

Fall 2014 – CHEM-651
Advanced Inorganic Chemistry I
Tues + Thurs 5:00 – 6:15 PM
BRL 206

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Office Hours by appointment

RECOMMENDED MATERIALS

Textbook: *Concepts and Models of Inorganic Chemistry* – 3rd Ed, Douglas, McDaniel & Alexander
(ISBN: 0471629782)

Website: http://www.udel.edu/chem/rosenthal/CHEM651/Chem651_2014.html

OPTIONAL MATERIALS – below is a list of several texts that will serve as appropriate background and reference.

Inorganic Chemistry – 4th Ed, Shriver and Atkins

Inorganic Chemistry – 4th Ed, Huheey and Keiter

Basic Inorganic Chemistry – 3rd Ed, Cotton and Wilkinson

Advanced Inorganic Chemistry -6th Ed, Cotton, Murillo and Bochmann

Physical Methods for Chemists – 2nd Ed, Drago

Orbital Interactions in Chemistry, Albright, Burdett and Whangbo

Physical Inorganic Chemistry, Kettle

COURSE INFORMATION

This course will focus on the molecular structures and properties of inorganic complexes and compounds. We will study concepts in bonding, trends in periodic properties, molecular symmetry and spectroscopy, inorganic reaction mechanisms, coordination chemistry, and electron transfer theory. We will introduce several broader topics including catalysis, organometallic chemistry and bioinorganic chemistry.

COURSEWORK AND GRADING

Assignments and work responsibilities are outlined as follows:

Problem Sets

Will be provided periodically on the course website. These problem sets will not be graded but will provide a means for students to practice and learn key principles and concepts germane to the class. *These problem sets should not be treated as optional!* Completing these assignments will be important to successfully navigating this course.

Midterm Examinations – 60%

Will be administered in class on 9/30 and 10/28. More details will be given as we approach these dates.

Literature Summary and Presentation – 10%

Each student will select one peer-reviewed article from either the journal *Science*, *Nature* or the *Proceedings of the National Academy of Science* (PNAS) that has been published since the beginning of 2013 and deals with an aspect of inorganic chemistry. All selections must be approved by October 16th. Students should provide a brief summary (approx. 1 paragraph) of their chosen paper and explain why the chosen study is of interest to them. Papers for review will be approved on a first come, first served basis and each student must review/present a distinct paper. On Saturday November 15th, we will gather for a class symposium in which each student will provide an approximately 10 minute presentation of their selected paper in order to teach the class about the subject they have reviewed. I will assign the order of the student presentations. Each presentation must be made using PowerPoint. More details regarding the final project will be distributed in the near future.

Final Examination – 30%

Time and place to be determined by registrar's office.

ACADEMIC INTEGRITY

Academic dishonesty will not be tolerated in this class. Such behavior is unethical, creates a negative atmosphere and inhibits learning. This later point is most critical as the material covered in this course is critical to your education and may be important to your future career path. It is expected that you will learn the material covered in this course because you will need it to be a functional chemist. If you have any questions about this issue, please review the University of Delaware's Academic Dishonesty Policy: <http://www.udel.edu/stuguide/14-15/code.html>.

For assigned problem sets, students are permitted to study in groups, but it is expected that each student will turn in their own independent work. For written assignments, cases of plagiarism will be taken very seriously. It is unethical to use previously published prose or ideas without proper acknowledgment and uncited quoting or paraphrasing is not appropriate. For the written project in this class, make sure to properly cite any sources you use. For more information, please see: <http://www.cas.udel.edu/associateinarts/georgetown/Pages/Writing-Center.aspx>

LEARNING GOALS – It is anticipated that upon completion of this course, students will be able to meet the following:

- Understand the basic concepts of atomic structure and periodicity
- Be capable of applying the concepts of chemical bonding
- Be able to connect electronic and molecular structure with chemical reactivity
- Be able to critically read, understand and evaluate the literature in inorganic chemistry
- Be prepared for future, more specialized courses in inorganic chemistry
- Be prepared for future inorganic cumulative examinations