JCL 207 (Aug) (3-0-0)
Physical Chemistry
Instructor: Balasubramanian Sundaram

Thermodynamics: Specific heats, enthalpy, entropy, free energies, laws, standard energies.
Reaction Equilibria, equilibrium constant, Le Chatelier principle.
Phase equilibrium, phase rule, phase diagrams, Clausius-Clapeyron equation, phase transitions, Landau theory, equations of state.

Solution equilibrium: Nonideal solution, activity, fugacity, partial quantities, Gibbs-Duhem equation.

Intermolecular forces: Van der Waals, hydrogen bonding, electrostatic interaction.
Statistical mechanics of gases and liquids: Theory of ensembles, entropy, partition function, configuration integral, thermodynamic limit, relationship to thermodynamics, molecular partition function.

Electrolytes: Debye-Huckel theory, ion association.

Thermodynamics of electrochemical systems: Galvanic cell, Daniel cell, standard electrode potential, electrical double layer.

Quantum theory for He atom, H_2^{+-}ion, H_2 molecules.

Reference Books:

1. Physical Chemistry by I.N. Levine
2. Physical Chemistry by Atkins
3. Modern Quantum Chemistry by Szabo and Ostlund
4. Statistical Mechanics by D.A. McQuarrie
5. Physical Chemistry by R.S. Berry, S.A. Rice and J. Ross
6. Quantum Chemistry by I.N. Levine