PHGN341 Thermal Physics
Spring 2014
Syllabus

Instructor: Gerald Arnold, Meyer Hall 353, gbarnold@mines.edu

Office Hours: MWF 3:00-4:00, or by appointment.

Course Description: Foundations of Statistical Mechanics, entropy and temperature, derivation of the laws of thermodynamics from statistical mechanics, Boltzmann distribution and Helmholtz free energy, thermal radiation and Planck distribution, chemical potential and Gibbs distribution, ideal gases, Fermi and Bose gases, heat and work, Gibbs free energy and chemical reactions, phase transformations, binary mixtures, cryogenics semiconductor statistics, kinetic theory, propagation of heat and propagation of sound in gases.

Text: *Thermal Physics*, Charles Kittel and Herbert Kroemer, W.H. Freeman and Co. New York.

Other reference: *Fundamentals of Statistical and Thermal Physics*, Reif, McGraw-Hill New York.

Homework policy: Physics is learned by doing, so homework is the essential component to learning and mastering the concepts. Homework will be assigned and graded approximately weekly. Students are encouraged to work together and seek help from a variety of sources, but the final product must be your own work, reflecting your own understanding. You may turn in homework up to one class late for no more than 75% credit. No homework will be accepted after one class from the due date.

Grading:

1. Homework 25%
2. Two one-hour in-class exams 50%
3. Final Exam 25%