B. P. Poddar Institute of Management & Technology

Department of Information Technology

Lesson Plan

Academic Year: 2024-25 Semester: 3rd Sem

Stream : IT

Data Structure and Algorithm
Code: PCC CS 301
Contacts: 3L

Lesson Plan

Lecture No.	Description	Reference	Pedagogy	Execution	Actual Date
L1	Introduction to Data Structures: Basic Terminologies	T1, R1	C&T	As planned	
L2	Elementary Data Organizations	T1, R2	C&T, S/P		
L3	Data Structure Operations: Insertion, Deletion, Traversal	T1, R1	S/P, DEMO		
L4	Analysis of Algorithms	T2, R3	C&T, S/P		
L5	Asymptotic Notations	T2, R3	S/P, QUIZ		
L6	Time-Space Trade-off	T1, R2	C&T, GD		
L7	Linear Search	T1, R1	S/P, DEMO		
L8	Binary Search	T1, R1	S/P, Code Tracing		
L9	ADT Stack and Operations	T1, R2	S/P, C&T		
L10	Applications of Stacks: Expression Conversion	T1, R1	S/P, DEMO		
L11	Expression Evaluation	T1, R1	S/P, Code Tracing		
L12	ADT Queue: Simple Queue	T1, R2	C&T, S/P		
L13	Circular Queue	T1, R2	S/P, DEMO		
L14	Priority Queue	T1, R2	S/P, C&T		
L15	Singly Linked Lists: Representation and Operations	T1, R1	S/P, Memory Diagrams		
L16	Linked List Operations: Traversing, Searching	T1, R1	S/P, Code Tracing		
L17	Insertion and Deletion in Linked Lists	T1, R1	S/P, DEMO		

L18	Linked Representation of Stack and Queue	T1, R2	C&T, S/P		
L19	Doubly Linked List	T1, R2	S/P, Simulation		
L20	Circular Linked List	T1, R2	S/P, C&T		
L21	Advanced Data Structures: Tries, Segment Trees (Be- yond Syllabus)	R4, WR1	ET/GL		
L22	Tree Terminologies	T2, R3	C&T, Tree Visualization		
L23	Binary Tree Operations	T2, R3	S/P, Code Tracing		
L24	Threaded Binary Tree	T2, R3	S/P, C&T		
L25	Binary Search Tree	T2, R3	S/P, Animation		
L26	AVL Tree	T2, R3	S/P, Rotation Demo		
L27	B Tree	T2, R3	S/P, Case Study		
L28	B+ Tree	T2, R3	S/P, GD , Memory Diagram		
L29	Algorithm Design Paradigms: Dynamic Programming, Greedy (Beyond Syllabus)	R4, WR2	Assignment, Coding		
L30	Graph Terminologies and Representations	T2, R3	S/P, Graph Drawing		
L31	Graph Traversals: BFS and DFS	T2, R3	S/P, Path finding Animation		
L32	Selection and Bubble Sort	T1, R1	S/P, Performance		

			Analysis		
L33	Insertion and Quick Sort	T1, R1	S/P, Code tracing		
L34	Merge and Heap Sort	T1, R1	S/P, Recursion Review		
L35	Hashing	T1, R2	S/P, C&T		
L36	Practical Applications: Database Indexing, Graph Algorithms (Beyond Syllabus)	WR3	GD, Case Study		

Teaching Methods

C&T: Chalk & Talk

S/P: Slides/PPT

DEMO: Demonstration (e.g., live coding)

QUIZ: Quiz-based assessments

GD: Group Discussion

ET/GL: Expert Talk/Guest Lecture

Code Tracing: Step-by-step code execution analysis

Simulation: Visual or interactive tools for concept demonstration

Memory Diagrams: Visual representation of memory allocation

Animation: Animated visualizations of algorithms

Text Books (T)

Reema Thareja, Data Structures Using C, Oxford University Press, 2014. (Chapters 1–5, 7–9)

Horowitz and Sahni, Fundamentals of Data Structures in C, Computer Science Press, 2008. (Chapters 3, 4, 6, 8)

Reference Books (R)

Kruse and Leung, Data Structures and Program Design in C, Pearson Education, 2007.

Lipschutz, Data Structures, McGraw Hill, 2014.

Cormen et al., Introduction to Algorithms, MIT Press, 2009.

Tenenbaum, Data Structures Using C, Pearson Education, 2003.

Web Sources (WR)

1. NPTEL (IIT Madras) – Data Structures and Algorithms – https://nptel.ac.in/courses/106/106/10
2. SWAYAM – Data Structures – https://swayam.gov.in/
3. Coursera – Algorithms Part I – https://www.coursera.org/learn/algorithms-part1

Assessment Methodologies:

1. Assignments
2. Tests
3. Report writing
4. Presentation
5. University examination