

BCA206: Data Structure Using C

Teaching Scheme

Lectures: 3 hrs/Week

Tutorials: 1 hr/Week

Credits: 4

Examination Scheme

Class Test - 12 Marks

Teachers Assessment - 6 Marks

Attendance - 12 Marks

End Semester Exam - 70 marks

Prerequisite: -

1. Familiarity with the fundamentals of C or other programming language
2. A solid background in mathematics, including probability, set theory

Course Objectives:

1. To learn the basics of abstract data types.
2. To learn the principles of linear and nonlinear data structures.
3. To build an application using sorting and searching.

Detailed Syllabus

UNIT I (10 Hours)

Introduction Data Structure: Introduction to Data Structure, Classification of data Structure, Operation on data structure, Top down and Bottom-up approaches to algorithm, Analysis of algorithm, Frequency count, Complexity measures in terms of time and space.

UNIT II (10 Hours)

Arrays: Representation of array (single & multi dimensional arrays), Traversing, insertion and deletion operations. Merging, matrix addition, subtraction, multiplication, transpose, sparse matrix

UNIT III (10 Hours)

Stacks: Introduction to stack, primitive operation on stack, Stacks application: Infix, post fix, Prefix and Recursion.

Queues: Introduction to queues, Primitive Operations on the Queues, Circular queue, Dequeue, Priority queue, Applications of queue.

UNIT IV (10 Hours)

Linked List: Introduction to the Linked List, Basic operations on linked list, Header nodes, Doubly Linked List, Circular Linked List, and Application of Linked List.

UNIT V (6 Hours)

Trees: Basic Terminology, Binary Trees, Tree Representations using Array & Linked List, Basic operation on Binary tree, Traversal of binary trees:- In order, Preorder & post order, Application of Binary tree, Threaded binary tree, Heap Tree, B-tree & Height balanced tree.

UNIT VI (10 Hours)


Searching and Sorting: Sequential search & binary search, Hashing, sorting method (Insertion sort, Selection sort, Bubble sort, Quick sort, Merge sort, Heap sort).


Head

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Text and Reference Books

1. Data Structures and Program Design in C, R.L. Kruse, B.P. Leung and C. L. Tondo, PHI, 2008.
2. Data Structures, Seymour Lipschutz, Mcgraw Hill Publication, 2009
3. Data structures using C, Aaron M.Tenanbaum, Pearson education, 2004.
4. Data structure through C, Yashvant Kanetkar, BPB Publication, 2006.

Course Outcomes:

1. Solving problems and simulate the insertion and deletion by using DS methods.
2. Understanding the concept and recognize the basic terminology used in computer programming.
3. Write, Compile and Debug programs in C language and use different data types for writing the programs.
4. Design programs connecting decision structures, loops and functions.
5. Understand the dynamic behavior of memory by the use of pointers
6. Use different data structures and create / manipulate basic data files and developing applications for real world problems.