# ICE-2231
# (Data Structures and Algorithms)

## Lecture on
# Chapter-1: Introduction

By
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# Course Details

Course Code: ICE 2231

Course Title: Data Structure and Algorithms

Total Credit:3 , Total Marks: 75

Total Lecture: 33 (Section A and B)

Exam Duration: 3 H

## Section-A

**Introduction:** Data types and data structures, Data structure operations, Introduction to algorithms, Performance analysis.

**Arrays, Records and Pointer:** Linear arrays, Relationships of arrays, Operation on arrays, Multidimensional arrays, Pointer arrays, Record structures, Representation of records, Sparse matrices.

**Stacks, Queues and Recursion:** Fundamentals, Different types of stacks and queues: Circular, Dequeues, etc., Evaluation of expressions, Recursion, Direct and indirect recursion, Depth of recursion, Implementation of recursive procedures by stacks.

**Linked List:** Linked lists, Representation of linked list, Traversing and searching a linked list, Doubly linked list and dynamic storage management, Generalized list, Garbage collection and compaction.

## Section-B

**Trees and Graphs:** Basic terminology, Binary trees, Binary tree representation, Tree traversal, Extended binary tree, Huffman codes/algorithm, Graphs, Graph representation, Shortest path and transitive closure, Traversing a graph.

**Sorting and Searching: :** Sorting, Insertion sort, Shell sort, Heap sort, Radix sort, The general method of divide and conquer method, Merge sort, Quick sort, Selection sort, Binary search.

**Symbol Tables:** Static tree tables, Dynamic tree tables, Hash tables overflow handling, Theoretical evaluation of overflow techniques.

**Dynamic Programming:** The general method, multistage graphs, All pairs shortest paths, Single source shortest paths problems.
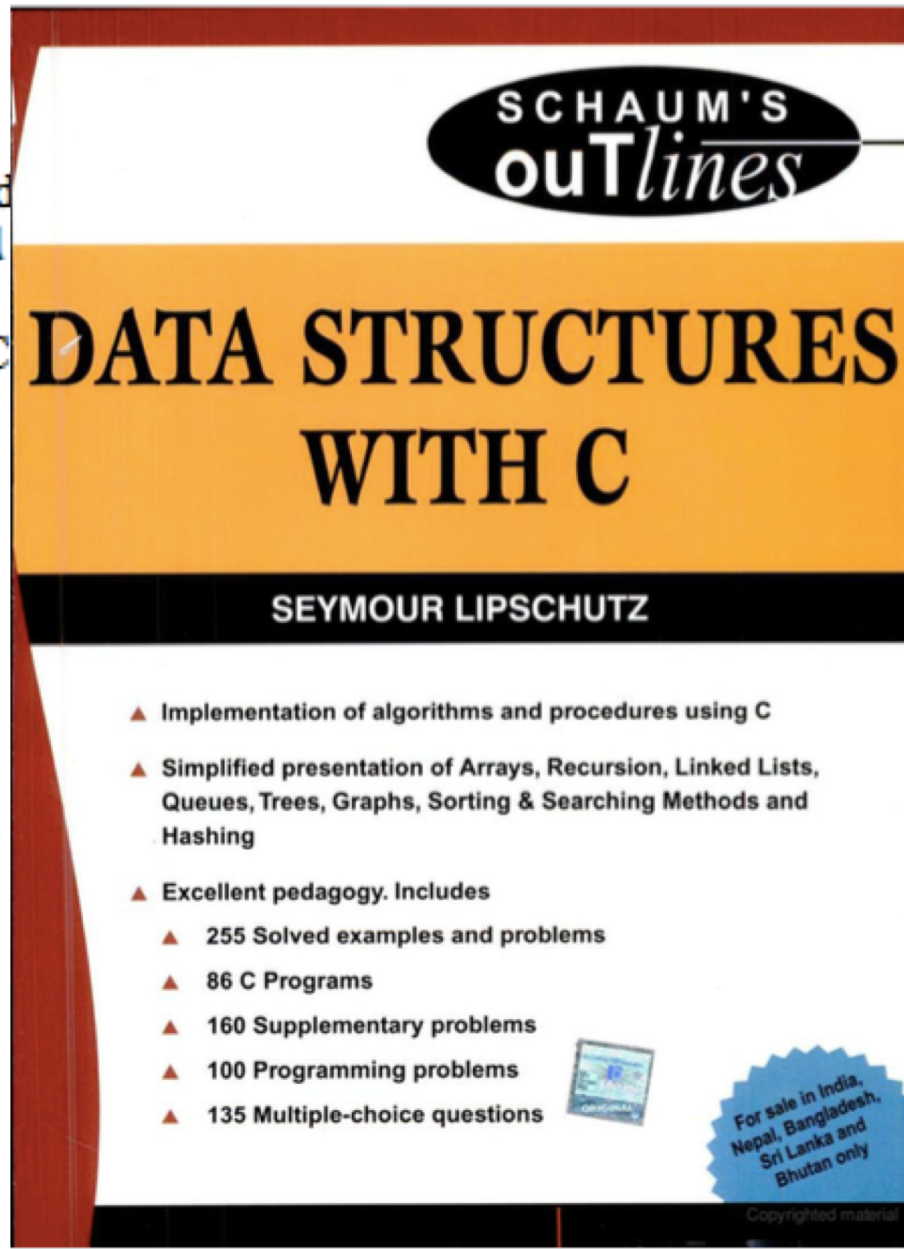
**Text Books:**

1. S Lipschutz ....... ta Structures

**Reference Books:**

2. E. Horowitz and ....... ctures
3. E. Horowitz and
4. Reingold
5. T. H. Cormen, C

## Section-A

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120

75

55

Seymour Lipschutz

**?**

✓ Data are simple values or set of values.

✓ Data item refers to a single unit of values

✓ Data items that are divided into sub-items are called group items.

For example:

An employee's name may be divided into three sub item.....

❖ First name

❖ Middle name

❖ Last Name

But, NID number would be normally be treated as a single item