

Detailed Course Syllabus

Module	Topics
Module -I	Foundations of Unity & Game Production- Introduction to Unity & Game Development- Unity Engine Overview, Unity Editor Interface: Project View, Hierarchy, Inspector, Toolbar, Scene View & Game View, Animation & Animator Window Basics, Unity Concepts: GameObjects, Components, Prefabs, Scenes, Game Production Pipeline- Game Development Pipeline Overview, Game Development Roles & Responsibilities, Game Design Document (GDD), Technical Design Document (TDD), Paper Prototyping, Gray Boxing, PoC, MVP, Vertical Slice, Project Setup Essentials- Creating a New Unity Project, Unity Asset Store Usage, Importing Offline Content, Source Control Basics (Git, Plastic SCM)
Module -II	Assets, Environment Building & Terrain Development Asset Management and Importing- Unity Units & Asset Types, Asset Pipeline in Production, Importing Models (FBX), Textures, Sprites, Audio, Configuring Animations in Imported Assets, Best Practices in Modeling, UV Mapping, Texturing, Prefabs: Creation, Optimization, Reuse, Terrain and Environment Design- Terrain Engine Basics, Heightmaps, Terrain Sculpting, Painting Textures, Grass, Trees, Details, Adding Water, Skybox & Fog, Organizing Scenes Using Layers, Materials, Shaders & Lighting- Materials and Shader Basics (Standard Shader, Shader Types), Shader Graph: Lit/Unlit Sprite Shader, Master Stack, Lighting Types, Shadows, Cookies, Baked Lighting, Reflection Probes, Light Probes
Module -III	Game Object Interaction, Physics & Prototyping GameObjects and Components- Creating & Manipulating GameObjects, Transforms, Parenting & Hierarchies, Empty GameObjects as Pivots, Physics & Scene Interactions- Rigidbody & Colliders, Physics Materials, Collision Detection, NavMesh, NavMesh Agents, NavMesh Obstacles, Prototyping & Design Fundamentals-Basic Design Theory, Coordinate Systems, Vectors, Faces, Edges, Vertices, Meshes, Rendering Pipelines: Built-in, URP, HDRP, Wireframing, Greyboxing, Rapid Prototyping
Module -IV	Scripting, Animation, Character Creation & Gameplay Scripting in Unity (C#)- Introduction to C# scripting in Unity, Variables & Data Types, Conditions (if-else) and Loops, Methods, Arguments, Return Types, Coroutines & Background Tasks, Using GetComponent(), working with GameObject communication, Serialization & Scriptable Objects, Animation & Rigging- Unity Animation Workflow, Animation Clips & Animator Controller, State Machines and Transitions, Rigging: FK/IK, Hierarchies, Bones, Constraints, Physics-Based Animation, Building Gameplay- Player Controller Implementation, Camera Setup and Cinematics, Allies & Enemies: Behavior Scripts, Enemy Spawning Systems, NPC Interactions, Advanced Programming Patterns for Games
Module -V	2D / 3D Game Creation, UI, Audio & Deployment 2D Game Development- Unity 2D Mode Overview, Sprites, Sprite Sheets & Sprite Animation, Parallax Backgrounds, 2D Physics, Collisions & Components, Camera Controls, Bounds, Transitions, 3D Game Development-3D Character Import & Setup, Animation-First Thinking, Interaction Systems for 3D Elements, UI/UX for Games-Unity

	UI Tools (Canvas, Rect Transform), Creating Buttons, Images, Text, Event System Interactions, Building Menus & HUD, Character Selection UI, Visual Effects Integration (UI Shaders, VFX Graph Basics), Audio in Games- Importing & Configuring Audio, Audio Listener, Audio Source, Mixer Groups & Effects, Character and Environment Audio, 1Audio Ducking Techniques, Particle Systems & VFX-Unity Particle System Concepts, Building Custom Effects (Lightning, Frost, Slime, etc.), Integrating FX into Gameplay, Build & Deployment- Player Settings & Quality Settings, Unity Gaming Services Overview, Desktop Build Process, Mobile Build Setup (Android/iOS), Adding Mobile UI & Input Controls, Performance Optimization for Mobile, Introduction to AR/VR
--	--