Subject Code: 2CS2010101	Subject Title: COMPUTER ORIENTED NUMERICAL & STATISTICAL METHODS
Pre-requisite	**Basic Knowledge of Mathematics**

Course Objective:

The objective of this course is to enable students to obtain an intuitive and working understanding of numerical and statistical methods for the basic problems and gain experience in the solving of numerical and statistical problems using a computer.

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)				
				Theory		Practical		
Lecture	**Tutorial**	**Practical**	**Credit**	**University Assessment**	**Continuous Assessment**	**University Assessment**	**Continuous Assessment**	**Total**
4	1	-	5	60	40	-	-	100

Subject Contents			
Sr. No	**Topic**	**Total Hours**	**Weight (%)**
1	**Error, Solution of Algebraic & Transcendental Equations:** Motivation, Errors: truncation error rounded off error, absolute error, relative error and percentage error, Bisection, False position, Secant, Newton-Raphson iteration and Rate of convergence of methods without proof. **System of Linear Algebraic Equations:** Solution of simultaneous linear equations by using Gauss elimination, Gauss-Jordan, Gauss-Seidal & Gauss-Jacobi iteration method.	12	25
2	**Interpolation:** Newton's Forward Difference Interpolation, Newton's Backward Difference Interpolation, Lagrange's Interpolation and its inverse interpolation, Newton's Divided Difference Interpolation. **Numerical Integration:** Numerical integration by Newton-Cote's formula. Trapezoidal rule, Simpson's 1/3rd & 3/8th rules. **Numerical Solution of first order ordinary differential equations:** Taylor series method, Picard's method, Euler's method, Euler's modified method, Runge-Kutta method of 2nd & 4th order.	12	25
3	**Descriptive Statistics:** Introduction to Statistics, Frequency distribution, Charts, Mean, Median, Mode, Percentiles, Variance, Standard Deviation, Coefficient of Variation, correlation coefficient. **Curve Fitting:** Least Squares Approximation, Linear Least Square Approximation, Nonlinear least square approximation of higher order polynomial & Principle of Least squares, Sampling and large sample tests.	12	25
4	**Basic Concepts of Probability:** Definition of probability, Application of permutations and combination to probability problems, Conditional probability, Baye's theorem, Binomial, Poisson and normal probability distributions	12	25

Course Outcome:

At the end of this course, the student would be able

1. To have a clear perception of the power of statistical and numerical techniques& ideas
2. To demonstrate the applications of these techniques to problems drawn from industry, management and other IT fields.

List of References:

1. Computer Oriented Numerical Methods, R. S. Salaria, Khanna Publisher
2. Numerical Methods in Science & Engineering Prog.- By Dr. B. S. Grawal, Khanna Pub., New Delhi.
3. Numerical Methods for engineers. S C Chapra and R P Canale. McGrow Hill International Edition.
4. Numerical Methods for Scientific & Engineering Computation, M. K. Jain, S.R.K
5. Statistical methods, Gupta S.P., S. Chand & Sons Pub, Delhi.
6. Fundamentals of Statistics, Gupta S.S, Himalaya Publications House.
7. Computer Oriented Numerical Methods by Dr. N Datta, Vikas Publication