MASTER SYLLABUS

Course number & title: CS 260: Video Games Design Basics

Department: Mathematics and Computer Sciences

Credit hours: 3

Prerequisites: None

Fees and charges: None

Effective date for this master syllabus: Spring 2020

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1. Catalog description: |
This course introduces you to the basics of video game design. We cover topics such as learning visual scripting to code of your game. We'll also explore how you, as a game designer, employ different game mechanics that players then leverage to create gaming experiences. Your final project is creating your own interactive video game using visual script coding and game mechanics.

2. Course content:
This course introduces students to the key elements of a basic video game: a single level of play with a start menu, interactive elements, and level complete scripting. Topics taught in the course include:

- Learning to code using visual scripting
- Crafting an interactive video game experience
- Building your own video game

3. Student learning outcomes for the course: Upon completion of this course, students will be able to:

a. Employ game mechanics for players to generate interactive gaming experiences
b. Demonstrate proficiency in coding using visual scripting
c. Build a basic, one-level, single player video game.

4. Course prerequisite: Each student will need to provide their own laptop. Your laptop must have sufficient process power, and can be either PC or Mac. The recommended specifications area:

- Windows 7 64-bit or Mac OS X 10.9.2 or later
- Quad-core Intel or AMD processor, 2.5 GHz or faster
- NVIDIA GeForce 470 GTX or AMD Radeon 6870 HD series card or higher
- 8 GB RAM

5. Student assessment criteria for the course:
Students will be evaluated by:
• Mid-Term Exam (30 percent)
• Video Game (60 percent)
• Presentation of your video game in a social mixer (10 percent)

Points breakdown:

Ice breaker introductions (online using FlipGrid)	5 points	
Initial video game project	20	
Mid-Term	25	
		50 pts
Iteration Participation	5 points	
Final video game project	40 points	
Social Mixer	5 points	
		50 points
		100 points

• For the initial project, each student will produce a packaged video game system. This includes a start menu, basic level, and level completion.

• The final project will be a functioning video game complete with start menu artwork, music, functioning targets, sound and particle effects.

• Iteration participation. During the course, students will meet in small groups to discuss and critique their designs for iteration improvements.

6. Study material

a. **Unreal Engine 4 Tutorial Guide**, Ashland University
b. Unreal Engine Online Documentation (free online)
c. Unreal Essential Training, LinkedIn.com (free)

7. Optional Resource:

- Sams Teach Yourself: Unreal Engine 4 Game Development in 24 Hours, Pearson Education2016 ISBN 13: 978-0-672-33762-8

8. Academic Integrity

Forms of academic dishonesty will be dealt with according to the "Policies and Procedures for Violations of Academic Integrity" found in the Student Handbook.

9. Course Outline:

Week 1: Introduction into the world of video games. Computers will be checked for performance capability in order to participate in the course. Student will install EPIC's Unreal Engine 4 (UE4) and create a basic game project.
• NOTE: student computers are check for their ability to process UE4.
• register an EPIC account
• install UE4 using the EPIC launcher interface
• install XCode for Macs or visual studio for PC
• create a new project in UE4
• save new project
• learn Project directory structure
Students will become familiar with the course's Blackboard interface

Week 2: Creating Level One (part 1) The goal is to create a default Level One.
Students are familiarized with navigating the UE4 Interface
Introduction to creating experiences using game mechanics.
• explain the various functions of the interface
• able to identify the panels of the interface
• create, name and save a new project using a typical project directory structure
• choose different game types
• develop proficiency in using the various panels and tabs of the UE
• learn Play in Editor (PIE)

Week 3: Creating Level One (part 2)
• establish the dimensions of a game's space
• learn about static mesh actors
• demonstrate proficiency in moving and scaling actors based on Cartesian coordinates and Gizmo
• locate actors in the Content browser
• learn how to import objects into view port

Week 4: Introduction to visual scripting
This week, students begin learning visual scripting, a node-based visual method of coding.
• explain commands within visual scripting nodes and flow charts
• create some simple scripts and explain them
• explain events, functions, variables

Week 5: Creating a game: creating the start menu
We create a start menu and talk about each element to create it.
• learn about widget blueprints
• familiar with Unreal Motion Graphics (UMG)
• learn how to add buttons
• learn how to link to level
• understand all the BP coding involved
• adding music to start menu

Week 6: Creating a game: Creating the Level Complete
Students create means to exit their game and either restart play or quit.
Other topics include collision effects on actors and adding ending music.

Week 7: Creating a game: Publishing your game
Basic game is complete with start menu, level one, and exit.
Students will package their initial project for Windows and Mac
Mid-Term Exam. This exam covers terms and concepts learned up to this point.

Week 9: Adding mechanics: Gray boxing your level
This week, students work on creating their level. Topics include additive and subtractive geometric brushes.

Week 10: Adding mechanics: Targets
• importing static meshes
• creating targets from static meshes
• adding collision
• transforming location, scale, and mobility

Week 11: Invoking emotion through the use of light and sound
Create mood with particle effects, such as light and fire. Add background music and sound effects.

Week 12: Work on Final Project
Other topics including setting up a scoring system or timer

Week 13: Work on Final Project

Week 14: Peer Review

Week 15: Polish game and submit game for grading
Revising materials from peer-review and building materials for the social mixer
• class social mixer
• Department social mixer