

Name of the Programme: Statistics		
POs, PSOs and COs		
Academic Year 2021-2022		
Programme Outcomes		
PO1	to identify, formulate and solve problem in statistics and related areas.	
PO2	to apply the knowledge of statistics in various fields.	
PO3	to develop statistical models.	
PO4	to get exposed and develop technical, analytical and creative skills.	
PO5	to promote and uphold self-discipline, leadership qualities, secular outlook, national integration and civic responsibility.	
PO6	augment the acquisition of micro and macro skills of Tamil, Malayalam, Hindi and french language usages.	
PO7	enhance communicative, linguistic, competency and employability quotient.	
PO8	exhibit consistent academic excellence and integrated personality towards lifelong learning.	
Programme Specific Outcomes		
PSO1	Develop the ability to work effectively in broad range of scientific, government, financial, health, technical and other positions.	
PSO2	Recognize the importance and value of statistical thinking, training and approach to problem solving in various disciplines.	
PSO3	Accomplish the ability to use various statistical techniques interpret accordingly.	

Course Outcomes		
Course Name	CO	Statement
Core I Descriptive Statistics - I	CO1	Explain the fundamental concepts of data.
	CO2	Determine the descriptive measures and its dispersion.
	CO3	Discuss the concepts of moments and kurtosis.
	CO4	Determine the curves transformable to the form of least square.
	CO5	Use statistics topics to demonstrate the real life situations.
Core II Applied Statistics	CO1	Forecast the time series data using different measurement of trends.
	CO2	Use the seasonal, cyclic and random methods to analyse the time series data.
	CO3	Portray the index numbers and the classification of index numbers.
	CO4	Calculate the chain index number and criteria of good index number using different tests.
	CO5	Predict the values of business forecasting
Core III Descriptive Statistics - II	CO1	Explain the concepts of correlation and Regression.
	CO2	Apply the methods of attributes to measure the dependence independence of data.
	CO3	Discuss the fundamental concepts of probability.
	CO4	State the theorems of probability.
	CO5	Use appropriate statistical tools for determining real life problems.
Core IV Probability Distribution - I	CO1	Explain the basic concepts and theorems of probability.
	CO2	Identify the discrete and continuous random variable.
	CO3	Examine the two dimensional

		random variable and transformation of variables.
	CO4	Calculate the Mathematical expectation, conditional expectation and Conditional Variance.
	CO5	Discuss the concepts of moments, cumulants and characteristic function.
Core Practical I Statistics Practical I	CO1	Calculate various measures of Descriptive Statistics and apply the fundamental concepts in exploratory data analysis.
	CO2	Construct charts and apply the appropriate forecasting techniques to a given data.
Core IV Demographic Methods	CO1	Construct and analyze simple and abridged life tables.
	CO2	Project a population using appropriate equations and assumptions.
	CO3	Recognize and analyze typical demographic patterns arising from the data.
	CO4	Describe basic demographic indicators and elaborate on their computation and interpretation
	CO5	Interpret the data base on which are built population projections and work force projections.
	CO6	Estimate the rate of change in a population.
Core V Probability Distribution I	CO1	Identify and predict types of variables.
	CO2	Find the probabilities associated with a discrete probability distribution.
	CO3	Compute the joint, marginal and continuous distribution functions for random variables.
	CO4	Interpret the mean of a random variable in terms of the law of large number

	CO5	Calculate the probabilities of mass and density function of random variables.
	CO6	Apply central limit theorem to problems involving sums and averages from probability distributions.
Allied III Computer Programming for Statistical Analysis – I	CO1	Develop simple programs using the basic elements like control statements, arrays and strings.
	CO2	Apply the concept of arrays to represent statistical data.
	CO3	Illustrate the code reusability with the help of user defined functions.
	CO4	Use string handling functions to address string oriented problems.
	CO5	Utilize the structures to represent statistical problems and manipulate the data efficiently.
	CO6	Develop programs for simple applications in an ethical manner.
Part IV – Non Major Elective Statistical Analysis	CO1	Identify the history and applications of statistics in various fields.
	CO2	Demonstrate the ability to apply various statistical tools in data analysis.
	CO3	Interpret the data using various kinds of charts and diagrams.
	CO4	Evaluate and analyze methods for examining central tendencies and dispersion.
	CO5	Measure the degree of relationship between the variables.
	CO6	Predict and forecast the relationship among the variables.
Part IV – Skill Enhancement Course I Actuarial Statistics I	CO1	Describe the theoretical and practical aspects of actuarial science.
	CO2	Explain the legality and administrative issues of life

		policies
	CO3	Demonstrate the skills for interpreting and analyzing actuarial and statistical information.
	CO4	Compare various kinds of life insurance policies and their benefits.
	CO5	Demonstrate mortality concepts in life insurance.
	CO6	Estimating the policy value of life insurance using annuities
Core VI Probability Distribution – II	CO1	Compute the probabilities associated with discrete distributions.
	CO2	Find probabilities associated with a normal probability distribution.
	CO3	Approximate the binomial probabilities using a normal distribution and other discrete distributions.
	CO4	Evaluate the expected value and variance of discrete and continuous probability distributions.
	CO5	Decide the normal random variable leading to chi square, t and F distributions
	CO6	Interpret and communicate probabilities obtained from probability distributions.
Core Practical II Statistics Practical II	CO1	Construct a life table used in mortality.
	CO2	Illustrate various demographic techniques.
	CO3	Determine the growth of population.
	CO4	Fit binomial distribution to a data suitable for binomial distribution.
	CO5	Fit Poisson distribution appropriately.
	CO6	Fit Normal distribution using different methods.

Allied IV Computer Programming for Statistical Analysis – II	CO1	Describe the significance of object oriented programming.
	CO2	Illustrate the use of various data types and decision making and looping structures.
	CO3	Demonstrate the use overloading concepts.
	CO4	Program using constructors.
	CO5	Build programs classes using appropriate encapsulation and design principles.
	CO6	Simulate problem in computer networks and real world problems.
Part III – Allied Practical C & C++ Programming	CO1	Demonstrate frequency distributions.
	CO2	Compute the various basic measures of descriptive statistics.
	CO3	Sketch straight line using the least square method.
	CO4	Fit Binomial and Poison distributions.
	CO5	Perform various matrix operations.
	CO6	Sort an array of numbers in a specified order.
Part IV – Skill Enhancement Course II Actuarial Statistics - II	CO1	Determine the various policies unique to the marine insurance industry
	CO2	Explore the different sectors within marine insurance: cargo insurance, Hull and Machinery insurance and others
	CO3	Provide complete details of the claims process
	CO4	Identify the different roles played within the marine insurance industry
	CO5	Classify the insurance needs of the owners and charterers as well as being able to identify relevant covers and the markets

		available for placing the covers.
	CO6	Identify and describe legal and policy issues in commercial contexts.
Core VII Statistical Inference - I	CO1	Construct contingency tables to test independence and homogeneity of the samples
	CO2	Demonstrate approaches to include a measure of accuracy for estimation procedures.
	CO3	Formulate estimators and test procedures based on point estimation.
	CO4	Find the Cramer-Rao lower bound for the variances of unbiased estimators.
	CO5	Compute confidence interval and confidence limit for a population parameter.
	CO6	Analyze and interpret real time empirical data.
Core VIII Sampling Theory	CO1	Estimate the sample size for a research or a study.
	CO2	Demonstrate the optimum results with the available sources at the disposal by studying the sample values.
	CO3	Develop an understanding about different sampling methods based on probability and non-probability sampling
	CO4	Obtain best possible estimates of the population parameters.
	CO5	Increase the level of efficiency and cost reduction of sampling.
	CO6	Evaluate mean and variance of the parameter based on different sampling methods.
Core IX Design of experiments	CO1	Demonstrate the variation of information under conditions that are hypothesized to reflect the variation
	CO2	Explain the partitioning of the total sum of squares into the 'within' and 'between' group

		components
	CO3	Predict the outcome by introducing a change of pre-conditions, represented by one or more independent variables.
	CO4	Study the effect of each factor on the response variable and the effects of interactions between factors on response variable
	CO5	Increase statistical power by reducing the within-group error variance
	CO6	Improve the robustness of the design or process.
Core X Statistical Quality Control - I	CO1	Describe the purpose and function of Quality control.
	CO2	Demonstrate to control material reception, internal rejections, clients, claims and evaluation of the same corrective actions related to their follow-up.
	CO3	Examine the difference between attributes and variables.
	CO4	Measure and control the quality by monitoring the manufacturing process using various charts in quality system.
	CO5	Develop and use the quality indicators to customer requirements and satisfaction and to the management.
	CO6	Take decisions to accept or reject a lot using various sampling plans.
Elective I Numerical Methods	CO1	Apply forward and backward interpolation in the correct context.
	CO2	Demonstrate the application of central difference formula
	CO3	Recognize the situations where interpolation with unequal intervals can be applied and apply the same.
	CO4	Derive various numerical formulae

	CO5	Compute derivatives of functions using interpolation methods
	CO6	Compute integrals of functions using interpolation methods
Elective I Biostatistics	CO1	Compare the means of two or more than two samples simultaneously.
	CO2	Evaluate the multiple regression coefficients and the suitability of the regression model.
	CO3	Determining the association of variables used in the research.
	CO4	Calculate and interpret the data using a wide variety of distribution free tests.
	CO5	Develop and use survival curves to make conclusions of research work.
	CO6	Interpreting the biological studies using various statistical tools.
Part IV – Skill Enhancement Course III Elements of Econometrics	CO1	Describe the basic principles of specification of econometric models
	CO2	Demonstrate an understanding of variations and generalizations of the basic regression models
	CO3	Predict the relationship of the variables based on the value of two or more variables
	CO4	Find the occurrence of high-inter correlations among independent variable in a multi-regression model
	CO5	Express consequences of using OLS in the presence of autocorrelation
	CO6	Explain, interpret, forecast and take policy actions relative to the economic phenomenon of interest
Core XI Statistical Inference - II	CO1	Demonstrate the plausibility of pre-specified ideas about the parameters of the model by examining the area of hypothesis testing.

	CO2	Identify the components of a classical hypothesis test including two types of errors, null and alternative hypothesis.
	CO3	Demonstrate the theory of likelihood ratio test to test the significance of samples
	CO4	Critically examine sequential procedures for appropriate statistical analysis.
	CO5	Demonstrate the use of non-parametric statistical methods and to interpret and analyze the results.
	CO6	Use the learnt statistical methods to analyze certain real life data
Core XII Statistical Quality Control -II	CO1	Apply and evaluate best practices for the attainment of total quality.
	CO2	Develop various operating cost components and applications of JIT for operations management.
	CO3	Elucidate the functioning and application of six-sigma in process control
	CO4	Explain how ISO 9000 series is used in attaining quality standards
	CO5	Demonstrate the fundamental concepts and methodologies used in reliability analysis.
	CO6	Follow ethics while implementing the tools of TQM
Core Practical III Statistical Practical- III (Using SPSS)	CO1	Interpret results using various types of charts.
	CO2	Carryout inferential statistical analysis using SPSS.
	CO3	Test the significant relationship between the variables and interpret the result
	CO4	Independently use the various tools to analyze real time data.
Core Practical IV Statistical Practical-IV	CO1	Estimate the parameters by using different methods practically.

	CO2	Estimate sample size, mean and variance for different probability sampling methods practically
	CO3	Test the significance between the variables using various linear model designs and interpret them statistically.
	CO4	Fit the hypothesis to test the given samples using various statistical tools.
	CO5	Check whether the product can be accepted or rejected using various quality control methods.
	CO6	Utilize the tools to interpret and analyze a real time data with an ethical insight
Elective II Operations Research	CO1	Formulate and solve linear programming problems using appropriate techniques and interpret the results obtained.
	CO2	Build and solve transportation models and assignment models.
	CO3	Propose good strategies in two person zero sum games.
	CO4	Optimize the outputs in terms of time, cost or profit
	CO5	Predict the profit and cost expenses in a simple inventory system
	CO6	Compute the necessary parameters in a network
Elective II Matrices	CO1	Perform common matrix operations such as addition, multiplication and transposition.
	CO2	Solve a system of linear equations and find out the feasible solution.
	CO3	Establish a sufficient condition for invertibility in terms of elementary matrices.
	CO4	Apply elementary transformations to reduce the matrix to Echelon and normal form and determine its rank.
	CO5	Finding powers of a matrix and determining matrix inverse using Cayley-Hamilton Theorem.

	CO6	Interpret existence and uniqueness of solutions geometrically.
Elective III – Psychological Statistics	CO1	Measure the degree of similarity between the variables by using different ranking techniques.
	CO2	Determine an ordinal relationship between rankings of different ordinal variable or different rankings of same variable.
	CO3	Identify the consistency of a measure using reliability techniques.
	CO4	Examines the issues involved in developing and validating multi-item self report scales of latent constructs.
	CO5	Predict the relationship between the variables in psychological research.
	CO6	Classify the research methods used in psychology and apply the statistical techniques used in psychological research.
Part IV – Skill Enhancement Course IV Project	CO1	Develop, practice and improve technical skills
	CO2	Apply basic statistical concepts and analytical tools appropriately.
	CO3	Demonstrate the analyzing skills in exploratory data analysis.
	CO4	Predict results for a current scenario.
	CO5	Compare two different sets of samples and interpret the result
	CO6	Propose the scope of research