

University of Puerto Rico

Río Piedras Campus, Department of Physics

METHODS OF MATHEMATICAL PHYSICS II (PHYS 4032)

Second Semester 2017-2018 -Tuesday and Thursday 11.00-12.40, C-311

Instructor: Marcelo R. Ubriaco

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Office hours: Monday and Wednesday: 10.00-11.30

Three hours/week; three credits

Pre-requisite: PHYS 4031 Co-requisite MATH3153 Cálculo III.

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.

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

Evaluation: Four exams

- 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

- Text
- Advanced Engineering Mathematics, Erwin Kreyszig, (Wiley) 9th Edition, ISBN-13:978-0-471-48885-9
- 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.

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