# SYLLABUS

## PAPER II-DIFFERENTIAL EQUATIONS-II

**Time : 3 Hours** **Max. Marks : 30**

**Note :**1. The syllabus has been split into two Units: Unit-I and Unit-II. Four questions will be set from each Unit

2. A student will be asked to attempt five questions selecting at least two questions from each Unit. Each question will carry 6 marks.

3. The teaching time shall be five periods (45 minutes each) per paper per week including tutorial.

4. If internal assessment is to be conducted in the form of written examinations, then there will be only one written examination per paper in a Semester.

### UNIT-I

Series solutions of differential equations– Power Series Method, Bessel and Legendre equations.

Bessel functions of First and Second kind. Legendre function. Generating Function. Recurrence relation and Orthogonality of Bessel and Legendre function.

Partial Differential Equations : Origin of first order Partial Differential Equations, Linear Equation of first order, Integral surfaces passing through a given curve, surfaces orthogonal to a given system of surfaces.

### UNIT-II

Inverse Laplace transforms– Linearity property, Shifting properties, Change of Scale Property. Inverse Laplace transforms of derivatives and integrals, Convolution theorem.

Applications of Laplace Transforms -Solution of differential equations with constant coefficients, Solution of differential equations with variable coefficients, Solution of simultaneous differential equations.

Laplace Transformation– Linearity of the Laplace transformation. Existence theorem for Laplace transformations, Shifting Theorems, Laplace transforms of derivatives and integrals, Multiplication of $t^{\pi}$, Division by $t$.