D.K. GOVT. COLLEGE FOR WOMEN (AUTONOMOUS), NELLORE.

BOARD OF STUDIES

2018-19

DEPARTMENT OF STATISTICS

Verified by AC

DK Govt. College for women (Autonomous), Nellore

CBCS SYLLABUS (Semester wise) 2018-19

BSC I YEAR: STATISTICS SYLLABUS

(With Mathematics Combination)

Semester - I CBCS (I Year)

Paper – I : Descriptive Statistics and Probability

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4 Hrs/Week

UNIT – I

Central and Non-Central moments and their interrelationship Sheppard's correction for moments, Measures of skewness based on quartiles and moments and kurtosis based on moments with examples.

UNIT – II

Basic concepts of Probability, random experiments, trial, outcome, sample space, event, mutually exclusive and exhaustive events, equally likely and favorable outcomes. Mathematical, Statistical, axiomatic definitions of probability. Conditional Probability and independence of events.

UNIT – III

Addition and multiplication theorems of probability for 2 and for a n events. Boole's inequality and Baye's theorems and problems based on Baye's theorem. Random variable: Definition, discrete and continuous random variables, functions of random variable. Probability mass function (p.m.f), Probability density function (p.d.f), Distribution function and its properties.

UNIT – IV

Bi variate random variable: definition, joint probabilities, densities, marginal and conditional probability and densities (definitions only). Mathematical expectation : Definition, function of a random variable. Moments, variance and covariance properties with proofs. Simple problems.

UNIT – V

Addition and Multiplication theorems on expectation for 2 events only. Definitions of moment generating function (mgf), characteristics fuction (cf), cumulant generating function (cgf) properties and proofs. Chebychev's Inequality and Cauchy schwartz's inequality.

Practicals – Semester – I

1. Calculation of coefficient of variation for continuous data.
2. Calculation of Central and non central moments for Ungrouped data
3. Calculation of Central and non central moments grouped data
4. Calculation of Beta and Gamma coefficients using Sheppard's corrections.
5. Measures of Skewness and Kurtosis.

Reference Books:

1. Introduction to probability – Charles M. rinstead, 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 Inference 7th edition Pearson.
6. B.A / B.Sc., I Year Statistics – descriptive Statistics, probability distribution – Telugu Academy – Dr. M. Jaganmohan Rao, Dr. N. Srinivasa Rao, Dr. P. Tirupathi Rao, Smt. D. Vijayalakshmi. 20

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DK Govt. College for women(Autonomous),Nellore
CBCS SYLLABUS (Semester wise) 2016-17
BSC I YEAR : STATISTICS SYLLABUS
(With Mathematics Combination)
Semester - II CBCS (I Year)
Probability Distributions

4 Hrs/Week

Unit-I

Binomial Distribution: Definition, mean, variance and mode. Moment generating function (mgf), characteristics fuction (cf), cumulant generating function (cgf), additive reproductive property, recurrence relation for moments, probabilities. Negative Binomial Distribution: definition, mean and variance, m.g.f and limiting case of poisson distribution.

Unit-II

Poisson Distribution : Definition, mean, variance and mode. Moment generating function (mgf), characteristics fuction (cf), cumulant generating function (cgf), additive reproductive property, recurrence relation for moments, probabilities. limiting case of poisson distribution Geometric Distribution: definition, mean and variance, m.g.f and lack of memory property. Hyper Geometric Distribution : mean and variance only.

Unit-III

Rectangular distribution: Mean, variance, mean deviation, moment generating function. Exponential Distribution: Mean and variance, moment generating function, lack of memory.

Unit-IV

Beta Distributions of two kinds; Definitions of two kinds, mean and variance for two kinds. Gamma distribution; mean , variance, M.G.F, C.F, reproductive property.

Unit - V

Normal Distribution: Definition, Importance, Properties of Normal distribution, . Moment generating function (mgf), characteristics fuction (cf), cumulant generating function (cgf), additive reproductive property, Odd and even order moments of Normal distribution, QD: MD:SD:: 10:12:15, Area property and simple problems. ND as a limiting case of Poisson distributions.

Practicals - Semester – II Conduct any 6 (Ms -excel is compulsory)

1. Fitting of Binomial Distribution – Direct method.
2. Fitting of Binomial Distribution – Indirect method.
3. Fitting of Poisson Distribution – Direct method.
4. Fitting of Poisson Distribution – Indirect method.
5. Fitting of Negative Binomial Distribution.
6. Fitting of Normal Distribution - Areas methods.
7. Fitting of Normal Distribution - Ordinates methods.
8. MS-Excel methods for the above Serial Numbers

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.

H.V. Lakshmi Rao 17/4/18

Govt. College for women (Autonomous), Nellore

CBCS SYLLABUS (Semester wise) 2016-17

BSC I I YEAR : STATISTICS SYLLABUS

(With Mathematics Combination)

Semester –III CBCS (I I Year)

Paper – III Statistical Methods

4Hrs/Week

Unit – I

Curve fitting: Method of least square – Fitting of linear, quadratic, Exponential and power curves and their problems. Attributes: Introduction, Nature, and consistency and mention its conditions. Concept of Independent and association of attributes.

Unit-II

Correlation: Def., scatter diagram, its coefficient and its properties. , scatter diagram, computation of correlation coefficient for ungrouped data. (Numerical Problems only) Spearman's rank correlation coefficient, properties of spearman's correlation coefficients(Numerical Problems only)

Unit-III Regression: simple linear regression, properties of regression coefficients and and Regression lines and their problems.

Unit-IV

Problem of estimation: Concept of population, Parameter, random sample, statistic, Estimation of a parameter, criteria of a good estimator – unbiasedness, consistency, efficiency, sufficiency and. Statement of Neyman's factorization theorem.

Unit –V

Methods of Estimation : Estimation of parameters by 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.

Text books

1. BA/BSc II year statistics – statistical methods and inference – Telugu Academy by A. Mohanrao, N.Srinivasa Rao, Dr R.Sudhakar Reddy, Dr T.C. Ravichandra Kum.
2. B.A/B.Sc. Statistical Methods ,B.V.L.N.Jogi Raju,Kalyani Publications
3. Fundamentals of Mathematics statistics: VK Kapoor and SC Guptha.

Reference Books:

1. Outlines of statistics, Vol II : Goon Guptha, M.K.Guptha, Das Guptha B.
2. Introduction to Mathematical Statistics : Hoel P.G.

Practical – Semester –III

Conduct any 6 (Ms-excel is compulsory)

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

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CBCS SYLLABUS (Semester wise) 2018-19

BSC I YEAR: STATISTICS SYLLABUS

(With Mathematics Combination)

Semester – IV CBCS (II Year)

Paper – II : Statistical Hypothesis and Tests of Significance

4Hrs/Week

UNIT-I

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.

UNIT II

Exact sampling distributions: sampling distribution, standard error. Statement and Properties of $\chi 2$, t, F distributions and their inter relationships

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).

Unit-V

Non-parametric tests – Advantages and Disadvantages. Two sample run test, Two sample Median test and Two sample sign test.

TEXT BOOKS

1. BA/BSc II year statistics – statistical methods and inference – Telugu Academy by A.Mohanrao, N.Srinivasa Rao, Dr R.Sudhakar Reddy, Dr T.C. Ravichandra Kumar.
2. B.A/B.Sc. Statistical Inference ,B.V.L.N.Jogi Raju,Kalyani Publications

REFERENCE BOOKS:

1. Fundamentals of Mathematics statistics : VK Kapoor and SC Guptha.
2. Outlines of statistics, Vol II : Goon Guptha, M.K.Guptha, Das Guptha B.
3. Introduction to Mathematical Statistics : Hoel P.G.

Practicals Semester – IV

Conduct any 6 (Ms-exel is compulsory)

1.Large sample tests for mean(s).

2. Large sample tests for Fisher's Z- transformation.

3.Small sample tests for Paired t-test.

4.F-Test.

5. Chi square test for independence of attributes.

6. Non-parametric testst – run test.

7. Non-parametric tests - median test.

8. Non-parametric tests - sign tests.

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CBCS SYLLABUS (Semester wise) 2018-19

BSC III YEAR : STATISTICS SYLLABUS
(With Mathematics Combination)

Semester-V CBCS.

Paper - V Sampling Techniques and Design of Experiments

3 Hrs/Week

Unit-I

Sampling Theory: Principle steps in a sample survey, Censes versus sample survey, sampling and Non-sampling errors. .

Unit-II

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

Unit-III

Stratified random sampling: Proportional and optimum allocation of sample sizes in stratification. Variances in these methods and comparison with SRS. Systematic sampling : Systematic sampling when N = nk comparison and its variance of sample mean.

Unit-IV

Analysis of Variance: One way with equal and unequal classifications and two way classifications.

Unit - V

Design of Experiments: Principles of experimentation in Designs, analysis of completely randomised design (CRD), Randomised block design (RBD) and Latin square design (LSD) including one missing observation and concept of factorial Experiment.

Text Books:

1.Telugu AcademyBA/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.

2. 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.Indian Official statistics - MR Saluja.

3.Anuvarthita Sankyaka Sastram - Telugu Academy.

Practicals Semester – V

Conduct any 6 (Ms-exel is compulsory)

1. Estimation of population Mean, variance by SRSWOR.
2. Estimation of population Mean, variance by SRSWR.
3. Comparison of proportional, optimum allocations with SRSWOR.
4. Systematic Sampling .
5. ANOVA-CRD.
6. ANOVA - RBD with one missing observation.
7. ANOVA - LSD with one missing observation.
8. Ms-excel practicals.

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CBCS SYLLABUS (Semester wise) 2018-19

BA/BSC III YEAR : STATISTICS SYLLABUS

(With Mathematics Combination)

Semester-V CBCS.

Paper - VI Quality and Reliability

3 Hrs/Week

Unit-I

Importance of SQC in industry, statistical basis of shewart control charts, uses of control charts. Interpretation of control charts, control limits, Natural tolerance limits and specification limits.

Unit – II

Variable Control Chart: Construction of $\overline{X}$, R charts for variables, Attribute control charts- np, p- charts, C chart.

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.Srinivasa Rao, Dr D.Giri. Dr A.Anand, Dr V.Papaiah Sastry.

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

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

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CBCS SYLLABUS (Semester wise) 2018-19

BSC IIIYEAR: STATISTICS SYLLABUS

(With Mathematics Combination)

Semester – VI CBCS

Elective Paper – VII(A) : APPLIED STATISTICS

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3 Hrs/Week

Unit-I

Analysis of times series: Components of times series: meaning and examples, trend by least squares (straight line) methods and moving average methods. Seasonal indices by simple averages, ratio to moving average.

Unit-II

Index numbers: Meaning, problems involved in the construction of index Meaning, problems involved in the construction of index numbers, simple and weighted index numbers. Criteria of good index numbers. Fixed base and chain base index numbers. Cost of living index numbers, wholesale price index numbers

Unit-III

Official Statistics: Functions and organization of CSO and NSSO. Agricultural Statistics, Area Statistics, Yield statistics, National income and its computation.

Unit-IV

Vital statistics: Meaning, Definition, uses, sources of vital statistics, various Death rates-CDR,ASDR,STDR and Birth rates -CBR,ASFR,TFR.

Unit-V

Reproduction Rates: Measurement of population growth, crude rate of natural increase, Pearle's vital index, Gross Reproduction Rate[GRR], Net Reproduction Rates[NRR]. Life tables (Introduction and uses only)

Text Books:

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

2. 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.

Reference Books:

1.Indian Official statistics - MR Saluja.

2.Anuvarthita Sankyaka Sastram - Telugu Academy.

Pract icals – Semester -VI Paper- VII(A)

Conduct any 6 of the fol lowing

1.Measurement of Linear Trend

2.Measurement of Seasonal Indices

3. Reversal tests.

4.Cost of living Index Numbers.

5.Mortality rates

6. Fertility rates

7.Reproduction rates

8.Any one of the above Using MS-Excel

M.V. Chalapathi Rao 17/4/18

K. Sreenu 17/4/18

DK Govt. College for women (Autonomous), Nellore

CBCS SYLLABUS (Semester wise) 2018-19

BSC IIIYEAR: STATISTICS SYLLABUS

(With Mathematics Combination)

Semester – VI CBCS

Elective Paper – VII (B) : DEMOGRAPHY & VITAL STATISTICS

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3 Hrs/Week

Unit-I

Population Theories: Coverage and content errors in demographic data, use of balancing equations and Chandrasekharan - Deming formula to check completeness of registration data. Adjustment of age data, use of Myer and UN indices, Population composition, dependency ratio.

Unit-II

Vital Statistics: Introduction and sources of collecting data on vital statistics, errors in census and registration data. Measurement of population, rate and ratio of vital events, Measurements of Mortality: Crude Death Rate (CDR), Specific Death Rate (SDR), Infant Mortality, Rate (IMR) and Standardized Death Rates.

Unit – III

Vital Statistics: Stationary and Stable population, Central Mortality Rates and Force of Mortality. Life (Mortality) Tables: Assumptions, description, construction of Life Tables and Uses of Life Tables.

Unit-IV

Vital Statistics: Abridged Life Tables; Concept and construction of abridged life tables by Reed-Merrell method, Greville's method and King's Method. Measurements of Fertility: Crude Birth Rate (CBR), General Fertility Rate (GFR), Specific Fertility Rate (SFR) and Total Fertility Rate (TFR).

Unit –V

Vital Statistics: Measurement of Population Growth: Crude rates of natural increase, Pearl's Vital Index Gross Reproduction Rate (GRR) and Net Reproduction Rate (NRR).

Suggested Reading:

1. Mukhopadhyay P. (1999): Applied St atistics, Books and Allied (P) Ltd.

2. K.Srinivasan: Basic Demographic Techniques and Application

3. Gun, A.M., Gupta, M.K. and Dasgupta, B. (2008): Fundamentals of Statistics, Vol. II, 9th Edition, World Press.

4. Biswas, S. (1988): Stochastic Processes in Demography & Application, Wiley Eastern Ltd.

5. Croxton, Fredrick E., Cowden, Dudley J. and Klein, S. (1973): Applied General Statistics, 3rd Edition. Prentice Hall of India Pvt. Ltd.,

6. Keyfitz N., Beckman John A.: Demogrphy through Problems S-Verlag New York.

Practicals – Semester-VI Paper-VII(B)

1. Measurements of Mortality

2. Measurements of Fertility:

3. Life Tables (Real Population Method)

4. Life Tables (Hypothetical cohort method)

5. Construction of Abridged Life tables

6.Reproduction rates

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CBCS SYLLABUS (Semester wise) 2018-19

B.Sc III year STATISTICS (With Maths)

Semester – VI CBCS

Cluster Elective Paper – VIII(A1) : OPTIMIZATION TECHNIQUES

3 Hrs/Week

UNIT –I

Introduction: Origin and development of OR, Nature and features of OR, Meaning and Definitions of OR, Applications and Limitations of OR.

UNIT – II

Linear Programming Problem: Introduction, Mathematical formulation of the LPP, Canonical and standard form of LPP. Graphical solution of a Linear Programming Problem , Problems.

UNIT – III

Solution of LPP: Definitions of BFS, IBFS, Degenerate solution, Slack and Surplus variables, Optimum solution, Computational procedure of Simplex method , Big- M method and Problems.

UNIT – IV

Transportation Problem: Introduction, Transportation Table, General Transportation problem Initial basic feasible solution(IBFS) by North West Corner Rule, Least cost method and Vogel's Approximation Method (VAM), Un-Balanced Transportation Problem

UNIT –V

Assignment problem: Introduction, Mathematical formulation of the problem, Optimal solution by Hungarian method. Un balanced assignment problem, The travelling salesman problem.

Text Book:

1. B.A/B.Sc III Year Paper-IV Statistics- Quality Reliability and Operations Research Telugu Academy by Dr T.C.Ravichandra Kumar, Dr R.V.S.Prasad, Dr D.Giri, Dr.G.S.Devasena
2. Classical Optimization techniques by A.L.Cambo

List of reference books:

1. Taha, H. A. (2007): Operations Research: An Introduction, 8th Edition, Prentice Hall of India.
2. KantiSwarup, Gupta, P.K. and Manmohan (2007): Operations Research, 13th Edition, Sultan Chand and Sons.
3. S.Kalavathy, Operations Research, 4th Edition, Vikas Publishing

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CBCS SYLLABUS (Semester wise) 2018-19

B.Sc III year STATISTICS (With Maths)

Semester – VI CBCS

Cluster Elective Paper – VIII(A2) : NUMERICAL ANALYSIS

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3 Hrs/Week

UNIT – I

Finite Differences: Definitions of operators Δ, ∇ and E, - Properties - Relationship among operators-Difference Table- Uses- Estimation of single and Two Missing values- Newton's Binomial expansion rule- Problems

UNIT – II

Interpolation and Extrapolation: Interpolation in equal intervals-- Newtons's forward formula- Newtons back ward formula- Interpolation in unequal intervals- Lagranges formula- Problems

UNIT – III

Central Difference: Gauss Forward and Backward formulae- Sterling's formula- Problems

UNIT – IV

Numerical Differentiation: First and Second order derivatives-Newton,s forward and Back ward Differentiation formulae-, Gauss Forward and Backward differentiation formulae- Sterling's formula.

UNIT – V

Numerical Integration: Importance- General Quadrature rule- Trapezoidal Rule- Simpson's -1/3 Rule- Simpson's -3/8 Rule - Problems

List of reference books:

1. Statistical Methods by S.C.Gupta,

2. Gupta, S. C. and Kapoor, V.K. (2008): Fundamentals of Mathematical Statistics, New Edition(Reprint), Sultan Chand & Sons

3. Statistics and Numerical methods by Dr. A. Singaravelu, ARS Publications.

4. Sankhya Visleshanam- Telugu Academy