

SWARNANDHRA
COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous)

SEETHARAMAPURAM, NARSAPUR-534280 W.G.DT. AP

DEPARTMENT OF BACHELOR OF COMPUTER APPLICATIONS(Honours)

TEACHING PLAN

Course Code	Course Title	Year/Sem	Branch	Contact hr/week	Academic Year
24BC1T06	Numerical and Statistical Methods	I/I	BCA(Honours)	5	2024-2025

Course Objectives:

The main objectives of the course are

- To learn how to perform error analysis for arithmetic operations.
- To demonstrate working of various numerical methods.
- To provide a basic understanding of the derivation and f methods of interpolation and numerical integration.
- To impart knowledge of various statistical techniques.
- To develop students understanding through laboratory activities to solve problems related to above stated concepts.

Course Outcomes (Cos): At the end of the course, student will able to

CO No:	Course Outcome	Knowledge Level(K)#
CO1	Apply methods like Secant, Regula-Falsi, Newton-Raphson, and Fixed Point Iteration to solve equations and perform error analysis	K3
CO2	Solve systems of linear equations using methods like Gauss Elimination, Gauss-Jordan, Gauss-Seidel, and LU-Decomposition, and compute Eigenvalues and Eigenvectors.	K3
CO3	Apply interpolation techniques (Newton's and Lagrange's methods) and numerical methods like Trapezoidal and Simpson's for differentiation and integration.	K3
CO4	Analyze data using statistical measures like mean, median, mode, standard deviation, skewness, kurtosis, and correlation coefficients.	K4
CO5	Understand and apply theorems of probability, including Bayes' Theorem and conditional probability, to solve problems.	K3

Week No	Outcome	Blooms Level	Topic / Activity	Text Books	Contact Hours	Delivery Method	
UNIT-I							
1,2	Apply methods like Secant, Regula-Falsi, Newton-Raphson and Fixed Point Iteration to solve equations and perform error analysis.	K3	1.1	Introduction – Solutions of algebraic and transcendental equations: Bisection method	T ₁ &T ₂	4	Chalk & Board, PPT , Interactive Whiteboarding
			1.2	Secant method	T ₁ &T ₂	1	
			1.3	Regula -Falsi method	T ₁ &T ₂	2	
			1.4	Newton-Raphson method	T ₁ &T ₂	3	
			1.5	Fixed point iteration method	T ₁ &T ₂	2	
UNIT-II							
3,4	Solve systems of linear equations using methods like Gauss Elimination, Gauss - Jordan, Gauss Seidal and LU- Decomposition and compute Eigen values and Eigen vectors.	K3	2.1	Gauss Elimination method	T ₁ &T ₂	3	Chalk & Board, PPT, Interactive Whiteboarding
			2.2	Gauss Jordan method.	T ₁ &T ₂	3	
			2.3	Gauss Seidal iteration method	T ₁ &T ₂	1	
			2.4	LU- Decomposition method	T ₁ &T ₂	3	
			2.5	Eigen values and Eigen vectors of a square matrix.	T ₁ &T ₂	2	
Mid I Exam							

UNIT-III							
5, 6	Apply interpolation techniques (Newton's and Lagrange's method) and numerical methods like Trapezoidal and Simpson's for differentiation and integration.	K3	3.1	Interpolation	T ₁ &T ₂	1	Chalk & Board, PPT, Interactive Whiteboarding
			3.2	Forward and Backward differences	T ₁ &T ₂	2	
			3.3	Newton's forward formula	T ₁ &T ₂	2	
			3.4	Newton's backward formula	T ₁ &T ₂	2	
			3.5	Lagrange's interpolation and Lagrange's inverse interpolation formula	T ₁ &T ₂	3	
			3.6	Numerical differentiation Forward and Backward formula	T ₁ &T ₂	2	
			3.7	Trapezoidal formula	T ₁ &T ₂	1	
			3.8	Simpson's formula	T ₁ &T ₂	1	
UNIT-IV							
7,8	Analyze data using statistical measures like mean, median, mode, standard deviation, skewness, kurtosis and correlation coefficients.	K4	4.1	Basic concepts and definition of statistics	T ₁ &T ₂	2	Chalk & Board, PPT, Interactive Whiteboarding
			4.2	Mean, Median, Mode, Standard deviation	T ₁ &T ₂	3	
			4.3	Coefficient of variation	T ₁ &T ₂	1	
			4.4	Skewness and Kurtosis	T ₁ &T ₂	2	
			4.5	Karl Pearson's correlation coefficient	T ₁ &T ₂	2	
			4.6	Rank correlation and illustratrd examples	T ₁ &T ₂	2	
UNIT-V							

9, 10	Understand and apply theorems of probability, including Baye's theorem and conditional probability to solve problems.	K3	5.1	Basic concepts and definition of probability	T1	3	Chalk & Board, PPT, Interactive Whiteboarding
			5.2	Probability axioms	T1	1	
			5.3	Conditional probability	T1	2	
			5.4	Addition and Multiplication theorem of probability	T1	3	
			5.5	Bayes theorem		1	
			5.6	Problems and applications		2	
Mid II Exam							
Total No. of Classes						62	

Recommended Text Books for Reading:

T1: Sunil S. Patil Numerical and Statistical Methods EBPB.

T2: S.S. Shastry Introductory methods of Numerical Analysis PHI (New Delhi)

Reference Text Books:

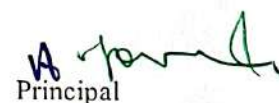
R1: Gupta S.C. & Kapuram VK Fundamentals of Mathematical Statistics.



Faculty



Head of the Department



Principal