

Wyoming Department of Education Required Virtual Education Course Syllabus

BIG HORN COUNTY SCHOOL DISTRICT #1

Program Name	WYCA	Content Area	Career and Vocational Education
Course ID	CAOT78107	Grade Level	9-12
Course Name	Game Design II	# of Credits	0.5
SCED Code	10205G0.5022	Curriculum Type	Connections Academy

COURSE DESCRIPTION

We live in a technologically-advanced world where virtual reality and video games play a major role in our daily lives. Have you ever thought about designing your own video game? By signing up for Game Design II, the student will learn the skills needed to conceptualize, design, and fully create his very own video game. Explore various video game software and hardware, sharpen coding skills, learn about game storylines, player progression, and algorithmic decision making. Also, the student will learn to analyze player goals, actions, rewards, and challenges, among many other game play components, as well as utilize 21st century skills of creativity, critical thinking, communication, collaboration, and technical expertise. When the student signs up for Game Design II, he is putting himself at the forefront of a future in technology.

WYOMING CONTENT AND PERFORMANCE STANDARDS

STANDARD#	BENCHMARK
CV12.2.1	College and career-ready students communicate clearly, effectively, and with reason.
CV12.2.2	College and career-ready students identify and model integrity, ethical leadership and effective management skills.
CV12.2.4	College and career-ready students apply safe, legal, and responsible use of information and technology as appropriate to the task.
CV12.3.1	College and career-ready students identify and define authentic problems and significant questions for investigation.
CV12.3.2	College and career-ready students identify trends, forecast possibilities, and explore complex systems and issues.
CV12.3.3	College and career-ready students employ valid and reliable research strategies and apply prior knowledge to solve a problem or complete a project.
CV12.3.4	College and career-ready students demonstrate creativity and innovation while considering the environmental, social, and economic impacts of decisions.
CV12.4.1	College and career-ready students produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. (*CCSS W.11.4)
CV12.4.2	College and career-ready students determine the meaning of symbols, key terms, and other content-specific words and phrases as they are used in technical context.
CV12.4.3	College and career-ready students acquire, manipulate, analyze, diagnose, and/or report information, using the appropriate technology.
CV12.4.4	College and career-ready students precisely follow a complex multistep procedure when performing technical tasks. (*Adapted from CCSS RL.9.3)
CV12.5.1	College and career-ready students manage resources to develop, analyze, and implement systems and applications.
CV12.5.2	College and career-ready students productively complete tasks taking constraints, priorities and resources into account.
CV12.5.3	College and career-ready students safely and ethically use current industry-standard tools and emerging technologies.
CV12.5.4	College and career-ready students utilize technology to develop innovative solutions or products.

SCOPE AND SEQUENCE

UNIT OUTLINE	STANDARD#	OBJECTIVES
<p>Unit 1: Principles of Game Design</p> <p>If you've signed up for this course, you've likely got a creative spirit, and you're ready to add some technical skills to your arsenal so you can move from just playing video games to making and distributing your own games. The field of game studies is relatively young compared to other fields. For that reason, you find bits of a lot of subject areas being used in game design. For example, the action and drama of video games pull from theater, cinema, and storytelling. Game artwork draws on art studies as well as sociology and anthropology; then there's music and sound design, and the list goes on. If you're one of those people who likes mixing knowledge from different fields together, then this course is especially for you. Before jumping straight into making your own game,</p>	<p>CV12.2.1 CV12.2.4 CV12.3.1 CV12.3.3 CV12.4.1 CV12.4.2 CV12.4.3 CV12.4.4 CV12.5.1 CV12.5.2 CV12.5.3 CV12.5.4</p>	<ul style="list-style-type: none"> Define what a game is and name the three main components of a game. Identify the three player perspectives and describe advantages and disadvantages of each. Give examples of how specific game mechanics can help form player immersion. Explain how some of your favorite games make use of Disney's 12 Principles of Animation.
<p>Unit 2: Create Some 3-D Game Content!</p> <p>With the ever-increasing technological capabilities that we have to render new worlds, it's not surprising that many of the most popular video games in recent years use 3-D graphics. Entering a 3-D game space adds an entire dimension to the game world and models more precisely how we perceive reality. That doesn't mean you are leaving 2-D game spaces or techniques behind. Take a closer look at a 3-D model in one of your favorite games: you will see that the model is made of a number of flat surfaces, which have 2-D images, called textures, applied to them. Are you curious how all those pieces get put together? Then, try your hand at making your own 3-D model!</p>	<p>CV12.2.1 CV12.2.4 CV12.3.1 CV12.3.3 CV12.4.1 CV12.4.2 CV12.4.3 CV12.4.4 CV12.5.1 CV12.5.2 CV12.5.3 CV12.5.4</p>	<ul style="list-style-type: none"> Use essential box modeling skills to create hard-edge objects. Apply UV mapping skills to 3-D objects. Create textures using procedural tools. Explain how to create the illusion of 3-D in a 2-D environment.
<p>Unit 3: History of Video Games and Related Technology</p> <p>The video game industry is one of the youngest industries in the world, starting in the 1970s when microprocessors and other computer technology became more powerful and affordable at the same time. Since then, the video game industry has evolved at a dizzying pace, incorporating the latest technology right along with it. Developing an understanding of the history of video games, related technology, and the key developments, events, and individuals that helped to shape the landscape of gaming helps a video game designer understand the trends,</p>	<p>CV12.2.1 CV12.2.4 CV12.3.1 CV12.3.3 CV12.4.1 CV12.4.2 CV12.4.3 CV12.5.2</p>	<ul style="list-style-type: none"> Identify the major advances in each generation of console design Explain how advances in computer hardware and technology coincided with the evolution of the video game industry Describe the core components of any gaming system Classify popular game development tools used in the video game industry

<p>Unit 4: Narratology – Storytelling in Games</p> <p>Story has become an increasingly important part of modern games and interactive entertainment, and as a result, creative writing is becoming more and more integral as a game design skill. A game’s story and narrative elements can be immersive and engaging for the player, or distracting and annoying, depending on how well the story is conveyed, what archetypes and framing devices the creative writer employs, and how well scripted the dialogue is, among other things. Let’s exam the elements of a good story, so we can learn to write them well!</p>	CV12.2.1 CV12.2.4 CV12.3.1 CV12.3.3 CV12.4.1 CV12.4.2 CV12.4.3 CV12.4.4 CV12.5.1 CV12.5.2 CV12.5.3 CV12.5.4	<ul style="list-style-type: none"> Describe the progression of the hero’s journey structure and give examples of this structure at use in video games Design a game character using Jungian archetypes Explain the various delivery methods for conveying story in games Contrast the different uses for storyboarding in the video game design industry
<p>Unit 5: Developing a Game Design Document</p> <p>Before you ever create a character model or lay out a game level, you have to make a blueprint for your entire game development process. This blueprint, better known as a Game Design Document (GDD), describes your video game from the ground up. This document, actually made up of several smaller documents, includes everything from the subject, style, nature, functionality, gameplay, mechanics, characters, plot, environment design, and user interface design to the narrative devices of your game. Yes, that’s a lot of information in one document,</p>	CV12.2.1 CV12.2.4 CV12.3.1 CV12.3.3 CV12.4.1 CV12.4.2 CV12.4.3 CV12.5.2	<ul style="list-style-type: none"> Explain the difference between a game concept document, a game proposal, and a game design document. Describe the roles of members on the game design team. Identify the principles for creating an engaging puzzle. Write a game concept document.
<p>Unit 6: Environment and Level Design</p> <p>A video game takes place in a certain space—a galaxy far, far away, a tennis court, or a 2-dimensional maze field. This space is the game world, or more specifically, the game environment. The game environment must be designed with care, because it is the cities, forests, towns, or mazes of the environment where the player will either enjoy exploring or will feel stuck. Designing a game environment is a large task because you need all the tiny details to fit together to create a believable, whole world.</p>	CV12.2.1 CV12.2.4 CV12.3.1 CV12.3.3 CV12.4.1 CV12.4.2 CV12.4.3 CV12.4.4 CV12.5.1 CV12.5.2 CV12.5.3 CV12.5.4	<ul style="list-style-type: none"> Describe the common pitfalls of environmental design and offer techniques for avoiding them Give examples of how careful environment design contributes to player immersion Use hotkeys to manipulate objects in Unity Design a level and a game environment
<p>Unit 8: Programming Concepts</p> <p>To be able to communicate with a computer, you have to speak its language. Programming languages have evolved over time, along with the machines they were designed to communicate with. Learning the principles, concepts, and techniques of computer programming is the key to defining the rules and behavior of your game. By learning about object oriented programming and some related concepts, you will be empowered to write well structured, high quality, and reusable code for your games.</p>	CV12.2.1 CV12.2.4 CV12.3.1 CV12.3.3 CV12.4.1 CV12.4.2 CV12.4.3 CV12.4.4 CV12.5.1 CV12.5.2 CV12.5.3 CV12.5.4	<ul style="list-style-type: none"> Explain the evolution of computer programming languages through their generations. Describe the basic components and advantages of object oriented programming. Identify the different components in a simple script. Program your first object in Unity.
<p>Unit 9: Developing Game Mechanics</p> <p>Game mechanics are at the core of gameplay. They determine how simulated aspects of the game world will behave and control how the player can interact with the game state. With knowledge of the fundamental concepts of computer programming, you are ready to dig deeper into the subject of game programming and put some action into game design. However, with every action, you can expect an equal and opposite action. What? Are you surprised that there’s physics in game design? When you’re building an entire environment, you’re in charge of the physics of that world as well. How do things move and respond to collisions? This is where designing really gets fun.</p>	CV12.2.1 CV12.2.4 CV12.3.1 CV12.3.3 CV12.4.1 CV12.4.2 CV12.4.3 CV12.4.4 CV12.5.1 CV12.5.2 CV12.5.3 CV12.5.4	<ul style="list-style-type: none"> Explain the uses of the different kinds of operators used in programming. Create a movement mechanic for a 2-D platformer style game. Apply physical forces to Rigidbody objects. Spawn objects and remove them, in real-time.
<p>Unit 10: Game Rules</p> <p>Game rules are the fundamental building blocks that define higher level game elements such as game mechanics and, ultimately, gameplay. Think for a minute about your favorite computer game, and then ask yourself: "What were the rules that made that game so fun to play?" Learn how to define positive and negative outcomes, reward and penalize player actions, and use goal design to create a truly long-lasting, engaging play experience.</p>	CV12.2.1 CV12.2.4 CV12.3.1 CV12.3.3 CV12.4.1 CV12.4.2 CV12.4.3 CV12.4.4 CV12.5.1 CV12.5.2 CV12.5.3 CV12.5.4	<ul style="list-style-type: none"> Explain how to create understandable and context appropriate game rules. Show how context appropriate game rules are connected to game progression and cognitive flow. Create a GameManager class to track global, game-wide variables, such as lives and score. Use goal design to create nested victories.

<p>Unit 11: Event Modeling, Simulation, and Testing</p> <p>Testing, testing, testing. It's a repetitive, often times laborious task, but it is also one of the most important steps in the professional game development process. Testing is the process by which game developers evaluate the condition of a game project, identify bugs and issues, improve, fix, and update until the game product is ready. You can be absolutely sure that all of your favorite computer games were rigorously tested. That is one of the main reasons why they turned out so well; bugs and issues were fastidiously identified and rectified via the testing process. If you want to make some truly great games, you have to learn about the simulation and quality assurance processes!</p>	<p>CV12.2.1 CV12.2.4 CV12.3.1 CV12.3.2 CV12.3.3 CV12.3.4 CV12.4.1 CV12.4.2 CV12.4.3 CV12.4.4 CV12.5.1 CV12.5.2 CV12.5.3 CV12.5.4</p>	<ul style="list-style-type: none"> • Explain the different phases of the software development cycle. • Understand how simulations help game designers test that their game is meeting the goals they want to achieve. • Create a simple Monte Carlo simulation to calculate statistical probabilities for random variables and events.
<p>Unit 12: UI and Audio</p> <p>Have you ever played a game that just felt so immersive and alive that you were compelled to extend your stay in its fictional world? If so, it was likely due, in part, to good sound design and an intuitive user interface. A well-crafted soundscape can turn a good game into a great one. Learning the principles of how to create this emotive, immersive experience is a must for any game designer.</p>	<p>CV12.2.1 CV12.2.4 CV12.3.1 CV12.3.3 CV12.4.1 CV12.4.2 CV12.4.3 CV12.4.4 CV12.5.1 CV12.5.2 CV12.5.3 CV12.5.4</p>	<ul style="list-style-type: none"> • Explain the difference between destructive and non-destructive audio editing. • Describe the advantages of different types of inventory systems used in computer games. • Generate, edit, and export sound effects for your games. • Enhance your gameplay by attaching sound effects to certain game events.
<p>Unit 13: The Business of Video Game Design</p> <p>So far, you have looked at the design and development process from a conceptualization and implementation point of view. What about the ethical and legal considerations involved in the games industry and game development process as a whole? You wouldn't want to pour your heart and soul into a game development project only to discover, upon publishing the game, that you have accidentally infringed on someone else's intellectual property, or copyright. It's extremely important to learn all of the ethical and legal factors of game design when embarking on a game development project.</p>	<p>CV12.2.1 CV12.2.2 CV12.2.4 CV12.3.1 CV12.3.2 CV12.3.3 CV12.3.4 CV12.4.1 CV12.4.2 CV12.4.3 CV12.4.4 CV12.5.1 CV12.5.2 CV12.5.3 CV12.5.4</p>	<ul style="list-style-type: none"> • Make justifiable decisions following an ethical decision-making process. • Outline the legal matters which relate to game development and design. • Explain the various kinds of companies and organizations which operate in the game industry space. • Decide which form of marketing and producing works best for your situation.