
**Description** A discussion of the structures and bonding in inorganic solids as well as of their physical and chemical properties. Links to practically important inorganic materials and solid-state devices will also be discussed.

**Instructor:** Prof. John Corrigan  
Chemistry Building 16, ext. 86387  
corrigan@uwo.ca (email messages *must* be from your @uwo.ca account. Please put Chem 4481B in the subject line.)  
Office hours: Every Mon. 1:30-2:30 pm or we can set up an appt if there are course conflicts

**Web Page:** OWL ([https://owl.uwo.ca/portal](https://owl.uwo.ca/portal))

**Course prerequisite:** Chemistry 3371F

**A Notice from the Registrar:** “Students are responsible for ensuring that their selection of courses is appropriate and accurately recorded and that all course prerequisites have been successfully completed. If the student does not have the requisites for a course, and does not have written special permission from his or her Dean to enroll in the course, the student will be removed from the course and it will be deleted from the student’s record. This decision may not be appealed. A student will receive no adjustment to his or her fees in the event that he or she is dropped from a course for failing to have the necessary prerequisites.”

**Scholastic offences** are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following Web site: [http://www.uwo.ca/univsec/handbook/appeals/scholoff.pdf](http://www.uwo.ca/univsec/handbook/appeals/scholoff.pdf)

**Plagiarism:** Students must write their essays and assignments in their own words. Whenever students take an idea or a 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. Plagiarism is a major academic offence (see Scholastic Office Policy in the Western Academic Calendar).

**Accessibility Statement** Please contact the course instructor if you require material in an alternate format or if you require any other arrangements to make this course more accessible to you. You may also wish to contact Services for Students with Disabilities (SSD) at 661-2111 x 82147 for any specific question regarding an accommodation.

**Support Services** Learning-skills counselors at the Student Development Centre ([http://www.sdc.uwo.ca](http://www.sdc.uwo.ca)) are ready to help you improve your learning skills. They offer presentations on strategies for improving time management, multiple-choice exam preparation/writing, textbook reading, and more. Individual support is offered throughout the
Fall/Winter terms in the drop-in Learning Help Centre, and year-round through individual counselling. Students who are in emotional/mental distress should refer to Mental Health@Western (http://www.health.uwo.ca/mental_health) for a complete list of options about how to obtain help. Additional student-run support services are offered by the USC, http://westernusc.ca/services. The website for Registrarial Services is http://www.registrar.uwo.ca.

Course Introduction

General: Chemistry 4481B builds on many of the concepts introduced in Chem. 2271/2281 and 3371. The subject matter presented in 4481B is done in a "bottom up" approach, whereby the many concepts introduced at the beginning of the lecture series are used throughout the course. It is thus important that students keep up with the material. Problem sets will be assigned and are a good guide as to the format of both the term tests and the final examination.

Reading and Reference List: There is no required text book for this course however you will find Chapter 6 in Inorganic Chemistry (4th Ed) by Housecroft and Sharpe useful as a general reference. Lecture notes will be supplemented with handouts.

The following texts are also on reserve in the Taylor library:


Evaluations:

Participation 5 % (problem sets discussion)
In class Test 15% Monday February 3, 2020, in class
Mid-term Test 30% Friday Feb 28, 2020 (6-8 pm; location TBD)
Final Examination (cumulative) 50% April Examination Period, date TBD (3 hours)

Course Schedule - 3 hours per week - all classes are held in Chemistry Building 115, Mon., Wed. and Fri. 8:30 am-9:30 am. Some Friday lecture periods will be reserved for discussing assignments. There is no make-up test dates. If the test/midterm is missed for valid reasons (you must use the self-reporting or arrange an appointment with an Academic Counselor in the Faculty of Science office and provide appropriate documentation – see below) the weighting will be transferred to the final examination.

If you are unable to meet a course requirement due to illness or other serious circumstances, you must seek approval for the absence as soon as possible. In the event of a missed final exam, the Faculty of Science will assess your eligibility to write the Special Exam and a "Recommendation of Special Examination" form must be obtained from the Dean's Office.
A student requiring academic accommodation due to illness, should use the Student Medical Certificate when visiting an off-campus medical facility or request a Records Release Form (located in the Dean’s Office) for visits to Student Health Services. The form can be found here: http://www.uwo.ca/univsec/handbook/appeals/accommodation_medical.pdf

**Problem Sets** will be handed out throughout the term. These will be taken up ~ one week after they are distributed. Participation by registrants is required (see Evaluation scheme).

**Learning Outcomes**

Recognize and describe the packing and crystal structures, bonding and electronic properties of inorganic solids.

Recognize the common synthetic methods of inorganic solids, and describe the characterization methods of these inorganic materials.

Be able to discuss the relationship between the chemical characteristics and physical properties of various inorganic solids

**Tentative Course Outline**

Course introduction

Packing & simple crystal structures

Preparation of solid state materials

Characterization

Bonding in solids; electronic properties

Defects and non-stoichiometry

Optical properties

Nanomaterials

Porous materials (time permitting)

Magnetochemistry (time permitting)