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| **UNIT** | **DETAILS** | **HOURS** |
| I | **LINEAR DATA STRUCTURES – LIST:** Abstract Data Types (ADTs) – List ADT – array-based implementation – linked list implementation –– singly linked lists- circularly linked lists- doubly-linked lists – applications of lists –Polynomial Manipulation – All operations (Insertion, Deletion, Merge, Traversal). | 9 |
| II | **LINEAR DATA STRUCTURES – STACKS, QUEUES:** Stack ADT – Operations - Applications - Evaluating arithmetic expressions- Conversion of Infix to postfix expression - Queue ADT – Operations - Circular Queue – Priority Queue - deQueue – applications of queues. | 9 |
| III | **NON LINEAR DATA STRUCTURES – TREES:** Tree ADT – tree traversals - Binary Tree ADT – expression trees – applications of trees – binary search tree ADT –Threaded Binary Trees- AVL Trees – B-Tree - B+ Tree - Heap – Applications of heap. | 9 |
| IV | **NON LINEAR DATA STRUCTURES - GRAPHS:** Definition – Representation of Graph – Types of graph - Breadth-first traversal - Depth-first traversal – Topological Sort – Bi-connectivity – Cut vertex – Euler circuits – Applications of graphs. | 9 |
| V | **SEARCHING, SORTING AND HASHING TECHNIQUES:** Searching- Linear Search - Binary Search. Sorting - Bubble sort - Selection sort - Insertion sort - Shell sort – Radix sort. Hashing- Hash Functions – Separate Chaining – Open Addressing – Rehashing – Extendible Hashing. | 9 |
| TOTAL HOURS | | 45 |

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| PROGRAMME: **Computer Science and Engineering** | DEGREE: **B.E.** |
| COURSE: **Data Structures** | SEMESTER: **III** CREDITS: **03** |
| COURSE CODE: **CS8391** REGULATION: **R 2017** | COURSE TYPE: **CORE** |
| COURSE AREA/DOMAIN: Discrete Structures, Intelligent Systems, Information Management | CONTACT HOURS:  **hours/Week.** |
| CORRESPONDING LAB COURSE CODE (IF ANY): **-CS 8381** | LAB COURSE NAME: **- Data Structures Laboratory** |

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| **T/R** | **BOOK TITLE/AUTHORS/PUBLICATION** |
| T | Mark Allen Weiss, ―Data Structures and Algorithm Analysis in C‖, 2nd Edition, Pearson Education, 1997. |
| T | Reema Thareja, ―Data Structures Using C‖, Second Edition , Oxford University Press, 2011 |
| R | Thomas H. Cormen, Charles E. Leiserson, Ronald L.Rivest, Clifford Stein, ―Introduction to Algorithms", Second Edition, McGraw Hill, 2002. |
| R | Aho, Hopcroft and Ullman, ―Data Structures and Algorithms‖, Pearson Education, 1983. |
| R | Ellis Horowitz, Sartaj Sahni, Susan Anderson-Freed, ―Fundamentals of Data Structures in C‖, Second Edition, UniversityPress, 2008 |