EEE 352, Properties of Electronic Materials

Time and Place of Lectures: 10:40-11:55 MWF, PS A118

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http://chaos1.la.asu.edu/~yclai/EEE352.html
Office Hours: 2:00-3:30pm MW, GWC610

Prerequisites
- CHM 114 (or 116); MAT 274; PHY 241. Basic knowledge of atomic structure, chemical bonding, and kinetic theory; Knowledge of classical mechanics, including Newton’s laws of motion; Knowledge of classical electromagnetics, especially electrostatics; Ability to manipulate complex numbers and solve ordinary differential equations with constant coefficients.

Text

Course Objective
- Introduction to the electronic properties of materials, applications of the basic principles of quantum mechanics, basic understanding of semiconductor physics and principles of solid-state devices.

Topics
1. Atomic structure of crystals
2. Classical waves, quantization, and wave-particle duality
3. Elementary quantum mechanics of electron
4. Chemical bonding and the periodic table
5. The free-electron theory of metals
6. Band theory of solids
7. Semiconductors: Doping, holes, statistics, transport, and excess carriers
8. Semiconductor device concepts
9. Dielectric properties of materials
10. Magnetic properties of materials
11. Optical properties of materials
12. Superconducting properties of materials

Student responsibilities
- Attending classes;
- Reading textbook;
- Completing and turning in homework assignments in time (about 10 times - 20%) - - *Late homeworks will not be accepted*.
- Two midterm exams (40% -20% each): in February and March, respectively - - *no make-up exams*.
- Final exam (40%) - - *no make-up exam*. 