Chemistry 484: Thermodynamics and Introduction to Statistical Thermodynamics.
Fall 2013

Course Syllabus

Time and Location: MWF 11:00 -11:50 a.m. in Venable G307
Professor: Max L. Berkowitz (maxb@unc.edu), Caudill 017, 962-1218
Office Hours: Tuesday 4:00 -5:00 and Thursday 11:00-12:00.

Textbook & Materials: Molecular Driving Forces By Ken Dill and Sarina Bromberg

Class website located at sakai.unc.edu

Prerequisite: Chem. 482.

Course Objective: Chem. 484 provides a survey of Thermodynamics (roughly 1/3 of the class) followed by an introduction to the classical and quantum Statistical Mechanics and their application to simple systems. Our objective is to get a clear understanding of basic ideas from Thermodynamics and Statistical Thermodynamics and their connection to Chemistry. With this in mind, the following chapters from the textbook will be discussed:

Part I. Thermodynamics.

1. Probability (Chapter 1).
2. Fundamentals of Thermodynamics (Chapters 3,5, 6,7;)
3. Free energies and Maxwell relations (Chapters 8,9;)
4. Boltzmann Distribution (Chapter 10;)

Part II. Statistical Thermodynamics: Applications.

1. Statistical Thermodynamics of Simple Gases and Solids (Chapters 11-12;)
2. Chemical Equilibria (Chapter 13)
3. Phase Equilibria (Chapter 14;)
4. Solutions and Solvation (Chapters 15-16)
5. Intermolecular Interactions (Chapter 24;)
6. Phase Transitions (Chapters 25-26;)
7. Adsorption and Binding (Chapters 27-28;).

Part I of the course (Section on Thermodynamics) can be taken separately for one hour credit.

Assigned Problems: Homework problems will not be taken up or graded, but it is essential that you do all the assigned ones and MORE.
**Exams:** Homework will be assigned but not graded. Two midterm exams will be given, one after finishing the discussion of Thermodynamics (approximately towards the end of September) and one towards the end of October.

**Final Exam:** There will be a comprehensive final exam.

**Grading:** Two mid-term exams will contribute 50% (25% each) towards the final grade and the final exam will also contribute 50% towards the final grade.

**Honor Code** (Additional information is available at http://honor.unc.edu)
*The University of North Carolina at Chapel Hill has had a student-administered honor system and judicial system for over 100 years. The system is the responsibility of students and is regulated and governed by them, but faculty share the responsibility. If you have questions about your responsibility under the honor code, please bring them to your instructor or consult with the office of the Dean of Students or the Instrument of Student Judicial Governance. This document, adopted by the Chancellor, the Faculty Council, and the Student Congress, contains all policies and procedures pertaining to the student honor system. Your full participation and observance of the honor code is expected. Plagiarism in the form of deliberate or reckless representation of another's words, thoughts, or ideas as one's own without attribution in connection with submission of academic work, whether graded or otherwise. All academic work in this course, including homework, quizzes, and exams, is to be your own work, unless otherwise specifically provided. It is your responsibility if you have any doubt to confirm whether or not collaboration is permitted.*