PROGRAMME OUTCOMES
PROGRAMME SPECIFIC OUTCOMES
COURSE OUTCOMES

B.Sc Statistics

OUTCOMES:

At the end of Under Graduate Program at St. Thomas College (Autonomous), a student will have obtained:

PO1	Critical Thinking: Ability to take informed actions after identifying the assumptions that frame our thinking and actions, checking out the degree to which these assumptions are accurate and valid, and looking at our ideas and decisions (intellectual, organizational, and personal) from different perspectives
PO2	Effective Communication: Ability to speak, read, write and listen clearly in person and through electronic media in English and in one Indian language, and make meaning of the world by connecting people, ideas, books, media and technology
PO3	Effective Citizenship: Ability to demonstrate empathetic social concern and equity-centered national development, and the ability to act with an informed awareness of issues and participate in civic life through volunteering
PO4	Environment and Sustainability: Ability to understand the issues of environmental contexts and sustainable development
PO5	Ethical Living: Ability to recognize different value systems including your own, understand the moral dimensions of your decisions, and accept responsibility for them
PO6	Social Interaction: Ability to elicit views of others, mediate disagreements and help reach conclusions in group settings
PO7	Problem Solving and Analytical Skills: Ability to think rationally, analyze situations and solve problems adequately

PROGRAM SPECIFIC OUTCOMES:

At the end of B.Sc Statistics at St. Thomas College (Autonomous), Thrissur, a student will have developed:

PSO1	Demonstrate the ability in collection, presentation, analysis and interpretation of data.
PSO2	Understand and solve problems in probability, statistical distributions, correlation and regression.
PSO3	Understand and apply the theories of classical inference involving estimation of parameters and testing of hypotheses.
PSO4	Understand and apply the techniques used in design of experiments, statistical quality control, time series and population studies

COURSE OUTCOMES:

B.Sc. Statistics

STA1B01: OFFICIAL STATISTICS AND PROBABILITY

At the end of this course, a student will have developed ability to:

CO1	Recognize important Statistical organizations in India and apply the measures of central tendency, measures of location, measures of dispersion and measures of shape.
CO2	Distinguish between correlation and regression in terms of explaining the relationship between two or more variables.
CO3	Apply the principle of least squares in fitting linear and non-linear curves.
CO4	Understand the concepts of random experiments and definitions of probability.
CO5	Understand and apply the theorems and results to compute the probabilities of events.
CO6	Explain discrete and continuous random variables, their probability functions and properties.

B.Sc. Statistics

STA2B02: BIVARIATE RANDOM VARIABLE AND PROBABILITY DISTRIBUTIONS

At the end of this course, a student will have developed ability to:

CO1	Understand the idea of expectations and there by obtaining the moments
CO2	Understand and apply the concepts of bivariate random variables and their probability distributions
CO3	Describe the shape of frequency curve and compute the conditional mean and variance using mathematical expectation.
CO4	Determine the nature of relationship and the independence of bivariate random variables using mathematical expectation.
CO5	Explain standard discrete probability distributions.
CO6	Understand and apply the law of large numbers.

B.Sc. Statistics

STA3B03: STATISTICAL ESTIMATION

At the end of this course, a student will have developed ability to:

CO1	Explain standard continuous distributions and their applications in real-life situations.
CO2	Establish and apply Lindberg- Levy central limit theorem for i.i.d case.
CO3	Distinguish between population and sample, and understand the concept of the sampling distribution.
CO4	Establish and explain t, chi square and F distributions and their properties.
CO5	Explain the properties of point estimation and apply the methods of point estimation.
CO6	Discuss the methods of interval estimation and construct confidence interval for mean and variance.

B.Sc. Statistics

STA4B04: TESTING OF HYPOTHESES

At the end of this course, a student will have developed ability to:

CO1	Understand the concepts of testing of hypotheses and compute the probabilities of two types of errors.
CO2	Illustrate the concepts of most powerful tests and SPRT.
CO3	Understand and apply the statistical tests for means and proportions.
CO4	Explain and apply tests based on F and Chi Square distribution
CO5	Discuss the concepts of Non parametric tests.
CO6	Identify and apply non parametric tests for suitable situations.

B.Sc. Statistics

STA5B05: MATHEMATICAL METHODS IN STATISTICS

At the end of this course, a student will have developed ability to:

CO1	Explain real number system and its properties.
CO2	Explain the concept of sequences and related theorems.
CO3	Describe infinite series and its convergence.
CO4	Discuss continuity and uniform continuity of real valued functions and prove associated theorems.
CO5	Explain differentiation and supporting results.
CO6	Explain Riemann integrability and fundamental theorems on integral calculus.

B.Sc. Statistics

STA5B06: SAMPLE SURVEYS

At the end of this course, a student will have developed ability to:

CO1	Compare census and sampling and discuss the organization and execution of samplesurveys and associated errors.
CO2	Design a questionnaire.
CO3	Explain the methods for simple random sampling and estimate the population mean, population total and their variances using simple random sampling methods.
CO4	Explain stratified and systematic sampling methods and estimate the population mean, population total and their variances usingthese methods
CO5	Describe cluster sampling and estimate the population mean, population total and their variances using cluster sampling methods.
CO6	Compare stratified, systematic and cluster sampling with simple random sampling.

B.Sc. Statistics

STA5B07: LINEAR REGRESSION ANALYSIS

At the end of this course, a student will have developed ability to:

CO1	Discuss the fundamentals of regression and model building.
CO2	Construct simple linear regression model, estimate its parameters and test their significance.
CO3	Describe and apply interval estimation of simple linear regression parameters and explain the method of maximum likelihood for estimating the parameters.
CO4	Construct multiple linear regression model, estimate its parameters and test their significance.
CO5	Explain and apply residuals and residual plots for model adequacy checking.
CO6	Discuss polynomial and logistic regression methods and estimate their parameters.

B.Sc. Statistics

STA6B08: STATISTICAL COMPUTING

At the end of this course, a student will have developed ability to:

CO1	To familiarise the students with the basics of R package.
CO2	To develop scientific and experimental skills of the students and to correlate the theoretical principles with application based studies.

B.Sc. Statistics

STA6B09: TIME SERIES AND INDEX NUMBERS

At the end of this course, a student will have developed ability to:

CO1	Understand the components and models of time series
CO2	Determination of trends and construction of seasonal indices.
CO3	Discuss the income and allied distributions.
CO4	Explain the definition and construction of index numbers.
CO5	Test the consistency for index numbers.
CO6	Discuss the attitude measurement scale and issues associated with it.

B.Sc. Statistics

STA6B10: DESIGN OF EXPERIMENTS

At the end of this course, a student will have developed ability to:

CO1	Understand the idea of estimation and there by obtaining the best estimates.
CO2	Understand and apply analysis of variance and related post hoc tests.
CO3	Understand the concept of analysis of covariance with a single observation per cell.
CO4	Understand the basic principles of experimentation
CO5	Compare and contrast complete block designs.
CO6	Understand and apply factorial designs and incomplete block designs.

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STA6B11: POPULATION STUDIES, ACTUARIAL SCIENCE AND VITAL STATISTICS

At the end of this course, a student will have developed ability to:

CO1	Recognize sources of vital statistics in India and its major functions
CO2	Understand and compute mortality rates, fertility and reproduction rates
CO3	Understand and construct life tables.
CO4	Understand the fundamentals of insurance.
CO5	Construct mortality tables to enhance the calculation of premiums of the life insurances.

B.Sc. Statistics

STA6B12: OPERATIONS RESEARCH AND STATISTICAL QUALITY CONTROL

At the end of this course, a student will have developed ability to:

CO1	Understand and apply linear programming problem to solve real life problems.
CO2	Understand and apply the transportation and assignment problems to solve real life problems
CO3	Explain the fundamental concept of control charts and causes of variations.
CO4	Understand and apply control charts for variables and attributes.
CO5	Discuss the fundamentals of acceptance sampling and OC curve.
CO6	Explain simple and double sampling plans and discuss the measures for the evaluation of performance of sampling plans.

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STA6B13: PROJECT WORK

At the end of this course, a student will have developed ability to:

CO1	To enhance Research attitude
CO2	To familiarise the students with the basics of SPSS and R package.
CO3	To apply the theory of research in real life situations.

B.Sc. Statistics

STA6B14 (E): PROBABILITY MODELS AND RISK THEORY

At the end of this course, a student will have developed ability to:

CO1	Discuss the model for individual claim random variables and sums of independent random variables of Individual risk model for a short time.
CO2	Explain the approximation for the distribution of sum of individual risk model for a short time and its application to insurance.
CO3	Describe the collective risk models for a single period and approximation to the distributions of aggregate claims.
CO4	Discuss the collective risk models over an extended period and understand the maximal aggregate loss.
CO5	Establish the applications of risk theory and claim amount distributions approximating the individual model.
CO6	Describe the stop-loss reinsurance and the effect of reinsurance on the probability of ruin.

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STA6B15 (E): STOCHASTIC PROCESSES

At the end of this course, a student will have developed ability to:

CO1	Discuss Conditional probability and Baye's theorem.
CO2	Understand stochastic process and its classifications.
CO3	Understand the fundamentals of Markov process
CO4	Explain Transition probability matrices
CO5	Discuss first passage probability and stationary distribution.
CO6	Understand Ergodic theorems and periodicity.

B.Sc. Statistics

STA6B16(E): RELIABILITY THEORY

At the end of this course, a student will have developed ability to:

CO1	Understand the idea of notions of structural properties of binary system.
CO2	Explore the concepts of system reliability
CO3	Understand the type of ageing properties of lifetime distribution
CO4	Determine the bounds of reliability.
CO5	Understand the applications of exponential and Poisson distributions in system reliability.

B.Sc. Statistics

STA5D 01: ECONOMIC STATISTICS

At the end of this course, a student will have developed ability to:

CO1	Understand components and models of time series data.
CO2	Determination of trends and construction of seasonal indices.
CO3	Explain the definition and construction of index numbers.
CO4	Test the consistency for index numbers.

B.Sc. Statistics

STA5D 02: QUALITY CONTROL

At the end of this course, a student will have developed ability to:

CO1	Explain the fundamental concept of control charts and causes of variations.
CO2	Understand and apply control charts for variables and attributes.
CO3	Discuss the fundamentals of acceptance sampling and OC curve.
CO4	Explain simple and double sampling plans and discuss the measures for the evaluation of performance of sampling plans.

B.Sc. Statistics

STA5D03 : BASIC STATISTICS

At the end of this course, a student will have developed ability to:

CO1	Compare census and sampling and discuss the principal steps in sample surveys and associated errors.
CO2	Understand and apply the measures of central tendency and measures of dispersion.
CO3	Discuss univariate and bivariate data and examine the linear correlation between two random variables.
CO4	Apply the principle of least squares in fitting curves.
CO5	Understand the concepts of random experiments and definitions of probability.
CO6	Understand and apply the theorems and results to compute the probabilities of events.

B.Sc. Statistics

STA1C01: INTRODUCTORY STATISTICS

At the end of this course, a student will have developed ability to:

CO1	Recognize important Statistical organizations in India.
CO2	Describe data and apply the measures of central tendency, measures of location, measures of dispersion and measures of shape.
CO3	Distinguish between correlation and regression in terms of explaining the relationship between two or more variables.
CO4	Apply the principle of least squares in fitting linear and non- linear curves.
CO5	Understand the concept and components of time series and compare the methods for estimating trends and seasonal variations.
CO6	Explain the concept of index numbers and compare the methods for constructing index numbers

B.Sc. Statistics

STA2C02: PROBABILITY THEORY

At the end of this course, a student will have developed ability to:

CO1	Understand the concepts of random experiments and definitions of probability.
CO2	Understand and apply the theorems and results to compute the probabilities of events.
CO3	Explain and apply discrete and continuous random variables, their probability functions and properties.
CO4	Understand and apply the idea of expectations and there by obtaining the moments.
CO5	Understand and apply the concepts of bivariate random variables and their probability distributions.
CO6	Determine the nature of relationship and the independence of bivariate random variables using mathematical expectation.

B.Sc. Statistics

STA3C03: PROBABILITY DISTRIBUTIONS AND SAMPLING THEORY.

At the end of this course, a student will have developed ability to:

CO1	Understand and derive discrete probability distributions and their properties.
CO2	Understand and derive continuous probability distributions and their properties.
CO3	Explain and apply Central Limit Theorems and laws of large numbers.
CO4	Understand the methods of sampling and identify the suitable situations.
CO5	Understand the fundamentals of sampling distribution.
CO6	Explain and derive Chi square, t, F distributions and their properties.

B.Sc. Statistics

STA4C04: STATISTICAL INFERENCE AND QUALITY CONTROL.

At the end of this course, a student will have developed ability to:

CO1	Understand and apply the theory of point estimation.
CO2	Understand and apply the theory of interval estimation.
CO3	Explore the concepts of testing of hypotheses.
CO4	Identify and apply suitable parametric tests for varying situations.
CO5	Identify and apply suitable non parametric tests for varying situations.
CO6	Explain and apply control charts for variables and attributes.

B.Sc. Statistics

PSY 1C 01- DESCRIPTIVE STATISTICS

At the end of this course, a student will have developed ability to:

CO1	To generate interest in Statistics
CO2	To equip the students with the concepts of basic Statistics
CO3	To provide basic knowledge about Statistical methods

B.Sc. Statistics

PSY 2C 02- REGRESSION ANALYSIS AND PROBABILITY THEORY

At the end of this course, a student will have developed ability to:

CO1	To make the students aware of various Statistical tools
CO2	To create awareness about probability
CO3	To create awareness about random variables

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PSY 3C 03- PROBABILITY DISTRIBUTIONS AND PARAMETRIC TESTS

At the end of this course, a student will have developed ability to:

CO1	To get a general understanding on various probability distributions
CO2	To familiarize the Methods of Sampling
CO3	To familiarize the uses of Statistical test.

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PSY 4C 04- STATISTICAL TECHNIQUES FOR PSYCHOLOGY

At the end of this course, a student will have developed ability to:

CO1	To make the students aware of various Statistical test in different areas of Psychology
CO2	To give knowledge about applications of Statistics in different areas of Psychological studies.
CO3	To provide basic knowledge about the Preparation of Questionnaire