**Microsoft .Net 4.5 and 5.0**

**Duration: 5 Days Methodology: Hand-On**

**Day 1**

**(Introduction, OOPS, coding standards, best practices)**

* .NET Framework Architecture
  + - * + Framework Elements
        + Application Domains
* Type System
  + - * + Understanding .NET Type system
        + Common Type System
        + Value types and Reference types
* Common Language Specification
  + - * + CLS compliance across .NET languages
* .NET Namespaces
  + - * + Significance of Namespaces in .NET
        + Understanding Namespaces
        + Namespace extended across assemblies
        + Multiple Namespaces within an assembly
        + Nesting Namespaces
* Object Oriented Features
  + - * + Encapsulation
        + Object type
        + Defining Properties
        + Read write
        + Read-only
        + Write only
        + Accessibility levels
        + Defining Methods
        + Using access modifiers
        + Initializations and cleanup using Constructors, Destructors
        + Importance of IDisposable
        + Static and instance members
        + Inheritance and Polymorphism
        + Invoking base class functionality from derived class
        + Defining virtual functions and overriding them
        + Abstract classes and methods
        + Sealed classes and methods
        + Hiding base class members
        + Partial Class
        + Static classes
* Exception Management
  + - * + Understanding exceptions
        + Handling exceptions
        + Exception class
        + User defined exceptions

Day 2

(Interfaces, Collections, Generics, File IO, Serialization, WSDL)

* Interfaces
  + - * + Defining Interfaces in .NET
        + Implementing interfaces
        + Providing interface specific implementation
        + Querying for a supported interface
* Collection Classes
  + - * + What are collection classes
        + .NET Collection Types
        + Name-Value pair Collections
* Generics
  + - * + Method with Generics
        + Class with Generics
        + Constraints on generic methods and classes
        + Delegate with Generics
* Iterators
  + - * + Creating Iterators for a class
        + Iterators with Generics and Non Generics class
        + Using Interfaces IEnumerable, Ienumerator
* File I/O
  + - * + Using the different stream classes in .NET
        + BinaryReader/Writer
        + StreamReader/Writer
        + FileInfo/DirectoryInfo
* Serialization
  + - * + Persisting object to a stream
        + Serialization and inherited classes
        + Serialization modes
        + Binary
        + SOAP
        + XML
        + Customizing Serialization by
        + Using attributes
        + Implementing ISerializable interface

Day 3

(C# 4.5 and 5.0, Lambda Expressions, Asynchronous Programming)

* C# Language Enhancement
  + - * + New C# Language Additions
        + Lambda Expressions
        + Expression Trees
        + Keyword var, Object Initialization, and Anonymous Types
        + Extension Methods
        + Partial Methods
        + Query Expressions
        + Binding Operators
        + Support for Dynamic to the Compiler
        + Support for parametrized constructors in Generics.
        + Support for WeakDelegate or WeakEvents
        + Better treatment for Null
        + Smart Case support
        + Extension properties
        + await in catch and finally block.
* Asynchronous Programming in C# (Async and Await)
  + - * + Introduction
        + Synchronous vs Asynchronous
        + Demo: Async before C#5
        + Demo: Async in C#
        + C# 5: async and await
        + Demo: await and the APM
        + Inside Await
        + Demo: Inside Await
        + Returning Tasks
        + Demo: Composing Tasks
        + Exceptions Management
        + Token Based Exception with Async and Await
        + Concurrent Work
        + Asynchronous vs Multithreading

**Day 4**

**(ASP.Net, Caching, Server side and client side considerations)**

* Introduction to ASP.NET
  + - * + Differences between ASP and ASP.NET
        + Defining an web application
        + Lifetime of an application
        + Understanding the HTTP Request/Response model
        + Event-based processing model
* ASP.NET Architecture
  + - * + Difference between ASP.NET 1.x and 2.0
        + Understanding how the pages are processed
        + Compilation options in ASP.NET 2.0
        + ASP.NET Architecture
        + Role of HTTP-Handlers and Modules
        + ASP.NET WebForms
        + ASP.NET Programming Model
        + Request processing life-cycle in ASP.NET
        + Dynamic compilation
        + Code behind model
        + Server Controls
* ASP.NET Tracing
  + - * + Tracing code execution
        + Page Level Tracing
        + Application Level Tracing
* ASP.NET Validation Controls.
  + - * + Validating input using validation controls
        + Using Custom Validator
        + Writing client side validation scripts
        + Validation groups
* Data Binding Controls
  + - * + Understanding data binding in ASP.NET
        + Data Source Controls
        + Sql Data Source
        + Object Data Source
        + Data Controls
        + Grid View, Data Repeater, Data List and Details View
        + Understanding templates
* Data Binding Controls
  + - * + Customizing output by defining user defined templates
        + Implementing paging and sorting using GridView
        + Editing data using GridView control
        + Passing Parameters
        + Using ControlParameters
        + Using QueryStringParameters
* Data Caching
  + - * + Using Cache object
        + Scope of data cached
        + Setting Expiry policies
        + Sliding Expiry
        + Absolute Expiry
        + Setting dependencies
        + Key dependency
        + File dependency

Day 5

(LINQ to Objects, Collections, SQL, Entity Framework, Data access)

* LINQ Architecture
  + - * + Understanding the LINQ Framework
        + LINQ Providers





* + - * + LINQ to Objects
        + LINQ to SQL
        + LINQ to Dataset
* LINQ to Objects
  + - * + IEnumerable<T> and IQueryable<T> interfaces
        + System.Linq namespace
        + Query Expressions







* + - * + from
        + where
        + order by
        + select
        + join
        + aggregate
* LINQ to SQL architecture
  + - * + Entity Classes
        + Defining the Data Model classes
        + Using Mapping attributes
        + Using the DataContext class
        + Defining Relationships using Associations
        + Creating a customized DataContext class
        + Querying data
* ADO.Net Entity Framework
* Editing and Updating Entity Data
* Customizing Entities
* Customizing the Data Model
* Querying Entity Data Models