.

Course Outline

Chemistry 271A will be composed of three main components; (1) Understanding the periodic table; (2) structure and bonding in main group compounds as well as molecular orbital theory of simple diatomics, and; (3) the chemistry of selected main group elements (see above).

Laboratory

The laboratory T.A.'s are Jocelyn Tindale, Jason Dutton and Michael Tiedemann. Jocelyn will be the Laboratory Coordinator/Senior Demonstrator. If you have general problems or issues with the lab, direct your queries to Jocelyn. Specific questions regarding the experiments are to be directed to your specific laboratory T.A. Speaking to Professor Ragogna is your last resort when it comes to laboratory issues.

Experiment 1 – Group II: Magnesium and Calcium

Two week lab (September 24th to October 5th)

Experiment 2 – Group III: Boron and Aluminum

Three week lab (October 22nd to November 5th)

Read the introductory pages in the Lab Manual – they have been printed for a reason. Be on time – there is no provision for making the lab period last longer. Being able to finish the required experiment in the allotted time is part of the challenge and your evaluation.

Safety

This is our number one priority. To help you find the hazards/safety information for the reagents that you will be using in the lab the following reference will help you:

On the web: http://www.uwo.ca/humanresources/facultystaff/h_and_s/lab_safety/msds_idx.htm

Chem 271A Late Policy

Work will be penalized 10% per day (weekends included) that an assignment/laboratory is late. The penalty will be applied until either 70% credit has been lost with no credit given after the material has been returned to the rest of the class (whichever comes first).

1 – Inorganic Chemistry 3rd Edition, Gary L. Miessler and Donald A. Tarr, Upper Saddle River, N.J. : Pearson/Prentice Hall, c2004.

2 – Periodicity and the s- and p-block Elements, Nicholas C. Norman, Oxford University Press, 1997

3 – Introduction to Coordination, Solid State, and Descriptive Inorganic Chemistry, Glen E. Rodgers, McGraw-Hill Inc.

In the library

Make every effort to use the library as much as possible. ALL the answers are there, you just have to find them! The reference section is excellent – some books that you may be interested to look at include:

1 – CRC Handbook of chemistry and physics (QD 65.C4)

2 – Lange's handbook of chemistry (QD 65.L36)

3 – Handbook of inorganic chemicals (QD 155.5.P37)

4 – Encyclopedia of inorganic chemistry (QD 148.E53 2005)

Plus... there are many other textbooks in the stacks, which contain lots of useful information. Go and browse this area of the library, you might be pleasantly surprised with what you find.