Textbook Suggestions
Physics 562: Statistical Mechanics
Spring 2006, James P. Sethna

(Draft) **Required Text**

J. P. Sethna, "Statistical Mechanics: Entropy, Order Parameters, and Complexity", to be published, Oxford University Press, this spring! Draft text to be copied by the Physics department and sold through the campus store. Also available on the Web, at http://www.physics.cornell.edu/sethna/StatMech/.

Optional, Old-fashioned Texts

(1) L. D. Landau and E. M. Lifshitz, "Statistical Physics". This was the text when I took the course. Wonderfully thoughtful, extremely terse, notation and vocabulary quite different from the standards in the West. It expresses Landau's view of the subject in the 1950's: not the modern view, but none of the other texts gets it either. Perhaps next year I'll assign it, despite its drawbacks.

(2) R. K. Pathria, "Statistical Mechanics", second edition. Occasionally misleading, often awkward, but covers the right material at roughly the right level for the course.

(3) Walter Greiner, Ludwig Neise, Horst Stöcker, "Thermodynamics and Statistical Mechanics", translated from German. A wonderful book, perhaps at a slightly lower level than the course (but the advanced parts of our course aren't in any of the texts). A good place to look up the answers to the problem sets.

(4) Michael Plischke and Birgir Bergersen, "Equilibrium Statistical Physics". This book rapidly gets into topics more appropriate for the second semester statistical physics course. The first sixty pages are good, and we'll touch on several of the more advanced topics.

(5) David Chandler, "Introduction to Modern Statistical Mechanics". It has a great classical treatment of the fluctuation dissipation theorem in Chapter 8. The quantum versions of the theorem are pretty obscure, and give answers which agree as $\hbar \to 0$

(5) Julia M. Yeomans, "Statistical Mechanics of Phase Transitions" A short book which summarizes the theory of critical phenomena and introduces the renormalization group.