

# **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: **2<sup>nd</sup> 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 _____

<b>Week No.</b>	<b>TOPICS</b>	<b>NO. OF PERIODS</b>
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	<b>Mid Term Exam</b>	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
<b>Total per Semester:</b>		<b>45</b>

#### **Sessional Criteria:**

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

Reviewed &

Prepared by: Dr. Muhammad Kamran

Approved by: Dr. Muhammad Mubashir Khan

Date

18-08-2025

Date