

**GOVT. HOLKAR AUTONOMOUS SCIENCE
COLLEGE INDORE
(CENTER FOR EXCELLENCE)**

2016-19 and onwards



Affiliated to Devi Ahilya Vishwavidyalaya, Indore

Syllabus for B.Sc.

Computer Science

(Faculty of Computer Science)

DEPARTMENT OF COMPUTER SCIENCE

Govt. Holkar Science College, Indore
Department of Computer Science
B.Sc. Computer Science

Session- 2016-2019

(Effective from July 2016 session for 2016-2019 batches onwards)

Marks Distributions

CLASS /SEMESTER	B. Sc.(CS)	CCE	MIN. MARKS	TERM END EXAM	MIN. MARKS	TOTAL 100%	MIN. MARKS
FIRST SEM.	CS-1101–Computer Organization	15	5	85	28	100	33
	CS-1101P- Practical on Computer Org. & MS Office	—	—	—	—	50	17
SECOND SEM.	CS-1201- Programming & Problem Solving through C.	15	5	85	28	100	33
	CS-1201P- Practical on C Language	—	—	—	—	50	17
THIRD SEM.	CS-2301-Data Structure using C Lang.	15	5	85	28	100	33
	CS-2301P-Practical on Data Structure	—	—	—	—	50	17
FOURTH SEM.	CS-2401- Data Base Management System	15	5	85	28	100	33
	CS-2401P-Practical on Data Base Management System	—	—	—	—	50	17
FIFTH SEM	CS-3501Object Oriented Programming using C++	15	5	85	28	100	33
	CS-3501P-Practical on C++	—	—	—	—	50	17
SIXTH SEM	CS-3601 Computer Networks	15	5	85	28	100	33
	CS-3601P-Practical on Web Technology	—	—	—	—	50	17

B. Sc. III Semester
Session 2016-2019
CS-2301 DATA STRUCTURE USING C

Unit- I

Introduction to Data Structures: Definition of Data structure and Abstract data type

Classification of Data structures: Linear, Non-linear, homogeneous, non homogeneous, static & dynamic.

Arrays: Definition & types of array, Memory representation of one & two dimensional array, Operations: Insertion , Deletion, Traversal

Sparse Matrix: Definition & memory representation.

Unit- II

Stack: Definition, Array implementation of stack (static stack) : Operations PUSH, POP, TRAVERSE.

Applications of stack: Infix, Prefix, Postfix representation and evaluation using stack, Use of stack in recursive implementation.

Queue: Definition, Array implementation of queue (static queue) : Operations INSERT, DELETE, TRAVERSE.

Introduction to Circular queue: Definition & implementation, Priority queue, Double ended queue, Applications of queue

Unit- III

Introduction to Linked List: Definition, advantages, Types of linked list: single, doubly, circular linked list

Operations: Creation, insertion, deletion & traversal of linked list

Unit- IV

Complexity of Algorithms: Time & space complexity, Best-case, worst-case, average-case, Big –oh notation.

Searching Algorithm: Linear or sequential search, Binary search, Interpolation search using array. Complexity of Linear search, Binary search, Interpolation Search

Sorting Algorithm: Bubble sort, Selection sort, Insertion sort, Merge sort Complexity of sorting algorithm.

Unit- V

Introduction to Tree: Definition and types, Binary tree: Definition, representation,

Operations: Traversal, insertion, deletion

Binary search Tree (BST): Definition and creation, Search using BST

Introduction to B-Tree & B+ tree.

Introduction to graph: Definition & representation, Graph Traversal: Depth First Search(DFS), Breadth First Search(BFS) algorithm.

Text Books:

1. Yedidyah Langsam Moshe J. Augenstein, Aaron M. Tenenbaum, "Data Structures using C & C++", PHI New Delhi, 2nd Edition

Reference Books:

1. G.S.Baluja, "Data Structures Through C", Dhanpat Rai & Co., 4th Edition

2. Seymour Lipschutz, "Data Structures", Schaum's Outline Series, Tata Mc Graw Hill Publishing Company Ltd.

3. Adam Drodzke, "Data Structures & Algorithm in C++", 2nd Edition

CS-2301P Practical exercise on Data Structure using C

1. Write a program for address calculation of an element in one and two dimensional array (row major order and column major order).
2. Write a program for insertion, deletion and traversal of elements of an array.
3. Write a program for sparse matrix implementation.
4. Write a program for complete implementation of stack using array with push, pop and traversal operations.
5. Write a program for conversion of an infix expression into postfix representation and evaluation of that postfix form.
6. Write a program for complete implementation of queue using array with insertion, deletion and traversal operations.
7. Write a program for complete implementation of circular queue using array with insertion, deletion and traversal operations.
8. Write a program for complete implementation of double ended queue using array with insertion, deletion and traversal operations.
9. Write a program to create singly linked list (creation, insertion, deletion and traversal).
10. Write a program to create doubly linked list (creation, insertion, deletion and traversal).
11. Write a program to create circular singly linked list (creation, insertion, deletion and traversal).
12. Write a program to create circular doubly linked list (creation, insertion, deletion and traversal).
13. Write a program for complete implementation of stack using linked list with push, pop and traversal operations.
14. Write a program for complete implementation of queue using linked list with insertion, deletion and traversal operations.
15. Write a program for implementation of binary tree (creation, insertion, deletion), with preorder, inorder and postorder traversal.
16. Write a program for implementation of binary search tree (creation, insertion, deletion), with preorder, inorder and postorder traversal.
17. Write a program for implementing graphs and showing depth first search and breadth first search traversals.
18. Write a program for linear search.
19. Write a program for Binary search.
20. Write a program for interpolation search.
21. Write a program for bubble sort.
22. Write a program for selection sort.
23. Write a program for insertion sort.
24. Write a program for merge sort.
25. Write a program for quick sort.