

INSTITUTE OF AERONAUTICAL ENGINEERING

Dundigal, Hyderabad - 500 043

COMPUTER SCIENCE AND ENGINEERING

COURSE DESCRIPTION FORM

Course Title	DATA STRUCTURES LAB			
Course Code	A30582			
Regulation	R13 - JNTUH			
Course Structure	Lectures	Tutorials	Practicals	Credits
Course Structure	-	-	3	2
Course Coordinator	Ms. B Padmaja, Associate Professor, CSE			
Toom of Instructors	Mr. Ch Suresh Kumar Raju, Associate Professor, CSE			
ream of mstructors	Mr. A Harekrishna, Assistant Professor, CSE			

I. COURSE OVERVIEW:

The objective of this lab is to teach students various data structures and to explain them algorithms for performing various operations on these data structures. This lab complements the data structures course. Students will gain practical knowledge by writing and executing programs in C using various data structures such as arrays, linked lists, stacks, queues, trees, graphs, hash tables and search trees.

II. **PREREQUISITE(S):**

Level	Credits	Periods/ Week	Prerequisites
UG	2	3	Computer Programming, Data Structures

III. MARKS DISTRIBUTION:

Sessional Marks	End Semester Exam	Total Marks
There shall be a continuous evaluation during the semester for 25 marks. Day-to-day work in the laboratory shall be evaluated for 15 marks and internal practical examination conducted by the concerned teacher shall be evaluated for 10 marks.	50	75

IV. EVALUATION SCHEME:

S. No	Component	Duration	Marks
1.	Day-to-day Evaluation	-	15
2.	Internal Practical Examination	2.5 hours	10
5.	End Semester Examination	2.5 hours	50

V. COURSE OBJECTIVES:

At the end of the course, the students will be able to:

- I. Be familiar with simple linear and non linear data structures.
- II. Be familiar with writing recursive methods.

- III. To strengthen the ability to identify and apply the suitable data structures for the given real world problem.
- IV. To gain knowledge in practical applications of data structures.
- V. To write and execute programs in C to implement various sorting and searching methods.

VI. COURSE OUTCOMES:

After completing this course the student must demonstrate the knowledge and ability to:

- 1. **Design** and analyze the time and space efficiency of the data structure.
- 2. **Identity** the appropriate data structure for given problem.
- 3. Understand the applications of data structures.
- 4. Choose the appropriate data structure and algorithm design method for a specified application.
- 5. **Understand** which algorithm or data structure to use in different scenarios.
- 6. Understand and apply fundamental algorithmic problems including Tree traversals, Graph traversals.
- 7. **Compare** different implementations of data structures and to recognize the advantages and disadvantages of them.
- 8. Write complex applications using structured programming methods.

VII. COURSE PLAN:

Division of	List of Experiments		
Experiments			
	Week -1		
	Write a C program that uses functions to perform the following:		
	a. Create a singly linked list of integers.		
	b. Delete a given integer from the above linked list.		
	c. Display the contents of the above list after deletion.		
	d. *Check whether two given lists are containing the same data.		
Linked Lists	Week -2		
	Write a C program that uses functions to perform the following:		
	a. Create a double linked list of integers.		
	b. Delete a given integer from the above double linked list.		
	c. Display the contents of the above list after deletion.		
	d. *Find the largest element in a given doubly linked list.		
	Week – 3		
	a) *Write a C program to implement stack using linked list.		
Stack	b) Write a C program that uses stack operations to convert a given infix		
	expression into its postfix equivalent, implement the stack using an array.		
	c) * Write a C program to reverse the elements of the stack using recursion.		
	Week – 4		
	Write C programs to implement a double ended queue ADT using		
Queue	a. Array		
	b. Double linked list		
	Week – 5		
	Write a C program that uses functions to perform the following:		
Binary Search Tree	a. Create a binary search tree of characters.		
	b. Traverse the above binary search tree recursively in postorder.		
	c. *Count the number of nodes in the binary search tree.		
	Week – 6		
	Write a C program that uses functions to perform the following:		
	a. Create a binary search tree of integers		
	b. Traverse the above binary search tree non recursively in inorder.		

	Week -7
	Write C programs for implementing the following sorting methods to arrange a
	list of integers in ascending order.
	a. Insertion sort
	h Merge sort
	Week -8
	Write Concerning for implementing the following conting methods to emerge a
a	while C programs for implementing the following sorting methods to arrange a
Sorting	list of integers in ascending order.
	a. Quick sort
	b. Selection sort
	c. *Radix sort
	Week -9
	Write a C program to perform the following operation:
	a. Insertion into a B-Tree.
	h Hean Sort
	Week – 10
	Write a C program to implement all the functions of a dictionary (ADT) using
	hashing
Hashing	Week – 11
	a) Write a C program for implementing Knuth-Morris-Pratt pattern matching
	algorithm.
	b) *Write a C program to sort a given list of strings.
	Week – 12
	Write C programs for implementing the following graph traversal algorithms:
Graph Traversal	a. Depth first traversal
	b Breadth first traversal

*Content beyond the university prescribed syllabi

Prepared by	: Ms. B Padmaja, Associate Professor, CSE
Date	: 6 June, 2015

HOD, CSE