

C and C++ Programming

Synopsis & Objective of Course

It is believed that a proficient knowledge of C and C++ helps one attain perfection in general programming; this efficacious training course is intended at the same covering entire aspects of programming. C follows a modular style of programming whereas C++ follows object oriented programming. A trainee will be able to gain command over both the styles of programming.

Target Audience

Programmers and developers who wish to gain a complete understanding of the use of C and C++ as a programming language.

Prerequisites

Attendees should have a basic knowledge of programming and computers.

Previous knowledge of the C language is helpful but not essential.

Delivery

The training will be instructor led, with each section of the material being covered by the trainer and followed by hands-on practical exercises. Programming will be using turboC / GNU C compiler, however trainees can request for any other compiler too. Certain development projects will be given as assignments (under complete guidance) to master a trainee in implementation oriented programming.

Duration : 3 days

Course Contents

Day	Topic	Sub topics
Day 1	Basics of C	What is a Language? Styles of programming & Introduction to C Data types & Modifiers Operators, Variables & Macros Concept of functions & parts of a program printf – scanf & basic functions
	Data memory map	Global & Local variables Storage Classes Stack & heap
	Flow control	Decision Control – <i>if else, goto</i> Loop Control – <i>while, do while</i> Loop Control – <i>for, continue, break,</i> Case Control – <i>switch</i>
	Pointers	Introduction to pointers Size & Dereferencing of pointer

Day 2	Arrays Functions Strings Run Time	Pointer Arithmetic Arrays – a form of pointers Multi Dimensional Arrays Passing values & references Function pointer Recursive Functions Character Arrays – Strings Array of pointers to String String Functions Command line arguments Dynamic memory allocation Void pointer
Day 3	User data Types Pre-Processor Compilation & Running of Code I/O handling	Structures Declaring & accessing Arrays, pointers & structures in Structure Structure arrays & Structure pointers Unions & Enums Features of C Preprocessor Macros & Arguments Conditional compilation Parts of a program – in detail Steps involved in compilation Source code, assembly & bin/hex file Parser & Linker File Handling in C Text v/s binary mode Formatted I/O Miscellaneous & Review
Day 4	Introduction to OOP	History of OOP & Structure of OOP, Disadvantages of OOP, Data types, Variables Operators Conditional and Loop constructs Arrays, Pointers and Reference Variables Type casting Operators & Bool data types structures in C ++ Functions.

	Classes	<p>Object oriented approach</p> <p>Difference between structures and classes,</p> <p>Constructor</p> <p>Destructor</p> <p>Types of constructor this pointer</p> <p>Functions within a class outside a class,</p> <p>Creating objects</p> <p>Object array</p> <p>Pointer object</p> <p>Memory allocation</p> <p>Access modifier</p>
Day 5	Operator Overloading	<p>Definition</p> <p>Need for it</p> <p>Why Operator Overloading</p> <p>Overloading arithmetic unary operator (example : complex, matrix classes, copy constructor, data conversion between objects of different classes)</p>
	Inheritance	<p>Concept</p> <p>Types of inheritance</p> <p>Over riding base class members,</p> <p>Access specifiers ,</p> <p>:: operators with over ridden members</p> <p>Base class initialization</p> <p>Multiple inheritance</p> <p>Problem and solution in multiple inheritance</p> <p>Inheritance using access specifiers</p>
Day 6	Polymorphism	<p>Late binding</p> <p>Early binding</p> <p>Types of polymorphism</p> <p>Virtual functions</p> <p>Friend functions</p> <p>Implementation of the above two functions</p> <p>Constructors & Destructors in polymorphism</p> <p>Virtual base class</p> <p>Virtual constructors and virtual destructors</p>
Day 7	Basic I/O And File concepts	<p>Hierarchy</p> <p>Manipulators</p> <p>Istream, ostream and iostream classes</p> <p>Overloading << & >> operators</p> <p>File I/O</p> <p>Opening & Closing of files</p>

Day 8	Templates	Generic programming Template class Function template Examples
	Exception Handling and Advanced Features	Classes within classes Friend class Namespaces RTTI Mutable & explicit keywords Need for it Try clause Throw an exception Catch block

Trainers' Profile

Corporate Trainer(s) with more than 6 years of experience in embedded development & corporate training in CMM level5 companies.

Scheduled & On-site Training

Apart from in-house training programs, comprehensive training can be also provided as per the requirement & will be optimally customized as per the client's needs.

For training calendar, availability of seats & other details please mail us at training@sigmasolutions.co.in