Physics 375: Solid State Physics
Spring (12) 2003
Course Information

Instructor: Mark Taylor **Office:** Gerstacker 118 **Phone:** (330) 569-5241 (office)
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Office Hours: MWF 2:00-5:00, Tues. 10:00-1:00, Thurs. 1:00-6:00 ... or ... just stop by. (I'm usually in my office on Thurs. evenings and Sunday afternoons). Also, feel free to call me or send me email.

Meeting Times: MWF 9:30-10:50, Gerstacker 10

Textbook: Introductory Solid State Physics, 2nd edition, by H.P. Myers

Course WebPage: http://home.hiram.edu/www/physics/solid_state_physics.htm

Course Overview: This course will provide an introduction to the concepts and methods of solid state physics. The general area of condensed matter physics is quite broad and the range of applications is huge, especially in the areas of materials and electronics. Our studies will focus on the mechanical, thermal, electrical, and magnetic properties of crystalline solids. These topics require a number of different theoretical approaches the most important of which will be statistical and quantum mechanics. In the lab we will use X-ray scattering techniques to probe the structure of crystalline solids and carry out bulk electrical and thermal measurements to elucidate the electronic properties of semiconductors.

Class Preparation and Participation: It is very important that you read the relevant sections of the textbook *before each class session*. Having some time to think about the material beforehand will make the class meetings a lot more useful, so please come to class with questions and prepared for discussion. Since I don't want to do all the talking, each week at least two of you will be responsible for presenting a homework problem to the class. These presentations will be your chance to teach us. From my own experience I know that one of the best ways to learn something is to try to teach it to someone else.

Homework: As you well know by now, learning physics has a lot to do with "doing" physics and thus the weekly problem sets are a very important part of this course. I encourage you to talk with each other about these problem assignments and please come see me if you have questions. Your written solutions are due each Friday by 5 pm. Graded papers and solution sets will be returned within a week.

Exams: There will be a mid-term exam (see syllabus) and a comprehensive take-home final.

Laboratory: We will work out a schedule early in the term, although you are free to work in the lab at other times. You will do a total of 4 or 5 experiments through the term, spending up to two weeks on each experiment. (See the syllabus for the list of experiments). We will start the lab work the third week of classes. You will need to purchase a quadrille-ruled lab notebook, available in the bookstore, before the first lab session

Grading:

Class participation and presentations	10%
Lab	20%
Problems sets	35%
Mid-term Exam	15%
Final Exam	20%

Final grades are based on a fixed scale: ≥88%=A, ≥76%=B, ≥64%=C, ≥52%=D.
(For each letter grade, a "+" or "–" corresponds to the upper and lower 4% of the range.)