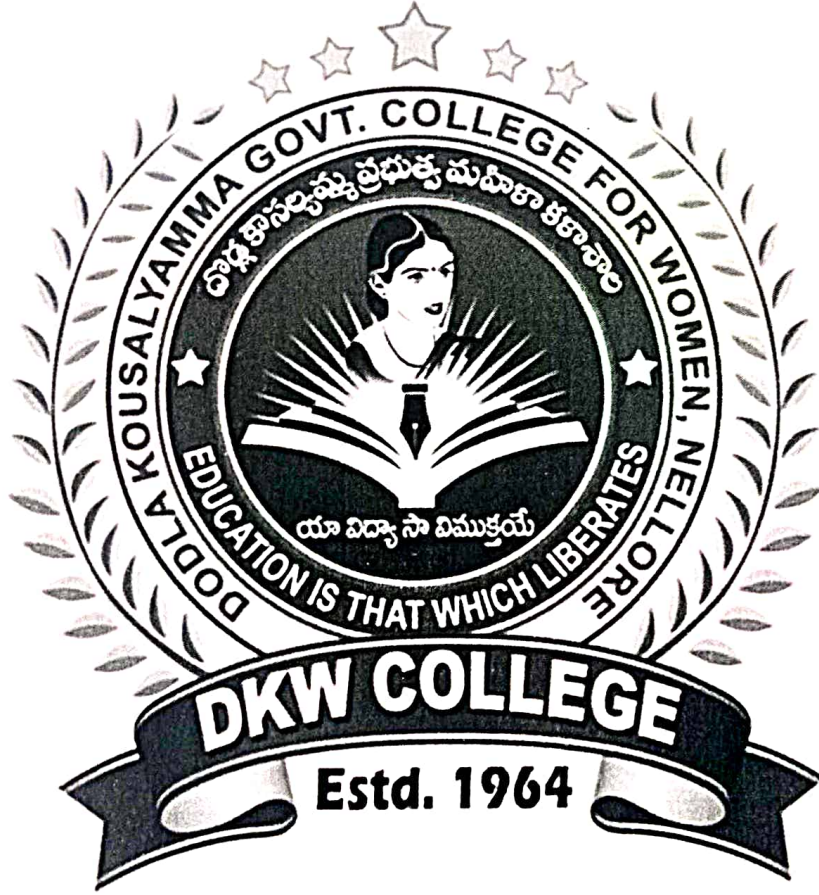


**D.K. GOVT. COLLEGE FOR WOMEN (A), NELLORE
SPSR NELLORE DISTRICT**

Re-accredited by NACC with A Grade

Recognized by UGC as “College with Potential for Excellence”



BOARD OF STUDIES

DEPARTMENT OF STATISTICS

2020-21

B.Sc., STATISTICS (WITH MATHEMATICS)
REVISED SYLLABUS
CBCS/SEMESTER SYSTEM (W.E.F 2020-21 ADMITTED BATCH)
SEMESTER – I
PAPER - I: DESCRIPTIVE STATISTICS

UNIT-I

Introduction to Statistics: Importance of Statistics. Scope of Statistics in different fields. Concepts of primary and secondary data. 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, Variance. Central and Non-Central moments and their interrelationship. Sheppard's correction for moments. Skewness and kurtosis.

UNIT-III

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

Correlation: Meaning, Types of Correlation, Measures of Correlation: Scatter diagram, Karl Pearson's Coefficient of Correlation, Rank Correlation Coefficient (with and without ties).

UNIT-IV

Regression: Concept of Regression, Linear Regression: Regression lines, Regression coefficients and its properties, and simple problems.

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, Contingency table: 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, Sulthand & 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 Goon AM, Gupta MK, Das Gupta B : Fundamentals of Statistics , Vol-I, the World Press Pvt.Ltd., Kolakota.
2. Hoel P.G: Introduction to mathematical statistics, Asia Publishing house.
3. M. JaganMohan Rao and Papa Rao: A Text book of Statistics Paper-I.
4. Sanjay Arora and Bansi Lal: New Mathematical Statistics: Satya Prakashan , New Delhi

B.Sc., STATISTICS (WITH MATHEMATICS)
REVISED SYLLABUS
CBCS/SEMESTER SYSTEM (W.E.F 2020-21 ADMITTED BATCH)
SEMESTER – II
PAPER - II: PROBABILITY THEORY AND DISTRIBUTIONS

UNIT-I

Introduction to Probability: 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 theorem

UNIT-II

Random variable: Definition of random variable, discrete and continuous random variables, functions of random variable. Probability mass function. Probability density function, Distribution function and its properties. For a given pmf, pdf calculation of Mean and Variance. Bivariate random variable - meaning, joint, marginal and conditional Distributions, independence of random variables

UNIT- III

Mathematical expectation : Mathematical expectation of a random variable and function of a random variable. Moments and covariance using mathematical expectation with examples. Addition and Multiplication theorems on expectation(Two variables Only).Definitions of M.G.F, C.G.F, P.G.F, C.F and their properties (Derivations not required).Chebyshev inequality.

UNIT-IV

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

UNIT - V

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

TEXT BOOKS:

1. V.K.Kapoor and S.C.Gupta: Fundamentals of Mathematical Statistics, Sultan Chand & Sons, New Delhi.
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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.

BSC II YEAR : STATISTICS SYLLABUS
(With Mathematics Combination)
Semester – III CBCS

Paper – III Statistical Methods

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. 95% and 99% Confidence intervals of the parameters of μ from normal population.

BSC II YEAR : STATISTICS SYLLABUS
(With Mathematics Combination)
Semester – IV CBCS.

PAPER – IV : STATISTICAL HYPOTHESIS AND TESTS OF SIGNIFICANCE

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 χ^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 χ^2 , t and F. χ^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.

BSC III YEAR : STATISTICS SYLLABUS

(With Mathematics Combination)

Semester-V (CBCS.)

Paper - VI -Sampling Techniques and Design of Experiments

Unit-I

Sampling Theory: Population, Census, Complete Enumeration , Limitations of Census method , Sampling Frame, Principle steps in a sample survey, Censes versus sample survey, Sampling and Non-sampling errors. Types of sampling - subjective, probability and mixed sampling methods, Advantages of Sampling over Complete Enumeration. Main Steps involved in Sample survey

Unit-II

Simple Random Sampling: Meaning of Samples and methods to draw , Methods of Selection Simple Random Sampling, estimation of population mean, Variances in SRSWR& SRSWOR. Comparison of SRSWR and SRSWOR, Merits and Demerits of SRS

Unit-III

Stratified random sampling: Proportional and optimum allocation of sample sizes in stratification. Variances in these methods. Systematic sampling: Systematic sampling when $N = nk$ comparison of their relative efficiencies. Advantages and Disadvantages of above methods of sampling.

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 randomized Design (CRD), Randomized block design (RBD) and Latin square design (LSD) including one Missing observation.

BSC III YEAR: STATISTICS SYLLABUS (With Mathematics Combination)
Semester-V CBCS.
Paper - VI Quality and Reliability

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 \bar{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.

REFERENCE BOOKS:

1. R.C.Gupta: Statistical Quality Control

THREE YEAR BA/B.SC (CBCS) DEGREE EXAMINATION
THIRD YEAR: SEMESTER-VI
Elective Paper – VII (A): APPLIED STATISTICS 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

Cost of living index numbers, wholesale price index numbers, Fixed base and chain base index numbers .**Vital statistics:** Meaning, Definition, uses, sources of vital statistics, various Death rates-CDR,ASDR,STDR .

UNIT-IV

Reproduction Rates: Birth rates -CBR,ASFR,GFR,TFR Measurement of population growth, crude rate of natural increase, Pearle's vital index, Gross Reproduction Rate [GRR], Net Reproduction Rates[NRR].

UNIT-V

Life table: Introduction - Components and Construction of Life-table, Inter Relations and Force of mortality. **Abridged Life-table:** Concept and Construction of abridged Life-tables .Concepts of Official Statistics—NSSO, CSO, Importance of National Income (Definitions only)