PRG200 : C Programming

Code : PRG200 **Duration :** 5 days **Category :** Programming

Audience :

This course is designed for programmers who want to write programs in C or other people who want to understand C code.

Prerequisites :

No prior programming knowledge is required to join this course. Knowledge of programming in another language is however beneficial to a quick understanding of the subject matter.

Realization :

The theory is treated on the basis of presentation slides and is interspersed with exercises. Illustrative demo programs are used to explain the concepts further. The course material is in English.

C Programming

Contents :

This course covers the basic principles of the C computer language. After an introduction about the background and characteristics of C and the function of the preprocessor, compiler and the linker, the program structure of C programs is discussed. Through a series of coordinated exercises, participants learn to program with the variables, data types, storage classes, operators and control flow constructs of the C language. Subsequently, the use of functions in C is addressed. It is explained how functions are declared and defined and how parameters are passed to functions. The difference between passing parameters by reference and by value is explained. Ample attention is also paid to the pointer concept, arithmetic with pointers, the equivalence between pointers and arrays and the use of function pointers. Next the focus is set on user defined composite data structures such as structures and unions. Finally, the C standard library is discussed, which includes the treatment of various functions for dealing with file IO, date and time, the manipulation of strings and the dynamic allocation of memory.

Module 1 : Intro C Language

C Programming Language
C Library
C Characteristics
C Programs
First C Program
C Compilers
Linkers
IDE Environments

Module 2 : Variables and Data Types

Variables
Variable Names
Basic Data Types
Signed and Unsigned Types
Constants
Numeric Constants
Character Constants
String Constants
Enumeration Constants
Symbolic Constants
Arrays
Character Arrays
Composed Data Types

Module 3 : Control Flow

Control Flow Constructs
Statements and blocks
Decisions
Ambiguity of else
else-if construction
switch and case
case Statements
Exit from switch
while Loop
for Loop
do while Loop
break And continue
goto And Labels

Module 4 : Operators

Operators
Arithmetic Operators
Relational Operators
Logical Operators
In- and Decrement Operators
Assignment Operators
Bitwise Operators
Bitwise or Operators
Shift Operators
Unary Operator
Conditional Operators
Type Conversions
sizeof Operator

Module 5 : Functions

Functions
Declaration and Definition
Parameter Passing
Call by Value
Recursion
Recursion Characteristics

Module 6 : Storage Classes

Storage Class Specifiers
Automatic Variables
External Variables
Static Variables
Register Variables
typedef
Scope
Initialization
Array Initialization

Module 7 : Preprocessor Directives

C Preprocessor
#include directive
#define directive
Macro's with arguments
Conditional Inclusion
Multiple Inclusion .h Files
Header Files

Module 8 : Pointers

Pointers
Variables and Addresses
Use of Pointers
Pointer Declaration
Initializing Pointers
Pointer Examples
Pointers to Variables
Pointer Dereferencing
Pointer Assignment
Pointers as Arguments
Exchange Function
Exchanging Data in Variables
Pointers and Arrays
Arrays in Function Calls
Address Arithmetic
null Pointer
Character Pointers
Command Line Arguments
Pointers to Functions

Module 9 : Structures and Unions

Structures
Structure Definition
Variables of Structure Type
Accessing Structures
Nested Structures
Structure Initialization
Structures and Pointers
Pointers as Structure Members
Structures and Functions
Structure Arrays
Accessing Structure Arrays
sizeof Structure Arrays
Bitfield Structures
typedef And Structures
Unions
Union Member Access
Type Fields in Structures with Unions
Pitfalls C Language

Module 10 : Standard C Library

Standard C Library
File I/O Functions
File Open Function
Access Modes
File Read and Write Function
File Handling Functions
scanf Function Parameters
Operation of scanf
Characteristics scanf
Utility Functions
Flow Control Functions
system Function
ASCII to Binary Functions
String to Long Function
Binary to ASCII Function
Memory Management Functions
Environment Function
Sort and Search Function
Time and Date Functions