GUJARAT TECHNOLOGICAL UNIVERSITY

Program Name: Bachelor of Computer Applications

Level: Under Graduate

Course / Subject Code : BC01001041

Course / Subject Name : Fundamental of Statistical Methods

w. e. f. Academic Year:	June-2024
Semester:	1
Category of the Course:	Minor Elective Subject (Any One)

Prerequisite:	Basic mathematical skills, understanding of data representation, and familiarity with fundamental probability concepts.
Rationale:	Statistics and probability are foundational disciplines essential for understanding and interpreting data in various fields such as business, science, economics, and social sciences. This course aims to equip learners with essential statistical tools and concepts necessary for effective decision-making and analysis. By delving into topics such as descriptive statistics, graphical representation of data, measures of central tendency and variability, and probability theory, students will develop the skills to analyze data systematically and draw meaningful conclusions. Understanding these concepts not only enhances quantitative reasoning but also fosters critical thinking by enabling students to assess the reliability and significance of data-driven insights. Furthermore, the exploration of probability distributions, both discrete (e.g., binomial, Poisson) and continuous (e.g., normal, exponential), provides a robust framework for modeling real-world uncertainties and predicting outcomes. This course emphasizes practical applications through examples and exercises, reinforcing the theoretical foundation with hands-on experience. By the end of the course, learners will have gained the proficiency to interpret statistical findings, apply probability principles to decision-making processes, and communicate insights effectively, thereby preparing them for advanced studies or professional roles where statistical and probabilistic knowledge is crucial.

Course Outcome:

After Completion of the Course, Student will able to:

No	Course Outcomes	RBT Level
01	Explain the basics of statistics and construct/interpret frequency distributions of data sets	AN
02	Apply various concepts, techniques, and methods used in Descriptive Statistics in carrying out preliminary Data analytics tasks	AP
03	Analyse and calculate probabilities using various methods(laws)	AN
04	Solve problems using discrete probability distributions	AP
05	Solve problems using continuous probability distributions	AP

Teaching and Examination Scheme:

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Teaching Scheme (in Hours)			Total Credits L+T+ (PR/2)	Assessment Pattern and Marks				Total Marks
				Theory		Tutorial / Practical		
L	T	PR	C	ESE (E)	PA / CA (M)	PA/CA (I)	ESE (V)	
3	0	2	4	70	30	20	30	150

Course Content:

Unit No.	Content	No. of Hours	% of Weightage
1	**Introduction to Statistics:** Statistics in Business, Basic Statistical Concepts, Data Measurement **Charts and Graphs:** Frequency Distributions, Graphical depiction of data (one and two variable)	6	14%
2	**Descriptive Statistics:** Measure of central tendency – mean, median, quartile, mode (for Group and ungrouped data) Measure of variability – Range, interquartile range, standard deviation, variance, coefficient of variation (for Group and ungrouped data) Measures of shape – kurtosis, skewness, boxplot Measures of association – Pearson's correlation	8	20%
3	**Probability:** Introduction to probability Methods of assigning probabilities Structure of probability Marginal, Union, Joint and Conditional probability Addition Laws Multiplication Laws Conditional probability Revision of probabilities: Bayes' Rule	8	20%
4	**Discrete Probability Distributions:** Binomial Distribution Poisson Distribution	10	23%

	Hypergeometric Distribution		
5	**Continuous Probability Distributions:** Uniform Distribution Normal Distribution Exponential Distribution	10	23%
	Total	**42**	**100**

Suggested Specification Table with Marks (Theory):

Distribution of Theory Marks					
R Level	**U Level**	**A Level**	**N Level**	**E Level**	**C Level**
10	**10**	**60**	**20**	**-**	**-**

Where R: Remember; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create (as per Revised Bloom's Taxonomy)

References/Suggested Learning Resources:

(a) Books:

1. Business Statistics by Sanjiv Jaggia and Alison Kelly; McGraw Hill Publication
2. Statistics for Management by Richard I. Levin and David S. Rubin; Pearson Publication
3. Statistics for Managers by D. P. Apte; Excel Publication
4. Business Statistics by Gerald Keller and Hitesh Arora; Cengage Publication
5. M. S. Excel: Statistical Tools for Managers by D. P. Apte; Excel Publication
6. Business Statistics by Naval Bajpai; Pearson Publicaiton

Suggested Course Practical List:

No	Title
1	Graphical representation of data.
2	Problems based on measures of central tendency.
3	Problems based on measures of dispersion.
4	Problems based on combined mean and variance and coefficient of variation.
5	Problems based on moments, skewness and kurtosis.
6	Fitting of binomial distributions after computing mean and variance.
7	Application problems based on binomial distribution.
8	Application problems based on Poisson distribution.
9	Application problems based on negative binomial distribution.
10	To find the ordinate for a given area for normal distribution.
11	Application based problems using normal distribution
12	Fitting of normal distribution when parameters are given.
13	Fitting of normal distribution when parameters are not given.

CO- PO Mapping:

Semester 1	Fundamentals of Statistical Methods										
	POs										
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	2	-	-	3	-	-	-	-	-	-
CO2	3	3	-	3	3	-	-	-	-	-	-
CO3	3	2	-	-	2	-	-	-	-	-	-
CO4	3	-	3	-	3	-	-	-	-	-	-
CO5	3	-	3	-	3	-	-	-	-	-	-
	3	**2.33**	**3**	**3**	**2.8**	**-**	**-**	**-**	**-**	**-**	**-**

*Legend: '**3**' for high, '**2**' for medium, '**1**' for low and '**-**' for no correlation of each CO with PO.*

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