



S Y L L A B U S

# Unity Game Development

**Duration: 5 Days (Total: 20 Hours)**

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## **1.0 Course Overview**

This training module provides an immersive and hands-on introduction to Unity for aspiring game developers. Participants will explore the Unity interface, build basic mechanics, create UI, and polish a playable game while learning the principles of game development and scripting in C#.

## **2.0 Learning Outcomes**

By the end of this course, participants will be able to:

- Understand the core workflow of Unity game development
- Navigate Unity's interface and tools efficiently
- Write scripts in C# for interactive gameplay
- Create scenes, physics, animations, and user interfaces
- Deploy a fully playable prototype game
- Apply debugging and polishing practices

## **3.0 Training Methodology**

- Hands-On Coding
- Game Jam Style Mini-Projects
- Visual Demonstrations
- Real-Time Development in Unity
- Group Collaboration
- Guided Troubleshooting & Debugging

## **4.0 Introduction to Game Development and Unity (3 Hours)**

### **Objectives:**

- Understand basic game design concepts
- Explore the Unity engine and its capabilities
- Set up the development environment

### **Topics Covered:**

- What is Game Development? (Genres, Elements, Pipeline)
- Why Use Unity? – Overview & Game Engine Comparison
- Installing Unity Hub and Unity Editor
- Creating a New Project
- Understanding Unity Project Structure

### **Activities:**

- Group Discussion: Favorite games & game mechanics
- Demo: First 3D project creation in Unity
- Quiz: Game genres and development tools

## **5.0 Unity Interface, Components, and Scripting (3 Hours)**

### **Objectives:**

- Familiarize with Unity's UI and GameObjects
- Learn C# basics and scripting logic

**Topics Covered:**

- Unity Editor Layout: Hierarchy, Scene, Inspector, Console
- GameObjects and Components
- Prefabs and Materials
- Introduction to C# Scripting in Unity
- Variables, Methods, Events

**Activities:**

- Code-Along: Move an object with player input
- Mini Lab: Create a reusable prefab object
- Simulation: Debugging basic movement script

**6.0 Building Gameplay Mechanics (4 Hours)****Objectives:**

- Implement common game features such as movement, collisions, and triggers

**Topics Covered:**

- Character Controls: 2D/3D Movement
- Collision Detection and Physics Materials
- Trigger Events and Collectibles
- Score Systems and Health Bars
- Enemy AI (Basic) and Object Spawning

**Activities:**

- Lab: Create a character controller
- Group Task: Build a coin collection system
- Experiment: Add a simple enemy with chase behavior

**7.0 User Interface and Scene Management (3 Hours)****Objectives:**

- Build interactive UI systems and navigate between scenes

**Topics Covered:**

- Canvas System: Buttons, Text, Images
- Score Display and Health UI
- Main Menu and Pause Menu
- Loading Screens
- Scene Switching with SceneManager

**Activities:**

- Lab: Build a start menu with Play and Quit buttons
- Role Play: UI/UX feedback for menu screens
- Group Task: Build a level completion screen

**8.0 Physics, Animation, and Audio (3 Hours)****Objectives:**

- Add realism through physics, sound, and animations

### **Topics Covered:**

- Unity's Physics Engine: Rigidbody, Colliders, Gravity
- Animator Controller and Keyframe Animation
- Audio Sources and Sound Effects
- Background Music and Audio Mixers

### **Activities:**

- Lab: Add jump physics to player
- Demo: Animate a character walk cycle
- Task: Integrate background music and SFX

## **9.0 Game Polish, Testing, and Deployment (2 Hours)**

### **Objectives:**

- Finalize, test, and build the game for release

### **Topics Covered:**

- Bug Fixing & Optimization Techniques
- Building the Game (Windows/Android/WebGL)
- Game Icons, Splash Screens, and Player Settings
- Introduction to Unity Asset Store
- Version Control and Project Backup

**Activities:**

- Final Project Polish Checklist
- Demo: Building for PC or WebGL
- Group Sharing: Showcase your mini-game

**10.0 Conclusion and Wrap-Up (1 Hour)****Key Takeaways:**

- Review of the development journey
- Reflection on creative decisions and teamwork
- Career advice in indie and studio game development

**Final Activities:**

- Group Presentation: Final Game Showcase
- Feedback Forms and Peer Review
- Certificate Distribution