

**Lesson Planning for the semester starting w.e.f. 8.01.2019**

**MKM girls Polytechnic college (179), Hodal(District Palwal)**

**Name of the Faculty:** Ruby

**Discipline:** Lecturer, Computer Engg.

**Semester:** 4<sup>th</sup>

**Subject:** DATA STRUCTURES USING 'C'

**Lesson Plan Duration:** 15 weeks (from January, 2019 to April, 2019)

**Work Load (Lecture/ Practical) per week (in hours):** Lectures- 03, Practicals-06

| Week            | Theory      |                                                                                                      | Practical       |                                                                          |
|-----------------|-------------|------------------------------------------------------------------------------------------------------|-----------------|--------------------------------------------------------------------------|
|                 | Lecture day | Topic (including assignment/ test)                                                                   | Practical day   | Topic                                                                    |
| 1 <sup>st</sup> | 1           | 1.1 Problem solving concept, top down and bottom up design, structured programming                   | 1 <sup>st</sup> | Introduction to 'C' language and data structures for practical exercises |
|                 | 2           | 1.2 Concept of data types, variables and constants<br>1.3 Concept of pointer variables and constants |                 |                                                                          |
|                 | 3           | Introduction to data Structure( Linear, Non Linear, Primitive, Non Primitive)                        |                 |                                                                          |
| 2 <sup>nd</sup> | 4           | Concepts of Data Structure(Array, Linked List, Stack, Queue, Trees, graphs)                          | 2 <sup>nd</sup> | The addition of two matrices using functions                             |
|                 | 5           | Revision of previous chapter, Assignment and class test.                                             |                 |                                                                          |
|                 | 6           | Concept of Arrays                                                                                    |                 |                                                                          |

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|-----------------|----|--------------------------------------------------------------------------------------------------------------------------|-----------------|-------------------------------------------------|
|                 |    | 2.2 Single dimensional array<br>2.3 Two dimensional array: Representation of Two dimensional Array(Base Address, LB, UB) |                 |                                                 |
| 3 <sup>rd</sup> | 7  | Operations on arrays with Algorithms for searching                                                                       | 3 <sup>rd</sup> | The addition of two matrices using functions    |
|                 | 8  | Operations on arrays with Algorithms for traversing                                                                      |                 |                                                 |
|                 | 9  | Operations on arrays with Algorithms for inserting                                                                       |                 |                                                 |
| 4 <sup>th</sup> | 10 | Operations on arrays with Algorithms for deleting                                                                        | 4 <sup>th</sup> | Push and pop operation in stack                 |
|                 | 11 | Revision of previous chapter, Assignment and class test                                                                  |                 |                                                 |
|                 | 12 | Introduction to linked list and double linked list                                                                       |                 |                                                 |
| 5 <sup>th</sup> | 13 | Representation of linked lists in Memory, Comparison between Linked List and Array                                       | 5 <sup>th</sup> | Conversion from in-fix notation                 |
|                 | 14 | Traversing a linked list<br>3.4 Searching linked list                                                                    |                 |                                                 |
|                 | 15 | Insertion and deletion into linked list (At first Node, Specified Position, Last node<br>3.6 Application of linked lists |                 |                                                 |
| 6 <sup>th</sup> | 16 | Doubly linked lists<br>3.8 Traversing a doubly linked lists                                                              | 6 <sup>th</sup> | The factorial of a given number using recursion |

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|------------------|----|------------------------------------------------------------------------------------------------------------------------|------------------|---------------------------------------------------------------------|
|                  | 17 | Insertion and deletion into doubly linked lists                                                                        |                  |                                                                     |
|                  | 18 | Revision of previous chapter, Assignment and class test                                                                |                  |                                                                     |
| 7 <sup>th</sup>  | 19 | Introduction to stacks<br>4.2 Representation of stacks with array and Linked List                                      | 7 <sup>th</sup>  | Insertion and Deletion of elements in queue using pointers          |
|                  | 20 | Implementation of stacks                                                                                               |                  |                                                                     |
|                  | 21 | Application of stacks                                                                                                  |                  |                                                                     |
| 8 <sup>th</sup>  | 22 | - Polish Notations<br>- Converting Infix to Post Fix Notation<br>- Evaluation of Post Fix Notation<br>- Tower of Hanoi | 8 <sup>th</sup>  | Insertion and Deletion of elements in circular queue using pointers |
|                  | 23 | Recursion: Concept and Comparison between recursion and Iteration<br>4.6 Introduction to queues                        |                  |                                                                     |
|                  | 24 | Implementation of queues (array and Linked List with algorithm)                                                        |                  |                                                                     |
| 9 <sup>th</sup>  | 25 | Circular Queues                                                                                                        | 9 <sup>th</sup>  | Insertion and Deletion of elements in linked list                   |
|                  | 26 | De-queues                                                                                                              |                  |                                                                     |
|                  | 27 | Revision of previous chapter, Assignment and class test                                                                |                  |                                                                     |
| 10 <sup>th</sup> | 28 | Concept of Binary Trees (Complete, Extended Binary Tree)                                                               | 10 <sup>th</sup> | Insertion and Deletion of elements in doubly linked list            |
|                  | 29 |                                                                                                                        |                  |                                                                     |
|                  | 30 | Concept of representation of Binary Tree                                                                               |                  |                                                                     |
| 11 <sup>th</sup> | 31 | Concept of balanced Binary Tree                                                                                        | 11 <sup>th</sup> | The linear search procedures to search an element in given list     |
|                  | 32 | Traversing Binary                                                                                                      |                  |                                                                     |
|                  | 33 |                                                                                                                        |                  |                                                                     |

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|------------------|----|----------------------------------------------------------|------------------|-------------------------------------------------------------------|
| 12 <sup>th</sup> | 34 | Trees (Pre order, Post order and In order)               | 12 <sup>th</sup> | The binary search procedures to search an element in a given list |
|                  | 35 | Searching, inserting and deleting in binary search trees |                  |                                                                   |
|                  | 36 |                                                          |                  |                                                                   |
| 13 <sup>th</sup> | 37 | Revision of previous chapter, Assignment and class test  | 13 <sup>th</sup> | The bubble sort techniques                                        |
|                  | 38 | Introduction of Sorting and Searching                    |                  |                                                                   |
|                  | 39 | Search algorithm (Linear and Binary)                     |                  |                                                                   |
| 14 <sup>th</sup> | 40 | Search algorithm (Linear and Binary)                     | 14 <sup>th</sup> | The selection sort techniques                                     |
|                  | 41 | Concept of sorting                                       |                  |                                                                   |
|                  | 42 | Bubble Sort, Insertion Sort                              |                  |                                                                   |
| 15 <sup>th</sup> | 43 | Selection Sort, Merge Sort                               | 15 <sup>th</sup> | Revision and test of practicals                                   |
|                  | 44 | Radix Sort, Heap Sort                                    |                  |                                                                   |
|                  | 45 | Revision of previous chapter, Assignment and class test  |                  |                                                                   |