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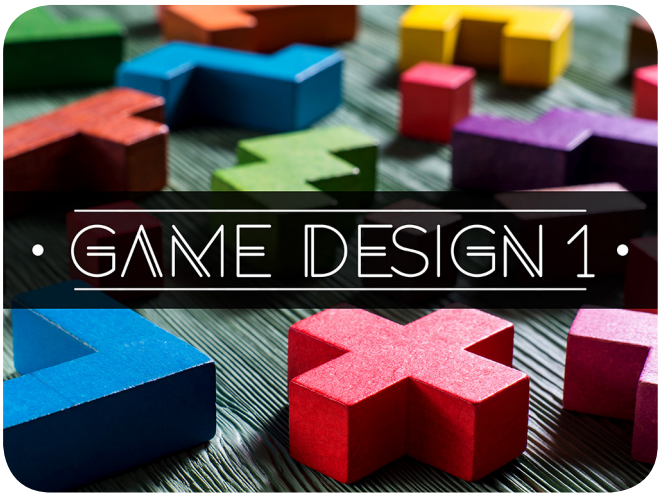
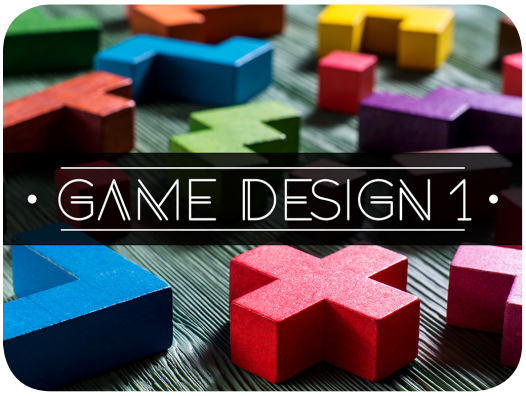
CAREER & ELECTIVE COURSES



Course Syllabus



Course Code: EDL081

Game Design 1

Course Description

Are you a gamer? Do you enjoy playing video games or coding? Does the idea of creating and designing your own virtual world excite you? If so, this is the course for you! Tap into your creative and technical skills as you learn about the many aspects involved with designing video games. You will learn about video game software and hardware, various gaming platforms, necessary technical skills, troubleshooting and internet safety techniques, and even the history of gaming. And to top it all off, you'll even have the opportunity to create your very own plan for a 2D video game! Turn your hobby into a potential career and go from simply being a player in a virtual world to actually creating one!

Required Materials

- Computer with:
  - **OS**: Windows 7 SP1+, 8, 10; Mac OS X 10.8+.
    Windows XP & Vista are not supported; and server versions of Windows & OS X are not tested.
  - **GPU**: Graphics card with DX9 (shader model 3.0) or DX11 with feature level 9.3 capabilities.
    More advanced gaming prototypes may require more advanced hardware!
- Students will be required to download Unity, a free software program, in order to complete course activities
- Audio Recording device (microphone, etc.)

Table of Contents

Lesson 1: Games and Gameplay

Lesson Summary

How does “play” work? Whether we’re talking about cooperative or competitive games against humans or artificial intelligences, it’s all play. Here you’ll analyze classic games to see the common elements they share; you’ll also look at what makes successful games in high-demand, or what makes people pass them over for something more fun. Then you’ll move on to the concepts of gameplay, strategy, and game mechanics, essentially, *how and when* to make certain moves in order to win. And if you play your cards right, you might just master all this material and move on to the next lesson!

Learning Objectives

- Explain the four basic elements of games.
- Describe the difference between gameplay and game mechanics.
- Understand how mastery contributes to a game’s success or failure.
- Discuss common game mechanics found in your favorite games.

Lesson 2: Video Games: A Historical Reboot

Lesson Summary

There's a lot we take for granted once we switch on a device and start up a game. Can you imagine electronic games before the internet? How do you think they worked? To better understand present technology, it's important to understand the major innovators in the video game scene. Gaming itself has also contributed to history. Let's start with a look back in time.

Learning Objectives

- Understand the functions of the components of a game console.
- Explain the way 2-D and 3-D graphics are rendered in computer games with graphing knowledge from mathematics.
- Identify an example of a hardware constraint for video games and how it was overcome.
- Describe the technological developments that contributed to the video game industry.

Lesson 3: What is Game Design?

Lesson Summary

The video game industry is expected to generate more than $100 billion in revenue worldwide in 2017. In the United States, the game industry grew by 9 percent between 2009 and 2012, while the overall U.S. economy grew by only 4 percent. At a time when older industries such as newspaper and print media production and even aerospace manufacturing are laying off workers and closing down production facilities, the video game industry is expanding—growing at 13 times the rate of the overall economy. But many people are unsure of what game designers do. In this unit, you'll learn all about the different roles in a game design team.

Learning Objectives

- Describe the various roles on a game development team.
- Explain the game design process, from concept to finished game.
- List software commonly used in game development.
- Analyze a game idea through the proper filters to determine whether it is a feasible idea.

Lesson 4: Into the Nitty-Gritty

Lesson Summary

Creating a game is like writing a novel. Wait—really? Well, sort of. Game designers follow a similar process, as they are also hoping for that beautiful quality called the "suspension of disbelief" when a player feels like they are part of the game. How does a game design team create this illusion? Through a lot of concrete decisions about the characters, point-of-view, strategy, and player choice in the game. All of these decisions are carefully documented as the game design team moves through their creative process. They will make so many changes along the way, but, at the end of the day, they will have a one-of-a-kind game ready to hit the market.

Learning Objectives

- Differentiate between player-centric and designer-centric game design.
- Explain how point-of-view and game camera views are different, giving examples of each.
- Define player immersion and show how immersion can be enhanced through different elements of game design.

Lesson 5: Let's Make a Game!

Lesson Summary

Let's get to work! Using Unity, a game engine you will download, you will start creating the basic elements of your game prototype. You might be surprised to know that designing a game involves some level of physics knowledge, but don't worry—Unity has you covered. As long as you have a general idea of how you want the different parts of your game to react when there is a collision, you don't have to go through all the sweat of calculating how far and how fast something will move after it is struck. In fact, playing with your game prototype might help you apply Newton's Laws of Motion in a new way that will make more sense than your physics textbook! You will also discover the basic elements of coding and write your first script. Exciting stuff!

Learning Objectives

- Move between the four main views in Unity.
- Explain how video games apply physics concepts, such as friction, drag, and collision.
- Describe how video games apply the mathematical concept of a 3-dimensional space, or a 3-axis coordinate system.
- Write a simple script in Unity.

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 five units in this course (Note: You will be able to open this exam only one time.)

Lesson 6: Programming Concepts

Lesson Summary

Ready to be a multilinguist? Programming a video game asks you to learn how to put a new language together and requires you to learn about algorithms, expressions, and conditional logic. Does that mean that you must have aced grammar and geometry just to get your player to jump away from fire at the right moment? Not necessarily—but if you enjoyed those classes, you might have a slight advantage. Now we will get down to the nuts and bolts, or wheels and triggers, as you learn how to link game events together and move your game objects around onscreen.

Learning Objectives

- Define common mathematical terms as they relate to programming languages.
- Set up keyboard controls for a game object.
- Write a simple conditional statement to create an action in the video game that occurs because of a related action.
- Ensure that code is free of typical errors.

Lesson 7: Level Design

Lesson Summary

When you create a game level, or environment, you are essentially a city planner. You get to decide the layout of all the objects. You have to help your players know how to move through the level in order to progress through the challenges you have laid out for them. You have to keep the players safe: Players shouldn't fall out of your game into dead space because you forgot to create a barrier that keeps them in the level. But you also have to challenge players with hidden enemies or attacks that they might see if they are skilled enough. All of these design components, and more, are a part of level design.

Learning Objectives

- Explain the difference between portals and occluders.
- Apply the correction cycle to your game prototype so that players have a way to practice and improve within your game.
- Avoid common bugs in level design.
- Design a game environment that supports the gameplay of your prototype.

Lesson 8: Art Production in 2D and 3D Games

Lesson Summary

Because video games are so visual, the artwork that goes into creating a video game is highly complex. There are a number of specialized careers related to getting the art in video games just right! If you've been considering merging a number of your interests like art, programming, and math into a video game art-related career, you'll find more information here on what you can be doing to gain experience in your field of interest, as well as the software and tools you should consider becoming familiar with. And, as usual, we have a few new tricks that you can use immediately on your game prototype you've been developing.

Learning Objectives

- Describe how a game's art might represent a particular culture or historical time period.
- List the different specializations within video game art and give examples of the background knowledge needed for these specializations.
- Categorize visual art software according to its function.
- Create a seamless texture to use in your game prototype.

Lesson 9: Balancing and Ramping Gameplay

Lesson Summary

After a video game is in general working condition, the next step is to test the game and make sure that everything works as intended. You must also ensure that the game is fun to play! How do you do this? First, you must make sure the game mechanics work smoothly; the game should feel just the right amount of fair and challenging. Along the way, you will notice that there are bugs that pop up, which you will need to address. This is no easy task, but there are a number of considerations and questions you can ask yourself to check if you have things covered.

Learning Objectives

- Describe the different elements that give your game good balance.
- Demonstrate the ramping involved in your video game, from level to level.
- Explain the steps in the game testing cycle.
- Discuss how video games can be made accessible to people with different abilities.

Lesson 10: Marketing Your Game

Lesson Summary

So, you've developed your innovative, revolutionary game through lots of hard work. You've created a gripping story, an immersive world, clever puzzles, and gameplay mechanics that appeal to almost everyone. There's one catch, though—it's likely that no one knows anything about your game. Are the only copies of your game on your developers' hard drives? It's time to start thinking about releasing a game that will be meet the approval of the gaming community.

Learning Objectives

- Discuss the legal considerations that go into marketing a game.
- Distinguish between the multiple agents that influence video game marketing: publishers, developers, marketers, distributors, retailers, and reviewers.
- Develop a strategy for marketing your own game.
- Evaluate a game in terms of government rating systems.

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 six to ten in this course – the last five units. (Note: You will be able to open this exam only one time.)