SUBJECT NO-MA20102, SUBJECT NAME- NUMERICAL SOLUTION OF ORDINARY AND PDE
LTP- 3-0-0,CRD- 3

SYLLABUS :-

Prerequisite: void Ordinary Differential Equations: Numerical solutions of IVP - Difference equations, stability, error and convergence analysis. Single step methods - Taylor series method, Euler method, Picardâs method of successive approximation, Runge Kutta Method. Multi step methods - Predictor-Corrector method, Euler PC method, Milne and Adams Moulton PC method. System of first order ODE, higher order IVPs. Numerical solutions of BVP - Linear BVP, finite difference methods, shooting methods, Newtonâs method for system of equations, stability, error and convergence analysis, non linear BVP, higher order BVP. Partial Differential Equations: Classification of PDEs, Finite difference approximations to partial derivatives, convergence and stability analysis. Explicit and Implicit schemes - Crank-Nicolson scheme, tri-diagonal system, Laplace equation using standard five point formula and diagonal five point formula. ADI scheme, hyperbolic equation, explicit scheme, method of characteristics. Solution of one dimensional heat conduction equation by Schmidt and Crank Nicolson methods. Solution of wave equation.