DATA STRUCTURES
(Common to CSE, IT, ECE & EEE)

Course Code: 13CT1106

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Course Educational Objectives:
Student will be able to
- Analyze algorithms.
- Develop software applications which are efficient in terms of space time complexity.
- Choose suitable Data Structures for different real world applications.
- Apply best algorithm to sort set of elements.
- Employ a structured methodology while providing a software solution to an engineering problem.

Course Outcomes:
At the end of the course student will be able to
- Get knowledge on how to develop algorithms, operations on queues and stacks.
- Work on different searching methods and graphs.
- Get knowledge on trees and binary trees.
- Work on different sorting methods.
- Get knowledge on different types of linked operations.

UNIT-I (12 Lectures)

ANALYSIS OF ALGORITHMS:
Efficiency of algorithms, apriori analysis, asymptotic notations, time complexity of an algorithm using O notation, polynomial Vs exponential algorithms, average, best and worst case complexities, analyzing recursive programs.
STACKS: Introduction, stack operations, applications.

QUEUES: Introduction, Operations on queues, circular queues, other types of queues, applications.

UNIT-II (12 Lectures)

LINKED LISTS:
Introduction, Singly linked lists, circularly linked lists, doubly linked lists, multiply linked lists, applications.

LINKED STACKS AND LINKED QUEUES:
Introduction, operations on linked stacks and linked queues, dynamic memory management and linked stacks, implementation of linked representations, applications.

UNIT-III (12 Lectures)

SEARCHING:
Introduction, linear search, transpose sequential search, interpolation search, binary search, Fibonacci search.

INTERNAL SORTING:
Introduction, bubble sort, insertion sort, selection sort, merge sort, quick sort.

UNIT-IV (12 Lectures)

TREES AND BINARY TREES:
Introduction, Trees: definition and basic terminologies, representation of trees, binary trees: basic terminologies and types, representation of binary trees, binary tree traversals, threaded binary trees, applications.

BINARY SEARCH TREES AND AVL TREES:
Introduction, binary search trees: definition and operations, AVL Trees: definition and operations, applications.

UNIT-V (12 Lectures)

GRAPHS:
Introduction, definitions and basic terminologies, representations of graphs, graph traversals and applications.
TEXT BOOKS:

REFERENCES:

WEB REFERENCES:
http://nptel.iitm.ac.in/video.php?subjectId=106105085