CSE 1201
Data Structure

Contact Hours/Week: 3 Hours
Credit Hour: 3.00

Course Contents:

Introduction: Concepts and Examples of Elementary Data Objects, Necessity of Structured Data, Types of Data Structure, Ideas on Linear and Nonlinear Data Structure.

Linear Array: Linear Array & its Representation in Memory, Traversing LA, Insertion & Deletion in LA, Multidimensional Array & its Representation in Memory, Algebra of Matrices, Sparse Matrices.

Stack: Stack Representation & Applications; PUSH and POP Operation on Stack. Polish Notation, Reverse Polish Notation; Evaluation of a Postfix Expression; Transforming Infix Expression into Postfix Expression.

Queue: Its Representation, Insertion & Deletion in Queue, Priority Queues, Recursion: [Factorial Function, Fibonacci Sequence, Ackermann Function, Towers of Hanoi].

Linked List: Linked List & its Representation in Memory, Traversing, Searching, Insertion & Deletion Operation on Linked List, Circular List, Header Linked Lists, Two Way Lists.

Complexity Analysis: Algorithm and Flowchart, Asymptotic Notations: Best case, Worst Case, Average Case, Complexity Analysis of Different Algorithms.

Sorting and Searching: Insertion Sort, Selection Sort, Bubble Sort, Quick Sort, Merge Sort, Binary and Linear Search, Hash Function, Collision Resolution.

Tree: Tree Terminology, Representation of Binary Trees in Memory, Traversing Binary Tree, Binary Search Tree, Insertion & Deletion on Binary Search Tree, Balanced Binary Search Tree, AVL tree, Red Black Tree, Insertion & Deletion on Heap, Heap Sort, B Trees, General Tree.