Course Description

Various themes of modern transition metal chemistry are examined, including but not restricted to: fundamental structure and bonding; spectroscopic characterization methods; as well as reactivity and reaction mechanisms.

Course Prerequisites

CHEM 3103.03 (grade of C- or better, or equivalent)

Course Anti-requisites

CHEM 4102.03

Course Objectives/Learning Outcomes

Students, upon completion of the course, should demonstrate working knowledge pertaining to:
- basic organometallic structure and bonding
- fundamental reaction classes involving organometallic complexes
- mechanistic organometallic chemistry and catalysis as per the material covered in the course

Course Materials

- Provided by the instructor
Course Assessment

Tests/quizzes 20% each: Two term tests (in class) on **22 Oct 2015 and 01 Dec 2015**

Final exam 40% (Scheduled by Registrar)

Literature opinion 20% (details and deadlines provided below under “Other course requirements”)

Assignments Self-study problem sets can be found in the course material that will be provided throughout the term. It is strongly recommended that students work through these problems in order to assess their progress in learning the course material. However, none of these problem sets will be graded.

Other course requirements

Literature opinion: Each student is required to submit a typed “Literature Opinion” (LO; 500-1000 words for 4102, 1000-1500 words for 5102, plus appropriate chemical drawings/figures/charts as needed) of a recent communication from the organometallic literature. A more detailed and thorough analysis is expected from students in 5102, and as such the length and value of the LO differs from that of 4102. Only one student per communication will be allowed and all communications must be approved in person on a first-come-first-served basis by M. Stradiotto on or before **October 6, 2015**. You should not select a communication that is directly related to research work that you have done previously/are doing (including past work in a research group in which you have worked previously). Failure to have your communication choice approved by this date will result in a loss of 5% of the allotted 20%. Submission of an unapproved LO, or of an LO after the due date of **December 1, 2015** (noon, under my office door 217 – NO ELECTRONIC SUBMISSIONS), will normally be assigned a grade of zero. The submission of an LO that is significantly outside of the suggested length range/scope will be assigned a grade of zero. The communication must come from one of the following journals in the last 24 months: Science, Nature, Nature Chemistry, Chemistry A European Journal, Journal of the American Chemical Society, Angewandte Chemie International Edition, Chemical Communications, or Organometallics. The purpose of the LO is to encourage students to examine the chemical literature and to demonstrate the ability of the student to utilize the material covered in the course in the thoughtful analysis of a published communication. The LO should be formatted as a typed, double-spaced document (no other special formatting is required), listing your information as well as the title/authors/journal information at the start of the document. The LO should be written in your own words and should not involve transcribing sentences directly from the communication (even if cited). The body of the LO must make use of the following headings: (a) Summary of research problem, approach and key findings; (b) Experimental support (for the claims made in the report); (c) Strengths of the reported work; (d) Limitations of the reported work. As a suggested guide, parts (a), (b) and (c+d) should each comprise about a third of the report. Be sure to attach a copy of the communication on which you are writing, and feel free to refer directly to any of the figures, schemes, etc in the original literature communication (don’t redraw). Feel free to add your own
Conversion of numerical grades to Final Letter Grades follows the Dalhousie Common Grade Scale

<table>
<thead>
<tr>
<th>Grade</th>
<th>Score Ranges</th>
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<tbody>
<tr>
<td>A+</td>
<td>90-100</td>
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<tr>
<td>B+</td>
<td>77-79</td>
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<tr>
<td>F</td>
<td>&lt;70</td>
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<tr>
<td>A</td>
<td>85-89</td>
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<tr>
<td>B</td>
<td>73-76</td>
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<tr>
<td>A-</td>
<td>80-84</td>
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<tr>
<td>B-</td>
<td>70-72</td>
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Course Policies

Missed tests 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

The impact of organometallic transition metal chemistry on the evolution of modern synthetic chemistry practices has been profound in recent years, as evidenced by the awarding of the Nobel Prize for Chemistry in 2001, 2005, and 2010 on this topic. This advanced class seeks to develop a fundamental understanding of such chemistry, as well as to highlight fundamental and applied aspects of organometallic reactivity. As such, this advanced class in organometallic chemistry will address a range of topics including structure and bonding models, reactivity and mechanism, and applications in synthetic chemistry. Students are responsible for all material covered in the lectures, including any handouts, as well as the assigned readings. While there is no formal textbook for the course, students are encouraged to consult advanced texts covering the topics of inquiry, as well as to address the self-study problems that will be provided. Students are encouraged to review in detail the material covered in the past inorganic chemistry courses. **Assumed Background for this course includes ALL material covered in Chemistry 2101 and 3103, for example: polyhedral geometries and isomerism; basic molecular orbital theory; symmetry; and the basics of d-block coordination chemistry. Students should also have the main group and transition elements of the periodic table memorized (you will need it for exams, etc.).**

Suggested Texts (especially for background reading):


ACCOMMODATION POLICY FOR STUDENTS

Students may request accommodation as a result of barriers related to disability, religious obligation, or any characteristic protected under Canadian Human Rights legislation. **Student Accommodation Policy:** [http://www.dal.ca/campus_life/student_services/academic-support/accessibility.html](http://www.dal.ca/campus_life/student_services/academic-support/accessibility.html)

Students who require accommodation for classroom participation or the writing of tests and exams should make their request to the Advising and Access Services Centre (AASC) prior to or at the outset of the regular academic year. More information and the **Request for Accommodation** form are available at [www.dal.ca/access](http://www.dal.ca/access).

ACADEMIC INTEGRITY

Academic integrity, with its embodied values, is seen as a foundation of Dalhousie University. It is the responsibility of all students to be familiar with behaviours and practices associated with academic integrity. Instructors are required to forward any suspected cases of plagiarism or other forms of academic cheating to the Academic Integrity Officer for their Faculty.

**Policy on Intellectual Honesty** and **Faculty Discipline Process:** [https://www.dal.ca/dept/university_secretariat/academic-integrity.html](https://www.dal.ca/dept/university_secretariat/academic-integrity.html)

STUDENT CODE OF CONDUCT

Dalhousie University has a student code of conduct, and it is expected that students will adhere to the code during their participation in lectures and other activities associated with this course. [http://www.dal.ca/dept/university_secretariat/policies/student-life/code-of-student-conduct.html](http://www.dal.ca/dept/university_secretariat/policies/student-life/code-of-student-conduct.html)

COPYRIGHT

All members of the Dalhousie community are expected to comply with their obligations under Canadian copyright law. Dalhousie copyright policies and guidelines, including our Fair Dealing Guidelines, are available at [http://www.dal.ca/dept/copyrightoffice.html](http://www.dal.ca/dept/copyrightoffice.html).

SERVICES AVAILABLE TO STUDENTS

The following campus services are available to all Dalhousie students. Unless noted otherwise, the services are **free**.

<table>
<thead>
<tr>
<th>Service</th>
<th>Support Provided</th>
<th>Location</th>
<th>Contact</th>
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| 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         |
<p>| Dalhousie Libraries    | Help to find books and articles for assignments                                 | Killam Library Ground floor                   | In person: Service Point (Ground floor)                                 |</p>
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<tr>
<td><strong>Help with citing sources in</strong></td>
<td>Help with citing sources in the text of your paper and preparation of bibliography</td>
<td>Librarian offices</td>
<td>By appointment: Identify your subject librarian (URL below) and contact by email or phone to arrange a time: <a href="http://dal.beta.libguides.com/sb.php?subject_id=34328">http://dal.beta.libguides.com/sb.php?subject_id=34328</a></td>
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<td><strong>Studying for Success (SFS)</strong></td>
<td>Help to develop essential study skills through small group workshops or one-on-one coaching sessions</td>
<td>Killam Library 3rd floor</td>
<td>To make an appointment: - Visit main office (Killam Library main floor, Rm G28) - Call (902) 494-3077 - e-mail Coordinator at: <a href="mailto:sfs@dal.ca">sfs@dal.ca</a> or - Drop in to see us during posted office hours All information can be found on our website: <a href="http://www.dal.ca/sfs">www.dal.ca/sfs</a></td>
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<td><strong>Writing Centre</strong></td>
<td>Meet with a tutor to discuss writing assignments (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</td>
<td>Killam Library Ground floor Learning Commons &amp; Rm G25</td>
<td>To make an appointment: - Visit the Writing Centre in the Killam Learning Commons (Rm G40) and book an appointment - Call (902) 494-1963 - e-mail <a href="mailto:writingcentre@dal.ca">writingcentre@dal.ca</a> - Book online through MyDal We are open six days a week See our website: <a href="http://writingcentre.dal.ca">writingcentre.dal.ca</a></td>
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