

Physics 140A, Condensed Matter Physics

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I will be in my office or lab during my scheduled office hours each week. You are welcome to find me for brief questions at other times. E-mail is by far the best way to get in touch with me.

Text: Ashcroft and Mermin, Solid State Physics—a classic book, challenging for undergraduates, almost 30 years old.

If you find A&M tough going, try Charles Kittel, Introduction to Solid State Physics—another classic, currently in its 8th edition, but often annoyingly glib; older editions are better about this.

Prerequisites: Some general familiarity with quantum mechanics is necessary. Physics 9D is adequate, although Physics 115A is preferable. Helpful topics include Fourier analysis, the simple harmonic oscillator, and the quantum particle-in-a-box solution. I will also assume some knowledge of statistical mechanics.

Grading

Homework 20%

Problem sets are due in class. I will usually pass out answer sets one lecture after the problem set is due, and up to this time you may turn in your work late for half credit. The exception is that just before the midterm I may hand out an answer set on the day the problem set is due; if so I will not accept late homework for that problem set. (I will warn you in advance if I am going to do this.) The lowest problem set score will be dropped.

Midterm 30%

There will be one midterm, on February 14.

Final Exam 50%

The final will be on Wednesday, March 22 at 10:30 AM.

Topics

Physics 140A will cover Ashcroft and Mermin, Chapters 1-6, 8-9, 12, 28-29, in that order. Physics 140B will use the same text. (Note that the division of material between 140A and 140B may vary from year to year.)