

SANATAN DHARMA COLLEGE, AMBALA CANTT

College with Potential for Excellence, UGC, New Delhi
NAAC Accredited Grade "A+" with CGPA 3.51 in 3rd cycle
ISO 9001:2015 & ISO 14001:2015 Certified



Department of Computer Science Lesson Plan (Session 2022-2023)

Class: BCA

Sem: IV

Course Code: BCA – 241

Nomenclature: Advanced Data Structures

Duration: 13 Weeks

Dates: (01.02.2023- 30.04.2023)

Syllabus

BCA – 241 ADVANCED DATA STRUCTURE

Maximum Marks: 100
Internal: 20

External: 80
Time: 3 hours

Minimum Pass Marks: 35

Note: Examiner will be required to set Nine Questions in all. First Question will be compulsory, consisting of objective type/short-answer type questions covering the entire syllabus. In addition to that eight more questions will be set, two questions from each Unit. A candidate will be required to answer five questions in all, selecting one question from each unit in addition to compulsory Question No. 1. All questions will carry equal marks.

UNIT – I

Tree: Introduction, Definition, Representing Binary tree in memory, Traversing binary trees, Traversal algorithms using stacks, Binary search trees: introduction, storage, Searching, Insertion and deletion in a Binary search tree, Huffman's algorithm, General trees.

UNIT – II

Graph: Introduction, Graph theory terminology, Sequential and linked representation of graphs, operations on graphs, traversal algorithms in graphs and their implementation, Warshall's algorithm for shortest path, Dijkstra algorithm for shortest path.

UNIT – III

Sorting: Internal & external sorting, Radix sort, Quick sort, Heap sort, Merge sort, Tournament sort, Comparison of various sorting and searching algorithms on the basis of their complexity.

UNIT – IV

Files: Introduction Attributes of a file, Classification of files, File operations, Comparison of various types of files, File organization: Sequential, Indexed-sequential, Random-access file. Hashing: Introduction, Collision resolution.

TEXT BOOKS

1. Seymour Lipschutz, "Data Structure using C", Tata-McGraw-Hill
2. Horowitz, Sahni & Anderson-Freed, "Fundamentals of Data Structures in C", University Press

REFERENCE BOOKS

2. Trembley, J.P. And Sorenson P.G., "An Introduction to Data Structures With Applications", Mcgrraw- Hill International Student Edition, New York.
3. Mark Allen Weiss, "Data Structures and Algorithm Analysis in C", Addison-Wesley, (An Imprint Of Pearson Education), Mexico City.

Course Outcomes

After the completion of this course, prospective Computer professionals will have the ability to

Semester-IV	
Course: BCA – 241 ADVANCED DATA STRUCTURE	
At the end of course student should be able to:	
CO-1	Understand and apply operations on Binary search Tree, General trees
CO-2	Perform Huffman's algorithm
CO-3	Understand and apply operations on Graph
CO-3	Implement Warshall's algorithm for shortest path, Dijkstra algorithm for shortest path
CO-4	Perform Sorting and Searching using various techniques.
CO-5	Differentiate different Sorting and Searching techniques
CO-6	Implement all types of File organization
CO-7	Implementing Hashing
CO-8	Understand and explain Collision Resolution

S.No	Instructional Technique	Assessment Methods(AM)
1	Chalk & Talk	Assignments
2	ICT tools	Quiz
3	Group discussions	Group Discussions
4	Industrial visit	Oral Tests
5	Case studies	Sessional
6	Small Projects	Presentations
7	Workshop	Seminar
8	Spoken Tutorials	University Exams
9	Flipped Class	
10.	E-Resources	

Detailed Lesson Plan

Week	Date	Topic to be Covered	Instructional Technique	Assessment Method
1	01.02.2023	Tree: Introduction	----	----
2	06.02.2023	Definition, Representing Binary tree in memory,	2-(PPT/Projector)	----
	07.02.2023	Representation Cont....	2(PPT/Projector)	1
	08.02.2023	Traversing binary trees	6	1,2,3,4
3	13.02.2023	Traversal algorithms using stacks	2-(PPT/Projector)	1,2,3,4
	14.02.2023	Traversal Cont...	2-(PPT/Projector)	1,2,3,4
	15.02.2023	Binary search trees: introduction, storage	6	1,2,3,4
4	20.02.2023	Searching, Insertion and deletion in a Binary search tree,	2-(PPT/Projector)	1,2,3,4
	21.02.2023	Searching Cont...	2-(PPT/Projector)	1,2,3,4

	22.02.2023	Huffman's algorithm, General trees.	9,10	1,2,3,4
5	27.02.2023	Graph: Introduction, Graph theory terminology	9,10	1,2,3,4
	28.02.2023	Sequential and linked representation of graphs	9,10	1,2,3,4
	01.03.2023	Operations on graphs	9,10	1,2,3,4
6	06.03.2023	Holi Vacations		
	07.03.2023			
	08.03.2023			
	09.03.2023			
	10.03.2023			
	11.03.2023			
	12.03.2023			
7	13.03.2023	Traversal algorithms in graphs and their implementation	2-(PPT/Projector)	1,2,3,4
	14.03.2023	Revision	----	----
	15.03.2023	Warshall's algorithm for shortest path, Dijkstra algorithm for shortest path.	6	1,2,3,4
8	20.03.2023	Sorting: Internal & external sorting	9,10	1,2,3,4
	21.03.2023	Radix sort, Quick sort	9,10	1,2,3,4
	22.03.2023	Heap sort, Merge sort	2-(PPT/Projector)	1,2,3,4
9	27.03.2023	Merge Sort Cont...	2-(PPT/Projector)	1,2,3,4
	28.03.2023	Tournament sort,	2-(PPT/Projector)	1,2,3,4
	29.03.2023	Comparison of various sorting and searching algorithms on the basis of their complexity.	2-(PPT/Projector)	1,2,3,4
10	03.04.2023	Comparison of various sorting and searching algorithms on the basis of their complexity.	9,10	1,2,3,4
	04.04.2023	HOLIDAY	----	----
	05.04.2023	Files: Introduction Attributes of a file, Classification of files	2-(PPT/Projector)	1,2,3,4

11	10.04.2023	File operations, Comparison of various types of files	2-(PPT/Projector)	1,2,3,4
	11.04.2023	File organization: Sequential, Indexed-sequential, Random-access file	6	1,2,3,4
	12.04.2023	Hashing: Introduction, Collision resolution.	6	1,2,3,4
12	17.04.2023	Hashing Cont....	2-(PPT/Projector)	1,2,3,4
	18.04.2023	Hashing Cont....	2-(PPT/Projector)	1,2,3,4
	19.04.2023	Hashing Cont....	6	1,2,3,4
13	24.04.2023	Revision	----	----
	25.04.2023	Class Test	----	----
	26.04.2023	Revision	----	----