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|  | **BCA113: Data Structure using C** | L  3 | T  0 | | P  2 | C  4 |
| Version No. |  | | | | | |
| Prerequisite |  | | | | | |
| Objectives: | Students will be able to design the data structure. | | | | | |
| Expected Outcome: | After completing the this course,  Students will solve the real world problem using data structure. | | | | | |
| **Module I** | **Introduction to Data Structure** | | |  | | |
| Introduction, Basic Terminology : Data and information, ADT,  Data Organization and types of Data Structure. | | | | | | |
| **Module II** | **Arrays** | | |  | | |
| Representation of Linear Arrays,  Types of Arrays : 1D,2D & M-D Concept,  Sorting & Searching Algorithms-Bubble,Selection,Merge, Quicksort, linear and binary search. Type of Memory Allocations | | | | | | |
| **Module III** | **Linked List** | | |  | | |
| Concept of Linked List,  Representation of linked List in memory, Memory Allocation, Garbage Collection ,  Overflow and Underflow, Traversing a linked list,  Searching a linked list, Insertion & Deletion in Linked List,   More types of linked list: Header Linked List , Two way List and Circular linked list. | | | | | | |
| **Module IV** | **Stacks, Queues , Recursion** | | |  | | |
| Concepts of Stack, Operation on Stack,  Array Representation of Stack, Arithmetic Expression POLISH Notation, Concepts of Queue,  Operation on Queue,  Representation of queues, Other types of queue: Priority Queues, Deque and Circular queue. Recursion : factorial number, Fibonacci series and Tower of Honai | | | | | | |
| **Module V** | **Introduction of Trees and Graph** | | |  | | |
| Introduction of Trees – Binary Trees –Binary Search Trees. Types of Graph | | | | | | |