

**UK Department of Chemistry**  
**CHE 440G: Introductory Physical Chemistry, Fall 2013**  
**Course Description and Syllabus**

**Meeting Times:** MWF 9:00-9:50 a.m. and M 4:00-4:50 p.m.  
**Classroom:** CP-220  
**Instructor:** Beth S. Guiton, CP-148C, beth.guiton@uky.edu  
**Office Hours:** Mondays 10 a.m.-12 p.m. and Fridays 3-4 p.m.

**Course Description (as described by the office of the registrar):** An introduction to the laws of thermodynamics, the thermo-dynamic functions and their application to phase equilibria, chemical equilibria, solutions and electrochemistry. Chemical kinetics, including rate laws, reaction mechanisms, Arrhenius, collision, and activated complex theories, and catalysis. Quantum theory including an elementary introduction to spectroscopy. The fourth hour to be devoted to problem solving and problem-solving techniques.

**Prerequisites:** MA 114; PHY 213 or PHY 232; CHE 226 or MA 213

**Required Text:** *Physical Chemistry (Ninth Edition)*, Atkins & De Paula; Freeman (2010). (electronic or hard copy)

**Recommended Text:** *Student Solutions Manual to Accompany Physical Chemistry (Ninth Edition)*, Trapp, Cady, & Giunta; Freeman (2010). (electronic or hard copy)

**Companion Website:** <http://bcs.whfreeman.com/pchem9e> (contains study aids such as living graphs).

**Course Content:**

1. Properties of Gases (Atkins Ch 1)
2. The First Law of Thermodynamics (Atkins Ch 2)
3. The Second Law of Thermodynamics (Atkins Ch 3)
4. Phase Equilibria (Atkins Ch 4 & 5)
5. Chemical Equilibria (Atkins Ch 6)
6. Kinetics of Chemical Reactions (Atkins Ch 21)
7. Collision Theory and Transition State Theory (Atkins Ch 22 & 23)
8. Introduction to Quantum Theory (Atkins Ch 7)
9. Applications of Quantum Theory (Atkins Ch 8)
10. Atomic Structure and Spectra (Atkins Ch 9)
11. Molecular Spectroscopy (Atkins Ch 12 & 13)

**CHE 580 home page:** [http://www.chem.uky.edu/research/guiton/che440g\\_F13.php](http://www.chem.uky.edu/research/guiton/che440g_F13.php).

**Examinations:** Three examinations will be given: two midterms on October 9, 2013 (9-9:50 a.m.) and November 13, 2013 (9-9:50 a.m.), and a Final on December 17, 2013 (8-10 a.m.). Unless announced otherwise Midterm 1 will examine the material covered in Problem Sets 1-3, Midterm 2 will examine the material covered in Problem Sets 4-7, and the Final will be cumulative. Any student with a legitimate conflict with an exam time must inform me in writing, according to university regulations posted online (<http://www.uky.edu/Registrar/bulletinCurrent/toc2.htm>) by the Office of the Registrar.

**Problem Sets:** Problem sets will be assigned on Wednesdays and due the following Wednesday during class. (Some variation to this schedule will occur around the Thanksgiving Break, and announced in class.) Late assignments (up to one week) will receive half credit.

**Grading:**

Problem sets (best 10 of 11):	20%
Midterm 1:	25%
Midterm 2:	25%
Final examination:	30%

Grades will be assigned according to the following tentative scheme. Ranges may be lowered but will not be raised. A: 80-100%; B: 70-79%; C: 60-69%; D: 50-59% (undergraduates only).

**Graduate Student Grading:** A grade of D cannot be awarded to graduate students. Therefore, graduate students whose course averages are in the D range will receive E grades. Because the University requires that graduate and undergraduate students be treated differently, graduate students enrolled in this course will have an additional assignment. This assignment will be an essay of 2-3 pages summarizing the course material and relating it to the student's research interest. The essay must be handed to me by Friday December 13, 2013, and the essay grade will account for 25% of the homework grade (ie. 5% of total).

**Attendance:** Attendance will be taken with a sign in sheet during each class. Students attending a *minimum of 33* (out of 36) of the regular 9 a.m. classes (or with legitimate excused absences) will be awarded five extra credit points.

**Important Dates:**

Labor Day (no class):	Monday September 2
Midterm examination 1:	Wednesday October 9, 9:00 – 9:50 a.m.
Midterm examination 2:	Wednesday November 13, 9:00 – 9:50 a.m.
Thanksgiving break:	November 27-30
Classes canceled:	December 2 (4 p.m. class); December 4 (9 a.m. class)
Last problem set due:	December 6
Dead week:	December 9-13
Final examination:	Tuesday December 17, 8:00 – 10:00 a.m.

**Academic Integrity:** Homework should be viewed as original pieces of work to convey that you understand the rationale for solving the problems. You may confer with others on various techniques and ask for help, but it is up to you to illustrate your understanding. Verbatim copying of someone else's homework will not be tolerated. The minimum penalty for cheating on this course is a grade of E.

**Excused Absences:** An excused absence must be documented in writing. Excused absences from exams or quizzes should be given to me (the instructor) prior to the exam or quiz. A make-up exam or quiz will be given to the student within a few days of the missed exam or quiz. The University allows excused absences for the following:

- Illness of the student or serious illness of a member of the student's immediate family.
- The death of a member of the student's immediate family.
- Trips for members of student organizations sponsored by an academic unit, trips for university classes, and trips for participation in intercollegiate athletic events.
- Major religious holidays. This must be notified to the instructor no later than the last day for adding classes.
- Any other circumstance which the instructor finds reasonable cause for nonattendance.

**Course Evaluations:** Course evaluations are an important component of the Department's instructional program. Time will be allotted during class towards the end of the semester to complete the evaluation of the course and the instructor.

**Letter of Accommodation:** If you have a documented disability that requires academic accommodations, please see me as soon as possible during scheduled office hours. In order to receive accommodations in this course, you must provide me with a **Letter of Accommodation** from the Disability Resource Center (Room 2, Alumni Gym, 257-2754, [jkarnes@uky.edu](mailto:jkarnes@uky.edu)) for coordination of campus disability services available to students with disabilities.