

COURSE PLAN

(Undergraduate Programme)

(Each Teacher to submit course plan individually)



F/QSP 11/10/06

Department of Computer Science and Information Technology

Course Code: **CT-159**

Course Title: **Data Structure Algorithms and Applications**

Teacher Name: **Dr. Muhammad Kamran**

Semester: **Fall**

Academic Session: **2025**

Class: **2nd Year (BSCS)**

No. of sections: **02**

No of contact hours per week per section: **03**

TEACHING TOOLS

<input checked="" type="checkbox"/> Problem-based learning	<input checked="" type="checkbox"/> Mini-project	<input type="checkbox"/> Case studies
<input type="checkbox"/> Innovative solution	<input checked="" type="checkbox"/> Group activity	<input type="checkbox"/> Entrepreneurial activities
<input type="checkbox"/> Industrial visit	<input type="checkbox"/> Student presentation	<input type="checkbox"/> Other _____

Week No.	TOPICS	NO. OF PERIODS
1	Introduction, Abstract data types, linear search, binary search	03
2	Linked List - Insertion, Deletion, Search, and Sorting	03
3	Doubly and Circular Linked Lists	03
4	Recursion and Stack	03
5	Queue, circular queue, and double ended queue	03
6	Elementary Sorting Techniques – bubble sort, insertion sort, selection sort	03
7	Advanced sorting techniques – Merge sort, quick sort	03
8	Mid Term Exam	03
9	Binary Tree – Properties and its types	03
10	Binary Heap, Heap sort, Priority Queue	03
11	Binary Search Tree – Operations, applications, issues	03
12	AVL Tree –Balance in binary search trees	03
13	Graph – representation and traversal, shortest path algorithm	03
14	Graph – Minimum spanning tree, graph algorithms, topological sorting	03
15	Hashing – hash function, collision resolution technique, rehashing	03
	Total per Semester:	45

Sessional Criteria:

Assessment Type	Marks	Schedule (Week No.)
Midterm exam	20	8 th
Activity/ Competition	5	8 th
Assignment	10	5 th , 12 th
Project Report	5	15 th
Total Sessional Marks	40	

Prepared by: **Dr. Muhammad Kamran**

Reviewed &

Approved by: **Dr. Muhammad Mubashir Khan**

Date 18-08-2025

Date _____