

Department of Statistics

Dr. Ambedkar College

Programme Specific Outcome:-

Statistics is an interdisciplinary subject and has wide applications in all the subjects in Physical Sciences, Life Sciences and Social Sciences.

- 1) Statistics as one of the subjects with a combination of two more from Physics, Mathematics and Computer Science is a nice group of subjects to pursue the under-graduate course.
- 2) The study of subject Statistics enables students to understand concepts in Physics such as Classical Mechanics, Quantum Mechanics and Thermodynamics. These concepts are well explained with the help of probability theory. Fluid Mechanics cannot be studied without Mathematics and the concept of Stochastic Processes which is a part of Statistics.
- 3) The type or form of relationship between two or more variables is of significant importance in all disciplines and walks of life. This can be efficiently done with the help of Regression Analysis which is covered in an undergraduate course in Statistics.
- 4) The Statistical tools and/or methods such as Testing of Hypothesis and Theory of Estimation are of prime importance in Physics as well as Computer Science.
- 5) Statistical tools have enabled designing of computer software whereas Computer Science has helped analyse voluminous data efficiently and precisely.
- 6) Combination of Statistics, Mathematics and Computer Science with advanced software does help social scientists undertake large scale studies or survey to solve social problems.
- 7) Undergraduate course in Statistics, Mathematics and Computer Science enables students to start working as data analyst, Quality Control Consultant, Manager in Industrial Organization. It will also enable students to plan, design and execute sample survey.

Course Outcomes of B.Sc. Statistics

B. Sc. Statistics Semester I Paper – I Probability Theory

CO 1:- Students will be able to understand basic terminology of subject Statistics, different approaches of Probability like Classical and Relative Frequency approach, Axiomatic Approach and Merits, Demerits of these approaches. Different terminologies related to random experiment like sample space, event, mutually exclusive and exhaustive events, operations of events, different theorems of Probability, Random experiments and its related concepts.

CO 2:- Students comprehend Conditional Probability and independence of events. Use of Multiplication Theorem of Probability, Bayes' theorem, Chebyshev's inequality and its application to the numerical problems in practicals.

CO 3:- Students understand difference between discrete random variable and continuous random variable, concept of probability mass function and how to find different probabilities for discrete r.v. using probability mass function. Understand use of probability density function for finding various measures of central tendency, dispersion, skewness, kurtosis for continuous r.v. Comprehend the concept of expectation for a discrete r.v. , its properties and analysis of problems based on this concept. Know about discrete and continuous random variables and its properties with pmf and pdf functions.

CO 4:- Acquire knowledge of concept and properties of Moment generating function and application of this knowledge to find measures of locations, dispersion, skewness and kurtosis. Students apply this knowledge to find these measures using moments for discrete and r.v.. Understand how to find moments from probability generating functions and moment generating functions with its properties. Students are able to solve problems based on measures of location, dispersion, skewness, kurtosis and comment on types of skewness and kurtosis.

B. Sc. Statistics Semester I Paper – II Descriptive Statistics I

CO 1:- Ability to scientifically collect data.

CO 2:- Understand Control Experiments and Observational Studies.

CO 3:- Ability to Classify data.

CO 4:- Ability to effectively represent data.

B. Sc. Statistics Semester II Paper I: - Probability distributions

CO 1:- Students received detailed knowledge of discrete distributions like Binomial,

Poisson, Negative Binomial Distribution and derivations of probability mass function of these distributions and of how to find measures of central tendency, dispersion, moments about arbitrary constants and central moments of these distributions and also of probability generating function and additive properties of these distributions. Hence, students are able to do practical problems based on situations in everyday life which are based on knowledge these distributions.

CO 2:- Students received knowledge of discrete distributions like Geometric, Hypergeometric, and Uniform distribution. The students comprehended lack of memory property, moment generating function, recurrence relation of geometric distribution, Students got knowledge of probability mass function, mean and variance, recurrence relation of hypergeometric distribution and application of this knowledge to solve numerical based on situations in everyday life.

CO 3:- Students received knowledge of continuous distributions like Rectangular dist., Exponential dist., Gamma dist., Beta distribution and how to find measures of central tendency and measures of dispersion for these distributions by using moment generating function and moments.

CO 4:- Students received knowledge of probability density function, moment generating function of Normal distribution. Properties of Normal dist., How to find mean, median, mode of this dist., how to find moments from moment generating function of Normal distribution, also under what conditions Normal distribution is limiting form of Binomial dist. Concept of standard normal variate and its applications. Students come to know that linear combination of independent normal variables is also normal variable. The most important is the area property of Normal distribution with the help of which students will comprehend how to solve practical numericals based on Normal distributions.

B. Sc. Statistics
Semester II
Paper II: - Descriptive Statistics II

CO 1:- Gain Knowledge of Analysis of Univariate data.

CO 2:- Understand Concept of dispersion used in Analysis of data.

CO 3:- : Understand Partition Values used in Analysis of data.

CO 4:- Gain Knowledge of Analysis of Bivariate data.

B. Sc. Statistics
Semester III
Paper I: - Statistical Methods

CO 1:- Understand Bivariate Probability Distribution.

CO 2:- Understand Bivariate Normal and Multinomial Distribution.

CO 3:- Understand Drawing of random Samples from Distributions.

CO 4:- Understand Sampling Distribution.

B. Sc. Statistics
Semester III
Paper II: - Economics Statistics

CO 1:- Gain Knowledge of Index Number and its Applications.

CO 2:- Understand the Concept of Consumer Price Index and Index of Industrial Production.

CO 3:- Gain Knowledge of Demand and Supply Analysis.

CO 4:- Understand the Concept of Time Series Analysis.

B. Sc. Statistics
Semester IV
Paper I: - Statistical Inference

CO 1:- Gain Knowledge of Point estimation and Concept of Testing of Hypothesis.

CO 2:- Ability to draw Conclusion about Population on the basis of small sample.

CO 3:- Understand the Concept of Chi-square test.

CO 4:- Ability to draw Conclusion about Population on the basis of Large sample.

B. Sc. Statistics
Semester IV
Paper II: - Applied Statistics

CO 1:- To understand the applications in Health Sciences studies specially mortality rates.

CO 2:- To understand measures to quantify & compare fertility rates.

CO 3:- To understand applications in making effective plans for efficient administration, management and research.

CO 4:- To understand the applications in method or product consistency, accuracy and quality.

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

CO 1:- Helps to know statistical methods to manage the quality of goods & services.

CO 2:- To understand applications in determining the quality of mass production.

CO 3:- To understand application in production, scheduling, inventories, allocation of products or work in different fields.

CO 4:- It helps to know applications in Industries for planning, maximizing profits.

**B. Sc. Statistics
Semester V**

Paper II: - Survey Sampling Techniques

CO 1:- Helps to know about Surveys & types of Sampling.

CO 2:- Understands Sampling designs.

CO 3:- Helps to understand Stratified random sampling.

CO 4:- Helps to understand Cluster & Systematic Sampling.

**B. Sc. Statistics
Semester VI**

Paper I: - Operation Research

CO 1:- It makes understand the effective Utilization of limited resources.

CO 2:- Helps to know applications in Projects execution time.

CO 3:- To understand application in minimum manufacturing cost.

CO 4:- Students gets to know the application in minimizing cost by optimum assignment of items

**B. Sc. Statistics
Semester VI**

Paper II: - Experimental Designs

CO 1:- Helps in analyzing multi-item scales in research.

CO 2:- Helps to know terminologies used for analyzing multi item.

CO 3:- To understand execution, interpretation of experiments with more clarity.

CO 4:- To understand more advanced designs for experimental research with multiple factors. .