Object-Oriented Programming in Visual Basic (5 Day)

This course is a practical introduction to programming in Visual Basic and the use of services provided by .NET. It emphasizes the Visual Basic language and how to build Visual Basic applications from an object-oriented perspective. Knowledge of the earlier version of the language, Visual Basic 6, is not required. The course is current to Visual Studio 2005 and .NET 2.0, which introduces important new features, such as generic types. The new features are covered throughout the course in the context of where they are applicable.

One of the strengths of Visual Basic, and the reason it has enjoyed such widespread use, is the ease with which Windows application can be developed. Microsoft has revamped the way that Windows applications are built under .NET. Windows Forms, used by .NET languages, represents a class library that brings uniformity to the components of a Windows application. The course includes substantial coverage of using Windows Forms in Visual Basic, including creating database applications with ADO.NET.

The first part of the course covers the fundamentals of Microsoft’s Visual Basic programming language. It starts with a brief chapter, “.NET: What You Need To Know,” which gets you up and running in the .NET environment with a minimum of fuss. The next five chapters cover the Visual Basic language essentials.

The second part of the course discusses object-oriented programming in Visual Basic. It contains three chapters that focus on developing classes using Visual Basic and then extending them via Visual Basic’s inheritance capabilities. Interface-based programming and collection classes are also introduced.

The final part of the course introduces the Windows Forms class library. Programmers familiar with previous versions of VB will notice that this significantly changes the programming model, yet also introduces flexibility not previously available. The four chapters in this part evolve from building simple form-based applications to ones with dialogs and menus. It concludes with an introduction to database programming using ADO.NET.

The course is practical, with many example programs and a progressively developed case study. The student will receive a comprehensive set of materials, including course notes and all the programming examples.

**LEARNING OBJECTIVES**

- Gain an understanding of the .NET architecture
- Gain a working knowledge of the Visual Basic programming language
- Learn how to build object-oriented applications using Visual Basic
- Learn how to implement Windows desktop applications using Windows Forms, including programs that interact with databases
- Gain a working knowledge of generic types and other new features in Visual Basic 2005.

**Prerequisites:** The student should have some programming experience.
1. **.NET: What You Need To Know**
   - .NET Executables and the CLR
   - A .NET Testbed for Visual Basic Programming
   - Visual Studio 2005

2. **Fundamentals of Visual Basic Programming**
   - Program Structure
   - Namespaces
   - Data Types
   - Variables
   - Conversions
   - Operators and Expressions
   - Console I/O

3. **Control Structures**
   - If Statement
   - Select Case Statement
   - Do/Loop Statement
   - For/Next Statement
   - Exit and Continue

4. **Procedures**
   - Subroutines
   - Functions
   - Pass-by-value Versus Pass-by-reference
   - Access modifiers
   - Overloading
   - Optional Parameters

5. **Advanced Data Types**
   - Arrays
   - Enumerations
   - Structures

6. **Exception Handling**
   - Error Detection
   - Exception Handling

7. **Object-Oriented Programming**
   - Object-Oriented Concepts
   - Defining Classes
   - Methods and Properties
   - Shared Data and Methods
   - Constructors

8. **Inheritance**
   - Inheritance
   - Controlling Base Class Construction
   - Access Control
   - Polymorphism
   - Events
   - Abstract and Not Inheritable Classes
   - Type Conversion in Inheritance

9. **Interfaces and Collections**
   - Interface Fundamentals
   - Programming with Interfaces
   - Using Interfaces at Runtime
   - Resolving Ambiguities
   - Collections
   - Generic Types
   - Type-Safe Collections

10. **Introduction to Windows Forms**
    - Creating Windows Applications
    - Using Visual Studio 2005
    - Partial Classes
    - Handling Events
    - Common Controls

11. **Windows Forms Controls**
    - Buttons, Labels and Textboxes
    - Radio Buttons and Group Boxes
    - Check Boxes
    - List Boxes and Combo Boxes
    - Timer Control
    - Flexible Event Handling

12. **User Interface Features**
    - Dialog Boxes
    - Menus

13. **Database Programming**
    - ADO.NET
    - .NET Data Providers
    - Using Data Readers
    - Using Data Sets
    - .NET 2.0 Data Binding