

B. Sc. IT (HONS.) 2020: 3 rd Semester				
Course	Credits-06		Total Marks- 90	
	Theory	Practical	Theory	Practical
BIT320C3: DATA STRUCTURE USING C	04	02	60	30

THEORY: 4 CREDITS;

MAX. MARKS: 60

MIN. MARKS: 24

UNIT-I: Introduction to Data Structures

Concept of structured data: General, Various Levels of Implementation. Different types of data structures.

Static Data Structure: Basic terminology, Linear Arrays and their Representation in memory, traversing, inserting and deleting algorithms in linear arrays.

Sorting and Searching Algorithms: Searching: (Linear search, Binary search, Comparison of Linear and Binary search). Sorting: (Bubble Sort, Insertion Sort, Selection Sort, Merge Sort and Quick Sort).

UNIT-II: Stacks and Queues

Stacks: Definition and operations (Insertion, Deletion and Display) using static implementation.

Applications of Stacks: Conversion of operations from infix to postfix and Conversion of operations from infix to prefix.

Queues: Definitions and operations in ordinary Queue (Insertion, Deletion and Display) using static implementation. D- Queue. Types of Queues and their application.

UNIT-III Pointers and Linked Lists

Review of Pointers: Declaring and initializing pointers, dangling pointer, Difference between array names and pointers, Pointer Arithmetic.

Linked Lists and their applications: Definition of linked lists and their representation in memory. Traversing and searching in linked list, Insertion and Deletion of nodes from singly linked list, reversing a linked list, circular linked lists, doubly linked lists.

UNIT-IV Trees

Binary Trees: Linked representation of a Binary Tree, Traversal of a Binary Tree (Pre-order, In-order, Post-order).

Binary Search Trees (BST): Inserting, deleting and searching of anode in a BST.

PRACTICAL: 2 CREDITS;

MAX. MARKS: 30

MIN. MARKS: 12

Note: *The Practical Component shall be based on the Unit-I to Unit-IV*

Recommended Books:

1. Lipischutz "Data Structures"
2. Yashwant Kanitkar "Understanding pointers in C"
3. Aaron M .Tenenbaum "Data Structure using C and C ++"
4. Fundamentals of Data Structures, Ellis Horowitz and Sartaj Sajni, Galgotia Publications.

Suggested Reading:

1. "Theory and Problems of Data Structure "- (Schuam's Outline Series)
2. Trembley Sorenson, Data Structures
3. Srivastava& Srivastava "Data Structures in Depth"