



Ganpat University
॥ विद्यया समाजोत्कर्षः ॥

Faculty of
Computer Applications



Programme	BCA Honors (Cyber Security)				Branch	Computer Applications			
Semester	II				Version	1.0.0.0			
Effective from Academic Year			2026-2027		Effective for the batch Admitted in			June 2026	
Subject Code	U102A2DFS		Subject Name		DATA AND FILE STRUCTURE				
Teaching scheme					Examination scheme (Marks)				
(Per week)	Lecture (DT)		Practical (Lab.)		Total		CE	SEE	Total
	L	TU	P	TW					
Credit	2		2	-	4	Theory	50	50	100
Hours	2		4	-	6	Practical	-	-	-
Objective:									
Objective of this subject is to teach students how to store data in different types of data structure like array, stack, queue, linked-list, graph, tree etc. Subjects also cover Types of Data structures, Sorting, Searching, File Structure, Methods of Data Access and Organization, Hashing Function.									
Pre-requisites:									
Understanding of data structures is essential and this facilitates the understanding of the language. The practice and assimilation of data structure techniques is essential for programming. The knowledge of "C"									
Course Outcomes :									
Name of CO	Description								
C01	Understand the concepts of data structures and its Linear and Nonlinear types								
C02	Implement operations like searching, insertion, and deletion on Array data structure, Stack								
C03	Implement Simple Circular and Doubly Queue, link list and its all operation								
C04	Learn to work with Non-linear data structure like trees and graph and perform different operations on it								
C05	Implement appropriate sorting/searching technique for given problems and analysis the complexity of given Algorithms								
Mapping of CO and PO									
Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	
C01	3	2	1	0	0	0	1	1	
C02	3	3	3	1	0	0	1	1	
C03	3	3	3	1	0	0	1	1	
C04	3	3	3	2	0	0	1	1	
C05	3	3	3	2	1	0	1	1	
Content:									
Unit									Hrs

1	Introduction to Data Structure Data, Data Organization, Data Access methods, Types of Data structure, Primitive and Non-Primitive Data Structure, Linear and Non Linear Data Structure, String Manipulation, String Length, String Copy, String Compare, String Concatenation	05
2	Linear Data Structure-I Array and its representation, Stack and its application: Polish Notation, Subroutine Invoking	05
3	Linear Data Structure-II Queues: Simple Queue, Circular Queue, De queue, Linked List: Singly Linked List, Circular Linked List, Doubly Linked List, Application of Linked List	06
4	Non Linear Data Structure Tree Structure, General Tree, Binary Tree, Tree Traversal Algorithms, Insert and Delete node in Binary tree, Searching a node, Graph and Networks: Concept, BFS Algorithm, DFS Algorithm	06
5	Sorting, Searching and File Structure Sorting Algorithms: Selection, Bubble, Insertion, Quick, Searching Algorithms: Sequential and Binary Search, File Organization: Introduction, Sequential, Index, Direct	08

Practical Content:

List of programs specified by the subject teacher based on above mentioned topics

Text Books:

1	Programming in ANSI-C By E. Balaguruswamy, TMH Publication
2	An Introduction to Data Structure with Applications by Tremblay J. and Sorenson, Publisher- Tata McGraw-Hill international Edition, 1087

Reference Books:

1	Data Management and File Structures By Mary E. S. Loomis-PHI Publications
2	Expert Data Structures with C by R.B.Patel
3	Classic Data Structures by Debasis Samanta, PHI Publications

Web References / MOOC / Certification Course

1	https://www.geeksforgeeks.org/dsa/data-structure-meaning/
2	Data Structures & Algorithms Using C++ https://www.edx.org/course/data-structures-algorithms-usingc?index=product&queryID=5e982537d17fe7faf11ca9b14f2e2e73&position=1
3	Data Structures & Algorithms I: ArrayLists, LinkedLists, Stacks and Queues : https://www.edx.org/course/data-structures-algorithms-i-arraylists-linkedlists-stacks-andqueues?index=product&queryID=56d095ca26c200729a3b6a468185fb0b&position=2
4	Foundations of Data Structures https://www.edx.org/course/foundations-of-datastructures?index=product&queryID=4b353248bd27c9f63ecc253098789e8b&position=3
5	Introduction to Data Structures https://www.edx.org/course/c-introduction-to-datastructures?index=product&queryID=38c79e174c0c255a4d77bbb76b5b71a7&position=4

Question Paper Scheme:

End Semester Examination Duration: (2 Hours Theory Examination)

Note for Examiner: -

Q-1 Any Five out of Seven (25 Marks)

Q-2 Any Two out of Three (06 Marks)

Q-3 Mandatory question (05 Marks)

Q-4 Any Two out of Three (08 Marks)

Q-5 Any Two out of Three (06 Marks)

The question paper must comprehensively address all Course Outcomes (COs), align Taxonomy levels, and ensure complete syllabus coverage.