CompuScholar, Inc.

Alignment to South Carolina **Game Design and Development** Standards

10th - 12th grades

South Carolina Course Details:

Course Title:	5352 - Game Design and Development
Grade Level:	10-12
Standards Link:	SCGameDesignandDevelopment.pdf

CompuScholar Course Details:

Course Title:	Unity Game Programming
Course ISBN:	978-0-9887070-7-8
Course Year:	2021

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

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

Note 3: "Supplemental" or "Suppl." citation(s) refer to Supplemental chapters included at the end of the course.

South Carolina Course Description

Game Design and Development provides students with the opportunity to design and develop fully-functional video games with product design documentation. This course emphasizes game control and logic, design tools, and the physics of games using computer programming.

South Carolina Course Standards

A. SAFETY	CITATION(S)
1. Review school safety policies and procedures. 2. Review classroom safety rules and procedures. 3. Review safety procedures for using equipment in the classroom. 4. Identify major causes of work-related accidents in office environments. 5. Demonstrate safety skills in an office/work environment.	School and classroom-level policies and procedures are delegated to local teachers.

B. STUDENT ORGANIZATIONS	CITATION(S)
1. Identify the purpose and goals of a Career and Technology Student Organization (CTSO).	Suppl. Chapter 3, Lesson 7
2. Explain how CTSOs are integral parts of specific clusters, majors, and/or courses.	Suppl. Chapter 3, Lesson 7

3. Explain the benefits and responsibilities of being a member of a CTSO.	Suppl. Chapter 3, Lesson 7
4. List leadership opportunities that are available to students through participation in CTSO conferences, competitions, community service, philanthropy, and other activities.	Suppl. Chapter 3, Lesson 7
5. Explain how participation in CTSOs can promote lifelong benefits in other professional and civic organizations.	Suppl. Chapter 3, Lesson 7

C. TECHNOLOGY KNOWLEDGE	**CITATION(S)**
1. Demonstrate proficiency and skills associated with the use of technologies that are common to a specific occupation.	Chapter 2 (Unity IDE) Chapter 3 (C# Scripting) Chapter 23, Lesson 3 (Image Editing) Chapter 25, Lessons 2, 3
2. Identify proper netiquette when using e-mail, social media, and other technologies for communication purposes.	Suppl. Chapter 1, Lesson 1
3. Identify potential abuse and unethical uses of laptops, tablets, computers, and/or networks.	Suppl. Chapter 1, Lesson 1 Suppl. Chapter 1, Lesson 3
4. Explain the consequences of social, illegal, and unethical uses of technology (e.g., piracy; illegal downloading; cyberbullying; licensing infringement; inappropriate uses of software, hardware, and mobile devices in the work environment).	Suppl. Chapter 1, Lesson 1 Suppl. Chapter 1, Lesson 3
5. Discuss legal issues and the terms of use related to copyright laws, fair use laws, and ethics pertaining to downloading of images, photographs, documents, video, sounds, music, trademarks, and other elements for personal use.	Suppl. Chapter 1, Lesson 2
6. Describe ethical and legal practices of safeguarding the confidentiality of business- related information.	Suppl. Chapter 1, Lesson 2 Suppl. Chapter 1, Lesson 3
7. Describe possible threats to a laptop, tablet, computer, and/or network and methods of avoiding attacks.	Suppl. Chapter 1, Lesson 3

D. PERSONAL QUALITIES AND EMPLOYABILITY SKILLS	CITATION(S)
1. Demonstrate punctuality. 2. Demonstrate self-representation. 3. Demonstrate work ethic. 4. Demonstrate respect. 5. Demonstrate time management. 6. Demonstrate integrity. 7. Demonstrate leadership. 8. Demonstrate teamwork and collaboration. 9. Demonstrate conflict resolution. 10. Demonstrate perseverance. 11. Demonstrate commitment. 12. Demonstrate a healthy view of competition. 13. Demonstrate a global perspective. 14. Demonstrate health and fitness. 15. Demonstrate self-direction. 16. Demonstrate lifelong learning.	Students have multiple opportuntities to work in teams to deliver full lifecycle projects (see Chapters 14 and 26), and will demonstrate these skills during those opportunities. See also Chapter 25, Lesson 3

E. PROFESSIONAL KNOWLEDGE	CITATION(S)
1. Demonstrate effective speaking and listening skills.	Chapter 13, Lesson 1 Chapters 14, 26 - Activities 2, 3
2. Demonstrate effective reading and writing skills.	Chapters 13, 14, 26 Chapter 25, Lesson 2
3. Demonstrate mathematical reasoning.	Chapter 6, Lesson 2 Chapter 7, Lessons 1-2 Chapters 15, 19
4. Demonstrate job-specific mathematics skills.	Chapters 15, 19 Suppl. Chapter 3, Lesson 4
5. Demonstrate critical-thinking and problem-solving skills.	Chapters 11, 13, 14, 21, etc.
6. Demonstrate creativity and resourcefulness.	Chapters 13, 14, 26 Chapter 13 Activity
7. Demonstrate an understanding of business ethics.	Suppl. Chapter 1, Lessons 1, 2
8. Demonstrate confidentiality.	Suppl. Chapter 1, Lessons 1, 2
9. Demonstrate an understanding of workplace structures, organizations, systems, and climates.	Chapter 25 Suppl. Chapter 3, Lesson 5
10. Demonstrate diversity awareness.	Chapter 25 Suppl. Chapter 3, Lesson 5
11. Demonstrate job acquisition and advancement skills.	Chapter 25 Suppl. Chapter 3, Lesson 5
12. Demonstrate task management skills.	Chapter 25 Suppl. Chapter 3, Lesson 5

13. Demonstrate customer-service skills.	Chapter 25 Suppl. Chapter 3, Lesson 5

F. INTRODUCTION TO GAME DESIGN AND DEVELOPMENT	CITATION(S)
1. Identify game design and development terminology.	Chapter 13 and throughout the course
2. Compare and contrast different gaming genres (e.g., action, simulation, role-playing, strategy, sports, puzzle, etc.).	Suppl. Chapter 2, Lesson 1
3. Analyze the advancement of gaming history (e.g., mainframe, arcade, home computers, online gaming, handheld games, mobile gaming, consoles, etc.).	Suppl. Chapter 2, Lesson 2

G. GAME PLANNING (INTEGRATED THROUGHOUT GAME DEVELOPMENT	CITATION(S)
1. Identify the primary steps in the design process (e.g., conceptualize, prototype, test, analyze).	Chapter 13 Chapter 25, Lesson 1
2. Identify/collect/create game structures (e.g., sprites/characters, visual components, stage/environment, etc.).	Chapter 2, Lessons 2-3 Chapters 17, 18, 23
3. Evaluate basic gameplay from an existing game.	Chapter 13, Lesson 2
4. Compare and contrast narratives/stories in gameplay and explain how and when the storyline could pertain to game design.	Chapter 13, Lesson 3
5. Develop objectives and outcome of a game, including reward systems.	Chapter 13
6. Create technical documentation using appropriate industry terminology.	Chapters 13, 14, 26 Chapter 25, Lesson 2

H. GAME DEVELOPMENT	CITATION(S)
GAME GRAPHICS	
1. Create game characters (players and avatars, non-players).	Chapter 2, Lesson 3 Chapters 7 - 10 Activities Chapters 16, 17 Activities
2. Create the game world/environment.	Chapters 15, 16, 20
3. Identify the mapping coordinates.	Chapter 2, Lesson 3 Chapters 15, 16
4. Create Splash, Credits, and Tutorial pages.	Chapter 24, Lesson 1
5. Create assets.	Chapter 18, Lesson 1 Chapter 23

COLLECTIONS AND OBJECTS	
1. Develop variable, fields, and methods as needed to construct the game world/environment.	Chapters 6, 9
2. Code, implement, and instantiate objects.	Chapters 9, 10
3. Implement object-oriented programming to manipulate objects.	Chapters 9, 10
4. Use collections (e.g., arrays, arraylists, etc.) to simplify coding on multiple instances of objects (enemies, stars, particles systems, ammo, snow/rain/sleet, etc.).	Chapters 8, 10, 12
GAME MECHANICS AND CONTROL	
1. Develop code to animate characters to respond to different control devices (i.e., keyboard, mouse, and controllers).	Chapter 17
2. Develop code to animate characters as needed.	Chapter 17
COLLISION THEORY AND LOGIC	
1. Code decision structures to detect collisions with other characters and elements of the game world/environment.	Chapter 5, Lessons 1, 2, 4
2. Code results of collision detection to produce intended reaction(s) (e.g., cause/effect, action/reaction).	Chapter 5, Lessons 1, 2, 4
3. Code looping structures as necessary (e.g., FOR, WHILE, or DO).	Chapter 12, Lessons 2-3
ENVIRONMENTAL FORCES (PHYSICS)	
1. Use mathematical formulas (addition, subtraction, increment, decrement, etc.) to code Gravity, Velocity, Acceleration, and Friction to affect Objects.	Chapter 4, Lesson 1 Chapter 6, Lesson 2 Chapter 19
2. Use trigonometry functions (sine, cosine, tangent, etc.) to code direction and rotation.	Chapter 4, Lesson 2 Chapter 19
3. Demonstrate the use of constraints in coding to provide more realistic animation of Objects.	Chapters 15, 16, 17

GAME ENHANCEMENTS (OPTIONAL)	
1. Select, edit, and incorporate appropriate music and sound effects.	Chapter 18
2. Select, edit, and incorporate appropriate video files.	N/A
3. Add and format dynamic input and output elements including textual data.	Chapter 6, Lesson 4 Chapter 22
4. Apply texturing/shading/lighting effects.	Chapter 16, Lessons 1, 3 (Texture only)
5. Develop a reward system (e.g., scoring, win/loss scenario, goal attainment, etc.).	Chapters 6, 7, 8 Activities Chapter 13
6. Develop progression indicators (e.g., power bar, status bar, map, etc.).	Chapters 6, 7, 8 Activities Chapter 15, Lesson 4
7. Develop additional challenge levels.	Chapter 13, Lesson 3
QUALITY ASSURANCE	
1. Develop an executable game.	Chapters 14, 26 and in each chapter activity
2. Collect usability and error feedback on game play.	Chapters 14, 26 - Activity 3
3. Fix errors based on feedback from game play.	Chapters 14, 26 - Activity 3

I. CAREER DEVELOPMENT	**CITATION(S)**
1. Research various career options, educational requirements, and employment outlook available in the game design industry.	Chapter 25, Lesson 3 Suppl. Chapter 3, Lesson 5
2. Analyze game design skills that can be used throughout business and industry.	Chapter 25, Lesson 3 Suppl. Chapter 3, Lesson 5
3. Research roles and responsibilities of a game design team's members.	Chapter 25, Lesson 3 Suppl. Chapter 3, Lesson 5
4. Develop an electronic portfolio to include games that demonstrate game design skills.	Students will complete playable games in each activity starting in Chapter 5