

UNIVERSITY OF PUERTO RICO
Rio Piedras Campus-Department of Physics

Physics 4032- Methods of Mathematical Physics II

- Number of Credits: 3
- Prerequisites: Physics 4031
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Department of Physics
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- Office hours: Monday and Wednesday: 10.00-11.30

Text

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

Bibliography

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

Minimum Required Facilities

- Traditional lecture room

Instructional Strategy

- Lectures

Student Evaluation

- Standard A to F grading system.
- Four 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

Grading

- Grading is based on four exams, with each exam having a 25% weight. Problems in the exams will be based on examples done in the class, suggested problems, and exercises given throughout the course.
- Rights of Students with disabilities

UPR complies with all Federal and State Laws and regulations regarding discrimination, including the Americans with Disabilities Act 1990 (ADA) and the Commonwealth of Puerto Rico Law 51. Students receiving services through Rehabilitation Vocational must contact the professor at the beginning

of the semester in order to plan for a reasonable accommodation and any required support equipment according to the recommendations given by the Oficina de Asuntos para Personas con Impedimentos (OAPI) of the Dean of Students. Likewise, students with special need that require some type of accommodation must contact the professor at the beginning of the semester.

- La Universidad de Puerto Rico promueve los más altos estándares de integridad académica y científica. El artículo 6.2 del Reglamento General de Estudiantes de la UPR (Certificación Núm. 13, 2009-2010, de la Junta de Síndicos) establece que "la deshonestidad académica incluye, pero no se limita a: acciones fraudulentas, la obtención de notas o grados académicos valiéndose de falsas o fraudulentas simulaciones, copiar total o parcialmente la labor académica de otra persona, plagiar total o parcialmente el trabajo de otra persona, copiar total o parcialmente las respuestas de otra persona las preguntas de un examen, haciendo o consiguiendo que otro tome en su nombre cualquier prueba o examen oral o escrito, así como la ayuda o facilitación para que otra persona incurra en la referida conducta". Cualquiera de estas acciones estará sujeta a sanciones disciplinarias en conformidad con el procedimiento disciplinario establecido en el Reglamento General de Estudiantes de la UPR vigente.