Name of Faculty	:	Faculty of Computer Science & Applications
Name of Program	:	Bachelor of Computer Applications in Data Science
Course Code	:	1BBM01
Course Title	:	Basis of Mathematics
Type of Course	:	Basic Science
Year of Introduction	:	2023-24

Prerequisite	:	-
Course Objective	:	To understand the rate of change, convergence, divergence, Cartesian, and polar system.
Course Outcomes	:	At the end of this course, students will be able to:
	CO 1	Understand the matrix use to solve any linear system of equations
	CO 2	Understand different techniques to solve first order difference equation and behaviour of the student at future time.
	CO 3	Understand the various and appropriate test for convergence of the sequence and series
	CO 4	Understand how the improper integration can be solved
	CO 5	Understand how area and volume can be find by double and triple integration

Teaching and Examination Scheme

Teaching Scheme (Contact Hours)			Credits	Examination Marks				
				Theory Marks		Practical Marks		Total Marks
L	T	P	C	SEE	CIA	SEE	CIA	
4	0	0	4	100	50	0	0	150

*Legends: **L**-Lecture; **T**–Tutorial/Teacher Guided Theory Practice; **P**–Practical, **C** – Credit, **SEE** – Semester End Examination, **CIA** - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.))*

Course Content

Unit No.	Topics	Teaching Hours	Weightage	Mapping with CO
1	**Matrices:** Concept of Matrix, Types of Matrices, Addition, Subtraction and multiplication by scalar of matrices, Product of two matrices Adjoint, Inverse and Rank of matrices.	15	25%	CO 1

2	**Set Theory:** Basic concept of set theory: Definition, Equality of set, Cartesian product, The power set, some operation of set, Venn diagram, Some basic set identities.	15	20%	CO 2
3	**Boolean algebra:** Definition of Boolean algebra as algebraic structures with two operations basic results truth values and truth tables, laws, and theorems of Boolean algebra, De-Morgan's theorem.	15	25%	CO 3
4	**Graphs:** Graphs terminology, Representing Graphs, Directed and undirected graphs and their matrix representations, **Trees:** Definition of trees, Branch nodes, leaf notes, root, Examples: Representation of tree Examples: binary tree, m-ary tree and complete binary tree.	15	30%	CO 4

Suggested Distribution of Theory Marks Using Bloom's Taxonomy					
Level	Remembrance	Understanding	Application	Analyse	Evaluate	Create
Weightage	**40**	**40**	**20**	-	-	-

NOTE: This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Suggested List of Experiments/Tutorials

Sr. No.	Name of Experiment/Tutorial	Teaching Hours
1	Echelon and row Echelons	2
2	Rank of the matrix and solution of system of linear equation	2
3	Solution of Ordinary Differential equation	2
4	Exact and Non Exact differential equation	2
5	Convergence and divergence of sequence and series	2
6	Power series	2
7	Convergence and Divergence of improper integration	2
8	Beta and Gamma Functions	2
9	Algebraic structure	2
10	Truth values and truth table	2

Suggested Learning Websites

Sr. No.	Name of Website
1	https://semesters.in/engineering-mathematics-for-btech-first-year/
2	https://www.nptel.ac.in
3	https://tutorial.math.lamar.edu/classes/calci/calci.aspx
4	https://www.khanacademy.com

Reference Books

Sr. No.	Name of Reference Books
1	Erwin Kreyszig, Advanced Engineering mathematics, John Wiley, 10th Ed., 2015.
2	B. S Grewal, Higher Engineering Mathematics, (43rd Edition), Khanna Pub., Delhi (2014).
3	B V Ramana, Higher Engineering Mathematics; McGraw-Hill
4	D C Lay, Linear Algebra and its Application; Pearson Publication
5	Mathematics 1 By Dr R C Shah
6	R. K. Jain and S. R. K. Iyernagar, Advanced Engineering Mathematics, Alpha Science, 3rd Ed., 2007.
7	Discrete Mathematics By Dr Purnima P. Patwardhan, Technical publication.