

CSC 212 : Data Structures

- Credit hours (Lectures, Lab, Tutorial): 3 (3 + 0 + 1).
- Prerequisites: CSC 113.

Course content: Introduction to Problem Solving (Problem solving, modular design, abstraction and information hiding, OO design. Key issues in programming: modularity, modifiability, ease of use, fail-safe programming, style, debugging.); Recursion; Abstract Data Types; Linked Lists; Stacks; Queues; Algorithm Efficiency (Measuring the efficiency of Algorithms: execution time of algorithms; algorithm growth rates, order-of-magnitude analysis (big O notation)); Sorting (Selection Sort, Bubble Sort, Insertion Sort, Merge Sort, Quick Sort); Trees (Terminology The ADT Binary Tree (traversals of a BT, representations of a BT); The ADT Binary Search Tree; The ADT Balanced Search Tree (2-3 Trees, 2-3-4.Trees); AVL Trees; Tables and Priority Queues (The ADT Table The ADT Priority Queue (a variation of the ADT Table, Heaps, a heap implementation of the ADT PQ); Hashing (Hash functions, resolving collisions, efficiency of hashing, designing a good hash function); Graphs (Terminology, Graphs as ADTs, implementing graphs, Graph Traversals: Depth-First Traversal, Breadth-First Traversal, Applications of Graphs).