BSC SEM-III P-I

COURSE CODE:22.090

Name of course :- Paper 1st : Estimation theory

Course Objective :- To know about population parameter and different methods for their estimation.

Course outcome:-

1. Student will be able to know the criteria of good estimatiors.
2. To know the differences between parameter and statistic.
3. To know how population parameters are estimated by statistic.
4. Which one is the best method for estimated on and why?
5. May able to calculate the limits of estimates.

Reference Book:-

1. Outline of statistics vol. 1st&2nd :- Goon, Gupta and Desgupta
2. Statistical Inference- Arun kumar and Alka Chaudhary .

BSC SEM-III P-II

COURSE CODE:22.100

Name of the Department : Statistics

Name of the Course: Distribution theory (Paper II,semester -3rd)

Course objective: This course aims to introduce students basic concepts of distribution theory.

Course outcome: By the end of this course, students-

1. Will learn how to apply log to normal distribution, Gamma distribution & beta distribution to various distribution problems.
2. Will learn how to apply laplace distribution, Exponential distribution and coucehy distribution to various business problems.
3. Will know how to apply Y^2 – test for different fields of experiments.
4. Will be able discuss and explain chi- square variate and how it is used in different field of studies.
5. Will know how to derive student's t-distribution, fishers t-distribution, Snedecor's F-distribution.

Text Book: Some special Distribution by Arun kumar Rao.

Reference Book: Fundamental of mathematical statistics by S.C.gupta &V.K.Kapoor.

BSC SEM-III P-III

COURSE CODE:22.110

Name of the Department : Statistics

Name of course: Paper III: Sample Survey-I (B.Sc.3rd Semester).

Course Objective: The objective of this course is to make student well know about the successful effectiveness of Sampling over complete enumeration or Census, different sampling Schemes and their applications.

Course outcome: Upon successful completion of **"Sample Survey-I" ,** a student will be able to:

1. Define terminology used in sample survey such as: population , sample, units, frame, objective etc.
2. Define the fields of application of sampling techniques, its advantage and disadvantages,
3. Know the requirement of good sample, concept of sampling non-sampling error,
4. Define Simple Random sampling (SRS),procedure for selecting sample (using Lottery method and Random number Table method),Estimation of Population Mean and Variance in case of sample random sampling with replacement (SRSWOR) and Sample random sampling without replacement(SRSWOR),
5. Define the sampling for Proportion or attribute, estimating its mean and variance under SRSWR and SRSWOR, obtain the unbiased estimate of variance of population proportion.
6. Define Stratified sampling, its advantages, estimation of population mean and its variance.
7. Define Allocation in stratified sampling – Equal Allocation , Neyman allocation and optimum allocation and compare their variances with sample random sampling.

Reference Book:

1. Theory and Analysis of sample of sample Survey Designs By Daroga Singh and F.S.Chaudhary.
2. Survey sampling By Arun kumar and Alka Chodhary
3. Applied Statistics By S.C. Gupta and V.K.Kapoor.

BSC SEM-III

COURSE CODE:22.120

Name of the Department: Statistics

Name of Course: Practical (B.Sc.3rd Semester).

Course Objective: The objective of this course is to make student well know about point, interval estimation and different sampling Schemes with the help of data

Course Outcome: Upon successful completion of "**Practical",** a student will be able to:

1. Estimate population mean using Sample random sampling and make comparison with Sample mean estimator.
2. Estimate of parameter using sample value by applying different methods,
3. Understand the interval estimation,
4. Estimation of population mean using Stratified Random sampling under Proportional, Optimum, and Neyman Allocation and further they are able to make comparison with SRS method,
5. Find out the Sample to be located in each stratum in stratified random sampling for fixes cost and fixed variance.

Reference Book:

1. Theory and Analysis of Sample Survey Designs By Daroga Singh and F.S . Chaudhary.
2. Survey sampling By Arun Kumar and Alka choudhary
3. Applied Statistics By S.C. Gupta and V.K.kapoor.

BSC SEM-IV P-I

COURSE CODE:22.130

Name of the Department: Statistics

Name of Course: Analysis of Variance and Design of Experiments. (paper-I, semester 4^{th})

Course objective : The principle objective of this course is to introduce undergraduate students to the underlying theory and the practical problems related to analysis of variance and design of experiments.

Course outcome : On successful completion of this course students will be able to-

1. Prepare ANOVA Tables for one way classification and two way classification of data,
2. Analyse completely Randomised design,
3. Analyse Randomised Block design and Latin square design,
4. Analyse missing plot technique to above design with one missing observation,
5. Conduct factorial experiments.

Text book: Analysis of variance & design of experiment by Arun kumar & Alka Chaudhary.

Reference Book: Fundamental of Applied statistics by S.C. Gupta & V.K. Kapoor.

BSC SEM-IV P-II

COURSE CODE:22.140

Name of the Department: Statistics

Name of Course: Paper II : Testing of Hypothesis

Course objective: To test the hypothesis using different test in various conditions and situations.

Course outcome:

1. Students will learn about basic concepts of hypothesis testing, errors involved.
2. Able to calculate errors and power of the test for different distributions,
3. Will know and apply X^2- test in different criteria and conditions,
4. Will know application of t, F and Z distributions ,
5. Able to know when and where t, F, Z tests are applied?

Reference Book:

1. Outline of statistics vol. I & II – Goon ,Gupta and Das gupta
2. Statistical Inference – Arun kumar and Alka chaudhary
3. Fundamentals of Mathematical statistics – S.C.Gupta and V.K.Kapoor.

BSC SEM-IV P-III

COURSE CODE:22.150

Name of the Department: Statistics

Name of Course: Paper III: Sample Survey-II (B.Sc.4th Semester).

Course Objective: The objective of this course is to make student well know about different sampling Schemes, there limitations and their applications.

Course Outcome: Upon successful completion of **"Sample Survey-II"**, a student will be able to:

1. Define Ratio method of estimation, calculation of their Bias and variance up to the first order of approximation. Further a comparison is done between ratio method of estimation and sample random sampling method on the basis of their Biases and variances obtained,
2. Define Regression method of estimation, calculation of their Bias and variances up to the first order of approximation. Further a comparison is done between Regression method of estimation with ratio method of estimation and sample random sampling method on the basis of their biases and variances obtained,
3. Defined systematic sampling, limitation of systematic sampling, Advantages and disadvantages of systematic sampling, estimation of mean and its variance under the condition N=nk, circular systematic sampling. Further a comparison is carried out between systematic sampling with Stratified sampling and simple random sampling when N=nk.
4. Defined Cluster sampling (with equal cluster size)under SRS, advantages and disadvantages of Cluster sampling , estimation of mean and its variance, estimation of unbiased estimate of variance of the estimate of population mean,
5. Make comparison between Cluster sampling with SRS in terms class correlation coefficient.

Reference Book:

1. Theory and Analysis of simple Survey Designs by Daroga singh and F.S. Chaudhary,
2. Survey sampling by Arun kumar and Alka Choudhary,
3. Applied Statistics by S.C.Gupta and V.K. kapoor.

BSC SEM-IV

COURSE CODE:22.160

Name of the Department: Statistics

Name of Course: Practical (B.Sc.4th Semester).

Course Objective: The objective of this course is to make student well known well about Design of experiment using analysis of variance technique and application of chi, t, F, and Z.

Course Outcome: Upon successful completion of "**Practical",** a student will be able to:

1. Understand and applied the theory of design of experiment using different techniques such as CRD, RBD and LSD.
2. Understand and apply chi-square distribution in real life experiments.
3. Understand and apply **t** distribution in real life experiments.
4. Understand and apply **F** distribution in real life experiments.
5. Understand and apply **Z** distribution in real life experiments.

Reference Book:

1. Theory and Analysis of Sample Survey Designs By Daroga singh and F.S. Chaudhary.
2. Survey sampling By Arun Kumar and Alka Choudhary
3. Applied Statistics By S.C. Gupta and V.K.kapoor.