Syllabus

Principles of Physical Chemistry (CHEM:4430:0100)  Fall 2015

Instructor: Prof. Alexei V. Tivanski
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Office Hours in E272 CB: M 2:30-4:00 PM; F 1:30-3:00 PM or by appointment
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Department of Chemistry Contact Information: Students in need of additional information may contact staff in the Chemistry Center (231 CB or phone: 335-1341) during normal business hours.

Lecture: MWF 11:30 AM -12:20 PM W55 CB
Course Materials: Course Web Page: http://courses.uiowa.edu/index.html
Textbooks: Physical Chemistry 10th Ed. by P. A. Atkins and J. de Paula; Student Solutions Manual for the textbook

Objectives: Physical chemistry is the study of the interaction of energy and matter. This course covers elementary thermodynamics, principles of kinetics and catalysis, and selected topics in quantum mechanics and spectroscopy with emphasis on applications of chemistry to areas of science including health and biosciences, materials sciences, environmental sciences, and related areas.

Discussion Sessions: A teaching assistant will conduct discussion sessions at the times listed below. This provides a good opportunity to have questions answered, work assigned problems, and to have concepts explained from a different perspective.

Discussion Sessions: TBA (will be determined 1st week of classes, one discussion per week, offered twice, 50 minutes long)
TA: Ellen Coddens, office hours: MW 9:30-10:30 AM, E208 CB

Exams: There will be three in-class exams of equal weight (100 points each). The dates of the exams will be announced during lectures. Note that the time limit for taking each in-class exam is 50 minutes. There will be one take-home final exam worth 150 points, that will be cumulative but with emphasis towards last quarter of the course material, focusing on quantum mechanics and spectroscopy. Make-up exams will be given only for excused absences or documented medical reasons. Please contact the instructor before the missed exam.

Homework: Four graded homework assignments (50 points each) will be given during the course of the semester. Homework may be discussed, but all written work must be performed independently.

Attendance: This course is demanding, we will cover a large amount of material this semester. Lectures are the most time-efficient approach to be able to keep up with the flow of the course. Attendance is strongly recommended.
Grading System: The +/- grading scale will be used. The homework, exams, and final exam will be weighted in the following manner:

- 4 homework assignments at 50 points each: 200 points (31%)
- 3 fifty minutes exams at 100 points each: 300 points (46%)
- 1 take-home final exam at 150 points: 150 points (23%)
- Total: 650 points (100%)

Use of Calculators: You will be permitted to use "simple" scientific calculators on exams. Palm-size, laptop, or other portable computing devices are not permitted during exams.

Course Contents: We will cover much of the material in the textbook covered in 4431/4432 (Pchem I/II). Problem solving is an important component of the learning process. Accordingly, you are expected to work (at a minimum) the problems that will be assigned from each chapter. These assigned problems will be graded and returned to you. The problems are representative of the type you will find on exams.

The chapter coverage follows:

**Ideal and Real Gasses**
- Ch 1 The properties of gasses

**The Laws of Thermodynamics**
- Ch 2 The First Law
- Ch 3 The Second Law

**Pure Substances and Equilibrium**
- Ch 4 Physical transformations of pure substances
- Ch 6 Chemical equilibrium

**The Rates of Chemical Reactions and Catalysis**
- Ch 21 The Rates of Chemical Reactions
- Ch 23 Catalysis

**Quantum Mechanics and Spectroscopy**
- Ch 7 Quantum Theory: Introduction and Principles
- Ch 8 Quantum Theory: Techniques and Applications
- Ch 9 Atomic Structure and Spectra
- Ch 10 Molecular Structure

For each semester hour credit in the course, students should expect to spend at least two hours per week preparing for class sessions (averaged over the entire semester).
Policies:

CLAS Policies and Procedures: Administrative Home: The College of Liberal Arts and Sciences is the administrative home of this course and governs matters such as the add/drop deadlines, the second-grade-only option, and other related issues. Different colleges may have different policies. Questions may be addressed to 120 Schaeffer Hall, or see the CLAS Academic Policies Handbook at http://clas.uiowa.edu/students/handbook.

Electronic Communication: University policy specifies that students are responsible for all official correspondences sent to their University of Iowa e-mail address (@uiowa.edu). Faculty and students should use this account for correspondences (Operations Manual, III.15.2,k.11).

Accommodations for Disabilities: A student seeking academic accommodations should first register with Student Disability Services and then meet privately with the course instructor to make particular arrangements. See www.uiowa.edu/~sds/ for more information.

Academic Honesty: All CLAS students or students taking classes offered by CLAS have, in essence, agreed to the College’s Code of Academic Honesty: “I pledge to do my own academic work and to excel to the best of my abilities, upholding the IOWA Challenge. I promise not to lie about my academic work, to cheat, or to steal the words or ideas of others; nor will I help fellow students to violate the Code of Academic Honesty.” Any student committing academic misconduct is reported to the College and placed on disciplinary probation or may be suspended or expelled (CLAS Academic Policies Handbook).

CLAS Final Examination Policies: The final examination schedule for each class is announced by the Registrar generally by the tenth day of classes. Final exams are offered only during the official final examination period. No exams of any kind are allowed during the last week of classes. All students should plan on being at the UI through the final examination period. Once the Registrar has announced the date, time, and location of each final exam, the complete schedule will be published on the Registrar’s web site and will be shared with instructors and students. It is the student’s responsibility to know the date, time, and place of a final exam.

Making a Suggestion or a Complaint: Students with a suggestion or complaint should first visit with the instructor (and the course supervisor), and then with the departmental DEO. Complaints must be made within six months of the incident (CLAS Academic Policies Handbook).

Understanding Sexual Harassment: Sexual harassment subverts the mission of the University and threatens the well-being of students, faculty, and staff. All members of the UI community have a responsibility to uphold this mission and to contribute to a safe environment that enhances learning. Incidents of sexual harassment should be reported immediately. See the UI Comprehensive Guide on Sexual Harassment for assistance, definitions, and the full University policy.

Reacting Safely to Severe Weather: In severe weather, class members should seek appropriate shelter immediately, leaving the classroom if necessary. The class will continue if possible when the event is over. For more information on Hawk Alert and the siren warning system, visit the Department of Public Safety website.