

COURSE OUTCOMES

DEPARTMENT OF STATISTICS

F.Y.B.Sc.		
Sem-1		
Paper-1	DESCRIPTIVE STATISTICS- I	Course code: USST101
Course outcome	Description The learner would be able to understand:	
CO1	<ul style="list-style-type: none"> • Categorization of different types of data. • Different types of data measurement scales. • To measure the association between two attributes. 	
CO2	<ul style="list-style-type: none"> • Construction of univariate and bivariate frequency distribution for discrete and continuous variables. Cumulative frequency distribution. • Graphical representation of data for above frequency distributions. • Analyze data using measures of central tendency. 	
CO3	<ul style="list-style-type: none"> • Analyze data using measures of dispersion. • Relate raw moments and central moments. • Concept of skewness and kurtosis. • Identify outliers. 	
	Paper-2	STATISTICAL METHODS-1 Course code: USST102
Course outcome	Description The learner would be able to understand	
CO1	<ul style="list-style-type: none"> • Basic rules of probability. Compute probabilities of events. 	
CO2	<ul style="list-style-type: none"> • Concept of random variable and its distribution and properties. 	
CO3	<ul style="list-style-type: none"> • Apply standard discrete probability distributions based on real life. 	

Sem-2		
Paper-1	DESCRIPTIVE STATISTICS-II	Course code: USST201
Course outcome	Description The learner would be able to understand:	
CO1	<ul style="list-style-type: none">• Compute the correlation between two variables and its interpretation.• Construction of simple linear regression model. Interpretation of regression coefficient and coefficient of determination.• Fitting of regression line and different types of curves using the method of least squares.	
CO2	<ul style="list-style-type: none">• Identifying various components of time series.• Different methods for identifying and eliminating these components.	
CO3	<ul style="list-style-type: none">• Concept and construction of index numbers.	
	Paper-2	STATISTICAL METHODS-2
		Course code: USST202
Course outcome	Description The learner would be able to understand:	
CO1	<ul style="list-style-type: none">• Concept of continuous random variable and its probability density function and cumulative distribution function.	
CO2	<ul style="list-style-type: none">• Different types of standard continuous probability distributions and their properties.	
CO3	<ul style="list-style-type: none">• Difference between point estimation and interval estimation.• Terminologies of testing of hypothesis and solving examples based on large sample test.	
S.Y.B.Sc.		
Sem-3		
Paper-1	PROBABILITY DISTRIBUTIONS	Course code: USST301
Course outcome	Description The learner would be able to understand:	
CO1	<ul style="list-style-type: none">• Compute M.G.F. , C.G.F. and Characteristic function of a random variable.	

CO2	<ul style="list-style-type: none"> Different standard discrete probability distributions and its properties.
CO3	<ul style="list-style-type: none"> Compute probabilities and derive the marginal and conditional distributions of bivariate random variables. The probability density function of transformation of random variables.
	Paper-2 THEORY OF SAMPLING Course code: USST302
Course outcome	Description The learner would be able to understand:
CO1	<ul style="list-style-type: none"> Terminologies of sampling and need of sampling. Concept of simple random sampling, formulate and calculate the estimates of population parameters.
CO2	<ul style="list-style-type: none"> Stratified sampling, formulate and calculate the estimates of population parameters.
CO3	<ul style="list-style-type: none"> Ratio and Regression estimation using SRSWOR. Systematic sampling, Cluster sampling and Two stage sampling.
	Paper- 3 OPERATIONS RESEARCH 1 Course code: USST303
Course outcome	Description The learner would be able to understand:
CO1	<ul style="list-style-type: none"> Formulate a linear programming problem and solving by using graphical method and simplex method. Concept of duality and obtaining solution of primal.
CO2	<ul style="list-style-type: none"> Transportation problem, obtain its solution using various methods and optimize it.
CO3	<ul style="list-style-type: none"> Assignment problem, obtain its solution using Hungarian method and optimize it. Sequencing problems using Johnson's method.
Sem-4	
	Paper-1 PROBABILITY AND SAMPLING DISTRIBUTIONS Course code: USST401
Course outcome	Description The learner would be able to understand:

CO1	<ul style="list-style-type: none"> Standard continuous probability distributions and its results.
CO2	<ul style="list-style-type: none"> Normal distribution and its properties.
CO3	<ul style="list-style-type: none"> Exact sampling distributions.
Paper-2 ANALYSIS OF VARIANCE & DESIGN OF EXPERIMENTS Course code: USST402	
Course outcome	Description The learner would be able to understand:
CO1	<ul style="list-style-type: none"> Analysis of One-way and Two-way classification.
CO2	<ul style="list-style-type: none"> Terminologies of design of experiments. Analysis of CRD and RBD.
CO3	<ul style="list-style-type: none"> Analysis of LSD. Factorial experiment and its analysis. Concept of confounding.
Paper-3 OPERATIONS RESEARCH – 2 Course code: USST403	
Course outcome	Description The learner would be able to understand:
CO1	<ul style="list-style-type: none"> Construction of project network and obtaining critical path. Concept of crash activities to optimize project cost.
CO2	<ul style="list-style-type: none"> Game theory, obtaining its solution using dominance property, graphical method and linear programming problem.
CO3	<ul style="list-style-type: none"> Decision theory Decision making under uncertainty. Decision making under risk.
T.Y.B.Sc.	
Sem-5	
Paper-1 PROBABILITY AND DISTRIBUTION THEORY Course code: USST501	
Course outcome	Description The learner would be able to understand:

CO1	<ul style="list-style-type: none"> Advanced concept of probability theory.
CO2	<ul style="list-style-type: none"> Under probability, inequalities and law of large numbers.
CO3	<ul style="list-style-type: none"> Trinomial distribution and derive its moment generating function. Multinomial distribution.
CO4	<ul style="list-style-type: none"> Concept of order statistics and its application.
	Paper-2 THEORY OF ESTIMATION Course code: USST502
Course outcome	Description The learner would be able to understand:
CO1	<ul style="list-style-type: none"> Point estimation and properties of good estimators.
CO2	<ul style="list-style-type: none"> Various methods of point estimation.
CO3	<ul style="list-style-type: none"> Obtain estimator of a parameter using Bayes' approach. Interval estimation.
CO4	<ul style="list-style-type: none"> General linear model of full rank.
	Paper-3 BIOSTATISTICS Course code: USST503
Course outcome	Description The learner would be able to understand:
CO1	<ul style="list-style-type: none"> Application of statistics in epidemiology.
CO2	<ul style="list-style-type: none"> Application of statistics in biological sciences.
CO3	<ul style="list-style-type: none"> Terminologies of Clinical trials.
CO4	<ul style="list-style-type: none"> Terminologies of Bioequivalence. Application of statistics in Clinical trials and Bioequivalence.
	Paper-4 Regression Analysis using R software Course code: USST504
Course outcome	Description The learner would be able to understand:
CO1	<ul style="list-style-type: none"> Fundamentals of R software. Data visualization and interpretation.

CO2	<ul style="list-style-type: none"> • Concept of simple linear regression model.
CO3	<ul style="list-style-type: none"> • Concept of multiple linear regression model.
CO4	<ul style="list-style-type: none"> • Validity of assumptions for linear regression model.
Sem-6	
Paper-1 DISTRIBUTION THEORY AND STOCHASTIC PROCESSES Course code: USST601	
Course outcome	Description The learner would be able to understand:
CO1	<ul style="list-style-type: none"> • Bivariate normal distribution and its properties.
CO2	<ul style="list-style-type: none"> • Concept of generating function and probability generating function.
CO3	<ul style="list-style-type: none"> • Different stochastic processes and derive its parameters.
CO4	<ul style="list-style-type: none"> • Different queueing models and derive its measures.
Paper-2 TESTING OF HYPOTHESIS Course code: USST602	
Course outcome	Description The learner would be able to understand:
CO1	<ul style="list-style-type: none"> • Terminologies of Testing of hypothesis. • Identify Most powerful test using Neyman- Pearson lemma.
CO2	<ul style="list-style-type: none"> • Identify Uniformly Most powerful using Neyman- Pearson lemma. • Obtain Likelihood Ratio test.
CO3	<ul style="list-style-type: none"> • Obtain Sequential probability ratio test for various probability distributions.
CO4	<ul style="list-style-type: none"> • Parametric and Non-parametric tests. • Applications of various Non-Parametric test.
Paper-3 OPERATIONS RESEARCH TECHNIQUES Course code: USST603	
Course outcome	Description The learner would be able to understand:
CO1	<ul style="list-style-type: none"> • Advanced techniques of linear programming problem.

CO2	<ul style="list-style-type: none"> • Meaning of inventory problem. • Deterministic and Probabilistic inventory models. • Compute reorder quantity and reorder period.
CO3	<ul style="list-style-type: none"> • Find optimum age of replacement of an item under different conditions. • Individual and group replacement policy.
CO4	<ul style="list-style-type: none"> • Simulate random numbers and random observations for some standard probability distributions. • Generation of random numbers using Mid-square method and Multiplicative congruential method. • Apply Monte-Carlo technique for solving inventory and queueing problem. • Concept of reliability. • Mathematical aspect of computing reliability.
Paper-4 ACTURIAL SCIENCE Course code: USST604	
Course outcome	Description The learner would be able to understand:
CO1	<ul style="list-style-type: none"> • Terminologies of mortality table. • Concept of mortality rate and selected rate.
CO2	<ul style="list-style-type: none"> • Meaning of nominal rate and effective rate. • Concept of present value and accumulated value. • Various types of annuities and its present value and accumulated value.
CO3	<ul style="list-style-type: none"> • Various types of life annuities and its present value and accumulated value.
CO4	<ul style="list-style-type: none"> • Concept of assurance. • Evaluate the single premium and the level annual premium for various assurance schemes.

APPLIED COMPONENT

	Sem V
	Computer Programming and System Analysis Course code USACCS501
CO I	Have a broad understanding of database concepts and database management system software, major DBMS components and their function, write SQL commands to create tables and indexes, insert, update, delete data and query data in relational DBMS, prepare various database tables and join them using SQL commands
CO II	Reflect on the advantages and benefits of PL/SQL within a database environment, work on processes of Database Development and Administration using SQL and PL/SQL, declaring program variables and complex data types, developing logic within PL/SQL program blocks, use PL/SQL code constructs of IF-THEN-ELSE and LOOP types as well as syntax and command functions, solve Database problems using Oracle 9i SQL and PL/SQL, use Procedures and Functions.
CO III	Know the Java software architecture, and the design decisions which make Java software portable, efficient, secure and robust, learn how to configure a simple Java development environment, know the data types and flow control constructs of the Java language for simple procedural programming, create Java technology applications that leverage the object-oriented features of the Java language, such as encapsulation, inheritance, and polymorphism, execute a Java technology application from the command line, use Java technology data types and expressions, use arrays and other data collections.
CO IV	Explain the various methodologies to handle the exception mechanisms and the principles of inheritance, packages and interfaces, implement error-handling techniques using exception handling, understand what exceptions are and when and how they happen, understand the try catch finally statement.
	Sem VI
	Computer Programming and System Analysis Course code USACCS601
CO I	Write and execute Java applets, use the graphics class, painting, repainting and updating an applet, sizing graphics, font class, draw graphical figures-lines and rectangle, circle and ellipse, drawing arcs, drawing polygons and Work with Colors: Color methods, setting the paint mode, use AWT package: Containers: Frame and Dialog classes, Components: Label; Button; Checkbox; Text Field, Text Area.
CO II	Will be able to identify Python object types, define the structure and components of a Python program, write loops, decision statements and functions and pass arguments in Python
CO III	Use lists, tuples and dictionaries in Python programs, use indexing and slicing to access data in Python programs, learn how to read and write files in python, design object-

	oriented programs with Python classes, use class inheritance in Python for reusability, use exception handling in Python application and error handling.
CO IV	Work with the Python standard library, describe data with statistics, and visualize it with line graphs and scatter plots, apply Python's symbolic math functions to solve algebraic problems.