

## Lesson Plan

Program: BCA Semester: III Course Code: BCA-302 Course Name: Data Structure using C & C++

#### **Course Objectives**

- (CO1): To learn the concepts of Array and its types.
- (CO2): To learn the concepts of stack and queues.
- (CO3): To learn the use of list and its operations.
- (CO4): To learn the concepts of trees and its implementation.
- (CO5): Understand and implement the concept of advanced data structure of B-trees.
- (CO6): Implement appropriate sorting/searching technique for given problem.

### Session Duration: 60 minutes Participants: BCA Third Semester Students

#### Entry level knowledge and skills of students

i. Basic Knowledge of C.

#### Equipment required in Classroom/ Laboratory/ Workshop

- i. Projector
- ii. White Board

#### **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 define array and its types.	(Understand K(2), Applying(K3))
(CO2):	Able to define the concepts of stack and queues.	(Understand K (2), Applying(K3)).
(CO3):	Able to understand the concept and implement the list and its opera	tions.
		(Understand K (2), Applying(K3))
(CO4):	Able to understand the concept and implement the trees and its operation	ons.
		(Understand K(2),Applying(K3))
(CO5):	Able to understand and implement the concept of advanced data struct	ure of B-trees.
		(Understand K (2),Applying(K3))
(CO6):	Able to implement appropriate sorting/searching technique for given pr	oblem.

(Understand K (2), Applying(K3))

L. No.	Topics	Sub Topics	Date of implementation		Pedagogy	CO- Covered	Facult y Sign	HoD's Remar k with Date	
	Unit - 1								
1.	Introduction and	Course				CO-1 to			
	discussion about	Objective				CO-5			
	the subject and	and Course							
	syllabus	Outcomes							
2.		Representa		•	Lecture	CO-1			
	Introduction to	tion of		٠	Brainstorming				
	Data Structure	single and							
	and its	multidimen							
	Characteristics	sional							
	Array	arrays							
3.		Sparse		•	Lecture	CO-1			
		arrays		•	Brainstorming				
4.		lower and		•	Lecture	CO-1			
		upper		•	Brainstorming				
		triangular			-				
		matrices							
5.		Tridiagonal		•	Lecture	CO-1			
		matrices		•	Brainstorming				
		with Vector			0				
		Representa							
		tion							



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U	nit 2						
6.		Introductio		•	Lecture		
		n and		•	Brainstorming		
	Stacks and	primitive		•	Demonstration	CO-2	
	Queues	operations					
		on stack					
7.			•	•	Lecture	CO-2	
		Stack		•	Brainstorming		
		application		•	Demonstration		
8.				•	Lecture	CO-2	
-				•	Brainstorming		
		Infix		•	Demonstration		
9.				•	Lecture	CO-2	
				•	Brainstorming		
		postfix		•	Demonstration		
10.				•	Lecture	CO-2	
		prefix		•	Brainstorming		
		expressions		•	Demonstration		
11.		Evaluation	•	•	Lecture	CO-2	
		of postfix		•	Brainstorming		
		expression		•	Demonstration		
12.		Conversion		•	Lecture	CO-2	
		between		•	Brainstorming		
		prefix		•	Demonstration		
		prenx					
13.			•	•	Lecture	CO-2	
		infix and	•	•	Brainstorming		
		postfix	•	•	Demonstration		
14.		introductio	•	•	Lecture	CO-2	
		n and		•	Brainstorming		
		primitive		•	Demonstration		
		operation					
		on queues					
15.		D- queues	•	•	Lecture	CO-2	
		and priority	•	•	Brainstorming		
		queues	•	•	Demonstration		
U	nit - 3						
16.				•	Lecture	CO-3	
	Lists	Introductio	•	•	Brainstorming		
		n to linked	•	•	Demonstratio		
		lists			n		
17.				•	Lecture	CO-3	
		Sequential	•	•	Brainstorming		
		and linked	•	•	Demonstratio		
		lists			n		



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18.				•	Lecture	CO-3		
		operations		•	Brainstorming			
		such as		•	Demonstratio			
		traversal,			n			
19.				•	Lecture	CO-3		
				•	Brainstorming			
		insertion		•	Demonstration			
20.				•	Lecture	CO-3		
				•	Brainstorming			
		deletion		•	Demonstration			
21.				•	Lecture	CO-3		
				•	Brainstorming			
		searching		•	Demonstration			
U	Init - 4							
22.		Introducti		•	Lecture			
	Introduction of	on and		•	Brainstorming	<b>CO 4</b>		
	Trees:	terminolog		•	Demonstratio	CO-4		
		у			n			
23.				•	Lecture	CO-4		
		Traversal of		•	Brainstorming			
		binary		•	Demonstratio			
		trees			n			
24.		Recursive		•	Lecture	CO-4		
		algorithms		•	Brainstorming			
		for tree		•	Demonstration			
		operations						
		such as						
		traversal						
25.				•	Lecture	CO-4		
				•	Brainstorming			
				•	Demonstration			
		insertion						
26.				•	Lecture	CO-4		
				•	Buzz Grouping			
		al a l a t i a m		•	Demonstratio			
27		deletion			n			
27.		Dimonst		•	Lecture	CO-4		
		Binary Search Tree		•	Brainstorming			
20		Searchiffee		-		<u> </u>		
28.		Povision of		•	Lecture	CO-4		
				•	Brainstorming			
		Unit 4	11!!	[•	Buzz grouping			
20			Unit -	5	· · ·			
29.	B-Trees	Introductio		•	Lecture	CO-5		
		n of B-tree		•	Brainstorming			



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	:			•	Demonstration		
30.				•	Lecture	CO-5	
		The		•	Brainstorming		
		invention		•	Demonstratio		
		of B-Tree,			n		
31.				•	Lecture	CO-5	
-		Statement		•	Brainstorming		
		of the		•	Demonstratio		
		problem.			n		
32.				•	lecture	CO-5	 
		with hinary		•	Brainstorming		
		search		•	Demonstratio		
		trees			n		
22		a hetter		•	Lecture	CO-5	
55.		approach			Brainstorming	CO-J	
		to tree			Domonstratio		
		indexes		•	Demonstratio		
24						CO F	
54.		D-Trees,		•	Lecture	0-5	
		from the		•	Brainstorning		
		hottom		•	Demonstration		
35		Evample			Locturo	CO-5	 
55.		for croating			Proinctorming	CO-J	
					Domonstration		
		a B-Tree			Demonstration		
36.		Revision of		•	Brainstorming	CO-5	
		Unit 5		•	Buzz grouping		
			Unit-6				
37.		Sorting		•	Lecture	CO-6	
	Sorting and	Technique		•	Brainstorming		
	Searching	S		•	Demonstration		
38.		Insertion		•	Lecture	CO-6	
		sort		•	Brainstorming		
					Demonstration		
39.				•	Lecture	CO-6	
		selection		•	Brainstorming		
		sort			Demonstration		
40.				•	Lecture	CO-6	
		merge		•	Brainstorming		
		sort,			Demonstration		
41.				•	Lecture	CO-6	
				•	Brainstorming		
		heap sort			Demonstration		
42.		searching		•	Lecture	CO-6	
		Technique		•	Brainstorming		
				1	3		



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	s: linear search		Demonstration		
43.	binary search	•	Lecture Brainstorming Demonstration	CO-6	
44.	hashing	•	Lecture Brainstorming Demonstration	CO-6	

#### **Text Books:**

- 1. E.Horowiz and S.Sahani, "Fundamentals of Data structures", Galgotia Book source Pvt. Ltd.2003
- 2. R.S.Salaria, "Data Structures & Algorithms", Khanna Book Pblishing Co. (P) Ltd., 2002

#### **Reference Books:**

3. Y.Langsam et. Al., "Data Structures using C and C++", PHI, 1999