

6. Elizabeth Tebeaux and Sam Dragga, **The Essentials of Technical Communication**, Oxford University Press, 2015.

7. Caroline Tagg, **Exploring Digital Communication: Language in Action**, Routledge, New York, 2015.

## **SEMESTER – II**

### **MCAC201: DATA STRUCTURES [4-1-0]**

#### **Course Outcomes:**

On completion of this course, the student will be able to:

**CO1:** develop programs using basic data structures: sets, lists, stacks, queues, trees, graphs and advanced data structures like balanced trees and skip lists.

**CO2:** understand the behaviour and application of advanced data structures like Tries, Prefix- and Suffix-trees.

**CO3:** identify best suited data structure for the problem at hand.

**CO4:** identify the programming constructs to optimize the performance of the data structure in different scenarios.

#### **Syllabus:**

**Unit-I Basic data Structures:** Primitive Data Types, Abstract Data Types, Arrays - Static and Dynamic, 2D Arrays, Linked Lists - Single, Doubly-linked, Circular; Stacks and Queues using arrays and linked lists; operations, their analysis; Applications to searching & sorting.

**Unit-II Trees:** Binary Tree, Binary Search Tree, Height Balanced Trees: AVL/RB Tree, 2-3Trees, B and B+ Trees, Splay Trees, Heaps, Priority Queues, Mergeable heaps, Tries, Prefix and Suffix Trees, Skip Lists; operations, their analysis, applications to searching.

**Unit-III Sets:** Sets, Multisets, Maps, Hash Tables, Dictionaries.

**Unit-IV Graphs:** Representation of Graphs, Searching in Graphs – BFS and its applications, DFS and its applications.

#### **Readings:**

1. Goodrich, M., Tamassia, R. and Mount D, **Data Structures and Algorithms in C++/Java**, 2<sup>nd</sup> Edition, 2016, Wiley.

2. Elliot B. Koffman, Paul A.T. Wolfgang, **Objects, Abstraction, Data Structures and Design Using C++/Java**, 1<sup>st</sup> Edition, 2005, Wiley Global Education.

3. T.H. Cormen, C.E. Leiserson, R.L. Rivest and C. Stein, **Introduction to Algorithms**, 3<sup>rd</sup> Edition, 2010, Prentice-Hall of India Learning Pvt. Ltd.