

## LESSON PLAN

NAME OF FACULTY: MRS. SUMAN CHAUDHARY

DISCIPLINE: COMPUTER ENGINEERING

SEMESTER: 4TH

SUBJECT: DATA STRUCTURES USING C

LESSON PLAN DURATION: 16 WEEKS

**WORK LOAD (LECTURE/ PRACTICAL): LECTURES-3, PRACTICALS -6**

| WEEK            | THEORY      |                                                                                              | PRACTICAL            |                                                          |
|-----------------|-------------|----------------------------------------------------------------------------------------------|----------------------|----------------------------------------------------------|
| 1st             | LECTURE DAY | TOPIC                                                                                        | PRACTICAL DAY/PERIOD | TOPIC                                                    |
|                 | 1           | <b>Unit 1 Fundamental Notations</b><br>Problem Solving concept top down and bottom up design | 1-3                  | The addition of two matrices using functions             |
|                 | 2           | structured programming<br>Concept of data types                                              | 1-3                  |                                                          |
|                 | 3           | variables and constants                                                                      |                      |                                                          |
| 2nd             | 1           | Concept of pointer variables and constants                                                   |                      |                                                          |
|                 | 2           | <b>Unit 2 ARRAYS</b><br>Concept of Arrays                                                    | 1-3                  | Sorting an array                                         |
|                 | 3           | Storage representation of multi-dimensional arrays.                                          | 1-3                  |                                                          |
| 3rd             | 1           | Storage representation of multi-dimensional arrays.                                          |                      |                                                          |
|                 | 2           | Operations on arrays with Algorithms- searching                                              | 1-3                  | The multiplication of two matrices                       |
|                 | 3           | Operations on arrays with Algorithms- traversing                                             | 1-3                  |                                                          |
| 4th             | 3           | Operations on arrays with Algorithms- inserting                                              | 1-3                  |                                                          |
|                 | 1           | Operations on arrays with Algorithms- deleting                                               | 1-3                  | Revision of Practicals                                   |
|                 | 2           | <b>TEST</b>                                                                                  |                      |                                                          |
| 5 <sup>th</sup> | 1           | <b>Unit 3 LINKED LISTS</b><br>Introduction to linked list                                    |                      |                                                          |
|                 | 2           | lists in Memory                                                                              | 1-3                  |                                                          |
|                 | 3           | Representation of linked Operations on linked list-Insertion                                 | 1-3                  | Insertion and deletion of elements in linked list        |
| 6 <sup>th</sup> | 1           | deletion and traversals                                                                      |                      |                                                          |
|                 | 2           | Application of linked lists                                                                  | 1-3                  |                                                          |
|                 | 3           | Doubly linked lists Operations on doubly linked lists- Insertion                             | 1-3                  | Insertion and deletion of elements in doubly linked list |
| 7th             | 1           | deletion and traversals                                                                      |                      |                                                          |
|                 | 2           | <b>Unit 4 STACKS, QUEUES AND RECURSION</b><br>Introduction to stacks                         | 1-3                  |                                                          |
|                 | 3           | Representation of stacks                                                                     | 1-3                  | Push and pop operation in stack                          |

|                  |   |                                                                |     |                                                                      |
|------------------|---|----------------------------------------------------------------|-----|----------------------------------------------------------------------|
| 8th              | 1 | Implementation of stacks                                       |     |                                                                      |
|                  | 2 | Applications of stacks                                         | 1-3 |                                                                      |
|                  | 3 | Introduction to queues                                         | 1-3 | Inserting and deleting elements in queue                             |
| 9th              | 1 | Implementation of queues                                       |     |                                                                      |
|                  | 2 | Circular Queues                                                | 1-3 | Inserting and deleting elements in circular queue                    |
|                  | 3 | De-queues                                                      | 1-3 |                                                                      |
| 10th             | 1 | Application of Queues                                          | 1-3 |                                                                      |
|                  | 2 | Recursion                                                      | 1-3 | The Factorial of a given number with recursion and without recursion |
|                  | 3 | <b>TEST</b>                                                    |     |                                                                      |
| 11 <sup>th</sup> | 1 | <b>Unit 5 TREES</b><br>Concept of Trees                        | 1-3 | Fibonacci series with recursion and without recursion                |
|                  | 2 | Representation of Binary tree in memory                        |     |                                                                      |
|                  | 3 | Traversing Binary Trees - Pre order                            | 1-3 |                                                                      |
| 12th             | 1 | Post order and In order                                        | 1-3 | Program for binary search tree operation                             |
|                  | 2 | Searching and inserting binary search trees                    | 1-3 |                                                                      |
|                  | 3 | Deleting binary search trees                                   |     |                                                                      |
| 13th             | 1 | Introduction to Heap                                           |     |                                                                      |
|                  | 2 | <b>Unit 6 SORTING AND SEARCHING</b><br>Introduction to sorting | 1-3 | The linear search procedures to search an element in a given list    |
|                  | 3 | Introduction to searching                                      | 1-3 |                                                                      |
| 14th             | 1 | Search algorithm - Linear                                      |     |                                                                      |
|                  | 2 | Search algorithm - Binary                                      | 1-3 | The binary search procedures to search an element in a given list    |
|                  | 3 | Sorting algorithms -Bubble Sort                                | 1-3 | The bubble sort technique                                            |
| 15th             | 1 | Sorting algorithms - Insertion Sort                            |     |                                                                      |
|                  | 2 | Quick Sort                                                     | 1-3 | The quick sort technique                                             |
|                  | 3 | Selection Sort                                                 | 1-3 | The selection sort technique                                         |
| 16th             | 1 | Merge Sort and Heap Sort                                       | 1-3 | The merge sort technique                                             |
|                  | 2 | <b>REVISION</b>                                                | 1-3 | Revision of practicals                                               |
|                  | 3 | <b>REVISION</b>                                                |     |                                                                      |

