

**SV UNIVERSITY: TIRUPATI**  
**B.A/B.Sc., STATISTICS (WM) CBCS REVISED SYLLABUS 2020-21**

Semester – II (CBCS With Maths Combination Common to BA/BSc)

Paper - II: Probability Distributions and Statistical Methods

UNIT-I

**Discrete Distributions:** Binomial, Poisson, Negative Binomial, Geometric distributions: Definitions, means, variances, M.G.F, C.F, C.G.F, P.G.F, additive property if exists. Poisson approximation to Binomial distribution. Hyper-geometric distribution: Definition, mean and variance.

UNIT - II

**Continuous Distributions:** Rectangular, Exponential, Gamma, Beta Distributions: mean , variance, M.G.F, C.F. **Normal Distribution:** Definition, Importance, Properties, M.G.F, additive property.

UNIT-III

**Correlation:** Meaning, Types of Correlation, Measures of Correlation: Scatter diagram, Karl Pearson's Coefficient of Correlation, Rank Correlation Coefficient (with and without ties), Bi-variate frequency distribution, correlation coefficient for bi-variate data and simple problems.

**Regression :** Concept of Regression, Linear Regression: Regression lines, Regression coefficients and its properties, Regressions lines for bi-variate data and simple problems. Correlation vs regression.

Unit IV

**Curve fitting:** Bi- variate data, Principle of least squares, fitting of degree polynomial. Fitting of straight line, Fitting of Second degree polynomial or parabola, Fitting of power curve and exponential curves.

UNIT-V

**Attributes :** Notations, Class, Order of class frequencies, Ultimate class frequencies, Consistency of data, Conditions for consistency of data for 2 and 3 attributes only , Independence of attributes , Association of attributes and its measures, Relationship between association and colligation of attributes, Contingencytable: Square contingency, Mean square contingency, Coefficient of mean square contingency, Tschuprow's coefficient of contingency.

*Text Books:*

1. V.K.Kapoor and S.C.Gupta: Fundamentals of Mathematical Statistics, Sultan Chand & Sons, New Delhi.
- 2 BA/BSc I year statistics - descriptive statistics, probability distribution - Telugu Academy - Dr M.Jaganmohan Rao, Dr N.Srinivasa Rao, Dr P.Tirupathi Rao, Smt.D.Vijayalakshmi.
3. K.V.S. Sarma: Statistics Made Simple: Do it yourself on PC. PHI

#### Reference Books

1. Willam Feller: Introduction to Probability theory and its applications. Volume –I, Wiley
2. Goon AM, Gupta MK, Das Gupta B : Fundamentals of Statistics , Vol-I, the World Press Pvt.Ltd.,Kolkata.
3. Hoel P.G: Introduction to mathematical statistics, Asia Publishinghouse.
4. M. JaganMohan Rao and Papa Rao: A Text book of StatisticsPaper-I.
5. Sanjay Arora and Bansi Lal: New Mathematical Statistics: Satya Prakashan , NewDelhi
6. Hogg Tanis Rao: Probability and Statistical Inference. 7<sup>th</sup>edition.Pearson.

**Credits 2**

#### Practicals Paper – II

1. Fitting of Binomial distribution – Direct method.
2. Fitting of binomial distribution – Recurrence relation Method.
3. Fitting of Poisson distribution – Direct method.
4. Fitting of Poisson distribution - Recurrence relation Method.
5. Fitting of Negative Binomial distribution.
6. Fitting of Geometric distribution.
7. Fitting of Exponential distribution.
8. Fitting of Normal distribution – Areas method.
9. Fitting of Normal distribution – Ordinates method.
10. Computation of correlation coefficient and regression lines direct method
11. Computation of correlation coefficient, forming regression lines –Deviation method
12. Calculation of Correlation Coefficient for Bivariate table
13. Fitting of straight line by the method of least squares(for even observations)
14. Fitting of parabola by the method of least squares(for odd observations)
15. Fitting of power curve of the type by the method of least squares.
16. Fitting of exponential curve of the type and by the method of least squares.
17. Computation of Yule's coefficient of association
18. Computation of Pearson's, Tschprovs coefficient of contingency

Note: Training shall be on establishing formulae in Excel cells and derive the results. The excel output shall be exported to MS word for writing inference.

#### **Course Learning Outcomes**

Students will acquire

- 1) ability to distinguish between random and non-random experiments,
- 2) knowledge to conceptualize the probabilities of events including frequentist and axiomatic approach. Simultaneously, they will learn the notion of conditional probability including the concept of Bayes' Theorem,
- 3) knowledge related to concept of discrete and continuous random variables and their probability distributions including expectation and moments,
- 4) knowledge of important discrete and continuous distributions such as Binomial, Poisson, Geometric, Negative Binomial and Hyper-geometric, normal, uniform, exponential, beta and gamma distributions,
- 5) to apply standard discrete and continuous probability distributions to different situations.