University of California at Berkeley
Department of Physics
Physics 112
Fall 2017, Section 1

Instructor: William Holzapfel
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510-642-5036
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Office Hours: Thursday 2-3 PM or by appointment

GSI:

Office Hours:

Lectures: TuTh 8:10-9:30; 50 Birge

Discussion: Section 101: Monday 10:10-11:00 PM; 20 Barrows
Section 102: Tuesday 5:10-6:00 PM; 20 Barrows

Required Texbook:
Charles Kittel and Herbert Kroemer, *Thermal Physics*, 2nd Edition (Freeman 1980)

Additional References:
1) Roger Bowley and Marianna Sanchez, *Introductory Statistical Mechanics*, 2nd Edition
2) Frederik Reif, *Fundamentals of Statistical and Thermal Physics* (McGraw Hill 1965)
3) Mark W. Zemansky and Richard H. Dittman*, Heat and Thermodynamics:*
An intermediate textbook, 7th Edition

A Copy of each of these books will be available at in the reference section of the Physics library.

Web Site:
https://bcourses.berkeley.edu/courses/1465266

Lectures: Lectures will be two times twice a week for 80 minutes. The Material in the lectures will loosely follow the presentation of Kittel and Kroemer. Students will be responsible for all material presented in the lectures.

Discussion: Discussion sections meet twice per week and will review the course material and present additional applications in a smaller informal group. Both discussion sections will be lead by the course GSI. Discussion sections begin the second week of class. You should attend the discussion section for which you are enrolled. Some of the scheduled discussion sections may be used to review for the midterm and final.

Homework: There will be weekly problem sets. The exam problems will be very similar to the homework; completing the homework is the best way to prepare for the exams.

Homework must be the original work of each student. Discussing the homework with your fellow students is allowed (encouraged), however you will find this most helpful after you have made a serious attempt at the problems yourself.

The homework assignments will be made available on the course website in PDF format. You will have approximately 10 days to complete each assignment and are encouraged to start early. The homework assignments are due by **5:00 PM** on the stated due date in the boxes in LeConte. Your homework should be neat and must contain the following information at the top:

1) The problem set #
2) Your name
3) Course Instructor and Section Number

The homework solutions will be posted on the course website in PDF format the following Monday after it is due. **Late Homework Will Not Be Accepted** without the permission of the professor. For each student, the lowest homework grade of the semester will be excluded from the average.

Examinations: There will be one 80 minute midterm and one 3-hour final. The midterm will be given during the usual lecture period. You are allowed to bring one 8.5 X 11" sheet of notes to the midterm, and three 8.5 X 11" sheets to the final. You will need to bring a pencil or pen and a calculator. Blue books will be provided. A makeup midterm will only be given in the case of well-documented exceptional circumstances. There will be no makeup exam for the final.

Grading: Your grade will be computed from the following weighted average:

Homework:	40%
Midterm:	25%
Final:	35%

A grade of incomplete will only be given when the student is unable to complete the required work due to exceptional circumstances their control (illness, accident, death in the family), and their work up until that point has been satisfactory.

Tentative Schedule:

Week Starting	Chapters (Kittel)	Homework Assigned	Homework Due 5 PM	Lecture Topics and Class Information
8/21	1			Probability and Statistics, States of a system **First Lecture Thursday 8/24**
8/28	1	#1 8/28		Spin systems
9/4	2	#2 9/4	#1 9/8	**No class Monday 9/4: Labor day**
9/11	2	#3 9/11	#2 9/15	Entropy and Temperature
9/18	3	#4 9/18	#3 9/22	Boltzmann Distribution and Helmholtz Free Energy
9/25	4	#5 9/25	#4 9/29	Thermal Radiation and Planck Distribution
10/2	4	#6 10/2	#5 10/6	Debeye Model for Solids
10/9	5,6	#7 10/9	#6 10/13	Gibbs Distribution and Chemical Potential; Ideal Gas
10/16	6	#8 10/16	#7 10/20	Ideal Gas **Midterm I: chapters 1-4 In class, Tuesday 10/17**
10/23	7	#9 10/23	#8 10/27	Fermi and Bose Gases
10/30	8	#10 11/30	#9 11/3	Heat, Work, Engines
11/6	9	#11 11/6	#10 11/10	Gibbs Free Energy, Chemical Reactions **No class Friday 11/10: Veteran's Day**
11/13	10	#12 11/13	#11 11/17	Phase Transitions
11/20	12			Cryogenics **No class Thursday 11/23: Thanksgiving**
11/27	14	#13 11/27	#12 12/1	Kinetic Theory
12/4			#13 12/8	Review **Last Day of class 12/8**
12/11				**Final Exam: Thursday 12/14 7-10PM**