



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 by NAAC with B++ Grade

DEPARTMENT OF SCIENCES

B.Sc (MATHEMATICS, STATISTICS, ARTIFICIAL INTELLIGENCE & MACHINE LEARNING)

ACADEMIC YEAR 2025 – 2026

COURSE OBJECTIVES AND COURSE OUTCOMES - SEMESTER I & II

S. No	Course Title	Course Code	Course Objective	Course Outcome
1	Differential Equations	DSC 1	<ul style="list-style-type: none"> ● Introduce the fundamental concepts and methods of solving ● first-order and higher-order differential equations. ● To provide an understanding of the role of integrating factors. ● To introduce higher-order linear differential equations, their solutions using operator methods. ● To introduce variation of parameters. 	<ul style="list-style-type: none"> ● Solve first order and first-degree differential equations using separable, homogeneous, linear, exact, and reducible forms. ● Apply the concepts of integrating factors and transformations to simplify and solve differential equations. ● Solve higher-order linear differential equations with constant coefficients, both homogeneous and non-homogeneous, using operator methods. ● Solve the method of undetermined coefficients.
2	Descriptive Statistics and Probability	BS-101-T	<ul style="list-style-type: none"> ● To familiarize with Basic Descriptive Statistics. ● To acquaint the computational foundation of Probability theory. ● To understand the procedures of Random Variables and its problems. ● Well trained in concepts of Mathematical Expectations and Generating Functions. 	<ul style="list-style-type: none"> ● Prepare and Analyze the Statistical reports using descriptives. ● Apply the computational concepts of Probability theory. ● Acquire the Knowledge of Random Variables. ● Evaluate Generating Functions on different Methods.

3	Fundamentals of Information Technology		<ul style="list-style-type: none"> ● To deal with computer hardware, its components and basic computer architecture. ● To acquaint storage devices and central processing unit. ● To familiarize with system software and types of networks. ● To introduce software development process and concepts of programming. 	<ul style="list-style-type: none"> ● Understand the basic structure of computer and its components. ● Analyse storage of data in physical devices, and structure and working of CPU. ● Familiar with operating system functions and computer networks. ● Evaluate the software project and the process of software development.
4	Real Analysis	DSC 2	<ul style="list-style-type: none"> ● To introduce students to the concepts of sequences and series ● To familiarize students with the concept of continuity and its properties and their limits. ● To teach students the basic properties of derivatives and important theorems in differentiation. ● To introduce students to the Riemann Integral and its properties. 	<ul style="list-style-type: none"> ● Apply limit theorems to evaluate limits of sequences and determine convergence of series. ● To identify and analyze continuous functions and understand the concept of uniform continuity. ● Compute derivatives using the basic rules of differentiation and apply the Mean Value Theorem to solve problems. ● evaluate definite integrals using the Fundamental Theorem of Calculus and apply integration techniques in solving problems.
5	Probability Distributions	BS-202-T	<ul style="list-style-type: none"> ● To Provide Knowledge about divisions of Probability Distributions. ● Acquaint with the Procedures of Geometric and Negative Binomial distributions. ● Familiarize with the concept and Procedures of Normal Distribution. ● Understand the procedures of Probability distributions. 	<ul style="list-style-type: none"> ● Differentiate Discrete and Continuous Distributions. ● Acquire the knowledge of Geometric and Negative Binomial Distribution. ● Resolve applications of Normal Distribution. ● Acquire the knowledge of Beta and Gamma Distribution.
6	Object Oriented Programming with Python		<ul style="list-style-type: none"> ● To know the basics of Programming for solving a problem with writing an algorithm and flow charts. To construct Python programs with control structures. 	<ul style="list-style-type: none"> ● Practise computational thinking and develop algorithmic solutions, develop and execute simple Python programs. ● Structure a Python program into functions.

		<ul style="list-style-type: none">● 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.	<ul style="list-style-type: none">● Represent compound data using Python lists, tuples, dictionaries.● Create classes and methods to solve problems.
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