

# **Game Development**

## **(2D/3D Games with Engines & Logic)**

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### **Chapter 1: Introduction to Game Development**

- What is game development
  - Types of games (2D, 3D, mobile, PC)
  - Game development pipeline
  - Roles in game development
  - Career opportunities
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### **Chapter 2: Game Design Fundamentals**

- Game mechanics & dynamics
- Game rules & objectives
- Player experience (UX for games)
- Level design basics
- Game documentation (GDD)

### **Chapter 3: Programming Basics for Games**

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- Programming logic fundamentals
  - Variables & data types
  - Conditions & loops
  - Functions & methods
  - Object-oriented concepts
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### **Chapter 4: Introduction to Game Engines**

- What is a game engine
  - Overview of Unity & Unreal Engine
  - Engine installation & setup
  - Editor interface overview
  - Project structure
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### **Chapter 5: 2D Game Development Concepts**

- 2D coordinate systems

- Sprites & animations
  - Physics in 2D
  - Collision detection
  - Camera movement
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## Chapter 6: 2D Game Development with Engine

- Building a 2D game scene
  - Player controls
  - Enemy AI basics
  - Scoring & UI elements
  - Sound & effects
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## Chapter 7: 3D Game Development Concepts

- 3D coordinate systems
- Models & textures
- Lighting & materials
- Physics in 3D
- Cameras & controllers



## Chapter 8: 3D Game Development with Engine

- Creating 3D environments
  - Character movement
  - Animations & rigging
  - Basic AI behavior
  - Interaction systems
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## Chapter 9: Game Physics & Mechanics

- Rigidbodies & colliders
  - Gravity & forces
  - Raycasting
  - Game mechanics implementation
  - Realistic vs arcade physics
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## **Chapter 10: Game UI, Audio & Effects**

- Game UI design
  - HUD creation
  - Sound effects & background music
  - Particle systems
  - Visual effects
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## **Chapter 11: Game Logic & Optimization**

- State machines
  - Game loops
  - Performance optimization
  - Memory management
  - Debugging games
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## **Chapter 12: Multiplayer & Advanced Concepts**

- Introduction to multiplayer games
  - Networking basics
  - Player synchronization
  - Leaderboards & achievements
  - Save & load systems
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## **Chapter 13: Game Testing & Publishing**

- Game testing methods
  - Bug fixing & balancing
  - Platform-specific builds
  - Publishing on PC & mobile
  - Store guidelines
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## **Chapter 14: Capstone Game Project**

- Game concept finalization
- End-to-end game development
- Polishing & optimization
- Final gameplay demo
- Portfolio presentation