

**ST.JOSEPH'S COLLEGE FOR WOMEN (AUTONOMOUS),VISAKHAPATNAM**  
**II SEMESTER**                                      **STATISTICS**                                      **TIME: 4HRS/WEEK**  
**MATHEMATICAL EXPECTATION AND PROBABILITY DISTRIBUTION**  
**ST 2201(3)**                                      **SYLLABUS**                                      **MAX.MARKS:100**

**Unit-I**

Mathematical expectation : Mathematical expectation( ME) of a random variable and function of a random variable. Moments and covariance using mathematical expectation with examples. Addition and Multiplication theorems on expectation. Definitions of M.G.F, C.G.F, P.G.F, C.F its properties. Chebyshev and cauchy - Schwartz inequalities.

**Unit-II**

Discrete Distributions : Binomial and Poisson distributions, their definitions, 1st to 4 central moments, M.G.F, C.F, C.G.F, P.G.F, mean, variance, additive property if exists. Possion approximation to Binomial distribution.

**Unit-III**

Negative Binomial, geometric, hyper geometric distributions - Definitions, means, variances, M.G.F, C.F, C.G.F, P.G.F, reproductive property if exists. Binomial approximation to Hyper Geometric Distribution, Poisson approximation to Negative binomial distribution.

**Unit-IV**

Continuous Distributions : Rectangular, Exponential, Gamma, Beta Distributions of two kinds. Other properties such as mean , variance, M.G.F, C.G.F, C.F, reproductive property.

**Unit - V**

Normal Distribution: Definition, Importance, Properties, M.G.F, additive properties, Interrelation between Normal and Binomial, Normal & Poisson distribution. Cauchy Distribution .

**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., Kolakota.

3. Hoel P.G: Introduction to mathematical statistics, Asia Publishing house.

4. M. JaganMohan Rao and Papa Rao: A Text book of Statistics Paper-I.

5. Sanjay Arora and Bansi Lal: New Mathematical Statistics: Satya Prakashan , New Delhi

6. Hogg Tanis Rao: Probability and Statistical Inference. 7th edition Pearson.

**Practicals - Semester – II**

Conduct any 6 (Ms-excel is compulsory)

1. Fitting of Binomial Distribution – Recurrence relation method.

2. Fitting of Poisson Distribution - Recurrence relation method.

3. Fitting of Negative Binomial Distribution.

4. Fitting of Geometric Distribution.

5. Fitting of Normal Distribution - Areas methods.

6. Fitting of Normal Distribution - Ordinates methods.

7. MS-Excel methods for the above Serial Numbers 1 and 2