



Paper Code : CON:302

Paper Name : Computer Oriented Numerical Methods

Teaching Hours (Per Week)		Examination Scheme		
TH. (hours)	Pr. (hours)	Internal	External	Total
		Th. (marks)	Th. (marks)	100 (marks)
4		30	70	

Lectures = 68 Hours
15 Hrs

UNIT 1

Computer Arithmetic

Number System, Conversion of Numbers, Representation of numbers, Floating point representation, Arithmetic operations with Normalized Floating point Numbers, consequences of normalization, pitfalls in computing.

Approximation and Errors

Significant digits, Types of errors, absolute and relative error.

UNIT 2

15 Hrs

Roots of Nonlinear Equations

Introduction, Methods of Solution, Iterative Methods, Bisection method, False position method, Netwon-Raphson method, Secant method, Rate of convergence of iterative methods.

UNIT 3

12 Hrs

Solution of simultaneous algebraic Equations

Gauss elimination method, Pivoting, ill-conditioned systems, Gauss-Seidel iterative method, Convergence of Iteration methods.

UNIT 4

12 Hrs

Polynomial Interpolation

Introduction, Polynomial Forms, Linear interpolation, Lagrange interpolation, Newton interpolation, Difference table, Forward and backward difference table.

UNIT 5

14 Hrs

Numerical Integration

Trapezoidal Rule, Simpson's 1/3 rule, Simpson's 3/8 rule.

Numerical Solution of Ordinary Differential Equations



Taylor Series Method, Euler's method, Second and Fourth order Runge-Kutta methods.

RECOMMENDED BOOK

1. Balagurusamy, E., Numerical Methods, Tata McGraw Hill, 1999.
2. Rajaraman V., Computer Oriented Numerical Methods, 3rd Edition, Prentice Hall India, New Delhi, 1998.

Reference:

1. Stoor, Bullrich, Computer Oriented Numericals Methods, Springer-Verlag, 1998.
2. Krishnamurthy, E.V., Sen, S.K., Computer Based Numerical Algorithms, East West Press, 1998.
3. Jain, M.K., Iyengar, S.R.K., Jain R.K., Numerical Methods : Problems and Solutions, New Age Int.(P) Ltd., New Delhi, 1997.
4. Jain, M.K., Iyengar, S.R.K., Jain R.J., Numerical Methods for Scientific and Engineering Competition, New Age Int. (P)Ltd., New Delhi, 1997.