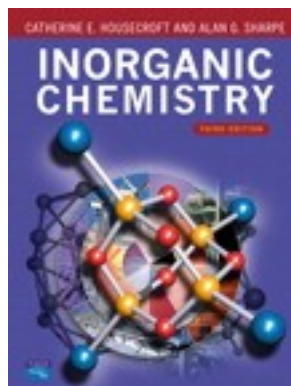


# ADVANCED INORGANIC CHEMISTRY FALL 2011

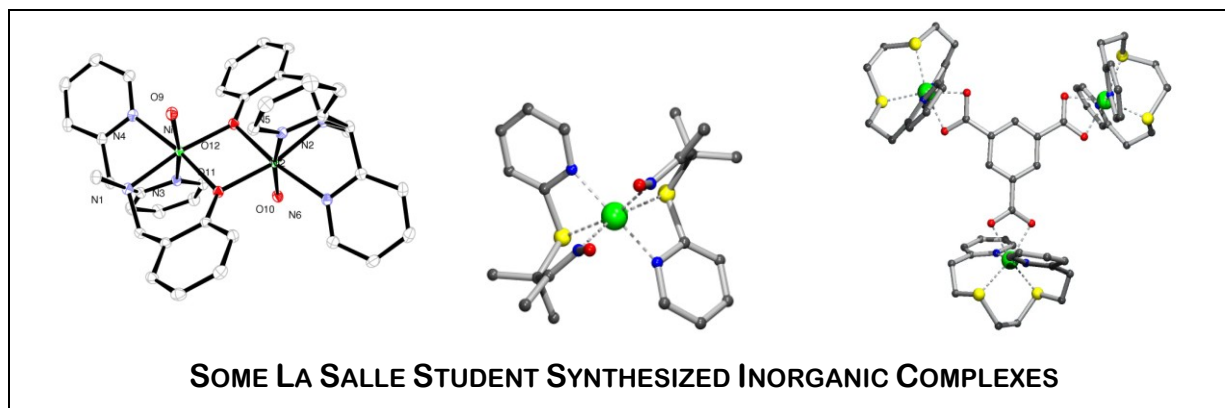
Dr. Michael J. Prushan  
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Office Hours: Mon. & Fri. 10-11 am.  
Mon. 2-4 pm., Fri 2-3 pm.  
and by appointment



**TEXT:** *Inorganic Chemistry*, 3<sup>rd</sup> Ed., Catherine E. Housecroft and Alan G. Sharpe, Pearson Prentice Hall 2008.

Course Handouts/Articles/Exercises/ Links are available on the course website. Follow the links from [www.lasalle.edu/~prushan](http://www.lasalle.edu/~prushan)



**INORGANIC CHEMISTRY:** If organic chemistry is defined as the chemistry of hydrocarbon compounds and their derivatives, inorganic chemistry can be described as the chemistry of “everything else”. This includes all the remaining elements in the periodic table, as well as carbon, which plays a major role in many inorganic compounds. Inorganic chemistry encompasses a large variety of topics ranging from solid-state chemistry, semiconductor

and superconductivity, industrial catalysts to the role of metals in biological systems. We will just skim the surface of inorganic chemistry in this course with introductions to the background necessary for deeper understanding of inorganic chemical topics.

### **COURSE OBJECTIVES:**

**The course will provide you with the necessary skills to understand the theoretical basis of structure and bonding as well as the physical and chemical properties of inorganic compounds. Through readings and presentations on the current literature, you will develop a knowledge base of current interests in inorganic chemistry. In the end, I hope that you will appreciate this very young, important and growing chemical discipline.**

### **TENTATIVE COURSE TOPICS OUTLINE:**

**Please Note: The *boxed* topics are considered review and will be expeditiously covered.**

1. Introduction to Inorganic Chemistry (Chapter 1, 1.1)
- 2. Review of Quantum Mechanics (Chapter 1 sections 1.1 to 1.10)**
- 3. Basic Concepts: molecules (Chapter 2) section 2.1 to 2.9**
- 4. Symmetry and Group Theory (Chapter 4 sections 4.1 to 4.8)**
5. Bonding in Polyatomic molecules (Chapter 5 sections 5.4 to 5.7)
6. Acid-Base and Donor-Acceptor Chemistry (Chapter 7 sections 7.1-7.4, 7.11, 7.13 )
7. d-block metal chemistry: general considerations (Chapter 20 sections 20.2-20.8). Coordination chemistry (Ch. 21, 21.1 to 21.10 and Ch. 26)
9. Bioinorganic chemistry (Chapter 29)
10. Organometallic Chemistry (Chapter 24 sections 24.1 to 24.15, 27)

**GRADING:** Homework problems will help you prepare from the exam, but exam questions will, in most cases, *be more involved than the homework*. It is therefore important that you UNDERSTAND what you are doing and that you do not just memorize various problem types.

## ACADEMIC INTEGRITY:

It is your responsibility to maintain a high degree of integrity in your work. Cheating of any kind will not be tolerated and will result in a failure in the course! The following are considered cheating: (a) Sharing of results and answers on lab reports, graded assignments, quizzes and exams; (b) Use of unauthorized materials during an exam; (c) Plagiarism.

Please see the attached La Salle University Academic Integrity Policy.

1. **Lecture:** The lecture portion of the course comprises 75% of the total grade and will be determined as follows:
  - a. Three exams (each worth 13.33 % for a total of 40 %)
  - b. Final cumulative exam (20 %)
  - c. A journal article presentation (*see below*, worth 5 %)
  - d. Quizzes or guided inquiry exercises each worth 10 %. The lowest quiz grade will be dropped. (11 quizzes for a total of 100 %)
  
2. **JOURNAL ARTICLE PRESENTATIONS** will be held in class weekly on Friday and should be 20 minutes in duration (15 min. presentation, 5 min. for questions). Attendance for all presentations is mandatory since students will also be required to assess the other presentations. Each presentation should begin with general background information on structure, bonding, synthesis, etc. and how it pertains to at least one of the recent example found in the chemistry literature. You should also address why the article advances chemistry, what warranted its publication and what is unique about the study performed. Reading from slides/overheads is not an acceptable seminar format. Be prepared to lecture to the class, slides should summarize the main points but not a script of the entire presentation. Powerpoint format is strongly recommended.
  
3. **LABORATORY:** The laboratory portion of the course is worth 25% of the total course grade. *Note: In order to receive a passing grade for*

*Advanced Inorganic Chemistry you **MUST** pass both the lecture and laboratory portions of the course!*

Your grade is based on your written lab reports as well as your performance in the laboratory (techniques).

**NOTE: Many of the concepts covered this semester involve 3D views of molecules and other forms of visualization. Your set of organic “tinker toys” and the SPARTAN computational software package and various website and links will be used extensively.**

The final grade for the course will be based on the grading scale below:

**A 90% B 80% C 70% D 60%**