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James Clemens High School

Course Description

Computer Game and Simulation Programming standards are designed to equip students with the skills needed to prepare for higher education and for success in careers such as a computer game simulator, designer, programmer, or software developer. Interest and involvement in the gaming industry has grown substantially over the years. Professions in this industry require technical skill proficiency, competency-based applied learning, higher-order reasoning, teamwork, and problem-solving skills. The course integrates core academic subjects with elements of visual design, digital audio and video, storyboarding, and collaboration to attain the knowledge, skills, and attitudes necessary to compete successfully in the gaming production industry.

Pre-requisites

Algebra or Algebra with Geometry, Geometry recommended

Instructional Delivery Plan

Students are able to:

1. Research information regarding video gaming historical figures and the development of the gaming process.
2. Conduct a video games and gain knowledge to collect for future programming procedures
3. Summarize and analyze the formal elements from researched data on video gaming development.
4. To evaluate the game from a design perspective – feeling, emotions, and interest level.
5. Identify and discuss the different types of video gaming ratings, genres, subgenres, and gaming types.
6. Compare different video gaming platforms that are developed.
7. Interpret different pricing plans for development platforms.
8. Explain the different steps of the gaming design production cycle from start to finish.
9. Create a plan of work for team members utilizing their skill set to fulfill the short- and long-term goals of video game design.

10. Determine the cost of the development process.
11. What concepts and game genres are used in development.
12. Understand the features, descriptions, features, story, target audience, platform, timeline, and marketing, along with data analysis of the development process.
13. Demonstrate an understanding of the components and features of the user interface.
14. Demonstrate how to detect and debug gaming software.
15. How to test along the way while developing software.
16. Develop a strategy game and describe the step-by-step process of progressing throughout the game.
17. Develop a game design that allows the player the ability to move in the game environment and control or drive.
18. Determine the difference in creating a good and bad UI experience for the player.
19. How to incorporate the correct elements for a good UI experience.
20. Develop and execute all the elements of creating an immersive gaming experience using all the gaming concepts.
21. Develop a title page that illustrates the instructions, characters, levels, puzzles, art, graphics, animation, and clear navigation, including start, pause, quit level, and end game.
22. Describe the tools and software used for gaming development.
23. Describe the tools and software applications needed to develop web pages, graphic designs, art, and animation for gaming development.
24. Create vectors, modeling, and paint techniques to create graphics and animation in gaming software.
25. How to demonstrate their understanding of 2D and 3D animation.
26. Compare different animation principles.
27. Create an effective readme file that can be understood by end users.
28. Demonstrate how to create a readme template in gaming software.
29. Explain the reasons for gaming libraries.
30. Explain the different intellectual protections of video games
31. Understand that previously gained knowledge of programming languages and game animation techniques will allow them to upgrade, modify, and update gaming programs.
32. Understand that a digital experience platform delivers a customer experience by bridging the gaps between various technological layers.
33. Understand that creating an original game will allow them to begin to understand the full scope of building gaming software.
34. Understand that techniques learned throughout the course will allow them to develop an original game with specific gaming mechanics and techniques.
35. Understand that simple steps can boost player engagement and retention to retain player interest
36. Understand that there are many possible fields in gaming and simulation, what training is needed, where to get training and an estimate of the time, and cost to get trained.
37. Understand that thorough career research and planning can allow a student a successful pathway in a career.

38. Understand that additional workplace skills are necessary for success in gaming and any field they are seeking.
39. Understand that creating a simulation or game that provides workplace and soft skills can help them prepare for their post-secondary careers.

Course Goals

Foundational Standards

1. Incorporate safety procedures in handling, operating, and maintaining tools and machinery; handling materials; utilizing personal protective equipment; maintaining a safe work area; and handling hazardous materials and forces.
2. Demonstrate effective workplace and employability skills, including communication, awareness of diversity, positive work ethic, problem-solving, time management, and teamwork.
3. Explore the range of careers available in the field and investigate their educational requirements, and demonstrate job-seeking skills including resume-writing and interviewing.
4. Advocate and practice safe, legal, responsible, and ethical use of information and technology tools specific to the industry pathway.
5. Participate in a Career and Technical Student Organization (CTSO) to increase knowledge and skills and to enhance leadership and teamwork.
6. Discuss and demonstrate ways to value diversity

Pre-Production

1. Research and share information on the history of video games, including timelines of events, historical figures, and changes in generational game development..
2. Play a variety of games to research, collect, and analyze game play data.
    a. Write a critical analysis of a current video game.
3. Research the methods used to create and sustain player immersion and explain why it is important..
4. Explain game ratings, genres, and types.

Game Platforms

5. Research and share information on various computer and mobile game development platforms.

Game Design and Development Process

6. Summarize the game design production cycle.
7. Define the roles and responsibilities of team members on a video game design team and identify their typical short- and long-term goals.
8. Demonstrate game concept development process and roles both independently and as part of a team.

9. Compare and contrast communication features and interface design.
10. Assess and apply strategies to prevent, debug, and eliminate problems. *Examples: viruses, malware, inconsistencies within data*
11. Develop an end-goal game strategy and feedback needed to progress through the game. Examples: earning points, reaching levels, overcoming obstacles
12. Incorporate a user-friendly experience for design functionality which allows players to change movements, immerse themselves in the environment, and take control or drive on their own.
13. Include interface elements in game design. Examples: sounds, graphics, spatial recognition, narration
14. Create an original game design which executes game concept development, communication features, interface design, game strategy, and immersification.
    a. Create a title page for an original project with instructions, characters, levels, puzzles, art, graphics, animation, and clear navigation, including start, pause, quit level, and end game.
15. Identify tools and software commonly used in game development, including web page and graphic design, art, and animation.

Software Application

16. Utilize vector, modeling, and paint programs used to make graphics and animation.
    a. Explain the principles of 2D and 3D animation as they relate to game graphics. *Examples: walk, run, jump, idle*
17. Explain the use of readme files and source codes and demonstrate appropriate documentation for templates, libraries, and copyrighted materials used.

Post-Production (Game Testing, Enhancement, and Release)

18. Integrate created assets into a functional digital platform with a logical theme or concept. *Examples: scoreboard, leaderboard, celebratory messages, levels, lives, instructional display*
19. Execute an original game and implement game testing. *Examples: in-house, larger testing group(s), open release without additional instructions*
    a. Demonstrate an understanding of the techniques used to evaluate game mechanics, game play, flow, and game design.
    b. Analyze design elements that maintain player interest and vary the degree of challenge.
20. Demonstrate project management skills, utilize feedback data to improve an original game, and add advanced features. *Examples: feedback from testing groups, basic general maintenance for overall improvement*

Career Awareness

21. Gather information on the gaming industry, including career opportunities and training in game design and production.
    a. Connect information to personal interests and develop a plan for a possible future career in the field of computer gaming and simulation programming.
22. Develop a plan to identify and enhance any workplace skills needing improvement in the computer game field.

a. Create a computer game or simulation designed to improve workplace skills.

Credentialing

Adobe Certified Associate (ACA) – Photoshop / Dreamweaver / Premier Pro / InDesign / Illustrator, ASK Institute – Concepts of Entrepreneurship and Management / Fundamental Business Concepts, Certiport- Entrepreneurship and Small Business (must hold concentrator status), IC3 Global Standard 6 (or higher), Microsoft Office Expert 2019/365 - Access / Excel / Word, Microsoft Office Specialist 2019/365 (MOS) (Two of the following areas REQUIRED: Excel Associate / Outlook Associate / PowerPoint Associate / Word Associate)

Grading and Assessment

Not all assignments are graded. It is imperative that students are conscientious and complete ALL of the required work on time. Students are required to participate in lectures, watch tutorial videos, read selections, and respond with appropriate grammar. It is the student's responsibility to obtain the class notes from another student if absent. Assessment is given in all kinds of formats; written, verbal, performance products, skills demonstrated, knowledge gained and development of problem-solving.

- *Assessments 70%*
- *In-Class Work 30%*

Late Work

Any assignments that are turned in late without excuse will result in 10 points deducted from the final grade. Each day late will result in another 10 points.

Makeup Work

If you are absent, you will be expected to make up the work that was missed. All missed assignments and tests must be made up within three days of an EXCUSED absence. If it is not excused, you will not be allowed to make up the work (including exams).
On the day you return to class, please review the TO DO LIST posted on Schoology for any content that you missed and if necessary make an appointment for a make-up quiz or test. If you enter school after class or leave school before class, you are expected to review the TO DO LIST to find out what you missed or will miss. You will be held accountable for work due that day or work assigned for homework that night.

TSA CTSO Integration

TSA is a fundamental part of this course and is a national career and technical student organization of students engaged in science, technology, engineering, and mathematics (STEM). TSA is integrated into the program which includes competitions and leadership opportunities. TSA provides students with activities during their class time and after school with our local TSA Chapter.

Embedded Numeracy Anchor Assignment

Students will calculate drawing scale ratios based on real-life measurements of an object and the paper size for drawing onto. Detail to proportions in the x, y and z axis along with scale, accuracy of drawing will help produce multiview drawings with industry standard compliance in projection, dimensioning and annotating.

This assignment will account for 200 points.

Embedded Literacy Anchor Assignment

Students will read and comprehend complex informational texts and videos used to evaluate video games on their critiques. Students will write an analysis of a video game of their choice according to the rubric.

Students will create technical documentation to accompany their video games, this may mean commenting on their code or building an instruction manual to go with their game.

This assignment will account for 200 points.

Culminating Project

Students will use their learned skills with the video game software engineering design process, creating the algorithm for their final game project using team building skills, programming skills, the game development cycle and technical writing to deliver a fully functional video game with at least 1 other partner.

Supplies

1. Folder or section in a binder for handouts.
2. Electronic notebook (for keeping track of their own notes, game ideas, etc.)
3. Calculator

Procedures

1. Once the bell has rung, the student is expected to be seated in class and ready to work.
2. Tardies are strictly enforced. James Clemens High School's tardy policy will be followed.
3. No hall passes for the last 10 minutes of class.
4. The hall pass is hanging next to the door, blue for our hallway, red for any other place in the building.
5. You have three days to do makeup work and tests. It is up to you to ask me about the work missed. You can also review the latest posts on Schoology, there is a to do list for your class..
6. During fire drills we will exit the building to the correct exit of the building. You are to always stay with me and form a single file line once we are safely outside and be ready to be counted.
7. When the intercom sounds, you must immediately sustain all talking.
8. Raise your hand and wait to be called upon.
9. Listen without interrupting.

10. Cell phones should be silenced, and left in the backpack.
11. If we finish before the bell, you must remain seated at your desk. Take advantage of this time to work on homework, other class assignments, etc.

CTE Dual Enrollment

Students at James Clemens High School can attend Calhoun Community College or UAH to take dual enrollment courses.

Revised 8/1/2022

Career Pathway Program	Computer Science (NEW 2023-2024) (Must teach three courses from this program list within two years.) This pathway includes the study of theoretical algorithms and the practical problems involved in implementing them through computer hardware and software. This pathway includes artificial intelligence, software engineering, programming, and computer graphics. The need for computer science as a discipline has grown as computers become more integrated into daily life and technology continues to advance. This pathway provides students with skills required for the workforce both now and in the future.		
Course Number	**Career Pathway Program Courses**	**Career Readiness Indicator (CRI)**	**Workforce Careers**
10001G1000	Information Technology Fundamentals	• Certified Internet Web (CIW) – JavaScript Specialist • Certiport Information Technology Specialist (ITS) Software Development • Certiport Information Technology Specialist (ITS) Java • Certiport Information Technology Specialist (ITS) JavaScript • Certiport Information Technology Specialist (ITS) Python • Certiport Information Technology Specialist (ITS) Databases • Certiport Information Technology Specialist (ITS) HTML5 Application Development • Certiport Information Technology Specialist (ITS) Artificial Intelligence • Microsoft Azure AI Fundamentals • Microsoft Azure Data Fundamentals • Microsoft Power Platform Fundamentals • Microsoft Office Specialist- Excel Expert 2019/O365 • Microsoft Office Specialist- Access Expert 2019/O365 • Oracle Certified Associate (OCA) – Java Programmer	• Software Engineer • Senior Software Engineer • Machine Learning Engineer • Java Web Developer • Software/Application Developer • DevOps Engineer- Azure • Research Scientist • AI Engineer • Machine Learning Engineer • Data Scientist
TBD	Programming Foundations		
TBD	Artificial Intelligence		
TBD	Computer Game and Simulation Programming		
TBD	Mobile Application Development		
TBD	Object-Oriented Programming I		
TBD	Object-Oriented Programming II		
TBD	Programming Design and Development		
10159E10SL	Computer Science, SL, IB		
10159E10HL	Computer Science, HL, IB		
10157E1000	**Computer Science A, AP		
10019R1000	**Computer Science Principles, AP		
10012G1001	**Exploring Computer Science		
10012G1002	*Introduction to Computer Science-TEALS		
10011G1000	Introduction to Digital Literacy and Computer Science-ACCESS		
21009G1000	Robotic Systems		
10997G1001	Career Pathway Project in Information Technology		
10997G1002	CTE Lab in Information Technology		
NOTE: *LEAs must contact TEALS for additional information prior to utilizing the course code listed above, as it does require submission of an application, an interview, and a signed partnership agreement. ** LEAs must contact the ALSDE program specialist listed on cover page prior to utilizing the course codes listed to obtain information for required training and curriculum material.			