Developing Visual C++ .NET Applications	5 Days

Course Aims:

This hands-on course provides the knowledge and skills to create desktop and data-driven applications using C++ managed extensions, .NET class libraries and Windows Forms. You also learn how to develop .NET components and integrate legacy code and ActiveX components.

Course Outline:

Introduction to .NET

THE .NET ARCHITECTURE

- Common Language Runtime (CLR)
- The .NET Intermediate Language (IL)
- Managed and unmanaged C++

VISUAL STUDIO .NET

- Development environment features
- Debugging tools and strategies

C++ Language Extensions

THE MANAGED ENVIRONMENT

- Managed heap and garbage collection
- Reference types vs. value types
- .NET types and namespaces

UNICODE

- Understanding Unicode
- Advantages & disadvantages of Unicode

MANAGED C++

- Language differences & extensions

DEVELOPING MANAGED CLASSES

- Defining __gc classes
- Overloading methods
- Providing data access via properties
- Managed operator overloading

TYPES, EVENTS AND EXCEPTIONS

- Managed pointer concepts
- Boxing and unboxing value types
- Event handling using delegates
- Responding to managed exceptions

Applying Advanced Class Features

MANAGED CLASS RELATIONSHIPS

- .NET-compatible inheritance
- Class composition in managed C++
- Abstract and sealed classes

INTERFACES AND POLYMORPHISM

- Defining interfaces with __ interface
- Exploiting dynamic behaviour

Incorporating .NET Class Libraries

EMPLOYING UTILITY CLASSES

- Class library namespaces
- Manipulating text with StringBuilder

WORKING WITH COLLECTIONS

- System::Collections namespace
- Sorting and enumerating collections

WORKING WITH FILES

- Sequential files
- Binary Files
- Serialization
- The BinaryFormatter object

MULTITHREADING

- Life cycle of a thread
- Thread priorities and scheduling
- Thread Synchronisation
- Asynchronous IO

Creating Windows Forms

ESTABLISHING A USER INTERFACE

- Windows Forms vs. MFC
- Designing forms with Visual Studio .NET
- Manipulating form properties

WORKING WITH CONTROLS

- Populating forms with controls
- Creating text and selection controls
- Organising menus and menu items
- Responding to events
- Advanced controls

IMPLEMENTING DIALOGUES

- Built-in dialogues
- Custom dialogues and data exchange

Integrating Legacy C++ Code

MIXING MANAGED AND UNMANAGED CODE

- Applying /clr and "It Just Works" (IJW)
- Supporting standard C++ features
- Pinning managed pointers with __ pin
- Exposing __gc classes with __ gcroot
- DLL access with PInvoke
- Marshalling data with InterOp

COM/ACTIVEX INTEROPERABILITY

- Accessing COM components from .NET
- COM client access to .NET components
- Integrating ActiveX controls

Developing .NET Components

ASSEMBLY STRUCTURE

- Identifying assembly structures
- Building assemblies
- Shared vs. private assemblies
- Generating strong assembly names with digital signatures

ASSEMBLY ADMINISTRATION

- Deploying components in the global assembly cache
- Version control with policy files

Accessing Data with XML and ADO.NET

XML DATA MANIPULATION

- .NET facilities for XML processing
- Reading, writing and modifying XML

PROCESSING RELATIONAL DATA

- The ADO.NET object model
- Connecting to a database
- Creating and executing commands
- DataSets and DataAdapters
- Data binding
- Disconnected DataSets

Networking with .NET

.NET NETWORKING

- .NET Clients & Servers
- Stream Socket connections
- Connectionless Client / Server with Datagrams

Target Audience:

This course is valuable for those interested in developing Visual C++ .NET applications and those migrating legacy C++ code to the .NET platform.

Assumed Knowledge:

Delegates must have at least three months of day-to-day experience of C++ to an intermediate level. Windows user-interface programming experience is not a requirement, but knowledge of MFC would be advantageous as would a basic knowledge of COM.