Game Developer – 100+ Lab Exercises (Basic, Intermediate, Advanced)

□ Basic Level (30+ Exercises)

Objective: Build core competencies in game development fundamentals, programming, and asset creation.

Game Development Fundamentals

- Introduction to game engines (Unity, Unreal Engine).
- Understand game loop, frame rate, and game states.
- Learn basic C# or C++ programming for games.
- Create simple 2D games (pong, platformer, shooter).
- Work with sprites, textures, and animations.

Game Design Principles

- Study game mechanics and dynamics.
- Develop storyboarding and level design basics.
- Implement basic physics and collision detection.
- Design UI elements for games.
- Introduction to audio integration (sound effects, music).

Asset Creation & Management

- Create 2D sprites and textures using Photoshop or GIMP.
- Model basic 3D assets with Blender.
- Import and manage assets in game engines.
- Optimize assets for performance.
- Use version control systems (Git).

□ Intermediate Level (40+ Exercises)

Objective: Advance proficiency in 3D game development, AI integration, and multiplayer features.

3D Game Development

- Build 3D environments and characters.
- Implement lighting, shadows, and shaders.
- Use physics engines for realistic movement.
- Create animations using skeletal rigs.
- Implement camera controls and effects.

Artificial Intelligence

- Develop NPC behaviors and pathfinding algorithms.
- Implement state machines and decision trees.
- Use machine learning for adaptive gameplay.
- Create enemy AI with varying difficulty levels.
- Integrate procedural content generation.

Multiplayer & Networking

- Understand client-server architecture.
- Implement basic multiplayer features using Photon or UNet.
- Synchronize game states across clients.
- Handle latency and network issues.
- Implement matchmaking and leaderboards.

Optimization & Debugging

- Profile game performance and memory usage.
- Optimize rendering and scripts.
- Fix bugs using debugging tools.
- Conduct playtesting and gather feedback.
- Prepare builds for multiple platforms.

□ Advanced Level (40+ Exercises)

Objective: Master complex game systems, VR/AR integration, and production pipeline management.

Advanced Game Mechanics

- Design complex physics-based puzzles.
- Implement advanced animation blending.
- Develop dynamic weather and day-night cycles.
- Create procedural world generation.
- Integrate in-game economies and progression systems.

Virtual Reality & Augmented Reality

- Develop VR games for Oculus, HTC Vive.
- Implement AR experiences using ARKit and ARCore.
- Optimize UX/UI for immersive environments.
- Integrate motion controls and haptics.
- Design spatial audio and interaction models.

Production & Pipeline

- Manage asset pipelines and collaboration tools.
- Use continuous integration for game builds.
- Apply agile methodologies to game development.
- Coordinate cross-disciplinary teams.
- Plan and execute game launches and updates.

Capstone Projects

- Develop a full-featured 3D adventure game.
- Create a multiplayer battle arena.
- Build a VR training simulation.
- Design an AR-based educational game.
- Publish a game on mobile and desktop platforms.

□ Tools & Technologies

- Unity, Unreal Engine
- Blender, Photoshop, Substance Painter
- Visual Studio, Git, Jira
- Photon, UNet, Mirror
- Oculus SDK, ARKit, ARCore

TRAINING TRAINS

96985 48633
90250 10144

IT Services and IT Consultancy \ Internship-Inplant Training \ Software Training Institute

உங்கள் கடை மற்றும் வியாபாரத்திற்கு ஏற்ற **Website & Andriod App** மற்றும்
Software மிகச்சிறந்த முறையில் செய்து கொடுக்கப்படும்.

Expertise : **AI, Machine Learning & Data Science \ Cybersecurity & Ethical Hacking**
IoT, Blockchain & Cloud Computing \ Full Stack Web & Mobile Development
Digital Marketing & SEO

W3 App Developers

332, MULLAMPARAPPU, N.G.PALAYAM POST
ERODE - 638 115

DomainHostly.COM