Syllabus

IVP for ODE: Solution of 1st order initial value problems by Euler's and modified Euler's method, Runge-Kutta method, predictor and corrector method, multi-step method, Adam-Bashforth, Adam-Moulton; stability analysis. Nonlinear system of equations: Fixed points for functions of several variables; Newton's and quasi-Newton's methods; steepsest descent technique. BVP for ODE: Shooting method for linear and nonlinear problems; finite difference method for linear and non-linear problems; Rayleigh-Ritz method. Numerical solution of PDE: Solution of elliptic, parabolic and hyperbolic PDE by finite difference method; preliminary idea about finite element methods.

Books Recommended:

- R L. Burden and J. D. Faires: Numerical analysis, prindle, Weber and Schmidt, Boston.
- G. D. Smith: Numerical solution of PDE, oxford University press
- M. K. Jain: Numerical solution of DE, Tata McGraw-Hill, India.