

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, 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
- 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

