



**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.

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

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

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**Unit 3: Moments, Skewness and Kurtosis**

**10**

- 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**

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- 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),
  - 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.

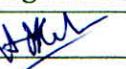
**\*Contact hours – 5 hours**

**Recommended Text Books:**

- Gupta S. C. and Kapoor V. K. 1987, *Fundamentals of Applied Statistics (3rd Edition)* S. Chand and Sons, New Delhi.
- Kulkarni M.B., Ghatpande S.B., Gore S.D. 1999, *Common Statistical Tests*, Satyajeet Prakashan, Pune
- Kulkarni M.B., Ghatpande S.B. 2007, *Introduction to Discrete Probability and Probability Distributions* SIPF Academy
- Sarma K.V.S. 2001 *Statistics Made Simple. Do it Yourself on P.C.* Prentice Hall

**Reference Books:**

- George W. Snedecor, William G. Cochran, *Statistical Methods*, John Wiley & sons.
- Agarwal B. L., *Programmed Statistics*, New Age International Publishers.
- Freund J.E., *Modern Elementary Statistics*, Pearson Publication, 2005.
- Kennedy and Gentle, *An Introductory Statistics*.
- Gupta and Kapoor, *Fundamentals of Applied Statistics (3rd Edition)*, S. Chand and Sons, New Delhi, 1987.

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