PRG202 : Advanced C Programming

Code : PRG202 **Duration :** 3 days **Category :** Programming

Audience :

This course is intended for C developers who want to understand and use the more advanced features and techniques of the C language.

Prerequisites :

To join this course knowledge of the basic concepts of programming in C and experience in C is required.

Realization :

The concepts are treated on the basis of presentation slides. Illustrative demo programs are used to clarify the treated concepts. There is ample opportunity to practice and theory and practice is interspersed.

Advanced
C Programming

Contents :

In the course Advanced C Programming the more advanced aspects of C programming like the use of modules and interfaces and object oriented programming in C using encapsulation are discussed. Potential dangers of certain constructs in C are highlighted such as C macros, evaluation order and the use of globals. Attention is paid to pointer techniques and the use of pointers to functions is discussed. The most common dynamic data structures such as arrays, linked lists, hash tables and trees and their implementation in C are addressed in detail. Also attention is paid to optimization techniques regarding speed and memory. More advanced functions of the C library such as setjmp, longjmp, signals, bsearch, and qsort etc. are also on the course program. Finally bit manipulation and advanced string handling and parsing are discussed.

Module 1 : C Pitfalls

Coding Style
Evaluation Order
Risk or macros
Use of const
Code re-use

Module 2 : Object Orientation in C

Modules
Interfaces
Object Oriented Programming in C
Encapsulation
Data Hiding

Module 3 : Pointers and Arrays

Pointer arithmetic
Function pointers
Variable Length Argument Lists
Arrays vs. Pointers
Multidimensional arrays
Dynamic Arrays
Ragged Arrays

Module 4 : Data Structures in C

Dynamic data structures
Linked Lists
Doubly Linked Lists
Stacks, Queues And Lists
Hash Tables
Open Address Hash Tables
Trees
Recursive traversal
Iterative traversal

Module 5 : Bit Manipulation

Bit Manipulation
Optimizing memory management
Optimization Techniques

Module 6 : C Standard Library

C Standard Library
Handling Asynchronous Events With Signal
setjmp and longjmp
atexit, assert, perror

Module 7 : String Handling

qsort and Bsearch
Advanced String Handling