

Physics 4032- Mathematical Physics II

- Number of Credits: 3
- Prerequisites: Physics 4031
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Text

- Advanced Engineering Mathematics, 9th Edition, E. Kreyszig

Bibliography

Mathematics of Classical and Quantum Physics, Vol 1 & 2, F. Byron and R. Fuller.

Minimum Require Facilities

- Traditional lecture room

Instructional Strategy

- Lectures

Student Evaluation

- Standard A to F grading system.
- Five exams.

Description

This is the second part of the introductory course on Mathematical Physics for undergraduate Physics students. The main topics to be discussed are: Fourier analysis and The theory of Complex variables.

Objectives

After completing this course the student will have a good background to understand the mathematical formalism required in more advanced physics courses

Contents

- Fourier Series and transforms
 - Functions of arbitrary period
 - Even and odd functions
 - Complex Fourier series
 - Fourier integrals
- Complex analysis
 - Complex numbers
 - Analytic functions
 - Cauchy-Riemann equations
 - Exponential, trigonometric and hyperbolic functions
 - Logarithm
- Complex Integration
 - Line integrals
 - Cauchy's integral Theorem
 - Cauchy's integral formula
 - Derivative of analytic functions
- Power series
 - Convergence tests
 - Functions given by a power series
 - Taylor series
- Laurent series, Residue integrations
 - Laurent series
 - Singularities and zeros
 - Residue integration method
 - Residue integration of real integrals

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