

## SEMESTER-I

### STATISTICS MAJOR

#### STAT-MD-CC1-1-Th

#### **(Descriptive Statistics -I& Probability-I)**

3 Credits

**THEORY**

*Statistics:* Definition and scope. Concepts of statistical population and sample.

*Data:* quantitative and qualitative, cross-sectional and time-series, discrete and continuous.

*Scales of measurement:* nominal, ordinal, interval and ratio.

*Presentation of data:* tabular and graphical. Frequency distributions, cumulative frequency distributions and their graphical representations. Stem and leaf displays. (10)

*Measures of Central Tendency:* Mean, Median, Mode.

*Measures of Dispersion:* Range, Mean deviation, Standard deviation, Coefficient of variation, Gini's Coefficient, Lorenz Curve. Moments, skewness and kurtosis. Quantiles and measures based on them. Box Plot. Outliers. (15)

*Probability:* Introduction, random experiments, sample space, events and algebra of events. Definitions of Probability: classical, statistical, and axiomatic. Conditional Probability, laws of addition and multiplication, independent events, theorem of total probability, Bayes' theorem and its applications. (20)

#### STAT-MD-CC1-1-P

#### **(Descriptive Statistics I & Probability I)**

1 Credit

**PRACTICAL**

#### **List of Suggested Practical**

- Diagrammatic representation of data.
- Problems based on construction of frequency distributions, cumulative frequency distributions and their graphical representations, stem and leaf plot.
- Problems based on measures of central tendency.
- Problems based on measures of dispersion.
- Problems based on combined mean and variance and coefficient of variation.
- Problems based on moments, skewness and kurtosis.
- Problems related to quantiles and measures based on them, construction of boxplot.
- Application problems based on Classical Definition of Probability.
- Application problems based on Bayes' Theorem.

### **Reference Books:**

- Goon, A.M., Gupta, M.K. and Dasgupta, B.: Fundamentals of Statistics, Vol. I, World Press, Kolkata.
- Goon, A.M., Gupta, M.K. & Dasgupta, B.: An Outline of Statistical Theory (Vol-1), World Press.
- Miller, Irwin and Miller, Marylees: John E. Freunds Mathematical Statistics with Applications, Pearson Education, Asia.
- Mood, A.M., Graybill, F.A. and Boes, D.C.: Introduction to the Theory of Statistics, Tata McGraw-Hill Pub. Co. Ltd.
- Tukey, J.W.: Exploratory Data Analysis, Addison-Wesley Publishing Co.
- Freedman, D., Pisani, R. and Purves, R.: Statistics, W.W. Norton & Company.
- Chung, K.L.: Elementary Probability Theory with Stochastic Process, Springer/Narosa.
- Feller, W.: An Introduction to Probability Theory & its Applications, John Wiley.
- Parzen, E.: Modern Probability Theory and its Applications, John Wiley.
- Uspensky, J.V.: Introduction to Mathematical Probability, McGraw Hill.
- Cacoullos, T.: Exercises in Probability, Narosa.
- Rahman, N.A.: Practical Exercises in Probability and Statistics, Griffin.
- Ross, S.: A First Course in Probability, Prentice Hall.
- Roychowdhury, S., Bhattacharya, D.: Statistics Theory and Practice, U.N. Dhur & Sons. Pvt. Ltd.
- Gupta, S.C., Kapoor, V.K.: Fundamentals of Mathematical Statistics, Sultan Chand & Sons