GUJARAT TECHNOLOGICAL UNIVERSITY

Syllabus for Bachelor of Vocation (B.Voc), 2nd Semester
Branch: Software Development
Subject Name: Data Structure Lab.
Subject Code: 1120205

With effective from academic year 2018-19

Type of course: Practical

Prerequisite: Programming in C

Rationale: Data structure is a subject of primary importance in Information and Communication Technology. Organizing or structuring data is important for implementation of efficient algorithms and program development. Efficient problem solving needs the application of appropriate data structure during program development. Understanding of data structures is essential and this facilitates the understanding of the language. The practice and assimilation of data structure techniques is essential for programming.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks						Total Marks
				Theory Marks			Practical Marks			
L	T	P	C	ESE (E)	PA (M)		PA(V)		PA (I)	
					PA	ALA	ESE	OEP		
00	00	02	02	00	00	00	30	00	20	50

L- Lectures; P- Practical; OJT- On Job Training; C- Credit; ESE- End Semester Examination; PA- Progressive Assessment

- Implement stack. Write functions like push, pop, Initialize, Empty or Full.
- Implement concept of queues
- Implement queues in a circular array.
- Implement queues as a circular linked list
- Implementing doubly linked list
- Binary search tree to sort an array

Practical List:

Sr. No.	Practical / Hands on Exercise	Hrs.
1	Write a C Program to implement array using row major order and column major order	2
2	Implement a program for stack that performs following operations using array. (a) PUSH (b) POP (c) PEEP (d) CHANGE (e) DISPLAY	4
3	Implement a program to convert infix notation to postfix notation using stack	2
4	Write a program to implement QUEUE using arrays that performs following operations (a) INSERT (b) DELETE (c) DISPLAY	4
5	Write a program to implement Circular Queue using arrays that performs following operations. (a) INSERT (b) DELETE (c) DISPLAY	2
6	Write a menu driven program to implement following operations on the singly linked list. (a) Insert a node at the front of the linked list. (b) Insert a node at the end of the linked list. (c) Insert a node such that linked list is in ascending order.(according to info. Field (d) Delete a first node of the linked list. (e) Delete a node before specified position. (f) Delete a node after specified position.	4
7	Write a program to implement following operations on the doubly linked list. (a) Insert a node at the front of the linked list. (b) Insert a node at the end of the linked list.	2

	(c) Delete a last node of the linked list. (d) Delete a node before specified position	
8	Implement recursive and non-recursive tree traversing methods inorder, preorder and postorder traversal.	4
9	Write a program to implement Bubble Sort.	2
10	Write a program to sort an array using Binary Search Tree.	2
	Total	**28**

Reference Books:

1. Data Structures, R.S. Salaria, Khanna Publishing House
2. An Introduction to Data Structures with Applications. by Jean-Paul Tremblay & Paul G. Sorenson Publisher-Tata McGraw Hill. Web Technologies, Black Book, dreamtech Press
3. Data and File Structures using C, Thareja,Reema Oxford University Press New Delhi 2011
4. Data Structures through C (A Practical Approach), G. S. Baluja, Dhanpat Rai & Co.

Course Outcomes:

Sr. No.	CO Statement	Marks % Weightage
CO-1	Understand and development the program development cycle.	10
CO-2	Differentiate primitive and non-primitive structures.	25
CO-3	Design and apply appropriate data structures for solving computing problems	25
CO-4	Apply appropriate data structures for developing various applications.	20
CO-5	Apply sorting and searching algorithms to the small and large data sets	20

List of Open Source Software/learning website:

Students must refer to following sites to enhance their learning ability.
1) Vlabs.iitb.ac.in
2) NPTEL tutorials