Technical Training Solutions

C# .NET Fundamentals (for Java developers)

(3 Day Course)

Technical Course Outline

Course Summary

C# and Java language syntax are both derived from C-style programming, but differences abound in keyword usage, underlying functionality, and their respective development environments. This course is designed to introduce the .NET development platform to current Java developers, with emphasis on identifying these differences, so they can quickly get up to speed working with the C# language, the .NET Framework, and the Visual Studio Integrated Development Environment.

While many different project/application types will be explored (Windows Forms, ASP .NET Web Application, ASP .NET Web Services, Class Libraries, Console), ***heavy emphasis is placed on class library development, object-oriented programming principles, and the underlying functionality of the .NET Framework***. Debugging techniques and the underlying workings of the .NET Framework are also covered in detail.

Intended Audience:

This course is intended for ***current Java developers who are already proficient*** with object-oriented programming principles as well as general programming concepts and best-practices.

Prerequisites:

To ensure the best learning experience for all participants, the following pre-requisites ***must be met*** in order to participate in this course:

- At least ***1 year*** of practical ***hands-on*** Java development.

Course Contents:

Getting To Know Visual Studio

- The Makeup of A Visual Studio .NET Project
- Project Configuration Settings
- Building, Saving, & Running Projects
- Getting Help
  - IntelliSense, Code Snippets, Code Expansion
  - The MSDN Library & The "Object Browser" Window

Introducing The Microsoft .NET Framework

- The CLR (Common Language Runtime)
  - The CLS (Common Language Specification)
  - The CTS (Common Type System)
- Types
  - Classes vs. Structures
  - Partial Types
- Assemblies, Namespaces & Classes
- .NET Memory Management
  - Value Types & Reference Types
  - The Managed Stack & The Managed Heap
  - Object Disposal of Resources
  - Object Finalization
  - Garbage Collection
  - Casting, Converting, & Parsing Tecniques
    - Boxing & Unboxing
    - Casts & Direct Casts
    - `TryParse`
    - The `Convert` Class

Exception Handling, Debugging & Testing Code

- The `Exception` Class
- `try`…`catch`…`finally` Blocks
- Setting Breakpoints & Stepping Through Code
- The Various Debugging Windows

Assemblies

- Private vs. Shared Assemblies
- The End of DLL Hell?
  - The Assembly Manifest, References, & Versioning
- Strong Naming An Assembly
  - The `sn.exe` Command Line Tool
- The Global Assembly Cache (The GAC)
  - Registering An Assembly Into The GAC

C# Language Elements & Syntax

- Naming Conventions
- Using Variables & Primitive Types
  - Primitive Types & C# Variable Declarations
  - Type Inferencing with **var**
  - C#'s Definite Assignment Rule
  - String Escape Character Sequences & Verbaitim Strings
- C# Functions
  - Returning Values vs. void
  - `ref` & `out` Parameters

Object-Oriented Programming & Building Class Libraries

- .NET Inheritance
- Overloading, Overloading, Virtual (Overriding), Static, Hiding
- Creating Classes
  - Fields, Properties, Methods, Events, Constructors
  - Member Scope
  - Visual Studio's "Class Diagram" & "Class Designer"
- Advanced Object-Oriented Programming Concepts
  - Building Enumerable Types (Enums)
  - Event Delegates
  - Abstract & Sealed Classes
  - Building & Implementing Interfaces
- Utilizing Class Libraries
  - Making Assembly References & Importing Namespaces
  - Instancing Classes

Introduction To ASP .NET Web Development

- The ASP .NET Page Request/Response Architectural Model
- ASP .NET Web Site vs. ASP .NET Web Application
- Web Form Control Families
  - Web Form, HTML, & HTML Server Controls

Introduction To ASP .NET XML Web Services

- Building Web Services
  - The `[WebService]` and `[WebMethod]` Compiler Attributes
- Using The Visual Studio Web Service Test Bed
- The Web Service Description Language (WSDL) Document
- Building A Web Service Client
  - Making The Web Reference
  - Using The Web Proxy