

EL- 603: Engineering Mathematics -II

Unit-1 (P-10)
Ordinary Differential Equations: First Order Ordinary Differential Equations, Basic Concepts, Modelling Separable Ordinary Differential Equations, Modelling, Exact Ordinary Differential Equations, Linear Ordinary Differential Equations .

Unit-2 (P-13)
Linear Differential Equations of Second Order :Homogeneous Linear Ordinary Differential Equations of second order, :Homogeneous Linear Ordinary Differential Equations with constant coefficients, Modelling: Free Oscillations, Euler-cauchy Equations, Existence and Uniqueness of solutions, Non-Homogeneous ODEs, Modeling: Forced Oscillations. Higher order homogeneous differential equations.

Unit-3 (P-12)
Series Solutions of Differential Equations and Special Functions: Power Series Method, Legendre Polynomials, Frobenius Method, Bessel's equations and Bessel's functions of first and second kind. Error functions and gamma function.

Unit-4 (P-13)
Fourier series :Functions of any period, even and odd Functions, half range expansions, Forced Oscillations, Complex Fourier Series Fourier Integral, Fourier Sine and Cosine Transforms. , Fourier Transforms ,Discrete and Fast Fourier Transforms.

Partial Differential Equations: Formation of Partial Differential Equation, Partial Differential Equation of First Order, Linear Equations of First Order, Non-linear Partial Differential Equations of First Order, Method of Separation of Variables, Classification of Partial Differential Equations of Second Order. Modeling a Vibrating string and the Wave Equation, Separation of Variables and Use of Fourier series.

Essential Texts

UNIT1

Chapter 1- E. Kreyszig, Advanced Engineering Mathematics, Wiley India (2008)

UNIT 2

Chapter 2,3- E. Kreyszig, Advanced Engineering Mathematics, Wiley India (2008)

UNIT 3

Chapters 4- E. Kreyszig, Advanced Engineering Mathematics, Wiley India (2008)

UNIT 4

Chapters 11,12- E. Kreyszig, Advanced Engineering Mathematics, Wiley India (2008)

Suggested Books:

- 1.B. V. Ramana, Higher Engineering Mathematics, Tata Mc-Graw Hill Publishing Company Limited (2007)
2. R. K. Jain, and S. R. K. Iyengar, Advanced Engineering Mathematics, Narosa Publishing House (2007)
3. C. R. Wylie and L. C. Barrett, Advanced Engineering Mathematics, Tata McGraw-Hill (2004)

Practicals Engineering Mathematics –2 (C/Matlab Based Practical)

1. Solve the linear differential equation of second order with variable coefficients.
2. Solve the linear differential equation of second order with constant coefficients.
3. Solve the higher order linear homogeneous differential equation.
4. Solve the higher order non- linear homogeneous differential equation.
5. Solve the linear partial differential equation of first order.
6. Solve the non-linear partial differential equation of first order.
7. Solve two dimensional wave equations.
8. Solve two dimensional heat equations.
9. Solve Bessel's function of first order.