



*Yogoda Satsanga
Mahavidyalaya*

COURSE PLAN

NAME OF THE DEPARTMENT:	BCA/IT
NAME OF THE FACULTY:	Prof. Saroj Kumari & Prof. Partha Sarathi Chattaraj
ACADEMIC SESSION:	2023-24
YEAR:	2023
PROGRAMME:	BCA & B.Sc(IT)
SEMESTER:	II (IT) & III (CA)
COURSE TYPE:	Core
COURSE NAME:	Data Structures with C
COURSE CODE:	C3 (IT) & C5 (CA)
TOTAL CREDIT:	6

PROGRAMME OUTCOMES (PO):

- PO1: Scientific & Computational Knowledge:** - Apply the information on scientific & computational ideas, software engineering and innovation basics.
- PO2: Problem Analysis, Design & Implementation:** - Identify, formulate and analyze real world problem. Design solution for Software, Hardware & Networking problems and implementation using Software & Network tools.
- PO3: Modern tool usage:** - Ability to select modern computing tools, skills and techniques necessary for innovative software solutions.
- PO4: Project Management:** -Comprehend Software Engineering and Technology standards and apply these to prepare own project and system as a part and pioneer in a group.
- PO5: Career Development & Entrepreneurship:** Classify opportunities, private enterprise dream and use of original thoughts to build worth and means for the betterment of the human being and the world.
- PO6: Communication:** Communicate effectively on computational & information Technology activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
- PO7: Ethics:** Ability to apply and commit professional Ethics, cyber regulations & control on software piracy in a global economic environment.
- PO8: Preparing students for future aspects:** Building and improving their creativity, social awareness, and general knowledge.
- PO9: Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological changes.

PROGRAMME SPECIFIC OUTCOMES (PSO):

- PSO1:** An ability to apply technical comprehension in varied areas of Computer Applications and experience a conducive environment in cultivating skills for thriving career and higher studies.
- PSO2:** Understand the concept of Programming logic, Web designing logic, Signal processing, Image processing, Mobile Applications, Multimedia Media.
- PSO3:** Develop competencies in various disciplines of technologies such as Server-side Web applications, computer networking, software engineering, database concepts and programming

A. COURSE OUTCOMES (COs):

- CO1:** Understand basic data structures such as arrays, linked lists, stacks and queues.
- CO2:** Ability to design programs using a variety of data structures such as stacks, queues, in an Array and Utility and conversion of these expressions from one to another
- CO3:** Understand basic data structures such as arrays, linked lists, stacks and queues. Normal and Circular representation of Stack in Lists; Self Organizing Lists; Skip Lists

- CO4:** Array and Linked representation of Queue, De-queue, Priority Queues and apply to solve the problems like sorting, searching, insertion and deletion of data
- CO5:** Developing Recursive of Simple Problems and their implementation and Advantages and Limitations of Recursion and what goes behind Recursion.
- CO6:** Learn and Analyze to Solve problem involving graphs, trees and heaps and recursive and Iterative traversals on Binary Search Trees, Threaded Binary tree.
- CO7:** Describe the hash function and concepts of collision and its resolution methods

B. CORRELATION BETWEEN POs AND COs

POs Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3
CO1	3	3	3	3	3	3	2	3	3	3	3	3
CO2	3	3	3	3	3	3	3	3	3	3	3	3
CO3	2	3	3	3	3	3	2	3	3	3	3	3
CO4	3	3	3	3	3	3	3	3	3	3	3	3
CO5	2	3	3	3	3	2	3	3	3	3	3	3
CO6	3	3	3	3	3	3	3	3	3	3	3	3
CO7	3	3	3	3	3	3	3	3	3	3	3	3

1. Weak

2. Moderate

3. Strong

COURSE TEACHING AND LEARNING ACTIVITIES

A. PEDAGOGY

- i. Whiteboard ✓
- ii. Flipped Class ✓
- iii. PPT ✓

B. COURSE COMPLETION PLAN

UNIT	NO. OF LECTURES		TEST	QUIZ	ASSIGNMENT
	THEORY	PRACTICAL/TUTORIAL			
1	4	6	✓		✓
2	4	6	✓		✓
3	6	14	✓		✓
4	4	6	✓		✓
5	4	6	✓		✓
6	15	25	✓		✓
7	4	6	✓		✓
8	4	6	✓		

C. COURSE DELIVERY PLAN:

UNIT	TOPIC/SUBTOPIC	LECTURE REQUIRED (Theory & Practical)	CO ADDRESSED	ASSIGNMENT/TEST/QUIZ
1	Single and Multi-dimensional Arrays, Sparse Matrices (Array and Linked Representation)	10	CO1,CO3	√
2	Implementing single / multiple stack/s in an Array; Prefix, Infix and Postfix expressions, Utility and conversion of these expressions from one to another; Applications of stack; Limitations of Array representation of stack	10	CO2,CO3	√
3	Singly, Doubly and Circular Lists (Array and Linked representation); Normal and Circular representation of Stack in Lists; Self Organizing Lists; Skip Lists	20	CO4	√
4	Array and Linked representation of Queue, De-queue, Priority Queues	10	CO4	√
5	Developing Recursive Definition of Simple Problems and their implementation; Advantages and Limitations of Recursion; Understanding what goes behind Recursion	10	CO5	√

	(Internal Stack			
6	Introduction to Tree as a data structure; Binary Trees (Insertion, Deletion , Recursive and Iterative Traversals on Binary Search Trees); Threaded Binary Trees (Insertion, Deletion, Traversals); Height-Balanced Trees (Various operations on AVL Trees).	40	CO6	√
7	Linear Search, Binary Search, Comparison of Linear and Binary Search, Selection Sort, Insertion Sort, Insertion Sort, Shell Sort, Comparison of Sorting Techniques	10	CO4	√
8	Introduction to Hashing, Deleting from Hash Table, Efficiency of Rehash Methods, Hash Table Reordering, Resolving collusion by Open Addressing, Coalesced Hashing, Separate Chaining, Dynamic and Extendible Hashing, Choosing a Hash Function, Perfect Hashing Function	10	CO7	√

F. SUGGESTED READINGS

a. TEXT BOOKS

Data Structures using C", by Y.Kanetkar.

b. REFERENCE BOOKS

Data structure by R.B Patel

Data structures using C by A.M Padma Reddy

c. VIDEO RESOURCE

- <https://youtu.be/4OGMB4Fhh50?list=PLBlnK6fEyqRhX6r2uhhlubuF5QextdCSM>
- https://youtu.be/DFpWCl_49i0?list=PLLOxZwkBK52Akgqf4oSWPOQO9ROWS_9rc

d. WEB RESOURCES

- <https://www.javatpoint.com/data-structure-tutorial>
- <https://www.geeksforgeeks.org/data-structures/>

e. E-RESOURCES

- PDF 's