

15 MMCC 202 Numerical Analysis (3-0-0)

Module –I (10 Hours)

Solution of equations in one and two variables: Mullers method, for two variables; fixed pt iteration, Newton's method.

Interpolation; Hermite, cubic spline and piecewise interpolation, Natural cubic splines, B. Splines

Numerical differentiation; first order derivative, higher order derivative, Richardson Extrapolation.

Module -II :(10 Hours)

Numerical integration; Romberg integration, Gaussian Quadrature (2-pt,3-pt,4-pt), asymptotic error formula and their applications, Newton-Cotes rules..

Numerical solution to ODE; Taylor's series methods, Adaptive Runge-Kutta method, predictor-corrector method, convergence and stability theory for multistep methods,

Module -III: (10 Hours)

Matrix eigen value problem; power method, shifted power method, inverse power, RQ-method, error and stability results.

Numerical solution to partial differential equations; parabolic, elliptic, Hyperbolic equations using finite difference method.

Text Book ::

1. Numerical Analysis: Richard L. Burden.(chapter – 3,4,5,6,7)
2. An introduction to Numerical Analysis : by Kendall E. Atkinson,Wiley

Reference Books :

1. Advanced numerical methods ,L.V. Fusset
2. Numerical methods for Scientific and Engineering Computation , M.k.Jain,S.R.K.Iyengar.
3. Numerical methods for Engineers by Chapra & Canale , TMH