

Chem 2211A (Fall 2022–23)

Inorganic Elements in Life

Prerequisite Requirements

Unless you have either the prerequisites for this course or written special permission from your Dean to enroll in it, you may be removed from this course and it will be deleted from your record. This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites.

The prerequisite for this course is Chemistry 1301A plus either Chemistry 1302A/B or Integrated Science 1001X. Chemistry 2271A is an antirequisite.

Course Website

News and course updates will be posted on Western's learning management system, OWL (<http://owl.uwo.ca>). This is the primary method by which information will be disseminated to all students in the class, so you are responsible for checking OWL on a frequent basis.

If you need technical assistance with OWL, seek support on the OWL Help page. Alternatively, contact the Western Technology Services Helpdesk by phone at 519-661-3800.

Learning Outcomes

A student receiving credit for Chem 2211A will be expected to reliably demonstrate competence in their ability to:

- Assess the importance of metals in nature.
- Analyze news reports and other articles about the roles of metals in life.
- Explain the functions of selected metals in biological processes in systems.
- Explain the mechanism of toxicity of selected metals.
- Describe the role of metals in medical treatments.
- Work independently, as well as with others in an effective, practical, social, and ethical manner.
- Communicate thoughts and ideas verbally and in writing.
- Obtain, evaluate, and integrate information from various sources, and determine its relevance.
- Analyze and critically assess problems, and take a systematic approach to solve them.

Key Dates

Date	Event
Week of September 19	Design-a-Meal groups will be announced followed by draws
Early October	Poster topics and teams will be announced
Friday, October 14	Last day for your team to specify preferred poster topics
Tuesday, October 18	Teams and topics will be finalized.
Thursday, October 27	Midterm Test (in-class)
Saturday, November 12	Last day to choose your team's poster assessment date and time. A date and time will be assigned if your team does not make a choice.
Friday, November 25	Posters must be put up by this date (location to be announced)
Last two weeks of class	30-min poster assessment

All of the dates related to group activities are subject to adjustment depending on course enrollment.

Class and Instructor Information

Section	Time	Room	Instructor	Office	Email
001	Tue 9:30–10:20 Thu 9:30–11:20	See below	Felix Lee	MSA 1202	flee32@uwo.ca

Initially, the class will be held in Chemistry Building room 9. Due to construction that may start sometime during the term, we may be required to move to 115.

Course Materials

No textbook is required for this course. However, students are expected to have a working knowledge of many concepts from first-year chemistry, so the materials from first-year chemistry will be a useful reference. Important topics from first-year chemistry include, but are not limited to, atomic structure, orbital shapes, electronic configuration, and coordination numbers.

Some students may find *Bioinorganic Chemistry: Inorganic elements in the chemistry of life*, 2nd edition, by Kaim, Schwederski, and Klein to be an informative reference. It is in the Taylor Library, stack 5, call number QU130.K13 2013.

Class Topics

The lecture component will introduce students to the fundamental concepts of bioinorganic chemistry, with an emphasis on the roles of metals in the biological world.

Topic	Description
A	Introduction to Bioinorganic Chemistry
B	Essential Inorganic Chemistry: orbitals, electronic configurations, HSAB theory, ligands, coordination complexes, equilibrium/stability constants
C	Essential Biochemistry: amino acids and their acid-base properties, protein structure, cells, common biological ligands
D	Metals in the Environment: origins, bioavailability, speciation, toxic metals
E	Oxygen Transport: iron, copper
F	Photosynthesis: magnesium
G	Catalysis: magnesium, zinc, cobalt, iron
H	Toxicity of Selected Elements
I	Introduction to Metals in Medicine

Evaluation

Components

Your grade out of 100 will be calculated as follows:

Component	Notes	Normal Value	Missed Midterm
Design-a-Meal	Group presentation marked on participation	5	5
Poster	Weighted average of individual and group marks	25	35
Midterm Test	Thursday, Oct. 27, 9:35–11:15 AM (in-class)	30	--
Final Exam	Cumulative, scheduled by the Registrar	40	60

The Design-a-Meal group presentations will allow students, in groups of two or three, to research and give a five-minute presentation on a how they would put together a selected meal that has a low or high amount of a specific element. Groups will be announced mid-September, and each group will then randomly draw a specific element and presentation date. Presentations will be held at the beginning of each class, starting in October.

The poster component will allow students, in groups of two or three, to research and then present a scientific poster on a topic chosen from a list provided by the course instructor. Each group will be assessed through outside-of-class “interviews” during the last two weeks of the term. Students will also visit, and learn from, other students’ posters during class time. This component will help you learn to access complex data and describe it in writing on your poster and orally during the interview. These are important skills that can be transferred to your future career! More details will be provided later.

Academic Policies and Legalities

The website for Registrarial Services is <http://www.registrar.uwo.ca>.

In accordance with policy, https://www.uwo.ca/univsec/pdf/policies_procedures/section1/mapp113.pdf, the centrally administered e-mail account provided to students will be considered the individual’s official university e-mail address. It is the responsibility of the account holder to ensure that e-mail received from the University at his/her official university address is attended to in a timely manner.

The only calculator that is permitted on tests and exams is a non-programmable scientific calculator. No other electronic devices (phones, iPods, etc.) may be in your possession during tests and exams, even for timekeeping purposes. They may not be at your test/exam desk or in your pocket. Any student found in possession of these prohibited devices will receive a mark of zero on the test or exam.

Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at this website: http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf

Computer-marked, multiple-choice tests and/or exams may be subject to submission for similarity review by software that will check for unusual coincidences in answer patterns that may indicate cheating.

In the event of a COVID-19 resurgence during the course that necessitates the course delivery moving away from face-to-face interaction, all remaining course content will be delivered entirely online synchronously or asynchronously. Details will be provided as needed. The grading scheme will **not** change. Any remaining assessments will also be conducted online as determined by the course instructor.

The Midterm Test and Final Exam are in-person assessments. In the event that one or more of these assessments need to be conducted online due to COVID-19, they may be conducted using a remote proctoring service. By taking this course, you are consenting to the use of this software and acknowledge that you will be required to provide **personal information** (including some biometric data)

and the session will be **recorded**. Completion of this course will require you to have a reliable internet connection and a device that meets the technical requirements for this service. More information about this remote proctoring service, including technical requirements, is available on Western's Remote Proctoring website at: <https://remoteproctoring.uwo.ca>.

Support Services

Please visit the Science & Basic Medical Sciences Academic Counselling webpage for information on adding/dropping courses, academic considerations for absences, appeals, exam conflicts, and many other academic related matters: <https://www.uwo.ca/sci/counselling/>.

Students with disabilities are encouraged to contact Accessible Education (http://academicsupport.uwo.ca/accessible_education/index.html), which provides recommendations for accommodation based on medical documentation or psychological and cognitive testing. The university's policy on Accommodation for Students with Disabilities can be found here: https://www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic%20Accommodation_disabilities.pdf

Learning-skills professionals at Learning Development & Success (<https://www.uwo.ca/sdc/learning>) 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.

Western is committed to reducing incidents of gender-based and sexual violence and providing compassionate support to anyone who has gone through these traumatic events. If you have experienced sexual or gender-based violence (either recently or in the past), you will find information about support services for survivors, including emergency contacts at https://www.uwo.ca/health/student_support/survivor_support/get-help.html. To connect with a case manager or set up an appointment, please contact support@uwo.ca.

Religious Accommodation: When a course requirement conflicts with a religious holiday that requires an absence from the University or prohibits certain activities, students should request accommodation for their absence in writing at least two weeks prior to the holiday to the Academic Counselling unit or Dean's Office of their home faculty or affiliated college. Please consult University's list of recognized religious holidays (updated annually) at <https://multiculturalcalendar.com/ecal/index.php?s=c-univwo>. The university's policy on Accommodation for Religious Holidays can be found here: http://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_religious.pdf

Students who are in emotional/mental distress should refer to Health and Wellness (<https://www.uwo.ca/health>) for a list of options about how to obtain help.

Western University is committed to a thriving campus as we deliver our courses in the mixed model of both virtual and face-to-face formats. We encourage you to check out the Digital Student Experience website to manage your academics and well-being: <https://www.uwo.ca/se/digital>.

Additional student-run support services are offered by the USC, <http://westernusc.ca/services>.

Student Absences

Students who experience an extenuating circumstance (such as illness or injury) sufficiently significant to temporarily render them unable to meet academic requirements may submit a request for academic consideration. In all cases, except where stated, requests must be made through the Academic Counselling unit or Dean's Office of your home faculty or affiliated college regardless of the circumstances or the value of the missed work.

- If you are a Science student, the Academic Counselling Office of the Faculty of Science is located in NCB 280, and can be contacted at 519-661-3040 or through the ticketing system on their website: <https://www.uwo.ca/sci/counselling/>

Students should note that individual instructors are not permitted to receive documentation directly from a student, whether in support of an application for consideration on medical grounds, or for other reasons. **All documentation required for absences must be submitted to the Academic Counselling unit or Dean's Office of your home faculty or affiliated college.**

For more information, please consult Western's policy on academic consideration for absences: https://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_illness.pdf

For the Student Medical Certificate (SMC), please see: http://www.uwo.ca/univsec/pdf/academic_policies/appeals/medicalform.pdf

If academic consideration has been granted for a missed Midterm Test, the weights of the Poster component and the Final Exam will be redistributed as per the evaluation scheme.

If academic consideration has been granted for a missed Final Exam, you will be able to write the Special Exam (the name given to a make-up Final Exam) in January of 2023. Two notes:

- If you miss the Special Exam, you will need to obtain academic consideration again. If it is granted, the date of the next Special Exam will normally be the scheduled date for the Final Exam the next time this course is offered. The maximum course load for the term in which the Special Exam is granted will be reduced accordingly. Please see the section on Special Exams in the Academic Calendar for details: https://www.westerncalendar.uwo.ca/PolicyPages.cfm?Command=showCategory&PolicyCategoryID=5&SelectedCalendar=Live&ArchiveID=#Page_65.
- If you are in a "Multiple Exam Situation" (more details at https://registrar.uwo.ca/academics/examinations/exam_conflicts.html), you may eligible to write the Special Exam.

If you are unable to attend your Design-a-Meal or Poster presentation, your group's presentation time will be rescheduled.