Bharati Vidyapeeth's

Dr. Patangrao Kadam Mahavidyalaya Sangli

<u>Department of Statistics</u>   (2022-23)

Program Outcomes:

PO-1: Students learn to design data collection plans and basic tools of descriptive statistics also handling of raw data.

PO-2: Students will get knowledge of Statistics which will help for post graduation and further studies in research.

PO-3: Students will able to understand various problems and identify the solution using appropriate statistical method also test the precision of this method and interpret the results with proper conclusion.

PO-4: Students will able to enhance programming knowledge.

PO-5: Students will able to apply the statistical knowledge to address the problems related to economy, business, marketing, quality control etc.

PO-6: Students will able to make presentation, writing project reports also they communicate effectively.

Program Specific Outcomes:

PSO-1: Students learn different types of discrete and continuous distribution with their properties and application.

PSO-2: Students learn identify situations where one way analysis of variance is appropriate also interpret the Analysis of variance.

PSO-3: Students will able to formulate and solve linear programming problem, assignment problem, transportation problem.

PSO-4: Students will able to explain different meanings of quality concepts and its influence.

PSO-5: Students will understand the concept of sampling distribution of a statistic and properties, difference between the parameter and statistic.

PSO-6: Students will develop Programming skills.

Course Outcomes B.Sc.I (Statistics)	
Semester-I	
Course	**Outcomes**
	After completion of these courses, students should able to,
Paper No.1 (Descriptive Statistics-I)	CO-1: The Students will acquire knowledge of meaning and scope of Statistics, various statistical organizations. CO-2: Able to acquire knowledge data , data types and data presenting methods. CO-3: To get knowledge about concept of Population, sample and various sampling methods. CO-4: understand concept of measure of central tendencies and dispersion
Paper No.2 (Elementary Probability theory)	CO-1: Students will able to distinguish between random and non-random experiments. CO-2: Acquire knowledge of concept of probability and use of basic probability rules. CO-3: Understand the concept of conditional probability and independence of events, also univariate random variable and its probability distribution. CO-4: Acquire knowledge of mathematical expectation of univariate random variable.

Course Outcomes

Course Outcomes B.Sc.I (Statistics) Semester-II	
Course	**Outcomes**
Paper No. III (Descriptive Statistics-II)	**After completion of these courses, students should able to,** CO-1: Students will acquire knowledge of correlation coefficient and interpret its value. CO-2: To know regression coefficient, interpret its value nad use of regression analysis. CO-3: To learn about Qualitative data including concept of independence and association between two attributes. CO-4: Understand vital statistics and concept of mortality and fertility and growth rates.
Paper No. IV (Discrete Probability Distributions)	CO-1: Able to acquire knowledge of bivariate discrete distributions, independence of bivariate random variable, mathematical expectation of bivariate discrete random variable. C0-2: To know one point distribution, two point distribution, Bernoulli distribution. CO-3: To learn uniform distribution, binomial distribution, Hypergeometric Distribution. CO-4:To understand Poisson distribution, Geometric distribution and negative binomial distribution.

Course Outcomes B.Sc. I (Statistics Practical)	
Course (Laboratory Practical)	**Outcomes** **After completion of these courses, students should able to,** CO-1: To acquire knowledge of computations using MS-Excel. CO-2: To represent statistical data diagrammatically and graphically. CO-3: To compute various measure of central tendency, dispersion, moments, skewness and kurtosis. CO-4: To compute correlation coefficient and regression coefficient. CO-5: To understand consistency, association and independence of attributes. CO-6: To interpret summary statistics of computer output. CO-7: To know applications of some standard discrete probability distributions. CO-8: To compute the various fertility rates, mortality rates and growth rates.

Course Outcomes B.Sc.II (Statistics) Semester-III	
Course	**Outcomes**
	After completion of these courses, students should able to,
Paper No. V (Probability Distribution-I)	CO-1: Understand the concept of discrete and continuous distributions with real life situations.
	CO-2: To distinguish between discrete and continuous distribution.
	CO-3: To find various measure of random variable and probabilities using its probability distribution.
	CO-4: To know relations among the different distributions and understand the concept of transformation of univariate and bivariate continuous random variable.
Paper No. VI (Statistical Methods-I)	CO-1: Understand the concept of multiple linear regression.
	CO-2: Understand the concept of multiple correlation and partial correlation.
	CO-3: To acquire knowledge of concept of sampling theory for example simple random sampling and stratified sampling.
	CO-4: To understand the need of vital statistics and concept of mortality and fertility.

Course Outcomes B.Sc.II (Statistics) Semester-IV	
Course	**Outcomes**
Paper No. VII (Probability Distribution-II)	**After completion of these courses, students should able to,** CO-1: Able to know some standard continuous probability distribution with real life situations. CO-2: To find various measure of continuous random variable and probabilities using its probability distribution. CO-3: To understand the relations among the different distributions. CO-4: To understand the chi-square, t and F distributions with their applications and interrelations.
Paper No. VIII (Statistical Methods-II)	CO-1: Able to know the concept and use of time series. CO-2: To understand the meaning, purpose and use of Statistical Quality Control, Construction and working of control charts for variables and attributes. CO-3: To understand the concept of testing of hypothesis using appropriate test statistics, CO-4: To apply the small sample tests and large sample tests in various situations.

Course Outcomes B.Sc. II (Statistics Practical)	
Course (Laboratory Practical)	**Outcomes** **After completion of these courses, students should able to,** CO-1: To be able to compute probabilities of standard probability distribution. CO-2: To compute the expected frequencies and test the goodness of fit. CO-3: To understand how to obtain random sample from standard probability distribution and sketch of the p.m.f./p.d.f. for given parameter . CO-4: To fit plane of multiple regression and compute multiple and partial correlation coefficients. CO-5: To Draw random samples by various methods. CO-6: To construct various control chart (mean chart, range chart, etc.). CO-7: To understand the applications of poisson , geometric and negative binomial distributions . CO-8: Sketch of discrete and continuous distributions for various parameters using MS-Excel.

Course Outcomes

Course Outcomes B.Sc.(Statistics) Semester-V	
Course	**Outcomes**
Paper No. IX (Probability Distributions)	**After completion of these courses, students should able to,** CO-1: To acquire knowledge of important univariate distributions such as Laplace, Cauchy, Lognormal, Weibull, Logistic, Pareto, Power series distribution. CO-2: To acquire knowledge of multinomial and bivariate normal distribution. CO-3: Understand the concept of truncated distribution and information of various measure of these probability distributions. CO-4: To apply standard continuous probability distribution.
Paper No. X (Statistical Inference-I)	CO-1: To acquire knowledge about important inferential aspects of point estimation. CO-2: Understand the concept of random sample from a distribution, sampling distribution of a statistic, standard error of important estimates such as mean and proportion. CO-3: To acquire knowledge about inference of parameters of standard discrete and continuous distribution. CO-4: To understand concept of Fisher information and CR inequality and acquire knowledge of different methods of estimation.

Course Outcomes

Course Outcomes B.Sc.(Statistics) Semester-V	
Paper No. XI (Design of Experiments)	CO-1: To acquire knowledge of basic terms used in design of experiments. CO-2: Understand the concept of one-way and two-way analysis of variance. CO-3: To know various design of experiments such as CRD, RBD, LSD and factorial experiments. CO-4: To acquire knowledge of using an appropriate experimental design to analyze the experimental data.
Paper No. XII (R-Programming and Quality management)	CO-1: To know importance of R programming and acquire knowledge of identifiers and operators used in R. CO-2: To acquire knowledge of conditional statements and loops used in R. CO-3: To understand the quality tools used in quality management. CO-4: To learn process and product control used in Quality management.

Course outcomes

Course Outcomes B.Sc.(Statistics) Semester-VI	
Course	**Outcomes** **After completion of these courses, students should able to,**
Paper No. XIII (Probability theory and application)	CO-1: To acquire knowledge about order statistics and associated distributions. CO-2: To understand the concept of convergence and Chebychev's Inequality and its uses. CO-3: To understand concept of law of large number and central limit theorem and its uses. CO-4: To acquire knowledge of terms involved in reliability theory as well as concept and measures.
Paper No. XIV (Statistical Inference-II)	CO-1: Understand concept of interval estimation. CO-2: To acquire knowledge of interval estimation of mean, variance and population proportion. CO-3: To acquire knowledge of important aspects of test of hypothesis and associated concepts. CO-4: To learn concept about parametric and non-parametric methods and understand some important parametric as well as non-parametric tests.

Course Outcomes B.Sc.(Statistics) Semester-VI	
Paper No. IX (Sampling Theory)	CO-1: To get basic knowledge of complete enumeration and sample, sampling frame sampling distribution, sampling and non-sampling errors, principles steps in sample surveys, sample size determination, limitations of sampling etc.
	CO-2: To understand the concept of various sampling methods such as simple random sampling, stratified random sampling, systematic sampling and cluster sampling.
	CO-3: To get an idea of conducting sample surveys and selecting appropriate sampling technique.
	CO-4: To understand comparing various sampling techniques also get ratio and regression estimators.
Paper No. XVI (Operations Research)	CO-1: To understand concept of linear programming problem and acquire knowledge of solving LPP by graphical and simplex method.
	CO-2: To acquire knowledge of transportation, Assignment and sequencing problems.
	CO-3: To know concept of queuing theory.
	CO-4: To learn simulation technique and Monte Carlo technique of simulation.

Course Outcomes B.Sc. III (Statistics Practical)	
Course (Laboratory Practical)	**Outcomes** **After completion of these courses, students should able to,** CO-1: To compute the expected frequencies and test the goodness of fit. CO-2: To understand multivariate and bivariate normal distribution. CO-3: To learn point estimation by method of moment and method of maximum likelihood. CO-4: To learn interval estimation for location and scale parameter. CO-5: To get knowledge of testing of hypothesis using non-parametric tests. CO-6: To learn analysis of completely randomized design. Randomized block design, Latin square design and factorial design. CO-7: To determine sample size in simple random sampling also learn various sampling methods. CO-8: To learn data input output, graphical representation, measure of central tendency and dispersion, simulation using R-programming. CO-9:To get knowledge about construction of CUSUM and EWMA chart in MS- Excel. CO-10: To solve linear programming problem using simplex method and Big-M method.