Physics 410 - 2003

Thermal and Statistical Physics

Monday, 5:30 - 6:20 p.m.; Wednesday, Friday, 4:10 - 5:00 p.m., 1415 BPS

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Office hours: 3:00 – 3:50 p.m. Tuesday, and by appointment

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Office hours: 3:00 – 4:00 p.m. Friday, and by appointment

Required Textbook: C. Kittel and H. Kroemer *Thermal Physics*, 2nd edition (Freeman, NY 1997).

Optional textbook: L.D. Landau and E.M. Lifshitz, *Statistical Physics*, 3rd edition, Part 1 (Butterworth-Heinemann, Oxford 1999).

Grading Scheme:

weekly problem sets	—	30%
two one-hour midterm exams	—	2×15%
a two hour final exam	—	40%.

The final grade will be calculated from the sum of the appropriately weighted percentage for each category, not from grades for each category. There will be extra credit problems on the exams.

Home assignments will be given on Wednesdays and are due before class a week from the day they are given; late assignments will not be accepted, generally. Assignments will also be posted on the web.

Exams: First midterm: February 17
Second midterm: March 31
Final exam: April 28, 5:45 to 7:45 p.m.

You will be allowed to bring one sheet of notebook paper to use on the exams. The exams will *not* be of the multiple-choice type.

Good luck!

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Tentative Schedule

Month	Day	Topic	Chapters
Jan	6 – 10	Introduction. Binary systems	1
Jan	13 – 24	Probability. Average values. Entropy.	2
		Laws of Thermodynamics	2
Jan	27 – 31	Canonical ensemble.	3
Feb	3 – 5	Free energy. Ideal gas.	3
Feb	7 – 14	Harmonic oscillator. Black body radiation.	4
Feb	17	**First Midterm Exam**	
Feb	19 – 24	The chemical potential. The grand canonical ensemble	5
Feb	27 – 28	Fermi-Dirac distribution.	6, 7
Mar	3 – 7	**Spring break**	
Mar	10	Ground state of Fermi gas.	6, 7
Mar	12 – 28	Bose-Einstein distribution. Classical ideal gas.	6, 7
Mar	31	**Second Midterm Exam**	
Apr	2– 11	Heat and work	8
Apr	14 – 21	Gibbs free energy. Chemical reactions and phase transformations.	9, 10
Apr	23 – 25	Kinetic theory.	14
April	28	**Final Exam**	