

SYLLABUS
Intermediate Inorganic Chemistry
CHMC31Y3, Winter 2022

Instructors Information

Instructor	Email	Office	Office hours
Alen Hadzovic (lectures and course coordinator)	alen.hadzovic@utoronto.ca	EV568	considering current situation, office hours will be online and by appointment only (please e-mail me to set up the time)
Marco Zimmer-Deluliis (labs)	m.zimmer.deiuliis@utoronto.ca	EV546	The announcement about office hours will be provided on Quercus in January
Sarah Forbes (librarian)	s.forbes@utoronto.ca	EV368	

Welcome to CHMC31Y3 course, a course that brings to you the exciting, rich and colorful world of transition elements. Below you will find a more detailed course scope and outline which will, we hope, give you a bit more information about what is in front of us and what is expected from us all this semester.

Course Scope and Goals

Intermediate Inorganic Chemistry (CHMC31Y3) builds up on the material covered in Introduction to Inorganic Chemistry (CHMB31H3). The course covers topics from the general and special chemistry of transition elements. General topics include structure and bonding, general reacti

general details can be found at [Your guide to the 2021-22 school year at U of T | University of Toronto \(utoronto.ca\)](https://utoronto.ca). More coursespecific details will be provided to you at the end of January

These are current plans for the Winter 2022 course delivery. The situation, however, can change rapidly so stay tuned!

Course Goals and Outline

As mentioned before, we'll need a solid knowledge from CHMB31 to be successful in CHMC31. This is particularly going to be evident in Topic 1 (see below) which we will use to review some earlier concepts and introduce the new material. If you have any trouble following our first topic, I strongly advise you to review the CHMB31 relevant material.

After successful completion of CHMC31Y3 you should:

- x Augment your understanding of periodic trends by inserting d block elements to the previous knowledge of main groups.
- x Be able to apply this knowledge to predict structures and reactivities of coordination compounds of d block elements.
- x Understand the mechanisms of reactions that govern coordination compound reactivities.
- x Solve intermediate problems in structure and reactivity of inorganic compounds.
- x Improve your formal report writing skills (more on this in the evaluation section).
- x Gain basic knowledge of organometallic chemistry.

These are re-T re-T

a

se

i. Thermodynamic stability of comp

9. ORGANOMETALLIC COMPOUNDS:

- a. Ligands in organometallic chemistry
- b. 18-electron rule and structure of organometallic compounds.
- c. Basic classes of organometallic compounds:
 - i. σ -bonded alkyl and aryl complexes
 - ii. π -bonded systems (alkenes, alkynes, cyclopentadienyl and other aromatic systems)
 - iii. Other common ligands in organometallic chemistry: hydride, dihydrogen, and phosphines

10. SPECIAL TOPIC: CATALYSIS - CHEMISTRY AND INDUSTRY:

- a. Energy considerations, green chemistry and atom economy principles
bg

session and during the semester

Your lecture notes, which will be available on the Blackboard, should be your major guides to mastering the material for this course. **However, the knowledge of both textbook and lecture materials is required.** Apart from the required textbook below, we shall analyze selected journal articles relevant to the course materials, and particularly during our writing workshop for the labs (the details of which will be announced on quercus).

CHMC313 library guide can be found at <https://guides.library.utoronto.ca/chmc31>.

Our required textbook is the same as for CHMB31H3

Weller, Overton, Rourke, and Armstrong. *Inorganic chemistry* 7th edition. Oxford University Press, 2018.

Recommended:

Hadzovic. *Solutions manual for Inorganic Chemistry* 7th ed. Oxford University Press, 2018.

These are additional sources (not required materials) for those of you who would like to explore more and can be found in the library (some texts are available in electronic format through the UofT library catalogue):

Crabtree, R. H. *The Organometallic Chemistry of Transition Metals* 2nd ed. Wiley-Interscience, 2005 (Useful the organometallic topics)

Greenwood, N.N. and A. Earnshaw. *Chemistry of the Elements* 2nd ed. Oxford: Butterworth Heinemann, 1998. (Probably one of the best and most detailed descriptive inorganic chemistry textbooks out there, but does not cover in great detail spectroscopic techniques and bonding. Useful to learn about the elements and their reactivity).

Huheey, J.E., E.A. Keiter, and R.L. Keiter. *Inorganic Chemistry: Principles of structure and reactivity*. 4th ed. Upper Saddle River: Pearson Prentice Hall, 1993-94 (a classic textbook, covers many relevant topics for our course)

Miessler, G.L., and D.A. Tarr. *Inorganic Chemistry* 3rd ed. Upper Saddle River: Pearson Prentice Hall, 2004. (A good text for our topics 2, 3 (UV-Vis), 6, and 8; it is on course reserves in UTSC library)

Wilkinson, A. and A. Cotton. *Advanced Inorganic Chemistry* 5th ed. New York; Toronto: Wiley, 1988 (a very detailed descriptive inorganic chemistry – for those who need or would like to learn more about the chemistry of elements)

Academic Integrity

Academic integrity is one of the cornerstones of the University of Toronto. It is critically important both to maintain our community which honors the values of honesty, trust, respect, fairness and responsibility. It also protects you, the student within our community as well as the value of the degree towards which you are all working so diligently. Detailed information about how to act with academic integrity, the Code of Behavior on Academic Matters, and the processes by which allegations of academic misconduct are resolved can be found online [Student Academic Integrity | Faculty of Arts & Science \(utoronto.ca\)](#) and [FAQ | Vice Principal Academic & Dean \(utoronto.ca\)](#)

Section B of the University of Toronto's Code of Behaviour on Academic Matters (<http://www.governingcouncil.utoronto.ca/policies/behaveac.htm>) lists actions that are considered academic

offences. Some of the most common offences are:

- f* To use someone else's ideas or words in their own work without acknowledging that those ideas/words are not their own with a citation and quotation marks, i.e. to commit **plagiarism**.
- f* To include **false, misleading** or **concocted** citations in their work.
- f* To obtain **unauthorized** assistance on any assignment.
- f* To provide **unauthorized** assistance to another student. This includes showing another student completed work.
- f* To submit their own work for credit in **more than one course** without the permission of the instructor.
- f* To **falsify** or **alter** any documentation required by the University. This includes, but is not limited to, doctor's notes.
- f* To use or possess an unauthorized aid in any test or exam.

There are other offences covered under the Code, but these are by far the most common. Please respect these