

Programme and Course Outcomes of Statistics Department at the Undergraduate Level:

Core Papers:

B.Sc 1st Semester (Honours):

Paper: STA-HC-1016: Descriptive Statistics

After successful completion of the course, the students will be able to:

- ❖ Organize, manage and present data.
- ❖ Statistical data can be analysed graphically using frequency distribution and cumulative frequency distribution.
- ❖ Acquaintance with different methods of collecting data and get familiar with some elementary methods of data viz. Measures of central tendency, dispersion, skewness and kurtosis and to interpret them.
- ❖ Establish inter-relation between two or more phenomenon with the help of curve fitting and correlation-regression analysis.
- ❖ Understand the linear relationship between two variables by using scatter plot.
- ❖ Understand the concept of least square method.

Paper: STA-HC-1026: Calculus

- ❖ Explain the relationship between the derivative of a function as a function and the notion of the derivative as the slope of the tangent line to a function at a point.
- ❖ Compare and contrast the ideas of continuity and differentiability.
- ❖ To able to calculate limits in indeterminate forms by using L' Hospital rule.
- ❖ Understand the concept of maxima and minima.
- ❖ To able to evaluate integrals of rational functions by partial fractions.

B.Sc 2nd Semester (Honours):

Paper: STA-HC-2016: Probability and Probability Distributions

- ❖ Understanding the basic concepts of probability and its applications in real life problems.
- ❖ Knowledge about the types of random variables and will be able to make a comparison between the types of random variables.
- ❖ Knowledge related to the concept of some important distributions like Binomial, Poisson, Normal, Exponential, Gamma etc.

Paper: STA-HC-2026: Algebra

- ❖ *Understanding the relation between the roots and coefficients.*
- ❖ *Idea about the vector space, basis and dimension.*
- ❖ *Learn how to compute determinant and matrices.*
- ❖ *Understanding the concepts behind the characteristic roots of a matrix and its related properties.*

B.Sc 3rd Semester (Honours):

Paper: STA-HC-3016: Sampling Distributions

- ❖ *Understand the concept of order statistics and its application in real world.*
- ❖ *Gather knowledge about the formulation and testing of a hypothesis by use of critical values in order to draw the conclusions regarding the sample obtained from the population.*
- ❖ *Idea about large sample tests and its related application.*
- ❖ *Knowledge about small sample test based on Chi-square, t and F distributions.*
- ❖ *Idea regarding the concept of confidence interval.*

Paper: STA-HC-3026: Survey Sampling and Indian Official Statistics

After completion of the course, the students will be able to understand:

- ❖ *The basic concept of sample survey and its requirement.*
- ❖ *How to draw an appropriate sample and interpret the result.*
- ❖ *Different methods of sampling techniques and its uses.*
- ❖ *Official statistical system in India and function of different agencies.*

Paper: STA-HC-3036: Mathematical Analysis

- ❖ *Understanding the basic properties about the field of real numbers.*
- ❖ *Idea about the theory of sequences and series.*
- ❖ *Knowledge about the limit of a function.*
- ❖ *Understanding the notion of continuous function and its related properties.*
- ❖ *Idea of interpolation and extrapolation will be achieved.*
- ❖ *Gaining knowledge about various methods of interpolation techniques.*

B.Sc 4th Semester (Honours):

Paper: STA-HC-4016: Statistical Inference

On successful completion of the course, the students will

- ❖ *Learn about various estimation methods and its related theorems.*
- ❖ *Understand the concept of a good estimator.*
- ❖ *Gather knowledge on inferential aspects such as point estimation, testing of hypothesis and its associated concepts.*

Paper: STA-HC-4026: Linear Models

- ❖ *Understanding the basic concept of linear model and its application.*
- ❖ *Idea about Gauss Markov Theorem and its use.*
- ❖ *Gather knowledge about simple and multiple regression models and their applications.*
- ❖ *Idea about fixed, random and mixed effect model.*

Paper: STA-HC-4036: Statistical Quality Control

- ❖ *Understanding the basic concept of quality control and its use in the real world.*
- ❖ *Idea about various control charts.*
- ❖ *Knowledge about Six-Sigma.*
- ❖ *Idea about interpretation and construction of acceptance sampling plans.*

B.Sc 5th Semester (Honours):

Paper: STA-HC-5016: Stochastic Processes and Queuing Theory

- ❖ *Understand the fundamental concept of random process and its related tools that are required to analyze the stochastic process.*
- ❖ *Idea behind the concept of Markov chain and its application.*
- ❖ *Knowledge about the concept of Poisson Process.*
- ❖ *Idea behind the theory of Queuing Systems.*

Paper: STA-HC-5026: Statistical Computing Using C/C++ Programming

After successful completion of the course, the students will be able to:

- ❖ *Write code in C in order to do statistical computation.*
- ❖ *Understand basic data structures and develop logics which will help them to create well-structured programs using C language.*
- ❖ *Gather knowledge about arrays, functions and pointer.*
- ❖ *Acquire an idea about the operators and expressions related to C programming.*

Paper: STA-HE-5016: Operation Research

- ❖ *Students will be able to understand mathematical models that will be used in Operation Research.*
- ❖ *Understanding the concept of Linear Programming Problem and its application.*
- ❖ *Idea of Simplex Method and Game Theory.*
- ❖ *Knowledge about Inventory Management.*

Paper: STA-HE-5026: Time Series Analysis

- ❖ *Understanding the basic concept regarding time series approach.*
- ❖ *Students will be able to forecast the pattern of trend exhibited by the given set of data.*
- ❖ *Students will get acquainted with various methods that are required in order to analyse time series data.*
- ❖ *Idea behind the concept of exponential smoothing.*

B.Sc 6th Semester (Honours):

Paper: STA-HC-6016: Design of Experiments

- ❖ *The fundamental concept on design of experiments and its application.*
- ❖ *Idea about some important designs like Completely Randomised Design, Randomised Block Design and Latin Square Design.*
- ❖ *The notion behind the concept of factorial experiments.*
- ❖ *Acquire knowledge about the use of appropriate experimental designs in order to analyze the experimental data.*

Paper: STA-HC-6026: Multivariate Analysis and Nonparametric Methods

- ❖ *Understanding the basic concept of multivariate data.*
- ❖ *Students will be able to analyse and interpret the multivariate dataset.*
- ❖ *Students will get acquainted with the concept of Hotelling T^2 statistic and its application.*
- ❖ *Knowledge about the importance of non-parametric procedure and its uses.*
- ❖ *Idea about different methods of non-parametric technique.*

Paper: STA-HC-6036: Demography and Vital Statistics

- ❖ *Understanding the basic concept related to demographic data.*
- ❖ *Knowledge about the life table and its application.*
- ❖ *Students will acquire knowledge behind various measures of mortality and fertility.*
- ❖ *Students will get acquainted with various errors in connection with demographic data.*

Paper: STA-HC-6046: Project

After the successful completion of the project, students will be in a position to

- ❖ Analyze and interpret and take appropriate decisions in solving real life problems using statistical tools.*
- ❖ Use different Statistical packages for data analysis and interpretation.*
- ❖ Writing the project in a very comprehensive manner.*