

## Introduction to C#

### Debugging in C#

- Various Types of .NET Projects
- Tracing, Debugging, Build
- Compile Options
- Using break points
- Using break conditions
- Using watch and output window
- Creating multiple projects within one solution
- Customizing Visual Studio Settings – Extensions, NUGet Package, Environmental Settings

## Data Types and Variables

- Implicitly Typed Local variables
- Var vs dynamic
- Equals() vs ==
- Default parameters, named parameters

## Control Statements

## Strings and StringBuilder

## Arrays

## Core Language Features in C#

## Class and Objects, Access Specifiers, Constructors

### OOP with C#

- Operator Overloading
- Extension methods
- Object Initializer

## Inheritance and Polymorphism

## Abstract Class and Interface

## Generic Class, Namespace and Indexers

## Exploring Structs, Enums, Static Classes, Sealed Classes, Random, and Math in C#

## Regular Expressions

## Exception Handling

- Purpose of Inner Exception

## Collections & Generics

## Delegates, Events & Lambda

- Anonymous Type
- Expression Tree

## File IO and Serialization

- JSON Serialization

## Threading, Parallel and Async programming with C#

- Task Parallel Library
- Threads Vs. Tasks
- Task Based Asynchronous Model
- Async and Await

- Using Locks

## Garbage Collection

### Garbage Collection in C#

- Role of a Garbage Collector
- Garbage Collection Algorithm
- Finalize vs Dispose

## C# 7 New Features

### New Features in C# 8.0

- Readonly members
- Default interface methods
- Pattern matching enhancements:
- Using declarations
- Static local functions
- Disposable ref structs
- Nullable reference types
- Asynchronous streams
- Asynchronous disposable
- Indices and ranges
- Null-coalescing assignment
- Unmanaged constructed types
- Stackalloc in nested expressions
- Enhancement of interpolated verbatim strings

### New Features in C# 10.0

- Record structs
- Improvements of structure types
- Interpolated string handlers
- Global using directives
- File-scoped namespace declaration
- Extended property patterns
- Improvements on lambda expressions
- Allow const interpolated strings
- Record types can seal ToString()
- Improved definite assignment
- Allow both assignment and declaration in the same deconstruction

- Allow AsyncMethodBuilder attribute on methods
- CallerArgumentExpression attribute
- Enhanced #line pragma
- Warning wave 6