CompuScholar, Inc.

Alignment to Georgia **Game Design: Animation and Simulation** Standards

Georgia Course Details:

Course Title:	Game Design: Animation and Simulation
Career Cluster:	CTAE / Information Technology
Course Code(s):	11.42900
Standards Link:	GameDesign-Animation-Simulation.pdf

CompuScholar Course Details:

Course Title:	Unity Game Programming
Course ISBN:	978-0-9887070-7-8
Course Year:	2022

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: Citation(s) to "Supplemental" or "Suppl." lessons can be found in Supplemental chapters at the end of each course.

Note 4: Items marked as "N/A", while not part of the course material, are still generally supported by the Unity development environment.

Course Description

Students completing this course will gain an understanding of the fundamental principles used at every stage of the game creation process.

Course Standards

IT-GDAS-1: Standard: Demonstrate employability skills required by business and industry.	CITATION(S)
IT-GDAS-1 standards are identical across all CTAE courses and are intended to be incorporated by the teacher into other lessons as opportunities arise. All CompuScholar courses contain opportunities for effective communication, research, problem solving, creative thought, career exploration and workspace traits, time management and teamwork.	Throughout the course

IT-GDAS-2: Demonstrate conceptual understanding of the game design process.	CITATION(S)
2.1 Identify the primary steps in the design process (e.g., conceptualize, prototype, test, analyze).	Chapter 13., Lesson 1

2.2 Evaluate basic gameplay from an existing game.	Chapter 13, Lesson 2
2.3 Compare and contrast the narratives in gameplay and explain how and when the storyline could pertain to game design.	Chapter 13, Lesson 3
2.4 Evaluate and describe various 2D & 3D, single & multi-user genre in games.	Supplemental Chapter 2, Lesson 1
2.5 Plan and layout the steps needed to execute a team project, from skills to dependencies and parallelization of tasks.	Chapter 14 (Mid-Term Project) Chapter 26 (Final Project)

IT-GDAS-3: Apply complex and abstract thinking to programming and scripting.	CITATION(S)
3.1 Introduce script binding, components, and prefabricated objects to projects.	Chapter 2, Lesson 2 and Chapter 5 (Components) Chapter 3 (Scripting) Chapter 10 (Prefabs)
3.2 Determine appropriate programming and scripting languages to create desired game mechanics, control the environment, user interface (UI), and gameplay.	Chapter 3 (Scripting) Chapter 4, Lesson 3 (Input) Chapter 22 (User Interfaces) Throughout the course - mechanics and gameplay.
3.3 Demonstrate an understanding of "if" and "switch" statements.	Chapter 7
3.4 Demonstrate an understanding of states for game, player, item, and other objects in the game universe.	As needed throughout the course
3.5 Demonstrate an understanding of loops to manage recurring events.	Chapter 3, Lesson 4 Chapter 12, Lessons 2, 3
3.6 Retarget motion data and animation setups between character rigs.	N / A
3.7 Import and use Motion Capture (Mocap) data to drive character animation.	N / A
3.8 Demonstrate an understanding of Object Oriented Programming.	Chapter 9
3.9 Demonstrate an understanding of the mathematical concepts, logic, and syntax of programming languages.	Chapter 6
3.10 Compare and contrast game creation tools including scripting languages, extensibility, 2D/3D support and others.	Chapter 1, Lesson 2

IT-GDAS-4: Analyze and synthesize the relationship of mathematics to game design.	CITATION(S)
4.1 Use algebraic, geometric, and trigonometric relationships to define game object characteristics and properties as well as Heads-Up Display (HUD) interface placement and scaling.	Chapter 15 (Virtual Worlds)
4.2 Demonstrate functions of linear algebra and vector mathematics (dot product, cross product, quaternions, etc.) to determine character perspective and field of view.	N / A

4.3 Explain how quaternion calculations are used in video game development.	Chapter 10, Lesson 2
4.4 Apply mathematical concepts to interactive application and video game design.	Chapters 6, 15, 19
4.5 Explain the use of collision geometry and "hit testing" for physics-based interactions and programming triggers.	Chapter 5, Lesson 2 Chapter 5, Lesson 4

IT-GDAS-5: Construct two-dimensional models using concepts of physics.	CITATION(S)
5.1 Explore the phenomena and apply Newtonian physics to static & dynamic systems for animation.	Chapters 17, 19
5.2 Explore mass, velocity, acceleration, torque, force, and other related measurements.	Chapter 5, Lesson 1 Chapter 19, Lesson 1
5.3 Use physics to create realistic motion of objects and characters (gravity, angular momentum, momentum, friction).	Chapter 5 Chapter 19
5.4 Apply the use of colliders and rigged bodies (kinesthetics).	Chapter 5
5.5 Demonstrate a working knowledge of two dimensional digital bitmap art tools.	Chapter 23
5.6 Demonstrate a working knowledge of two dimensional digital vector art tools.	N / A

IT-GDAS-6: Develop three-dimensional models, backgrounds, and scenes.	CITATION(S)
6.1 Create 3D Models with appropriate highlights and shading.	N / A
6.2 Determine the effect of various camera angles and emphasize perspective.	N / A
6.3 Demonstrate a working knowledge of 3D modeling & animation tools.	N / A

IT-GDAS-7: Analyze 2D/3D character animation and character controls.	CITATION(S)
7.1 Create character states, and transition between states when a specified event occurs.	Chapter 17
7.2 Manipulate state-based animations and transitions.	Chapter 17
7.3 Define volumes and entrance/exit events.	N / A
7.4 Create fire particle events, audio events, and object state events (e.g., inventory levels, timers).	Chapter 10, Lesson 4 (Invoke) Chapter 18 (Sound Effects)
7.5 Construct a 2D and 3D maze and maneuver through it in first and third person as a character.	N / A

IT-GDAS-8: Explain how to create an Augmented Reality experience.	CITATION(S)
8.1 Understand geo-location, geo-fencing principles, and location event models.	N / A
8.2 Understand and implement environmental events such as camera inputs, accelerometers, and audio inputs.	N / A
8.3 Create a map and navigation for UI (user interface) with transparent overlays superimposed on real world sensors.	N / A
8.4 Define how to create an Augmented Reality experience.	N / A
8.5 Create an asset to use in your Augmented Reality experience (e.g., 3D Model, Animation).	N / A

IT-GDAS-9: Design an augmented reality experience into a location-based game.	CITATION(S)
9.1 Use the assets created in Standard 8 and incorporate into a location based game.	N / A

IT-GDAS-10: Design and develop a game in teams.	CITATION(S)
10.1 Create a plan working with the skills of team members and the requirements of the game.	Chapter 14 (Mid-Term Project) Chapter 26 (Final Project)
10.2 Develop a solid game – building, versioning, debugging, and optimization.	Chapter 14 (Mid-Term Project) Chapter 26 (Final Project)
10.3 Create a hypothetical technology pipeline for an interactive application or video game project.	Chapter 14 (Mid-Term Project) Chapter 26 (Final Project)

IT-GDAS-11: Deploy a student-team created game for beta testing.	CITATION(S)
11.1 Coordinate and produce a game that contains lighting and sound.	Chapter 18 (Sound) Chapter 23 (Game Art)
11.2 Demonstrate a working knowledge of video capture, editing, and post-processing tools.	N / A
11.3 Apply the correct graphic file formats and file interoperability.	Chapter 23 (Game Art)
11.4 Apply video file formats and file interoperability.	N / A
11.5 Apply audio file formats and file interoperability.	Chapter 18 (Sound)
11.6 Use interactive and real-time editing within the game.	Chapter 14 (Mid-Term Project) Chapter 26 (Final Project)
11.7 Deploy the game to a mobile device for testing and peer review.	Chapter 24, Lesson 3

VSAG-IDM-12: Examine how related student organizations are integral parts of career and technology education courses through leadership development, school and community service projects and competitive events.	CITATION(S)
12.1 Explain the goals, mission, and objectives of the career-technical student organization (CTSO).	Supplemental Chapter 3, Lesson 7
12.2 Explore the impact and opportunities a student organization can develop to bring business and education together in a positive working relationship through innovative leadership and career development programs.	Supplemental Chapter 3, Lesson 7
12.3 Explore the local, state, and national opportunities available to students through participation in related student organization including but not limited to conferences, competitions, community service, philanthropy, and other CTSO activities.	Supplemental Chapter 3, Lesson 7
12.4 Explain how participation in career and technology education student organizations can promote lifelong responsibility for community service and professional development.	Supplemental Chapter 3, Lesson 7
12.5 Explore the competitive events related to the content of this course and the required competencies, skills, and knowledge for each related event for individual, team, and chapter competitions.	Supplemental Chapter 3, Lesson 7