PHY 347
Mathematical Applications in Physics I

Course Description

This course covers the formulation and solution of physical problems using vector analysis, complex variables, Fourier series and transforms in addition to differential equations.

Course Prerequisites

- Electricity, Sound, and Light (PHY 132) or Technical Physics II (PHY 242)
- Calculus II (MTH 234)

Specific Course Requirements

Textbook Requirements

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

Course Objectives

The object of this course is to develop the mathematical tools used by physicists and engineers to describe fundamental principles in classical mechanics, electricity and magnetism, optics, thermodynamics and quantum mechanics.

Student Learning Outcomes

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

- Demonstrate the ability to utilize algebra and the calculus of complex numbers in physics applications.
- Demonstrate skill in using advanced mathematical techniques to solve physics problems in classical mechanics, electricity and magnetism, optics, thermodynamics and quantum mechanics.

Course Content

- Complex Numbers and Variables
- Fourier Series
- Fourier Transforms
- Ordinary Differential Equations
- Calculus of Variations
- Vectors
- Vector Calculus

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.