# STATISTICS MINOR

**STAT-H-MC1-3-Th**                                                                                           **3 Credits**

**(Descriptive Statistics-I&-Probability-I)**                                              **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.Stemandleafdisplays.                              (10)

*Measures of CentralTendency*: Mean,Median,Mode.

*Measures of Dispersion*: Range, Mean deviation, Standard deviation, Coefficient of variation, Ginis Coefficient, LorenzCurve. 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-H-MC1-3-P**                                                                                           **1Credit**

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

## List of Suggested Practical

- Diagrammaticrepresentationof data.
- Problems based on construction of frequency distributions, cumulative frequency distributions and their graphical representations, stem and leaf plot.
- Problems based on measures of centraltendency.
- 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.

### *ReferenceBooks:*

➢ 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), WorldPress.

➢ Miller, Irwin and Miller, Marylees: John E. Freunds Mathematical Statistics withApplications, 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, McGrawHill.

➢ Cacoullos, T.: Exercises in Probability, Narosa.

➢ Rahman, N.A.: Practical Exercises in Probability and Statistics, Griffin.

➢ Ross, S.: A First Course in Probability, PrenticeHall.

➢ Roychowdhury, S., Bhattacharya, D.: Statistics Theory and Practice, U.N.Dhur & Sons.Pvt.Ltd.