Course Title: C# .NET Programming Language Syllabus

Course Description: This course provides an introduction to C# programming language and the .NET framework for developing desktop, web, and mobile applications. Students will learn the fundamentals of C# syntax, object-oriented programming concepts, and how to utilize the .NET framework to build robust and scalable applications.

Prerequisites: Basic understanding of programming concepts. Familiarity with any programming language is beneficial but not required.

Course Objectives:

1. Understand the fundamentals of C# programming language.
2. Learn object-oriented programming principles and apply them using C#.
3. Develop skills in using .NET framework for application development.
4. Gain proficiency in developing desktop, web, and mobile applications using C# and .NET.
5. Explore advanced topics such as LINQ, asynchronous programming, and error handling in C#.

Course Outline:

1. **Introduction to C# and .NET**
   - History and evolution of C# and .NET framework
   - Installing and setting up development environment (Visual Studio)
   - Writing and running C# programs
2. **C# Basics**
   - Variables, data types, and operators
   - Control structures (if-else, switch, loops)
   - Methods and functions
3. **Object-Oriented Programming in C#**
   - Classes and objects
   - Inheritance, polymorphism, and encapsulation
   - Abstraction and interfaces
4. **Collections and Generics**
   - Arrays, lists, dictionaries, and other collections
   - Using generics to create reusable components
5. **Exception Handling**
   - Handling exceptions using try-catch blocks
   - Throwing and catching exceptions
   - Custom exceptions
6. **File I/O and Serialization**

- Reading from and writing to files
- Serialization and deserialization of objects
- Working with streams

7. **Introduction to Windows Forms Applications**
   - Designing GUI using Windows Forms
   - Handling user events and interaction
   - Data binding and validation
8. **Introduction to ASP.NET Web Applications**
   - Basics of web development with ASP.NET
   - Creating web forms and handling user input
   - State management in web applications
9. **Introduction to .NET Core**
   - Overview of .NET Core framework
   - Developing cross-platform applications using .NET Core
   - Migrating applications to .NET Core
10. **Database Access with ADO.NET**
    - Connecting to databases using ADO.NET
    - Executing SQL queries and stored procedures
    - Working with datasets and data readers
11. **LINQ (Language Integrated Query)**
    - Basics of LINQ and query syntax
    - Querying collections, databases, and XML data
    - Using LINQ to Objects, LINQ to SQL, and LINQ to XML
12. **Asynchronous Programming**
    - Introduction to asynchronous programming in C#
    - Using async and await keywords
    - Handling asynchronous operations efficiently

Assessment:

- Weekly assignments to reinforce learning concepts.
- Midterm project: Developing a desktop application using Windows Forms.
- Final project: Designing and implementing a web application using ASP.NET.

Textbook: "C# 9.0 in a Nutshell" by Joseph Albahari and Ben Albahari

Additional Resources:

- Online tutorials and documentation (Microsoft Docs, C# Corner, Stack Overflow, etc.).
- Supplemental readings and materials provided by the instructor.

Grading:

- Assignments: 30%
- Midterm Project: 20%
- Final Project: 40%
- Participation and Attendance: 10%

Attendance Policy: Regular attendance is expected. Students are allowed a maximum of three unexcused absences. Excessive absences may result in a reduction of the final grade.

Office Hours: Instructor office hours will be held twice a week for additional help and clarification.