

Certificate in Data Structure

CCE offers many job oriented computer courses.”Certificate in Data Structure” is one of the CCE approved course.The detailed contents of this course is in the attachment.

COURSE CODE: CCE-13
ELIGIBILITY 10th
DURATION : 2 Months

SYLLABUS

Introduction

- Basic Terminology , Elementary Data Organization , Data Structure operations , Algorithm Complexity and Time-Space trade-off

Arrays

- Array Definition , Representation and Analysis , Single and Multidimensional Arrays , address calculation , application of arrays , Character String in C , Character string operation , Array as Parameters , Ordered List , Sparse Matrices , and Vectors.

Stacks

- Array Representation and Implementation of stack , Operations on Stacks : Push & Pop , Array Representation of Stack , Linked Representation of Stack , Operations Associated with Stacks , Application of stack : Conversion of Infix to Prefix and Postfix Expressions , Evaluation of postfix expression using stack.

Recursion

- Recursive definition and processes , recursion in C , example of recursion , Tower of Hanoi Problem , simulating recursion.Backtracking , recursive algorithms , principles of recursion , tail recursion , removal of recursion.

Queues

- Array and linked representation and implementation of queues , Operations on Queue : Create , Add , Delete , Full and Empty.Circular queue , Deque , and Priority Queue.

Linked list

- Representation and Implementation of Singly Linked Lists , Two-way Header List , Traversing and Searching of Linked List , Overflow and Underflow , Insertion and

deletion to/from Linked Lists , Insertion and deletion Algorithms , Doubly linked list , Linked List in Array , Polynomial representation and addition , Generalized linked list , Garbage Collection and Compaction.

Trees

- Basic terminology , Binary Trees , Binary tree representation , algebraic Expressions , Complete Binary Tree.Extended Binary Trees , Array and Linked Representation of Binary trees , Traversing Binary trees , Threaded Binary trees.Traversing Threaded Binary trees , Huffman algorithm.

Searching and Hashing

- Sequential search , binary search , comparison and analysis , Hash Table , Hash Functions , Collision Resolution Strategies , Hash Table Implementation.

Sorting

- Insertion Sort , Bubble Sorting , Quick Sort , Two Way Merge Sort , Heap Sort , Sorting on Different Keys , Practical consideration for Internal Sorting.

Binary Search Trees

- Binary Search Tree (BST) , Insertion and Deletion in BST , Complexity of Search Algorithm , Path Length , AVL Trees , B-trees.

Graphs

- Terminology & Representations , Graphs & Multi-graphs , Directed Graphs , Sequential Representations of Graphs , Adjacency Matrices , Traversal , Connected Component and Spanning Trees , Minimum Cost Spanning Trees.

File Structures

- Physical Storage Media File Organization , Organization of records into Blocks , Sequential Files , Indexing and Hashing , Primary indices , Secondary indices , B+ Tree index Files , B Tree index Files , Indexing and Hashing Comparisons.