Game Development Pathway for Beginners

June 21, 2025

1 Personalized Learning Approach

This course is designed specifically for your son, building on his interest in games to develop practical programming skills. Recognizing the value of hands-on learning, we'll:

- Start from his current interests and expand his skills
- Use project-based learning with immediate visual feedback
- Eliminate theoretical lectures - everything will be hands-on
- Develop troubleshooting skills through guided problem-solving
- Build confidence through achievable milestones

2 Course Structure & Methodology

Learning Pathway

Weekly Sessions:

- 60 minute hands-on coding sessions
- Flexible scheduling (recommended weekly)
- Focused on student's questions and project progress

Homework Philosophy:

- Purpose-driven mini-games (not exercises)
- Designed for 15-30 minute daily practice
- Optional challenges for deeper exploration
- Midweek progress check-ins available

Learning Foundation:

- Concepts introduced through game mechanics
- Math taught visually through game physics
- Just-in-time learning - no boring lectures!

3 Initial Skills Assessment

In the first session, your son will create a simple game prototype to demonstrate his approach to building games:

Game Choice	Learning Focus
Ping-Pong	Physics, collision detection
Space Invaders	Enemy patterns, scoring
Dinosaur Runner	Obstacle generation
Student's Choice	Creative design

What We'll Observe

- **Problem-solving**: Approach to challenges
- **Resource usage**: Documentation/Google skills
- **Debugging**: Response to errors
- **Creativity**: Unique solutions to game mechanics

The specific game doesn't matter as much as understanding his approach and interests to personalize the learning journey.

4 Python Foundations

- **Reference:** Core Syllabus (Variables, Control Flow, etc.)
- **Game Connection:** Basic game mechanics and logic
- **First Project:** Simple interactive story game
- **Pace:** Determined by student's comfort level

5 Core Game Development

- Pygame basics: Sprites, collision, animation
- Game physics: Movement, gravity, collisions
- **Project:** Custom platformer game
- **Progress:** Move forward when core mechanics work

6 Advanced Game Features

- **Level Design:** Creating engaging challenges
  - Obstacle placement
  - Difficulty progression
  - Power-up systems
- **Project:** Multi-level adventure game
- **Trigger:** When basic game is functional

7 AI for Game Enhancement

- **Smart Enemies:** Basic AI behaviors
  - Pathfinding algorithms
  - Pattern-based movement
  - Adaptive difficulty
- **Project:** Strategy game with intelligent opponents
- **Trigger:** When ready for more complex challenges

8 Game Polish & Publishing

- **Polishing:** Menus, sound effects, visual effects
- **Optimization:** Performance improvements
- **Publishing:** Packaging for sharing
- **Capstone:** Completed game to share with friends
- **Trigger:** When core game is complete

9 Learning Pathway

Learning Pathway

Student-Led Progression:

- Control over learning speed and game choices
- Concepts introduced when relevant to current project
- Advancement based on project milestones

Game Development Pathway:

Skill	Timing	Game Application
Python Basics	First 1-2 sessions	Game logic, scoring systems
Pygame Fundamentals	When ready for visuals	Character control, graphics
Game Physics	First platformer	Movement, collisions, jumps
AI Behaviors	Mid-course	Smart enemies, NPCs
Polish & Publishing	Final project	Menus, effects, sharing

10 Improvements

If you seek improvements to this syllabus or a change in the general direction, let me know and the necessary modifications will be made.