FMCC 102   Ordinary Differential Equation   (3-1-0)

Module-I : (14 Hours)

Basic Concepts of Differential Equation: Origin and Classification of Differential equation, Solution of Differential Equation, Kinds of solution, Initial and Boundary value problem, Existence and uniqueness of solution, Formation of Differential equation. **First Order First Degree Equation:** Variable separable, Homogenous Equation, Exact Differential equation, Integrating Factors, Linear equations, Equation reducible to linear form.

Equations of First order but of Higher Degree : Equations solvable for p, Equation solvable for y, Equation solvable for x,

Module-II : (14 Hours)

Linear Equations with Constant coefficient : Linear differential equation of nth order, Homogenous Linear equation with constant coefficient, Non- Homogenous Linear equation with constant coefficient, Operators and its use to solve linear differential equations with constant coefficient, Method of Variation of Parameter, Linear Differential Equation with variable coefficient: Method of reduction of order, method based on the removal of the first derivatives.

Existence and Uniqueness of solution: Picard's method of successive Approximation, Existence and uniqueness Theorem.

Module-III : (12 Hours)

Series Solution and special function: Power series, Radius of convergence of power series, Ordinary point, singular point and regular singular point(only definition), Series solution about an ordinary point, Legendre equation and Legendre polynomial, Orthogonality, Power series method about singular point, Bessel 's equation and Bessel's function, Orthogonality in Bessel function. Boundary value problem for Ordinary Differential Equation; Sturm –Liouville Problems.

Text Books:

1.   A Course on Ordinary and Partial Differential Equation by J. Sinha Roy, S Padhy, Kalyani Publisher.
Chapters:1(1.1-1.4),2(2.1-2.7),3(3.1-3.4)4(4.1-4.6),6(6.1,-
        6.3),7(7.1,7.2,7.3(7.3.1),7.4(7.4.1)),10 (10.1,10.2).

Reference Books:

1. Ordinary Differential Equation by P C Biswal (Pub- PHI)