

Unity C# Game Development with DOTS & ECS

Course Duration: 60 Days

Topics & Details

Introduction to Unity C# Game Development with DOTS & ECS:

★ **Lesson 1: Kick-off & Install**

- Install Unity Hub + Unity 2023 LTS (Entities package)
- Create a 3-D (URP) project

★ **Lesson 2: Editor Navigation**

- Scene view controls
- Move, rotate, scale objects

★ **Lesson 3: Basic Building Blocks**

- Place cube, plane, ramp prefabs
- Snap to grid for tidy rooms

★ **Lesson 4: Materials & Lighting Basics**

- Create a URP Lit material
- Add a directional light & shadows

★ **Lesson 5: C# Script "Hello World"**

- Attach a "DoorController.cs" script
- Print text to Console

★ **Lesson 6: What is DOTS?**

- Install Entities package via Package Manager
- Convert a static mesh to an Entity

★ **Lesson 7: First ECS System**

- Write "RotateSystem" to spin coins
- Burst-compile & compare FPS

★ **Lesson 8: Player Controller (Monobehaviour)**

- Add Starter Assets First-Person prefab
- Adjust speed & mouse look

★ **Lesson 9: Convert Player to Entity**

- Use Baker to convert Character
- Read input with Input System



★ **Lesson 10: UI Starter – Health Bar**

- Create UI Toolkit document
- Bind to Health value

★ **Lesson 11: Collectable Coins (Entity Prefab)**

- Authoring component for "Value"
- On trigger → destroy coin & add score

★ **Lesson 12: Score Display**

- UI Toolkit label for score
- Update via ScoreSystem

★ **Lesson 13: Very Simple Enemy (NavMesh)**

- Bake NavMesh surface
- Enemy walks toward player
- Damage on contact

★ **Lesson 14: Damage & Knock-back**

- Reduce Health component value
- Play hit sound & screen flash

★ **Lesson 15: Game Over & Restart**

- If Health ≤ 0 reload scene
- Show "Game Over" UI panel

★ **Lesson 16: Footsteps & Music**

- Add AudioSource for footsteps
- Loop background track with mixer

★ **Lesson 17: Particle Effects (VFX Graph)**

- Create spark burst on coin pickup
- GPU fire effect for torches

★ **Lesson 18: Terrain Basics**

- Sculpt small hill area
- Paint grass texture layer

★ **Lesson 19: Water Surface**

- Add URP Water system
- Splash sound on enter



- ★ **Lesson 20: Checkpoint System**
 - Place Checkpoint entity
 - Save Transform & score on entry
- ★ **Lesson 21: Simple Main Menu**
 - UI Toolkit canvas (Play/Quit)
 - Load scene on Play
- ★ **Lesson 22: Save/Load Data**
 - Serialize JSON file for coins + checkpoint
 - Load on startup
- ★ **Lesson 23: Lighting Polish**
 - Add fog volume & sunshaft effect
 - Tweak skybox for sunset look
- ★ **Lesson 24: Performance Pass**
 - Use Profiler & Entity Debugger
 - Burst compile "EnemyAI" system
 - Ensure 120 FPS target
- ★ **Lesson 25: Windows Build**
 - Set icons & splash screen
 - Build and run EXE
- ★ **Lesson 26: Mobile Preview (Optional)**
 - Switch to Android target
 - Enable touch joystick prefab
- ★ **Lesson 27: Intro Cut-scene (Timeline)**
 - Timeline camera fly-through
 - Fade into gameplay
- ★ **Lesson 28: Post-Processing Flair**
 - Add colour-grading LUT
 - Bloom & vignette subtle effects
- ★ **Lesson 29: Screenshots & Trailer**
 - Capture 4K screenshots
 - Record 30 sec gameplay clip with Recorder
- ★ **Lesson 30: Showcase Day**
 - Classmates play each game
 - Collect feedback & receive certificates

