

Inorganic Chemistry CHEM 343
Spring 2020

Professor: Nicole Crowder
Office: Jepson 439
Contact: ncrowder@umw.edu, (540)-654-1411
Lecture: MWF 1:00-1:50 pm, Jepson 454

Office Hrs: **M** 2-3; **Tu** 11-12; **W** 11-12, 2-3; **F** 11-12

Required Materials: Meissler and Tarr, *Inorganic Chemistry*, 4th or 5th ed. (**recommended**)
Coursepack for CHEM 343
Calculator with scientific notation and exponential functions; you will only be able to use non-graphing calculators on all quizzes and exams. The TI-30X series calculators are recommended (available in bookstore).

Web Site: This course will make use of the Canvas course management system. Please check here frequently as materials posted will include course announcements, assignments, and other course materials as necessary.

Content and Course Objectives: This course will focus mainly on the d-block of the periodic table and include analysis of the structure and reactivity of these metals and the coordination complexes that they form. Review of chemical bonding theories, molecular structure, solid state structures, and molecular symmetry will provide a basis for these explorations. After completing the course, a student should

- Understand the basis for chemical bonding and reactivity in metals, inorganic compounds, and organometallic complexes
- Understand the characteristics of molecules and complexes through application of the molecular orbital theory and molecular symmetry
- Be able to solve problems related to the chemical principles covered in class

Grading:	Points	Total
Problem Sets (6)	30	180
Literature Projects (3)	40	120
Quizzes (best 8 of 9)	25	200
In-Class Exams (3)	100	300
Final Exam	200	<u>200</u>
		1000

Students with a C average or lower will receive a Mid-Semester Deficiency Report.

Problem Sets: Problem sets will consist of questions taken either from your text, the literature, or material covered in lecture. These problem sets will be collected at the start of the class period they are due. **Late work will not be accepted.** These assignments are for your benefit as they will help you master the course material and prepare you for quizzes and exams. You are allowed to work on the problem sets with other students, but you may not copy or plagiarize. Please write the names of those you worked with or received help from on the front page of your problem set. Remember that you must work alone on quizzes and exams, so it is in your best interest to be sure *you* understand the material.

In-Class Behavior: Please act respectfully in class of other students and myself. This includes turning your cell phone, etc. off during class time, using laptops only for note taking purposes, and arriving to class on time. You are expected to participate in all activities and discussions. I reserve the right to dismiss you from class if I feel you are acting disrespectfully or are disrupting the class.

Literature Projects: An understanding of the chemical literature is important for any sub-discipline of chemistry. The ability to search the literature effectively, analyze journal articles, evaluate suggested mechanisms and results, and draw conclusions based off of literature research will be addressed with these literature projects. More information regarding these projects will be distributed upon their assignment.

Quizzes: A total of nine 15-20 minute quizzes will be given throughout the term at the end of class. Quiz questions will be similar to problems in the text or come from the assigned reading or lecture material. The lowest quiz grade will be dropped. There will be no make-up quizzes.

Exams: There will be three in-class exams during the semester which will emphasize material introduced since the last exam. There will be no make-up exams without my prior consent. No cell phones or other electronic communication devices will be permitted during exams. Non-graphing calculators must be used for ALL quizzes and exams.

The final exam will be comprehensive and must be taken at the time scheduled by the University: **April 29th, 12:00-2:30 pm**. According to University policy, any student who does not take the final exam will fail the course.

If you feel a mistake has been made in the grading of your exam, you must write out what you wish to be re-graded and why (your reasoning is critical) on a separate sheet of paper within one week of the exam's return. Please note that the *entire* exam will be re-graded, and the new score (higher or lower) will be recorded.

Attendance: Attendance in lecture is highly recommended. Often material will be presented in lecture with a different emphasis than your textbook, and you will be responsible for learning this material even if you are absent. Regardless of attendance, all assignments are due at the start of class on the scheduled date. **No late assignments will be accepted.**

Academic Dishonesty: In accordance with the University's Honor Code, all work submitted for grading must be your own and be pledged as such by signing the complete honor pledge at the top of the assignment. Academic dishonesty in any shape or form will not be tolerated.

Suspected violations of the Honor Code will be addressed according to the policy established by the Honor Council. Please familiarize yourself with the University's policies of academic dishonesty: ignorance is not an excuse!

Disability Resources: The Office of Disability Resources has been designated by the University as the primary office to guide, counsel, and assist students with disabilities. You will need to request appropriate accommodations through this office as soon as possible, and then make an appointment with me to discuss your approved accommodation needs. Please bring your accommodation letter with you to the appointment. I will hold any information you share with me in the strictest confidence unless you give me permission otherwise.

Course Schedule: The tentative schedule that follows is how I see the course arranged. It is not set in stone; if there is material that is confusing to the class, we will spend more time on it. The quiz and exam dates will remain as scheduled unless there are extenuating circumstances (i.e. – weather cancellations). If all of the “scheduled” material has not been presented prior to the quiz/exam, the quiz/exam will include only what has been covered.

Last day to drop a course: January 31

Last day to withdraw from a course or change to pass/fail grading: March 20

<u>Date</u>	<u>Topic</u>	<u>Chapter</u>	<u>Assignment</u>
Jan. 13	Introduction, Gen. Chem/Orgo Review	2 & 3	
Jan. 15	Gen. Chem./Orgo Review	2 & 3	
Jan. 17	Molecular Orbital Theory	5	Q1
Jan. 22	Molecular Orbital Theory	5	
Jan. 24	Unit Cells, Close Packed Structures	7	
Jan. 27	Unit Cells, Close Packed Structures	7	Q2
Jan. 29	Unit Cells, Close Packed Structures	7	
Jan. 31	Ionic Solids, Lattice Energy	7	
Feb. 3	Ionic Solids, Lattice Energy	7	Q3
Feb. 5	Bonding in Metals, Semiconductors	7	
Feb. 7	EXAM 1	2, 3, 5, 7	EXAM
Feb. 10	Symmetry Operations	4	
Feb. 12	Symmetry, Point Groups	4	
Feb. 14	Character Tables, Group Theory	4	
Feb. 17	Lewis Acids/Bases, Hard/Soft	6	Q4
Feb. 19	d-block Metals	9	
Feb. 21	Coordination Compounds	9	
Feb. 24	Coordination Compounds	9	Q5
Feb. 26	Isomerism and Chirality	9	
Feb. 28	Crystal Field Theory, Jahn-Teller	10	
Mar. 2	Spring Break, NO CLASS	-	
Mar. 4	Spring Break, NO CLASS	-	
Mar. 6	Spring Break, NO CLASS	-	
Mar. 9	Crystal Field Theory, Jahn-Teller	10	
Mar. 11	Crystal Field Theory, Jahn-Teller	10	Q6
Mar. 13	MO with Coordination Compounds	10	
Mar. 16	MO with Coordination Compounds	10	
Mar. 18	MO with Coordination Compounds	10	
Mar. 20	EXAM 2	4, 6, 9, 10	EXAM
Mar. 23	Electronic Spectra, Tanabe-Sugano	11	
Mar. 25	Electronic Spectra, MLCT, LMCT	11	
Mar. 27	Common Ligands, Bonding	13	Q7
Mar. 30	Common Ligands, Bonding	13	
Apr. 1	Reactions: Ligand Substitution	12 & 14	
Apr. 3	Reactions: Ligand Substitution	12 & 14	
Apr. 6	Reactions: Redox, Inner & Outer Sphere	12 & 14	Q8
Apr. 8	Reactions: Redox, Inner & Outer Sphere	12 & 14	
Apr. 10	Reactions: Ox. Addition, Red. Elimination	12 & 14	
Apr. 13	Reactions: Metathesis	14	
Apr. 15	Reactions: Insertions	14	
Apr. 17	EXAM 3	11-14	EXAM
Apr. 20	Special Topics: Catalysis	14	
Apr. 22	Special Topics: Catalysis	14	Q9
Apr. 24	Special Topics: f-Block Metals	-	
Apr. 29	FINAL EXAM: 12:00 – 2:30 pm	Comprehensive	EXAM

Policy on Recording Class and Distribution of Course Materials

Classroom activities in this course may be recorded by students enrolled in the course for the personal, educational use of that student only, and may not be further copied, distributed, published, or otherwise used for any other purpose without the express written consent of the course instructor.

All students are advised that classroom activities may be taped by students for this purpose.

Distribution or sale of class recordings is prohibited without the written permission of the instructor and other students who are recorded.

Any class materials (any document or other item provided by or made available by the instructor to students enrolled, including but not limited to coursepacks, annotated lectures, handouts, laboratory experiments, quizzes, exams, review sheets or past exams) provided for this course (in the coursepack, during class or lab, or posted on Canvas) are for the personal, educational use of that student only, and may not be further copied, distributed, published, or otherwise used for any other purpose without the express written consent of the course instructor.

Distribution or sale of any and all class materials is prohibited without the written permission of the instructor.

Distribution without permission is a violation of copyright law. Students in violation of any part of this policy are subject to disciplinary action through the Office of Judicial Affairs and Community Standards.

This policy is consistent with UMW's Policy on Recording Class and Distribution of Course Materials.

Title IX Statement

University of Mary Washington faculty are committed to supporting students and upholding the University's *Policy on Sexual and Gender Based Harassment and Other Forms of Interpersonal Violence*. Under Title IX and this Policy, discrimination based upon sex or gender is prohibited. If you experience an incident of sex or gender based discrimination, we encourage you to report it. ***While you may talk to me, understand that as a "Responsible Employee" of the University, I MUST report to UMW's Title IX Coordinator what you share.*** If you wish to speak to someone confidentially, please contact the below confidential resources. They can connect you with support services and help you explore your options. You may also seek assistance from UMW's Title IX Coordinator. Please visit <http://diversity.umw.edu/title-ix/> to view UMW's policy and to find further information on support and resources.

Resources

Stephanie Lucas-Waverly
Title IX Coordinator
Office of Title IX
Fairfax House
540-654-5656
slucaswa@umw.edu

Crystal Rawls
Title IX Deputy for Students
UC 303
540-654-1801
crawls@umw.edu

Confidential Resources

On-Campus
Talley Center for Counselling Services
Lee Hall 106

Student Health Center
Lee Hall 112

Off-Campus
Empowerhouse
540-373-9373

RCASA
540-371-1666