


MindNurture's Comprehensive Curriculum for Game Programming and Design

The course that transitions students from high school to college level and spans a 15-week semester is a fantastic initiative. Given the target audience's basic programming knowledge, the curriculum will start with fundamentals and progress to more advanced topics, preparing students for a career in game development.

Week 1: Introduction to Game Development and the Gaming Industry

- Topics Covered: Overview of the gaming industry, history of video games, current trends, and career paths.

- Key Skills: Understanding the scope of the gaming industry and identifying potential career paths.

- Recommended Resources: Gama sutra, Game Developer magazine.

- Assignments: Write an essay on the evolution of video games.

- Assessment: Participation in discussions and essay evaluation.

Week 2: Basics of Programming in C++

- Topics Covered: Introduction to C++, variables, control structures, functions, and basic data structures.

- Key Skills: Writing simple programs in C++.

- Recommended Resources: Codec Academy's C++ course, "C++ Primer" by Lippman, Lajoie, and Moo.

- Assignments: Simple calculator program.

- Assessment: Code review of assignments.


Week 3: Introduction to Game Engines

- Topics Covered: Overview of Unity and Unreal Engine, setting up a development environment.

- Key Skills: Basic project setup in Unity and Unreal Engine.

- Recommended Resources: Unity Learn, Unreal Online Learning.

- Assignments: Create an introductory scene in both Unity and Unreal Engine.

- Assessment: Project submission and presentation.

Week 4: Game Design Principles

- Topics Covered: Game mechanics, dynamics, aesthetics, storytelling in games.

- Key Skills: Designing a simple game concept.

- Recommended Resources: "The Art of Game Design: A Book of Lenses" by Jesse Schell.

- Assignments: Draft a game design document for a simple game.

- Assessment: Peer review of game design documents.

Week 5: User Experience (UX) in Games

- Topics Covered: Introduction to UX design, playability, and user testing.

- Key Skills: Basic UX evaluation and improvement strategies.

- Recommended Resources: "The Gamer's Brain: How Neuroscience and UX Can Impact Video Game Design" by Celia Hodent.

- Assignments: Conduct a UX review of a popular game.

- Assessment: Presentation of UX review findings.


Week 6-7: 3D Modeling and Animation

- Topics Covered: Basics of 3D modeling, texturing, rigging, and animation using Blender.

- Key Skills: Creating simple 3D models and animations.

- Recommended Resources: Blender Guru tutorials, "Introducing Character Animation with Blender" by Tony Mullen.

- Assignments: Model and animate a simple character.

- Assessment: Submission of 3D models and animations.

Week 8: Scripting in Unity

- Topics Covered: Introduction to scripting in Unity, using C# for game mechanics.

- Key Skills: Writing scripts for basic game functionalities.

- Recommended Resources: Unity scripting tutorials on the Unity website.

- Assignments: Script a simple gameplay mechanic in Unity.

- Assessment: Code review and gameplay demonstration.

Week 9: Scripting in Unreal Engine

- Topics Covered: Blueprint visual scripting system, introduction to C++ in Unreal.

- Key Skills: Creating game logic using Blueprints and C++ in Unreal.

- Recommended Resources: Unreal Engine documentation and tutorials.

- Assignments: Develop a simple game feature using Blueprints.

- Assessment: Project presentation and code review.


Week 10: Multiplayer Game Programming

- Topics Covered: Networking basics, creating a simple multiplayer game environment.

- Key Skills: Implementing basic multiplayer functionalities.

- Recommended Resources: Unity and Unreal Engine networking documentation.

- Assignments: Add a multiplayer feature to an existing project.

- Assessment: Demonstration of multiplayer gameplay.

Week 11-12: Virtual Reality (VR) and Augmented Reality (AR) Game Development

- Topics Covered: Introduction to VR and AR, developing for VR and AR using Unity or Unreal Engine.

- Key Skills: Creating basic VR and AR experience.

- Recommended Resources: Oculus Developer Guide, ARKit, and AR Core documentation.

- Assignments: Create a simple VR or AR application.

- Assessment: Project submission and demonstration.

Week 13: Portfolio Development

- Topics Covered: Importance of a portfolio, selecting projects, creating a web presence.

- Key Skills: Portfolio compilation and presentation.

- Recommended Resources: GitHub Pages, Digital Booklet.

- Assignments: Begin compiling a portfolio of completed projects.

- Assessment: Review of portfolio structure and content.


Week 14: Career Preparation in Game Design and Programming

- Topics Covered: Resume writing, job search strategies, interview preparation.
- Key Skills: Preparing job application materials and understanding the job market.
- Recommended Resources: LinkedIn Learning, Glassdoor.
- Assignments: Draft a resume and cover letter for a game development position.
- Assessment: Peer review of job application materials.

Week 15: Project Presentations and Course Wrap-up

- Topics Covered: Final project presentations, course review, feedback session.
- Key Skills: Effective communication and presentation skills.
- Recommended Resources: N/A.
- Assignments: Finalize and present a comprehensive game project.
- Assessment: Presentation, project evaluation, course feedback.

Throughout the course, encourage students to collaborate on projects, participate in game jams, and engage with the game development community online (e.g., forums, Discord servers). This real-world engagement will complement their academic learning and prepare them for a successful career in game development.