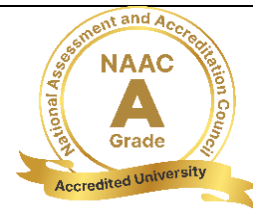




Ganpat University

॥ विद्यया समाजोत्कर्षः ॥

Faculty of
Computer Applications



FACULTY OF COMPUTER APPLICATIONS

Programme	BCA Honors (Artificial Intelligence & Machine Learning)					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	U92A2DFS		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	2	1	1	1	1	3
C02	3	3	3	2	1	1	1	1
C03	3	3	3	2	1	1	1	1
C04	3	3	3	3	1	1	1	2
C05	3	3	2	3	1	1	1	2

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	5
2	Linear Data Structure-I Array and its representation, Stack and its application: Polish Notation, Subroutine Invoking	5
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	6
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	6
5	Sorting, Searching and File Structure Sorting Algorithms: Selection, Bubble, Insertion, Quick, Searching Algorithms: Sequential and Binary Search, File Organization: Introduction, Sequential, Index, Direct	8
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	www.javatpoint.com
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) <i>The question paper must comprehensively address all Course Outcomes (COs), align Taxonomy levels, and ensure complete syllabus coverage.</i>