



UNIVERSITY OF CALGARY

DEPARTMENT OF CHEMISTRY COURSE OUTLINE WINTER 2015

1. **Course:** Chemistry 333, Inorganic Chemistry: Transition Metals

L01: MoWeFr, 11:00-11:50, ES 162; Instructor, Warren Piers; Office, EEEL 548; Tel. No., 220-5746; e-mail address, wpiers@ucalgary.ca; Office Hours: TBD

Desire 2 Learn (D2L) CHEM 333 L01 - (Winter 2015) - Inorganic Chem:Transition Metals
SA 229, 220-5341, uginfo@chem.ucalgary.ca

2. **Prerequisites:** Chemistry 201 or 211, and 203 or 213 and 331.

3. **Grading:** The University policy on grading and related matters is described sections F.1 and F.2 of the online University Calendar. In determining the overall grade in the course the following weights will be used:

Chemistry 333 instruction consists of attending lectures and laboratories. Grades are assigned for laboratory experiments (quizzes and projects), two term tests and one final examination.

Laboratories	25%
Midterm Test 1	20% (In class February 13, 2015)
Midterm Test 2	20% (In class March 20, 2015)
Final Exam	35% (To be scheduled by the Registrar)
Total	100%

Special Needs Students must be registered with the Disability Resource Center (DRC), must identify themselves to their instructor as soon as possible and will be dealt with on an individual basis. A mark of less than 50% in the laboratory component and/or on the weighted average of the term tests and final examination will result in a final grade of no greater than D+, which does not satisfy the pre-requisite requirements for further chemistry courses. Students will be expected to understand at every stage the material covered in all components of the course.

The Midterm Tests will be held in class, Friday, February 13th and Friday March 20th, 2015. There are no deferred term tests. The weight of a legitimately missed term test will be pro-rated among the remaining components of the course. The final examination will be scheduled by the Registrar's Office. All exams are cumulative. The marks for all of the course components will be recorded as numerical scores and combined to arrive at a final numerical score, which will be converted to the letter grade that is reported to the Registrar according to the following grading scale.

Grading Scale:

A+	A	A-	B+	B	B-
95% - 100%	85% - 94%	80% - 84%	75% - 79%	70% - 74%	65% - 69%

C+	C	C-	D+	D	F
60% - 64%	55% - 59%	50% - 54%	45% - 49%	40% - 44%	< 40%

4. **Missed Components of Term Work:** The regulations of the Faculty of Science pertaining to this matter are found in the Faculty of Science area of the Calendar in [Section 3.6](#). It is the student's responsibility to familiarize himself/herself with these regulations. See also [Section E.6](#) of the University Calendar

5. **Scheduled out-of-class activities:** Not applicable.
6. **Course Materials:** Housecroft, C.E. and Sharpe, A.G., "Inorganic Chemistry", Pearson/Prentice Hall, Fourth Edition (2012), plus the Student Solutions Manual . This text is to be used as a dictionary-like reference to the lecture notes. The contents of chapters will not be followed in any set order.
7. **Examination Policy:** Exams will be closed book exams; necessary resources will be provided in the exam paper. Calculators are allowed. Students should also read the Calendar, [Section G](#), on Examinations.
8. **Approved Mandatory and Optional Course Supplemental Fees:** The Department of Chemistry has a laboratory glassware breakage fee. At the start of the course, each student is assigned a locker and checks-in to establish that they have a complete set of usable glassware. By signing for check-in, a student agrees that they are now responsible for the glassware until check out. Any equipment that is missing, unusable or has been replaced during the semester will be charged to the student. All students, even those who withdraw early from the course must check out of the laboratory before the last day of lectures. Any student who fails to check out before the last day of lectures for the term will be assessed a charge of \$30.00. If this fee is not paid by the last day of the final examination period of the term, an additional \$10.00 administrative fee will be charged and university services (registration, transcripts, etc.) may be withheld.
9. **Writing across the curriculum statement:** For all components of the course, in any written work, the quality of writing (language, spelling, grammar, presentation etc.) will be taken into consideration. See also [Section E.2](#) of the University Calendar.
10. **Human studies statement:** Not applicable.

11. OTHER IMPORTANT INFORMATION FOR STUDENTS:

- (a) **Academic Misconduct:** (cheating, plagiarism, or any other form) is a very serious offence that will be dealt with rigorously in all cases. A single offence may lead to disciplinary probation or suspension or expulsion. The Faculty of Science follows a zero tolerance policy regarding dishonesty. Please read the sections of the University Calendar under [Section K](#). Student Misconduct to inform yourself of definitions, processes and penalties
- (b) **Assembly Points:** In case of emergency during class time, be sure to FAMILIARIZE YOURSELF with the information on [assembly points](#).
- (c) **Academic Accommodation Policy:** Students with documentable disabilities are referred to the following links: [Calendar entry on students with disabilities](#) and [Student Accessibility Services](#).
- (d) **Safewalk:** Campus Security will escort individuals day or night (<http://www.ucalgary.ca/security/safewalk/>). Call 220-5333 for assistance. Use any campus phone, emergency phone or the yellow phones located at most parking lot pay booths.
- (e) **Freedom of Information and Privacy:** This course is conducted in accordance with the Freedom of Information and Protection of Privacy Act (FOIPP). As one consequence, students should identify themselves on all written work by placing their name on the front page and their ID number on each subsequent page. For more information see also <http://www.ucalgary.ca/secretariat/privacy> .
- (f) **Student Union Information:** VP Academic Phone: 220-3911 Email: suvpaca@ucalgary.ca.
SU Faculty Rep. Phone: 220-3913 Email: sciencerep@su.ucalgary.ca; [Student Ombudsman](#)
- (g) **Internet and Electronic Device Information:** You can assume that in all classes that you attend, your cell phone should be turned off unless instructed otherwise. Also, communication with other individuals, via laptop computers, Blackberries or other devices connectable to the Internet is not allowed in class time unless specifically permitted by the instructor. If you violate this policy you may be asked to leave the classroom. Repeated abuse may result in a charge of misconduct.
- (h) At the University of Calgary, feedback provided by students through the Universal Student Ratings of Instruction (USRI) survey provides valuable information to help with evaluating instruction, enhancing learning and teaching, and selecting courses (www.ucalgary.ca/usri). Your responses make a difference - please participate in USRI Surveys.

CHEMISTRY 333 - INORGANIC CHEMISTRY: TRANSITION METALS
WINTER 2015
COURSE SYLLABUS

COURSE CONTENTS	Lectures^a	Chapter in Textbook^b <i>(not all sections will be covered)</i>
INTRODUCTION to CHEM 333 Discussion of course objectives Review of Electronic Structure of Transition Metal Atoms Introduction to Transition Metal Compounds	1 through 3	Chapter 19
TRANSITION METAL COMPLEXES – Structural Aspects Geometry Isomerism Symmetry 18 electron rule	4 through 7	Chapters 4, 19, 24
TRANSITION METAL COMPLEXES – Bonding Theory Crystal Field Theory Splitting, spectrochemical series, high and low spin Magnetochemistry Ligand field theory Molecular Orbital Theory □ bonding metal-metal bonding	8 through 13	Chapter 20
TRANSITION METAL COMPLEXES – Physical Methods Electronic Absorption Spectra Magnetic Measurements X-ray Crystallography	14 through 19	Chapter 4
TRANSITION METAL COMPLEXES – Reactions Mechanisms Labile and inert complexes The Trans effect Electron Transfers Marcus Theory	20 through 25	Chapter 26
DESCRIPTIVE TRANSITION METAL CHEMISTRY Organometallic Chemistry Catalysis Bioinorganic Chemistry	25 through 36	Chapters 24, 25, 29

^a **The number of lectures allocated to each topic is TENTATIVE. There are a total of 39 lecture timeslots for the term, two of which are reserved for the in-class Midterm Tests—the dates for the Midterms will not change.**

^b C.E. Housecroft and A.G. Sharpe, *"INORGANIC CHEMISTRY"*, Pearson/Prentice Hall, Fourth Edition (2012).

See Lab Manual for Outline of laboratory experiments.