CompuScholar, Inc.

Correlations to the Texas Essential Knowledge and Skills (TEKS):

Game Programming and Design

Texas Course Details:

Chapter	Chapter 127. Texas Essential Knowledge and Skills for CTE
Subchapter	Subchapter O. STEM
Course	§127.767 Game Programming and Design
Standards	Subchapter O. STEM
TEKS Coverage	100%

CompuScholar Course Details:

Course Title:	Unity Game Programming
Course ISBN:	9780988707085
Course Year:	2023

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.

Course Description

Game Programming and Design will foster student creativity and innovation by presenting students with opportunities to design, implement, and present meaningful programs through a variety of media. Students will collaborate with one another, their instructor, and various electronic communities to solve gaming problems.

Course Standards

Knowledge and Skills Statement: (1) Creativity and innovation. The student develops products and generates new understanding by extending existing knowledge. The student is expected to:

Student Expectation	Citation(s)
(A) understand the basic game design elements, including conceptual ideas, storyline, visualization, storyboard, game effects, sound elements, game play, game controls, and player tutorial;	Chapter 13
(B) create a design concept document;	Chapters 13, 14, 26
(C) create a storyboard;	Chapters 13, 14, 26

(D) demonstrate an understanding of the fundamentals of game art, including the look and feel, graphics coordinate system, basics of color, and color palettes;	Chapter 2, Lesson 3 Chapter 15, Lessons 2, 4 Chapter 23
(E) use bitmap graphics images, including designing, creating, reading, and manipulating images;	Chapter 2, Lesson 3 Chapter 23
(F) create backgrounds, including solid, image, and tiled backgrounds;	Chapter 8, Lesson 2 Chapters 15, 16
(G) write programs creating images using geometric shapes;	Chapter 15, Lesson 4
(H) create games using sprites by evaluating the role of sprites, creating sprites, and managing sprites;	Chapter 2, Lesson 3
(I) create programs using sprite sheets;	Chapter 17
(J) demonstrate an understanding of image rendering, including transparency, refresh rate, hardware acceleration, and animation;	Chapters 17, 23 Supplemental Chapter 3, Lesson 6
(K) find, create, and edit game audio sound effects and music; and	Chapter 18
(L) implement game sound mechanics, including playing, pausing, and looping.	Chapter 18

Knowledge and Skills Statement: (2) Communication and collaboration. The student communicates and collaborates with peers to contribute to his or her own learning and the learning of others. The student is expected to:	
Student Expectation	**Citation(s)**
(A) design and implement procedures to set timelines for, track the progress of, and evaluate a game product;	Chapters 14, 25, 26
(B) seek and respond to input from peers and professionals in evaluating a game project;	Chapters 14, 26
(C) demonstrate knowledge and appropriate use of operating systems, program development tools, and networking resources;	Students use keyboard and mouse inputs, multiple software IDEs, file management and related skills throughout the course
(D) use network resources to acquire, organize, maintain, and evaluate information;	Students access all course material online and frequently dowload and upload project files
(E) collaborate to research the business of games, including the roles of developer, marketing, publisher, and retail sales; and	Chapter 25, Lesson 3
(F) demonstrate an understanding of and evaluate online technology, including online interaction and massive multiplayer games.	Supplemental Chapter 2, Lesson 1

Knowledge and Skills Statement: (3) Research and information fluency. The student locates, analyzes, processes, and organizes data. The student is expected to:	
Student Expectation	**Citation(s)**
(A) play board games to research and collect game play data;	Supplemental Chapter 2, Lesson 1
(B) evaluate, analyze, and document game styles and playability; and	Chapter 13
(C) research the dramatic elements in games, including kinds of fun, player types, and nonlinear storytelling.	Chapter 13

Knowledge and Skills Statement: (4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	
Student Expectation	**Citation(s)**
(A) demonstrate an understanding of the game design process, including generating ideas, brainstorming, and paper prototyping;	Chapter 13
(B) write programs using variables of different data types;	Chapter 6, Lesson 1
(C) evaluate game rules and instructions;	Chapters 13, 14, 26
(D) demonstrate an understanding of the user experience by comparing rules and game-play patterns;	Chapter 13
(E) write game rules and instructions;	Chapters 13, 14, 26
(F) develop game software;	All chapters and lessons
(G) write computer game code, resolve game defects, and revise existing game code; and	All chapters and lessons
(H) test a finished game product by implementing sound testing techniques.	Chapters 11, 14, 26

Knowledge and Skills Statement: (5) Digital citizenship. The student explores and understands safety, legal, cultural, and societal issues relating to the use of technology and information. The student is expected to:	
Student Expectation	**Citation(s)**
(A) explore intellectual property, privacy, sharing of information, copyright laws, and software licensing agreements;	Supplemental Chapter 1, Lessons 1, 2
(B) model ethical acquisition and use of digital information;	Supplemental Chapter 1, Lessons 1, 2
(C) demonstrate proper digital etiquette when using networks, responsible use of software, and knowledge of acceptable use policies;	Supplemental Chapter 1, Lesson 1
(D) model respect of intellectual property, including manipulating graphics, morphing graphics, editing graphics, and editing sound;	Supplemental Chapter 1, Lesson 2

(E) discuss and evaluate the social issues surrounding gaming; and	Supplemental Chapter 1, Lesson 1 Supplemental Chapter 2, Lesson 1
(F) evaluate the cultural aspects of game design fundamentals, including rationale for games and types of games.	Supplemental Chapter 2, Lesson 1
Knowledge and Skills Statement: (6) Technology operations and concepts. The student understands technology concepts, systems, and operations as they apply to game programming. The student is expected to:	
Student Expectation	**Citation(s)**
(A) identify basic game components, including the game engine, game play subsystems, data structures, models, and interfaces;	Chapters 1, 12, 13, 19, 22
(B) generate random numbers in a program;	Random numbers generated and used in multiple projects throughout the course
(C) create a program implementing conditional statements;	Chapter 7
(D) develop an appropriate data model;	Chapters 9, 10, 12, 15
(E) demonstrate an understanding of and apply object-oriented game programming;	Chapter 9
(F) demonstrate an understanding of game programming essentials, including event-driven programming, communicating with messages, and device management;	Chapter 3, Lesson 4 and throughout the course as needed
(G) demonstrate an understanding of the role of game events, the animation loop, and game timing;	Chapter 3, Lesson 4 Chapter 17 Chapter 19, Lesson 1
(H) demonstrate an understanding of the role of game engines;	Chapter 1
(I) demonstrate an understanding of video display flicker and double buffering;	Supplemental Chapter 3, Lesson 6
(J) apply basic game screen design and layout, including visual controls, user interfaces, menus, and options;	Chapters 20, 22, 24
(K) use game control design to understand, access, and control input devices, including keyboard, mouse, and joystick;	Chapter 4, Lesson 3
(L) demonstrate an understanding of and apply game animation, including the principles of animation and frame-based animation;	Chapter 17
(M) demonstrate an understanding of decision making and types of decisions;	Chapter 7
(N) demonstrate an understanding of game events, including listeners, triggers, and timed events;	Chapter 3, Lesson 4 Chapter 5, Lesson 4 Chapter 10, Lesson 4
(O) demonstrate an understanding of and implement collision detection, including bounding boxes and sprite collisions;	Chapter 5, Lesson 2 Chapter 5, Lesson 4
(P) implement a tile-based game, including loading tile maps, drawing tile maps, rendering a tile map, and layering sprites;	Chapter 15, Lesson 3

(Q) demonstrate an understanding of artificial intelligence and develop and implement artificial intelligence;	Chapter 21
(R) demonstrate an understanding of game balance and tuning; and	Chapter 13 Chapter 21 Activity
(S) demonstrate an understanding of player progression, including leveling, linear progression, and maintaining high score data.	Chapter 13, Lesson 3