Glendale Unified School District

High School

May 23, 2017
(Revised Course Title Board Approved November 28, 2017)

Department:	Career Technical Education
Course Title:	3D Game Design 1-2 (Formerly Video Game Design and Programming 1-2)
Course Number:	2255V/2256V
Grade Level(s):	9-12
Course Credits:	10
Recommended Prerequisite:	None
Recommended Textbook:	Creating Games with Unity and Maya by Adam Watkins Published by Focal Press © 2011
Course Overview:	3D Game Design 1-2 is a beginning course for the Arts, Media and Entertainment Pathway. This course is designed to give students a taste of game development and various types of animation and to develop an appreciation for them. Most importantly, students will learn the twenty-first century skills of creativity, critical thinking, communication, collaboration, and technical expertise, which will increase employment capacity across the job market. This two semester (one year) course will introduce students to the methods and techniques involved in the creation of 3D animations, 3D models and Video Game Design and Computer Programming (as used in video games - Javascript, C#). The techniques and applications taught are used in numerous professional careers including; 3D Animation movies and special effects, video game design and publishing, Computer Programming, film production, CAD/CAM, engineering, graphic design, military simulations, and the entertainment industries.

I. Standards - **Common Core State Standards - College and Career Readiness Anchor Standards for Technical Subjects**

A. CCSS.ELA-LITERACY.RST.6-8.3
Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.

B. CCSS.ELA-LITERACY.RST.6-8.4
Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 6-8 texts and topics*.

C. CCSS.ELA-LITERACY.RST.6-8.9
Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.

II. Standards-**Career Technical Education -Game Design and Integration Pathway**

A. D2.7 Describe a designer-centric game to highlighting features other than game play and entertainment value.

B. D3.1 Implement common programming concepts, including logic operators, conditional statements, loops, variables, events, actions, and handling user input.

C. D3.2 Understand the basics of game physics, including collision and motion.

D. D3.3 Examine the use of math and physics (such as gravity and friction) in game development

E. D3.5 Implement a small video game utilizing mathematics and physics that features at least one moving object (such as a spaceship) which rotates along an axis and moves in whichever direction it is facing after rotation. The game must include collision physics.

F. D5.6 Test a classmate's game project and create a bug report for the game. For each error submitted, write steps in sufficient detail so it is identifiable and reproducible to the developer. Use a metric to identify how critical the error is based on its negative impact on game play.

G. D9.4 Analyze job and career requirements as related to career interests and opportunities in the game industry.

III. Sample Assessments

A. Completed Projects – 3D Models - Maya
B. Completed Projects – 3D Animations - Maya
C. Exporting Models Maya to Unity3D
D. Video Game World Design and Creation
E. Creating Lights – cameras
F. Using Physics for collisions, gravity, spatial movements, etc.
G. Programming using C# or Javascript to make the game interactive and perform as designed. Learning to computer program
H. Publishing the game in different formats so it can be sent vide Google drive or dropbox
I. Cooperative Projects
J. Game play and competition

IV. Topic of Study - Suggested Time Distribution

First Semester - 20 weeks

A) Principles and use of Digital Media in society 1 week
   a) Changes in 3D animation – Special effects
   b) Making 3D animation movies and video games
   c) Where is the future going

B) Using Maya to create 3D Models and Animations 8 weeks
   a) 3D Coordinate system
   b) X,Y, Z space and moving in it
   c) Create 3D polygons and Nurbs
   d) Texture Mapping – real world
   e) Animating a model and making a movie
   f) Exporting a Model and Animation to Unity3D
   g) Lighting to set your scenes and models
   h) Rendering models for visualization

C) Unity Video Game Engine 11 Weeks
   a) What is a video game
   b) Using Variables – Classes – Operations- Functions
   c) X, Y, Z space in games
   d) Unity Video Game Engine Interface
   e) Bringing Maya 3D objects into your game- FBX file import
   f) Design the game in screen view and play in game view and why
   g) Creating movement and obstacles in your game, and then creating and

writing the physics and programs for them to interact

h) Creating and moving in your own virtual world
i) C# programming in Unity Monodevelop to make your game perform and play.

Second Semester - 20 weeks

A) Team Project -Creating and Developing Your Video Game 10 weeks

B) Publishing your Video Game for different media play 4 weeks

C) Presenting and selling your Video Game Online 6 weeks

V. Textbooks and Supplemental Reading Materials

A) Getting Started in 3D with Maya: Create a Project from Start to Finish - Model, Texture, Rig, Animate, and Render in Maya by Adam Watkins from Focal Press

B) Learning C# Programming with Unity3d by Alex Okita and CRC Press

C) Supplemental Materials
   a. http://curriculum.autodesk.com/student/public/level1/digital/software_id/3/category_id/
   b. http://www.computergraphics.com
   c. http://unity3d.com
   d. http://autodesk.com
   e. https://www.youtube.com/user/misterh3d?feature=em-subs_digest
   f. Autodesk Maya 2017
   g. Autodesk MudBox 2017
   h. Unity3D 5.5