B. Sc. 202
Data Structure using C

Unit I:
Introduction: Basic Terminology, Data type, Data object, Need of Data Structure, Types of Data Structure, Elementary Data Organization, Data Structure operations, Algorithm Complexity and Time-Space trade-off.

Unit II:
Arrays, Single and Multidimensional Arrays, address calculation, application of arrays, Character String in C, Sparse Matrices, and Vectors, Searching- Sequential search, binary search. Sorting algorithms with efficiency- Bubble sort, Insertion sort, Merge sort, Quick Sort

Unit III:
Stacks: Representation and Implementation of stack, Operations on Stacks: Push & Pop, Linked Representation of Stack, Operations Associated with Stacks. Applications 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, recursive algorithms, principles of recursion, removal of recursion.

Unit IV:
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, 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, Polynomial representation. Garbage Collection and Compaction.

Unit V:
Trees: Basic terminology, Binary Trees, Binary tree representation, algebraic Expressions, Complete Binary Tree. Extended Binary Trees, BST, Traversing Binary trees, operations on binary trees-Create, Insert, Delete.

References :

1. Data structures and Algorithm Analysis in C++, Mark Allen Weiss,3rd edition, Pearson Education. Ltd.,
 2. Data structures and Algorithms in C++, Michael T.Goodrich, R.Tamassia and D.Mount, Wiley   student edition,seventh edition, John Wiley and Sons.
3. Data structures , Algorithms and Applications in C++,S.Sahani, Universities Press.