B.S. Junior Year – Spring Semester Lecture

CEM 484 Molecular Thermodynamics

Description: Statistical mechanics and its use in classical chemical thermodynamics. Applications of thermodynamics to chemical systems at equilibrium. Kinetic theory of gases.

Credit: 3 hours (3 hours lecture and 1 hour recitation per week)

Prerequisite: (CEM 142 or CEM 152 or CEM 182H or LB 172) and (MTH 235 or MTH 255H) and (PHY 184 or PHY 294H or LB 272); Recommended background: CEM 483 or CEM 392 SA: CEM 361. Not open to students with credit in CEM 383.

Lecture Topics:

1. Energy Levels of Atoms and Molecules
2. Properties of Gases
3. Boltzmann Factor, Ensembles, and the Partition Function
4. Partition Functions and Ideal Gases
5. Kinetic Theory of Gases
6. Classical Thermodynamics
7. Phase Equilibria
8. Liquid-Liquid Solutions
9. Solid-Liquid Solutions
10. Chemical Equilibrium

Notes:

The material on the topic list for CEM 484 is found in Chapters 16-27 of the textbook *Physical Chemistry: A Molecular Approach* by D. A. McQuarrie and J. D. Simon.

"Classical" Reaction Kinetics is now included in CEM 395. Analytical/Physical Laboratory.