



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