Physics 3400 - Thermodynamics - Fall 2009 Tuesdays and Thursdays 9-10:15 Lecture Room: C2045

Prerequisites

MATH 2000, PHYS 2053 and PHYS 2750 or 2056

Instructor

Dr. Stephanie Curnoe Office: Room C-3003, Phone 737-8888

Textbook

Required: An Introduction to Thermal Physics by Daniel V. Schroeder

Evaluation Scheme

Assignments (4-5) 20%Mid-term examination (October 22, 2009) 25%Final examination 55%

Supplemental examination will **not** be available.

We will cover chapters 1-5 of the textbook.

Topics	Text Sections
Review: thermal equilibrium, ideal gases and equipartition	1.1-1.3
Heat and work; compression work	1.4 - 1.5
Heat capacities, latent heat, enthalpy	1.6
Rates of processes, transport coefficients	1.7
The Second Law: two-state systems, Einstein model of a solid, interacting systems	2.1 - 2.3
The Second Law: large systems, ideal gases	2.4 - 2.5
The Second Law: interacting ideal gases, entropy	2.5-2.6
Interactions: temperature	3.1
Interactions: entropy and heat	3.2
Interactions: paramagnetism	3.3
Interactions: mechanical equilibrium & pressure; diffusive equilibrium & chemical potential	3.4-3.6
Engines and Refrigerators: heat engines	4.1
Engines and Refrigerators: refrigerators	4.2
Engines and Refrigerators: real heat engines	4.3
Engines and Refrigerators: real refrigerators	4.4
Free Energy and Chemical Thermodynamics: free energy as available work	5.1
Free Energy and Chemical Thermodynamics: free energy as a force toward equilibrium	5.2
Free Energy and Chemical Thermodynamics: phase transformations of pure substances	5.3
Free Energy and Chemical Thermodynamics: phase transformations of mixtures	5.4
Dilute Solutions; Chemical Equilibrium	5.5 - 5.6