

COURSE OUTLINE

<u>TOPIC</u>	<u>READINGS</u>
1. Thermodynamic Quantities	RB Chapter 1
2. The Second Law of Thermodynamics	RB Chapter 2
3. Entropy and Efficiency	RB Chapter 3
4. Combinatorics and Probability	Boas §16.1–16.8
5. Quantum Microstates and Statistical Mechanics	RB Chapter 4
6. The Canonical Probability Distribution	RB Chapter 5
	RB Chapter 13, pp. 314—326
7. The Planck Distribution: photons and phonons	RB Chapter 6
8. The Chemical Potential	RB Chapter 7
9. The Free Energies	RB Chapter 10
10. Chemical Equilibrium	RB Chapter 11
11. Phase Equilibrium	RB Chapter 12
12. The Quantum Ideal Gas	RB Chapter 8
13. Fermions and Bosons at Low Temperature	RB Chapter 9
14. The Third Law of Thermodynamics	RB Chapter 14
15. Critical Phenomena	RB Chapter 15

The mathematical introduction to combinatorics and probability theory can be found in Chapter 16 of *Mathematical Methods in the Physical Sciences*, by Mary L. Boas. All other readings refer to the textbook by Ralph Baierlein (RB).