CHEM:4431 Physical Chemistry I
Fall 2015

Instructor: Christopher M. Cheatum
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Teaching Assistant: Grader:

Lecture: 8:30-9:20 Monday, Wednesday, and Friday in room W268 CB

Discussions: Tuesday 8:30-9:20 C139 PC or Wednesday 5:30-6:20 C139 PC

Office Hours: 9:30-11:00 Monday and Wednesday or by appointment


Website: http://icon.uiowa.edu

Course Objectives:
Physical chemistry is the study of the interaction of energy and matter. Topics covered typically include kinetic theory of gases, intermolecular forces, thermodynamics (i.e., the application of enthalpy, entropy, and free energy to chemical equilibrium, phase equilibria, and electrochemistry), and statistical mechanics. The course is intended primarily for chemistry, biochemistry, environmental science, and chemical and biochemical engineering majors. The course requires use of differential and integral calculus and skill in mathematical problem solving.

Course Content:
- Review of Mathematics
- Introduction of Thermodynamic Variables
- Equations of State
- 1st Law of Thermodynamics
- Heat Capacities
- Enthalpy
- Applications of the 1st Law
- 2nd Law of Thermodynamics
- Entropy
- Free Energies
- Thermodynamic Formulae
- Phase Transitions
- Mixtures
- Chemical Equilibrium
- Probability and Statistics
- Statistical Thermodynamics
Grading:

<table>
<thead>
<tr>
<th>Exam</th>
<th>Date</th>
<th>Time</th>
<th>Location</th>
<th>Weight</th>
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<tbody>
<tr>
<td>Exam 1</td>
<td>September 22, 2015</td>
<td>6:30-8:30 PM</td>
<td>(W128 CB)</td>
<td>15%</td>
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<tr>
<td>Exam 2</td>
<td>October 20, 2015</td>
<td>6:30-8:30 PM</td>
<td>(W128 CB)</td>
<td>15%</td>
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<tr>
<td>Exam 3</td>
<td>November 17, 2015</td>
<td>6:30-8:30 PM</td>
<td>(W128 CB)</td>
<td>15%</td>
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<tr>
<td>Problem Sets</td>
<td>Approximately 1 per week</td>
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<td>30%</td>
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<td>Final Exam</td>
<td>TBA</td>
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<td>25%</td>
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The distribution of grades will be consistent with the College of Liberal Arts and Sciences recommended distribution for an advances course:

22% A, 38% B, 37% C, 3% D, 1% F

Final grades will use +/- designations. A+ will be reserved for only the most exceptional cases.

Course Policies and Procedures:

Prerequisites and Required Background Material

The prerequisites for this course include calculus and elementary physics. I will make every effort to introduce important mathematical and physical concepts before we need them, but these elements are an essential part of physical chemistry. You will be expected to master and apply the necessary mathematical methods including multivariable calculus to be successful in this course.

Expected Student Workload

This is a 3 credit hour course, so under University policy you should expect to spend a minimum of six hours per week outside of class on activities related to this course.

Make-Up Exams

If you are ill or a personal emergency makes it impossible to be present for a scheduled exam, please contact me as soon as possible. If there is a conflict with an exam time that you are aware of in advance, it may be possible to take the exam early depending on the nature of the conflict. Permission to take a make-up exam will require an Explanatory Statement of Absence which is available at the Registration Center, 30 Calvin Hall.

Timely Completion of assignments

Problem sets turned in late will not be accepted for a grade. Unless otherwise noted, all problem sets are due at the beginning of class on the date noted on the assignment. Please turn in your solutions before the lecture begins.

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. Scroll down to k.11.)
Accommodations for Disabilities
A student seeking academic accommodations should first register with Student Disability Services and then meet with the course instructor privately in the instructor's office to make particular arrangements. See http://sds.studentlife.uiowa.edu/ 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 Registrar announces the final examination schedule for each class, generally by the fifth week 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 Public Safety web site.

*These CLAS policy and procedural statements have been summarized from the web pages http://www.clas.uiowa.edu/of the College of Liberal Arts and Sciences and The University of Iowa Operations Manual.

I want to emphasize again that if you have any questions or concerns, please communicate those to me so that I can help you. I am available and I will be happy to talk with you.