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

- 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

Exam 1, September 18, 6:30-8:30 PM (W128 CB) 15%
Exam 2, October 16, 6:30-8:30 PM (W128 CB) 15%
Exam 3, November 13, 6:30-8:30 PM (W128 CB) 15%
Problem Sets, approximately 1 per week 35%
Final Exam (date, time, and room TBA) 20%

A Word about the Date and Time of the Final Exam: The final examination date and time will be announced during the first half of the semester by the Registrar. We will announce the final examination date and time for this course at the course ICON site once it is known. Do not plan your end of the semester travel plans until the final exam schedule is made public.

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.

If you have questions about your grade status, please see an instructor during office hours or by appointment.

Final grades will use + and - designations, with A+ reserved for exceptional cases.
Portions of problem sets will be given as in-class assignments. See the below section on **Attendance** for further details.

The problem sets are an integral part of this course. If you do not turn in 5 or more problem sets, you will receive a failing grade (F) for the course. The only exception to this policy is if excused absences interfere with problem set due dates, and in such cases absences must be accounted for as detailed in the section on **Attendance**.

If you want any of your work (problem sets or exams) considered for regrading, you must bring it to our attention within a week of when the assignment/exam is returned. In addition, you must, on a separate sheet of paper, clearly state why you want your work considered for regrading. This explanation should include a re-working of the problem in detail, with your notes on where and why you think more points should be awarded. An exception to this rule is if you think your points are simply mis-added, in which case you still must bring your paper to an instructor within a week of the return date but you are not required to write up an explanation sheet.

Since course exams are held in the evening outside of regular class time, three lectures will be canceled during the semester to compensate. The specific dates of these canceled lectures will be announced in class and posted on ICON. Discussion sessions will also be canceled during exam weeks.

**Prerequisites and Required Background Material**

The prerequisites for this course include calculus and elementary physics. We will make every effort to introduce important mathematical and physical concepts before they are used in class, but these elements are an essential part of physical chemistry. You will be expected to master and apply the necessary mathematical methods 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.

**Attendance**

Attendance is expected. 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/](http://registrar.uiowa.edu/)) You may not use cells phones while attending class. Unexcused absences will result in zero credit for any missed in-class assignments. Excused absences will be given a chance to make up for any missed in-class work.
Make-Up Exams
If you are ill or a personal emergency makes it impossible to be present for a scheduled exam, please contact an instructor 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. On the days that assignments are due, a folder will be placed in the front of the lecture room for you to turn in your solutions. That folder will not be available after class begins, and late assignments may be penalized or refused for grading as the instructor sees fit. You are responsible for turning in your own work. If you are observed handing in an assignment but not staying for lecture, your work will not be graded unless the absence is excused as detailed above under Attendance. If you are observed handing in work for another student who is absent without an excuse, neither your paper or theirs will be graded.

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 towards a classmate who is “somewhat behind” you in terms of studying. In other words, your solutions to each problem set should be detailed enough to serve as a study aid to another student in class whose understanding of the materials is less proficient than your own. Err on the side of explaining a little too much, or showing a bit too much work. Also be sure that your solutions are easily readable and that you use the same symbols/notation as used in class and in the text. This will ensure that you receive optimal point credit for your solutions.

The active course instructor will personally grade a portion of each problem set and will review the quality of 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.

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.

CLAS Policies and Procedures continued next page
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.

We want to emphasize again that if you have any questions or concerns, please communicate those to us so that we can help you.