Course Details and Evaluation Plan

Course Code	:	MA207
Course Title	:	Numerical Methods
L-T-P	:	3-0-0
Credits	:	3
Teaching Department	:	Mathematical and Computational Sciences (MACS)
Evaluation Plan	:	10 % weightage for Quiz-I
		25 % weightage for Mid-Semester Exam
		15 % weightage for Quiz-II
		50 % weightage for End-Semester Exam
Attendance	:	Must have at least 75 %
Course Instructor	:	Dr. P. Sam Johnson

Topics

Approximations and errors in computation, finite differences-divided differences, Newton-Gregory forward and backward interpolation formulae, Newtons divided difference interpolation, Lagrange's interpolation, inverse interpolation, curve fitting by the method of least squares, linear and quadratic curve fitting.

Numerical differentiation and numerical integration, trapezoidal and Simpsons rules, numerical double integration.

Numerical solution of initial value problems in ordinary differential equations by Taylors series method, modified Eulers method, Runge-Kutta methods of second and fourth orders, predictor-corrector method, Adams Bashforth and Adams Moultan methods, Milnes method.

Numerical solution of algebraic and transcendental equations, rate of convergence and condition of convergence, Methods of ordinary iteration, Regula-falsi and Newton-Raphson methods, Multiple roots of polynomial equations by generalized Newtons method, Solution of systems of linear equations by Newton-Raphson method.

Solution of systems of linear equations, Guass-Jacobi, Gauss-Seidel and relaxation methods, eigenvalues and eigenvectors, finding the largest eigen value by power method.

Solving difference equations with constant coefficients, system of difference equations and solution.

References

1. **Richard L. Burden and J. Douglas Faires**, *Numerical Analysis - Theory and Applications*, Cengage Learning, Singapore.
2. **Kendall E. Atkinson**, *An Introduction to Numerical Analysis*, Wiley India.
3. **David Kincaid and Ward Cheney**, *Numerical Analysis - Mathematics of Scientific Computing*, American Mathematical Society, Providence, Rhode Island.
4. **S.S. Sastry**, *Introductory Methods of Numerical Analysis*, Fourth Edition, Prentice-Hall, India.

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