C# Syllabus

MS.NET Framework Introduction

- The .NET Framework - an Overview
- Framework Components
- Framework Versions
- Types of Applications which can be developed using MS.NET
- MS.NET Base Class Library
- MS.NET Namespaces
- MSIL / Metadata and PE files.
- The Common Language Runtime (CLR)
- Managed Code
- MS.NET Memory Management / Garbage Collection
- Common Type System (CTS)
- Common Language Specification (CLS)
- Types of JIT Compilers
- Security Manager

VS.NET and Entry Point Method –Main

- Introduction to Project and Solution in Studio
- Entry point method - Main.
- Compiling and Building Projects
- Using Command Line Arguments
- Importance of Exit code of an application
- Different valid forms of Main
- Compiling a C# program using commandline utility CSC.EXE

C # Language Syntax

- Why Datatypes
- Global, Stack and Heap Memory
- Common Type System
- Reference Type and Value Type
- Datatypes & Variables Declaration
- Implicit and Explicit Casting
- Checked and Unchecked Blocks – Overflow Checks
- Casting between other datatypes
- Boxing and Unboxing
- Enum and Constant
- Operators
- Control Statements

- Working with Arrays
- Working with Methods
- Pass by value and by reference and out parameters
- Misc…

OOPs-Concept

- Learning about Class, Object, Component, Encapsulation, Inheritance, Polymorphism & Object Creation and Instantiation.

OOPs-Programming Encapsulation

- Understanding Encapsulation Concept through an example.

OOPs-Inheritance

- Introduction to Inheritance
- Constructor & Inheritance
- Type Casting of Reference Types
- Static and Dynamic Binding
- Abstract Class

OOPs-Interface & Polymorphism

- What is Polymorphism
- Overview of Interface
- Interface with examples
- Types of Inheritance

Collections and Generics

- Introducing Collections .
- Benefits of Collection Classes .
- Understanding and using commonly used collections.
- Generics
- Advantages of Generics .
- How Generics Work at Runtime .
- Constraint on Type Parameters .
- Generic Methods
- Generic Collections
- Selecting a Collection Class

Assemblies and GAC

- What is a DLL and how is it different from EXE
- Types of DLL
- What is an Assembly Assemblies
- How to build a ClassLibrary?
- How to use a ClassLibrary in another Application?
- What is Namespace?
- Internal Access Specifier
- Types of Assemblies
- Global Assembly Cache

Exception Handling

- Defining Exception
- Understandings try and catch keywords
- Using "finally" block
- "using" statement
- Throwing exceptions
- Creating User defined/Custom Exception class.

IO Streams

- What is a streams?
- Types of Stream
- Standard I/O Streams – Console
- Handling text in files
- Dealing with Binary files
- Serialization / Deserialization

Unsafe Code

Reflection and Attributes

- What is Reflection?
- Using Reflection to read type information
- Attributes.
- Pre-defined Attributes
- Custom Attributes.
- Using Reflection to read custom attributes

More on Classes

- Operator Overloading
- Partial Classes and Methods
- Anonymous Types
- Extension Methods
- Tuples
- Caller Method Information
- Configuration File

Developing GUI Application Using WINFORMS

- Basic Controls
- Panel & Layouts
- Drawing and GDI Devices
- MenuStrip, ToolbarStrip and ContextMenuStrip
- Model and Modeless Dialog boxes
- Mutiple Document Interface(MDI)
- Form Inheritance
- Building Login Form
- Working with Resource Files and Setting
- Notify Icon Controls
- Using Components like Timer, FileSystemWatcher, Process, BackgroundWorker
- Drag and Drop
- Working with Advanced Controls like TreeView and ListView

Database Programming Using ADO.NET

- Prerequisite - Knowledge of SQL Queries
- Introduction and Evolution of ADO.NET
- Understanding the Role of Managed Provider and ADO.NET Objects
- installing Required Software - Sql Server and Management studio
- Connecting to Database and Connection Pooling
- Performing Insert, Update and Delete Operations
- Fetching Data from database - Executing Select Statements
- How to implement Login facility with database
- Use of Multiple Active Result Sets
- Parameterized Prepared Statements
- Inserting Image into Database table
- Executing Stored Procedure
- Using Transaction
- Asynchronous Execution of Queries
- Writing Provider Independent Code
- Writing Common Code for Execution of Stored Procedures
- Quick Overview of all ADO.NET objects

Managing Data using DataSet

- Introduction DataSet and its Object Model
- Filling DataSet using DataAdapter
- Binding DataSet to DataGridView
- Updating changes to database using DataAdapter
- Using SqlCommandBuilder
- Managing DataTable Programmatically
- DataAdapter events
- Handling concurrency issue
- Working with DataViews
- Constraints in DataTable
- Using DataRelations object
- Creating DataSet/DataTable dynamically
- Working with Typed DataSet
- Summary and Important Classes and their properties and methods

N-Tier Layered Architecture Application

- Understanding Tier and Layer
- Dividing Application into multiple layers
- Developing an application using Layered Architecture
    - a. Creating Table and Stored Procedure
    - b. Creating Data Class
    - c. Creating DAL Class
    - d. Creating BO Class
    - e. Creating Form and handlingevents
    - f. Creating Dialog Box for Add and Edit OPerations.

XML

- Introduction
- Well Formed and Valid XML Document
- Structure of XML Document
- XML DOM Parser
- XPath Specification
- XML and DataSet
- XMLDataDocument for reading from DataSet
- XMLTextWriter & XMLTextReader
- XPathDocument & XPathNavigator

Windows Services

- Introduction to Windows Service
- Windows Service Project Template
- Developing Windows Services
- Installing, Deploying and Launching Windows Service
- Developing a Service Controller Application
- Handling Custom Commands in Windows Services

Delegates & Events

- Introduction to Delegates
- Creating a Chat Application Using Delegates
- Events Declaration, Raising and Handling
- Anonymous Methods

User Control and Custom Control
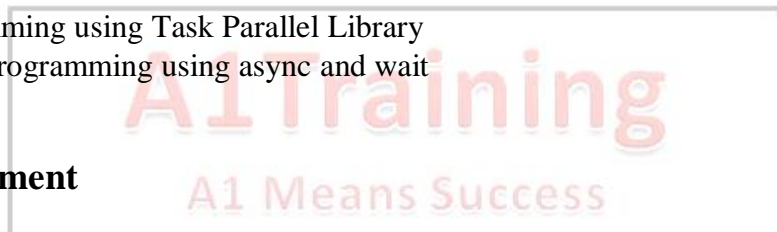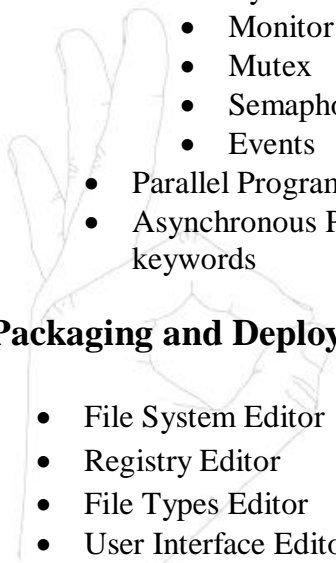
Multithreading

- Threading Overview
- Scheduling
- Thread States
- Programming Threads
- Methods of Thread Class
- Thread Pool
- Thread Synchronization
  - Monitor
  - Mutex
  - Semaphore
  - Events
- Parallel Programming using Task Parallel Library
- Asynchronous Programming using async and wait keywords

Packaging and Deployment

- File System Editor
- Registry Editor
- File Types Editor
- User Interface Editor
- Custom Actions
- Launch Condition Editor
- Creating Uninstall Shortcut

Debugging and Diagnostics

- What is Debugging?
- Build Configuration(Debug and Release)
- List of Debugging Windows
- Break Point Hit Count and Condition
- Debugging Exception
- What is Diagnostics?
- Debug and Trace Classes

- Types of Listeners
- Boolean and Trace Switch

ASP.NET Syllabus

Web Programming Inroduction

- Understanding role of Web Server and Web Browser.
- Brief about HTTP Protocol.
- HTTP Request structure.
- Form Tag and comparison between Get and Post methods.
- HTTP Response Structure.

HTML and JavaScript

- Understanding HTML Form Tag and elements within it.
- Javascript using Sample Programs.

Introduction to ASP

- Introduction to ASP.
- Types of Path.
- Examples using Response object of ASP.
- Working with FORM tag.
- Important Points about the FORM submission.
- Few more examples.
- Problem with ASP.

ASP.NET Introduction & Sample Programs

- How to create and run the first ASP.NET application.
- Understanding the code generated by VS.NET.
- Example Programs.
- Understanding AutoPostBack.
- Types of Server Controls
  - a. HTML controls.
  - b. Web Server Controls.
- Exploring Server Controls.

Validation Controls

- BaseValidator
- ValidationSummary
- RequiredFieldValidator
- CompareValidator
- RangeValidator
- RegularExpressionValidator
- CausesValidation Property of Button

- Grouping Controls for Validation

Applying Themes and Styles to Controls

- Working with CSS
- Using Themes to Customize a Site
- Named Skins within a Theme
- Server-side Styles using Themes
- Contents of a Theme and Skin
- Themes and Profiles

ASP.NET Architecture

- What is AppDomain
- Life cycle of a WebForm when requested by a client.
- How does a control manages its state
- EnableViewState property
- Event Handling in WebForms
- Writing / Using Custom Classes in WebApplication

Page Navigation Options

- Response.Redirect
- Server.Transfer
- CrossPagePostBack property of Button
    a. Accessing controls of PreviousPage
    b. Accessing Properties of PreviousPage
    c. PreviousPageType page directive

Creating a Layout Using Master Pages

- Why Master Pages.
- Significance of ContentPlaceHolder Tag in MasterPage and Content Tag in WebForm.
- How a control of MasterPage can be accessed / programmed in WebForm.
    a. Master.FindControl
    b. Public property in MasterPage and <%@MasterType directive in WebForm.
- Load and LoadComplete events of the Page and MasterPage classes.
- Understanding ClientID and UniqueID properties.

User Control

- Creating a UserControl.
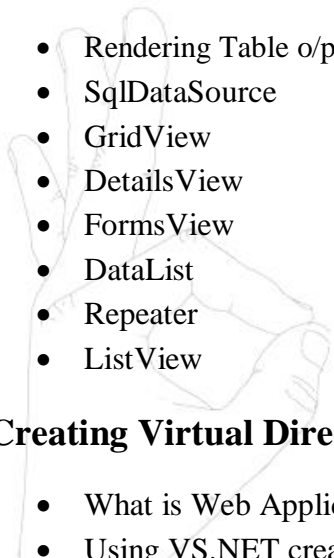- Adding a Usercontrol to the WebForm.
- Register – Directive.

- Loading UserControl Dynamically.
- Usage of Page.ClientScript.RegisterClientScriptBlock Method

ASP.NET State Management

- Need for state management
- Static members in Webform
- Global Class in App_Code folder
- ViewState
- HiddenField
- QueryString
- HttpContext
- HttpCookie and Cookie Dictionary
- HttpSessionState
- HttpApplicationState

Databound Controls

- Rendering Table o/p using SqlDataAdapter and SqlCommandReader
- SqlDataSource
- GridView
- DetailsView
- FormsView
- DataList
- Repeater
- ListView

Creating Virtual Directory & Web Application

- What is Web Applications & Virtual Directory
- Using VS.NET creating Web Application with Location as IIS.
- How to create a Virtual Directory & Web Application in IIS
- Advantages of Web Application
- Steps for moving Web Application created using File System to IIS
- How to use Virtual Directory which is not a WebApplication.

Globa.asax & HttpApplication

- Global.asax file
- HttpApplication Class
- Events of HttpApplication Object
- Examples
    - a. Url Rewriting

   b. Handling Errors

   c. Tracking number of Sessions

Understanding Configuration File - Web.Config

- Importance of web.config
- Managing Application Settings.
- Handling Errors / Custom Errors.
- URL Re-Writing.
- Tracing of Page Life Cycle.
- ConfigSource attribute
- Location Section
- Updating Web.Config Programmatically.

Web Caching

- Overview
- Page Output Caching
- Page Fragment Caching
- Data Caching
- SQL Cache Invalidation
   a. Notification-based Invalidation
   b. Polling-based Invalidation
- Expiration Policies and Cache Dependencies

Authentication & Authorization

- Authentication & Authorization
- Windows Based Authentication
- Form Based Authentication
- Authorizing Users and Roles
- Impersonation
- Using Login Controls
- ASP.NET 2.0 Membership and Roles
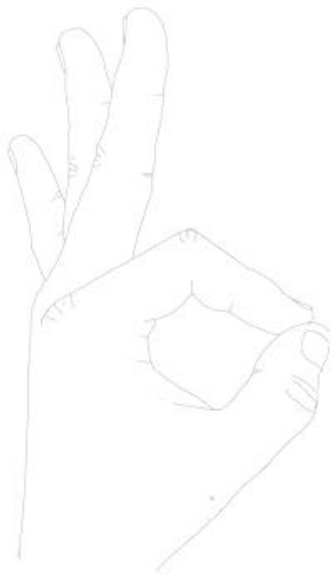- Securing Non-ASP.NET files

Globalization and Localization

- Request and Response Encoding
- Local and Global Resources
- Implicit Expressions to Local Resources
- Explicit Expressions to Local Resources
- Programmatic Access to Global Resources
- Localizing Static Content
- Storing Language Preferences
- Right to Left Mirroring

- Culture specific formatting

AJAX.NET

- Architecture
- Working with AJAX Pro
- Using AJAX.NET Controls
    - a Accordion
    - b. Calendar
    - c. CascadingDropDow
    - d. CollapsiblePanel
    - e. FilteredTextBox
    - f. NumericUpDown
    - g. ModalPopup
    - h. PopupControl