



# NEXOGEN SDC

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# C# Syllabus

## 1. 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.
- ❖ (CLR) , (CTS) , (CLS)
- ❖ Managed Code
- ❖ MS.NET Memory Management / Garbage Collection
- ❖ Types of JIT Compilers
- ❖ Security Manager

## 2. 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 command line utility CSC.EXE

## 3. Language Basics

- ❖ Why Data types
- ❖ Global, Stack and Heap Memory
- ❖ Common Type System
- ❖ Reference Type and Value Type
- ❖ Data types & Variables Declaration
- ❖ Implicit and Explicit Casting
- ❖ Checked and Unchecked Blocks – Overflow Checks
- ❖ Casting between other data types
- ❖ Boxing and Unboxing
- ❖ Enum and Constant
- ❖ Operators
- ❖ Control Statements
- ❖ Working with Arrays

- ❖ Working with Methods
- ❖ Pass by value and by reference and out parameters

#### **4. 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.

#### **5. Programming Object Oriented – Encapsulation**

- ❖ Write a class and add field members to the class
- ❖ Create an Object of the Class and understand the difference b/w 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

#### **6. 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

## **7. Interface & Polymorphism**

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

## **8. 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.

## **9. 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.

## **10. Operator Overloading, Partial Class, Attributes, Reflection, Configuration**

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

## **11. 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

## 12. 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**
  - Program to Read from Console
  - Program to Write to Console
  - Reading and Writing to File
  - Reading and Writing to Text File
  - Reading and Writing to Binary File
- ❖ **Working with File System of HDD**
  - File & FileInfo
  - Directory & DirectoryInfo
  - Serialization & Deserialization

## 13. 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

## 14. Data Access using ADO.NET

- ❖ **Session 1:**
  - a) Introduction to SQL.
  - b) Evolution of ADO.NET after Native Drivers, ODBC Drivers,
- ❖ **DAO/RDO and ADO.**
  - a) About Managed Providers

- b) Important Objects in Managed Provider
- ❖ **Session 2:**
  - a) Creating Database using VS.NET
  - b) Establishing Connection with Database
  - c) Connection String Formats
- ❖ **Session 3:**
  - a) Executing simple Insert, Update and Delete Statements
  - b) Executing Select Statement and using SqlDataReader
  - c) MultipleActiveResultSets(MARS)
- ❖ **Session 4:**
  - a) Prepared Statements
  - b) Stored Procedures
- ❖ **Session 5:**
  - a) Managing Transactions
  - b) Asynchronous Execution of Sql Statements
  - c) To write provider independent code

## 15. 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

## **16. Windows Services**

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

## **17. Multithreading**

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

## **18. Debugging and Tracing**

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

## **19. 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

## **20. Microsoft SQL Server 2008 R2**

# **ASP.NET Syllabus**

## **1. 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.

## **2. HTML and JavaScript**

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

## **3. 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.

## **4. 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**
  - HTML controls.
  - Web Server Controls.
- ❖ Exploring Server Controls.



## 5. Validation Controls

- ❖ BaseValidator
- ❖ ValidationSummary
- ❖ RequiredFieldValidator
- ❖ CompareValidator
- ❖ RangeValidator
- ❖ RegularExpressionValidator
- ❖ CausesValidation Property of Button
- ❖ Grouping Controls for Validation

## 6. 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

## 7. 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

## 8. Page Navigation Options

- ❖ Response.Redirect
- ❖ Server.Transfer
- ❖ **CrossPagePostBack property of Button**
  - Accessing controls of PreviousPage
  - Accessing Properties of PreviousPage
  - PreviousPageType page directive

## 9. 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.
  - Master.FindControl
  - Public property in MasterPage and <%@MasterType directive in WebForm.
- ❖ Load and LoadComplete events of the Page and MasterPage classes.
- ❖ Understanding ClientID and UniqueID properties.

## 10. User Control

- ❖ Creating a UserControl.
- ❖ Adding a UserControl to the WebForm.
- ❖ Register – Directive.
- ❖ Loading UserControl Dynamically.
- ❖ Usage of Page.ClientScript.RegisterClientScriptBlock Method

## 11. 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

## 12. Databound Controls

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

## 13. 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.

## 14. Global.asax & HttpApplication

- ❖ Global.asax file
- ❖ HttpApplication Class
- ❖ Events of HttpApplication Object
- ❖ **Examples**
  - Url Rewriting
  - Handling Errors
  - Tracking number of Sessions

## 15. 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.

## **16. Web Caching**

- ❖ Why Caching
- ❖ Output Caching
- ❖ Fragment Caching
- ❖ Substitution Caching
- ❖ Data Caching
- ❖ Expiration Policy to expire Data & Output Cache

## **17. Authentication & Authorization**

- ❖ Authentication & Authorization
- ❖ Windows Based Authentication
- ❖ Form Based Authentication
- ❖ Authorizing Users and Roles
- ❖ Impersonation

## **18. Globalization and Localization**

- ❖ Need for Globalization.
- ❖ How to handle multilingual dynamic data in database.
- ❖ Creating of Local and Global resource file.
- ❖ Mapping Control properties to Keys in resource file
- ❖ Setting Culture and UICulture of thread.
- ❖ Right to left direction of text in web page.

## **19. AJAX.NET**

- ❖ Architecture
- ❖ Working with AJAX Pro
- ❖ Using AJAX.NET Controls
- ❖ Accordion
- ❖ Calendar
- ❖ CascadingDropDown
- ❖ CollapsiblePanel
- ❖ FilteredTextBox
- ❖ NumericUpDown
- ❖ ModalPopup
- ❖ PopupControl

## **20. Microsoft SQL Server 2008 R2**