

**Physics 410**  
**Thermal and Statistical Physics**  
**Spring 2009**

**Lecture:** 4:10 - 5:00 pm M W F BPS 1415

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Home page: [www.pa.msu.edu/~mahanti/PHY410](http://www.pa.msu.edu/~mahanti/PHY410)

Office hours: M 1:00-2:00; W 11:00-12:00

**Grader:** Bik (NgocBich) Nguyen;

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Office Hours: F 1:00-2:00

**Course textbook:** "Thermal Physics" by Kittel and Kroemer, 2nd edition  
W.H. Freeman and Company

**On reserve:**

"Fundamentals of Statistical and Thermal Physics" by Frederick Reif  
McGraw-Hill Publishers

"Thermal Physics" by Daniel V. Schroeder, Addison Wesley Longman

# Homework, Quizzes, Examination, and Grading Procedure

## Homework

Homework (HW) and reading assignments will be given at the beginning of each week. All assigned HW problems will be posted on the Phy 410 home page ([www.pa.msu.edu/~mahanti/PHY410/](http://www.pa.msu.edu/~mahanti/PHY410/)). HW will be due at the beginning of the class on Monday of each week. In case the due date falls on a holiday, HW will be due the next class day. **No late HW will be accepted.**

## Quizzes

There will be roughly one in-class quiz per week. The quizzes will be open book and open notes.

## Examination

There will be two hourly examinations and one final exam. The two hourly exams will be given in the class. They are on **Feb 20** and **April 3**. The final examination will be on **May 4 from 5:45-7:45 pm**. The place will be announced later.

All the exams will be closed books and closed notes. You will be expected to remember the important equations and how to use them in solving problems.

## Grading Procedure

Your final grade will be determined as follows:

Homework	20%
Quizzes	10%
Each hourly exam	20%
Final Exam	30%

## Tentative Schedule

Week	Month	M	W	F	Ch	Subject
1	Jan	12	14	16	1	Multiplicity, States of a model binary system
2	Jan	ML K	21	23	1,2	Binary magnetic system, Ensembles, Entropy
3	Jan	26	28	30	2,3	Temperature, Laws of Thermodynamics, Boltzmann factor
4	Feb	2	4	6	3	Partition function, Helmholtz free energy, Pressure, Ideal gas
5	Feb	9	11	13	3,4	More examples, Thermal radiation, Planck distribution,
6	Feb	16	18	EX1	4	Stephan-Boltzmann law, Electrical noise
7	Feb	23	25	27	4,5	Phonons in solids, Einstein and Debye model
8	Mar	2	4	6	5	Chemical Potential, Gibbs factor and Gibbs sum
9	Mar	9	11	13		SPRING BREAK
10	Mar	16	18	20	6	Gibbs sum, FD and BE distribution function, Classical limit
11	Mar	23	25	27	6,7	Classical gas, Fermi gas
12	Mar/Apr	30	1	EX2	7	Fermi gas, Bose gas
13	Apr	6	8	10	7,8	Bose gas, Energy & Entropy transfer
14	Apr	13	15	17	8,9	Heat and Work, Irreversibility, Gibbs free energy
15	Apr	20	22	24	9,10	Equilibrium in reactions, Phase transitions
16	Apr/May	27	29	1	10	Phase transitions, Review

**FINAL EXAMINATION: May 4, 5:45-7:45 pm**