GUJARAT TECHNOLOGICAL UNIVERSITY
Syllabus for Integrated MSc, 4th Semester
Branch: Information Technology
Subject Name: Statistical Methods and probabilities
Subject Code: 1340502

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks				Total Marks
				Theory Marks		Practical Marks		
L	T	P	C	ESE(E)	PA (M)	PA (I)	ESE (V)	
3	0	2	4	70	30	20	30	150

Course Content:

Sr. No.	Content	Teaching Hours	Module (%) Weightage
1	**Basic Probability:** Experiment, definition of probability, Conditional probability, Independent events, Total probability, Bayes' theorem.	06	15
2	**Random Variables:** Bayes' rule, Bernoulli trials, Random variables, Discrete random variable, Probability mass function, Continuous random variable, Probability density function, Cumulative distribution function, Properties of cumulative distribution function, Two dimensional random variables and their distribution functions, Marginal probability function, Independent random variables, Expected value of two dimensional random variable.	08	15
3	**Some special Probability Distributions:** Binomial distribution, Poisson distribution, Poisson approximation to the binomial distribution, Normal, Exponential and Gamma densities.	08	20
4	**Basic Statistics:** Measure of central tendency, Moments, Expectation, Dispersion, Skewness, Kurtosis, Linear Correlation, Correlation coefficient, Rank correlation coefficient, Regression lines.	09	25
5	**Applied Statistics:** Formation of Hypothesis, Test of significance: ***Large sample test***: for single proportion, Difference of proportions, Single mean, Difference of means, and Difference of standard deviations. ***Test of significance for Small samples:*** t- Test for single mean, difference of means, t-test for correlation coefficients, F- test for ratio of variances, Chi-square test for goodness of fit and independence of attributes.	09	25

Suggested Specification table with Marks (Theory):

Distribution of Theory Marks				
R Level	U Level	A Level	N Level	E Level
7	28	35	0	0

Legends: R: Remembrance; U: Understanding; A: Application, N: Analyze and E: Evaluate and above Levels (Bloom's Taxonomy)

Reference Books:

1. Introduction to Probability Theory, P. G. Hoel, S. C. Port and C. J. Stone, Universal Book Stall.
2. A First Course in Probability, 6th Edition, S. Ross, Pearson Education India.
3. An Introduction to Probability Theory and its Applications, W. Feller, Vol. 1, Wiley.
4. Applied Statistics and Probability for Engineers, Wiley, D. C. Montgomery and G. C. Runger
5. Probability and Statistics for Engineering and the Sciences, J. L. Devore, Cengage Learning.

Course Outcome:

After learning the course, the students should be able to:

No.	CO statement
CO-1	Understand the terminologies of basic probability
CO-2	Understand two types of random variables and their probability functions
CO-3	Observe and analyze the behaviour of various discrete and continuous probability distributions
CO-4	Understand the central tendency, correlation and correlation coefficient and also regression
CO-5	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