Chem 251: Physical Chemistry I

Total Credit: Three

Lecturer: Reinhard Schweitzer-Stenner; RSchweitzer-Stenner@drexel.edu, Disque Hall 218, phone: 215-895-2268

Textbook: Peter Atkins and Julio de Paula, Physical Chemistry, 7th edition. Laidler, Meiser, Sanctuary, Physical Chemistry, will be used occasionally i

Assignments: Home assignments will generally be provided on Wednesday in two-week intervals and shall be submitted by 12.00 a.m. on the Friday of the subsequent week. The assignments will be graded and count 50%.

Exams: The midterm exam will take place on Monday, February 7, 2005 (6th week). It will be a written, open book exam with an emphasis on problem solving. It will count for 25% of the final grade. Students are allowed to bring along with themselves all types of textbooks and class notes. The final exam will be multiple choice, open book and will also count 25%. The final grade will be calculated from your total score due to the following scheme: A: 100-85 P, B: 84.99-70 P, C: 69.99 P-55 P, D: 54.99-40 P, F; less than 40 P.

Complaints: Complaints about the scores of assignments and exams have to be brought to the attention of the lecturer within 48 hours after their return. All scores are considered final afterwards.

Drop out: According to Drexel University policy, students are allowed to drop courses until the last day of the sixth week.

Office hour: To comply with Drexel policy I officially offer office hours on Monday from 3.30 through 5.00 p.m. However, students are urged to see me in my office in the case of any problems and questions.

Principal philosophy: The course will emphasize conceptual thinking instead of memorizing. Students shall be prepared to employ concepts introduced in class to a variety of problems. Exams will frequently contain question, which check the understanding of the subject. It is assumed that the participating students have a solid working knowledge of pre-calculus and calculus. The lecturer will be ready to work on mathematical deficiencies, if this is necessary.

Behavior in class: Students are asked to appear on time for the class and to switch off their cellular phones. Cheating will lead to an F for the entire course. I am encouraging discussions, but not chattering while I am lecturing.
Syllabus

1. The properties of gas
   - The ideal gas
   - The real gas

2. The First Law
   - Concepts
   - Work and Heat
   - Thermochemistry
   - State functions
   - Consequences of the first law

3. The 2nd law
   - Spontaneous change
   - Helmholtz and Gibbs energies
   - Looking on thermodynamic potentials

4. Physical transformations
   - Phase diagrams
   - Phase transitions
   - Liquid surface

5. Simple mixtures
   - Thermodynamic descriptions
   - Solution properties
   - Activity of solutions

6. Phase diagrams in more detail
   - Phases and components
   - Two-component systems
   - Activity of solutions

7. Thermodynamic equilibrium
   - Reversible chemical reactions
   - Temperature dependence

We will deal with chapters 6 and 7 only, if sufficient time is available.