PHY 532
Electromagnetic Waves

Course Description

This course examines the theory of electromagnetism, static, and time varying fields and propagation, reflection and refraction of electromagnetic waves. This course carries four semester hours of credit.

Course Prerequisites

- Graduate standing
- Introduction to Electricity and Magnetism (PHY 440)

Specific Course Requirements

Textbook Requirements

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

Course Objectives

The main purpose is to expose students to the language and major concepts of electromagnetic theory in forms that are useful for physics research as well as advanced coursework in condensed matter physics, quantum field theory, optical physics, and nuclear physics.

Student Learning Outcomes

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

- Describe electromagnetic behavior of conductors, insulators, capacitors, charge distributions and their associated electric field.
- Examine electrostatics, electrostatic energy, and the electrostatic field in dielectric media.
- Construct the electric potential for a wide variety of cases.
- Describe the magnetic properties of matter, magnetostatics, and electromagnetic induction.
- Manipulate Ohm's law, Ampere's Law, and Maxwell's equations
- Solve Poisson's Equation and Laplace's Equation.

Course Content

- Vector Analysis
- Electrostatics
- Special Techniques
- Electric Fields in Matter
- Magnetostatics
- Magnetic Fields in Matter
- Electrodynamics

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.