M. G. Science Institute, Ahmedabad

Autonomous | Affiliated to Gujarat University, Ahmedabad

(Managed by The Ahmedabad Education Society)

Department of Statistics

Bachelor of Science (Hons.) in Statistics

B.Sc. (Hons.) Statistics

4 Year, 8 Semester Full-Time Programme

Choice Based Credit System (CBCS) & Grading System

Outcome-Based Education Pattern

(Effective from Academic Year 2024-25)

Semester: IV	Course Title: Statistics for Mathematics (T)	Credit: 2
Course No.: STE244		Hours: 2/week

Course Outcomes: On successful completion of the course the learner will be able to

CO	COGNITIVE ABILITIES	COURSE OUTCOMES
CO 1	REMEMBERING	Recall the principle of counting, describe random and non-random experiment.
CO 2	UNDERSTANDING	Explain basic concepts of probability. Create sample space for some random experiment and identify the events and their types.
CO 3	APPLYING	Apply the theory of probability to various real-life situations to find the probability of different types of events.
CO 4	ANALYSING	Explain definition of independence of events, concept of conditional probability, Bayes' theorem.
CO 5	EVALUATING	
CO 6	CREATING	

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	3	2	1		
CO 2	1	1		2	
CO 3	1	2	3		
CO 4	2	1	2	2	1
CO 5					
CO 6					

Unit	Detailed Syllabus	No. of Hours of Teaching
I	**Introduction to Probability** Random Experiment, trial, sample point, sample space, definitions of equally likely, mutually exclusive, and exhaustive events. Definition of probability: classical, relative, and axiomatic approach and its properties.	15
II	**Conditional Probability and Baye's theorem** Conditional probability, multiplicative law of probability, Boole's inequality, Bonferroni's inequality, and Chebyshev's Inequality. Independence of events, law of total probability, Bayes theorem and its applications.	15

Suggested Reference Books:

1. Applied Statistics, Publisher: Books & Allied (P) Ltd. Mukhopadhyay P. (2015).
2. Basic Statistics, Agarwal, B. L., New Age International (P) Ltd.
3. Introduction to the theory of Statistics, Mood, A. M., Greybill, F.A., Boes, D.C., McGraw Hill.
4. Fundamentals of Mathematical Statistics, S. C. Gupta and V. K. Kapoor, Sultan Chand and Sons, New Delhi.
5. Statistical Methods, Tata Mcgraw Hill Publishing. Das (2009).
6. Statistical analysis: Graphs and diagrams, S. M. Nair and M. Garg, Spectrum Books (P) Ltd, New Delhi.

STE244 (P) Statistics for Mathematics

Semester: IV	Course Title: Statistics for Mathematics (P)	Credit: 2
Course No.: STE244 (P)		Hours: 4/week

Part A: Manual

Sr. No.	Title of the Practical	No. of Hours of Teaching
1	Computation of probability: law of addition, law of multiplication in probability	4
2	Computation of conditional probability and related examples.	4
3	Examples related to Chebyschev's inequality.	4
4	Mutual and Pairwise independence of events.	4
5	Applications of Bayes' Theorem in different area of applications	4
6	Construction of univariate and Bivariate probability distributions. Computation of measures of central tendency and dispersion.	4
7	Construction of marginal and conditional probability distributions.	4
8	Conditional mean and variance for Bivariate Probability distribution.	4

Part B: Computer

Sr. No.	Title of the Practical	No. of Hours of Teaching
1	Computation of probability: law of addition, law of multiplication in probability	4
2	Computation of conditional probability and related examples.	4
3	Examples related to Chebyschev's inequality.	4
4	Mutual and Pairwise independence of events.	4
5	Applications of Bayes' Theorem in different area of applications	4
6	Construction of univariate and Bivariate probability distributions. Computation of measures of central tendency and dispersion.	4
7	Construction of marginal and conditional probability distributions.	4
8	Conditional mean and variance for Bivariate Probability distribution.	4