# Scope & Sequence

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| Course Name: Video Game Design**PEIMS Code:** 13009970 | **Course Credit:** 1.0**Course Requirements:** This course is recommended for students in Grades 9-12.**Prerequisites:** None.**Recommended Prerequisite:** Principles of Art, Audio/Video Technology, and Communications. |
| **Course Description:** Video Game Design will allow students to explore one of the largest industries in the global marketplace and the new emerging careers it provides in the field of technology. Students will learn gaming, computerized gaming, evolution of gaming, artistic aspects of perspective, design, animation, technical concepts of collision theory, and programming logic. Students will participate in a simulation of a real video game design team while developing technical proficiency in constructing an original game design. |
| **NOTE:** This is a suggested scope and sequence for the course content. This content will work with any textbook or instructional materials. If locally adapted, make sure all TEKS are covered. |
| **Total Number of Periods****Total Number of Minutes****Total Number of Hours** | 175 Periods.7,875 Minutes.131.25 Hours.\* | \*Schedule calculations based on 175/180 calendar days. For 0.5 credit courses, schedule is calculated out of 88/90 days. Scope and sequence allows additional time for guest speakers, student presentations, field trips, remediation, extended learning activities, etc.  |
| **Unit Number, Title, and Brief Description** | **# of Class Periods\***(assumes 45-minute periods)Total minutes per unit | **TEKS Covered****130.93. (c) Knowledge and skills** |
| **Unit 1: History and Current Trends in Video Game Design**In this unit, students will research the history and evolution of video game design and use the information discovered to explain its history. Students will also compare current technologies with historical technologies and describe how those changes are affecting the industry. Additionally, students will examine video game design through the lens of various cultures and compare the many styles of game design. The knowledge gained in this unit will assist the student in the understanding and mastery of the required skills throughout the remainder of the course. | 10 periods450 minutes | (11) The student researches the history and evolution of video game design. The student is expected to:(A) explain the history of video game design;(B) describe how changing technology is affecting the industry;(C) analyze the use of symbols in video game design of diverse cultures;(D) compare current video game design technologies with historical technologies;(E) compare various styles of video game design; and(F) explore emerging and innovative video game design technologies and software. |
| **Unit 2: Application of ELA and Math in Video Game Design**Students will build upon their ELA and Math skills to create and design interesting and exciting video games. Skills learned will be applied as projects, presentations, and games are created and shared. The culminating activity for the unit will span the entirety of the course as skills learned will be applied in the various projects required for course completion. | 10 periods450 minutes | (2) The student applies academic knowledge and skills in video game design projects. The student is expected to:(A) apply English language arts knowledge by demonstrating skills such as correct use of content, technical concepts, vocabulary, grammar, punctuation, and terminology to write and edit a variety of documents; and(B) apply mathematics knowledge and skills such as using whole numbers, decimals, fractions, and knowledge of arithmetic operations. |
| **Unit 3: Ethical Decision Making**Mastery of the skills in this unit will allow the students to analyze the impact of video game design on society. Such analysis will include discussion on acceptable use, copyright laws, and respecting intellectual property. Students will also model ethical conduct with regard to others and the confidentiality required by the design process. Student learning will be assessed through the creation of group projects that demonstrates understanding of and compliance with applicable laws and regulations. | 15 periods675 minutes | (7) The student applies ethical decision making and understands and complies with laws regarding use of technology in video game design. The student is expected to:(A) exhibit ethical conduct related to interacting with others such as maintaining client confidentiality and privacy of sensitive content and providing proper credit for ideas;(B) discuss and apply copyright laws;(C) model respect of intellectual property;(D) demonstrate proper etiquette and knowledge of acceptable use policies; and(E) analyze the impact of the video game design industry on society. |
| **Unit 4: Technology Applications, Problem Solving, and Efficiency**In this unit, students will utilize technology applications and problem solving skills, both individually and in groups, to efficiently write technology specifications and debug specific issues. Students will carefully plan their work and insure timely completion of all tasks assigned. The skills and knowledge gained through this unit will serve as background information for all subsequent units and will inform all aspects of video game design. | 10 periods450 minutes | (21) The student uses technology applications to facilitate evaluation of communication processes and products. The student is expected to:(A) write technology specifications for planning/evaluation rubrics documenting variables, prompts, and programming code internally and externally; and(B) debug and solve problems using reference materials and effective strategies. (4) The student understands and employs problem-solving methods and conflict-management skills. The student is expected to:(A) employ critical-thinking skills independently and in groups; and(B) employ interpersonal skills in groups to solve problems.(17) The student applies problem-solving strategies. The student is expected to apply design specifications, step-wise refinement, or algorithm development.(8) The student applies technical skills for efficiency. The student is expected to employ planning and time-management skills to complete work tasks. |
| **Unit 5:** **Professional Communications**Students will learn and understand sound communications techniques and utilize those skills to communicate clearly—both orally and in writing. Students will appropriately adapt the language used to deliver formal and informal presentations. Additionally, students will practice and apply active listening skills and have the opportunity to work with individuals from diverse backgrounds. The culminating activity for this unit will span the entirety of the course as skills learned will be applied in the various projects required for course completion | 10 periods450 minutes | (3) The student understands professional communications strategies. The student is expected to:(A) adapt language for audience, purpose, situation, and intent;(B) organize oral and written information;(C) interpret and communicate information;(D) apply active listening skills; and(E) communicate with diverse individuals. |
| **Unit 6: Cyber Safety**Cyber safety is becoming more important as the world becomes increasingly dependent on technology. As video game design is heavily dependent on technology, insuring the safety of students and student work is critical. Students will have the opportunity to implement personal and professional safety rules and regulations as they go about the creation of their video games. The culminating activity for this 10-period unit will span the entirety of the course as skills learned will be applied in the various projects required for course completion. |  5 periods225 minutes | (5) The student applies cyber safety procedures. The student is expected to implement personal and professional safety rules and regulations. |
| **Unit 7: Creating New Knowledge**One of the exciting aspects of video game design is its ability to participate in gaming and on–line learning activities that reach far beyond the brick and mortar of the school house walls. In this unit, students will utilize the Internet to participate in electronic communities as a learner, initiator, contributor and teacher/mentor. The culminating activity for this unit will be a student–created project that documents the student forays and activities in which the student participated while in the electronic communities. | 20 periods900 minutes | (20) The student uses research skills and electronic communication, with appropriate supervision, to create new knowledge. The student is expected to:(A) participate with electronic communities as a learner, initiator, contributor, and teacher or mentor;(B) extend the learning environment beyond the school walls with digital products created to increase teaching and learning in the foundation and enrichment curricula; and(C) participate in relevant, meaningful activities in the larger community and society to create electronic projects. |
| **Unit 8:** **Employability and Career Development**Students will learn, understand, and demonstrate the positive work behaviors and personal qualities needed to secure employment and to stay employed. Additionally, students will seek out and participate in training and education that leads to certification and/or employment. Students will also have the opportunity to create a career portfolio that includes the completed job applications, resumes, and cover/application letters. The culminating activity for this unit will be the completion and presentation of their career portfolio that includes work experience, licenses held, certifications obtained, and samples of student work to the other students and/or the teacher. | 5 periods225 minutes | (1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:(A) identify and demonstrate positive work behaviors and personal qualities needed to be employable;(B) demonstrate skills related to seeking and applying for employment;(C) create a career portfolio to document information such as work experiences, licenses, certifications, and work *samples; and*(D) demonstrate skills in evaluating and comparing employment opportunities. |
| **Unit 9: Leadership**This unit enables the student to identify, develop, and employ the characteristics of leadership. Additionally, students will demonstrate the leadership skills learned individually and in groups. The skills and knowledge gained through this unit will serve as background information for all subsequent units and will inform all aspects of video game design. | 5 periods225 minutes | (6) The student applies leadership characteristics to student leadership and professional development activities. The student is expected to:(A) demonstrate leadership skills; and(B) participate in a group setting. |
| **Unit 10: Programming and Coding**A deep understanding or programming and coding is essential to design, create and deploy effective video games. In this unit students will discuss and demonstrate their knowledge of programming languages and terminology. Additionally, students will have the opportunity to correctly and efficiently use coding to develop expressions and user–defined functions. The culminating activity for this unit will a student–created project that features user–defined functions (e.g., proper operator precedence, sequential, conditional, repetitive control structures) and specific programming terminology and concepts. | 20 periods900 minutes | (16) The student differentiates current programming languages. The student is expected to:(A) discuss the use of computer programming languages in other fields of study; and(B) demonstrate knowledge of specific programming terminology and concepts.(18) The student develops coding with correct and efficient use of expressions. The student is expected to use user-defined functions; proper operator precedence; and sequential, conditional, and repetitive control structures. |
| **Unit 11: Design Process and Video Game Design**In this unit, students will create a video game using an appropriate design process that includes a combination of graphics, images, and sound, and also requires technical documentation of the techniques used. The student will further demonstrate their knowledge of video game design by including a variety of computer hardware, software, and operating systems, and crafting the game so that it has cross–platform compatibility and can be shared via a variety of file sharing formats. The culminating activity for this unit will be the creation of the afore– mentioned video game and the sharing of that game with others. The game sharing will also include the opportunity for the evaluation of visual effects using the principles of the design process. | 20 periods900 minutes | (10) The student employs an appropriate design process to create and modify solutions to problems. The student is expected to:(A) combine graphics, images, and sound;(B) apply principles of design;(C) develop and reference technical documentation; and(D) edit products.(9) The student develops an understanding of video game design. The student is expected to:(A) demonstrate knowledge and appropriate use of computer operating systems;(B) demonstrate appropriate use of hardware components, software programs, and storage devices;(C) demonstrate knowledge of sound editing;(D) demonstrate knowledge of file formats and cross-platform compatibility;(E) acquire and exchange information in a variety of electronic file sharing formats; and(F) evaluate visual information by recognizing the use of principles and elements of design. (15) The student creates video game design projects. The student is expected to use a variety of techniques and software programs. |
| **Unit 12: Video Game Principles**Students will understand and apply video game design principles, elements, and techniques in their video game productions. This includes, but is not limited to, production processes such as titles and credits as well as script writing, character design, and storyboarding. As these are the building blocks of game design, the culminating activity for this unit will span the entirety of the course as skills learned will be applied in the various projects required for course completion. | 20 periods900 minutes | (12) The student understands and applies video game design principles, elements, and techniques. The student is expected to:(A) employ audience identification, script writing, character design, storyboarding, and audio and delivery formats;(B) describe and use motion paths, scripting, programming, and interactivity;(C) describe lighting and perspective; and(D) describe and use production processes such as titles, credits, and special effects. |
| **Unit 13: Technology Concepts, Systems, and Operations**To design an effective video game, students must understand technology concepts, systems, and operations such as the identification of basic game components, the generation of random numbers, the creation of a program implementing conditional statements, and the development of an appropriate data model. Additionally, students must be able to develop an understanding of and be able to demonstrate the myriad of gaming essentials required to make the game design intriguing and captivating to potential users. The skills in this unit, much like those in the video game principles unit are the foundation of game design and, as such, the culminating activity will span the entirety of the course as skills learned will be applied in the various projects required for course completion. | 20 periods900 minutes | (22) The student understands technology concepts, systems, and operations as they apply to game programming. The student is expected to:(A) identify basic game components, including the game engine, game play subsystems, data structures, models, and interfaces;(B) generate random numbers in a program;(C) create a program implementing conditional statements;(D) develop an appropriate data model;(E) demonstrate an understanding of and apply object-oriented game programming;(F) demonstrate an understanding of game programming essentials, including event-driven programming, communicating with messages, and device management;(G) demonstrate an understanding of the role of game events, the animation loop, and game timing;(H) demonstrate an understanding of the role of game engines;(I) apply basic game screen design and layout, including visual controls, user interfaces, menus, and options;(J) use game control design to understand, access, and control input devices;(K) demonstrate an understanding of and apply game animation, including the principles of animation and frame-based animation;(L) demonstrate an understanding of game events, including listeners, triggers, and timed events;(M) demonstrate an understanding of and implement collision detection, including models and sprite collisions;(N) demonstrate an understanding of player progression, including leveling, linear progression, and maintaining high score data; and(O) demonstrate an understanding of algorithmic decision making. |
| **Unit 14: Evaluation and Constructive Criticism**When the video game has been designed and tested, it must be evaluated (both orally and in writing) to determine if expectations were met. Such an evaluation will require the use of critical–thinking skills and criticisms should be constructive in nature. Products will be evaluated using rubrics and established criteria and the evaluation should be conducted by peers and professionals. The culminating activity for this unit will be the effective use of evaluations on all video game projects delivered during the term of the course. | 5 periods225 minutes | (14) The student presents oral or written evaluations of video game design projects. The student is expected to:(A) identify the intended audience;(B) describe aesthetics;(C) explain the storyline;(D) summarize subject matter; and(E) discuss the use of sound.(13) The student evaluates a product using critical-thinking skills. The student is expected to evaluate products and product quality against established criteria and rubrics.(19) The student applies constructive criticism to products. The student is expected to seek and respond to advice from peers and professionals in delineating technological tasks. |