

Faculty of Science Course Syllabus Fall 2021
Department of Chemistry

Organometallic Characterization Methods – CHEM 6153 Winter 2022

Instructor(s): Mark Stradiotto mark.stradiotto@dal.ca

Lectures: TBA

Course delivery: *In-person delivery of lectures and discussion of problem sets (as well as testing) in the determined classtime.*

Course Description

This advanced class in inorganic/organometallic chemistry will address a range of topics related to structural characterization techniques, including NMR spectroscopy and X-ray crystallography.

Course Prerequisites

CHEM 4102.03, CHEM 5102.03 or permission of the instructor

Course Objectives/Learning Outcomes

Students, upon completion of the course, should demonstrate working knowledge pertaining to NMR spectroscopy and single-crystal X-ray diffraction methods as related to the characterization of molecular inorganic compounds.

Course Materials

- Provided by the instructor

Course Assessment

Tests/quizzes two tests 50% each (dates TBA).

Other course requirements

The course will be offered as a set of lectures given by Prof. Stradiotto in two parts

PART ONE: Insights regarding the structure and dynamics of organometallic complexes, as well as the mechanistic pathways traversed by such complexes, are often gained by use of NMR spectroscopic techniques. The focus of this part of the course is to introduce students to a selection of important NMR techniques commonly employed in the study of organometallic molecules, with a particular emphasis on the study of paramagnetic complexes, quadrupolar nuclei, dynamic NMR techniques, and the factors that influence the spectroscopic features of such complexes. The material will be treated from both a theoretical and practical perspective, using appropriate case studies from the literature. Your understanding of this material will be examined in a test (50%).

PART TWO: Single-crystal X-ray diffraction studies offer a unique opportunity to interrogate the structure of inorganic and organometallic complexes in the solid state. The focus of this part of the course is to introduce students to a range of diffraction techniques commonly employed in the study of inorganic and organometallic molecules. Topics to be discussed include, but are not restricted to: theory surrounding X-ray diffraction by single crystals including Bragg's law; space groups and related symmetry concepts; reciprocal space; X-ray diffraction instrumentation; theoretical aspects of crystallographic solution and refinement; and crystallographic disorder and other issues in structure determination. Your understanding of this material will be examined in a test (50%).

Conversion of numerical grades to Final Letter Grades follows the Dalhousie Common Graduate-level Grade Scale

A+ (90-100)	B+ (77-79)	F (<70)
A (85-89)	B (73-76)	
A- (80-84)	B- (70-72)	

Course Policies

Missed course requirements will be made up promptly at a date that is mutually agreeable to the student and the instructor. Please also see the commentary under "other course requirements". Effective September 1, 2014, the Department of Chemistry policy is that for all Chemistry courses beyond first year, a minimum grade of 50% on the written test/final exam component is required in order to pass the course.

Course Content - Please see above.

Faculty of Science Course Syllabus (Section B) (revised June-2021)**Fall 2021****CHEM 4102/5102****University Policies and Statements**

This course is governed by the academic rules and regulations set forth in the University Calendar and by Senate

Academic Integrity

At Dalhousie University, we are guided in all of our work by the values of academic integrity: honesty, trust, fairness, responsibility and respect (The Center for Academic Integrity, Duke University, 1999). As a student, you are required to demonstrate these values in all of the work you do. The University provides policies and procedures that every member of the university community is required to follow to ensure academic integrity.

Information: https://www.dal.ca/dept/university_secretariat/academic-integrity.html

Accessibility

The Advising and Access Services Centre is Dalhousie's centre of expertise for student accessibility and accommodation. The advising team works with students who request accommodation as a result of a disability, religious obligation, or any barrier related to any other characteristic protected under Human Rights legislation (Canada and Nova Scotia).

Information: https://www.dal.ca/campus_life/academic-support/accessibility.html

Student Code of Conduct

Everyone at Dalhousie is expected to treat others with dignity and respect. The Code of Student Conduct allows Dalhousie to take disciplinary action if students don't follow this community expectation. When appropriate, violations of the code can be resolved in a reasonable and informal manner—perhaps through a restorative justice process. If an informal resolution can't be reached, or would be inappropriate, procedures exist for formal dispute resolution.

Code: https://www.dal.ca/dept/university_secretariat/policies/student-life/code-of-student-conduct.html

Diversity and Inclusion – Culture of Respect

Every person at Dalhousie has a right to be respected and safe. We believe inclusiveness is fundamental to education. We stand for equality. Dalhousie is strengthened in our diversity. We are a respectful and inclusive community. We are committed to being a place where everyone feels welcome and supported, which is why our Strategic Direction prioritizes fostering a culture of diversity and inclusiveness

Statement: <http://www.dal.ca/cultureofrespect.html>

Recognition of Mi'kmaq Territory

Dalhousie University would like to acknowledge that the University is on Traditional Mi'kmaq Territory. The Elders in Residence program provides students with access to First Nations elders for guidance, counsel and support. Visit or e-mail the Indigenous Student Centre (1321 Edward St) (elders@dal.ca).

Information: https://www.dal.ca/campus_life/communities/indigenous.html

Important Dates in the Academic Year (including add/drop dates)

https://www.dal.ca/academics/important_dates.html

University Grading Practices

https://www.dal.ca/dept/university_secretariat/policies/academic/grading-practices-policy.html

Student Resources and Support

Advising

General Advising https://www.dal.ca/campus_life/academic-support/advising.html

Science Program Advisors: <https://www.dal.ca/faculty/science/current-students/academic-advising.html>

Indigenous Student Centre: https://www.dal.ca/campus_life/communities/indigenous.html

Black Students Advising Centre: https://www.dal.ca/campus_life/communities/black-student-advising.html

International Centre: https://www.dal.ca/campus_life/international-centre/current-students.html

Academic supports

Library: <https://libraries.dal.ca/>

Writing Centre: https://www.dal.ca/campus_life/academic-support/writing-and-study-skills.html

Studying for Success: https://www.dal.ca/campus_life/academic-support/study-skills-and-tutoring.html

Copyright Office: <https://libraries.dal.ca/services/copyright-office.html>

Fair Dealing Guidelines <https://libraries.dal.ca/services/copyright-office/fair-dealing.html>

Other supports and services

Student Health & Wellness Centre: https://www.dal.ca/campus_life/health-and-wellness/services-support/student-health-and-wellness.html

Student Advocacy: <https://dsu.ca/dsas>

Ombudsperson: https://www.dal.ca/campus_life/safety-respect/student-rights-and-responsibilities/where-to-get-help/ombudsperson.html

Safety

Biosafety: <https://www.dal.ca/dept/safety/programs-services/biosafety.html>

Chemical Safety: <https://www.dal.ca/dept/safety/programs-services/chemical-safety.html>

Radiation Safety: <https://www.dal.ca/dept/safety/programs-services/radiation-safety.html>

Scent-Free Program: <https://www.dal.ca/dept/safety/programs-services/occupational-safety/scent-free.html>

Dalhousie COVID-19 information and updates: <https://www.dal.ca/covid-19-information-and-updates.html>

SERVICES AVAILABLE TO STUDENTS

The following campus services are available to help students develop skills in library research, scientific writing, and effective study habits. The services are available to all Dalhousie students and, unless noted otherwise, are free.

Service	Support Provided	Location	Contact
General Academic Advising	Help with - understanding degree requirements and academic regulations - choosing your major - achieving your educational or career goals - dealing with academic or other difficulties	Killam Library Ground floor Rm G28 Bissett Centre for Academic Success	In person: Killam Library Rm G28 By appointment: - e-mail: advising@dal.ca - Phone: (902) 494-3077 - Book online through MyDal
Dalhousie Libraries	Help to find books and articles for assignments Help with citing sources in the text of your paper and preparation of bibliography	Killam Library Ground floor Librarian offices	In person: Service Point (Ground floor) By appointment: Identify your subject librarian (URL below) and contact by email or phone to arrange a time: http://dal.beta.libguides.com/sb.php?subject_id=34328
Studying for Success (SFS)	Help to develop essential study skills through small group workshops or one-on-one coaching sessions Match to a tutor for help in course-specific content (for a reasonable fee)	Killam Library 3rd floor Coordinator Rm 3104 Study Coaches Rm 3103	To make an appointment: - Visit main office (Killam Library main floor, Rm G28) - Call (902) 494-3077 - email Coordinator at: sfs@dal.ca or - Simply drop in to see us during posted office hours All information can be found on our website: www.dal.ca/sfs
Writing Centre	Meet with coach/tutor to discuss writing assignments (e.g., lab report, research paper, thesis, poster) - Learn to integrate source material into your own work appropriately - Learn about disciplinary writing from a peer or staff member in your field	Killam Library Ground floor Learning Commons & Rm G25	To make an appointment: - Visit the Centre (Rm G25) and book an appointment - Call (902) 494-1963 - email writingcentre@dal.ca - Book online through MyDal We are open six days a week See our website: writingcentre.dal.ca