Name of Faculty	:	Faculty of Computer Science & Applications
Name of Program	:	Bachelor of Computer Applications in Data Science
Course Code	:	2BDM01
Course Title	:	Discreet Mathematics & Calculus
Type of Course	:	Basic Science
Year of Introduction	:	2023-24

Prerequisite	:	Basics of Mathematics
Course Objective	:	Different Techniques to solve higher order ODEs, Direction and magnitude studies, PDEs
Course Outcomes	:	At the end of this course, students will be able to:
	CO 1	To calculate line integral , use of grad, div and curl, green and stock's theorem
	CO 2	Apply different techniques to solve higher order ODEs
	CO 3	Understand the rate of change when more than one independent variables present, apply partial derivative equation techniques to predict the behaviour of certain phenomena.
	CO 4	To represent Fourier series and integral of periodic function
	CO 5	To solve initial-value problems for linear differential equations with constant coefficients.

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	**Permutation and combination:** Introduction, rule of sum and product, combination-permutation, circular and restricted permutation, permutation with repetition of objects, principal of mathematical introduction.	15	25%	CO 1
2	**Functions and Relation:** Introduction to function, one to one function, onto function ,floor function,	15	25%	CO 2

	Ceiling function, Big-O notation ,Big-omega ,Big-Theta notation.			
3	**Differentiation:** Derivative, Derivatives of Sum, Differences, Product & Quotients, Chain Rule, Derivatives of Composite Functions, simple integration.	15	25%	CO 3
4	**Central values computation:** arithmetic mean, median, mode, dispersion, standard deviation, co-relation, regression.	15	25%	CO 4

Suggested Distribution of Theory Marks Using Bloom's Taxonomy						
Level	Remembrance	Understanding	Application	Analyse	Evaluate	Create
Weightage	**40**	**35**	**25**	-	-	-

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	Linearly dependent and independent set, Basis and dimension, Gradient, divergence, and curl, Directional derivative	2
2	Line integration, Green's theorem, Gauss divergence theorem and Stoke's theorem	2
3	Homogenous Linear ODEs with constant coefficient, Euler- Cauchy equations, Wronskian	2
4	Non homogenous ODEs, Method of undetermined coefficient, solution by variation of parameter.	2
5	First order partial differential equation and it's solution Euler's theorem, Total derivatives	2
6	Jacobeans', Maxima and Minima of two variables using Lagrange's multipliers.	2
7	Fourier Series of periodic function	2
8	Fourier integral of cosine and sine function.	2
9	Laplace transform of derivatives and integrals – shifting theorem – differentiation and integration of transforms	2
10	inverse transforms – application of convolution property – solution of linear differential equations with constant coefficients using Laplace transform – Laplace transform of unit step function, impulse function and periodic function	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	R. K. Jain and S. R. K. Iyernagar, Advanced Engineering Mathematics, Alpha Science, 3rd Ed., 2007.