

# Inorganic Chemistry

Chemistry 1130

## Textbooks/Readings:

*Inorganic Chemistry* 5<sup>th</sup> Ed.  
Miessler, Fischer, and Tarr  
Pearson

## Primary Topics:

Introduction and Periodic Table  
Group Theory  
MO Theory  
Coordination Chemistry  
Organometallic Chemistry  
Catalysis

**Description:** Modern inorganic chemistry is an incredibly broad field. Formal training in inorganic chemistry can lead to employment across the chemical industry from pharmaceutical and materials science companies to companies that specialize in energy and sustainability. Chemists belonging to the sub-fields of bioinorganic chemistry, organometallic chemistry, supramolecular coordination chemistry, solid-state chemistry, synthetic nanoscience, and polymer chemistry often have received formal training in inorganic chemistry. This diversity is very exciting. We will focus on the basic theory and principles of inorganic chemistry that are used to describe the bonding, structure, reactivity, and physical properties of inorganic compounds and materials.

This course is divided into 3 Primary Units: **Group Theory and Molecular Orbital Theory (I)**, **Coordination Chemistry (II)**, and **Organometallic Chemistry and Catalysis (III)**. Each section of the course builds upon material from prior sections. I anticipate that each topic on the syllabus will be covered, but I reserve the right to eliminate certain topics and add others as needed.

**Canvas:** All course materials will be distributed over canvas.

**Coursework:** Students are required to complete problem sets and take exams. In class exercises and quizzes may be included.

# Topics

(can be subject to change)

## UNIT I

- introduction, review material, and bonding
- symmetry and group theory
- character tables and molecular motions
- MO theory

## UNIT II

- ligands, metals, and complexes
- bonding theories and ligand field effects
- ligand substitution reactions and mechanisms
- special topics

## UNIT III

- organometallics introduction and ligand survey
- reaction chemistry
- catalysis