STAT-H-CC1-1-Th / STAT-H-MC1-1-Th / 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. Stem and leaf displays. (10)

Measures of Central Tendency: Mean, Median, Mode. Measures of Dispersion: Range, Mean deviation, Standard deviation, Coefficient of variation, Ginis 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-H-CC1-1-P / STAT-H-MC1-1-P / STAT-H-MC1-3-P **1 Credit**

(Descriptive Statistics I & Probability I) **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 box plot.
- 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. (2002): Fundamentals of Statistics, Vol. I & II, 8th Edn. The World Press, Kolkata.

Miller, Irwin and Miller, Marylees (2006): John E. Freunds Mathematical Statistics with Applications, (7th Edn.), Pearson Education, Asia.

Mood, A.M., Graybill, F.A. and Boes, D.C. (2007): Introduction to the Theory of Statistics, 3rd Edn. (Reprint), Tata McGraw-Hill Pub. Co. Ltd.

Tukey, J.W.(1977): Exploratory Data Analysis, Addison-Wesley Publishing Co.

Freedman, D., Pisani, R. and Purves, R. (2014): Statistics, 4th Edition, W. W. Norton & Company.

Chung, K.L. (1983): Elementary Probability Theory with Stochastic Process, Springer / Narosa.

Feller, W. (1968): An Introduction to Probability Theory & its Applications, John Wiley.

Goon, A.M., Gupta, M.K. & Dasgupta, B. (1994): An Outline of Statistical Theory (Vol-1), World Press.

Parzen, E. (1972): Modern Probability Theory and its Applications, John Wiley.

Uspensky, J.V. (1937): Introduction to Mathematical Probability, McGraw Hill.

Cacoullos, T. (1973): Exercises in Probability, Narosa.

Rahman, N.A. (1983): Practical Exercises in Probability and Statistics, Griffin.

Ross, S. (2002): A First Course in Probability, Prentice Hall.