

**Instructor**

Prof. Matt Liptak

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**Course Description**

Chemistry 231 will cover the fundamentals of inorganic chemistry within the frameworks of molecular symmetry and qualitative molecular orbital theory. All areas of inorganic structure, bonding, and reactivity will be covered, with an emphasis on transition metal complexes.

**Textbook**

Miessler, G.L. and Tarr, D.A. *Inorganic Chemistry*, 5<sup>th</sup> Ed., Prentice Hall, 2013

**Web Content**

Lecture notes, problem sets, and problem set answer keys will be available through Blackboard (bb.uvm.edu). These materials are available for all current, UVM-affiliated, students, but they may not be shared off-campus without permission of the instructor.

**Preparation**

Chapters 1 – 3 of Miessler and Tarr do an excellent job of reviewing the relevant background material for this course. Most of this material should have been covered in your *General Chemistry* course(s). I strongly encourage you to review this material early in the semester!

**Course Goals**

Upon completion of Chemistry 231, it is anticipated that you will:

1. Understand the relationship between molecular symmetry and bonding
2. Appreciate the use of qualitative molecular orbital theory as a *general* approach that can explain the chemical properties of inorganic and organic molecules
3. Recognize why transition metal complexes can have structures and properties unique from those of main group compounds
4. Be able to read, understand, and discuss a journal article from *Inorganic Chemistry*

**Academic Honesty**

As UVM students, you are expected to conduct yourself in accordance with the Code of Academic Integrity: <http://www.uvm.edu/policies/student/acadintegrity.pdf>

**Course Outline*****Unit #1 – Fundamentals of Inorganic Chemistry***

- I. Atomic Theory
- II. Molecular Symmetry
- III. Vibrational Spectroscopy
- IV. Molecular Orbital Theory

***Unit #2 – Structure and Bonding in Inorganic Systems***

- V. Lewis Acid-Base Chemistry
- VI. Solid State Chemistry
- VII. Coordination Chemistry
- VIII. Electronic Spectroscopy

***Unit #3 – Reactivity of Inorganic Complexes***

- IX. Substitution Reactions
- X. Electron Transfer Reactions
- XI. Organometallic Chemistry
- XII. Bioinorganic Chemistry

**Problem Sets**

Problem sets will be handed out approximately once a week throughout the course of the semester. These problem sets are intended to solidify your understanding of the major course concepts and challenge you to think critically using your new-found knowledge. Please follow a “no writing utensil” rule when discussing these assignments with your classmates. Problem sets are due at the **beginning** of class. Late Problem sets will not be accepted, but the two lowest scores will be dropped.

**Exams**

Three exams are scheduled for Chemistry 231, which will cover units 1 – 3 separately. In other words, the exams will not be cumulative. Exams #1 and #2 are scheduled for 7 PM on **September 26** and **October 29**. Exam #3 will use our final exam time: **December 13** at 10:30 AM.

**Grading**

Your grade will be based upon problem sets (25%) and three exams (25% each).