MOHAMED SATHAK A.J COLLEGE OF ENGINEERING

Siruseri IT park, OMR, Chennai - 603103

LESSON PLAN			
Department of COMPUTER SCIENCE AND ENGINEERING			
Name of the Subject	Data Structures and Algorithms	Name of the handling Faculty	JEBA MALAR M
Subject Code	CD3291	Year / Sem	II/III
Acad Year	2022-2023	Batch	2021-2025

Course Objective

1. To understand the concepts of ADTs
2. To Learn linear data structures – lists, stacks, and queues
3. To understand sorting, searching and hashing algorithms
4. Be exposed to graph algorithms
5. To apply Tree and Graph structures

Course Outcome

CO1. Explain abstract data types

CO2. Design, implement, and analyze linear data structures, such as lists, queues, and stacks,according to the needs of different applica

CO3. Design, implement, and analyze efficient tree structures to meet requirements such as

CO4 .Model problems as graph problems and implement efficient graph algorithms to solve them

CO5. Critically analyse the various algorithms.

Lesson Plan

Sl. No.	Topic(s)	T / R*	Periods Required	Teaching (BB / PPT / NPTEL /	Blooms Level (L1-L6)	CO
UNIT-I ABSTRACT DATATYPES						
1	Abstract Data Types (ADTs)	T1	1	BB	L1	CO1
2	ADTs and classes	T1	1	BB	L1	CO1
3	Introduction to OOP	T1	1	BB	L1	CO1
4	classes in Python,Inheritance	T1	1	BB	L2	CO1
5	namespaces	T1	1	BB	L2	CO1
6	shallow and deep copying	T1	1	BB	L1	CO1
7	asymptotic notations	T1	1	BB	L2	CO1

8	divide and conquer	T1	1	BB	L2	CO1
9	Recursion,Analyzing recursive algorithms	T1	1	PPT	L2	CO1
Suggested Activity: Assignment / Case Studies / Tuorials/ Quiz / Mini Projects / Model Developed/others Planned if any						
Evaluation method						
UNIT II LINEAR STRUCTURES						
10	List ADT	T1	1	BB	L1	CO2
11	array based implementation	T1	1	BB	L2	CO2
12	linked list implementation	T1	1	BB	L1	CO2
13	singly linked lists	T1	1	BB	L2	CO2
14	circularly linked list	T1	1	BB	L2	CO2
15	doubly linked lists	T1,W2	1	BB,PPT	L3	CO2
16	Stack ADT	T1,W2	1	BB,PPT	L3	CO2
17	Queue ADT	T1	1	BB,PPT	L3	CO2
18	double ended queues,Applications	T1	1	PPT	L2	CO2
Suggested Activity: Assignment / Case Studies / Tuorials/ Quiz / Mini Projects / Model Developed/others Planned if any .						
Evaluation method						
UNIT III SORTING AND SEARCHING						
19	Bubble sort	T1	1	BB	L1	CO3
20	selection sort	T1	1	BB	L1	CO3
21	Insertion sort	T1	1	BB	L1	CO3
22	merge sort	T1	1	BB	L2	CO3
23	quick sort	T1	1	BB	L2	CO3
24	Analysis of sorting algoriths	T1	1	BB,PPT	L2	CO3
25	linear search,binary search	R1,W1	1	BB,PPT	L2	CO3
26	Hashing- Hash Functions	T1,W2	1	BB,PPT	L1	CO3
27	Collision handling,rehashing	T1,W1	1	BB	L3	CO3
Suggested Activity: Assignment / Case Studies / Tuorials/ Quiz / Mini Projects / Model Developed/others Planned if any						
Evaluation method						
UNIT IV TREE STRUCTURES						
28	Tree ADT	T1	1	BB	L1	CO4
29	Binary tree ADT	T1	1	BB	L1	CO4
30	tree traversals	T1	1	BB	L2	CO4

31	binary search trees	T1	1	BB	L2	CO4
32	AVL trees	T1	1	BB	L2	CO4
33	Examples	T1	1	BB	L3	CO4
34	Binary heap	T1	1	BB,PPT	L3	CO4
35	heaps	TI,R1,W2	1	BB,PPT	L2	CO4
36	multiway search trees	T1,R1,W2	1	BB,PPT	L3	CO4
Suggested Activity: Assignment / Case Studies / Tuorials/ Quiz / Mini Projects / Model Developed/others Planned if any						
Evaluation method						
UNIT V GRAPH STRUCTURES						
37	Graph ADT	T1	1	BB	L1	CO5
38	representation of graph	T1	1	BB	L2	CO5
39	graph traversals	T1	1	BB	L2	CO5
40	DAG	T1	1	BB	L2	CO5
41	topological ordering	T1	1	BB,PPT	L3	CO5
42	greedy algorithms	T1	1	PPT	L4	CO5
43	dynamic programming,shortest path	T1,W2	1	BB	L3	CO5
44	minimum spanning tree	R1,W2	1	BB	L3	CO5
45	to complexity classes and intractability	R1,W2	1	BB	L3	CO5
Suggested Activity: Assignment / Case Studies / Tuorials/ Quiz / Mini Projects / Model Developed/others Planned if any 1.Kru Prim algorithm						
Evaluation method						
Content Beyond the Syllabus Planned						
1	R-Programming Language					
2	Graph Databases					
Text Books						
1	Michael T. Goodrich, Roberto Tamassia, and Michael H. Goldwasser, “Data Structures & Algorithms in Python”, An Indian Adaptation, John Wiley & Sons Inc., 2021					
2	T2. 2. Mark Allen Weiss, “Data Structures and Algorithm Analysis in C++”, 2nd Edition, Pearson Education, 2005					
Reference Books						

1	Lee, Kent D., Hubbard, Steve, "Data Structures and Algorithms with Python" Springer Edition 2015
2	Rance D. Necaise, "Data Structures and Algorithms Using Python", John Wiley & Sons, 2011

Website / URL References

1	W1: http://nptel.ac.in/
2	W2: https://www2.cs.siu.edu/~mengxia/Courses%20PPT/435/Chapter_03.pdf
3	W3: http://www.cs.tau.ac.il/~nachumd/models/Nets.pdf

Blooms Level

Level 1 (L1) : Remembering	Lower	Fixed	Level 4 (L4) : Analysing
Level 2 (L2) : Understanding	Order	Hour	Level 5 (L5) : Evaluating
Level 3 (L3) : Applying	Thinking	Exam	Level 6 (L6) : Creating

Mapping syllabus with Bloom's Taxonomy LOT and HOT

Unit No	Unit Name	L1	L2	L3	L4	L5	L6	LOT	HOT
Unit 1	ABSTRACT DATA TYPES	4	5	0	0	0	0	9	0
Unit 2	LINEAR STRUCTURES	2	4	3	0	0	0	9	0
Unit 3	SORTING AND SEARCHING	4	4	1	0	0	0	9	0
Unit 4	TREE STRUCTURES	2	4	3	0	0	0	9	0
Unit 5	GRAPH STRUCTURES	1	3	5	1	0	0	8	1
Total		13	20	12	1	0	0	44	1
Total Percentage		28.9	44.4	26.66667	2.22222	0	0	97.78	2.22222

CO PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1
CO1	3	2	1	0	0	0	0	0	0	0	0	0	3
CO2	3	2	1	0	0	0	0	0	0	0	0	0	3
CO3	3	2	1	0	0	0	0	0	0	0	0	0	3
CO4	3	2	1	0	0	0	0	0	0	0	0	0	3

CO5	3	2	1	1	0	0	0	0	0	0	0	0	3
Avg	3	2	1	0.2	0	0	0	0	0	0	0	0	3

Justification for CO-PO mapping

CO1	Implement abstract data types
CO2	Design,implement and analyse linear data structures succh as lists queues and stack according to the needs of different applic
CO3	Design and implement and analyse efficient tree strucyures to meet requirements such as searching
CO4	Critically analyse the various algorithms.
CO5	Identify the different data structures to problem solutions.

3	**High level**	**2**	**Moderate**	1	**low level**

Name & Sign of Subject Expert :

Head of the Department :IT

Format No :231

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Projects / Mini Projects
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