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 & H

TEACHING PLAN

Course Code	Course Title	Semester	Branches	Contact Periods /Week	Academic Year	Date of commencement of Semester
24MC1T05	Mathematical and Statistical Foundations	I	MCA	6	2025-26	25-08-2026

COURSE OUTCOMES: Students are able to	
CO1	Make use of probability theory in our day to day life and in the decision making in the face of uncertainty (K3).
CO2	Construct the probability distribution of a random variables, based on real-world situation, and use it to compute expectation and variances (K3) Also compute probabilities based on practical situations by discrete and continuous probability distributions (K3).
CO3	Compute sampling distribution of means for large and small samples also compute moment generating and characteristic functions((k3)
CO4	Apply the concept of hypothesis testing for large and small samples (K3)
CO5	Estimate the extent of correlation and regression between bivariate data (K3).

UNIT	Out Comes / Bloom's Level	Topic No.	Topics/Activity	Text Book/ Reference	Contact Hour	Delivery Method
I	CO1 Students are able to Make use of probability theory in our day to day life and in the decision making in the face of uncertainty (K_3).		**Basic Probability and Random Variables**			
		1.1	Random Experiments, Sample space and Events	T_1&T_2	1	PPT& BB
		1.2	Concept of Probability the Axioms of Probability	T_1&T_2	1	PPT& BB
		1.3	Some Important Theorems on Probability Assignment of Probabilities	T_1&T_2	1	PPT& BB
				T1&T2	1	PPT& BB
		1.4	Conditional Probability Theorems and Independent Events	T_1&T_2	1	PPT& BB
				T1&T2	1	
		1.5	Bayes Theorem or Rule	T_1&T_2	1	PPT& BB
		1.6	Random Variables and Discrete Probability Distributions	T_1&T_2	1	PPT& BB
				T1&T2	1	PPT& BB

		1.7	Distribution Functions for Random Variables	T_1&T_2	1	PPT& BB
		1.8	Distribution Functions for Discrete Random Variables	T_1&T_2	1	PPT& BB
				T_1&T_2	1	
		1.9	Continuous Random Variables	T_1&T_2	1	PPT& BB
				T_1&T_2	1	
				Total	**14**	
II	CO2 Students are able to Construct the probability distribution of a random variables, based on real-world situation, and use it to compute expectation and variances (K3) Also compute probabilities based on practical situations by discrete and continuous probability distributions (K1 & K3).	**Sampling and Estimation Theory**				
		2.1	Population and Sample	T_1 & T_2	1	PPT& BB
		2.2	Sampling With and Without Replacement Random Samples,	T_1&T_2	1	PPT& BB
				T1&T2	1	
		2.3	Sampling Distributions and Frequency Distributions	T_1&T_2	1	PPT& BB
				T1&T2	1	
		2.4	Computation of Mean, Variance, and Moments for Grouped Data	T_1&T_2	1	PPT& BB
				T1&T2	1	
		2.5	Unbiased Estimates and Efficient Estimates Point .	T_1&T_2	1	PPT& BB
				T1&T2	1	
		2.6	Estimates and Interval Estimates	T_1&T_2	1	PPT& BB
				T1&T2	1	
		2.7	Reliability Confidence Interval Estimates of Population Parameters	T_1&T_2	1	PPT& BB
				T1&T2	1	
		2.8	Maximum Likelihood Estimates	T_1&T_2	1	PPT& BB
				T1&T2	1	
				Total	**15**	
III	CO3 Students are able to Compute sampling distribution of means for large and small samples also compute moment generating and	**Tests of Hypothesis and Significance**				
		3.1	Statistical Decisions and Statistical Hypotheses	T_1&T_2	1	PPT& BB
		3.2	Null Hypotheses Tests of Significance , Type I and Type II Errors	T_1&T_2	1	PPT& BB
				T1&T2	1	
		3.3	Level of Significance, One	T_1&T_2	1	PPT& BB

	characteristic functions((k3)		Tailed and Two Tailed tests	T1&T2	1	
		3.4	Tests of Significance for Large Samples	T_1&T_2	1	PPT& BB
				T1&T2	1	
		3.5	Tests of Significance for Small Samples	T_1&T_2	1	PPT& BB
				T_1&T_2	1	
		3.6	Relationship between Estimation Theory and Hypothesis Testing	T_1&T_2	1	PPT& BB
				T_1&T_2	1	
		37	The Chi-Square Test for Goodness of Fit, Contingency Tables	T_1&T_2	1	PPT& BB
				T_1&T_2	1	
				Total	**13**	
IV	CO4 Students are able to Apply the concept of hypothesis testing for large and small samples (K3)	**Algebraic Structures and Number Theory**				
		4.1	Algebraic Systems, Examples and General Properties	T_1&T_2	1	PPT& BB
				T1&T2	1	
		4.2	Semi Groups and Monoids	T_1&T_2	1	PPT& BB
		4.3	Homomorphism of Semi Groups Semi Groups and Monoids	T_1&T_2	1	PPT& BB
		4.4	Group, Subgroup and Abelian Group	T_1&T_2	1	PPT& BB
				T1&T2	1	
		4.5	Homomorphism and Isomorphism	T_1&T_2	1	PPT& BB
		4.6	Properties of Integers and Division Theorem	T_1&T_2	1	PPT& BB
		4.7	The Greatest Common Divisor and Euclidean Algorithm	T_1&T_2	1	PPT& BB
		4.8	Least Common Multiple and Testing for Prime Numbers	T_1&T_2	1	PPT& BB
		4.9	The Fundamental Theorem of Arithmetic, Modular Arithmetic (Fermat's Theorem and Euler's Theorem)	T_1&T_2	1	PPT& BB
				T_1&T_2	1	
				T_1&T_2	1	
				Total	**13**	

V	CO5 Students are able to estimate the extent of correlation and regression between bivariate data (K1,K3).	Graph Theory				
		4.1	Basic Concepts of Graphs and Sub graphs	T_1&T_2	1	PPT& BB
				T_1&T_2	1	
		4.2	Matrix Representation of Graphs, Adjacency Matrices and Incidence Matrices	T_1&T_2	1	PPT& BB
				T_1&T_2	1	
		4.3	Isomorphic Graphs, Paths and Circuits	T_1&T_2	1	PPT& BB
					1	
		4.4	Eulerian and Hamiltonian Graphs	T_1&T_2	1	PPT& BB
		4.5	Multigraphs, Planar Graphs and Euler's Formula	T_1&T_2	1	PPT& BB
				T_1&T_2	1	
		4.6	Graph Coloring and Covering, Chromatic Number	T_1&T_2	1	PPT& BB
		4.7	Spanning trees and Algorithms for Spanning Trees	T_1&T_2	1	PPT& BB
				T_1&T_2	1	
				Total	12	
				Cumulative Proposed Periods	67	

Text Books:	
S.No.	AUTHORS, BOOK TITLE, EDITION, PUBLISHER, YEAR OF PUBLICATION
T1	Mr. K. Murugesan and Mr. P. Gurusamy, Probability and Statistics, Anu radha Publication, 2011
T2	R.E Walpole and Raymond H. Myers ,Probability and statistics for engineers and scientists,9/e, Pearson Education-2024

Reference Books:	
S.No.	AUTHORS, BOOK TITLE, EDITION, PUBLISHER, YEAR OF PUBLICATION
R1	Miller & Freund,Richard A. Johnson, Probability and statistics for engineers,9/e, PHI Publication-2017
R2	Dr. B.S. Grewal, Higher Engineering Mathematics, 45nd Edition, Khanna Publications-2024

Web Details	
1	https://archive.nptel.ac.in/courses/106/102/106102064/
2	https://ocw.mit.edu/courses/6-006-introduction-to-algorithms-spring-2020/video_galleries/lecture-videos/
3	https://www.cs.usfca.edu/~galles/visualization/Algorithms.html
4	https://visualgo.net/en
5	https://elearn.daffodilvarsity.edu.bd/course/view.php?id=11771

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		Name	Signature with Date
i.	Faculty	Mr. P.V.Narayana (MCA)	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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