

PHYS 4230: Thermal Physics

4 Credit Hours

Prerequisite: PHYS 3710

This course is a study of the principles of thermal equilibrium, physical statistics, irreversible processes, and the approach to equilibrium. Students will learn how to apply the statistical nature of thermodynamics using Boltzmann, Bose-Einstein, and Fermi-Dirac statistics.

PHYS 4240: Solid State Physics

3 Credit Hours

Prerequisite: PHYS 3710

In this course students will apply quantum mechanics to solid materials. Students will study the binding forces and bonding theory in solids along with the mechanical, thermal, and electrical properties of solids. If time permits, an application to solid-state devices will also be presented.

PHYS 4260: Quantum Mechanics II

3 Credit Hours

Prerequisite: PHYS 4210

This course is a continuation of Quantum Mechanics I, PHYS4210. Students will learn time-independent and time-dependent perturbation theory, the variational principle, and scattering theory. This course also introduces techniques of field quantization and their applications. Students will revisit perturbation theory in the context of interacting quantum fields. Students will be exposed to applications of quantum mechanics and field theory techniques that are used in many areas of modern physics (e.g., particle physics, quantum optics, and condensed matter physics).