Instructor: Rory Waterman
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Lecture: MWF 14:20–15:10, Rowell 115

Office hours: Stop by my office as needed or feel free to make an appointment.

Course description: Molecular symmetry and group theory with an emphasis on application to molecular orbital theory and bonding, basic transition-metal chemistry, introductions to bioinorganic, solids state, main group, and related special topics.

Course objective: My goal is that students who complete this course should be able to understand a typical seminar presentation on the field of inorganic chemistry, broadly defined. To meet that goal, one should have a basic idea about the bonding across inorganic systems, the interplay of symmetry and physical properties, transition metals, main group elements, biological systems, and the solid state.

Learning outcomes: The course is broken into several parts (up to seven, if all goes well—see outline below). Each section will have a set of specific objectives associated with it. Those documents for a roadmap for the course. If you *understand* what the objectives are discussing and can *perform* the skills, then you are learning the course material. We will get to that point by using class time to review concepts and for you to do exercises and activities that reinforce those ideas and practice skills. That plan will work if you engage in course materials (the book, homework, or other provided materials) before or after a given class, as prescribed.

Course outline: I. Molecular symmetry and group theory
II. Applications of group theory
III. Main group chemistry
IV. Transition-metal chemistry
V. Organometallic chemistry
VI. Solid state chemistry
VII. Bioinorganic and electron transfer

Web content: Course materials are available at Blackboard (bb.uvm.edu).

Important dates: Wednesday, October 14, proposals draft 1 due
Friday, October 23, midterm exam (tentative)
Wednesday, December 9, last class
Friday, December 11 at 10:30 AM, final exam

No lectures: Monday 9/7 (Labor Day) and Wednesday – Friday 11/23–11/27 (Thanksgiving recess). I will be away for a few days in October and November. These classes will be rescheduled.

Text: *Inorganic Chemistry* by Miessler, Fischer, and Tarr (ISBN-13: 978-0-321-81105-9). Additional readings will be assigned, distributed in class or on line, or available in the library.

Grading: There will be one mid-term exam (25%), a final exam (30%), homework (25%), and a short (≤ 2 page) research proposal (20%).

Homework: Homework will be assigned approximately weekly and is due at the *beginning* of class on the date noted. Homework turned in within 24 hours of the due date will be given 50% credit and after 48 hours no credit. I will accept and correct homework after 48 hours: Practicing the concepts presented in class is more important than the grade on an individual assignment.

Academic Honesty: As students of the University of Vermont, you are expected to conduct yourself in this class in accordance with the Code of Academic Integrity (http://www.uvm.edu/~uvmppg/ppg/student/acadintegrity.pdf).

I encourage a high degree of collaboration on in-class work, and I recommend discussing your proposals with colleagues and faculty. However, the rule of thumb for this class is to do your own work for all graded assignments.

Miscellaneous: For those issues not explicitly noted in these documents, the instructor may set policies during the semester. However, no part of this course does or is meant to supersede the policies of the University of Vermont and the College of Arts and Sciences.

Learning Goals: The Department of Chemistry has a set of learning goals for all chemistry majors. The specific learning objectives of this class are meant to directly address some of these goals as part of the broader program.

1. Students will demonstrate general knowledge in chemistry and will be able to apply chemical and physical principles in the solution of qualitative and quantitative chemical problems.
2. Students will understand the interplay of observational data, hypotheses, and hypothesis-driven experimentation through application of the scientific method.
3. Students will become proficient in chemical laboratory techniques and be able to apply these to practical and current problems in research.
4. Students will be able to read and critically evaluate the chemical and scientific literature.
5. The students will learn to present scientific data clearly and effectively through both written and verbal communication.

Parts of CHEM 231 specifically addresses goals 1, 2, 4, and 5.

The instructor reserves the right to make changes, with notice