THE OHIO STATE UNIVERSITY

CHEMISTRY 6310 – Coordination Chemistry Fall 2022 Lecture Syllabus

Monday, Wednesday, & Friday | 9:10 am – 10:05 am | Evans 2002 (1.5 credit hours)

Instructor:	Shiyu Zhang	**TA:**	Margaret Ball
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Office:	CBEC 282	**Office:**	CBEC 270A
Office Hours:	By appointment	**Office Hours:**	By appointment

Recommended Textbook:
Organotransition Metal Chemistry: From Bonding to Catalysis
John Hartwig; University, Science Books, Sausalito, CA, 2010
Two copies on reserve in 18th Ave. library
Inorganic Chemistry
Gary L. Miessler, Paul J. Fischer and Donald A. Tarr (5th edition)

Course Objective:

Coordination chemistry enables the efficient catalytic synthesis of organic molecules, energy storage, energy conversion, and other challenging chemical transformations. This course explores the connection between the structure of transition metal complexes and their reactivity patterns. The course introduces fundamental concepts of coordination chemistry, including coordination number, electron counting, and symmetry. We will use these concepts to help us understand the structure and bonding in typical transition metal complexes and predict the reactivity of metal-bound functional groups. Problem sets will engage students with the current literature as well as with online searches using SciFinder, Google Scholar, along with the Cambridge Structural Database (CSD) for X-ray structures. Feel free to contact Prof. Zhang for more information.

Course Grade: Your performance in the course will be evaluated based on the components below.

Assignment Group	%
Problem set	25%
Midterm (Sep 23rd, in-class)	25%
Final exam (Oct 10th-14th, take-home)	45%
Class participation	5%

Problem sets: Problem sets are typically assigned on a Friday and due to Margaret Ball (TA) 1-2 weeks later. Problem sets will be graded based on completion and a randomly selected question.

Lecture Topics:

Topic 1: Fundamental of metal-ligand interactions
Topic 2: Symmetry, crystal field theory, molecular orbital theory
Topic 3: Characteristic reactivity of functional groups

Course Schedule: This course will cover the following topics according to the schedule below/table below. Pace and content are subject to change:

CHEM 6310 Actual Lecture Schedule

Week	Monday	Wednesday	Friday
Aug 22-26	No Class	Introduction	Ligand classification Problem set #1
Aug 29-Sept 2	Electron counting	18-e rule	M-L multiple bonds
Sept 5-11	No Class	M-L multiple bonds	Redox-active ligand **Problem set #1 due** Problem set #2
Sept 12-16	Back-bonding	Crystal Field Theory	Crystal Field Theory
Sept 19-23	Symmetry	Mulliken symbol	**Midterm exam (in-class)**
Sept 26-30	Forst Circle	MO of BH_3	1σ, 1π-donors M-OR, M-NR_2
Oct 3-7	1σ, 1π-donors M=CR	1σ, 2π-donors M=O, M=N	1σ, 2π-donors Others **Problem set #2 due**
Oct 10-14	**Final exam (take-home)**		**Final exam due**

Students with Disabilities: Any student who feels s/he may need an accommodation based on the impact of a disability should contact me privately to discuss your specific needs. Please contact Prof. Zhang or the Office for Disability Services at 614-292-3307 in room 150 Pomerene Hall to coordinate reasonable accommodations for students with documented disabilities.

Academic Integrity: Academic integrity is essential to maintaining an environment that fosters excellence in teaching, research, and other educational and scholarly activities. The Ohio State University and the Committee on Academic Misconduct (COAM) expect that all students have read and understand the University's Code of Student Conduct, and that all students will complete all academic and scholarly assignments with fairness and honesty. If you have any questions about the University's policies regarding academic misconduct, please see the OSU COAM web page (http://oaa.osu.edu/coam.html).

Diversity Statement: The Department of Chemistry and Biochemistry promotes a welcoming and inclusive environment for all students and staff, regardless of race, gender, ethnicity, national origin, disability or sexual orientation. There is no tolerance for hateful speech or actions. All violations of this policy should be reported to the OSU Bias Assessment and Response Team (BART, studentaffairs.osu.edu/bias).