C++ Complete

Course Outline

Course Format: Five Days
Max Capacity: 6 People

t the end of this course, delegates will be able to develop complex object-oriented C++ console programs that can take advantage of multi core processors and implement parallelism. The course will also cover efficient C++ programming. No prior C++ knowledge is assumed although knowledge of the Microsoft Visual Studio development environment is required. This course is a very intense 5-day course and is not suitable for absolute beginners. As such some prior programming knowledge is essential.

Introduction
- C++ programs
- Components of a C++ program
- A simple C++ program
- Adding two numbers together
- Variables
- Keywords

- **C++ Simple Data Types & Expressions**
- Fundamental data types
- Declaring variables
- Integer numbers
- Integer operators
- Compound assignments
- Increment and decrement
- Prefixand postfix operators
- Floating point numbers
- Character data
- Boolean data
- Unsigned variables
- Constants
- Type conversion
- The side of operator

Composite Data Types:
- Typedefs
- Enumerations
- Arrays
- The #include compiler directive
- Structures
- Uninions
- Bit structures
- Structure alignment

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 Outline Continued

- **Function**
- 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
- Pasting copied parameters - by value
- Passing referenced parameters - by reference
- Argument types
- Return types
- Inline functions

Dynamic Memory Allocation

- The stack & the heap
- Memory leakage
- The new & delete operators
- Placement new operator
- Manipulating pointers
- Pointers to structures
- Strings in C++
- Pointers to char
- Character manipulation routines
- Strlen()
- Strcpy() and Strncpy()
- Strcat() and Strncat()
- Strcmp() and Strncmp()
- Character test functions
- Character conversion functions
- Microsoft & C++ extentions to character
- Manipulation routines
- Tokenising strings with Strtok_s()
- Null pointers
- C++11 Nullptr
- Smart pointers (C++11)

More Pointers

- Pointers to arrays
- Pointer arithmetic
- The void pointer
- Pointers to functions
- 64 bit pointers
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- Inheritance
- Polymorphism
- Virtual functions
- Abstract classes

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