



Game Design and Programming

Grade(s):	9-12
Discipline/Course:	Business/ Game Design
Course Title:	Game Design and Programming
Prerequisite(s):	Completion of Algebra I (B or better)
Course Description: <i>Program of Studies</i>	The purpose of this course is to give students the general knowledge required to understand many of the general programming concepts required in any programming language. In addition to the general programming concepts, students will gain the ability to design, test, and debug fully functioning programs using the most popular programming languages.
Course Essential Questions:	<ul style="list-style-type: none"> ● What education and background is required for a career in the computer industry? ● What does it mean to be "professional" in software development? ● What components are involved in a computer system and how do they work? ● How does a computer professional define a business problem and create an automated solution? ● What sequence would the information need to be processed? ● How would technology design and problem-solving methods apply to common business problems? ● How have technological developments impacted the way we live? ● What role does technology have in the business environment?
Course Enduring Understandings:	<ul style="list-style-type: none"> ● Understand the role computers and technology play in career options. ● Computer components are interactive and rely on each other to function. ● Applications and the Internet can be useful tools for information analysis, research, problem-solving, decision making, and creative production. ● In writing computer programming language, solutions to problems can be found. ● Computers and applications have unique characteristics which lead to ethical questions.
Duration:	Full Year / 1.0 Credits

Course Materials/Resources:	Access to a desktop computer and programs
FPS Course Academic Expectation(s):	<p><u>Synthesizing and Evaluating</u> The student weighs evidence, arguments, claims and beliefs in order to critically and effectively solve problems and to justify conclusions.</p> <p><u>Creating and Constructing</u> The student transforms existing ideas and knowledge into original ideas, products, and processes.</p>
Year at a Glance (Units):	<p>Unit 1: Introduction to Computer Careers (2 weeks)</p> <p>Unit 2: Programming (18 weeks)</p> <p>Unit 3: Game Design (18 week)</p>

Unit Number and Title:	Unit 1: Introduction to Computer Careers
Duration:	2 weeks
Resource(s):	Online Career Databases Software: word processing, spreadsheet, presentation
Overview	To provide students with educational and career path options during and after high school.
Learning Goals	
Standard(s):	State of Connecticut Curriculum Frameworks Connecticut State Standards are met in the following areas: EKS.03.01 - Demonstrate use of relational expressions such as: equal to, not equal, greater than, less than, etc. EKS.05.02 - Analyze elements of a problem to develop creative solutions. EKS.05.04 Create ideas, proposals, and solutions to problems 21st Century Skills/International Society for Technology in Education National Business Education Association (NBEA) Standards
Essential Question(s):	<ul style="list-style-type: none"> ● What challenges do computer professionals face in today’s world? ● What will the computer industry look like in 10 years?
Enduring Understanding(s):	<ul style="list-style-type: none"> ● The career field is shifting into the new spaces created by innovative technologies. ● There are ever increasing demands for transformation, enhancing customer experience, and cybersecurity concerns.
Learning Goal(s): <i>Students will be able to use their learning to:</i>	Students will: <ul style="list-style-type: none"> ● use analytical skills and support conclusions with specificity. ● access and research information using the Internet.

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| | <ul style="list-style-type: none">● display creative thinking, problem-solving, and decision making.● organize and maintain files.● use computers to process information.● define different careers associated with computers.● define the requirements and education necessary for these careers. |
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Unit Number and Title:	Unit 2: Programming
Duration:	18 weeks
Resource(s):	Windows base PC with access to Internet
Overview	To provide all students the opportunity to learn computer science within a rigorous and engaging framework. To reach, retain, and teach traditionally underrepresented groups, the curriculum is designed to foster welcoming learning environments that are respectful of the diverse strengths of all students
Learning Goals	
Standard(s):	<p>State of Connecticut Curriculum Frameworks</p> <p>Connecticut State Standards are met in the following areas:</p> <ol style="list-style-type: none"> 1. EKS.03.01 - Demonstrate use of relational expressions such as: equal to, not equal, greater than, less than, etc. 2. EKS.05.02 - Analyze elements of a problem to develop creative solutions. 3. EKS.05.04 Create ideas, proposals, and solutions to problems <p>21st Century Skills/International Society for Technology in Education</p> <p>National Business Education Association (NBEA) Standards</p>
Essential Question(s):	<ul style="list-style-type: none"> ● What sequence would the information need to be processed? ● How would technology design and problem solving methods apply to common business problems? ● How have technological developments impacted the way we live? ● What role does technology have in the business environment?

Enduring Understanding(s):	<ul style="list-style-type: none"> ● To find specific solutions to generalizable problems, programmers represent and organize data in multiple ways. ● To find specific solutions to generalizable problems, programmers represent and organize data in multiple ways ● The way statements are sequenced and combined in a program determines the computed result. ● Programmers break down problems into smaller and more manageable pieces. By creating procedures and leveraging parameters, programmers generalize processes that can be reused. Procedures allow programmers to draw upon existing code that has already been tested, allowing them to write programs more quickly and with more confidence. ● There exist problems that computers cannot solve, and even when a computer can solve a problem, it may not be able to do so in a reasonable amount of time.
Learning Goal(s): <i>Students will be able to use their learning to:</i>	Students will be able to: <ul style="list-style-type: none"> ● develop a user interface using IDE Interface. ● create programs using variables, constants, and calculations. ● create programs using decisions and conditions. ● create programs using loops and iterations. ● create programs using arrays.

Unit Number and Title:	Unit 3: Game Design
Duration:	18 weeks +/-
Resource(s):	various
Overview	To provide all students the opportunity to learn computer science game design within a rigorous and engaging framework. To reach, retain, and teach traditionally underrepresented groups, the project-based curriculum is designed to foster welcoming learning environments that are respectful of the diverse strengths of all students
Learning Goals	
Standard(s):	<p>State of Connecticut Curriculum Frameworks</p> <p>Connecticut State Standards are met in the following areas:</p> <ol style="list-style-type: none"> 4. EKS.03.01 - Demonstrate use of relational expressions such as: equal to, not equal, greater than, less than, etc. 5. EKS.05.02 - Analyze elements of a problem to develop creative solutions. 6. EKS.05.04 Create ideas, proposals, and solutions to problems <p>21st Century Skills/International Society for Technology in Education</p> <p>National Business Education Association (NBEA) Standards</p>
Essential Question(s):	<ul style="list-style-type: none"> ● What role does animation play in 21st-century technology?
Enduring Understanding(s):	<ul style="list-style-type: none"> ● To find specific solutions to generalizable problems, programmers represent and organize data in multiple ways in gaming and game design. ● To find specific solutions to generalizable problems, programmers represent and organize data in multiple ways ● Programming language skills are necessary in developing a video game.

	<ul style="list-style-type: none"> • Develop skills in problem solving, teamwork, marketing, and interface design are essential components when developing a video game.
Learning Goal(s): <i>Students will be able to use their learning to:</i>	Students will be able to: <ul style="list-style-type: none"> • create an animated movie using animation software.