MCA- C201 Data Structures				
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Course objective:

1. To impart the basic concepts of data structures.
2. To understand concepts about searching and sorting techniques
3. To understand basic concepts about stacks, queues, lists, trees and graphs.
4. To enable them to write algorithms for solving problems with the help of fundamental data structures.

Course outcome:

1. For a given Search problem (Linear Search and Binary Search) student will able to implement it.
2. For a given problem of Stacks, Queues and linked list student will able to implement it
3. Student will able to write an algorithm for Selection Sort, Bubble Sort, Insertion Sort, Quick Sort, Merge Sort, Heap Sort
4. Student will be able to implement BST, Graph search and traversal algorithms

Arrays, Stacks and Queues: Representation of Array (Single & Multi-Dimensional Arrays), Address Calculation using Column & Row Major Ordering, Representation of Stacks & Queues Using Arrays and their Operations, Circular Queues, Conversion from Infix to Postfix and Evaluation of Postfix expressions using Stack.

Linked List: Singly linked list (operations on list), Linked stacks and queue, Polynomial representation and manipulation using linked list; Reading and Writing polynomials, Polynomial addition. Circular Linked list and doubly linked list.

Trees: Definition, BST traversal methods (Preorder, Postorder and Inorder), Recursive and non- recursive algorithms for traversal methods, Insertion into and deletion from a BST and their implementation. B- trees: Definition, Insertion and Deletion operations.

Searching and Sorting: Sequential & binary searches; Hashing schemes: hashing, Hash functions, Collision functions, Open addressing (Linear probing and modification), Chaining; Sorting methods: Insertion, selection, Bubble, Quick, Merge and Heap sorts.

Threaded binary tree: Introduction, Threads, in-order, preorder and post-order traversal, Insertion in Threaded tree.

Graph: Introduction. Representation: Adjacency Matrix and Adjacency List. *Graph Traversals:* Depth First Search, Breadth First Search. Applications of Graphs.

Recommended Books:

1. Kruse, Leung and Tondo, Data Structures and Program Design in C, PHI.
2. Ellis Horowitz and Sartaj Sahni, Fundamentals of Data Structures, Galgotia Publ.

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