PRAJYOTI NIKETAN COLLEGE, PUDUKAD

CERTIFICATE COURSE 2024-25 – C# + Unity

Module 1: Introduction to C# and Unity (4 Hours)

- **Session 1.1: Introduction to C# (2 hours)**

  o Overview of C#

  o Setting up the development environment

  o Basic syntax and program structure

- **Session 1.2: Introduction to Unity (2 hours)**

  o Unity Interface Overview

  o Importing Assets

  o Basic navigation and tools

Module 2: Basic Programming Concepts (6 Hours)

- **Session 2.1: Variables and Data Types (2 hours)**

  o Understanding Variables and Data Types

  o Type conversion and casting

- **Session 2.2: Control Structures (2 hours)**

  o Conditional statements (if, else)

  o Loops (for, while, foreach)

- **Session 2.3: Methods and Debugging (2 hours)**

  o Creating and using methods

  o Debugging in Visual Studio and Unity

Module 3: Advanced C# Concepts (6 Hours)

- **Session 3.1: Object-Oriented Programming - Part 1 (2 hours)**

- o Classes and Objects

- o Constructors, fields, properties

- **Session 3.2: Object-Oriented Programming - Part 2 (2 hours)**

  - o Inheritance and Polymorphism

  - o Abstract classes and Interfaces

- **Session 3.3: Collections and Exception Handling (2 hours)**

  - o Arrays, Lists, Dictionaries

  - o Exception handling techniques

Module 4: Unity Development Basics (6 Hours)

- **Session 4.1: Scripting in Unity (2 hours)**

  - o Scripting basics, GameObject manipulation

  - o Event-driven programming in Unity

- **Session 4.2: Working with Components (2 hours)**

  - o Understanding Components and Prefabs

  - o Physics components, Colliders, Rigidbodies

- **Session 4.3: Animation and UI Elements (2 hours)**

  - o Basic Animation using Unity Animator

  - o Creating UI elements and controlling them via scripts

Module 5: Intermediate Unity Development (6 Hours)

- **Session 5.1: Advanced Scripting (2 hours)**

  - o Singleton pattern

  - o Delegates and events in Unity

- **Session 5.2: Advanced Game Mechanics (2 hours)**
  - o Raycasting and input handling

  - o Creating and managing game scenes

- **Session 5.3: Audio and Particle Systems (2 hours)**

  - o Working with Audio Sources and Listeners

  - o Particle systems basics

- Unity 2021 or later
- Visual Studio Community Edition

- **Additional Learning Materials:**

  - Online documentation from Unity and Microsoft for C#

  - Tutorial videos from Unity Learn
  - Community forums for discussion and problem-solving