

# Computer Oriented Numerical Methods

## UNIT - I

Numerical system and error and types of error, Floating point Arithmetic, Source of error, Zeros of transcendental equations and polynomials (03), system of non linear equation (04), Solution of Algebraic and transcendental function - Bisection Method, Iteration Method, Method of false position, Newton Raphson method, Generalized Newton's method (04).

Lectures: 11

## UNIT - II

Solution of system of linear equation, Gaussian elimination method, Gauss Jordan method (04), Pivoting, Iterative methods of Jacobi and Gauss Seidel Methods (04), Matrix Inversion Method (02), Method of Factorization (02).

Lectures: 12

## UNIT - III

Interpolation, Errors in Polynomial Interpolation, Finite Differences, Forward differences, Backward Differences, Central Differences (02), Newton's formula for interpolation, Gauss's central difference formula (03), Stirling's Formula, Bessel's formula (03), Lagrange's Interpolation Formula, Error in Lagrange's Interpolation Formula (04).

Lectures: 12

## UNIT - IV

Numerical differentiation, Error in Numerical differentiation, Cubic Spline method (03), Numerical Integration: Trapezoidal rule, Simpson's 1/3 rule, Simpson's 3/8 rule, Romberg's Interpolation (04), Numerical solutions of ordinary differential equations: Solution by Taylor's series, Euler's Method, Runge-Kutta Methods (03).

Lectures: 10