

Mangalmay Institute of Management Technology

NAAC

Lesson Plan

 Program: BCA
 Semester: V
 Course Code: 406
 Course Name: Numerical Methods

Greater Noida (U.P.)

Course Objectives

(CO1): To enumerate the fundamental knowledge of solving problems using Numerical Methods.

(CO2): To understand concept of Differentiation and Integration by Numerical Approach.

(CO3): To understand the Numerical Method in solving Linear Equation.

(CO4): To understand the concept of Differential Equation Numerical Method Approach.

Session Duration: 60 minutes

Participants: BCA Fifth Semester Students

Entry level knowledge and skills of students

- i. Basics of Functions
- ii. Basic Knowledge of Derivative
- iii. Basic knowledge of Scientific Calculator

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 solve the problems where exact solution of some problems is very hard to find, in that case approximate solution is found using Numerical Methods. Understanding (K2), Applying (K3)
- (CO2): Able to solve the problems of Differentiation and Integration using Numerical Methods.

Understanding (K2), Applying (K3)

- (CO3): Able to solve the problem of System of Linear Equation where approximate solution exist using
 Numerical Methods
 Understanding (K2), Applying (K3)
- (CO4): Able to solve the problem of Differential Equation using Numerical Methods.

Understanding (K2), Applying (K3)



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SL.	Topics	Sub Topics	Date of implementatio	Pedagogy	CO- Covere	Faculty	HoD's Remark			
NO.			n		d	Sign	with Date			
	Unit - 1									
1.	Discussion about									
	the Subject									
		Course			CO-1					
	Syllabus and	Objective			то					
	Learning	-			CO-4					
	Learning	& Course								
	outcomes	Outcome								
r										
۷.	Roots Of Equations	Bisections		 Brainstorming 	CO1					
	ROOLS OF Equations	Method		• Brainstorning	001					
3.				Lecture						
		Problem		 Brainstorming 	CO1					
		Exercise								
4.		False Position		Lecture	CO1					
		Method			001					
5.		Problem		Lecture	CO1					
6		Exercise								
6.		Newton s			CO1					
		Method		Brainstorming	01					
7.		Problem		Drainstorning						
		Exercise		•						
8.		Rate of								
		convergence								
		of Newton's								
		method		•						
9.		.		Discussion	601					
		Revision of		Brainstorming	001					
10		Unit-1		Buzz Grouping Discussion						
10.		University		Brainstorming	CO1					
		questions		Buzz Grouping	001					
	l	44001010	Unit - 2		1					
11.		Finite								
		Differences,		Lecture	602					
	Interpolation and	The operator		 Brainstorming 	02					
	Extrapolation	E								
12.	Newton's Forward									
	and				CO2					
	Backward			Lecture Brainstorming						
13	שוופופוונפז	Practice of								
13.		Question		Lecture	CO2					
		Using		Brainstorming						



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		Scientific					
		calculator					
14.	Newton's dividend						
	differences			٠	Lecture	CO2	
	formulae			•	Brainstorming		
15.	Lagrange's						
	Interpolation			٠	Lecture	602	
	formula for			•	Brainstorming	02	
	unequal Intervals				C C		
16.	Gauss's						
	Interpolation			•	Lecture	CO2	
	formula			•	Brainstorming		
17		Practice of					
		Question		•	Lecture		
		Using			Brainstorming	CO2	
		Scientific		-	bramstorning	002	
		calculator					
18		culculator			Locturo		
10.					Brainstorming	<u> </u>	
	Starling formula			•	Diamstonning	02	
10	Starling formula				1		
19.				•	Lecture	CO2	
	Bessel's formula			•	Brainstorming		
20.				•	Lecture		
				•	Brainstorming	CO2	
	Laplace-Everett						
	formula						
21.		Practice of					
		Question					
		Using		•	Lecture	CO2	
		Scientific		•	Brainstorming		
		calculator					
22.		Practice		•	Lecture	<u> </u>	
		session		٠	Brainstorming	02	
23.				•	Discussion		
				•	Brainstorming		
		De tite of		•		CO2	
		Revision of		•	Buzz Grouping		
24		Unit-1			<u> </u>		
24.		Discussed		•	Discussion		
		University		•	Brainstorming	CO2	
		questions		٠	Buzz Grouping		
25.		Class Test-1				CO2	
			Unit – 3	3			
26.	Numerical			•	Lecture	CO3	
	Differentiation	Introduction,		•	Brainstorming		
	Numerical	direct			. 0		
	Integration	methods					
27.		maxima and		•	Lecture	CO3	
		minima of a			-	-	
		1 · · · · · · · · · · · · · · · · · · ·					



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		tabulated		•	Brainstorming		
		function			-		
28.		General		•	Lecture	CO3	
		Quadratic		•	Brainstorming		
		formula			0		
29.				•	Lecture	CO3	
		Trapezoidal		•	Brainstorming		
		rule			0		
30.				•	Lecture	CO3	
				•	Brainstorming		
		Exercise			-		
31.				•	Lecture	CO3	
		Simpson's One		•	Brainstorming		
		third rule			-		
32.						CO3	
				•	Lecture		
				•	Brainstorming		
		Simpson's					
		three- eight					
		rule					
33.						CO3	
				•	Lecture		
				•	Brainstorming		
		Practice					
		ractice					
24		36331011			Discussion	<u> </u>	
54.		Devision of			Discussion	COS	
		Revision of		•			
25		Unit-3		•	Buzz Grouping	602	
35.		Discussed		•	Discussion	03	
		University		•	Brainstorming		
		questions		•	Buzz Grouping		
	I	T	Unit - 4	1			
36.		Introduction					
		To Linear					
		Equation					
	Solution of Linear	System of		•	Lecture		
	Equation	Linear		•	Brainstorming	CO4	
		Equation					
37.		Gauss's		•	Lecture	CO4	
		Elimination		•	Brainstorming		
		method					
38.						CO4	
				•	Lecture		
		Exercise		•	Brainstorming		
39.		Gauss's		•	Lecture	CO4	
		Siedel		•	Brainstorming		
		iterative		1			



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		method					
40.				٠	Discussion	CO4	
		Revision of		٠	Brainstorming		
		Unit-4		٠	Buzz Grouping		
41.		Discussed		•	Discussion	CO4	
		University		٠	Brainstorming		
		questions		٠	Buzz Grouping		
			Unit – 5	5			
42.	Introduction to	Formation of				CO5	
	Differential	Differential					
	Equation	Equation,Orde		٠	Lecture		
		r and Degree		٠	Brainstorming		
43.				٠	Lecture	CO5	
	Solution of	Euler's		٠	Brainstorming		
	Differential	method					
	Equations						
44.		Exercise		٠	Lecture	CO5	
				٠	Brainstorming		
45.						CO5	
		Picard's		٠	Lecture		
		method		٠	Brainstorming		
46.		Exercise		٠	Lecture	CO5	
				٠	Brainstorming		
47.						CO5	
				•	Lecture		
		Fourth order		•	Brainstorming		
		Ranga -					
		Kutta method					
48		Ratta methoa				CO5	
.0.				•	Lecture	000	
				•	Brainstorming		
					5.0		
		Exercise					
49.		Revision of		٠	Discussion	CO5	
		Unit-4		٠	Brainstorming		
				٠	Buzz Grouping		
50.		Discussed		٠	Discussion	CO5	
		University		٠	Brainstorming		
		questions		٠	Buzz Grouping		
51.		Class Test					
			Revision	1			
52.				٠	Lecture		
				•	Brainstorming	CO1	
	UNIT-I						



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53.	UNIT-II		LectureBrainstorming	CO1	
54.	UNIT-III		LectureBrainstorming	CO2	
55.	UNIT-IV		LectureBrainstorming	CO3	
56.	UNIT-V		LectureBrainstorming	CO4	
57.	UNIT-VI		LectureBrainstorming	CO5	

Reference Books:

- 1. P. Kandasamy, "Numerical Methods", Chand (S.) & Co Ltd , India (December 1, 2006).
- 2. S.S. Sastri, "Introductory Methods of Numerical Analysis", Gardners Books (July 31, 2004)
- 3. A.K.Vashist, "Numerical Analysis", Krishna Publication.
- B.S. Grewal, "Numerical Methods in Engineering & Science: with Programs in C and C++", Khanna Publishers (January 1, 2010)
- 5. John H. Mathews and Kurtis D. Fink, Numerical Methods using MATLAB, 4th edition, PHI Learning Private Limited, New Delhi, 2007.