KAMARAJ
COLLEGE OF ENGINEERING & TECHNOLOGY
(An Autonomous Institution - AFFILIATED TO ANNA UNIVERSITY, CHENNAI)
S.P.G.Chidambara Nadar - C.Nagammal Campus
S.P.G.C. Nagar, K.Vellakulam – 625 701 (Near VIRUDHUNAGAR).

Department of Computer Science and Engineering

Value Added Course on Mastering the Art of Coding Batch V
12-02-2024 to 17-02-2024

Syllabus
Advanced C Programming
Phoenix Softech

Total : 45 hours

Course Objectives:

- Programming basics and the fundamentals of C
- Mathematical and logical operations
- Using if statement and loops
- Arranging data in arrays
- Implementing pointers
- File management and dynamic memory allocation

Unit I: Foundations of Advanced C Programming

Review of Basic Concepts- Pointers and memory management- Structures and unions -File I/O- Advanced Data Types - Enumerations and bit fields- Typedef and type casting- Dynamic Memory Allocation – malloc (), free (), calloc (), realloc ()-Memory leaks and memory debugging.

Unit II: Advanced Control Flow

Function and Pointers- Pointers to functions- Wild Card Pointers- Recursion and Tail recursion- Understanding recursion in C- Optimizing recursive functions with tail recursion.

Unit III: Advanced Pointers and Functions

Pointers to Structures and Unions- Accessing members through pointers- Pointer arithmetic with structures- Function Pointers and Callbacks- More in-depth examples and applications- Practical usage in real-world scenarios.

Unit IV: Advanced Data Structures

Linked Lists- Singly linked lists- Doubly linked lists- Circular linked lists- Advanced Sorting and Searching- QuickSort, MergeSort- Binary search and variation- Dynamic Functionality- Dynamic function creation using function pointers- Use of function pointers in real-world examples.

Unit V: File Handling and Input/Output
File Operations in C- Sequential and random file access- Binary file I/O- Error Handling in File Operations- Handling file errors- Strategies for robust file I/O- Standard I/O Library - Advanced formatting with printf and scanf- Stream manipulators.

Unit VI: Advanced Topics and Optimization
C-PreProcessor- #ifdef, #undef- C Macros- Interview Based Technical Aptitude- Mini Project Work.

Course Outcomes:

- Develop a C program
- Control the sequence of the program and give logical outputs
- Repeat the sequence of instructions and points for a memory location
- Apply code reusability with functions and pointers
- Understand the basics of file handling mechanisms