

# PHYS 4142 (Statistical Mechanics) SYLLABUS

**Textbook:** *Charles Kittel/Herbert Kroemer, "Thermal Physics", second edition*

**Chapter 1-7, 9, 10**

1. States of a Model System
2. Entropy and Temperature
3. Boltzmann Distribution and Helmholtz Free Energy
4. Thermal Radiation and Planck Distribution
5. Chemical Potential and Gibbs Distribution
6. Ideal Gas
7. Fermi and Bose Gases
- ~~8. Heat and Work~~
9. Gibbs Free Energy and Chemical Reactions
10. Phase Transformation

**Place and Times:** L5, Howey Physics Building; T,Th 12:05-1:25 pm

**Instructor:** Zhigang Jiang, email: zhigang.jiang(at)physics.gatech.edu

**Instructor office hours:** Tuesday 4:00-6:00 pm in B18, Boggs Building

**TA:** Li Han

**TA office hours:** Thursday 2:00-5:00 pm in W503, Howey Physics Building

**Homework:** Homework will be assigned for each Chapter (**due the next week TA office hours after it is assigned**). The end-of-chapter problems listed on page *ix* will be assigned and graded. A fraction of the rest of problems will be graded at random. You can discuss homework problems with each other, but the solutions have to be executed and submitted individually. All students are expected to comply with the academic honor code.

**Grading:** Homework 40%; Quizzes (3) 30%; Final 30%

**Tentative schedule:**

1/7 L#1 (introduction)	1/9 L#2
1/14 L#3	1/16 L#4
1/21 L#5	1/23 L#6
1/28 L#7	1/30 L#8
2/4 Quiz #1	2/6 L#9 and quiz review
2/11 L#10	2/13 L#11
2/18 L#12	2/20 L#13
2/25 L#14	2/27 L#15
3/4 Quiz #2	3/6 Quiz/homework review (TA)
3/11 L#16	3/13 L#17
3/18 Spring Break	3/20 Spring Break
3/25 L#18	3/27 L#19
4/1 L#20	4/3 Quiz #3
4/8 Quiz/homework review (TA)	4/10 L#21
4/15 L#22	4/17 L#23
4/22 L#24	4/24 Final review
4/29 Final Exam (11:30am-2:20pm)	