



B.Sc. (CS) Semester-II

Course Code	UAS2MACSC01	Title of the Course	Advanced C Programming and Introduction to Data Structures
Total Credits of the Course	4	Hours per Week	4

Course Objectives:	1. To study the concepts of structures and unions in the C programming language. 2. To understand various file handling operations in C. 3. To learn the basic concepts related to data structures. 4. To gain fundamental knowledge on stacks, queues and linked lists. 5. To learn the basics of sorting and searching techniques.
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Course Content		
Unit	Description	Weightage* (%)
1.	Structures and Unions – Basics of structures, Structures and functions, Structures and arrays – Pointers to structures, Nested structures – Unions, working with unions – Structures versus Unions – Typedef and enum keyword – Passing Structures to Functions by Reference	25%
2.	File Handling – Introduction to file handling and its usage – Operations on files, File access modes, Handling text files – File management I/O functions – Appending Data to Files	25%
3.	Introduction to Data Structures, Stack and Queue – Introduction to data structures, their usage, applications and advantages, Primitive and non-primitive data structures and operations on them, Linear and non-linear data structures – Stacks : Introduction to stacks, operations on stacks, Applications of stacks – Queues: Queues and their uses, Types of queues: Simple queues, Circular queues, Double-ended queues, Priority Queues	25%
4.	Linked Lists, Sorting and Searching Techniques – Introduction to linked lists: Types of linked lists, Singly linked lists, doubly linked lists, Circular linked lists, Applications of	25%



	linked lists – Sorting and Searching Techniques: Basic sorting techniques (Bubble, Selection, Insertion), Searching techniques (Sequential and Binary) - Graph Data Structure (Basic Introduction)	
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Teaching-Learning Methodology	Blended learning approach incorporating both traditional classroom teaching as well as usage of ICT tools.
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Evaluation Pattern		
Sr. No.	Details of the Evaluation	Weightage
1.	Internal Examination	50%
2.	University Examination	50%

Course Outcomes : Having completed this course, the learner will be able to understand	
1.	the basics of structures and unions in the C programming language.
2.	various file handling operations in C.
3.	the fundamental concepts related to data structures.
4.	the basics of stacks, queues and linked lists.
5.	the basic sorting and searching techniques.

Suggested References:	
Sr.No.	References
1.	Balaguruswami, Programming in ANSI C., Tata McGraw Hill Publication, 2008.
2.	Cooper H. & Mullish H., The Spirit of C, Jaico Publication House, New Delhi, 2006.



3.	Kernighan B., Ritchie D., The C Programming Language, Prentice Hall, 1988.
4.	Tremblay J. & Sorenson P.G., An Introduction to Data Structures with application, 2nd Edition, McGraw-Hill International Edition, 1987.
5.	Singh Bhagat & Naps Thomas, Introduction to Data Structures, Tata McGraw-Hill Publishing Co. Ltd., 1985.

On-line resources to be used if available as reference material

On-line Resources

http://www.w3schools.com/



Charutar Vidya Mandal's Institution
V.P. & R.P.T.P. SCIENCE COLLEGE (AUTONOMOUS) (Grant-in-Aid)
Affiliated to Sardar Patel University
VALLABH VIDYANAGAR-388120
Syllabus with effect from the Academic Year 2026-2027
(B. Sc.) (Computer Science)
B. Sc. (CS) Semester-II



Course Code	UAS2MACSC02	Title of the Course	Practical Based on UAS2MACSC01
Total Credits of the Course	4	Hours per Week	8

Course Objectives:	1. To apply the concepts of Advanced C programs 2. To apply the concepts of data structures using C programming.
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Course Content		
Part	Description	Weightage* (%)
I.	Practical Based on UAS2MACSC01 (Unit-1 and Unit-2)	50%
II.	Practical Based on UAS2MACSC01 (Unit-3 and Unit-4)	50%

Teaching-Learning Methodology	Practical-based learning in small groups and Hands on training through required ICT tools.
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Evaluation Pattern		
Sr. No.	Details of the Evaluation	Weightage
1.	Internal Examination	50%
2.	University Examination	50%

Course Outcomes: Having completed this course, the learner will be able to	
1.	Learn how to implement Structures, Unions and File Handling programs in C.
2.	Learn how to implement various operations on stacks, queues and Linked lists by developing programs in C.

On-line resources to be used if available as reference material
On-line Resources
w3schools.com