

SARDAR PATEL UNIVERSITY

Programme & Subject : B.Sc (CA & IT) – M.Sc (CA & IT) Dual Degree

Semester – 4

PS04CIIT21 : Advanced Data & File Structure

(w.e.f June 2019)

Credits : 4

Exam Duration : 3hrs

Lectures per week : 4

All units carry equal weightage.

Unit	Description in detail	Weightage
I	Arrays, Stack & Graphs <ul style="list-style-type: none">➤ Introduction to arrays, one and two-dimensional arrays➤ Representation of arrays in memory : row-major and column-major order➤ Address calculation of elements of one and two-dimensional arrays➤ Sparse array, Applications of arrays➤ Stack - Prefix, Infix and Postfix expressions, Utility and conversion of these expressions from one to another➤ The concept of a graph and basic terminology	25%
II	Trees and Binary Tree <ul style="list-style-type: none">➤ Introduction to trees➤ Definitions of basic terms : Tree, Directed Tree, Root, Leaf, Branch, Level, Node, Forest➤ Applications of a tree➤ Binary trees : Introduction, Linear and Linked Representations➤ Traversal of a binary tree: Preorder, Inorder and Postorder➤ Insertions and deletions in a lexically ordered binary tree➤ Types of Binary Tree : Full Binary Tree, Complete Binary Tree, Binary Search Tree, Heap Tree, Height Balanced Tree (AVL Tree), B-Tree	25%
III	Sorting and Searching techniques <ul style="list-style-type: none">➤ Sorting – Introduction, Applications of sorting➤ Techniques - Bubble sort, Insertion sort, Selection Sort, Quick sort, Merge sort➤ Searching – Introduction, Applications of searching➤ Techniques - Sequential search and Binary search➤ Sorting vs. Searching	25%
IV	File Organization <ul style="list-style-type: none">➤ Terminology, definitions and concepts in file organization➤ The structure of sequential files➤ Processing sequential files➤ Direct files, Processing direct files➤ Hashing Functions: The Division Method, The Midsquare Method, The Folding Method, Digit Analysis, The length-Dependent Method➤ Direct files, Processing direct files➤ The structure of indexed sequential files (IBM Only), Processing indexed sequential files	25%

Basic Text & Reference Books :

1. Tremblay J. & Sorenson P. G.: An Introduction to Data Structures with Applications, 2nd Edition, Tata McGraw-Hill Edition, 1991.
2. Singh Bhagat& Naps Thomas: Introduction to Data Structures, Tata McGraw-Hill Publishing Co.Ltd., 1985.
3. R. B. Patel: Data Structure using C – Khanna Publications. ISBN: 81-87522-41-0
4. D. Samanta - Classis Data Structures, 2nd Edition – PHI Publication
5. G. S. Baluja - Data Structures through C, 4th Edition – Dhanpat Rai & Co.