Physics 480

Introduction to Solid State Physics

Spring 2012

Logistics Lecture Room: **1100** (Live Oak)
Meeting Time: Tuesday & Thursday 5:00 – 6:15 pm

Instructor
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Prerequisites Quantum Mechanics or Modern Physics at 375 level

Textbook Introduction to Solid State Physics, Charles Kittel, Wiley, 8th Edition
Reference: Neil W. Ashcroft and N. David Mermin, Solid State Physics

Objectives This course has the general aim: to introduce the students to several topics in Solid State Physics ranging from: Periodic Structure and Symmetry of Crystals; Diffraction, Reciprocal Lattice; Chemical Bonding; Lattice Dynamics; Phonons ; Thermal Properties ; Free Electron Gas; Model of Metals; Bloch Theorem and Band Structure; Nearly Free Electron Approximation ; Tight Binding Method; Fermi Surface; Semiconductors Electrons; Holes; Impurities; Magnetism; and superconductivity. (Chapters 1 -12).

Homework I would like to emphasize strongly the issue of problem solving. Learning how to approach and solve problems is **the most basic and essential part** of this course, and it is a highly useful skill in itself. Solving problems is also important because the process brings understanding of the physics and helps perform well in the exams. **The assigned problems are by no means the only ones the students should attempt.** They are just a set representative of the type of problems the students should know how to solve. **Using the web site above includes practice homework and tests with on-line feedback/grading keyed to the text.**

Requirement The final letter grade for the course will be determined by the scores from **1) two in-class mid-term tests (25%, 25%)**; 2) the **final** exam (**30%**) and 3) the **homework (20%)**. The letter grades will be based on the overall performance of the class. All tests will be closed book and notebook. Students will be provided with a sheet which will contain ALL necessary equations and constants. The two midterms and final will be on:

- **1st midterm: Tuesday February 21, 2012**
- **2nd midterm: Thursday March 22, 2012**
- **Final: Finals week (May 14-19; check catalog)**

There will be weekly homework assignments; the solutions will be made available on my web site one week after the material is covered. The homework will be collected the following week and problems will be graded and returned the following week. The students are expected to work on the homework problems, as it is the surest way of learning the material. My web site is : http://www.csun.edu/~nkioussi/ . The numerical simulations for Solid State Physics can be found on http://www.physics.cornell.edu/sss/simulationlist.html