



Physics 534 Solid State Physics

Course Description

An interplay of experiment and theory provides insight into both surface and interface physics, non-crystalline solids and alloys. Energy band structures and dispersion relationships expand the student's command of electrodynamics, crystallography, thermodynamics, optics, classical quantum mechanics, and statistical mechanics. This course relies heavily on quantum mechanics, thermodynamics and statistical physics, vector calculus, linear vector spaces, and matrices. This course carries four semester hours credit.

Course Prerequisites

- Graduate standing
- Introductory Quantum Mechanics (PHY 431)

Specific Course Requirements

Textbook Requirements

See current semester textbook list at <http://www.physics.sfasu.edu/docs/books.pdf>

Course Objectives

The objective of the course is to present the central principles and a more rigorous foundation of the quantum theory of solids to students who have already taken an introductory course in quantum mechanics.

Student Learning Outcomes

By the end of the course, a successful student will be able to:

- Associate the physical applications of quantum physics to the study of the solid state.
- Examine the behavior of solid state systems and, through the application of physical laws, make quantitative predictions of future behavior based upon the boundary conditions which exist.
- Develop the facility for problems associated with the solid state with respect to semiconductor physics.

Course Content

Advanced study of the solid state of matter. The application of quantum mechanics and thermodynamics to the study of mechanical waves and electron propagation in solids subject to boundary conditions that exist.

Course Assessment

The course assessment may use any or all of the following evaluation tools: exam scores, classroom participation, homework average, quizzes, and team projects.