



SARVAJANIK UNIVERSITY
Sarvajani College of Engineering and Technology
Bachelor of Technology



B. Tech. Semester IV (AI&DS, IT)

Subject Name: Probability and Statistics

Subject Code: BTAS-11402

Type of course: Basic Science Course

Prerequisite: Probability basics

Rationale: Systematic study of uncertainty (randomness) by probability - statistics and curve fitting by numerical methods

Teaching and Examination Scheme:

Teaching Scheme				Theory Marks			Practical Marks		Total
L	T	P	C	TEE	CA1	CA2	TEP	CA3	
3	1	0	4	60	25	15	0	0	100

CA1: Continuous Assessment (assignments/projects/open book tests/closed book tests) **CA2:** Sincerity in attending classes/class tests/ timely submissions of assignments/self-learning attitude/solving advanced problems **TEE:** Term End Examination **TEP:** Term End Practical Exam (Performance and viva on practical skills learned in course) **CA3:** Regular submission of Lab work/Quality of work submitted/Active participation in lab sessions/viva on practical skills learned in course

Content:

Sr. No.	Contents	Total Hours	% Weightage
01	Basic Probability: Experiments, Definition of Probability, Conditional probability, Independent events, Mutually exclusive events, Multiplication law, Bayes' Theorem, Discrete random variable, Continuous random variable, Probability mass function, Probability density function, and Cumulative distribution function.	08	20%
02	Application of Probability Distributions: Discrete probability distributions- Bernoulli trials, Binomial distribution, Poisson distribution, Poisson approximation to the binomial distribution, Using table values of Binomial probabilities and Poisson probabilities. Continuous probability distributions- Normal curve, Standard normal probability distribution, Normal approximation to the Binomial distribution, Computing probabilities using tables of Normal distributions.	10	25%
03	Basic Statistics: Measures of central tendency- Mean, median, mode, quartiles, percentiles. Measures of variation- Range, Interquartile range, variance, standard deviation, coefficient of variation. Measures of association- Covariance, Correlation coefficient, Rank correlation coefficient	10	20%
04	Applied Statistics: Formation of hypothesis- Developing Null and Alternative hypothesis.	10	25%



SARVAJANIK UNIVERSITY
Sarvajani College of Engineering and Technology
Bachelor of Technology



	Testing the hypothesis- One-tailed test, Two-tailed test Decision making- Using p-value approach, critical value approach, confidence interval approach Test of significance- Single population mean when population standard deviation is known and unknown, Single population variance, Chi-square test for goodness of fit.		
05	Curve fitting: The method of least squares, Fitting of straight line, fitting of second degree polynomial.	04	10%

Suggested Specification table with Marks (Theory): (For B. Tech. only)

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
00	20	10	10	20	0

Legends: R: Remembrance, U: Understanding; A: Application, N: Analyze, E: Evaluate C: Create (Revised Bloom's Taxonomy)

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Reference Books:

Sr no	Title of book /article	Author(s)	Publisher and details like ISBN	Year of publication	Publication Edition
1.	Introduction to Probability Theory	P. G. Hoel, S. C. Port and C. J. Stone	Universal Book Stall.	1971	
2.	A First Course in Probability	S. Ross	Pearson Education India	2010	8th Ed.
3.	An Introduction to Probability Theory and its Applications	W. Feller	Wiley	Jan. 1991	Vol. 1
4.	Applied Statistics and Probability for Engineers	D. C. Montgomery and G. C. Runger	John Wiley & Sons, Inc.	2003	Third Edition
5.	Miller and Freund's Probability and Statistics for Engineers	Richard A. Johnson	PHI	2003	Sixth Edition



SARVAJANIK UNIVERSITY
Sarvajani College of Engineering and Technology
Bachelor of Technology



Course Outcome:

Sr. No.	After learning this subject, students will be able to	Weightage in %
CO-1	apply the terminologies of basic probability, two types of random variables and their probability functions	20
CO-2	explain the behavior of various discrete and continuous probability distributions	25
CO-3	evaluate the central tendency, correlation and correlation coefficient and regression	20
CO-4	apply the statistics for testing the significance of the given large and small sample data by using t- test, F- test and Chi-square test	25
CO-5	apply the fitting of various curves by method of least square	10

Mapping with POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12
CO-1	3	3	1	1	-	-	-	-	-	-	-	1
CO-2	3	3	2	2	2	1	1	-	-	-	-	2
CO-3	3	3	2	2	1	-	-	-	-	-	-	2
CO-4	3	3	2	3	2	1	1	-	-	-	-	2
CO-5	3	3	1	1	-	-	-	-	-	-	-	1
Rationale*												

List of Open Source learning website: MIT Open courseware, NPTEL