

Physics 140B–Statistical Physics Syllabus

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Discussion session: Mondays, 5-5:50pm, 110 Solis Hall

Instruction: January 4-March 10

Midterm: February 17, 8:00-9:20am, 2113 WLH

Final: March 17, 8:00-10:59am, TBA

Office hours: by appointment

Required Text: D.V. Schroeder, An introduction to thermal physics, (Addison Wensley, 2000)

Recommended Text: A.H. Carter, Classical and statistical thermodynamics, (Prentice Hall, 2001)

Prerequisites: 140A.

Grading: There will be one midterm exam (50% of the total grade) and a final exam (50% of the total grade). Approximately one homework per week will be assigned and solutions will be provided. However, the homeworks will not be graded.

List of Topics: Bose-Einstein gases and condensation.
Fermi-Dirac gases.
Thermal behavior of magnetic materials.
Phase transitions, the Ginzburg-Landau model, critical exponents, renormalization group.
Transport phenomena, Boltzmann equation, microscopic reversibility and macroscopic irreversibility, Brownian motion, hydrodynamics.
Information theory and relation to thermodynamics.