Physics 5163

Statistical Mechanics

Spring 2010

Instructor. K. A. Milton

Lecture. MW 2:00–3:15 pm, NH 103

Office. NH 325—phone 325-3961 ext 36325 (extension sufficient on campus)

Office hours. MWF 12:30–1:30 pm, by appointment, or whenever you can catch me in my office.

Text. R. K. Pathria, *Statistical Mechanics, Second Edition*, Butterworth-Heinemann. My lecture notes will also be available, in installments, on the web.

Supplementary References. (On reserve in the Physics Library)

J. Williard Gibbs, *Elementary Principles in Statistical Mechanics*
Erwin Schrödinger, *Statistical Thermodynamics*
F. Reif, *Fundamentals of Statistical and Thermal Physics*
L. D. Landau and E. M. Lifshitz, *Statistical Physics*, 3rd edition, part 1
W. Pauli, *Statistical Mechanics*
Kerson Huang, *Statistical Mechanics*
Richard Tolman, *Principles of Statistical Mechanics*

Grading.

Homework	30%
Two midterm exams	20% each
Final exam	30%
TOTAL	100%

Examinations will be held as follows in NH 103:

1st midterm	Monday, February 15, 2:00 pm
2nd midterm	Monday, April 12, 2:00 pm
Final exam	Thursday, May 13, 4:30–6:30 pm

All exams will be of the closed-book variety. Make-up examinations will not be given, nor will late homework be accepted. The current regulations concerning dropping the course will be strictly followed.

Statistical Mechanics

Tentative Course Outline

This course will develop the foundations of statistical mechanics, and make application to both classical and quantum statistical systems. Topics to be covered include the following:

I. Fundamental Principles. Ensembles.

II. Thermodynamics.

III. Ideal Gases.

IV. Quantum Statistics. Fermi-Dirac and Bose-Einstein Distributions.

V. Solids.

VI. Fluctuations.

VII. Phase Transitions.

VIII. Introduction to Superfluids and Superconductors.

IX. Magnetism.

Policy on Religious Holidays: "It is the policy of the University to excuse absences of students that result from religious observances and to provide without penalty for the rescheduling of examinations and additional required classwork that may fall on religious holidays."

Reasonable Accommodation Policy: "Any student in this course who has a disability that may prevent him or her from fully demonstrating his or her abilities should contact me personally as soon as possible so we can discuss accommodations necessary to ensure full participation and facilitate your educational opportunities."