Physical Chemistry–I (CHEM-3411-A)

Term: [ ]

Instructor

[ ]

Teaching assistant

[ ]

Textbooks


Miscellanea

Prerequisites: CHEM 1310 (or equivalent) is an enforced prerequisite. Mathematics through Calculus III, and calculus-based physics is very helpful. Students lacking a strong background in these subjects may want to consider the use of Thermodynamics and Kinetics for the Biological Sciences, by G. G. Hammes, (Wiley, ISBN 0-471-37491-1).

Course description: This is part of a two-semester sequence of courses in physical chemistry for students of science and engineering. This course covers chemical thermodynamics and kinetics. CHEM 3412 covers elementary quantum chemistry, atomic and molecular structure, and spectroscopy.

Instructor-to-students communications: Information that needs to be accessed quickly by all students will be sent by e-mail (through T-Square). Archival information such as material from the syllabus, homework and exam solutions, copies of transparencies used in
lectures, and supplementary material will be made available on the webpage dedicated to this course on T-Square (https://t-square.gatech.edu).

**Grading policy**

**Tests:** Three (3) tests will be given during the semester. The tentative dates of the tests are [insert dates]. The tests consist of a closed-book part that will be administered during a normal lecture period and a take-home (open-book) part. In-class and take-home parts count 2/3 and 1/3 of the test grade, respectively. The take-home part will be handed out at the closed-book test and turned in at the next lecture. Each test (closed-book + take-home) counts 1/6 of the final course grade (for a total of 1/2).

**Final Exam:** A three-hour closed-book final exam is scheduled for [insert date]. The final exam counts 1/3 of the course grade. Students who accumulate $\geq 90\%$ of the possible points on the tests (see above) and homework (see below), will receive an A grade in the course and will not be required to take the final exam.

Schedule, make-ups and drops: You must take the exam at the assigned lecture time. Photo-ID is required at each exam. The only valid reasons for missing an exam are: illness, official Tech business and out-of-town job interviews. Make-ups can only be given if advance notification is given or upon presentation of a doctor’s note. All make-up exams must be administered before the exams are returned to the class. Exams not made-up by this time, for any reason, will receive a score of zero.

**Homeworks:** A list of homeworks will be given regularly, weekly or bi-weekly. Homeworks will not be checked for correctness. Homeworks will be graded based on the student’s effort and work shown in solving the problems. Corrected assignments will be available during the office hours in the TA’s office. Homeworks count 1/6 of the course grade.

**Changes in Exam Grades:** Changes in test grades must be requested within one week of the class period that the graded test is returned to students. Grades become “carved in stone” after this one week period.

**Borderline Grades:** If a student is on the borderline between two grades, the decision on whether they should get the higher or lower grade will be based on (1) class attendance and participation and (2) performance on the final exam.

**Honor Code:** Students are expected to adhere to the Georgia Tech honor code (http://honor.gatech.edu). The work you submit on examinations must be entirely your work without reference to notes or other materials.

**Topics:**
- Classical Thermodynamics
– The properties of gases (Chap 1) plus kinetic model of gases – Chap 20 Sec 1
– The First Law (Chap 2)
– The Second Law (Chap 3)
– Physical transformations of pure substances (Chap 4)
– Simple mixtures (Chap 5)
– Chemical equilibrium (Chap 6)

• Statistical Thermodynamics
  – Concepts (Chapter 15)
  – Applications (Chapter 16)

• Chemical reactions (Chap 21)