

Course Description: Microsoft .NET is an advance in programming technology that greatly simplifies application development both for traditional, proprietary applications and for the emerging paradigm of Web-based services. .NET is a complete restructuring of Microsoft's whole system infrastructure and represents a major learning challenge for programmers developing applications on Microsoft platforms. This comprehensive 5-day course is designed for the experienced programmer to help you quickly come up to speed on the C# language and the core features of the .NET Framework. The course consists of two modules. The first module concisely covers the essentials of programming using Microsoft's new C# programming language. It starts with a brief chapter "what you need to know about .NET," which gets you up and running in the .NET environment with a minimum of fuss. The next two chapters cover C# language essentials and object-oriented programming in C#. The next chapter discusses how C# relates to the .NET Framework. The final chapter provides a succinct introduction to creating GUI programs using Windows Forms. An appendix explains the fundamentals of working with the Visual Studio .NET development environment. The second module starts with an introduction to the architecture and key concepts of .NET. It then discusses class libraries, assemblies, versioning, and deployment, which constitute a major advance in the simplicity and robustness of deploying Windows applications, ending the notorious "DLL hell." The next two chapters discuss important topics in the .NET programming model, including metadata, reflection, I/O and serialization. The following chapter continues the discussion of the .NET programming model, covering threading, contexts, application domains, marshal by value, marshal by reference, and memory management. .NET Security is introduced in some detail, including both code access security and role-based security. The next chapter covers interoperability of .NET with COM and with Win32 applications. The module concludes with an introduction to database programming using ADO.NET. Numerous programming examples are examined throughout the course and students will have the opportunity to work on many programming exercises. This course ships in two volumes, consisting of both the C# ESSENTIALS and the .NET FRAMEWORK USING C# courses.

Who Should Attend:

Prerequisites: The student should be an experienced application developer or architect. Some background in object-oriented programming is helpful.

Benefits of Attendance: Upon completion of this course, students will be able to:

- Acquire a working knowledge of C# programming.
- Learn about important interactions between C# and the .NET Framework.
- Learn how to implement simple GUI programs using Windows Forms.
- Gain a thorough understanding of the philosophy and architecture of .NET.
- Acquire a working knowledge of the .NET programming model and .NET security.
- Learn how to implement database applications using .NET.

Course Outline:

Volume 1: C# Essentials

.NET- What You Need To Know
 .NET Executables and the CLR
 A .NET Testbed for C# Programming

C# For The Sophisticated Programmer

First C# Console Application
 Namespaces
 Data Types
 Control Structures
 Subroutines and Functions
 Console I/O
 Exception Handling

Object-oriented Programming In C#

Classes
 Access Control
 Methods and Properties
 Static Data and Methods
 Inheritance
 Overriding Methods
 Interfaces

C# And The .NET Framework

Class Hierarchies
 .NET Interfaces
 Using Generic Interfaces: ICloneable and IComparable
 System.Array
 Collections
 Delegates
 Events

Introduction To Windows Forms

Creating Windows Applications Using Visual

Studio .NET
 Handling Events

Appendix A. Using Visual Studio .NET

Overview of Visual Studio.NET
 Creating a Console Application
 Project Configurations
 Debugging

Volume 2: .NET Framework Using C#

.NET Fundamentals
 What is Microsoft .NET?
 Common Language Runtime
 Attribute Based Programming
 Interface Based Programming
 Metadata
 Common Type System
 Framework Class Library
 Language Interoperability
 Managed Code
 Assemblies and Deployment
 Web Services
 ASP.NET

Class Libraries
 Components in .NET
 Building Class Libraries at the Command Line
 Class Libraries Using Visual Studio .NET
 Using References

Assemblies And Deployment

Assemblies
 Private Assembly Deployment
 Shared Assembly Deployment

Assembly Configuration
 Multi-Course Assemblies

Metadata And Reflection

Metadata
 Reflection
 Late Binding

I/O And Serialization

Directories
 Files
 Serialization
 Attributes

.NET Programming Model

Threading and Synchronization
 Contexts
 Application Domains
 Marshal By Value
 Marshal By Reference
 Memory Management and Garbage Collection

Security

Authentication and Authorization
 Internet Security
 Configuring Security
 Code Access Security
 Permissions
 Role-Based Security
 Principals and Identities

Interoperating With Com And Win32

.NET Client Calling a COM Server
 COM Client Calling a .NET Server
 PInvoke

Database Programming Using ADO.NET

ADO.NET Overview
 .NET Data Providers
 Using DataReaders
 Using DataSets
 Interacting with XML Data

Appendix A: A Visual Studio .NET

Database Testbed
 Server Explorer
 Query Analyzer
 OSQL