Villa Marie Degree College for Women

6-3-1089, Raj Bhavan Road, Somajiguda, Hyderabad-500082

Affiliated to Osmania University, Management Program Approved by AICTE
Recognised by UGC u/s 2(f), an ISO 9001:2015 Certified Institution
Accredited with B++ Grade by NAAC

Program: B.Sc. (Mathematics, Statistics & Data Science)

Mathematics – Course Objectives and Outcomes -2024-25

S.No	Course Title	Course Code	Course Objective	Course Outcome
1.	Differential & Integral Calculus	DSC-IA	● To expose basic notions in differential calculus. ● Well trained in concepts of partial differentiation. ● Calculate the Centre of curvature, radius of curvature, chord of curvature. ● Achieve confidence in surfaces of revolution problems	● Realize wide ranging applications of differentiation. ● Apply Concepts of partial differentiation. ● Analyze functions using radius of curvature, chord of curvature. ● Recognize the appropriate tools of calculus to solve applied problems.
2.	Differential Equations	DSC-1B	● To introduce techniques of solving differential equations. ● Familiarize solving Linear Differential Equations with integrating Factors. ● Acquaint with methods of solving linear differential equations ● To provide Knowledge in methods for solving higher order nonlinear differential equations.	● Understand the tools of differential equations that arise in several branches of science. ● Analyze Solving techniques of Linear Differential Equation. ● Comprehend the applications of first order differential equation. ● Use the appropriate tools for solving higher order differential equations.
3.	Real Analysis	DSC-1C	● To acquaint with Concepts of the Real Analysis. ● To provide Knowledge of sequences and series. ● To familiarize the usage of continuous functions. ● Utilize concepts of Riemann integral along with properties	● Analyze the concepts of real analysis. ● Evaluate limits of sequences and series. ● Understand the properties of continuous functions. ● Learn important concepts of Riemann integration.
4.	Algebra	DSC-1D	● To provide the knowledge of basic algebraic structures like groups, rings etc. ● Acquaint cayley's theorem along with the properties of	● Understand algebraic structures that arise in matrix algebra. ● Use properties of Isomorphism.

			isomorphism. ● Familiarize with cosets and Lagrange's theorem of Group. ● To introduce concepts of Cyclic groups.	● Comprehend the concept of permutation groups and their properties. ● Analyse cyclic groups with their properties.
5.	Linear Algebra	DSC-E	● To expose various concepts of vector spaces, basis, dimension, Eigen values etc. ● Familiarize basic terms and concepts of matrices, vectors and complex numbers. ● Provide the matrix calculus in solving a system of linear algebraic equations. ● Elicit the use of various forms of complex numbers to solve numerical problems.	● Prepare a research design and to select appropriate tools in analysis and interpretation of data. ● Understand basic concepts of linear algebra ● Solve computational problems of linear algebra ● Use the MATLAB software package by solving linear algebra problems.
6.	Numerical Analysis	DSC-1F	● Students will be made to understand some methods of numerical analysis ● Solving equations of one variable using different 7methods in algebra ● Computation of Interpolation Polynomials for given data. ● Comprehensive the use of methods for Solving Numerical Differentiation & Integration.	● Students realize the importance of the subject in solving some problems of algebra and calculus ● Usage of zeros of polynomials concept ● Understanding interpolation and polynomial approximation. ● Proper understanding of the Richardson extrapolation and the various integration methods.

Statistics - Semester I and II

Course Objectives and Outcomes -2024-25

S.No	Course Title	Course Code	Course Objective	Course Outcome
1	Descriptive Statistics and Probability	BS-101-T	• Familiarize students with basic concepts and measures of descriptive statistics. • Enable students to organize and summarize data using statistical techniques. • Introduce the principles of probability theory and its real-life applications. • Develop problem-solving skills using statistical and probabilistic methods.	• Apply descriptive statistical techniques to summarize and interpret data. • Compute and interpret measures of central tendency, dispersion, and skewness. • Use probability concepts to analyze random phenomena and solve problems. • Build a foundation for advanced study in statistics and probability.
2	Probability Distributions	BS-202-T	• Introduce students to the concept and types of probability distributions. • Explore the properties and applications of discrete and continuous distributions. • Develop analytical skills to solve problems involving probability distributions. • Provide a foundation for advanced statistical modeling and analysis.	• Understand and differentiate between discrete and continuous probability distributions. • Analyze and interpret real-world data using appropriate probability distributions. • Solve problems involving standard distributions like Binomial, Poisson, and Normal. • Apply probability distributions in various fields of science and research.

Data Science - Semester I and II

Course Objectives and Outcomes -2024-25

S.No	Course Title	Course Code	Course Objectives	Course Outcomes
1	**Problem Solving and Python Programming**	**BSDS-101T**	• To know the basics of Programming for solving a problem with writing an algorithm and flow charts, python programs with control structures. • To structure a Python Program as a set of functions • To use Python data structures-lists, tuples, dictionaries. • To input/output with files in Python, construct Python programs with classes and a set of objects.	Students will be able to ● Practice computational thinking and develop algorithmic solutions, develop and execute simple Python programs. ● Structure a Python program into functions. ● Represent compound data using Python lists, tuples, dictionaries. ● Create classes and methods to solve problems
2	**Data Structures & Algorithms**	**BSDS-202-T**	• Grasp the fundamental concepts of data structures and algorithms • Learn to use Recursion in Data Structures • Develop an understanding of Trees and Graphs, along with the algorithms developed through them • Gain knowledge on searching and sorting algorithms, with heaps.	Students will be able to ● Analyze the time and space complexities of algorithms, implement stacks ● Deploy and build Queues and Linked Lists ● Apply Non-Linear Data Structures (Trees and Graphs) in common problems encountered in Data Science ● Utilize sorting and searching techniques in the data structures learnt above.