

FMCC704 ADVANCED NUMERICAL METHOD (3-1-0)

Module –I (14 Hours)

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

Interpolation; Hermite, cubic spline and piecewise interpolation.

Numerical differentiation; first order derivative, higher order derivative

Module -II :(14Hours)

Numerical integration; Romberg integration, Gaussian quadrature (2-pt, 3-pt, 4-pt), asymptotic error formula and their applications, automatic numerical integral, singular integrals.

Numerical solution to ODE; Multistep methods, midpoint method, trapezoidal method, a lower order predictor-corrector method, convergence and stability theory for multistep methods,

Module -III: (12 Hours)

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

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

Text Book ::

1. An Introduction to Numerical Analysis by Kendall E. Atkinson
2. Advanced numerical methods, L.V. Fusset.

Reference Books :

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