



## Enhanced Network Solutions Group

Systems Integration • Learning Solutions • CIO Consulting  
Managed Outsourcing • Healthcare Solutions • Security Solutions

7224 Engle Road - Fort Wayne, IN 46804 - Phone: (260) 432-1364 - Fax: (260) 432.3168

# Introduction to C# and the Microsoft .NET Framework

C#08 Rev 02.10

## 5 days

### Description

This course serves as an introduction to C# programming. It covers basic and advanced topics to get students up to speed and developing C# applications. The course begins with an introduction to the building blocks of C# and the Microsoft .NET Framework. Students will learn common terms and the basic execution model of all C# applications. The bulk of the course is spent learning the basic skills necessary to be a successful C# programmer including working with data types and variables, creating custom types, and string parsing with regular expressions. Students will be exposed to basic object oriented programming principles such as encapsulation and polymorphism and how they are implemented in C#. Students will work with relational databases using LINQ and the Microsoft Entity Framework. Students will also learn to access data stored on the file system and in XML documents. The course concludes by introducing students to Windows Presentation Foundation (WPF) and discusses all of the important topics related to this new UI technology.

### Audience

The target audience for this course is beginning level programmers who have little to no experience with C# and the Microsoft .NET Framework.

### Prerequisites

- *An understanding of problem-solving techniques that apply to software development*
- *A basic understanding of Web, Macro, and Windows scripting techniques and some experience writing scripts*
- *A general understanding of the purpose, function, and features of the .NET Framework*
- *Experience using Visual Studio 2008*
- *Experience in object oriented design and development*

### Course Outline

#### **Module 1: Introduction to the .NET Framework**

Topic A: What is Managed Code?

Topic B: What is the Common Language Runtime?

Topic C: What are Assemblies and Namespaces?

#### **Module 2: Building .NET Framework Applications Using Visual Studio 2008**

Topic A: Creating Projects and Solutions

Topic B: Referencing External Assemblies

Topic C: Using Visual Studio Components

Topic D: Common Application Templates

Topic E: Debugging Applications

Topic F: Documenting Applications

Topic G: Unit Testing



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### **Module 3: C# Core Concepts Part 1**

Topic A: Data Types and Variables

Topic B: Reference Types versus Value Types

Topic C: Working with Common Types: Integers, Characters, Strings and DateTime

Topic D: C# Control of Flow Statements

### **Module 4: C# Core Concepts Part 2**

Topic A: Defining Methods and Parameters

Topic B: Working with Arrays

Topic C: Using and Creating Enumeration Types

Topic D: Using and Creating Structure Types

Topic E: Using Nullable Types

### **Module 5: Defining Class Types**

Topic A: Creating Class Types

Topic B: Creating Fields and Methods

Topic C: Creating Objects Using Object Initializers

Topic D: Class Constructors

Topic E: Static Members and Instance Members

Topic F: Object Oriented Programming Best Practices

Topic G: Introduction to Design Patterns

Topic H: Encapsulating Fields by Using Class Properties

### **Module 6: Implementing Inheritance and Polymorphism**

Topic A: Creating Base Classes

Topic B: Optimizing Performance by Using Sealed Classes

Topic C: Implementing Polymorphism

Topic D: Working with Abstract Classes

Topic E: Upcasting and Downcasting

Topic F: Working with System.Object

### **Module 7: Understanding Structured Exception Handling**

Topic A: Implementing Try-Catch Blocks

Topic B: Cleaning Up Resources with Finally

Topic C: Creating and Using Custom Exception Classes

### **Module 8: Working with Interfaces**

Topic A: Implementing Polymorphism via Interfaces

Topic B: Implementing Class Communication Using Interfaces

Topic C: IEnumerable and IEnumerator Interfaces

Topic D: IComparable and IComparer Interfaces

### **Module 9: Collections and Generics**

Topic A: Using the List Collections

Topic B: Using Dictionary Collections

Topic C: Defining Generic Classes, Interfaces and Methods



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### **Module 10: Working with Strings**

- Topic A: Encoding, Encoders and Decoders
- Topic B: Manipulating Strings Using Regular Expressions
- Topic C: The System.Text.RegularExpressions Namespace

### **Module 11: Introducing LINQ**

- Topic A: Introduction to LINQ
- Topic B: LINQ to Objects, the 50 Standard LINQ Operators
- Topic C: LINQ to XML
- Topic D: LINQ to SQL

### **Module 12: Accessing Relational Databases with LINQ and the Microsoft Entity Framework**

- Topic A: What is the Entity Framework?
- Topic B: Creating New Entity Classes with Visual Studio 2008
- Topic C: Querying Entity Classes Using LINQ
- Topic D: Modifying Databases using LINQ and Entity Classes
- Topic E: Binding to Entity Classes

### **Module 13: File IO and Isolated Storage**

- Topic A: Navigating the File System Using Directory and File Classes
- Topic B: Reading and Writing Text Files with StreamReaders and StreamWriters
- Topic C: Reading and Writing Binary Files with BinaryReaders and BinaryWriters
- Topic D: Securing File Access with Isolated Storage

### **Module 14: Introducing Windows Presentation Foundation and XAML**

- Topic A: Exploring the WPF Assemblies
- Topic B: Building an XAML-Centric WPF Application
- Topic C: Building WPF Applications with Visual Studio and Expression Blend

### **Module 15: Programming with WPF Controls**

- Topic A: Declaring Controls in XAML
- Topic B: Understanding Dependency Properties and Routed Events
- Topic C: Using WPF Layout Controls
- Topic D: Using WPF Content Controls
- Topic E: Using WPF Item Controls
- Topic F: Implementing Binding to Datasources and Other Controls

### **Module 16: WPD 2D Graphical Rendering, Resources, and Themes**

- Topic A: Working with WPD Drawing Objects
- Topic B: Understanding the WPF Animation Framework
- Topic C: Working with Resources
- Topic D: Defining and Applying Styles
- Topic E: Altering a Control's UI Using Templates



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