Programme: B.Sc. Degree Class: B.Sc.	Year: III	Semester: V

Subject: Mathematics

Course Code: **Course Title: Numerical Analysis**

Course Outcome	CO1: Understanding of approximate numbers and associated errors. CO2: Find the roots of algebraic and transcendental equations with desired accuracy. CO3: Applyvarious interpolation formulae to interpolate discretely defined functions. CO4: Determine the numerical solution of a given system of linear equations.

Unit No.	Course Content	Hours
I	Approximate numbers and significant digits, rounding off a number, type of errors viz inherent, truncation, absolute, relative and percentage errors, general error formula, error in addition, subtraction, multiplication, division and exponent of numbers, error in a series approximation.	12
II	Solution of algebraic and transcendental equations via Bisection, Iteration, Regula-Falsi, Newton-Raphson and Graeffe's root squaring methods.	12
III	Finite difference operators viz forward, backward, central, average, shift and divided difference operators, relation between finite difference operators, finite differences of a polynomial and transcendental functions, missing term technique, detection of errors by finite difference table.	12
IV	Newton's forward and backward interpolation formulae, Gauss's forward and backward difference interpolation formulae, Lagrange's interpolation and Newton's divided difference interpolation formulae for unevenly spaced points.	12
V	Numerical solution of a system of linear equations via matrix inversion, Gauss elimination, Gauss-Jordan, Cholesky and Croutmethods(direct methods only).	12

Suggested Readings:

1. F. B. Hildebrand, Introduction to Numerical Analysis, McGraw-Hill, N.Y.
2. S.S. Sastry, Introductory Methods of Numerical Analysis, Prentice Hall of India, Pvt. Ltd.
3. C. E. Froberg, Introduction to Numerical Analysis, Addison-Wesley.
4. M.K. Jain, S.R.K Iyengar and R.K.Jain, Numerical methods for Scientific and Engineering Computation, New Age International Pub.
5. R. V. Dukkipati, Applied Numerical methods, New Age International Pub.

Mapping of course outcomes with program outcomes & program specific outcomes

CO's No.	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	1	2	2	3	3	2	2	2	2
CO2	3	3	3	3	3	3	3	3	3
CO3	1	2	3	3	3	3	2	3	3
CO4	2	3	3	3	3	2	2	3	3