15 MAMC102 ORDINARY DIFFERENTIAL EQUATION(3-0-0)

Module-I(8 hours)

Existence and uniqueness of Solution: Lipchitz condition, Gronwall inequality, Successive approximations, Picard's theorem, Second order linear equations, Separation and comparison theorems, Solutions in series, Legendre and Bessel functions

Module-II(10 hours)

Systems of differential equations: Existence and uniqueness of solution of systems, Systems of linear Differential equations, nth order equations of a first order system, Fundamental matrix, Non- homogeneous linear systems, linear systems with constant coefficients ,Eigen values and Eigen vectors

Module-III(12 hours)

Boundary value problems for Ordinary differential equations:, Green's functions, Construction of Green's functions, Non-homogenous boundary conditions. Self-Adjoint Eigenvalue Problems: Sturm-Liouville Systems, Eigen values and Eigen functions, expansion in Eigen functions. Stability: Stability of linear and non linear systems, Asymptotically stability, Critical points, Autonomous Systems, , Lyapunov stability.

Books Recommended:

Text book:

Tyn Myint-U: Ordinary Differential Equations, New York, Chapters:2,3(3.1-3.5),4(4.1-4.4)5(5.1-5.6),6(6.1-6.4),7(7.1-7.3),8(8.1-8.5)

Reference Books:

1. S.D.Deo, V. Lakshmikantham and V. Raghavendra: Text book of Ordinary differential equations, 2nd edition, TMH

2. Boyce,W., and R. Diprima. Elementary Differential Equations and Boundary Value Problems. New York;Wiley.