Mangalmay Institute of Management Technology
Greater Noida (U.P.)

Program: BCA **Semester:** I **Course Code**: 101 **Course Name:** Mathematics-I

Course Objectives

(CO1): To enumerate the fundamental knowledge of Determinant of a Matrix.
(CO2): To understand concept of Limit.
(CO3): To understand the concept of Differentiation.
(CO4): To understand the concept of Integration.
(CO5): To understand the concept of Vectors and its properties.

Session Duration: 60 minutes

Participants: BCA First Year

Entry level knowledge and skills of students

i. Basics of Set Theory and Relation, Functions
ii. Basic Knowledge of Differentiation and Integration of Function

Equipment required in Classroom/ Laboratory/ Workshop

i. Projector
ii. White Board & Marker

Assessment Schemes

S. No.	Criteria	Marks (100)
1	CCSU End Term Examination	75
2	Internal Evaluation Scheme	25
2(a)	Teacher Assessment (Continuous Evaluation) (Assignment & Attendance)	25
2(a)(i)	Assignment -1	10
2(a)(ii)	Assignment -2	10
2(a)(iii)	Attendance (compulsory)	5

Course Outcomes (starting with action-oriented observable and measurable verb)

(CO1): Able to understood the concept of Determinant, Matrices ,physical meaning of Determinant and its properties. ***Understanding (K2), Applying (K3)***

(CO2): Able to understand the meaning of Limit of a function, continuity of a function and its application. ***Understanding (K2), Applying (K3)***

(CO3): Able to understood the concept of Derivative of a function and its applications. ***Understanding (K2), Applying (K3)***

(CO4): Able to solve problem on Integration& its geometrical meaning ***Understanding (K2), Applying (K3)***

(CO5): Able to understand the concept of Vectors, able to solve problem on Vectors. ***Understanding (K2), Applying (K3)***

SL. No.	Topics	Sub Topics	Date of implementation	Pedagogy	CO-Covered	Faculty Sign	HoD's Remark with Date
Unit - 1							
1.	Discussion about the Subject Syllabus and Learning outcomes	Course Objective & Course Outcome			CO-1 TO CO-5		
2.	Introduction to Matrices	• Matrices • Deteminant		• Lecture • Brainstorming	CO1		
3.	Minors, Cofactors			• Lecture • Brainstorming	CO1		
4.	Properties of Determinants			• Lecture	CO1		
5.	Types of Matrices	Identity Matrix Scalar Matrix Upper Traingular Matrix Lower Traingular Matrix		• Lecture	CO1		
6.		Diagonal Matrix Symetric Matrix Skew symetric Matrix		• Lecture • Brainstorming	CO1		
7.	Operation in Matrix	Addition Subtraction Mutiplication		• Discussion • Brainstorming • Buzz Grouping	CO1		
8.	Adjoint Of Matrix,Inverse Of Matrix			• Discussion • Brainstorming • Buzz Grouping	CO1		
9.	Cramers Rule, Rank of Matrix Dependence of Vectors			• Lecture	CO1		
10.	Eigen Vectors of a Matrix	Eigen Value Eigen Vector		• Lecture	CO1		
11.	CaleyHamilton Theorem			• Lecture • Brainstorming	CO1		

	(without proof).						
12.		Revision		• Discussion • Brainstorming • Buzz Grouping	CO1		
13.		Discussed University questions		• Discussion • Brainstorming • Buzz Grouping	CO1		
Unit - 2							
14.	Introduction to Limit	Limit Limit at a point		• Lecture • Brainstorming	CO2		
15.	Properties of Limit			• Lecture • Brainstorming	CO2		
16.	Computation of Limits	L-Hospital rule		• Lecture • Brainstorming	CO2		
17.		1^{∞} Form 0^0 Form etc		• Lecture • Brainstorming	CO2		
18.	Various Types of Functions	Costant Function Identity Function Monotonic Functions		• Lecture • Brainstorming	CO2		
19.	Continuity at a Point, Continuity Over an Interval			• Lecture • Brainstorming	CO2		
20.	Intermediate Value Theorem			• Lecture • Brainstorming	CO2		
21.	Type of Discontinuities	Removable Non-Removable		• Discussion • Brainstorming • Buzz Grouping	CO2		
22.		Discussed University questions		• Discussion • Brainstorming • Buzz Grouping	CO2		
23.		Class Test					
Unit - 3							
24.	Introduction to Differentaition	Geometrical Meaning Derivative of Elemntary Function		• Lecture • Brainstorming	CO3		
25.	Algebra of derivative	Derivative of sum,difference,product,quotient of two function.		• Lecture • Brainstorming	CO3		

26.	Chain Rule, Derivatives of Composite Functions			• Lecture • Brainstorming	CO3		
27.	Logarithmic Differentiation, Rolle's Theorem			• Lecture • Brainstorming	CO3		
28.	Mean Value Theorem			• Lecture • Brainstorming	CO3		
29.	Expansion of Functions	Maclaurin's & Taylor's Series expansion		• Lecture • Brainstorming	CO3		
30.	Tracing			• Lecture	CO3		
31.	Maxima & Minima			• Lecture	CO3		
32.	Successive Differentiation & Liebnitz Theorem			• Lecture	CO3		
33.		Doubt Class		• Discussion • Brainstorming • Buzz Grouping	CO3		
34.		Discussed University questions		• Discussion • Brainstorming • Buzz Grouping	CO3		
Unit - 4							
35.	Introduction to Integration	Integration Geometrical meaning		• Lecture • Brainstorming	CO4		
36.		Basics Integration of some function					
37.		Integral as Limit of Sum		• Lecture • Brainstorming	CO4		
38.	Fundamental Theorem of Calculus (without proof.)			• Lecture • Brainstorming	CO4		
39.	Indefinite Integrals			• Lecture • Brainstorming	CO4		
40.	Methods of Integration	Substitution Method		• Lecture	CO4		

41.		By Parts		• Lecture	CO4		
42.		By Partial Fractions		• Lecture	CO4		
43.		Reduction Formulae for Trigonometric Functions		• Lecture	CO4		
44.	Gamma and Beta Functions			• Lecture	CO4		
45.		Doubt Class		• Discussion • Brainstorming • Buzz Grouping	CO4		
46.		Discussed University questions		• Discussion • Brainstorming • Buzz Grouping	CO4		
47.		Discussed University questions		• Discussion • Brainstorming • Buzz Grouping	CO4		
Unit - 5							
48.	Introduction to Vector	Scalar Vector Tensor		• Lecture • Brainstorming	CO5		
49.		vector in 2 and 3 Dimensions		• Lecture • Brainstorming	CO5		
50.	Algebra of Vectors	Addition Subtraction		• Lecture • Brainstorming	CO5		
51.		Scalar Product Vector Product		• Lecture • Brainstorming	CO5		
52.	Triple Scalar and Vector Product	Scalar Product Cross product		• Lecture	CO5		
53.		Area Volume		• Lecture	CO5		
54.		Doubt Class		• Discussion • Brainstorming • Buzz Grouping	CO5		
55.		Discussed University questions		• Discussion • Brainstorming • Buzz Grouping	CO5		
56.		Class Test					

REVISION							
57.		Revision of Unit-1					
58.		Revision of Unit-2					
59.		Revision of Unit-3					
60.		Revision of Unit-4					
61.		Revision of Unit-5					

Text Books: JP Chauhan "Mathematics-I"

Reference Books: Referential Books:

1. .S. Grewal, "Elementary Engineering Mathematics", 34th Ed., 1998.

2. Shanti Narayan, "Integral Calculus", S. Chand & Company, 1999

3. H.K. Dass, "Advanced Engineering Mathematics", S. Chand & Company, 9th Revised Edition, 2001.

4. Shanti Narayan, "Differential Caluculs", S.Chand & Company, 1998.