PHY 6524
STATISTICAL PHYSICS

Prof. B. Gerstman Spring 2008

Syllabus

Textbook: Fundamentals of Statistical and Thermal Physics, F. Reif, McGraw-Hill Book Company.
The course grade is based on equa1 parts of:
a)weekly homework sets that are graded b)two in-class exams c)final exam

Topics

I. Chapter 1, Introduction to statistical methods

II. Chapter 2, Statistical description of systems of particles

III. Chapter 3, Statistical thermodynamics

IV. Chapter 4, Macroscopic parameters and their measurements. This is a review chapter that should be read by students but will not be covered in class.

V. Chapter 5, Simple applications of macroscopic thermodynamics

VI. Exam I

VII. Chapter 6, Basic methods and results of statistical mechanics

VIII. Chapter 7, Simple applications of statistical mechanics

IX. Chapter 8, Equilibrium between phases or chemical species

X. Supercooling, Supersaturation, and cloud seeding (instructor's notes)

XI. Exam II

XII. Chapter 9, Quantum Statistics of ideal gases

XIII. White Dwarf Stars (instructors notes)

XIV. Chapter 10, Systems of interacting particles

XV. Chapter 11, Magnetism and superconductivity

XVI. Chapter 12, Elementary kinetic theory of transport processes

XVII. Chapter 13-14, Transport theory using relaxation time approximation, Boltzmann Equation, scattering cross-sections

XVIII.Irreversible processes and fluctuations, Non-Linear Dynamics and Chaos (instructor's notes)