QUICK SUMMARY

**Course**: **Visual Studio 2015**

**TRAINING METHODOLOGY**

**Learning by Example:** Instructor-led training programme

**STIPULATED DURATION 34 Days** (9 hours each for the Training)

PREREQUISITES

**PREREQUISITE SKILLS**

The following are the basic requirements in terms of skills for each of the candidates:

* Working knowledge of the Microsoft Windows Operating System
* Object Oriented Programming concepts
* Proficiency in any OOPs programming language (preferably C++/Java)

**LAB SETUP**

The following are the minimum basic software requirements for the Participant Computers (in order of installation):

* Microsoft Windows 7 Professional
* Internet Explorer 11
* Microsoft Office 2010
* Adobe Acrobat Reader
* WinRar / WinZip
* Visual Studio .NET 2015 Professional
* Microsoft SQL Server 2012 Database with Client Tools
* Internet Information Server (IIS 7.0 or above)
* All Machines Should be in Shared Network
* Internet in all Machines

|  |  |
| --- | --- |
| C#.NET 4.5 | 7 Days |
| SQL Server 2008 | 3 Day |
| ADO.NET | 2 Day |
| Entity Framework | 2 Day |
| HTML, CSS, XML, JavaScript,JQuery | 4 Days |
| ASP.NET 4.5 | 5 Days |
| WCF | 2 Day |
| MVC/Web API | 4 Days |
| Angular JS | 1 Day |
| SVN Version Controlling, Debugging, Publishing Code | 1 Day |
| Application Development | 3 Days |
| **Total Duration** | **34 Days** |

THE MODULES – Day 01

### Overview of the Microsoft .NET Framework

* Introduction to the .NET Platform and .NET Framework
* Framework Class Library,ADO.NET Library and ASP.NET Library
* Understanding the Common Type System (CTS)
* Introduction to the Need for the Common Language Runtime (CLR)
* Components of CLR and Roles
  + JIT Compiler
  + Type Checker
  + Exception Manager
  + Security Checker
  + Com Marshaler
  + Thread Support
  + Garbage Collector
  + Code manager
  + Class Loader
* Managed Code Vs. Unmanaged Code
* Understanding the Just-In-Time (JIT) Compilation Process
  + MSIL Code
  + Metadata- The Self Explanatory Files
  + Extracting IL Code and Viewing Metadata using ILDASM Tool
  + .NET Assemblies Explanation
  + Difference between .NET Exe File and Other Exe, DLL Description
* Overview of the .NET-Based Languages
* Comparison of the .NET-Based Languages
* The .NET Framework – Ver. 1.1 Vs. 2.0 Vs. 3.0 Vs. 3.5

### Using Microsoft Visual Studio .NET 2015

* Overview of Visual Studio .NET IDE Features
* Properties Window
* Tool Box
* Solution Explorer
* Server Explorer
* Object Browser
* Editor Browser
* Creating a Console Application Project
* Compiling Running and Debugging Application
* Folder Structure and File Types Created by Application

### C# Language Fundamentals

* Structure of a C# Program
* Basic Input/Output Operations
* Commenting a Program
* Recommended Practices

### Using Value-Type Variables in C#

* Naming Variables
* Best Practices for Naming Conventions
* Using Built-In Data Types
* Creating User-Defined Data Types
* Converting Data Types
* Typecasting
* Boxing and Un-boxing data types.
* Console.WriteLine and Console.ReadLine
* Arrays in C#.

THE MODULES – Day 02

### C# Statements

* Introduction to Statements
* Using Selection Statements
* Using Iteration Statements
* Using Jump Statements
* Using Conditional Statements
* Applications Based on All Statements

### Essentials of Object-Oriented Programming in C#

* Understanding Namespaces
* Understanding Access Specifiers (public, private, protected and internal)
* Defining Classes
* Instantiating and Working with Objects
* Difference between Abstraction and Encapsulation
* Understanding and Implementing Encapsulation
* Defining Object-Oriented Systems

### Access Modifiers and Constructor

* Access Modifiers in C#
* Default Accessibility Level for Class, Methods and Structures
* Default Constructor and Parameterized Constructor
* Discussing Public, Private and Protected Constructor

THE MODULES – Day 03

### Inheritance in C#

* Deriving classes
* Understanding Type Hierarchy
* Hiding Base Class Member in Derived Class
* Implementing Multi Level Inheritance
* Using base keyword
* Constructor Execution Sequence in Inheritance Scenario
* Understanding and Implementing Interface
* Using Sealed Class and Sealed Method
* Discussed Inheritance and Interface Implementation in Structure
* Discussion to Differentiate Virtual Method, Abstract Method and Interface

### String and Arrays in C#

* String Handling
  + The String and String Builder Class
  + Different Methods and Properties of String and String Builder Class
* Arrays
  + Overview of Arrays
  + Creating and using Single Dimension and Multi Dimension Arrays
  + Jagged Arrays
  + Using foreach Loop, Param Keyword

### Methods and Parameters using C#

* Using Methods
* Using Parameters
  + Passing value type parameters
  + Passing Reference types(string, Array, object) as parameters
* Passing Parameters using Ref and Out keyword
* Passing Parameters using Param
* Explaining Constant and ReadOnly

### Properties and Indexers in C#

* Properties
* Using Indexers
* Compare and Contrast between Properties and Indexers

THE MODULES – Day 04

### Static Classes

* Using Static Classes
* Static and Instance Members
* Understanding Static Constructor
* Differentiating Static Constructor and Instance Constructor by call Mechanism
* Implementing Singleton Design Pattern and Understanding Static Class

### Exception Handling

* Checked and Unchecked Statements
* Try, Catch and Finally
* Throw
* Creating User Defined Exception. Why to create User defined exceptions?
* Do’s and Don’ts of Exception Handling. Funneling of Exceptions

### Language Enhancements in C# 2.0

* Static Classes
* Property Accessors
* Nullable types
* Iterators
* Partial types
* Generics

### Operators and Equality Comparision

* Introduction to operators
* Operator overloading
* Equality Comparison Operators and Methods
  + Comparing Value Equality
  + Comparing Reference Equality
  + Using ==, Equals, ReferenceEquals, CompareTo
  + Comparison by GetHashCode Method
  + Overriding Methods and Operators for Equality Comparison
  + Overriding ToString Method

THE MODULES – Day 05

### Delegates and Events in C#

* Creating and using Delegates
  + Multicast Delegates
  + Anonymous Method
* When to Use Delegates, Events and Interfaces
* Implementing Polymorphism Using Delegates
* Defining and using Events
* Creating Custom Events and Using it

### Passing Event Arguments

### Collection Classes in C#

* Understanding Collection
* Using Different Collections viz. ArrayList, Stack, Queue, SortedList
* Understanding and Implementing Different Interface viz. IEnumerable, IEnumerator, IComparable, IComparer, IList
* Hashing Mechanism
* Generic Collection Classes
* Performance Improvement using Generic Collection over Non Generic version

THE MODULES – Day 06

### File Handling

* FileSystemInfo Base Class, FileInfo Class and their Members
* Streams
* Reader/Writer
* Basic File IO

### Language Enhancements in C# 3.0

* Implicitly typed local variables
* Anonymous Types
* Extension Methods
* Object and Collection Initializer
* Lambda Expressions
* Query Expressions

### Language Enhancement in C# 4.0

* Named and Optional Parameters
* Co and Contra variance
* Dynamic Typing and Late Binding

THE MODULES – Day 07

### Introduction to LINQ and Lambda

* Using Inbuilt Extension Methods with Lambda Query
* The Role and Scope of LINQ
* Use of Extension Methods / Lambdas with LINQ
* Core LINQ Assemblies / Namespaces / Project Types
* Examining LINQ Query Operators
* The Query Operator - LINQ type relationship
* Building LINQ Query Expressions
* LINQ Over Objects

THE MODULES – DAY 08

### SQL Server

* Client Tools
  + SQL Management Studio

### Creating Tables and Data Types

* Table Architectures
* Designing Tables
* Working with SQL Table Scripts
* Column in Tables
* Exploring Data Types
  + Character Data Types
  + Numeric Data Types
  + Date/Time Data Types
  + TEXT/NTEXT Data Types
  + Other Data Types

### Enforce Data integrity

* Types of data Integrity
  + Entity Integrity
  + Domain Integrity
  + Referential Integrity
  + User-Defined Integrity
* Creating Keys
  + Primary Key Considerations
  + Creating Primary Keys
  + Creating foreign Keys
* Creating User Data Columns
  + Column Constraints

### Modifying Data

* Inserting Data
* Updating Data
* Deleting Data

THE MODULES – DAY 09

### Retrieval of Data using Select and its clauses

* Select Data From a single Table
* Where
* Like , Not Like
* Between , Not Between
* In , Not IN
* Order BY
* Group By
* Working with Nulls
  + Testing for Nulls
  + Handling Nulls
* Scalar Functions
* having

### JOINS

* Select Data from Multiple Tables
* Using Joins
  + Inner Joins
  + Outer Joins
* Self Joins

THE MODULES – Day 10

### T-SQL Programming

* Stored Procedures
* Functions
* Views
* Temporary Table and Table Variable
* Index

THE MODULES – DAY 11

### Data-Centric Applications and ADO.NET

* Creating a Windows Form
* Windows Form Controls
* Writing Code for Control Events

### Data-Centric Applications and ADO.NET

* Comparision Between ADO and ADO.NET
  + The Difference Between Connected Model and Disconnected Model
  + Difference Between dataset and Recordset
  + The Dataset Model
* The Managed provider
  + ADO.NET SQL Server managed Provider
  + OLEDB Managed Provider
* Understanding ADO.NET Architecture

### Connecting to Data Sources

* Choosing a .NET data Provider
* Defining a Connection
* Managing a Connection
* Handling Connection Exceptions
* Connection Pooling

### Performing Connected Database Operations

* Working in a Connected Environment
* Building Command Objects
* Executing Commands That Return a Single Value
* Executing Commands That Return Rows
* Executing Command That Doesn’t Return any Value
* Applications Using All These Features

THE MODULES – DAY 12

### Building Datasets

* Working in a Disconnected Environment
* Building DataSets and DataTables
* Building and Saving DataSets
* Defining Data Relationship
* Modifying Data in a Data Table
* Sorting and Filtering
* Application Using All These Features

### Calling Stored Procedure from ADO.NET Code

* Calling Stored Procedure of SQL Server from ADO.NET
* Calling the OUT Parameter of STORED Procedure from C# ADO.NET Code

THE MODULES – Day 13

### Entity Framework

* Entity Data Model
* CRUD Operation using Database First Approach

THE MODULES – DAY 14

* Calling Stored Procedures in Entity Framework
* Model First Approach – Overview
* Code First Approach – An Example to Insert, Select

THE MODULES – Day 15

### HTML 5 and CSS 3

* Canvas Tags
* Audio/Video Controls
* Local Storage and Session Storage
* New Tags like Article , Menus , Nav , Header , Footer
* New Form Elements

### CSS 3

* Versions of CSS
* Inline Style Sheets
* Mixed Style Sheets
* External Style Sheets
* Types of Style Sheet Elements – Elements and Classes
* Borders , Box Shadow, Text Shadow, Multi Column Layout
* Animation
* CSS3 Transformation
* CSS3 Transitions

THE MODULES – DAY 16 and Day 17

### JavaScript

* Introduction to JavaScript
* Declaring Variables, Keyboard Input, Display Output
* Conversions
* Arrays
* Working with JavaScript Functions
* Passing Parameters
* Returning Values
* Handling HTML Events
* Validating a Form before Submission using JavaScript

### Jquery

* jQuery basics and functions
* Using selectors with jQuery
* Manipulating page elements with jQuery
* jQuery event model
* jQuery and Ajax
* jQuery animation and advanced effects
* jQuery plugins

THE MODULES – DAY 18

### XML

* What is XML
* XML Syntax Rules
* XML Elements
* XML Attributes

### XML Validation

* DTD Validation
* XSD Validation

THE MODULES – Day 19

### ASP.NET Application Model

* What is ASP.NET
* Role of IIS in Web Application
* Request/Response Model
* How Web Request is Processed
* Application Life Cycle
* Compilation Model in ASP.NET 4.5

### ASP.NET Web Forms

## ASP.NET Programming Model

## Web Forms Code Model

## The code behind Web Forms

## Separation of content & Business logic

## Web Forms Page Life Cycle

### ASP.NET Web Form Controls

* HTML Controls
* HTML Server Controls
* ASP Web Controls
* Writing Inline Code
* Writing Code Separately in Code Behind File

### ASP.NET Web Form Event Model

* Understanding Page Level Events
* Control Level events
* Application Level Events
* Session Level Events
* Error Events

### The ASP.NET 4.5 PostBack Model

* Understand PostBack model of ASP.NET 4.5
* Write code that interacts with the PostBack model of ASP.NET 4.5

### Validation in ASP.NET

* Validation Scenarios
* Understanding The Need for Validation
* Client side Validation and Server side Validation
* Using Different Validation Controls
  + Required Field Validator
  + Compare Validator
  + Range Validator
  + Custom Validator
  + Regular Expression Validator

### THE MODULES – Day 20

### Data Binding in ASP.NET

* GridView
* Repeater
* DataList
* FormView
* ListView
* Customizing GridView And Selecting Data from GridView Rows

### Master Pages

* Overview of Master Pages
* Content Placeholder
* Nested Master Pages
* Calling a Masterpage in ASP.NET Web Form

### Themes and Skins

* Adding Themes.
* Creating skin files.

### Navigation Controls

* Creating web.sitemap
* TreeView
* Menus

### THE MODULES – Day 21

### State Management

* Session Objects
* Application Objects
* Cookies and Cookie less Session
* Query String
* View State
* Global.asax and Session and Application Events

### Caching

* Understanding Caching.
* Output Caching.
* Fragment Caching.

### THE MODULES – Day 22

### Data Caching

* Absolute Expiry
* Sliding Expiry
* Cache Dependency

### Securing a Microsoft ASP.NET 4.5 Web Application

* Web Application Security Overview
* Working with Windows-Based Authentication
* Working with Forms-Based Authentication
* Overview of Microsoft Passport Authentication
* Implementing Security to parts of a Web Application

### Deploying an ASP.NET Web Application

* Web application deployment options.
* Copy Web Site tool.
* Publish Web Site utility.

### THE MODULES-DAY 23

### ASP.NET AJAX

* Introduction to AJAX
* AJAX Architecture and working
* ASP.NET Ajax Controls
* UpdatePanel
* ScriptManager
* ScriptManagerProxy
* Timer
* Update Progress
* Nested Updated Panels
* AJAX- HTTP Get and HTTP Post

### THE MODULES – Day 24

### INTRODUCTION TO WINDOWS COMUNICATION FOUNDATION

* Designing SOA Applications for WCF
* Overview of WCF Architecture
* Creating a WCF Service in Visual Studio 2015
* Consuming a WCF Service in Visual Studio 2015

### CONFIGURING AND HOSTING WCF SERVICES

* Programmatically Configuring a Managed Application to Host a WCF Service
* Calling a Service From a Managed Application by Using Programmatic Configuration
* Defining Service Settings by Using External Configuration
* Selecting a Hosting Option for a WCF Service- Self Hosting, IIS Hosting
* Deploying a Service

### THE MODULES – DAY 25

### Other Hosting

* Windows Hosting
* Overview of WAS Hosting

### Defining and Implementing Microsoft WCF Contracts

* What Is a Contract?
* Contract Types
* Messaging Patterns
* Designing WCF Contracts

### Troubleshooting WCF Service

* Errors and Symptoms
* WCF Faults

### ENDPOINTS AND BEHAVIORS

* Exposing WCF Services Over Different Endpoints
* Adding Behaviors to Services and Endpoints

### THE MODULES – Day 26-29

### Exploring ASP.NET MVC

* Exploring ASP.NET MVC 5
* ASP.NET Web Forms – issues
* ASP.NET MVC Architecture
* ASP.NET MVC Benefits
* features of MVC 5
* ASP.NET Web Forms or MVC?
* Exploring a Web Pages Application
* Exploring a Web Forms Application
* Exploring an MVC Application

### Getting Started with ASP.NET MVC

* ASP.NET MVC project templates
* Understanding the structure of an ASP.NET MVC project
* Naming conventions
* Creating views
* Defining controllers
* Defining a data model

### Creating a Complete ASP.NET MVC Application

* Creating strongly-typed views
* Understanding URLs and action methods
* Using HTML helpers
* Handling form post-backs (Ajax call with json)
* Data validation
* Defining Models and Views
* Handling Form Submissions
* Custom model bindings

### Working with Controllers in ASP.NET MVC

* Routes and Controllers
* Adding custom entries to a route table
* Actions and Parameters
* Action Results
* Action Selectors
* Action Filters
* Passing validation errors to Views
* Passing temporary data to Views
* Asynchronous Controllers

### Using the Razor View Engine

* What, why and when
* Razor Syntax
* Code Expressions
* Code Blocks
* Layout Views
* HTML Helpers
* Partial Views
* Rendering Sections
* Commenting
* Calling utility functions
* Calling Model data
* Bundling and Minification

### Building a Resilient ASP.NET MVC 5 Web Application

* Developing Secure Sites
* State Management
* View bag
* Data view
* Temp Data
* Using hidden fields
* Session and Application State

### Working with Data (Part 1)

* The Entity Framework (Code based/model based/ DB first)
* Building Entities
* Using LINQ
* Defining a data repository
* Performing CRUD operation in database using Scaffolding
* Html Custom Helper Templates

### Working with Data (Part II)

* Performing complex custom CRUD operations
* Using ADO.NET Entity Framework
* Using ADO.NET
* Table relation in code first approach and others
* Data Annotation

### Controlling Access to ASP.NET MVC 5 Web Applications

* Authentication & Authorization
* Membership providers
* Roles based authentication
* Avoiding cross site request forgery
* OAuth - social login
* Implementing Authentication and Authorization
* Assigning Roles and Membership

### RESTful Web Services using Web API

## Why REST Services?

## What is REST?

## Comparing REST with other SOA frameworks

## Introduction to ASP.NET Web API

### Implementing Web APIs in ASP.NET MVC 5 Web Applications

## Developing a Web API

## Calling a Web API from Web Applications

## Developing a Web API to perform a CRUD operation

## Calling a Web API from ASP.NET MVC application

### THE MODULES – Day 30

### Angular JS

## Introduction to AngularJS

## Hello world program using ng-modal and two binding

## AngularJS Client Side MVC

## AngularJS Modules

## AngularJS Routing

## Angular JS Forms

## Angular JS Tables

## Angular JS Services

### THE MODULES – Day 31

### SVN, Debugging and Publishing

* Version Controlling – An overview
* A Glance to Different Version Controlling Tools like SVN, CVS,TFS etc.
* Installing SVN Server and Client
* Creating Repository
* Creating Users
* Adding Project to Repository
* Checkin and Checkout project to Users
* Resolving the conflicts when checking in the projects to repository

### Debugging the projects

* Step In
* Step Over
* Watch Window
* BreakPoints
* Publishing the Projects

### THE MODULES-DAY 32 to 34

### Application Development (MVC or ASP.NET as suggested by SME)

* Case Study Details
* DB Design
* Coding Practices , Naming Convention
* Applying all Concepts learnt in the Class Room Session in the project
* Demo

Topics to be added:

Windows Applications

Win Forms and WPF Applications.

Event Driven Coding models.