CompuScholar, Inc.

Alignment to Utah **Game Development Fundamentals** Standards

Utah Course Details:

Course Title:	Game Development Fundamentals
Primary Career Cluster:	CTE / Information Technology
Course Code(s):	35.02.00.00.045
Standards Link:	Strands and Standards, Game Development Fundamentals, July 2017

CompuScholar Course Details:

Course Title:	CompuScholar: Unity Game Programming
Course ISBN:	978-0-9887070-7-8
Course Year:	2017

Note 1: Citation(s) listed may represent a subset of the instances where objectives are met throughout the course.

Note 2: Citation(s) refer to the "Lesson Text" elements within the course, unless otherwise noted. The course "Instructional Video" components are supplements designed to introduce or re-enforce the main lesson concepts, and the Lesson Text contains full details.

Note 3: Per guidance from the Utah State BOE, all items listed in parentheses after a standards line item are illustrative examples only and are not exhaustive requirements that must all be met. Publishers may choose to meet those standards with their own examples or relevant material.

Course Description

This course is designed to provide students with knowledge and project based experience of fundamental gaming development concepts relating to STEM. These concepts include game design, scripting, creation of digital assets, graphic resources, animations, understanding hardware, problem solving, critical thinking, collaboration, and project management.

Course Standards

STRAND 1: Video Game History (7% -4 of 54 pts): Students will understand the relevant history of video games.	CITATION(S)
Standard 1 Relevant History --The student will be able to discuss the history of gaming including; arcade, console, computer, mobile, and modern devices.	See Below
• Identify key figures and designers in the history of gaming (Ralph Baer/father of video games, Nolan Bushnell/founder of Atari, Shigeru Miyamoto/key figure in Nintendo, etc.)	Supplemental Chapter 2, Lesson 2

• Identify early games (Pong, Pac-Man, Donkey Kong, Space Invaders, Centipede, Missile Command, Asteroids, etc.)	Supplemental Chapter 2, Lesson 1 Supplemental Chapter 2, Lesson 2
• Understand important milestones in gaming (why gaming boomed or dwindled over the years, Golden age of arcade video games, the North American Video Game crash of 1983, etc.)	Supplemental Chapter 2, Lesson 2
Standard 2 Game Ratings -- Students will be familiar with the ESRB (Entertainment Software Rating Board) and its ratings categories:	See Below
• eC - early childhood • E - Everyone • E 10+ - Everyone 10 and up • T – Teen • M – Mature • AO - Adults only • RP - Rating Pending	Supplemental Chapter 3, Lesson 3

STRAND 2: Communication Features and Game Interface Design (15% -8 of 54 pts): Students will be able to apply communication features and game interface design.	**CITATION(S)**
Standard 1 Game Strategy & Feedback -- Students will understand what it means to design a game strategy and provide game feedback.	See Below
• Identify game strategies -what is needed to "win" the game; the end goal for the player (high score, fastest time, most levels, % indicator, end of story)	Chapter 13, Lesson 1 Chapter 13, Lesson 2 Chapter 13, Lesson 3
• Identify the feedback needed for progress in the game (defeating enemies, earning points, reducing health, specific sounds, winning screen, points earned, life lost, etc.)	Chapter 13, Lesson 1 Chapter 13, Lesson 2 Chapter 13, Lesson 3
• Understand duration (levels, time, rooms, lives, etc.)	Chapter 13, Lesson 2 Chapter 13, Lesson 3
Standard 2 Game Control -- Students will understand the design of game control concepts	See Below
• Understand design functionality (determine what to include in the game with regard to movements, power-ups, jumping, avoiding obstacles, collecting, etc.)	Chapter 4, Lesson 3 Chapter 13, Lesson 2
• Create usability in game control (implement the ability for the player to change movements, switching views, etc.)	Chapter 4, Lesson 3

• Describe accessibility (refers to what is used to play the game -- keyboard and mouse, joystick, game controller, touch screen, motion control/gyroscope, etc.)	Chapter 13, Lesson 2
• Understand immersion (feeling part of the game, emotions, etc.)	Chapter 13, Lesson 3
Standard 3 Design Aesthetics -- Students will understand the aesthetics of game design, and its importance in creating an immersive experience.	See Below
• Design of World/Background (dark and gloomy, 8-bit art, photorealistic graphics, etc.)	Chapter 13, Lesson 1

• Player View -- Students will understand the importance of "Player View" in game design, understanding the many view options:
  • Two-Dimensional (flat, 2D-world, platform games are usually 2Dgames)
  • Isometric (3/4 perspective)
  • First-Person (from the character's point of view -- you don't see the character)
  • Third-Person (view from behind the character -- you see the character -- often an over the shoulder view)
  • Top-Down (looking down from the top -- you usually see the character)
	Chapter 23, Lesson 1

Standard 4 Interface Elements -- Students will understand the classifications of interface elements	See Below
• Understand diegetic and non-diegetic elements (diegetic - elements that come from the world in the game -- sounds, graphics, etc. / non-diegetic - in the game but added on top of the world - health bar, score, narration, etc.)	Chapter 6, Lesson 4 Chapter 15, Lesson 4
• Understand spatial elements (how things are placed in the game – layer to layer)	Chapter 6, Lesson 4 Chapter 8, Lesson 2 Chapter 15, Lesson 4

STRAND 3: Game Platforms (7% -4 of 54 pts): Students will be able to identify various gaming platforms and develop at least one game on one of those platforms.	**CITATION(S)**
Standard 1 Gaming Console Platforms -- Students will be able to identify gaming consoles and their significant generations. (Atari, Nintendo, Sega, PlayStation, Xbox, etc.)	Chapter 24, Lesson 4 Supplemental Chapter 2, Lesson 2
Standard 2 Computer Platforms -- Students will be able to identify computer platforms and features (Windows 7/8/10, Macintosh OSX, Linux, etc.)	Chapter 24, Lesson 2 Supplemental Chapter 2, Lesson 2

Standard 3 Mobile Platforms -- Students will be able to identify and describe mobile platforms and features (Android, iOS, Windows, Nintendo Gameboy, Nintendo DS/3DS/2DS, PlayStation PSP/Vita, etc.)	Chapter 24, Lessons 3-4

STRAND 4: Game Genres and Types (13% -7 of 54 pts): Students will define various game genres and types.	CITATION(S)
Standard 1 Game Genres -- Students will be able to identify the following game genre categories (categories of games based on challenges):	See Below
• Action (includes physical challenges) • Adventure (focuses on an interactive story) • Role Playing Game/RPG (player undertakes a quest in a fictional world) • Simulation (used to simulate a real setting) • Strategy (decision making/skillful thinking and planning)	Supplemental Chapter 2, Lesson 1
Standard 2 Game Types -- Students will be able to identify the following game types:	See Below
• Single-player (player vs. the situation) • Two-player (player vs. another player) • Multiplayer competitive (every player for themselves - against each other) • Multiplayer cooperative (all of us in this together to defeat the enemy) • Team-based (our team vs. their team, each team controlled by one or many players)	Supplemental Chapter 2, Lesson 1

STRAND 5: Game Design Production Cycle (54% -29 of 54 pts): Students will be able to create and develop a game, in one of the identified game genres (Action, Adventure, RPG, Simulation or Strategy), using the Game Design Production Cycle.	CITATION(S)
Standard 1 Game Concept Development -- Students will be able to work alone or in a team (designer, programmer, project manager, graphic artist, etc.) to develop a game	See Below
• Develop a concept with considerations for plan, cost, and time	Chapter 13, Lesson 1 Chapter 13 Activity Chapter 14, Activity 1 Chapter 25, Lesson 1 Chapter 26, Activity 1
• Create a game proposal "Pitch Document" (components include: goal, characters, environment, obstacles, platform) • Create storyboard • Sketch and plan characters (protagonist, antagonist)	Chapter 13, Lesson 1 Chapter 13 Activity Chapter 14, Activity 1 Chapter 26, Activity 1

Standard 2 Pre-Production (Design) -- Students will be able to design documents as part of the Pre-Production of the game.	PUBLISHER'S NOTE: We cover these items in a combination of "Requirements" and "Design" documents, per standard software engineering practice.

• Put together a "Game Design Document" (the overall blueprint) and include the following components:
  • Title
  • Genre (Action, Adventure, Role Playing Game/RPG, Simulation/fictional reality, Strategy/decision making)
  • Game type (Single-player: player vs. the situation, Two-player: player vs. another player, Multiplayer competitive: every player for themselves - against each other, Multiplayer cooperative: all of us in this together to defeat the enemy, Team-based: our team vs. their team, each team controlled by one or many players)
  • Brief description (short text on back of game box to entice gamers to purchase)
  • Rules of the game
  • Design of levels and rooms
  • Script (what the characters are going to say, dialogue, etc.)
  • Game mechanics (the challenges presented to the player and the actions the player is permitted to take)
  • Game goals (successful completion of the game/what it takes to win the game)
  • Select a game engine (possible engines: Scratch, Sploder, Unity, Construct 2, GameMaker, Game Salad, Unreal, etc.)
	Chapter 13, Lessons 1 - 4
	Chapter 13 Activity
	Chapter 14, Activities 1 - 2
	Chapter 25, Lessons 2 - 3
	Chapter 25 Activity
	Chapter 26, Activities 1 - 2

Standard 3 Production (Create) -- Students will be able to create assets and incorporate them in a game.	See Below
• Create art and text	Chapter 6, Lesson 4 Chapter 23, Lesson 3
• Develop sounds for the game	Chapter 18
• Implement scripting as needed	Chapter 3 and throughout the course
• Create game animations	Chapter 17
• Design the User Interface/UI components (could include inventory, score, health bar, lives, navigation, powerbar, text indicators, maps, level, sound on/off, etc.)	Chapter 6, Lesson 4 Chapter 15, Lesson 4 Chapter 22
• Create an analog or digital prototype version of a game	Chapter 13, Lesson 1

Standard 4 Post Production (Game Testing and Release) -- Students will implement game testing and release the game after it has been developed.	See Below
• Alpha Testing (in-house/controlled, small group testing to find and repair bugs and glitches, make needed adjustments)	Chapter 11 Chapter 14, Activity 3 Chapter 25, Lesson 1 Chapter 26, Activity 3
• Beta Testing (outside, large group testing to receive feedback from selected end users, make needed adjustments and repairs that were not discovered in-house) • Game Release (game is open for playing) • Game Maintenance (provide updates, repair more identified bugs and glitches)	Chapter 24 Chapter 25, Lesson 1

STRAND 6: Understanding Careers (4% - 2 of 54 pts): Students will explore careers and training in the game design and production world.	**CITATION(S)**
Standard 1 Career Awareness -- Students will develop career awareness related to working in the gaming industry.	See Below

• Identify personal interests and abilities related to Gaming, such as:
  • Identify personal creative talents
  • Identify organizational and leadership skills
  • Identify special interest areas
	Chapter 25, Lesson 3
	Supplemental Chapter 3, Lesson 5 / Activity 5

• Identify the primary Gaming Industry's job titles, such as: Lead Programmer, Lead Designer, General Game Designer, Mechanics Designer, Level Designer/World Builder, User Interface (UI) Designer, Animator, Writer, Audio Director, Art Director, Project Manager, etc.	Chapter 25, Lesson 3 Supplemental Chapter 3, Lesson 5 / Activity 5
• Investigate career opportunities, trends, and requirements related to Gaming Industry careers.	Supplemental Chapter 3, Lesson 5 / Activity 5 Supplemental Chapter 3, Lesson 7 / Activity 7
Standard 2 Educational Pursuits -- Students will develop a realistic Plan for College and Career Readiness to help guide further educational pursuits	See Below
• Identify factors for employability and advancement in the gaming industry.	Chapter 25, Lesson 3 Supplemental Chapter 3, Lesson 5 / Activity 5
• Survey existing Game Development businesses to determine what training is required.	Supplemental Chapter 3, Lesson 5 / Activity 5

• Survey universities and colleges to determine programs, degrees and training availability.	Supplemental Chapter 3, Lesson 5
• Identify which state universities have gaming degrees. (University of Utah, Utah Valley University, Weber State offers a certification but not degree.) (Others may add some in the future. Keep checking what is offered.)	Supplemental Chapter 3, Lesson 5
• Develop employability competencies/characteristics: responsibility, dependability, ethics, respect, and cooperation.	Chapter 25, Lesson 3 Supplemental Chapter 3, Lesson 5 / Activity 5
• Achieve high standards of personal performance with a positive work ethic and attitude.	Chapter 25, Lesson 3 Supplemental Chapter 3, Lesson 5 / Activity 5