



SWARNANDHRA

COLLEGE OF ENGINEERING & TECHNOLOGY

(AUTONOMOUS)

Accredited by National Board of Accreditation, AICTE, New Delhi, Accredited by NAAC with "A" Grade – 3.32 CGPA, Recognized under 2(f) & 12(B) of UGC Act 1956. Approved by AICTE, New Delhi, Permanent Affiliation to JNTUK, Kakinada Seetharampuram, W.G.DT., Narsapur-534280, (Andhra Pradesh)

DEPARTMENT OF S & II

TEACHING PLAN

Course Code	Course Title	Semester	Branches	Contact Periods /Week	Academic Year	Date of commencement of Semester
24BC1T06	Numerical & Statistical Methods	I	BCA	6	2025-26	22-09-25
COURSE OUTCOMES: Students are able to						
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).					
UNIT	Out Comes / Bloom's Level	Topic No.	Topics/Activity	Text Book/ Reference	Contact Hour	Delivery Method
I	CO1 Apply methods like Secant, Regula-Falsi, Newton-Raphson, and Fixed Point Iteration to solve equations and perform error analysis (K ₃).	Solutions of Equations				
		1.1	Introduction – Solutions of algebraic and transcendental equations	T ₁ &T ₂	1	PPT& BB
		1.2	Bisection method-Problems	T ₁ &T ₂	1	PPT& BB
				T ₁ &T ₂	1	
				T ₁ &T ₂	1	
		1.3	Secant method-Problems	T ₁ &T ₂	1	PPT& BB
				T ₁ &T ₂	1	
		1.4	Regula -Falsi method-Problems	T ₁ &T ₂	1	PPT& BB
				T ₁ &T ₂	1	
		1.5	Newton-Raphson method-Problems	T ₁ &T ₂	1	PPT& BB
				T ₁ &T ₂	1	
		1.6	Fixed point iteration method-Problems	T ₁ &T ₂	1	PPT& BB
				T ₁ &T ₂	1	
Total				12		



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II	CO2 Solve systems of linear equations using methods like Gauss Elimination, Gauss-Jordan, Gauss-Seidel, and LU-Decomposition, and compute Eigenvalues and Eigenvectors (K3).	Solution of system of linear equations							
		2.1	System of linear equations	T ₁ & T ₂	1	PPT& BB			
		2.2	Gauss Elimination method	T ₁ &T ₂	1	PPT& BB			
				T1&T2	1				
		2.3	Gauss Jordan method.	T ₁ &T ₂	1	PPT& BB			
				T1&T2	1				
		2.4	Gauss Seidal iteration method	T ₁ &T ₂	1	PPT& BB			
				T1&T2	1				
		2.5	LU-Decomposition method	T ₁ &T ₂	1	PPT& BB			
				T1&T2	1				
2.6	Eigen values and Eigen vectors of a square matrix	T ₁ &T ₂	1	PPT& BB					
		T1&T2	1						
		T1&T2	1						
Total				12					
III	CO3 Apply interpolation techniques (Newton"s and Lagrange"s methods) and numerical methods like Trapezoidal and Simpson"s for differentiation and integration(K3)	Interpolation							
		3.1	Interpolation	T ₁ &T ₂	1	PPT& BB			
		3.2	Forward and Backward differences	T ₁ &T ₂	1	PPT& BB			
				T1&T2	1				
		3.3	Newton's forward formula	T ₁ &T ₂	1	PPT& BB			
				T1&T2	1				
		3.4	Newton's backward formula	T ₁ &T ₂	1	PPT& BB			
				T1&T2	1				
		3.5	Lagrange's interpolation and Lagrange's inverse interpolation formula	T ₁ &T ₂	1	PPT& BB			
				T ₁ &T ₂	1				
		3.6	Numerical differentiation Forward and Backward formula	T ₁ &T ₂	1	PPT& BB			
T ₁ &T ₂	1								
3.7	Trapezoidal and Simpson's formula	T ₁ &T ₂	1	PPT& BB					
Total				12					



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IV	CO4 Analyze data using statistical measures like mean, median, mode, standard deviation, skewness, kurtosis, and correlation coefficients.(K4)	Basic concepts and definition of statistics				
		4.1	Basic concepts and definition of statistics	T ₁ &T ₂	1	PPT& BB
				T1&T2	1	
		4.2	Mean , Median and Mode	T ₁ &T ₂	1	PPT& BB
				T ₁ &T ₂	1	
		4.3	Standard deviation and Coefficient of variation	T ₁ &T ₂	1	PPT& BB
				T1&T2	1	
		4.4	Skewness and Kurtosis	T ₁ &T ₂	1	PPT& BB
				T ₁ &T ₂	1	
		4.5	Karl Pearson's correlation coefficient	T ₁ &T ₂	1	PPT& BB
4.6	Rank correlation and illustratrd examples	T ₁ &T ₂	1	PPT& BB		
Total			12			
V	CO5 Understand and apply theorems of probability, including Bayes" Theorem and conditional probability, to solve problems(K3).	Probability				
		4.1	Basic concepts and definition of probability	T ₁ &T ₂	1	PPT& BB
				T ₁ &T ₂	1	
		4.2	Probability axioms and Problems	T ₁ &T ₂	1	PPT& BB
				T ₁ &T ₂	1	
		4.3	Conditional probability	T ₁ &T ₂	1	PPT& BB
				T ₁ &T ₂	1	
		4.4	Addition and Multiplication theorem of probability	T ₁ &T ₂	1	PPT& BB
				T ₁ &T ₂	1	
				T ₁ &T ₂	1	
4.5	Bayes theorem	T ₁ &T ₂	1	PPT& BB		
4.6	Problems and applications	T ₁ &T ₂	1	PPT& BB		
		T ₁ &T ₂	1			
Total			12			
Cumulative Proposed Periods			60			
Text Books:						
S.No.	AUTHORS, BOOK TITLE, EDITION, PUBLISHER, YEAR OF PUBLICATION					
T1	Sunil S .Patil ,Numerical and Statistical Methods ,EBPB,2/e,2018					
T2	S.S.Shastry, Introductory methods of Numerical Analysis, PHI (New Delhi),5/e-2012					



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Reference Books:			
S.No.	AUTHORS, BOOK TITLE, EDITION, PUBLISHER, YEAR OF PUBLICATION		
R1	Gupta S.C & Kapuram VK, Fundamentals of Mathematical Statistics, 12/e, S.Chand, 2020		
R2	Muppidi Maruthi , Dr. Vishal Mehta, Dr. Rajib Mandal, Dr. Jitendra Kumar, Statistics And Numerical Methods,, 1/e, RK Publications, 2025		
R3	Dr. B.S. Grewal, Higher Engineering Mathematics, 45 th Edition, Khanna Publications, 2024		
Web Details			
1	https://onlinecourses.nptel.ac.in/noc21_ma45/preview		
2	https://onlinecourses.nptel.ac.in/noc20_ge20/preview		
3	http://digimat.in/nptel/courses/video/111105077/L02.html		
4	http://www.digimat.in/nptel/courses/video/111105077/L25.html		
5	https://www.youtube.com/watch?v=ya-vR7KVVj8		
		Name	Signature with Date
i.	Faculty	Mr. P.V.Narayana (BCA- A&B)	P.V.Narayana
ii.	Course Coordinator	Mr. P.V.Narayana	P.V.Narayana
iii.	Module Coordinator	Mr.K.D.N.Murthy	K.D.N. Murthy
iv.	Programme Coordinator	Dr.V. Swaminadhan	V. Swaminadhan




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