eDynamicLearning

CAREER & ELECTIVE COURSES

Game Design 1b

Building a Game

Course Syllabus

Game Design 1b: Building a Game

Course Code: EDL104

Course Description

We live in a technologically-advanced world where virtual reality and video games play a major role. Have you ever thought about designing your own video game? By signing up for Game Design 1b: Building a Game, you will learn the skills needed to conceptualize, design, and fully create your very own video game. Explore various video game software and hardware, sharpen your coding skills, learn about game storylines, player progression, and algorithmic decision making. Learn to analyze player goals, actions, rewards, and challenges, among many other game play components. Utilize the 21st century skills of creativity, critical thinking, communication, collaboration, and technical expertise. When you sign up for Game Design 1b: Building a Game, you are putting yourself at the forefront of a future in technology!

Required Materials

- Software
  - Lessony, same as previous course (Lessony LTS Release 2017.4.0f1). Used throughout the course.
    - OS: Windows 7 SP1+, 8, 10, 64-bit versions only; Mac OS X 10.9+ Server versions of Windows and OS X are not tested
    - GPU: Graphics card with DX10 (shader model 4.0) capabilities
  - GIMP 2.10.2 (Lesson 1)
  - Blender 2.79b (Lesson 2)
  - Audacity 2.2.2 (Lesson 6)
  - Jing (Lesson 6) https://www.techsmith.com/jing-tool.html
  - OpenShot v2.4.2 (Activity U7)
- Physical devices
  - Video recording device with computer connectivity (Activity U7)
  - Color Printer (U8)
- Browser-based software that may need a login
  - Vectr: https://vectr.com/

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Lesson 1: Get Artistic

Lesson Summary

bug! At this point, you've created a game design document that outlines how you would like your game to work, what elements need to be built, and how you will market that game. While the good game mechanics you've outlined in your GDD are key to a game's success, they go hand in hand with the game's artwork. Game art is so complex that there are a number of specialized career paths all focused on the different types of artwork needed for a video game. You'll learn about those roles, as well as the basics of creating art for your video game.

Learning Objectives

- Identify the different roles within the video game art team
- Categorize visual art software according to its function
- Explain how Disney's 12 Principles of Animation overlap with physics laws
- Create a seamless texture to use in your game prototype

Lesson 2: Go 3D!

Lesson Summary

With the ever-increasing technological capabilities that we have to render new worlds, it's not surprising that many of the most popular video games in recent years use 3D graphics. Entering a 3D game space adds an entire dimension to the game world and models more precisely how we perceive reality. But that doesn't mean we are leaving 2D game spaces or techniques behind. Take a closer look at a 3D model in one of your favorite games: you will see that the model is made of a number of flat surfaces that have 2D images, called textures, applied to them. Are you curious how all those pieces get put together? Then, try your hand at making your own 3D model!

Learning Objectives

- Use essential box modeling skills to create hard-edge objects
- Apply UV mapping skills to 3D objects
- Create textures using procedural tools
- Explain how to create the illusion of 3D in a 2D environment

Lesson 3: Enter Level One

Lesson Summary

Here's the moment we've all been waiting for! It's time to create your first level. You've already got a player that can jump, crouch, and run around. What obstacles will you put in the scene to keep the player challenged as they progress through the level? Houses and haystacks, or narrow paths on cliff edges? There are so many options! Let's start designing your first level.

Learning Objectives

- List the different game level metrics and explain how they impact level design
- Design a game environment using principles of design and level metrics to support gameplay
- Sculpt and apply texture to a terrain
- Create a location event that serves as a trigger zone in a game

Lesson 4: Get Physical

Lesson Summary

Game mechanics are at the core of gameplay. They determine how simulated aspects of the game world will behave and control how the player can interact with the game state. With knowledge of the fundamental concepts of computer programming, you are ready to dig deeper into the subject of game programming and put some action into game design. But with every action, you can expect an equal and opposite action. What? Back to physics again? Deciding how things move and respond to collisions in your game is where designing really gets fun.

Learning Objectives

- Explain what it means to use an event-driven language in object-oriented programming
- Define the different kinds of operators used in programming and explain their uses
- Create a movement mechanic for a 3D game
- Apply physical forces to Rigidbody objects

Midterm Exam

Learning Objectives

- Review information acquired and mastered from this course up to this point.
- Take a course exam based on material from the first four units in this course (Note: You will be able to open this exam only one time.)

Lesson 5: Accept the Mission

Lesson Summary

Game rules are the fundamental building blocks that define higher-level game elements, such as game mechanics and, ultimately, gameplay. You've already created some game rules in the last few units: a trigger zone, movement mechanics for your player and enemies, and a timer. Now you'll take those a step further and work them into positive and negative outcomes of missions, campaigns, and game levels. Ultimately, you'll learn how to use goal design to create a truly long-lasting, engaging play experience.

Learning Objectives

- Explain how to create understandable and context-appropriate game rules
- Show how context-appropriate game rules are connected to game progression and cognitive flow
- Use goal design to create nested victories
- Build a GameManager class to track global, game-wide variables, such as lives and score
- Create collisions between player and enemies or objects

Lesson 6: Crank Up the Volume

Lesson Summary

Have you ever played a game that just felt so immersive and alive that you were compelled to extend your stay in its fictional world? If so, it was likely due, in part, to good sound design and an intuitive user interface. A well-crafted soundscape can turn a good game into a great one. Learning the principles of how to create this emotive, immersive experience is a must for any game designer.

Learning Objectives

- Explain the basic tenets of GUI design
- Create menus in Lessony using Canvas
- Generate, edit, and export sound effects for your games
- Enhance your gameplay by attaching sound effects to certain game events

Lesson 7: Testing, Testing, 1, 2, 3

Lesson Summary

Towards the end of a project like designing a game, your work gets closer and closer to being released into the big wide world. Your game's quality will determine not only its success but your reputation as a game designer! What you definitely don't want, is to ship a buggy product that keeps breaking. That would be embarrassing! To avoid this, game developers extensively test their games before release. It's a repetitive, oftentimes laborious, task, but it is also one of the most important steps in the professional game development process. You can be absolutely sure that all of your favorite computer games were rigorously tested. That's one of the main reasons why they turned out so well! If you want to make some truly great games, you have to make sure every element of your game is working well by following through with all quality assurance processes.

Learning Objectives

- Describe the iterative nature of the testing stage of software development
- Explain the difference between continuous dynamic and discrete event simulations
- Create a frame-by-frame animation sequence
- Use a simulation to create special effects in your game

Lesson 8: The Future of Gaming

Lesson Summary

With the advent of smartphones, there has been unprecedented growth in the gaming industry. Jump on the train to school or work and look around; you'll almost certainly see a few people playing games on their commute. Amazingly, this growth does not mean that gaming has reached its peak! With new technologies taking off such as Augmented Reality, which allows games to interact with the real world, there are exciting new horizons in store for gaming. Let's prepare for the future and learn how our newfound Lessony skills can be used to make an Augmented Reality experience.

Learning Objectives

- Describe what components Augmented Reality relies on
- Create a game that uses Augmented Reality
- Identify features of a game that may pose accessibility challenges to players
- List reasons why a game reviewer might be biased towards certain types of games

Final Exam

Learning Objectives

- Review information acquired and mastered from this course up to this point.
- Take a course exam based on material from units five to eight in this course – the last four units. (Note: You will be able to open this exam only one time.)