

CHEM 457- INORGANIC CHEMISTRY SPRING 2011

Instructor: Dr. Svilen Bobev
Office: 304A Drake / Lab: 306 Drake
Phone: x 8720 / Lab: x 8848
e-mail: bobev@udel.edu

Class Time: Tuesday and Thursday 11:00 – 12:15 pm, Brown Lab 206
Office Hours: Anytime really, but official office hours will be Mon and Wed, 1 to 2 pm

Text: *Shriver and Atkins' Inorganic Chemistry* – 4th or 5th Ed is required (ISBN 1-4292-1820-7). The accompanying solution manual (ISBN 1-4292-5255-3) is highly recommended.
This text will probably be loosely followed; there might be some aspects in which I will not follow it at all. Any comprehensive inorganic textbook (advanced level) would be suitable for background reading – Cotton and Wilkinson (Advanced Inorganic Chemistry); Huheey (Inorganic Chemistry: Principles of Structure and Reactivity); etc. Recommended references for symmetry and its applications in chemistry - Carter (Molecular Symmetry and Group Theory) and Cotton (Chemical Applications of Group Theory). There are many others that you might find useful.

Exams: In class, tentatively scheduled
Exam no.1 February 24 (THR)
Exam no.2 April 7 (THR)
Exam no.3 May 3 (TUE)
Final May 19-25 (tba)

Grading: Each exam will be worth 25% of the grade. Quizzes and graded homework that might be assigned will be counted as part of the grade of the exam covering the same material.

Learning goals: <http://www.udel.edu/chem/goals.html>

PROTOCOL

- Class attendance is expected.
- Only in the case of 'excused absences' as defined by the University handbook, there will be an allowed 'make-up' exam or quiz. See me for your excuse, if possible, before missing an exam or as soon as possible afterwards. Unexcused absences will be assigned a grade of zero.
- During quizzes and exams, the University policy of no cheating and honorable work will be applied.
- Any questions about grading must be turned in to me in writing within a week of the date the exams (quizzes or graded homework) are returned.

PLANNED TOPICS (SUBJECT TO CHANGE)*

1. Atomic structure

- Bohr-model
- Schrödinger equation and wave-functions
- electronic configurations
- periodic properties

2. Molecular shape and symmetry

- VSEPR
- symmetry elements and symmetry operations
- point groups
- fundamentals of Group theory
- groups representations

3. Molecular structure

- Valence bond and Molecular Orbital theories
- simple diatomic, triatomic, and polyatomic molecules
- simple Hückel theory and π -aromaticity
- main-group cluster compounds

4. Transition metal complexes

- introduction to coordination compounds
- Crystal-field and Ligand-field theories
- vibrational and electronic spectra

5. Extended structures

- band theory and structure of solids
- plane groups and space groups
- crystal packing
- atomic and ionic radii
- overview of some basic structures
- basics of diffraction and crystallography

6. Overview of acids and bases

LAST DATE to add/drop without penalty: Monday, February 21

** This syllabus and course outline are subject to change at any time at my discretion*