Chem 2110

Instructor: Haitao Liu
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Meeting Times: TBD
Office Hours: TBD

Important Dates
First lecture: TBD
Jan 16th: No class, MLK day
Exam 1: TBD
Mar 5-12th: Spring break, No Class
Exam 2: TBD
April 3rd-6th: ACS Meeting, No Class
Final exam: TBD

Grading
• Exam 1 25%
• Exam 2 25%
• Final exam 25%
• In class quiz (unannoncued) 10%
• Homework 10%
• Mandatory in class lecture/review 5%

Homework
Selected problems will be graded in full; the rest of the assignments will be graded for completeness only. Working in groups is encouraged but each individual must hand in a separate set of answers.

Textbook
Required:
Recommended:

These textbooks are available in the chemistry library (2 hour reserve).

Course Policy
Exam/quiz/homework:
No make-up exam/quiz will be given. If a student must miss an exam/quiz because of severe illness or a family emergency, it is imperative to contact the instructor before the exam. In such cases, the missing exam/quiz will not be dropped from the final grade; the related quiz/exam will receive a higher weight in these cases. If the student misses an exam/quiz without a good reason, he/she will receive 0 for that exam/quiz. If the student misses an exam/quiz without a good reason, he/she will receive 0 for that exam/quiz. Missing 2 exams will result in an incomplete/fail grade. Homework submitted after deadline will receive partial credit and/or no credit.

Academic Integrity:
Students in this course will be expected to comply with the University of Pittsburgh’s Policy on Academic Integrity, which can be found at http://www.as.pitt.edu/faculty/policy/integrity.html. Any student suspected of violating this obligation for any reason during the semester will be required to participate in the procedural process, initiated at the instructor level, as outlined in the University Guidelines on Academic Integrity. This may include, but is not limited to, the confiscation of the examination of any individual suspected of violating University Policy. Furthermore, no student may bring any unauthorized materials to an exam, including dictionaries and programmable calculators.

Disabilities:
If you have a disability for which you are or may be requesting an accommodation, you are encouraged to contact both your instructor and Disability Resources Services (DRS), 140 William Pitt Union, (412)648-7890/(412)383-7355(TTY), as early as possible in the term. DRS will verify your disability and determine reasonable accommodations for this course.

Course Outline
I. Molecular symmetry & group theory
Basics of group theory: properties, subgroups, classes; symmetry: symmetry elements and operations, point groups, matrix representation of symmetry operation, representation of groups, character table. (Ch 2-4)

II. Molecular vibrations
Symmetry of normal modes, calculations of vibrational motion, selection rules for Raman and IR transitions. (Ch 6, 10)

III. Chemical bonds & MO theory
MO theory for simple molecules: pi bonding, AB₃ molecules; Walsh diagram; selection rules; bonding in solid state. (Ch 5, 7, 8)

IV. Transition metals and additional topics
Ligand field theory, Jahn-Teller effect, terms, selection rule for optical transitions in transition metal complex. (Ch 9 and additional reading materials)