



# C# COURSE SYLLABUS



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## C# Course Syllabus

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### 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, ToolStrip and ContextMenuStrip
- ❖ Model and Modeless Dialog boxes
- ❖ Multiple 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

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