

SEMESTER-III**Ordinary Differential Equations****Total Marks: 100** (Theory 80, Internal Assessment 20)

No. of Credits: 4

Each unit carries equal credit

Base syllabus: MAT-HG-3016/MAT-RC-3016: Differential Equations (UG CBCS)**Course Level: 200-299****No. of Contact classes: 60****No. of Non-Contact classes: 0****Prerequisites: Class XII Mathematics****Course Objectives:** The main objective of this course is to introduce the students to the exciting world of differential equations and their solutions methods.**Course Learning Outcomes:** The course will enable the students to:

- Learn basics of 1st order ordinary differential equations and 2nd order linear differential equations
- Learn different techniques for solving the differential equations

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: 40)**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: 40)**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.