

# C++ Programming (for C Programmers)

---

**Length:**

5 days

**Description:**

This course follows the ANSI C++ standard and contains many example programs. It contains self-assessment tests for most topics and 15 programming exercises of increasing level of difficulty.

**Objectives:**

Upon completion of this course, you will be able to:

- Write object-oriented programs in C++
- Understand how C++ is a better C
- Do simple object-oriented analysis and design
- Use classes and modularize a program using classes
- Use inheritance and virtual functions
- Use simple exceptions and simple templates
- Become acquainted with the standard template library

**Audience:**

This course is for C Programmers who want to learn to create programs using C++

**Prerequisites:**

C or procedural C++ programming skills

**Course Contents:****Chapter 1 - Introducing C++**

- The C++ Program
- Comments
- Statements and Blocks
- The C++ Environment
- Simple Input/Output
- Stream Output - cout
- cout State Flags
- Stream Input - cin
- End of File and Errors
- Manipulators
- Predefined Manipulators
- External Variables and Scope
- Keywords
- Operators
- Variable Declarations
- Assignment of Pointers of Type void\*
- Tag Names as Type Names
- Reference Variables
- new and delete
- Operator Precedence

**Chapter 2 - Functions**

- Function Definition
- Formal Parameters

- Default Values
- Inline Functions
- Pass by Value
- Pass by Reference
- Returning from a Function
- Function Overloading

### **Chapter 3 - Input and Output**

- Stream Output - cout
- cout State Flags
- Miscellaneous Output Facilities
- Stream Input - cin
- End of File and Errors
- Character and String Input
- Miscellaneous Input Facilities
- Manipulators
- Predefined Manipulators
- User Defined Manipulators
- Manipulators with Arguments
- Other Input and Output
- File Input and Output

### **Chapter 4 - Object Orientation**

- Abstract Data Types
- Classes
- Inheritance
- Class Inheritance
- Metaclasses
- Multiple Inheritance
- Object Identity
- Object Oriented Analysis Overview
- Object Oriented Design Overview

### **Chapter 5 - Classes**

- Class Syntax
- Data Members
- Member Functions
- Constructors and Destructors
- Initialization
- Memberwise Initialization
- Special Pointer this
- Operator Overloading
- Accessor Functions

### **Chapter 6 - Inheritance**

- C++ Inheritance
- Initialization Order Under Derivation
- Standard Conversion Under Derivation
- Initialization and Assignment Under Derivation
- Overloaded Functions with Class Arguments
- Inheriting Operator Functions

### **Chapter 7 - Virtual Functions**

- Virtual Functions
- Virtual Destructors
- Virtual Function Invocation

Virtual Base Classes  
Virtual Base Class Access  
Constructor and Destructor Ordering  
Virtual Base Class Scope

**Chapter 8 - Exceptions, Templates, and the STL**

Exceptions  
Exception Handling  
Templates  
Function Templates  
Template Classes  
Standard Template Library