Very Preliminary Class Schedule

Date	Chap	Topics
Jan 9	Preface	
11	1. 1-4	**From microscopic to macroscopic behavior**: approach to equilibrium
16	1. 5-8	Work, heating and the first law
18	1. 9-13	Models of matter (ideal gas, interatomic potentials, lattice models)
23	2. 1-11	**Thermodynamic concepts and processes**: Basics
25	2. 12,13,17,18,19	Second law, the fundamental relation
30	2. 14-16	Engines
Feb 1	2. 20-24	Applications and mathematics
6	3. 1-3	**Concepts of probability**: basics (skip all starred sections)
8	3. 4	Uncertainty
13	3. 5-7	Bernoulli processes, binomial distribution, central limit theorem
15	4. 1-2	**Statistical mechanics** basics
20	4. 3-4	Counting microstates
22	4. 5-7	Microcanonical and canonical formulations
27	4. 8,12,14.2	Applications, Grand canonical formulation, Fluctuations in canonical
Mar 1	5. 1-3	**Magnetic systems** noninteracting moments; thermodynamics
6	5. 4-5	Ising model, a one-dimensional chain of spins
8	5. 6-7	Two-dimensional Ising model; mean field theory
12-16		*Spring break*
20	6. 1-2	**Many particle systems** Ideal gas in semiclass limit; classical stat mech
22	6. 3-5	Occupation numbers for bosons and fermions; densities of state
27	6. 6-8	Eq. state ideal gas; grand potential; black-body radiat; ideal Fermi gas
29	6. 9-11	Heat capacity of solids; Bose-Einstein condensation, fluctuations
Apr 3	7. 3	**Chemical potential and phase equilibria** Phase equilibria
5	7. 4	van der Waals gas
10	7. 5	Chemical reactions
12	9.1	**Critical Phenomena:** Landau theory
17	9.2-3	Universality and scaling; A geometrical phase transition (percolation)
19	9.4-5	Renormalization group method for percolation, 1D Ising model
24	Ch 1-4	**Review:** Thermodynamics and statistical mechanics
26	Ch 5-7	Magnetism, many particle systems, phase equilibria
Apr 30	Exam	**Final Exam**, Monday, April 30, 13:00-15:00 or 16:00

Chapters are readings in: *Statistical and Thermal Physics: with Computer Applications*, Harvey Gould and Jan Tobochnik (Princeton, 2010). Text and computer applications are freely available at http://www.compadre.org/stp. Also at http://stp.clarku.edu.

Schedule subject to change. Don't forget to reload.   January 9, 2018