Advanced .NET Programming

## Course Overview

This training course teaches attendees the following:

* Windows Communications Foundation (WCF)
* ASP.NET MVC 3.0
* Advanced JavaScript

## Duration

3 Days

## Assumption

* Participants have a minimum of 2 years working experience in .NET and related technologies
* Participants are aware of the WCF basics

## Hardware requirements

* Pentium Processor
* 2 GB RAM or greater
* 10 G Hard Drive or greater
* Networked with TCP/IP (required)
* Internet connection **(Mandatory)**

## Software requirements

* Windows XP Professional (SP2), Windows Vista, or Windows Server 2003 SP2 or 2008
* Visual Studio 2010 with SP1
* ASP.NET MVC 3 : http://www.asp.net/mvc
* NuGet : <http://www.nuget.org>
* SQL Server 2008 Express or Developer Edition
* SQL Server 2008 Management Studio / Express
* IIS
* Office System 2003 or 2007, or Microsoft Word reader
* Adobe Acrobat Reader

## Course Contents

#### Framework basics 1.0 Day

* Assemblies
  + Assembly Characteristics
  + Metadata and Manifest
  + Private Assemblies and Public Assemblies
  + Publishing Public Assemblies
* LINQ
  + Lambda Expressions
  + Lazy Evaluation
  + Operators
  + Projection
  + Aggregation
  + Transformation
* Parallelism
  + Introduction
  + Overview of TPL
  + Types of Parallelism
  + Task Parallelism
  + Data Parallelism
  + Data Flow Parallelism
  + Task Parallel Library
  + Parallel.For & Parallel.ForEach
* Task Parallelism
  + Creating Tasks
  + Waiting Tasks
  + Retrieving Results
  + Cancellation of Tasks
  + Exception Handling
* Miscellaneous
  + Reflection
  + Using COM Interop
  + ADO.NET
  + DataSets
  + Table Adapters
  + Using Data Readers

#### Windows Communication Foundation 0.5 Days

* Introduction to WCF
  + Review the challenges of building distributed applications
  + Examine the concept of Service Oriented application
  + Learn a high level overview of windows communication foundation
  + Build and host the first WCF service
* Hosting and Calling WCF Services
  + Understand how to host a WCF service
  + Understand how clients communicate with services
  + Learn how to host and call a service using multiple bindings
  + Learn how to configure endpoint in code and in configuration files
* Bindings and Contracts
  + Understand how to work with bindings
  + Explore how to create service and data contracts
  + Learn the implications of modifying service and data contracts
  + Versioning Data Contracts
* Exceptions, Diagnostics and Message Patterns
  + Learn how to handle exceptions in WCF services
  + Learn techniques for diagnosing services
  + Explore one-way and duplex communication
  + Using MSMQ for one-way services
* Building Clients
  + Consuming WCF Services synchronously
  + Consuming WCF Services asynchronously
* WCF Security
  + Explore the basics of WCF security
  + Learn how to authenticate callers of a service
  + Learn how to authorize callers based on roles

#### ASP.NET MVC 3.0 1.5 Days

* Architecture of ASP.NET MVC
  + Identifying the components of MVC
  + Benefits of an MVC architecture
  + Describing the MVC request processing cycle
* Preparing the environment
  + Installing ASP.NET MVC
  + Structuring the project layout
  + Integrating test-driven development
* Writing Unit Tests in NUnit
  + Structuring Unit Tests
  + Classic Asserts and Constraint Based Asserts
  + Handling Expected and Unexpected Exceptions
* Defining controller architecture
  + Differentiating controller types
  + Delegating request processing to actions
  + Initiating the response with action results
  + Handling special cases using viewless controllers
* Enhancing functionality
  + Intercepting request processing through action filtering
  + Generating advanced operations by extending core controllers
  + Decorating actions with additional behaviors
* Navigating the model landscape
  + Analyzing the role of the model in different scenarios
  + Constructing the N-tier architecture
  + Improving application structure with dependency injection
* Persisting the domain model
  + Implementing the model classes using Entity Framework
  + Insert, update and delete operations
* Rendering the response with MVC views
  + Implementing dynamic views
  + Streamlining the view structure with HTML helpers
  + Creating custom HTML helpers
  + Incorporating existing ASP.NET views into MVC applications
* Collecting data with forms
  + Accessing submitted data
  + Assigning validation rules to input fields
  + Client-side vs. server-side data validation
  + Reporting errors
  + Uploading files
* The role of AJAX
  + Building Web 2.0 functionality
  + Benefiting from built-in support for AJAX
* Communicating efficiently with JSON
  + Serializing application data using JSON structures
  + Developing JSON in controllers for AJAX
  + Consuming JSON client-side in the view
* Controlling access with authentication
  + Managing Windows-based authentication
  + Gathering user credentials with HTML-based forms
* Restricting application access
  + Shielding sensitive URLs
  + Integrating role-based security
  + Accessing user and role information in controllers
* Packaging and distributing options
  + Enhancing application performance with cache configuration
  + Publishing the completed application
* Advanced JavaScript
  + JavaScript as a prototypal language
  + JavaScript as a functional language
  + Building LINQ in JavaScript
  + Techniques for organizing code in client-side
  + Unit Testing in JavaScript using Jasmine
  + Overview of CoffeeScript