

BSc (IT) Third Sem

Numerical and Statistical Analysis (LTP::4:0:2)

6 Credits

UNIT-1

Computer Arithmetic: Floating point representation of numbers, arithmetic operations with Normalization, consequences of normalized floating point representation of numbers, Errors in numbers.

Finding the roots of an equation: Iterative method: Introduction, Beginning an iterative method, Bisection method, Newton Raphson method, Regula Falsi method, Secant Method. Comparison of Iterative methods, Order of Convergence of Newton Raphson Method and Secant Method.

UNIT-2

Solving simultaneous linear equations: Introduction, Gauss Elimination method, pivoting, illconditioned equations, Gauss Jordan method, LU Decomposition method and Gauss-Seidel iterative method. Comparison of direct and iterative methods.

UNIT-3

Interpolation: Introduction, Lagrange interpolation, Difference Tables- Newton-Gregory Forward and Backward interpolation, Truncation error in interpolation.

Ordinary differential equations: Euler's method, Taylor series method, Range Kutta II and IV order methods. **Numerical Integration:** Simpson's 1/3 and 3/8 rule, Trapezoidal rule.

UNIT-4

Statistical methods: Introduction, definitions, classifications, frequency distribution, mean - arithmetic mean for grouped and ungrouped data, continuous frequency distribution (step deviation method), Geometric mean for grouped and ungrouped data.

Standard deviation - Meaning standard deviation for actual mean method, assumed mean method and step deviation method using discrete series and continuous series. **Coefficient of variation** - meaning and problems. **Median** - meaning, calculations of median for ungrouped, discrete series, continuous series. **Mode** - meaning calculations of mode for discrete series and continuous series.

Text Books:

1. Computer Oriented Numerical Methods by Rajaraman. V.
2. Fundamentals of Mathematical Statistics by Gupta and Kapoor (Sultan Chand).
3. Probability and Statistics for engineers and scientists by Ronald E. Walpole and Raymond H Mayers.
4. Mathematical Statistics by John Freund (Prentice Hall India Pvt. Ltd.)
5. Numerical Methods by Jain M.K., S.R.K. Iyengar and R.K. Jain
6. Numerical methods by K Krishnamurthy and Sen