**C# Training**

**Total Duration: 5 Days**

**Day 1**

**Introduction and Environment Setup**

* **Introduction to .NET Core Framework**
* **Introduction to C# Programming Language**
* **.NET Core Environment Setup**
* **Download and Install Visual Studio 2022**
* **Download and Install .NET Core SDK**
* **Download and Install Visual Studio Code**
* **Download and Install SQL Server 2022**
* **Download and Install SSMS**
* **Difference Between .NET Core and .NET Framework**
* **.NET Core vs .NET Framework Code Execution Process**
* **Creating First Console Application using Visual Studio**

**C#.NET Basics**

* **Basic Structure of C# Program**
* **Methods and Properties of Console Class in C#**
* **Data Types in C#**
* **Literals in C#**
* **Type Casting in C#**
* **Variables in C#**
* **Operators in C#**
* **Control Flow Statements in C#**
* **If-Else Statements in C#**
* **Switch Statements in C#**
* **Loops in C#**
* **While Loop in C#**
* **Do While Loop in C#**
* **For Loop in C#**
* **Break Statement in C#**
* **Continue Statement in C#**
* **Goto Statement in C#**
* **Functions in C#**
* **User-Defined Functions in C#**
* **Call By Value and Call By Reference in C#**
* **Command Line Arguments in C#**
* **String in C#**
* **Static Keyword in C#**
* **Static vs. Non-Static Members in C#**
* **Const and Read-Only in C#**
* **Properties in C#**
* **Why we Should Override ToString Method in C#**
* **Override Equals Method in C#**
* **Difference Between Convert.ToString and ToString Method in c#**
* **Checked and Unchecked Keywords in C#**
* **Stack and Heap Memory in C#**
* **Boxing and Unboxing in C#**

**Day 2**

**OOPs in C#**

* **Object Oriented Programming (OOPs) in C#**
* **Class and Objects in C#**
* **Constructors in C#**
* **Types of Constructors in C#**
* **Why We Need Constructors in C#**
* **Static vs Non-Static Constructors in C#**
* **Private Constructors in C#**
* **Destructors in C#**
* **Garbage Collection in .NET Framework**
* **Differences Between Finalize and Dispose in C#**
* **Access Specifiers in C#**
* **Encapsulation in C#**
* **Abstraction in C#**
* **Inheritance in C#**
* **Types of Inheritance in C#**
* **IsA and HasA Relationship in C#**
* **Generalization and Specialization in C#**
* **Abstract Class and Abstract Methods in C#**
* **Interface in C#**
* **Multiple Inheritance in C#**
* **Polymorphism in C#**
* **Method Overloading in C#**
* **Operator Overloading in C#**
* **Method Overriding in C#**
* **Method Hiding in C#**
* **Partial Class and Partial Methods in C#**
* **Sealed Class and Sealed Methods in C#**
* **Extension Methods in C#**
* **Static Class in C#**
* **Variable Reference and Instance of a Class in C#**

**Real-Time Applications Using OOPs Concepts**

* **Real-time Examples of Encapsulation in C#**
* **Real-Time Examples of Abstraction in C#**
* **Real-Time Examples of Inheritance in C#**
* **Real-Time Examples of Polymorphism in C#**
* **Real-Time Examples of Interface in C#**
* **Real-Time Examples of Abstract Class in C#**
* **Real-Time Examples of Static Class in C#**
* **Real-Time Examples of Sealed Class in C#**
* **Real-Time Examples of Partial Class in C#**
* **Real-Time Examples of Extension Methods in C#**

**Day 3**

**Exception Handling**

* **Exception Handling in C#**
* **Multiple Catch Blocks in C#**
* **Finally Block in C#**
* **How to Create Custom Exceptions in C#**
* **Inner Exception in C#**
* **Exception Handling Abuse in C#**

**Events, Delegates, and Lambda Expression in C#**

* **Introduction to Events, Delegates, and Lambda Expression**
* **Roles of Events, Delegates, and Event Handler in C#**
* **Delegates in C#**
* **Multicast Delegates in C#**
* **Delegates Real-Time Example in C#**
* **Generic Delegates in C#**
* **Anonymous Method in C#**
* **Lambda Expressions in C#**
* **Events in C# with Examples**

**Day 4**

**Multithreading in C#**

* **Multithreading in C#**
* **Thread class in C#**
* **How to Pass Data to Thread Function in Type Safe Manner in C#**
* **How to Retrieve Data from a Thread Function in C#**
* **Join Method and IsAlive Property of Thread Class in C#**
* **Thread Synchronization in C#**
* **Lock in C#**
* **Monitor Class in C#**
* **Mutex Class in C#**
* **Semaphore Class in C#**
* **SemaphoreSlim Class in C#**
* **Deadlock in C#**
* **Performance Testing of a Multithreaded Application**
* **Thread Pool in C#**
* **Foreground and Background Threads in C#**
* **AutoResetEvent and ManualResetEvent in C#**
* **Thread Life Cycle in C#**
* **Threads Priorities in C#**
* **How to Terminate a Thread in C#**
* **Inter Thread Communication in C#**
* **How to Debug a Multi-threaded Application in C#**

**Collections in C#**

* **Arrays in C#**
* **2D Arrays in C#**
* **Advantages and Disadvantages of Arrays in C#**
* **Collections in C#**
* **ArrayList in C#**
* **Hashtable in C#**
* **Non-Generic Stack in C#**
* **Non-Generic Queue in C#**
* **Non-Generic SortedList in C#**
* **Advantages and Disadvantages of Non-Generic Collection in C#**
* **Generic Collections in C#**
* **Generics in C#**
* **Generic Constraints in C#**
* **Generic List Collection in C#**
* **How to Sort a List of Complex Types in C#**
* **Comparison Delegate in C#**
* **Dictionary Collection Class in C#**
* **Conversion Between Array List and Dictionary in C#**
* **List vs. Dictionary in C#**
* **Generic Stack Collection Class in C#**
* **Generic Queue Collection Class in C#**
* **Foreach Loop in C#**
* **Generic HashSet Collection Class in C#**
* **Generic SortedList Collection Class in C#**
* **Generic SortedSet Collection Class in C#**
* **Generic SortedDictionary Collection Class in C#**
* **Generic LinkedList Collection Class in C#**
* **Concurrent Collection in C#**
* **ConcurrentDictionary Collection Class in C#**
* **ConcurrentQueue Collection Class in C#**
* **ConcurrentStack Collection Class in C#**
* **ConcurrentBag Collection Class in C#**
* **BlockingCollection in C#**

**Day 5**

**File Handling in C#**

* **File Handling in C#**
* **FileStream Class in C#**
* **StreamReader and StreamWriter in C#**
* **File Class in C#**
* **TextWriter and TextReader in C#**
* **BinaryWriter and BinaryReader in C#**
* **StringWriter and StringReader in C#**
* **FileInfo Class in C#**
* **DirectoryInfo Class in C#**
* **Export and Import Excel Data in C#**