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
- 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, ToolStrip 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 handling events
  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 Introduction

- 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.

**Global.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

**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. CascadingDropDown
  d. CollapsiblePanel
  e. FilteredTextBox
  f. NumericUpDown
  g. ModalPopup
  h. PopupControl

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