



Name of the Programme: B.A./B.Sc. Statistics (FYUGP)

PROGRAMME OUTCOME

After completing this programme, it is expected to provide the students a good overall knowledge of Statistics covering various aspects. As a result, they will not only be able to understand the important statistical techniques but also able to apply some commonly used statistical techniques to other fields.

PO1: Critical Thinking:

- Enrich the students with ability to examine basic statistical issues in a more logical and methodical manner.
- The students will strengthen themselves both computationally and analytically.

PO2: Problem Solving:

- The students will be able to examine various hypotheses involved, and will be able to identify and consult relevant resources to find their rational answers.

PO3: Analytical Reasoning:

- The students are expected to develop capability to identify logical flaws and loopholes in the arguments of practicing Statisticians, analyze and synthesize data from a variety of sources and accordingly draw conclusions.

PO4: Research Related Skills:

- The students should be able to develop original thinking for formulating new problems and providing their solutions.
- Develop thought provoking skills for their own subject as well as for those who are practicing Statistics.

PO5: Communication Skills and Team Work:

- Develop effective and confident Communication skill
- Ability to work in a team as well as in isolation while carrying field work and project.

PO6: Moral and Ethical Awareness:

- The students are expected to develop ethical and social responsibility as well.
- The students will be able to identify ethical issues, avoid unethical behaviour such as fabrication, falsification or misrepresentation and misinterpretation of data.

PO7: Scientific Reasoning:

- The students will be able to analyze, interpret and draw appropriate conclusions from both quantitative and qualitative data and critically evaluate ideas, evidence and experiences with an unbiased and consistent approach while analysing data collected by them during Project work.

PO8: Information/Digital literacy:

- The proposed course is expected to develop digital literacy among the students for using ICT in different learning situations.
- The students are able to equip themselves with in depth programming and simultaneously use appropriate Statistical software for Statistical computing.

PO9: Self-directed Learning:

- The students are expected to be familiar with data collection, compilation, analysis and interpretation and writing of project reports independently.

Programme Specific Outcomes(PSO)**Programme Name: B.Sc in Statistics**

After completion of B.Sc (Statistics) programme students should be able to:

PSO1: Basic Theories of Statistics

- Understand the basic theories of descriptive and inferential statistics.

PSO2: Applications of Statistics in different Domain

- Knowledge of Statistics and its scope and importance in various areas such as Medical, Engineering, Agricultural and Social Sciences etc.
- Information about various Statistical organisations in India and their functions for societal developments,

PSO3: Data Analysis and Interpretation

- Knowledge of various types of data, their organization and evaluation of summary measures such as measures of central tendency and dispersion etc.
- Knowledge of other types of data reflecting quality characteristics including concepts of independence and association between two attributes.

PSO4: Probability Theory and Distribution:

- Knowledge to conceptualize the probabilities of events including frequentist and axiomatic approach. Simultaneously, they will learn the notion of conditional probability including the concept of Bayes' Theorem.

- Knowledge of important discrete and continuous distributions such as Binomial, Poisson, Geometric, Negative Binomial and Hyper-geometric, normal, uniform, exponential, beta and gamma distributions,
- Insight to apply standard discrete and continuous probability distributions to different situations.

PSO5: Sampling Distribution:

- The concept of convergence in probability and law large numbers and their uses.
- concept of random sample from a distribution, sampling distribution of a statistic, standard error of important estimates such as mean and proportions,
- knowledge about important inferential aspects of test of hypotheses and associated concepts,

PSO6: Statistical Inference:

- Various methods of estimation, Principles of test of significance, most powerful test, UMP test, Neyman Pearson Lemma, Likelihood ratio test and properties etc.

PSO7: Statistical Quality Control:

- The concepts underlying statistical quality control and to develop their ability to apply those concepts to the design and management of quality control processes in industries.

PSO8: Statistical Computing using C Programming:

- This course will enable the students to understand and apply the programming concepts of C which is important for statistical as well as mathematical investigation and problem solving.
- Student can gain knowledge of history and importance of C Programming language, basic structure programming, operators and expressions, decision

making and branching, arrays, user defined functions, category of functions, recursion functions, storage class variables etc.

PSO9: Project Work:

- Analyze and interpret and take appropriate decisions in solving real life problems using statistical tools.
- Use different Statistical packages for graphical interface, data analysis and interpretation.
- Write and present a systematic Statistical Project Report.

Course Outcomes (CO)

Semester I

Course Title: Descriptive Statistics

Course Code: STSC1

On completing the course, the student will be able to:

- CO1 Understand the definition and scope of statistics, types of data, collection, presentation, tabulation of quantitative data and attributes
- CO2 Evaluate measures of various dispersion
- CO3 Understand the concept of bivariate data, correlation and regression
- CO4 Understand Index number- definition, its' construction and uses
- CO5 Apply different measures of location and dispersion in real life problems.

Course Title: Basic Statistical Methods

Course Code: MINSTS1

On completing the course, the student will be able to:

- CO1 Develop a clear understanding of the fundamental concepts of descriptive statistics
- CO2 Evaluate measures of various dispersion
- CO3 Understand the concept of bivariate data, correlation and regression
- CO4 Understand Index number- definition, its' construction and uses
- CO5 Apply different measures of location and dispersion in real life problems

Course Title: Collection of Data Presentation**Course Code: SECSTS1**

On completing the course, the student will be able to

- CO1 Understand the importance of data collection and presentation in decision -making process
- CO2 Identify appropriate data collection methods based on research objectives and constraints
- CO3 Design and Conduct surveys, interviews and observations to collect primary data.
- CO4 Apply statistical techniques to analyze data and derive meaningful insights
- CO5 ret and communicate data findings accurately and concisely

Course Title: Statistical Methods**Course Code: GEC-1**

On completing the course, the student will be able to

- CO1 Develop a clear understanding of the fundamental concepts of descriptive statistics
- CO2 Evaluate measures of various dispersion
- CO3 Understand the concept of bivariate data, correlation and regression
- CO4 Understand Index number- definition, its' construction and uses
- CO5 Apply different measures of location and dispersion in real life problems

Semester II**Course Title: Probability theory and Statistical Distributions****Course Code: STSC2**

On completing the course, the student will be able to

- CO1 Understand basic concepts of Probability theory
- CO2 Remember knowledge of random variable, pmf, pdf, cdf, distribution function etc.
- CO3 Evaluate Mathematical expectation, generating functions for single and bivariate r.v. and related topic
- CO4 Understand probability distributions and their properties
- CO5 Learn different methods of studying a theoretical distribution

Course Title: Basic Probability Theory and Distribution**Course Code: MINSTS1****On completing the course, the student will be able to**

- CO1 Understand basic concepts of Probability theory
- CO2 Remember knowledge of random variable, pmf, pdf, cdf, distribution function etc.
- CO3 Evaluate Mathematical expectation, generating functions for single and bivariate r.v. and related topic
- CO4 Understand probability distributions and their properties
- CO5 Learn different methods of studying a theoretical distribution

Course Title: Data Science using MS Excel**Code: SECSTS2****On completing the course, the student will be able to**

- CO1 Understand the basic introduction to MS Excel
- CO2 Learn MS Excel tools, handling various types of data and their graphical presentation
- CO3 Apply different data analytic tools in real life problems
- CO4 Learn different excel functions for data handling and manipulation
- CO5 Apply the tools for real life data analysis project and presentation

Course Title: Basics of Statistical Distributions and Inference**Course Code: GECSTS2****On completing the course, the student will be able to**

- CO1 Understand basic concepts of Probability theory
- CO2 Remember knowledge of random variable, pmf, pdf, cdf, distribution function etc.
- CO3 Evaluate Mathematical expectation, generating functions for single and bivariate r.v. and related topic
- CO4 Understand useful sampling distributions and their properties
- CO5 Analyze and interpret the data and statistical inference in data analysis

Semester III**Course Title: Sampling Distribution****Code: STS3**

- CO1 Understand the basic concepts of sampling distributions, the central limit theorem and its applications
- CO2 Understand the basic theory of different sampling distributions namely chi-square, student-t, F distributions etc
- CO3 Develop knowledge about distributions of various order statistics
- CO4 Understand the properties of different sampling distribution and their real data applications
- CO5 Understand the mathematical knowledge and built functions for further study of statistical inference

Course Title: Mathematics for Statistics**Code: STSC 4****On completing the course, the student will be able to**

- CO1 Developed a clear understanding of the fundamental concepts of real analysis
- CO2 Evaluate Infinite Series, their convergence and related topics essential for understanding Statistics
- CO3 Understand the basic concept of algebra of matrices and determinants
- CO4 Understand the basic concept of rank of a matrix and their properties
- CO5 Learn mathematical concepts and tools to strengthen of statistical theory

Course Title: Data Science using SPSS**Code: SECSTS****SL.No. On completing the course, the student will be able to**

- CO1 Understand the basic tools of SPSS and data analytic techniques
- CO2 Learn SPSS tools, handling various types of data and their graphical representation
- CO3 Understand descriptive statistics in SPSS
- CO4 Understand fundamental applications of inferential statistics in SPSS
- CO5 Apply the tools for real-life data analysis projects and reporting

Course Title: Statistical Inference-I**Course Code: MINSTS3****On completing the course, the student will be able to**

- CO1 Understand the basic concept of sampling distribution
- CO2 Understand different methods of parameter estimation
- CO3 Learn the concept of small sample and large sample tests
- CO4 Analyze and interpret the data and statistical inference in data analysis
- CO5 Gain working knowledge of sequential analysis

Course Title: Applied Statistics**Course Code: GECSTS3****On completing the course, the student will be able to**

- CO1 Understand the Basic concepts of quality control and different control charts
- CO2 Understand the basic concepts of Index number and its applications in real data set
- CO3 Understand the basic concepts of demographic methods
- CO4 Understand life tables and its applications in mortality study
- CO5 Understand useful applications of statistics in Economics, Industry and Society
