Program	BACHELOR OF VOCATION (B.Voc.)	**Semester - 2**
Type of Course	-	
Prerequisite		
Rationale	-	
Effective From A.Y.	2024-25	

Teaching Scheme (Contact Hours)				Examination Scheme				
Lecture	**Tutorial**	**Lab**	**Credit**	**Theory Marks**		**Practical Marks**		**Total Marks**
				SEE T	**IAT**	**SEE P**	**CCE**	
3	-	-	3	50	-	-	-	50

*SEE - Semester End Examination, **IAT** - Internal Assessment Test, **CCE** - Continues & Comprehensive Evaluation*

Course Content		**T** - Teaching Hours | **W** - Weightage	

Sr.	Topics	T	W
1	**Module 1** Concepts of Structure, Union, Array and Pointer, Program, Introduction to Algorithm- Definition and characteristics, Algorithm Design Tools- Flowchart, Pseudo code statements, Abstract Data Types, Analysis of Algorithm (Time and space analysis of algorithms-Average, best and worst case analysis), Using a sentinel value to end a program.	7	10
2	**Module 2** Data structure- Introduction, Need of Data Structure, Types of Data Structure- Primitive and Non-primitive, Linear and Non-Linear, Static and Dynamic, Stack- Operations on Stack- Algorithm for Push and Pop operations, Stack implementation- Array and Linked list implementation, Stack application- Infix, post fix, Prefix and Recursion, Queue- Introduction, Representation of queues, Operations on Queues, Implementation of queue, Circular queue, Dequeue, Priority queue, Applications of queue.	10	25
3	**Module 3** Introduction to the Linked List, Comparison between Array and Linked List, Representation and Implementation of Linked list, Header node, Types of Linked List- Singly Linked List, Circular linked list, Doubly Linked List, Applications of Linked List.	10	25
4	**Module 4** TREES - Basic Terminology, Binary Trees, Tree Representations as Array & Linked List, Types of Binary tree, Traversal of binary trees- In order, Preorder & post order, Application of Trees, Binary Search Tree, threaded binary tree, B- tree & Height balanced tree, B+ tree, 2-3 trees, Counting binary trees GRAPH- Introduction to graphs, Definition, Terminology, Directed, Undirected & Weighted graph, Representation of graphs, Graph Traversal-Depth first & Breadth first search, Spanning Trees, minimum spanning Tree- Prim's Algorithm, Shortest path algorithm- Dijkstra Algorithm	9	20
5	**Module 5** Hashing and File Structures- Hash Table, Collision resolution Techniques, Searching and Sorting- Sequential Searching, Binary search, Introduction of Sorting, Insertion sort, Selection sort, Quick sort, Bubble sort, Heap sort, Comparison of sorting methods.	9	20
	Total	45	100

Suggested Distribution Of Theory Marks Using Bloom's Taxonomy

Level	Remembrance	Understanding	Application
Weightage	10	20	20

NOTE : This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Course Outcomes

At the end of this course, students will be able to:	
CO1	Understand and development the program development cycle
CO2	Differentiate primitive and non primitive structures
CO3	Design and apply appropriate data structures for solving computing problems
CO4	Apply appropriate data structures for developing various applications
CO5	Apply sorting and searching algorithms to the small and large data sets

Reference Books

1.	**Data Structures (TextBook)** By R.S. Salaria | Khanna Publishing House
2.	**An Introduction to Data Structures with Applications (TextBook)** By Jean-Paul Tremblay & Paul G. Sorenson | Tata McGraw Hill
3.	**Data and File Structures using C, (TextBook)** By Thareja,Reema | Oxford University Press New Delhi, Pub. Year 2011
4.	**Data Structures through C (A Practical Approach) (TextBook)** By G. S. Baluja, Dhanpat Rai & Co.