



Statistics Paper-I
Descriptive Statistics
[CORE COURSE]

Semester I	Credits: 2	Subject Code: BS12005	Lectures : 40
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Course Outcomes:

At the end of this course, the learner will be able to:

- Organize, manage and present data. Analyze statistical data graphically using frequency distributions and cumulative frequency distributions.
- Calculate and apply measures of central tendency for grouped and ungrouped data. Represent mode, median, quartiles graphically.
- Calculate and apply measures of dispersion for grouped and ungrouped data.
- Analyze statistical data using measures of central tendency, dispersion.
- Calculate and apply measures of skewness and kurtosis. Analyze natures of skewness and kurtosis using graphs.
- Understand Likert scale, classification, relationship among different class frequencies (up to two attributes), calculate coefficient of association and interpret.

Unit 1: Data condensation and Presentation of Data	09
<ul style="list-style-type: none"> • Definition, importance, scope and limitations of statistics. • Data Condensation: Types of data (Primary and secondary), Attributes and variables, discrete and Continuous variables. • Graphical Representation: Histogram, Ogive Curves, Steam and leaf chart. [Note: Theory paper will contain only procedures. Problems to be included in practical] • Numerical problems related to real life situations. 	

Unit 2: Descriptive Statistics	14
<ul style="list-style-type: none"> • Measures of central tendency: Concept of central tendency, requisites of good measures of central tendency. • Arithmetic mean: Definition, computation for ungrouped and grouped data, properties of arithmetic mean (without proof) combined mean, weighted mean, merits and demerits. • Median and Mode: Definition, formula for computation for ungrouped and grouped data, graphical method, merits and demerits. Empirical relation between mean, median and mode (without proof) • Partition Values: Quartiles, Box Plot. • Concept of dispersion, requisites of good measures of dispersion, absolute and relative measures of dispersion. • Measures of dispersion: Range and Quartile Deviation definition for ungrouped and grouped data and their coefficients, merits and demerits, • Variance and Standard deviation: definition for ungrouped and grouped data, coefficient of variation, combined variance & standard deviation, merits and demerits. • Numerical problems related to real life. Situations. 	

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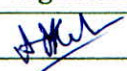
Unit 3: Moments, Skewness and Kurtosis	10
<ul style="list-style-type: none"> • Concept of Raw and central moments: Formulae for ungrouped and grouped data (only first four moments), relation between central and raw moments up to fourth order. (without proof) • Measures of Skewness: Types of skewness, Pearson's and Bowley's coefficient of skewness, Measure of skewness based on moments. • Measure of Kurtosis: Types of kurtosis, Measure of kurtosis based on moments. Numerical problems related to real life situations. 	

Unit 4: Theory of Attribute	7
<ul style="list-style-type: none"> • Attributes: Concept of a Likert scale, classification, notion of manifold classification, dichotomy, class-frequency, order of a class, positive class frequency, negative class frequency, ultimate class frequency, relationship among different class frequencies (up to two attributes), <ul style="list-style-type: none"> ○ Consistency of data up to 2 attributes. ○ Concepts of independence and association of two attributes. ○ Yule's coefficient of association (Q), $-1 \leq Q \leq 1$, interpretation. 	

***Contact hours – 5 hours**

Recommended Text Books:
<ul style="list-style-type: none"> • Gupta S. C.and Kapoor V. K. 1987, <i>Fundamentals of Applied Statistics (3rd Edition)</i> S. Chand and Sons, New Delhi. • Kulkarni M.B., Ghatpande S.B.,Gore S.D. 1999, <i>Common Statistical Tests</i>, Satyajeet Prakashan, Pune • Kulkarni M.B., Ghatpande S.B. 2007, <i>Introduction to Discrete Probability and Probability Distributions</i> SIPF Academy • Sarma K.V.S. 2001 <i>Statistics Made Simple. Do it Yourself on P.C.</i> Prentice Hall

Reference Books:
<ul style="list-style-type: none"> • George W. Snedecor, William G, Cochran, <i>Statistical Methods</i>, John Wiley & sons. • Agarwal B. L., <i>Programmed Statistics</i>, New Age InternationalPublishers. • Freund J.E., <i>Modern Elementary Statistics</i>, PearsonPublication, 2005. • Kennedy and Gentle, <i>An Introductory Statistics</i>. • Gupta and Kapoor,<i>Fundamentals of Applied Statistics(3rd Edition)</i>,S. Chand and Sons, New Delhi, 1987.

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Faculty	Ms. Amrita Basu	<i>Amrita Basu</i> 21/7/20
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Industry Expert	Dr. Saikat Roy	<i>Saikat Roy</i> 21/7/20
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