

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

Developing Console Application

- 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

Language Basics

- 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...

Introduction to Object Oriented Features

- What is an Object?
- What is not an Object?
- What is state of an Object?
- What is the Lifecycle of an Object?
- How will you distinguish two Objects?
- What is the relationship between Class and Object?
- Define Application using Objects?
- Principles of Object Orientation
- Encapsulation
- Inheritance
- Polymorphism
- Encapsulation is binding of State and Behavior together
- Inheritance is based on “is a” relationship.
- Understanding Polymorphism with Examples.

Programming Object Oriented – Encapsulation

- Write a class and add field members to the class
- Create an Object of the Class and understand the difference between object and reference.
- Access the members of the object
- Copy the reference in another reference variable.
- Abandoning the object.
- Working with Methods
- Working with Properties
- Constructor & Destructor.
- Working with "static" Members

Inheritance

- Inheritance and "is a" relationship
- Protected Keyword
- Constructor in Inheritance
- Type Casting of Reference Types
- Static and Dynamic Binding and Virtual Methods
- Abstract Class

- Object as Parent of all classes

Interface & Polymorphism

- What is Interface
- Syntax for Implementation of Interface
- Explicit Implementation of Interface members
- Types of Inheritance

Exception Handling

- What is Exception
- Rules for Handling Exception
- Exception classes and its important properties
- Understanding & using try, catch keywords
- Throwing exceptions
- Importance of finally block
- "using" Statement
- Writing Custom Exception Classes.

Working With Collections and Generics

- Importance of IList and IDictionary.
- Using ArrayList and Hashtable.
- Understanding IEnumerable and IEnumerator.
- Sorting Items in the collection using IComparable.
- Typesafety issue with ArrayList and Hashtable classes.
- Writing custom generic classes.
- Working with Generic Collection Classes.

Operator Overloading, Partial Class, Attributes, Reflection, Configuration

- Operator Overloading.
- Partial Classes.
- Importance of Attributes.
- Reflection
- Configuration Files.

Working with Components / Assemblies

- What is a DLL and how is it different from EXE
- Types of DLL
- About Assemblies
- How to build a ClassLibrary?
- How to use a ClassLibrary in another Application?

- What is Namespace?
- Internal Access Specifier
- Private Assemblies
- Shared Assemblies

Data Streams and Files

- Introduction to streams
- Understanding the difference between Text Stream and Binary Stream
- To understand importance of Encoding in Text Streams
- System.IO and Base classes of Stream
- Standard / Console I/O Streams
- Sample Programs
 - a. Program to Read from Console
 - b. Program to Write to Console
 - c. Reading and Writing to File
 - d. Reading and Writing to Text File
 - e. Reading and Writing to Binary File
- Working with File System of HDD
 - a. File & FileInfo
 - b. Directory & DirectoryInfo
- Serialization & Deserialization

WinForms

- Introduction
- Controls
- Menus and Context Menus
- MenuStrip, ToolStrip.
- Graphics and GDI
- SDI and MDI Applications
- Dialogbox (Modal and Modeless)
- Form Inheritance
- Developing Custom, Composite and Extended Controls
- Other Misc topics.
- Working with Resource Files
- Working with Settings

Data Access using ADO.NET

- Introduction to SQL.
- Evolution of ADO.NET after Native Drivers, ODBC Drivers, DAO/RDO and ADO.
- About Managed Providers
- Important Objects in Managed Provider

- Creating Database using VS.NET
- Establishing Connection with Database
- Connection String Formats
- Executing simple Insert, Update and Delete Statements
- Executing Select Statement and using SqlDataReader
- MultipleActiveResultSets(MARS)
- Prepared Statements
- Stored Procedures
- Managing Transactions
- Asynchronous Execution of Sql Statements
- To write provider independent code

Data Access using ADO.NET – DataSet

- What is Dataset?
- Advantages of DataSet
- DataSet Object Model
- Programming DataSet - Walkthrough
 - a. Fetching data using Fill method of DataAdapter and filling data into DataSet to create a DataTable
 - b. Showing DataTable in DataGridView
 - c. Fetching data from DataRow
 - d. To get a DataRow from a collection for rows using Select method of DataTable and specifying the condition
 - e. Updating data using Update method of DataAdapter
 - f. Using SqlCommandbuilder to automatically generate commands of DataAdapter
 - g. Adding / Editing / Deleting rows in the DataTable programmatically
 - h. Handling DataAdapter events
 - i. Handling Concurrency while updating data to the database.
 - j. Working with DataView
- Purpose of Creating ForeignKeyConstraint and adding the same to DataTable
- Working with DataRelation
- Creating DataSet / DataTable Dynamically (without DataAdapter)
- Set Primary Key for a DataTable Programmatically
- Working with Typed DataSet

Windows Services

- Purpose and Advantage
- Developing and Deploying
- Debugging Windows Service
- Sending Custom events

XML

- Introduction
- XML-DOM
- XmlDocument, XMLElement, XMLAttribute
- Interoperating with DataSet
- XMLDataDocument
- XML TextReader / XML TextWriter
- XPath.

Multithreading

- Introduction
- Application Domains
- Creating and Managing Threads
- Threads Priority
- Thread States
- Thread Synchronization & Inter-thread Communication.
- Using Monitor

Debugging and Tracing

- Debug and Release Compilation
- Debug and Trace Objects
- Tracing Switches & Listeners
- Debugging JavaScript from VS.NET
- Debugging SQL-Server Stored Procedures.

Delegates & Events

- Introduction
- Delegate Declaration
- Sample Application
- Chat Application using Delegates
- Understanding += and -= Operator (Events)
- Chat Application using Delegates and Events
- General Syntax for Delegates and Events
- Anonymous Methods

Developing N-Tier Arch Applications

- Understanding Importance of Every Layer
- Coding All the Layers
- Developing GUI in WinForms

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