

SEMESTER II

Semester-II

19PHU601

Mathematics-II

4H – 4C

Instruction Hours / week: L: 4 T: 0 P: 0

Marks: Internal: 40

External: 60 Total: 100

End Semester Exam: 3 Hours

Course Objectives

This course enables the students to learn

- The Concept of Fourier analysis and solving boundary value problems.
- Techniques of Fourier and Laplace transform
- To solve differential equations.
- Numerical techniques of differentiation and integration.

Course Outcomes (COs)

On successful completion of this course, the students will be able to

- Appreciate the physical significance of Fourier series
- Understand the mathematical principles on transforms.
- Apply mathematical foundation to formulate and solve problems arising in physics
- Synthesize numerical techniques for practical problems

UNIT I

Fourier series: Definition – Finding Fourier coefficients for a given periodic function with period 2π – Odd and Even functions – Half Range Series

UNIT II

Fourier Transforms: Definition of Fourier Transform-Properties of Fourier Transform- Inverse Fourier transform-Convolution theorem-Finite Fourier Sine & Cosine Transform – Parseval's theorem.

UNIT III

Laplace Transforms: Definition of Laplace Transform - Properties of Laplace Transform, Inverse Laplace Transform. Application of Laplace Transform.

UNIT IV

Differential Equations: Types of Linear differential equations with constant coefficients – Simultaneous differential equations with constant coefficient.

UNIT V

Numerical methods: Solving simultaneous equations–Gauss Elimination method, Gauss Jordan method, Gauss Jacobi Method, Gauss – Seidel method. Numerical Integration – Trapezoidal Rule, Simpson's Rule.

SUGGESTED READINGS

1. Venkataraman. M. K.,1998. Engineering Mathematics, The National Publications & Co., Chennai. (Unit I, II)
2. Manickavasagam Pillai.T.K , and S. Narayanan, 2002.“Calculus”, Volume I, and Volume II S.V Printers & Publishers, Chennai (Unit IV, V)
3. Sastry .S.S,2009, Engineering mathematics, PHI learning Pvt. Ltd, New Delhi (Unit-III)