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)

B. Sc. Sem II Statistics **Detailed Syllabus for STE123 (T) Basics of Data Science-II**

Semester: II	Course Title: Basics of Data Science- II	Credit: 2
Course No.: STE123 (T)		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, data and data types.
CO 2	UNDERSTANDING	Understand basic concepts of discrete and continuous data and their measures of central tendency and dispersion.
CO 3	APPLYING	Apply the different central measures and dispersion on various kinds of data.
CO 4	ANALYSING	Analyze different methods of central tendency and methods of dispersion.
CO 5	EVALUATING	Compute the measures of central tendencies and measures of dispersions
CO 6	CREATING	Students can summarize the data numerically for real-life data analysis problems.

	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	1	1		1	
CO 6	1	1	2	3	1

Unit	Detailed Syllabus	No. of Hours of Teaching
I	**Measures of Central Tendency** Concept of central tendency, various measures of central tendency, and their interrelationship. Their merits and demerits. The empirical relation between mean, median, and mode. Properties and applications of measures of central tendency. Partition values (quartiles, deciles and percentiles.)	15
II	**Measures of Dispersion and Moments** Concept of variation/dispersion, quartile deviation, Absolute and relative measures of dispersion with their merits, demerits, and applications. Moments: raw moments, central moments, factorial moments, and their interrelationship. Skewness, Kurtosis and their measures. Box plot.	15

Suggested Reference Books:

1. Introduction to the Practice of Statistics, Moore, S. David; McCabe, P. George W. H. Freeman and Company, New York.
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., Mc Graw Hill.

4. Fundamentals of Mathematical Statistics, S. C. Gupta and V. K. Kapoor, Sultan Chand and Sons, New Delhi.
5. Mathematical Statistics, P. Mukhopadhyay, New Central Book Agency (P) Ltd, Calcutta
6. An Introduction to Probability and Statistics, V. K. Rohatgi and A.K.Md. Ehsanes Saleh, Wiley Series.

STE123 (P) Basics of Data Science-II

Semester: II	Course Title: Basics of Data Science-II (P)	Credit: 2
Course No.: STE123 (P)		Hours: 4/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, data and data types.
CO 2	UNDERSTANDING	Understand basic concepts of discrete and continuous data and their measures of central tendency and dispersion.
CO 3	APPLYING	Apply the different central measures and dispersion on various kinds of data.
CO 4	ANALYSING	Analyze different methods of central tendency and methods of dispersion.
CO 5	EVALUATING	Compute the measures of central tendencies and measures of dispersions and interpret the results.
CO 6	CREATING	Students can summarize the data numerically for real-life data analysis problems.

Part A (Manual)

Sr. No.	Title of the Practical	No. of Hours of Teaching
1	Computation of measures of central tendency: Mean, Median, Mode, Harmonic mean, Geometric mean.	30
2	Computation of measures of dispersion: Range, variance, standard deviation,	
3	Computation of absolute relative measures: mean deviation from mean, mean deviation from median, mean deviation from mode.	
4	Computation of partition values: Quartiles, Quartile Deviation, Interquartile range, decile, percentile and their applications.	
5	Computation of raw moments, central moments and their inter relationship.	
6	Computation of factorial moments and its applications.	
7	Computation of coefficient of skewness and kurtosis and its interpretation	

Part B (Using MS Excel)

Sr. No.	Title of the Practical	No. of Hours of Teaching
1	Computation of measures of central tendency: Mean, Median, Mode, Harmonic mean, Geometric mean.	30

2	Computation of measures of dispersion: Range, variance, standard deviation,	
3	Computation of absolute relative measures: mean deviation from mean, mean deviation from median, mean deviation from mode.	
4	Computation of partition values: Quartiles, Quartile Deviation, Interquartile range, decile, percentile and their applications.	
5	Computation of raw moments, central moments and their inter relationship.	
6	Computation of factorial moments and its applications.	
7	Computation of coefficient of skewness and kurtosis and its interpretation	

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4. Fundamentals of Mathematical Statistics, S. C. Gupta and V. K. Kapoor, Sultan Chand and Sons, New Delhi.