

# **S.K.S.D. MAHILA KALASALA, UG & PG (A), TANUKU**

## **B.Sc I YEAR: STATISTICS SYLLABUS w.e.f. 2015-2016**

### **I SEMESTER**

#### **PAPER – I Descriptive Statistics and Probability**

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##### **Unit- I**

Origin, Development, Definition, Uses and Limitations (Nature and scope) of Statistics. Concepts of Primary and Secondary data. Methods of collection and editing of primary data. Designing a questionnaire and a schedule. Measures of Central Tendency – Mean, Median, Mode, Geometric Mean and Harmonic Mean.

##### **Unit- II**

Measures of dispersion: Range, Quartile Deviation, Mean Deviation and Standard Deviation. Central and Non- Central moments and their interrelationship. Sheppard's correlation for moments. Skewness and kurtosis.

##### **Unit- III**

Basic Concepts of Probability, random experiments, trial, outcome, sample space, event, mutually exclusive and exhaustive events, equally likely and favourable outcomes. Mathematical, Statistical, axiomatic definitions of probability. Conditional Probability and independence of events. Addition and multiplication theorems of probability for 2 and for n events. Boole's inequality and Baye's theorems and problems based on Baye's theorem.

##### **Unit - IV**

Definition of random variable, discrete and continuous random variables, functions of random variable. Probability mass function. Probability density function, Distribution function and its properties. Bivariate random variable – meaning, joint, marginal and conditional Distribution, independence of random variables.

##### **Reference Books (W.M.):**

1. Introduction to probability – Charles M. Grinstead, J. Laurie Snell.
2. Fundamentals of Mathematical Statistics by VK Kapoor & S.C. Gupta
3. Fundamentals of Statistics – Goon Gupta, Das Gupta
4. Sambavyatha avadi Sidhantam – Telugu Academy
5. Hoog. Taims Rao: Probability and Statistical Inferences 7<sup>th</sup> edition Pearson.
6. 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. Vijaya Lakshmi

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**B.Sc I YEAR: STATISTICS SYLLABUS w.e.f. 2015-2016**

## **I SEMESTER Practicals**

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### **Practicals - Semester - I**

1. Diagrammatic representation of data (Bar and Pie)
2. Graphical representation of data (Histogram, Frequency polygon, Frequency curves, Ogives)
3. Central and Non central moments and Sheppard's corrections for moments.
4. Measures of Skewness and Kurtosis.
5. MS-Excel methods for the above Serial Numbers 1,2,4.

#### **Note:**

1. MS-Excel methods to be made mandatory for all the Semesters after proper training only to the teaching staff by the University concerned.

#### **Reference Books (W.M.):**

1. Introduction to probability – Charles M. Grinstead, J. Laurie Snell.
2. Fundamentals of Mathematical Statistics by VK Kapoor & S.C. Gupta
3. Fundamentals of Statistics – Goon Gupta, Das Gupta
4. Sambavyatha avadi Sidhantam – Telugu Academy
5. Hoog. Taims Rao: Probability and Statistical Inferences 7<sup>th</sup> edition Pearson.
6. 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. Vijaya Lakshmi

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**B.Sc I YEAR: STATISTICS SYLLABUS w.e.f. 2015-2016**

## **II SEMISTER**

### **PAPER – II Mathematical Expectation and Probability Distributions**

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#### **Unit - I**

Mathematical expectation of a random variable and of a 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. Statements of properties. Chebyshev and Cauchy – Schwartz inequalities.

#### **Unit – II**

Discrete Distributions : Binomial, Poisson and Negative Binomial distributions – Definitions, means, variances, M.G.F., C.G.F., P.G.F., C.F., reproductive property if exists. Poisson Approximation to Binomial and poisson distributions.

#### **Unit – III**

Geometric, Hyper geometric, Rectangular, Exponential Distributions - Definitions, means, variances, M.G.F., C.G.F., P.G.F., C.F., reproductive property if exists. Binomial Approximation to Hyper Geometric distribution.

#### **Unit – IV**

Continuous Distributions: Gamma, Beta distributions of 2 kinds (means & variances only). Other Properties such as M.G.F., C.G.F., P.G.F., C.F., reproductive property if exists.

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

#### **Reference Books (W.M.):**

1. Introduction to probability – Charles M. Grinstead, J. Laurie Snell.
2. Fundamentals of Mathematical Statistics by VK Kapoor & S.C. Gupta
3. Fundamentals of Statistics – Goon Gupta, Das Gupta
4. Sambavyatha avadi Sidhantam – Telugu Academy
5. Hoog. Taims Rao: Probability and Statistical Inferences 7<sup>th</sup> edition Pearson.
6. 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. Vijaya Lakshmi

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**B.Sc I YEAR: STATISTICS SYLLABUS w.e.f. 2015-2016**

## **II SEMISTER Practicals**

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### **Practicals – Semester - II**

1. Fitting of Binomial Distribution - Direct and Recurrence methods.
2. Fitting of Poisson Distribution – Direct and Recurrence methods.
3. Fitting of Negative Binomial Distribution.
4. Fitting of Geometric Distribution.
5. Fitting of Normal Distribution – Areas and Ordinates methods.
6. MS-Excel methods for the above Serial Numbers 1 and 2.

### **Reference Books (W.M.):**

1. Introduction to probability – Charles M. Grinstead, J. Laurie Snell.
2. Fundamentals of Mathematical Statistics by VK Kapoor & S.C. Gupta
3. Fundamentals of Statistics – Goon Gupta, Das Gupta
4. Sambavyatha avadi Sidhantam – Telugu Academy
5. Hoog. Taims Rao: Probability and Statistical Inferences 7<sup>th</sup> edition Pearson.
6. 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. Vijaya Lakshmi

**S.K.S.D. MAHILA KALASALA, UG & PG (A), TANUKU**  
**BSC II YEAR : STATISTICS SYLLABUS**  
(With Mathematics Combination)  
Semester - III CBCS

**Paper - III Statistical Methods**

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**Unit-I**

Correlation: Def., scatter diagram ,its coefficient and its properties. scatter diagram, computation of correlation coefficient for ungrouped data. spearman's rank correlation coefficient, properties of spearman's correlation coefficients and problems.

**Unit-II**

Regression: simple linear regression, properties of regression coefficients. Regression lines, Concept of Correlation ratio, partial and multiple correlation coefficients, correlation verses regression and their problems - Curve fitting: Method of least square - Fitting of linear, quadratic, Exponential and power curves and their problems.

**Unit-III**

Attributes: Introduction, Nature, and consistency and mention its conditions. Independence and association of attributes, co-efficient of association, coefficients of contingency and their problems.

**Unit -IV**

Exact sampling distributions: Concept of population, Parameter, random sample, Need of taking sample, concept of sampling, Sample Vs. Census statistic, sampling distribution, standard error. Statement and Properties of  $\chi^2$ , t, F distributions and their inter relationships.

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**STATISTICS METHODS**

**PRACTICAL SEMESTER - III**

**Conduct any 6 (Ms-exel is compulsory)**

- 1. Fitting of straight line.**
- 2. Fitting of exponential curves.**
- 3. Fitting of power curve.**
- 4. Computation of correlation coefficient & Fitting of Regression lines.**
- 5. Rank correlation coefficient.**
- 6. Computation of Contingency coefficients.**

**MS-Excel methods any for the Serial Numbers 1,2,4,5**

**S.K.S.D. MAHILA KALASALA, UG & PG (A), TANUKU**  
**BSC II YEAR : STATISTICS SYLLABUS**  
**(With Mathematics Combination)**  
**Semester - IV CBCS.**  
**Paper - IV : Statistical Inference**

**UNIT-I**

Theory of estimation: Estimation of a parameter, criteria of a good estimator – unbiasedness, consistency, efficiency, & sufficiency and. Statement of Neyman's factorization theorem. Estimation of parameters by the methods of moments and maximum likelihood (M.L), properties of MLE's. Binomial, Poisson & Normal Population parameters estimate by ML method. Confidence intervals of the parameters of normal population.

**UNIT II**

Concepts of Statistical hypothesis: Null and alternative hypothesis, critical region, two types of errors, level of significance, power of a test. 1 tailed, 2 tailed tests, Neyman - Pearson's lemma. Examples in of Binomial. Poisson, Normal distributions.

**UNIT -III**

Large Sample Tests : Large sample tests for single mean, two means, Single proportion, Two proportions, Standard Deviation of single and double samples and Fisher's Z transformation .

**UNIT -IV**

Small sample tests: Tests of significance based on  $\chi^2$ , t and F.  $\chi^2$ -test for test for independence of attributes, t-test for single, double and paired tests, Variance Ratio Test(F-test), Equality of Means Test, Introduction of 'ANOVA'. Non-parametric tests - Advantages and Disadvantages. Two sample run test, two sample Median test and Two sample sign test.

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## **Practicals Semester – IV**

Conduct any 6 (Ms-exel is compulsory)

1. Large sample tests for mean(s).
2. Large sample tests for proportion(s).
3. Large sample tests for standard deviation(s).
4. Large sample tests for Fisher's Z- transformation.
5. Small sample tests for Single and Doublet-test.
6. Small sample tests for Paired t-test.
7. F-Test.
8. Chi square test for independence of attributes.
9. Non-parametric testst – run test.
10. Non-parametric tests - median test.
- 11 Non-parametric tests - sign tests.
12. MS-Excel methods for the above Serial Numbers  
1,2,3,4.(any one of above)

**S.K. S. D. Mahila Kalasala (U.G&P.G.) (A), Tanuku-534211**  
(Affiliated to Adikavi Nannaya University, Rajamahendravaram)  
**III B.Sc., : STATISTICS SYLLABUS (w.e.f.2017-18)**  
**Semester-V**

**Paper - V : Sampling Techniques and Design of Experiments**

**Unit-I**

**Sampling Theory:** Principle steps in a sample survey, Censuses versus sample survey, sampling and Non-sampling errors. Types of sampling - subjective, probability and mixed sampling methods.

**Unit-II**

**Simple Random Sampling :** Meaning of Samples and methods to draw, estimation of population mean, variances in SRSWR & SRSWOR. Advantages and Disadvantages of these methods.

**Unit-III**

**Stratified Random sampling:** Proportional and optimum allocation of sample sizes in stratification. Variances of these methods. Comparison of their relative efficiencies. Advantages and Disadvantages of stratified sampling. Concept of systematic sampling Advantages and disadvantages.

**Unit-IV**

**Analysis of Variance:** Causes of variation, Statement of Cochran's theorem, One - way with equal and unequal classifications and two way classifications.

**Design of Experiments:** Principles of experimentation in Designs, analysis of completely randomised design (CRD), Randomised block design (RBD) and Latin square design (LSD), efficiency of these designs. Concept of Factorial experiments.

**Text Books:**

1. Telugu Academy BA/BSc III year paper - III Statistics - applied statistics - Telugu academy by prof. K. Srinivasa Rao, Dr D. Giri, Dr A. Anand, Dr V. Papaiah Sastry.
- K.V.S. Sarma Statistics Made Simple: Do it yourself on PC. PHI.

**Reference Books:**

1. Fundamentals of applied statistics : VK Kapoor and SC Gupta.
2. Anuvarthita Sankhyaka Sastram - Telugu Academy.

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(Affiliated to Adikavi Nannaya University, Rajamahendravaram)  
**III B.Sc., : STATISTICS PRACTICAL SYLLABUS (w.e.f.2017-18)**  
**Semester-V**

**Paper - V : Sampling Techniques and Design of Experiments**

**Practicals Semester - V** Conduct any 6 (Ms-excel is compulsory)

1. Estimation of population Mean, variance by SRSWOR.
2. Estimation of population Mean, variance by SRSWR.
3. ANOVA One -way classification.
4. ANOVA-CRD.
5. ANOVA - RBD.
6. ANOVA - LSD.
7. Ms-excel methods for the above serial numbers 4,5,6(any one)

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**III B.Sc., : STATISTICS SYLLABUS (w.e.f.2017-18)**  
**Semester-V**

**Paper - VI : Quality and Reliability**

**Unit-I** Importance of SQC in industry, statistical basis of shewart control charts, uses of control charts., control limits, Natural tolerance limits and specification limits.concept of six-sigma

**Unit - II**

**Variable Control Chart:** Construction of mean , R ,s.d,charts for variables, Interpretation of control charts

**Attribute control charts-** nP, P charts, C chart, Interpretation of control charts. **Unit-III**

**Acceptance sampling plans:** Scope, Producer's risk and consumer's risk . Concepts of AQL and LTPD.

**Unit-IV**

**Sampling Plans:** Single and double sampling plans, OC and ASN functions, Double and single Sampling plans for attributes using Binomial.

**Unit-V Reliability:** Introduction, failure rates, Hazard function, estimation of reliability, exponential distribution as life model, its memoryless property.

**Text Books:**

1.BA/BSc III year paper - IV Statistics - applied statistics - Telugu academy by Prof.K.SrinivasaRao, Dr D.Giri. Dr A.Anand, Dr V.PapaiahSastry.

2. Fundamentals of applied statistics : VK Kapoor and SC Gupta

1. S.K Sinha: Reliability and life testing. Wiley Eastern.

**S.K. S. D. Mahila Kalasala (U.G&P.G.) (A),Tanuku-534211**  
(Affiliated to Adikavi Nannaya University, Rajamahendravaram)

**III B.Sc., : STATISTICS PRACTICAL SYLLABUS (w.e.f.2017-18)**  
**Semester-V**

**Paper - VI : Quality and Reliability**

**Practical's - Semester - V** Conduct any 6 (Ms-excel is compulsory)

1Construction of( mean ,R) charts.

2.Construction of P-chart-Fixed sample size.

3. Construction of P-chart-variable Sample size

4. Construction of nP-Chart .

5.Construction of C-Chart.

6.MS-Excel methods for the Serial Numbers 1.

7.MS-Excel methods for the Serial Numbers 2 to 4.(any one)

**S.K. S. D. Mahila Kalasala (Degree&P.G.) (A)::Tanuku-534211**  
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**III B.Sc., Degree Examination (at the end of VI Semester)**

**STATISTICS SYLLABUS**

**(With Mathematics Combination)**

**Semester – VI CBCS**

**Paper – VII – B: Optimization Techniques**

**(With effect from 2015-2016 admitted Batch)**

**Unit –I**

**Operations Research:** Origin and development of O.R., Nature and features of O.R., Scientific

method and Modeling in O.R., Advantages and limitations of models, General solution methods

for O.R., models.

**Unit -II**

**Linear Programming Problem:** Definition, components, basic assumptions, Mathematical

formulation of the problem, Illustrations on mathematical formulation of L.P.P. L.P.P. –

graphical solution method, some exceptional cases in graphical method- Alternative optima,

unbounded solution and infeasible solution.

**Unit -III**

**Linear Programming Problem-Simplex Method-I :**General L.P.P. –Objective function,

constraints, non-negative restrictions, Solution of L.L.P, feasible solution and optimum solution,

Canonical and Standard forms of L.P.P., Basic solution- definition, degenerate solution, basic

feasible solution, Associated cost vector, improved basic feasible solution, optimum basic

feasible solution and net evaluation, Fundamental theorem of L.P.P, The computational

procedure- Simplex Algorithm, Simple linear programming problems.

#### **Unit -IV**

**Linear Programming Problem Simplex Method -II:** Artificial Variable Technique,

The Big  $M$  Method or Penalties, Degeneracy, Alternative optima, unbounded solutions, Non

existing or infeasible solutions.

**Duality in Linear Programming:** General primal – Dual pair, formulating a dual problem,

Primal-Dual Pair in Matrix form, Duality

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**III B.Sc., Degree Examination (at the end of VI Semester)**

**STATISTICS SYLLABUS**

**(With Mathematics Combination)**

**Semester – VI CBCS- CLUSTER - B**

**Paper – VIII - B1: Operations Research – I**

**(With effect from 2015-2016 admitted Batch)**

**Unit –I**

**Linear Programming Problem – Advanced Techniques:** Revised Simplex Method –

Algorithm, Simple Problems (2 and 3 variables), Simplex method versus revised simplex

method, Bounded Variables- Computational procedure, Simple problems (2 and 3 variables).

**Unit –II**

**Transportation Problem:** L.P. formulation of the Transportation problem, Tabular

Representation, Initial Basic Feasible Solution (I.B.F.S) to Transportation Problem, North west

Corner, least cost and Vogles approximation Methods.

**Transportation Problem:** The Optimality Test – Transportation Algorithm – MODI (Modified

Distribution Method), Degeneracy Transportation Problem.

**Unit –III**

**Assignment Problem:** Mathematical Formulation of the problem, Hungarian method for

assignment problem, Special cases in Assignment problems – Unbalanced, Prohibited,

Maximization. Travelling Salesman Problem.

#### **Unit -IV**

##### **Sequencing Problem:**

Problem of Sequencing, Principal Assumptions, Solution of Sequencing, Problem – Processing n

jobs through 2-Machines and Processing n jobs through 3-Machines-Johnson's Optimal

sequence Algorithm, Processing n jobs through k-Machines – Johnson's Optimal sequences

Algorithm, Simple Problems.

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**III B.Sc., Degree Examination (at the end of VI Semester)**  
**STATISTICS SYLLABUS**

**Cluster –B: Paper – VIII – B2: Operations Research – II**

**Unit –I**

**Games and Strategies:** Introduction, Two person zero sum games, some basic terms, the Maxima-Minima Principle, Games without saddle points – Mixed strategies, Graphical Solutions of  $2 \times n$  and  $m \times 2$  Games, Dominance property.

**Unit –II**

**Inventory Control – I:** Basic concept of inventory problem, Types of inventories and Cost associated with inventories, Factors affecting inventory control, the concept of EOQ (Economic Order Quantity), Deterministic inventory Problems (Static Demand Model).

**Unit –III**

**Inventory Control – II:** Price Breaks (Quantity Discounts): Problems of EOQ with – One price break and More than one price break, Simple problems, Probabilistic inventory models, Instantaneous demand, No setup cost model – Discrete case and Continuous case, Newspaper Boy Problem, Simple Problem.

**Unit –IV**

**Network Scheduling – I:** Basic steps in PERT/CPM technique Basic components, Logical sequencing (errors in drawing networks), Rules for network construction, Critical path analysis – Forward pass Method Backward pass Method, Determination of floats and slack times, Simple problems.

**Network Scheduling – II:** Probability considerations in PERT (Project Evaluation and Review Technique), Distinction between PERT and CPM, Applications of network techniques, Limitations and difficulties in using Network, Project Cost, Time Cost optimization algorithm, Simple Problems.

### **List of Reference Books:**

1. Quality, Reliability & Operations Research, First Edition (2010), Published by Telugu Academy, Hyderabad.
2. Operations Research Theory, Methods and Applications, S.D. Sharma, Himanshu
3. Sharma, improved and enlarged edition, Kedar Nath Ram Nath & Co., Meerut.
4. Krishna's Operations Research, Dr.R.K.Gupta, 27<sup>th</sup> Edition ,2010, Krishna Prakashan Media(P) Ltd., Meerut.
5. Operations Research: theory and Applications, J.K.Sharma, 5th Edition, 2013, Macmillan.
6. Operations Research: An Introduction, Hamy A.Taha, 9<sup>th</sup> edition, 2010, prentice Hall.

**S.K.S.D. MAHILA KALASALA, UG & PG (AUTONOMOUS), TANUKU**

(Grant-in-Aid Institution, Affiliated to Adikavi Nannaya University)

Re-accredited by NAAC with 'B' Grade at 2.81 CGPA

**III B.A., B.Com.& B.Sc.**

**DISASTER MANAGEMENT SYLLABUS (w.e.f.2017-18)**

**SEMESTER – VI**

**Paper – IX (Elective Paper – 3)**

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**UNIT - I:**

Introduction to Disaster Management: Meaning, Definition, Nature, Scope of Disaster Management

**UNIT - II:**

Natural Hazards: causes, distribution pattern, consequences and mitigation measures for : Earthquake, Tsunami

**UNIT - III:**

Natural Hazards: causes, distribution pattern, consequences and mitigation measures for : Cyclone, Flood

**UNIT - IV:**

Natural Hazards: causes, distribution pattern, consequences and mitigation measures for : Drought, Landslide