

**Course Title : C Programming and Data Structures**

**No. of Credits:4**

**Course Code :19CSEAC01**

**No. of Teaching Hours: T-30, P-30**

**Course Objectives**

To impart knowledge to make the students

1. To Understand the Programming in C language
2. To Understand the various Data structures for representation of structures and searching

**UNIT I**

An overview of C -data types and sizes -declarations -variables -constants -operators - hierarchy of operators -C expressions -precedence and order of evaluation -program control structure -the loop control structures. –Storage classes.

**UNIT II**

Arrays -strings –Functions –function prototypes -recursion -structures -array of structures – additional features of structures -difference between array and structures -structure in functions -self-referential structures -unions

**UNIT III**

Pointers –array of pointers –pointers to an array –pointer to pointers –pointers to functions – function returning pointers -pointers to structure -problems with pointers. Files –Sequential and random accessing -command line arguments -C preprocessor.

**UNIT IV**

Stacks & Recursion: Stacks-Introduction to Recursion-Principles of Recursion-Polish Notation-Evaluation of Polish Expression-Translation from Infix form to polish form. Queues: -Circular queues -Polynomial Arithmetic. Linked Lists: Single Linked List – Doubly Linked list.

**UNIT V**

Trees & Graphs: Binary Search Trees -AVL Trees -B-Trees. Graphs: Definitions-Undirected & Directed Graphs-Traversal-Topological Sorting-Shortest Paths. Tables: Tables of various shapes-Abstract Tables-Radix Sort-Hashing