DEPARTMENT OF STATISTICS
PROGRAMME: B.SC.
Statement of Course Outcomes (COs)

B Sc SEM I – Paper I Probability Theory

The concept of probability is extremely important ,as it has very extensive applications in the development of all physical sciences.

At the end of first semester , the students will be aware of

- Evolution of Theory of Probability
- Different approaches ,different definitions of probability along with their drawbacks
- Various terms used in the theory of probability
- Additive and multiplicative laws of probability
- Various results ie theorems in probability
- Conditional Probability, Bayes theorem ,its applicatons
- Chebyshev's inequality and its importance
- Concept of Random variable ,pmf, pdf, pgf, distribution function,mgf and its uses
- Moments ,measures of location ,dispersion ,skewness and kurtosis

B.Sc. sem-I Statistics paper II (Descriptive Statistics-I):-

Students will learn-
- To collect, tabulate and analyse the different types of data.
- To understand population census and analysis of categorical data.
- The presentation of data using MS-Excel and R-commands.
- To draw different types of diagrams and graphs.

B Sc SEM II – Paper I Probability Distributions

- The syllabus of second semester covers various discrete and Continuous distributions. Therefore at the end of Second Semester , the students will have the knowledge of
- Discrete Distributins such as Bernoulli , Binomial, Poisson, Uniform , Hypergeometric and Geometric ,Negative Binomial with their properties and applications.
- Lack of memory property of Geometric distribution Continuous Distributions such as Uniform , Beta ,Gamma , Normal and their properties

B.Sc. sem-II Statistics paper II (Descriptive Statistics-II):-

Students will learn-
- The concepts of central tendency and location.
- The different concepts and measures of dispersion.
- The different types of partition values and the concepts of skewness and kurtosis
- The concept of bivariate data and correlation coefficient as well as regression.

B.Sc. II year Sem. III, Paper I Statistical Methods

At the end of course the student will be able

Unit I:

- To extend the concept of uni variate distribution to bivariate distribution in case of both discrete and continuous random variables.
- To study the concept of joint distribution and the independence of two random variables.
- To implement the variation and the relation between two random variables by using the concept of covariance and correlation between two random variables.
- To study the practical utility of these topics by solving various numerical problems attached with each concept studied in this unit.

Unit II:

- To implement the basic concepts to bivariate normal distribution and study various properties of bivariate normal distribution.
- To derive the marginal and conditional distributions of the bivariate normal distribution and also study the independence of two random variables.
- To define a tri variate discrete random variable and application of multinomial distribution in various practical situations.
- To study different properties of multinomial distributions such as mean, variance and solve numerical problems based on it.

Unit III:

- To understand the concept of random sample and its sampling distribution.
- To draw samples from various probability distributions such as Binomial, Poisson and Normal distribution etc. .
- To transform variables from one probability distribution to another by using the variable transformation technique in case of both the discrete and continuous random variable.
- To understand the concept of sampling and its transformation in detail by solving various numerical problems based on it.

Unit IV:

- To find the sampling distribution of sum of variables from some probability distributions (Binomial, Poisson and Normal distribution).
- To define and derive the probability density function of exact sampling distributions like chi-square distribution and study its properties.
- To define Student's 't' and Snedecor's F distribution and to derive its different properties such as mean, variance and mode.
- To establish the relationship between various distributions such as relation between chi-square distribution and 'F' distribution, Student's 't' and 'F' distribution etc.

B.Sc Sem III paper II: - Course Outcome:

Students will be able :

- To have detailed knowledge about various types of index numbers related to Economic Statistics.
- To use Consumer Price index for regulation of D.A.
- To apply time series analysis in various fields.

- To apply demand analysis, Pareto's income distribution, Lorenz curve etc.

B.Sc. Part III Semester VI Paper-I :-Operations Research

By the end of this Programme, the students will be able to:
- Understand different concepts of Network Analysis
- Construct Network Diagram
- Draw conclusion from Network using PERT analysis and CPM analysis
- Optimize network using time – cost algorithm
- Understand concept of Duality in LPP, relationship between primal and dual problem and its economic interpretation
- Explain General transportation problem, its LPP formulation
- Solve transportation problem to obtain initial basic feasible solution and optimum solution.
- Understand Assignment problem, its LPP formulation
- Solve Assignment problemto obtain optimum solution.
- Understand basic concepts of Game theory, two person zero sum game and solution of game

B.Sc. Part III Semester VI   Paper-II :-Experimental designs

By the end of this Programme, the students will be able to:
- Gain knowledge about theory of linear estimation, analysis of variance (ANOVA).
- Analyse data using various ANOVA techniques and draw conclusions.
- Understand basic principles of designs of experiments.
- Analyse data using various experimental designs CRD, RBD, LSD and draw conclusions.
- Explain factorial experiments, Yates' method to calculate main   effects and interaction effects in 2^2 and 2^3 factorial experiments.

B.Sc. Part III Semester V Paper-I :- Statistical Quality Control and Linear Programming Problem

By the end of this Programme, the students will be able to:
- Understand basic concepts ofStatistical Quality Control, causes of variation and Uses of SQC.
- Explain Process and product control
- Use tools of SQC, Draw control charts for mean, standard deviation and range
- Draw conclusion about whether process is in statistical quality control or not.
- Understand Acceptance Sampling concepts, Single and double sampling
- Explain Continuous sampling inspection plans
- Understand the concept of Optimization problem, linear theory of Convex set
- Explain Linear programming problem, General form of LPP and Standard form of an LPP
- Understand concept of Optimum solution of LPP
- Solve Linear Programming problem using Graphical method and Simplex Method

B.Sc. Part III Semester V Paper-II :- Survey Sampling Techniques

By the end of this Programme, the students will be able to:

- Gain knowledge about official statistics ; purpose and functions of CSO, NSSO.
- Understand basic concepts of sample survey, sampling and types of sampling and non sampling errors. They will be able to plan, execute and analyse a sample survey.
- Explain SRSWOR, SRSWR, sampling for proportions.
- Understand concept of stratified sampling, systematic sampling and cluster sampling and compare various sampling techniques.
- Analyse data using various sampling techniques and draw conclusions.