Semester	FIVE
Course	Minor
Paper Code	B3ST230512T/B3ST230512P
Paper Title	Descriptive Statistics
No. of Credits	4
Theory / Practical /Composite	Composite
Classes per week	4 Theory and 2 Practical
Module	1

Course outcomes

1.	**Remember** the basic concepts, terminology, and scope of descriptive statistics, including types of data and scales of measurement.
2.	**Understand** methods of organizing and presenting data through tabulation, diagrams, and graphical representations.
3.	**Apply** appropriate descriptive measures such as moments, quantiles, measures of central tendency, dispersion, skewness, and kurtosis to real datasets.
4.	**Analyze** univariate, bivariate, and categorical data using contingency tables, correlation, regression, and graphical tools.
5.	**Evaluate** the nature and strength of relationships between variables using measures of association, correlation coefficients, and goodness-of-fit statistics.
6.	**Create** suitable graphical displays, summary measures, and fitted regression models to effectively describe and interpret data.

Syllabus

Unit/Module	Content	No. of lectures	CO mapping	Cognitive levels
Unit 1	**Statistical Methods** - Definition and scope of Statistics, concepts of statistical population and sample. Variables, Scales of measurement. Types of statistical data. Tabulation. Diagrammatic representation of non-frequency data: line, bar, pie, and component bar diagram. Frequency distribution and their graphical representation: column diagram, histogram, step diagram, and ogive.	8	CO1 CO2 CO6	K1 K2 K6
Unit 2	**Analysis of Univariate Quantitative Data** –Moments and Quantiles. Concepts and measures of central tendency, dispersion and skewness. Moment measure of kurtosis. Box-Plot	13	CO3 CO4 CO6	K3 K4 K6
Unit 3	**Analysis of Categorical Data:** Contingency Tables. Association and Independence. Measures for 2x2 Tables – Odds Ratio. k x l contingency tables: Gamma measure, Pearsonian χ^2.	5	CO4 CO6	K4 K6
Unit 4	**Analysis of bivariate data:** Scatter plot, product moment correlation			

	coefficient, Regression Analysis: Fitting of linear, quadratic and exponential curves by principle of least squares, Correlation Index of order 2. Spearman's rank correlation coefficient (without ties)	13	CO4 CO5 CO6	K4 K5 K6

List of Practical

1.	Graphical representation of data
2.	Problems based on measures of central tendency
3.	Problems based on measures of dispersion
4.	Problems based on moments, skewness and kurtosis
5.	Categorical Data Analysis
6.	Scatter plot; Correlation coefficient; Fitting of linear, quadratic and exponential curves
7.	Spearman's rank correlation coefficient

Reading/ Reference list

1.	Goon A.M., Gupta M.K. and Dasgupta B. (2002): Fundamentals of Statistics, Vol. I, & II, 8th Edn. The World Press, Kolkata.
2.	Yule G.U. and Kendall M.G (1994) : An Introduction to the theory of Statistics. 14th Edn. Universal Book stall, Delhi.
3.	.Nagar A. L., Das R. K. (1997): Basic Statistics. Oxford University Press.
4.	Hogg, R.V., Tanis, E.A. and Rao J.M. (2009): Probability and Statistical Inference, Seventh Ed, Pearson Education, New Delhi.

Evaluation

	Theory CIA: 15 Semester Exam: 45	Practical CA: 40 Semester Exam: (Not applicable)
Paper Structure for Theory Semester Exam	Short Questions (5 Marks Each)	Long Questions (15 Marks Each)
	3 out of 5	2 out of 3

CO	CO Description	Cognitive levels
CO1	**Remember** the basic concepts, terminology, and scope of descriptive statistics, including types of data and scales of measurement.	K1
CO2	**Understand** methods of organizing and presenting data through tabulation, diagrams, and graphical representations.	K2
CO3	**Apply** appropriate descriptive measures such as moments, quantiles, measures of central tendency, dispersion, skewness, and kurtosis to real datasets.	K3
CO4	**Analyze** univariate, bivariate, and categorical data using contingency tables, correlation, regression, and graphical tools.	K4
CO5	**Evaluate** the nature and strength of relationships between variables using measures of association, correlation coefficients, and goodness-of-fit statistics.	K5
CO6	**Create** suitable graphical displays, summary measures, and fitted regression models to effectively describe and interpret data.	K6