

SEMESTER-III

MAT030104: Ordinary Differential Equations

Total Marks: 100 (External 60, Internal Assessment 40)

No. of Credits: 4

No. of Contact classes: 60

No. of Non-Contact classes: 0

Prerequisites: MAT040104: Classical Algebra

Course Outcomes:

- CO1 Identify 1st order ordinary differential equations like exact first order differential equations, Bernoulli equations and rules of finding integrating factors of exact equations.
- CO2 Recognize the second order differential equations like homogenous equations with constant coefficients equations, non-homogenous equations and Cauchy-Euler equations
- CO3 Solve first order and second order differential equations
- CO4 Calculate Wronskian and show its properties.
- CO5 Use the method of undetermined coefficients, variation of parameters.

UNIT 1: First Order Ordinary Differential Equations

Classification of differential equations; their origin and application. Solutions. First order exact differential equation. Integrating factors, Rules to find an integrating factor.

[1] Chapter 1(Sections 1.1and 1.2) Chapter 2 (Sections 2.1, 2.2 and 2.4)

Linear equations and Bernoulli equations. Basic theory of higher order linear differential equations. Solving differential equation by reducing its order. Wronskian and its properties.

[1] Chapter 2 (Section 2.3), Chapter 4 (Sections 4.1 and 4.6)

(No. of classes: 30, Marks: 30)

UNIT 2: Second Order Linear Differential Equations

Linear homogenous equations with constant coefficients. Linear non- homogenous equations; the method of undetermined coefficients, the method of Variation of Parameters. The Cauchy-Euler equations.

[1] Chapter 4 (Sections 4.2, 4.3, 4.4 and 4.5)

(No. of classes: 30, Marks: 30)

Text Book:

[1] Ross, Shepley L. (1984). Differential Equations (3rd Ed.), John Wiley & Sons, Inc.

Reference Book:

1. Kreyszig, Erwin (2011). Advanced Engineering Mathematics (10th ed.). John Wiley & Sons, Inc. Wiley India Edition 2015.