

NUMERICAL METHODS

Course No: **MM24001GE**

Semester: **M.A/M.Sc 1st Semester**

Continuous Assessment: **Marks 10, Theory Marks: 40** Time Duration: **1½ Hrs Course**

Total Credits: **02**

Total Marks: **50**

Course objectives: To provide the student with different techniques in order to find approximate numerical solutions to the problems where exact solutions are not available.

Course Outcomes: Students will be aware of and able to utilize numerical computation libraries and software tools that facilitate the implementation of complex numerical methods. They will be able to use interpolation methods to estimate values between known data points and understand approximation techniques like polynomial fitting.

UNIT -I

Solution of algebraic and transcendental and polynomial equations, bisection method, iteration method based on first degree equation, secant method, regula-falsi method, Newton-Raphson method, rate of convergence of Newton- Raphson method & secant method, system of linear algebraic equation, Gauss elimination method, Gauss Jordan method.

UNIT -II

Interpolation and approximation of finite difference operators, Newton's forward, backward interpolation, central difference interpolation, Lagrange's interpolation, Newton Divided Difference interpolation, Hermite interpolation, Spline interpolation, numerical differentiation and Integration.

Recommended Books:

1. M.K. Jain, Numerical Solution of Differential Equations, Wiley Eastern (1979), Second Edition.
2. R.L. Burden, and J. Douglas Faires, Numerical Analysis, P.W.S. Kent Publishing Company, Boston (1989), Fourth edition.
3. S.S. Sastry, Introductory methods of Numerical analysis, Prentice- Hall of India, New Delhi, Fifth Edition (1998).
4. M.K. Jain, S.R.K. Iyengar and R.K. Jain, Numerical methods for scientific and Engineering computation, Wiley Eastern (1993).