

# COURSE SYLLABUS



COURSE TITLE: CHEM-220: Inorganic Chemistry

CLASS SECTION: 001

TERM: Winter 2023

COURSE CREDITS: 3

DELIVERY METHOD(S): Face-to-face

Camosun College campuses are located on the traditional territories of the Lək̓ʷəŋən and W̱SÁNEĆ peoples. We acknowledge their welcome and graciousness to the students who seek knowledge here.

Learn more about Camosun's [Territorial Acknowledgement](#).

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<HOLD FOR 2021F COVID-19 LANGUAGE>

*Camosun College requires mandatory attendance for the first class meeting of each course. If you do not attend, and do not provide your instructor with a reasonable explanation in advance, you will be removed from the course and the space offered to the next waitlisted student.*

## INSTRUCTOR DETAILS

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NAME: John Lee

EMAIL: [leejohn@camosun.ca](mailto:leejohn@camosun.ca)

OFFICE: F350 C or F348 D

HOURS: Monday 9:00 to 9:30, Tuesday 9:30 to 10:00, Thursday 9:30 to 10:00. Or by Appt.

*As your course instructor, I endeavour to provide an inclusive learning environment. However, if you experience barriers to learning in this course, do not hesitate to discuss them with me. Camosun College is committed to identifying and removing institutional and social barriers that prevent access and impede success.*

## CALENDAR DESCRIPTION

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This course extends concepts from CHEM 120 and CHEM 121, the main group elements and the first row transition elements. The emphasis is on chemical bonding, structure and reactivity, coordination compounds, catalysts and bioinorganic chemistry. Labs emphasize the characterization and synthesis of inorganic compounds and expose students to many techniques.

### PREREQUISITE(S):

All of:

- C in CHEM 121

### CO-REQUISITE(S):

### EXCLUSION(S):

## COURSE LEARNING OUTCOMES / OBJECTIVES

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Upon completion of this course a student will be able to:

1. Utilize a detailed knowledge of the electronic structure of atoms to rationalize many of the physical and chemical properties of atoms.
2. Apply simple and sophisticated bonding theories to explain many of the properties of ionic and molecular substances.
3. Comment on the chemistry of the first row transition metals, especially in respect to formation of coordination compounds, their catalytic activity, and their relevance to bioinorganic chemistry.
4. Describe the major features of the chemistry of the main group elements of groups 14 and 18.
5. Use equipment associated with the preparation and analysis of inorganic compounds and perform reactions under an inert atmosphere for air- or water-sensitive compounds.
6. Outline the common approaches to synthesizing inorganic and coordination compounds in the laboratory.

## REQUIRED MATERIALS & RECOMMENDED PREPARATION / INFORMATION

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A CHEM 220 Laboratory Manual, lab coat and safety glasses are required.

There is no requirement to purchase a textbook, but there are some recommended resources available free from [https://chem.libretexts.org/Bookshelves/Inorganic\\_Chemistry](https://chem.libretexts.org/Bookshelves/Inorganic_Chemistry)

In particular, Inorganic Chemistry (Housecroft).

## COURSE SCHEDULE, TOPICS, AND ASSOCIATED PREPARATION / ACTIVITY / EVALUATION

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The following schedule and course components are subject to change with reasonable advance notice, as deemed appropriate by the instructor.

Classes: Tuesdays, Thursdays and Fridays 8:30-9:20 am F306 Laboratory: Mondays 9:30-12:20pm F356

WEEK or DATE RANGE	ACTIVITY or TOPIC	Laboratory Activity
1 (9 <sup>th</sup> to 13 January)	Quantum Theory and Electron Configurations	Welcome and Review
2 (16 <sup>th</sup> to 20 <sup>th</sup> January)	Periodic Properties	Gold Nanoparticles Experiment
3 (23 <sup>rd</sup> to 27 <sup>th</sup> January)	Structure and Bonding: Lewis/VSEPR/Molecular Orbital Theory	Quantum Dots
4 (30 <sup>th</sup> January to 3 <sup>rd</sup> February)	Molecular Orbital Theory and Symmetry	Luminescent Lanthanides
5 (6 <sup>th</sup> to 10 <sup>th</sup> February)	Molecular Symmetry, IR Spectroscopy applications of symmetry	Linkage Isomerism Part 1
6 (13 <sup>th</sup> to 17 <sup>th</sup> February)	Semiconductors and bonding in solids	Term Test 1

WEEK or DATE RANGE	ACTIVITY or TOPIC	Laboratory Activity
7 (20 <sup>th</sup> to 24 <sup>th</sup> February)	Reading Break	Family Day
8 (27 <sup>th</sup> February to 3 <sup>rd</sup> March)	Ionic and Metallic Crystal Structures and Ionic Lattice Structures	Linkage Isomerism Part 2
9 (6 <sup>th</sup> to 10 <sup>th</sup> March)	Transition Metal Chemistry; Introduction, Nomenclature and the 18 electron Rule	Optical Activity at an Octahedral Cobalt Centre
10 (13 <sup>th</sup> to 17 <sup>th</sup> March)	Electron Counting and Crystal Field Theory	Titanium
11 (20 <sup>th</sup> to 24 <sup>th</sup> March)	Crystal Field Theory, Substitution Reactions, and Catalytic Cycles	Synthesis of SnI <sub>4</sub>
12 (27 <sup>th</sup> to 31 <sup>st</sup> March)	Main group Chemistry	Term Test 2
13 (3 <sup>rd</sup> to 7 <sup>th</sup> April)	Main Group Chemistry	Micro-reactions of Transition Metals
14 (10 <sup>th</sup> to 14 <sup>th</sup> April)	Material Review & Element Jeopardy	Easter Monday
15 (17 <sup>th</sup> to 21 <sup>st</sup> April)	Final Exams	

Students registered with the Centre for Accessible Learning (CAL) who complete quizzes, tests, and exams with academic accommodations have booking procedures and deadlines with CAL where advanced notice is required. Deadlines can be reviewed on the [CAL exams page](http://camosun.ca/services/accessible-learning/exams.html). <http://camosun.ca/services/accessible-learning/exams.html>

## EVALUATION OF LEARNING

DESCRIPTION	WEIGHTING
Laboratory (Attendance, Participation and Pre/Post Lab Assignments)	30 %
Midterm 1	15 %
Midterm 2	15 %
Final Written Exam	40 %
<b>TOTAL</b>	<b>100%</b>

If you have a concern about a grade you have received for an evaluation, please come and see me as soon as possible. Refer to the [Grade Review and Appeals](http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.14.pdf) policy for more information. <http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.14.pdf>

## COURSE GUIDELINES & EXPECTATIONS

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### **Class Attendance**

To get the most out of this course, students are expected to attend all classes and be on time. It is your responsibility to acquire all information given during a class missed, including notes, hand-outs, changed exam dates etc.

### **Laboratory Attendance**

Laboratory participation is essential to the course learning outcomes, and largely involves practical exploration of the core topics. It is also an opportunity for students to practice key skills that will be required for further chemistry courses. Punctual attendance of all laboratory classes is mandatory, however it is recognized that circumstances such as illness, may prevent this from being possible. In these cases, you should provide an email as a courtesy to your instructor if you know you are going to be unable to attend a laboratory class, (or meet a laboratory assignment deadline). Without this, the instructor reserves the right to assign you a mark of zero for a missed lab, or deduct marks for a late submission. A passing grade of 50 % is required on the laboratory section of the course in order to pass the course. This requires attending at least 6 of the 9 practical laboratory experiments.

### **Exam Procedures**

All exams must be written at the scheduled times with the exception of students requiring an accommodation by CAL. It is understood that emergency circumstances do occur (e.g. illness or family emergency), in which case the weight of the missed test will be carried over to the final, unless you are able to arrange an alternate time with your instructor, or the Assessment Centre. <https://camosun.ca/apply/how-apply/assessment-and-testing/rescheduled-camosun-course-exams>

If it is advantageous to the student the theory mark will be solely derived from the final examination, or a combination of midterms and the final.

## SCHOOL OR DEPARTMENTAL INFORMATION

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The School of Arts and Science offers a Science Help Centre at Lansdowne campus. Tutors are available in Fisher 264 everyday from 9:00 am to 4:00 pm to assist you in chemistry, biology and physics.

Students may only use recording devices in the classroom with the prior permission of the instructor, or the Centre for Accessible Learning. The instructor's permission is not required when the use of a recording device is sanctioned by the College's Centre for Accessible Learning in order to accommodate a student's disability, *and* when the instructor has been provided with an instructor notification letter which specifies the use of a recording device.

Camosun College is a scent-free institution. Please refrain from wearing scents. Thank you.

## STUDENT RESPONSIBILITY

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Enrolment at Camosun assumes that the student will become a responsible member of the College community. As such, each student will display a positive work ethic, assist in the preservation of College property, and assume responsibility for their education by researching academic requirements and policies; demonstrating courtesy and respect toward others; and respecting expectations concerning attendance, assignments, deadlines, and appointments.

## SUPPORTS AND SERVICES FOR STUDENTS

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Camosun College offers a number of services to help you succeed in and out of the classroom. For a detailed overview of the supports and services visit <http://camosun.ca/students/>.

Academic Advising	<a href="http://camosun.ca/advising">http://camosun.ca/advising</a>
Accessible Learning	<a href="http://camosun.ca/accessible-learning">http://camosun.ca/accessible-learning</a>
Counselling	<a href="http://camosun.ca/counselling">http://camosun.ca/counselling</a>
Career Services	<a href="http://camosun.ca/coop">http://camosun.ca/coop</a>
Financial Aid and Awards	<a href="http://camosun.ca/financialaid">http://camosun.ca/financialaid</a>
Help Centres (Math/English/Science)	<a href="http://camosun.ca/help-centres">http://camosun.ca/help-centres</a>
Indigenous Student Support	<a href="http://camosun.ca/indigenous">http://camosun.ca/indigenous</a>
International Student Support	<a href="http://camosun.ca/international/">http://camosun.ca/international/</a>
Learning Skills	<a href="http://camosun.ca/learningskills">http://camosun.ca/learningskills</a>
Library	<a href="http://camosun.ca/services/library/">http://camosun.ca/services/library/</a>
Office of Student Support	<a href="http://camosun.ca/oss">http://camosun.ca/oss</a>
Ombudsperson	<a href="http://camosun.ca/ombuds">http://camosun.ca/ombuds</a>
Registration	<a href="http://camosun.ca/registration">http://camosun.ca/registration</a>
Technology Support	<a href="http://camosun.ca/its">http://camosun.ca/its</a>
Writing Centre	<a href="http://camosun.ca/writing-centre">http://camosun.ca/writing-centre</a>

**If you have a mental health concern**, please contact Counselling to arrange an appointment as soon as possible. Counselling sessions are available at both campuses during business hours. If you need urgent support after-hours, please contact the Vancouver Island Crisis Line at 1-888-494-3888 or call 911.

### Academic Accommodations for Students with Disabilities

The College is committed to providing appropriate and reasonable academic accommodations to students with disabilities (i.e. physical, depression, learning, etc). If you have a disability, the [Centre for Accessible Learning](#) (CAL) can help you document your needs, and where disability-related barriers to access in your courses exist, create an accommodation plan. By making a plan through CAL, you can ensure you have the appropriate academic accommodations you need without disclosing your diagnosis or condition to course instructors. Please visit the CAL website for contacts and to learn how to get started:

<http://camosun.ca/services/accessible-learning/>

### Academic Integrity

Please visit <http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.13.pdf> for policy regarding academic expectations and details for addressing and resolving matters of academic misconduct.

### Academic Progress

Please visit <http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.1.pdf> for further details on how Camosun College monitors students' academic progress and what steps can be taken if a student is at risk of not meeting the College's academic progress standards.

### Course Withdrawals Policy

Please visit <http://camosun.ca/about/policies/education-academic/e-2-student-services-and-support/e-2.2.pdf> for further details about course withdrawals. For deadline for fees, course drop dates, and tuition refund, please visit <http://camosun.ca/learn/fees/#deadlines>.

### Grading Policy

Please visit <http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.5.pdf> for further details about grading.

### Grade Review and Appeals

Please visit <http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.14.pdf> for policy relating to requests for review and appeal of grades.

### Mandatory Attendance for First Class Meeting of Each Course

Camosun College requires mandatory attendance for the first class meeting of each course. If you do not attend, and do not provide your instructor with a reasonable reason in advance, you will be removed from the course and the space offered to the next waitlisted student. For more information, please see the "Attendance" section under "Registration Policies and Procedures" (<http://camosun.ca/learn/calendar/current/procedures.html>) and the Grading Policy at <http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.5.pdf>.

### Medical / Compassionate Withdrawals

Students who are incapacitated and unable to complete or succeed in their studies by virtue of serious and demonstrated exceptional circumstances may be eligible for a medical/compassionate withdrawal. Please visit

<http://camosun.ca/about/policies/education-academic/e-2-student-services-and-support/e-2.8.pdf> to learn more about the process involved in a medical/compassionate withdrawal.

### Sexual Violence and Misconduct

Camosun is committed to creating a campus culture of safety, respect, and consent. Camosun's Office of Student Support is responsible for offering support to students impacted by sexual violence. Regardless of when or where the sexual violence or misconduct occurred, students can access support at Camosun. The Office of Student Support will make sure students have a safe and private place to talk and will help them understand what supports are available and their options for next steps. The Office of Student Support respects a student's right to choose what is right for them. For more information see Camosun's Sexualized Violence and Misconduct Policy: <http://camosun.ca/about/policies/education-academic/e-2-student-services-and-support/e-2.9.pdf> and [camosun.ca/sexual-violence](http://camosun.ca/sexual-violence). To contact the Office of Student Support: [oss@camosun.ca](mailto:oss@camosun.ca) or by phone: 250-370-3046 or 250-3703841

### Student Misconduct (Non-Academic)

Camosun College is committed to building the academic competency of all students, seeks to empower students to become agents of their own learning, and promotes academic belonging for everyone. Camosun also expects that all students to conduct themselves in a manner that contributes to a positive, supportive, and safe learning environment. Please review Camosun College's Student Misconduct Policy at <http://camosun.ca/about/policies/education-academic/e-2-student-services-and-support/e-2.5.pdf> to understand the College's expectations of academic integrity and student behavioural conduct.

**Changes to this syllabus:** Every effort has been made to ensure that information in this syllabus is accurate at the time of publication. The College reserves the right to change courses if it becomes necessary so that course content remains relevant. In such cases, the instructor will give the students clear and timely notice of the changes.