



## C++ Introduction

Format: Three Days:  
Max Capacity 6

At the end of this course, delegates will be able to develop basic ANSI-compliant C++ console programs. No prior C++ knowledge is assumed although some knowledge of a development environment such as Microsoft Visual Studio & some programming experience would be beneficial.

### Course Content

#### Introduction

- C++ programs
- The history of C++
- Components of a C++ program
- Variables
- Keywords

#### The C++ Interactive Development Environment

- Microsoft Visual Studio
- Starting a new program
- Writing and compiling a program

#### C++ Simple Data Types And Expressions

- Fundamental data types
- Declaring variables
- Integer numbers
- Integer operators
- Compound assignments
- Increment and decrement
- Floating point numbers
- Character data
- Boolean data
- Unsigned variables
- Constants
- Type conversion
- The size of operator

#### Composite Data Types

- Typedefs
- Enumerations
- Arrays
- The #Include Compiler directive
- Structures

#### Flow Control

- Sequential statements
- The if statement
- The while statement
- the for statement
- Range based for loop
- Break and continue statements
- The switch statement
- The do while loop
- The ternary conditional operator

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### Course Content (continued)

#### Functions

- Modular programming
- Header files
- Source files
- Function declarations
- Calling functions
- Function definition
- Returning values using the return statement
- Function overloading
- Default arguments
- References
- Passing parameters
- Passing copied parameters- by value
- Passing referenced parameters - by reference
- Inline functions
- Scope of variables
- Storage class
- Automatic local variables
- Static local variables
- Global variables
- Extern variables
- Dynamically allocated objects

#### Dynamic Memory Allocation

- The stack & the heap
- Memory leakage
- The new & delete operators

#### Pointers

- Memory addresses
- Declaring pointers
- Manipulating pointers
- Pointers to structures
- Strings in C++
- Pointers to char
- Character manipulation routines
- Null pointers
- C++11 nullptr

#### More Pointers

- Pointers to arrays
- Pointer arithmetic
- The void pointer

#### Architectural Issues

- Namespaces
- Header & source files
- #Defined constants
- Defined macros

#### Files in C++

- Files - review
- File types
- Text file examples
- Binary file examples

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### Course Content (continued)

#### The Principles Of Object Orientated Programming

##### - Review

- Object orientated principles

#### Classes & Objects

- Class implementation
- Writing classes
- The public interface
- The private interface
- Class definition
- Inserting class definitions
- Using objects
- Object lifetime
- Constructors
- Destructors

#### Static Class Members

- Static class data members
- Static class member functions

#### The C++ Const Modifier

- Constant variables & pointers
- Constants & functions
- Constant class member functions