

PARUL UNIVERSITY - Faculty of Engineering and Technology

Department of Computer Science & Engineering

SYLLABUS FOR 3rd SEM B. Tech PROGRAMME

Design of Data Structures Laboratory(CC1)
(303105202)

Type of Course: B. Tech

Prerequisite: strong foundation in programming and computer science concepts.

Rationale: Data structures optimize data storage, retrieval, and manipulation. They enable efficient algorithm design and execution. By organizing and managing data effectively, they enhance problem-solving capabilities

Teaching and Examination Scheme:

Teaching Scheme			Credit	Examination Scheme					Total
LectHrs/	Tut Hrs/	Lab Hrs/W eek		External		Internal			
				T	P	T	CE	P	
0	0	2	1	-	30	-	-	20	50

Lect- Lecture, **Tut** - Tutorial, **Lab** - Lab, **T** - Theory, **P**- Practical, **CE**- CE, **T** - Theory, **P**- Practical

Objectives:

1. Understanding of fundamental Data Structures including linked-lists, trees, binary search trees, AVL trees, stacks, queues, priority queues, and hash-tables and skip Lists.
2. Understanding of fundamental abstract data types which can include: Stacks and Queues.
3. Ability to program data structures and use them in implementations of abstract data types.
4. Ability to devise novel solutions to small scale programming challenges involving data structures and recursion.
5. Understanding of basic algorithmic complexity.
6. Ability to estimate the algorithmic complexity of simple, non-recursive programs
7. Ability to perform simple inductive proofs and proofs by contradiction and reason about program correctness and invariants.

List of Practical:

P1: program to find the smallest number which greater than a given number and has same set of digits as given number

P2: Given a set of time intervals in any order, merge all overlapping intervals into one and output the result which should have only mutually exclusive intervals.

P3 : Given an expression string exp, write a program to examine whether the pairs and the orders of “{”, “}”, “(”, “)”, “[”, “]” are correct in the given expression.

P4: Given an array, print the Next Greater Element (NGE) for every element.

P5 Given an array of integers heights representing the histogram's bar height where the width of each bar is 1, return the area of the largest rectangle in the histogram.

P6: Given a Linked List and a number N, write a function that returns the value at the Nth node from the end of the Linked List.

P7: Merge Two sorted Linked Lists

P8 Find the Height of the Binary Tree

P9: Deletion of a node in the BST

P10: Given Two Binary Trees Check whether the two binary trees are mirrored or not

P11: Given Tree is BST or not?

P12 For a Given Graph find the Minimum Spanning Tree using Prims Algorithm

P13: For a Given Graph find the Minimum Spanning Tree using Kruskal's Algorithm