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.

- Mathematics review
- 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
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- Phase Transitions
- Mixtures
- Chemical Equilibrium
- Probability and Statistics
- Statistical Thermodynamics

Grading

Exam 1, September 21, 5:30-7:30 PM (W128 CB) 15%
Exam 2, October 19, 5:30-7:30 PM (W128 CB) 15%
Exam 3, November 16, 5:30-7:30 PM (CB 128) 15%
Problem Sets, approximately 1 per week 35%
Final Exam, December 15, 2:15-4:15 (room TBA) 20%

The distribution of grades will be consistent with the College of Liberal Arts and Sciences recommended distribution for an advanced course:
22% A, 38% B, 37% C, 3% D, 1% F.
Final grades will use + and - designations, with A+ reserved for 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 six hours per week outside of class on activities related to this course.

Calculators for Exams
Calculators (without graphing capability) will be provided for exams. These are the only calculators that will be allowed for use during exams.

Attendance
Attendance is mandatory. If you must miss class on an assignment due date or on an exam date, you must complete an Explanatory Statement of Absence form. These forms are available through the University Registrar. (http://registrar.uiowa.edu/)
You may not use cells phones while attending class.

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 you are aware of a conflict in advance, it may be possible to take the exam early. Permission to take a make-up exam will require an Explanatory Statement of Absence.
Timely Completion of Assignments
Problem sets turned in late will not be accepted for a grade without a completed Explanatory Statement of Absence. 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.

Expectations for the Completion of Assignments
You can discuss problem sets as a group. However, copying work is not discussion. The written work must be individually prepared. Work that is copied from another student is not acceptable. Please see the section in the Student Academic Handbook on Rights and Responsibilities for University policy on academic misconduct: http://www.clas.uiowa.edu/students/handbook/x/

When answering a question, one needs to know the audience for the answer. In preparing problem set solutions, direct your answers toward a classmate who is “somewhat behind” you in terms of studying. Err on the side of explaining a little too much, or showing a bit too much work. This will ensure that you receive optimal point credit for your solutions.

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 Student Academic 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 privately with the course instructor to make particular arrangements. See www.uiowa.edu/sds/ for more information.

Continued Next Page
Academic Fraud
Plagiarism and any other activities when students present work that is not their own are academic fraud. Academic fraud is a serious matter and is reported to the departmental DEO and to the Associate Dean for Undergraduate Programs and Curriculum. Instructors and DEOs decide on appropriate consequences at the departmental level while the Associate Dean enforces additional consequences at the collegiate level. See the CLASH Academic Fraud section of the Student Academic Handbook.

CLAS Final Examination Policies
Final exams may be offered only during finals week. No exams of any kind are allowed during the last week of classes. Students should not ask their instructor to reschedule a final exam since the College does not permit rescheduling of a final exam once the semester has begun. Questions should be addressed to the Associate Dean for Undergraduate Programs and Curriculum.

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