

Florida Department of Education  
Curriculum Framework

**Program Title:** Game/Simulation/Animation Programming  
**Program Type:** Career Preparatory  
**Career Cluster:** Information Technology

**Note 1:** The BTE Core, which is part of this program, will undergo major changes in the 2016 – 2017 school year. Please access the [BTE Core](#) document for more information.

Secondary – Career Preparatory	
Program Number	8208300
CIP Number	0550041116
Grade Level	9-12, 30, 31
Standard Length	4 credits
Teacher Certification	BUS ED 1 @2 COMPU SCI 6 COMM ART @7 7G TV PRO TEC @7 7G COMP PROG 7G
CTSO	FBLA BPA
SOC Codes (all applicable)	15-1199 – Computer Occupations, All Other 15-1131 – Computer Programmers
CTE Program Resources	<a href="http://www.fldoe.org/academics/career-adult-edu/career-tech-edu/program-resources.stml">http://www.fldoe.org/academics/career-adult-edu/career-tech-edu/program-resources.stml</a>

**Purpose**

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers such as a Game/Simulation Designer, Game Programmer, and Game Software Developer in the Information Technology career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Information Technology career cluster.

The content includes but is not limited to practical experiences in game/simulation conceptualization, design, storyboarding, development methodologies, essential programming techniques, and implementation issues. Specialized programming skills involving advanced mathematical calculations and physics are also integrated into the curriculum.

**Additional Information** relevant to this Career and Technical Education (CTE) program is provided at the end of this document.

**Program Structure**

This program is a planned sequence of instruction consisting of three occupational completion points. Students enrolling in this program must be computer literate. This literacy can be achieved by completing one credit of the Business Technology Education core. This includes Computing for College and Careers (8209020) or Introduction to Information Technology (8207310). It is also recommended that students complete core courses in advanced mathematics and physics. A student who completes the applicable competencies at any occupational completion point may either continue with the training program or exit as an occupational completer.

The following table illustrates the secondary program structure:

OCP	Course Number	Course Title	Length	SOC Code	Level	Graduation Requirements
A	8208110	Game & Simulation Foundations <b>OR</b>	1 credit	15-1199	2	VO
	8200320	Applied Computer Business Skills I <b>AND</b>	.5 credit		2	VO
	8200330	Applied Computer Business Skills II <b>OR</b>	.5 credit		2	
	8209020	Computing for College and Careers <b>OR</b>	1 credit		2	VO
	8207310	Introduction to Information Technology	1 credit		2	VO
	8208120	Game & Simulation Design	1 credit		2	VO
B	8208330	Game & Simulation Programming	1 credit	15-1131	3	VO
C	8208340	Multi-User Game & Simulation Programming	1 credit	15-1131	3	VO

*(Graduation Requirement Abbreviations- EQ= Equally Rigorous Science, PA= Practical Arts, EC= Economics, VO= Career and Technical Education)*

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**Academic Alignment Table**

Academic alignment is an ongoing, collaborative effort of professional educators specializing in the fields of science, mathematics, English/language arts, and Career and Technical Education (CTE). This initiative supports CTE programs by improving student performance through the integration of academic content within CTE courses. Career and Technical Education courses that have been aligned to the Next Generation Sunshine State Standards for Science and the Florida Standards for Mathematics and English/Language Arts will show the following data: the quantity of academic standards in the CTE course; the total number of standards contained in the academic course; and the percentage of alignment to the CTE course.

Courses	Anatomy/ Physiology Honors	Astronomy Solar/Galactic Honors	Biology 1	Chemistry 1	Earth-Space Science	Genetics Honors	Integrated Science 1	Marine Science 1 Honors	Physical Science	Physics 1	Environmental Science
8208110	1/87 1%	14/80 18%	23/83 28%	9/69 13%	28/67 42%	2/69 3%	28/82 34%	9/66 14%	34/74 46%	16/72 22%	6/70 9%
8207310	15/87 17%	22/80 28%	14/83 17%	20/69 29%	12/67 18%	15/69 22%	12/82 15%	23/66 35%	16/74 22%	18/72 25%	23/70 33%
8208120	6/87 7%	18/80 23%	27/83 33%	13/69 19%	31/67 46%	6/69 9%	31/82 38%	12/66 18%	41/74 55%	20/72 28%	13/70 19%
8208330	20/87 23%	20/80 25%	1/83 1%	20/69 29%	1/67 1%	20/69 29%	1/82 1%	15/66 23%	1/74 1%	20/72 28%	20/70 29%
8208340	22/87 25%	33/80 41%	5/83 6%	27/69 39%	7/67 10%	22/69 32%	9/82 11%	24/66 36%	5/74 7%	27/72 38%	24/70 34%

\*\* Alignment pending review

# Alignment attempted, but no correlation to academic course

Courses	Algebra 1	Algebra 2	Geometry	English 1	English 2	English 3	English 4
8208110	14/67 21%	9/75 12%	13/54 24%	0/46 0%	0/45 0%	0/45 0%	0/45 89%
8207310	20/67 30%	15/75 20%	4/54 7%	40/46 82%	40/45 83%	40/45 89%	40/45 0%
8208120	16/67 24%	11/75 15%	17/54 31%	7/46 15%	7/45 16%	7/45 16%	7/45 16%
8208330	8/67 12%	18/75 24%	8/54 15%	0/46 0%	0/45 0%	0/45 0%	0/45 0%
8208340	8/67 12%	14/75 19%	8/54 15%	0/46 0%	0/45 0%	0/45 0%	0/45 0%

\*\* Alignment pending review

# Alignment attempted, but no correlation to academic course

## **Program Recommendations**

This program is project-based and focuses on broad, transferable skills and stresses understanding and demonstration of the following rudiments of the game and simulation industry: production planning, elements of production design, storyboarding, elements of visual design, integration of digital audio and digital video into new game/simulation productions, programming for single and multi-user environments, delivery systems, and collaboration/teamwork.

The Foundations and Design courses should be taken in sequence prior to the Programming and Multi-User Programming courses. The Programming and Multi-User Programming courses may be taken concurrently. It is highly recommended that students complete a programming course prior to taking the last two courses of this program. The BTE core course may be taken concurrently with either the Foundations course or the Design course.

The Programming (8208330) and Multiuser Programming (8208340) courses should be offered with a concentration on one programming language

to ensure students are prepared for industry certifications.

The Game/Simulation/Animation Advanced Applications program (8208400) is an appropriate follow-on capstone program.

The Game/Simulation/Animation Programming program lends itself to integration of the core academic subjects of language arts, math, science, visual arts, and social studies into project activities. It is through a balanced and integrated curriculum that students attain the attitudes, skills, and knowledge needed to compete successfully in today's work force. To achieve total curriculum integration, academic and career and technical education teachers should be scheduled with common planning times.

### **Florida Standards for Technical Subjects**

*Florida Standards (FS) for English Language Arts and Literacy in History/Social Studies, Science, and Technical Subjects are the critical reading and writing literacy standards designed for grade 6 and above. These standards are predicated on teachers of history/social studies, science, and technical subjects using their content area expertise to help students meet the particular challenges of reading, writing, speaking, listening, and language in their respective fields. It is important to note that the 6-12 literacy standards in history/social studies, science, and technical subjects are not meant to replace content standards in those areas but rather to supplement them.*

This curriculum framework incorporates the grades 9-10 reading and writing literacy standards in the first two courses of this CTE program and grade 11-12 reading and writing literacy standards in the third and fourth courses of this CTE program. The standards for Mathematical Practices describe varieties of expertise that educators at all levels should seek to develop in their students. These practices rest on important “processes and proficiencies” with longstanding importance in mathematics education. This curriculum framework incorporates the appropriate mathematical practices in the first four courses of this CTE program.

## **Common Career Technical Core – Career Ready Practices**

Career Ready Practices describe the career-ready skills that educators should seek to develop in their students. These practices are not exclusive to a Career Pathway, program of study, discipline or level of education. Career Ready Practices should be taught and reinforced in all career exploration and preparation programs with increasingly higher levels of complexity and expectation as a student advances through a program of study.

1. Act as a responsible and contributing citizen and employee.
2. Apply appropriate academic and technical skills.
3. Attend to personal health and financial well-being.
4. Communicate clearly, effectively and with reason.
5. Consider the environmental, social and economic impacts of decisions.
6. Demonstrate creativity and innovation.
7. Employ valid and reliable research strategies.
8. Utilize critical thinking to make sense of problems and persevere in solving them.
9. Model integrity, ethical leadership and effective management.
10. Plan education and career path aligned to personal goals.
11. Use technology to enhance productivity.
12. Work productively in teams while using cultural/global competence.

## Standards

After successfully completing this program, the student will be able to perform the following:

- 01.0 Methods and strategies for using Florida Standards for grades 09-10 reading in Technical Subjects for student success in Game/Simulation/Animation Audio/Video Effects.
- 02.0 Methods and strategies for using Florida Standards for grades 09-10 writing in Technical Subjects for student success in Game/Simulation/Animation Audio/Video Effects.
- 03.0 Methods and strategies for using Florida Standards for grades 09-10 Mathematical Practices in Technical Subjects for student success in Game/Simulation/Animation Audio/Video Effects.
- 04.0 Create a game design production plan that describes the game play, outcomes, controls, interface and artistic style of a video game.
- 05.0 Use information technology tools.
- 06.0 Design and create a playable game.
- 07.0 Categorize the different gaming genres.
- 08.0 Categorize different gaming platforms.
- 09.0 Understand the historical significance of electronic and non-electronic games.
- 10.0 Describe the trends in current and future game development.
- 11.0 Identify the business model commonly used in game development industries.
- 12.0 Examine and categorize the significant processes in the production of games.
- 13.0 Understand the core tasks and challenges that face a video game design team.
- 14.0 Identify legal issues that affect games, developers and players.
- 15.0 Demonstrate the professional level of written and oral communication required in the game development industry.
- 16.0 Investigate career opportunities in the game industry.
- 17.0 Demonstrate an understanding of the vocabulary of the industry for discussing games and play.
- 18.0 Demonstrate research and information fluency.
- 19.0 Demonstrate an understanding of the techniques used to evaluate game mechanics, game play, flow, and game design.
- 20.0 Identify popular games and identify commonality between them.
- 21.0 Understand the general procedure and requirements of game design.
- 22.0 Explore the methods used to create and sustain player immersion.
- 23.0 Become familiar with popular game tools such as DirectX, 3DMax, and different gaming engines.
- 24.0 Demonstrate language arts knowledge and skills.
- 25.0 Demonstrate mathematics knowledge and skills.
- 26.0 Demonstrate science knowledge and skills.

**OR**

**For competencies associated with the BTE Core visit the following link: [BTE Core](#)  
The BTE Core includes the Technical Competencies of the first OCP A of this program.  
Technical competencies following OCP A:**

- 27.0 Create a working game or simulation individually or as part of a team.

- 28.0 Describe the game development life cycle.
- 29.0 Identify hardware constraints on video games including processors and I/O devices.
- 30.0 Understand the general principles of storytelling.
- 31.0 Understand character archetypes and character design.
- 32.0 Understand the use of storyboarding in game design.
- 33.0 Develop a game design document or cut.
- 34.0 Understand outlining in game designs.
- 35.0 Explore elements of puzzle design.
- 36.0 Discuss game designer strategy considerations.
- 37.0 Understand the process of creating and designing player choice.
- 38.0 Create and design the game flow as it relates to story and plot.
- 39.0 Assess common principles and procedures in game flow design.
- 40.0 Describe rule creation elements of player challenge.
- 41.0 Identify tools and software commonly used in game development.
- 42.0 Understand the technical methodologies for integrating digital media into a game or simulation.
- 43.0 Identify commonly used art and animation production tools in the game design industry.
- 44.0 Understand the general concepts of environmental design.
- 45.0 Describe how environmental design is used in conjunction with game level design.
- 46.0 Describe pertinent issues facing game designers.
- 47.0 Describe Monte Carlo simulation as it relates to game design.
- 48.0 Understand the use of inventory systems in game design.
- 49.0 Use information technology tools.
- 50.0 Describe the roles within a game studio.
- 51.0 Describe the importance of professional ethics and legal responsibilities.
- 52.0 Methods and strategies for using Florida Standards for grades 11-12 reading in Technical Subjects for student success in Game/Simulation/Animation Programming.
- 53.0 Methods and strategies for using Florida Standards for grades 11-12 writing in Technical Subjects for student success in Game/Simulation/Animation Programming.
- 54.0 Methods and strategies for using Florida Standards for grades 11-12 Mathematical Practices in Technical Subjects for student success in Game/Simulation/Animation Programming.
- 55.0 Identify functions of information processing.
- 56.0 Test programs.
- 57.0 Plan program design.
- 58.0 Code programs.
- 59.0 Perform program maintenance.
- 60.0 Create and maintain documentation.
- 61.0 Evaluate assigned game programming tasks.
- 62.0 Implement enhanced program structures.
- 63.0 Demonstrate the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance.
- 64.0 Demonstrate leadership and teamwork skills needed to accomplish team goals and objectives.
- 65.0 Demonstrate personal money-management concepts, procedures, and strategies.

- 66.0 Identify and describe basic network terminology and network security.
- 67.0 Game configuration.
- 68.0 Test programs.
- 69.0 Plan program design.
- 70.0 Create and maintain documentation.
- 71.0 Code programs.
- 72.0 Demonstrate an understanding of operating systems, environments, and platforms.
- 73.0 Implement enhanced program structures.
- 74.0 Implement multimedia programming.
- 75.0 Develop an understanding of programming techniques and concepts.

Florida Department of Education  
Student Performance Standards

Course Title: Game & Simulation Foundations  
 Course Number: 8208110  
 Course Credit: 1

Course Description:

This course is designed to provide an introduction to game and simulation concepts and careers, the impact game and simulation has on society and industry, and basic game/simulation design concepts such as rule design, play mechanics, and media integration. This course compares and contrasts games and simulations, key development methodologies and tools, careers, and industry-related information. This course also covers strategies, processes, and methods for conceptualizing a game or simulation application; storyboarding techniques; and development tools.

Hands-on activities using an entry-level game development tool should be integrated into the curriculum. **Regardless of topic sequencing, the culminating activity is the creation of a playable game.**

Game & Simulation Creation

Instruction relating to the standards in this section should be interspersed throughout the entire course with the other standards taught progressively in the context of game design and development.

Florida Standards		Correlation to CTE Program Standard #
01.0	Methods and strategies for using Florida Standards for grades 09-10 reading in Technical Subjects for student success in Game/Simulation/Animation Visual Design.	
01.01	Key Ideas and Details	
01.01.1	Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions. LAFS.910.RST.1.1	
01.01.2	Determine the central ideas or conclusions of a text; trace the text’s explanation or depiction of a complex process, phenomenon, or concept; provide an accurate summary of the text. LAFS.910.RST.1.2	
01.01.3	Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text. LAFS.910.RST.1.3	
01.02	Craft and Structure	
01.02.1	Determine the meaning of symbols, key terms, and other domain-specific	

Florida Standards		Correlation to CTE Program Standard #
	words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics. LAFS.910.RST.2.4	
01.02.2	Analyze the structure of the relationships among concepts in a text, including relationships among key terms (e.g., force, friction, reaction force, energy). LAFS.910.RST.2.5	
01.02.3	Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, defining the question the author seeks to address. LAFS.910.RST.2.6	
01.03 Integration of Knowledge and Ideas		
01.03.1	Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words. LAFS.910.RST.3.7	
01.03.2	Assess the extent to which the reasoning and evidence in a text support the author's claim or a recommendation for solving a scientific or technical problem. LAFS.910.RST.3.8	
01.03.3	Compare and contrast findings presented in a text to those from other sources (including their own experiments), noting when the findings support or contradict previous explanations or accounts. LAFS.910.RST.3.9	
01.04 Range of Reading and Level of Text Complexity		
01.04.1	By the end of grade 9, read and comprehend literature [informational texts, history/social studies texts, science/technical texts] in the grades 9–10 text complexity band proficiently, with scaffolding as needed at the high end of the range.	
01.04.2	By the end of grade 10, read and comprehend literature [informational texts, history/social studies texts, science/technical texts] at the high end of the grades 9–10 text complexity band independently and proficiently. LAFS.910.RST.4.10	
02.0 Methods and strategies for using Florida Standards for grades 09-10 writing in Technical Subjects for student success in Game/Simulation/Animation Visual Design.		
02.01 Text Types and Purposes		
02.01.1	Write arguments focused on discipline-specific content. LAFS.910.WHST.1.1	
02.01.2	Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes. LAFS.910.WHST.1.2	

Florida Standards		Correlation to CTE Program Standard #
02.02	Production and Distribution of Writing	
02.02.1	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. LAFS.910.WHST.2.4	
02.02.2	Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience. LAFS.910.WHST.2.5	
02.02.3	Use technology, including the Internet, to produce, publish, and update individual or shared writing products, taking advantage of technology's capacity to link to other information and to display information flexibly and dynamically. LAFS.910.WHST.2.6	
02.03	Research to Build and Present Knowledge	
02.03.1	Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation. LAFS.910.WHST.3.7	
02.03.2	Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the usefulness of each source in answering the research question; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation. LAFS.910.WHST.3.8	
02.03.3	Draw evidence from informational texts to support analysis, reflection, and research. LAFS.910.WHST.3.9	
02.04	Range of Writing	
02.04.1	Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences. LAFS.910.WHST.4.10	
03.0	Methods and strategies for using Florida Standards for grades 09-10 Mathematical Practices in Technical Subjects for student success in Game/Simulation/Animation Visual Design.	
03.01	Make sense of problems and persevere in solving them. MAFS.K12.MP.1.1	
03.02	Reason abstractly and quantitatively. MAFS.K12.MP.2.1	
03.03	Construct viable arguments and critique the reasoning of others.	

Florida Standards	Correlation to CTE Program Standard #
	MAFS.K12.MP.3.1
03.04 Model with mathematics.	MAFS.K12.MP.4.1
03.05 Use appropriate tools strategically.	MAFS.K12.MP.5.1
03.06 Attend to precision.	MAFS.K12.MP.6.1
03.07 Look for and make use of structure.	MAFS.K12.MP.7.1
03.08 Look for and express regularity in repeated reasoning.	MAFS.K12.MP.8.1

**Abbreviations:**

FS-M/LA = Florida Standards for Math/Language Arts

NGSSS-Sci = Next Generation Sunshine State Standards for Science

CTE Standards and Benchmarks	FS-M/LA	NGSSS-Sci
04.0 Create a game design production plan that describes the game play, outcomes, controls, interface and artistic style of a video game. – The student will be able to:		
04.01 Use industry standard game design production documents to create a game design production plan.		SC.912.N.1.1
05.0 Use information technology tools. – The student will be able to:		SC.912.P.10.1; 10.2; 10.5; 10.16; 12.2
05.01 Use personal information management (PIM) applications to increase workplace efficiency.		
05.02 Employ technological tools to expedite workflow including word processing, databases, reports, spreadsheets, multimedia presentations, electronic calendar, contacts, email, and internet applications.		
06.0 Design and create a playable game. – The student will be able to:		
06.01 Use a number of computer tools to enhance and ease game programming and artistry.		
06.02 Use a game engine to create a playable game.		SC.912.N.1.1
06.03 Use animated objects.		SC.912.N.1.1
06.04 Integrate sound and music to enhance the game experience.		SC.912.N.3.5
06.05 Test and debug to game completion.		SC.912.N.1.1
07.0 Categorize the different gaming genres. – The student will be able to:		

CTE Standards and Benchmarks	FS-M/LA	NGSSS-Sci
07.01 Research, compare and categorize the different gaming genres.		SC.912.L.15.4
07.02 Analyze examples of different gaming genres.		SC.912.L.15.6
07.03 Define and use the necessary vocabulary related to gaming and the different genres.		
08.0 Categorize different gaming platforms. – The student will be able to:		
08.01 Research, compare and categorize different gaming platforms.		SC.912.N.1.1
08.02 Analyze the distinctive features of each system.		SC.912.L.15.6
08.03 Define the target audience for different platforms based on features, available games, and price of system and games.		
08.04 Define and use the necessary vocabulary related to gaming platforms.		
09.0 Understand the historical significance of electronic and non-electronic games. – The student will be able to:		SC.912.P.10.18; 10.20.
09.01 Discuss the history of non-electronic games.		SC.912.N.3.2
09.02 Describe the history and theory of mainstream and experimental media including radio, movies, television, art, and theatre.		SC.912.N.2.4
09.03 Explain the historical timeline of electronic games, marking the significant highlights in their evolution.		
10.0 Describe the trends in current and future game development. – The student will be able to:		SC.912.N.1.7; .3.5; SC.912.P.10.2; 10.10; 12.2; 12.3; 12.5; 12.6.
10.01 Determine and analyze the significant trends in game development in the past two decades.		SC.912.N.1.1
10.02 Research and brainstorm the possibilities for the future of electronic games based on current and emerging technologies and future predictions.		SC.912.N.1.1
11.0 Identify the business model commonly used in game development industries. – The student will be able to:		
11.01 Identify, define and discuss the different ways games are funded, marketed and sold.		
11.02 Identify and describe licensing management for different gaming platforms.		
11.03 Discuss the product value and business differences between major game platforms.		
11.04 Identify successful business models and analyze various facets of those models, such as market analysis, marketing strategy, and product value.		

CTE Standards and Benchmarks	FS-M/LA	NGSSS-Sci
11.05 Discuss the opportunities available to independent game developers and entrepreneurs in the mobile application market.		
12.0 Examine and categorize the significant processes in the production of games. – The student will be able to:		SC.912.N.1.1; 1.5
12.01 Discuss the relationships between publishers, developers, distributors, marketers, and retailers.		
12.02 Identify processes of development including content creation, team roles, design documentation, and process management.		
12.03 Explore and describe the effects of globalization on the design and production of video games.		
13.0 Understand the core tasks and challenges that face a video game design team. – The student will be able to:		SC.912.N.1.1
13.01 Identify and define the roles and responsibilities of team members on a video game design team.		SC.912.L.14.2
13.02 Describe the effects of group dynamics and the importance of team building for a design team.		
13.03 Explore and discuss methods of communications and scheduling for design teams.		
13.04 Describe the importance and interrelationship between development schedule and budget constraints in video game design.		
14.0 Identify legal issues that affect games, developers and players. – The student will be able to:		
14.01 Define and discuss intellectual property and contract law as it relates to the gaming industry.		
14.02 Describe legal and liability issues that could affect online communities.		SC.912.N.1.3
14.03 Compare and contrast government and industry content regulation and industry ratings of video games.		
15.0 Demonstrate the professional level of written and oral communication required in the game development industry. – The student will be able to:		SC.912.N.1.1
15.01 Use listening, speaking, telecommunication and nonverbal skills and strategies to communicate effectively with supervisors, co-workers, and customers.		SC.912.N.1.1
15.02 Organize ideas and communicate oral and written messages appropriate for the game development industry environment.		SC.912.N.1.1
15.03 Identify, define, and discuss terminology appropriate for both internal and external communications in the game development industry environment.		
15.04 Compose electronic documents used to facilitate formal and informal communication in the game industry such as letters, reports, memos, emails, presentations, budgets, charts and calendars.		

CTE Standards and Benchmarks		FS-M/LA	NGSSS-Sci
16.0	Investigate career opportunities in the game industry. – The student will be able to:		SC.912.N.4.2
16.01	Use personal assessment tools to identify personal strengths and weaknesses related to learning and work environments.		
16.02	Analyze job and career requirements and relate career interests to opportunities in the global economy.		
16.03	Describe job requirements for a variety of occupations within the game development industry.		
16.04	Identify current employment trends and career opportunities in the game industry.		
16.05	Evaluate personal aptitude and skills to match specific employment opportunities.		
16.06	Develop an educational plan to acquire the skills and requirements of a selected employment opportunity within the game industry.		
17.0	Demonstrate an understanding of the vocabulary of the industry for discussing games and play. – The student will be able to:		
17.01	Identify, define, and discuss professional game design and analysis terminology appropriate for internal and external communications in a game design environment.		
17.02	Identify and define the vocabulary used by game players and online gaming communities.		
18.0	Demonstrate research and information fluency. - The student will be able to:		
18.01	Locate, analyze, process, and organize data from multiple sources including the Internet.		
18.02	Play games to research and collect game play data.		
18.03	Evaluate, analyze and document game styles and playability.		
18.04	Determine the dramatic elements in games, including kinds of fun, player types and nonlinear storytelling.		
19.0	Demonstrate an understanding of the techniques used to evaluate game mechanics, game play, flow and game design. – The student will be able to:		
19.01	Test and analyze games to determine the quality of rules, interfaces, navigation, performance, play, artistry and longevity in design and structure.		SC.912.N.1.1
19.02	Research and evaluate the game analysis techniques used by the video game industry.		SC.912.N.1.1
19.03	Identify the key elements in a game and make intelligent judgments about whether the game succeeded or failed in its objectives.		SC.912.N.1.1
19.04	Evaluate professional reviews and write a critical analysis of a current video game.		SC.912.N.1.1
20.0	Identify popular games and identify commonality between them. – The student will be able to:		

CTE Standards and Benchmarks	FS-M/LA	NGSSS-Sci
20.01 Analyze and deconstruct game environments and interactions.		SC.912.N.1.1
20.02 Compare and contrast the top selling video games in terms of player interaction, plot complexity, and reward.		
20.03 Categorize gameplay elements by player type. (killer, talker, explorer and achiever)		
21.0 Understand the general procedure and requirements of game design. – The student will be able to:		SC.912.N.1.7
21.01 Describe the design process from conception to production.		SC.912.N.1.1
21.02 Explain the iterative nature of game design through the different stages of design iterations including pre-alpha, alpha, beta, release candidate, going gold and support.		
21.03 Develop design plans, for example, character sketches, documentation and storyboards for proposed games.		
22.0 Explore the methods used to create and sustain player immersion. – The student will be able to:		
22.01 Research and define the term “player immersion”.		
22.02 Explore and explain the factors that create player immersion in a game.		
22.03 Examine popular games and explain the methods each game uses to increase player immersion.		
23.0 Become familiar with popular game technology such as DirectX, 3DMAX, and different gaming engines. – The student will be able to:		
23.01 Identify and discuss the popular game development tools currently used in the industry.		
23.02 Identify and discuss popular gaming engines.		
23.03 Research and analyze the uses for different game development tools.		SC.912.N.1.1
24.0 Demonstrate language arts knowledge and skills. – The student will be able to:		
24.01 Locate, comprehend and evaluate key elements of oral and written information.		SC.912.N.1.1
24.02 Draft, revise, and edit written documents using correct grammar, punctuation and vocabulary.		
24.03 Present information formally and informally for specific purposes and audiences.		SC.912.N.1.1
25.0 Demonstrate mathematics knowledge and skills. – The student will be able to:		
25.01 Demonstrate knowledge of arithmetic operations.		SC.912.P.10.3
25.02 Analyze and apply data and measurements to solve problems and interpret documents.		SC.912.N.1.1

CTE Standards and Benchmarks	FS-M/LA	NGSSS-Sci
25.03 Construct charts/tables/graphs using functions and data.	MAFS.912.F-IF.3.7	SC.912.N.1.1
26.0 Demonstrate science knowledge and skills. – The student will be able to:		
26.01 Discuss the role of creativity in constructing scientific questions, methods and explanations.		SC.912.N.1.7
26.02 Formulate scientifically investigable questions, construct investigations, collect and evaluate data, and develop scientific recommendations based on findings.		SC.912.N.1.1

**As an alternative to Game & Simulation Foundations students can take ACBI & II or CCC or IIT.**

**BTE Core:**

The first course recommended in this program is a selection from the BTE Core (**Applied Computer Business Skills I and II, or Computing for College and Careers, or Introduction to Information Technology**). The course selections and their descriptions are located here: [BTE Core](#)  
Student course enrollment in the BTE Core, as with all other secondary courses, requires the reporting of a program in which the student is enrolled. The BTE Core is not an independent program, but a selection of courses for the initial OCP of a program. Student enrollment in the BTE Core cannot be reported without an accompanying program number. Teacher certification and other information regarding the BTE Core is identified by the program in which the student is enrolled. See the selected program framework for the appropriate information.

2015 – 2016

**Florida Department of Education  
Student Performance Standards**

**Course Title:** Game & Simulation Design  
**Course Number:** 8208120  
**Course Credit:** 1

**Course Description:**

This course covers fundamental principles of designing a game or a simulation application, rules and strategies of play, conditional branching, design and development constraints, use of sound and animation, design tools, and implementation issues. The content includes market research, product design documentation, storyboarding, proposal development, and presentation of a project report. Emphasis is placed on the techniques needed to develop well-documented, structured game or simulation programs. Extensive use is made of evaluating and analyzing existing games or simulations.

Hands-on activities using an entry-level game development tool should be integrated into the curriculum. **Regardless of topic sequencing, the culminating activity is the creation and presentation of a playable game with design documentation.**

**Game/Simulation Project**

Instruction relating to the standards in this section should be interspersed throughout the entire course with the other standards taught progressively in the context of game design and development.

Florida Standards		Correlation to CTE Program Standard #
01.0	Methods and strategies for using Florida Standards for grades 09-10 reading in Technical Subjects for student success in[Game/Simulation/Animation Visual Design.	
01.01	Key Ideas and Details	
01.01.1	Cite specific textual evidence to support analysis of science and	

Florida Standards		Correlation to CTE Program Standard #
	technical texts, attending to the precise details of explanations or descriptions. LAFS.910.RST.1.1	
01.01.2	Determine the central ideas or conclusions of a text; trace the text's explanation or depiction of a complex process, phenomenon, or concept; provide an accurate summary of the text. LAFS.910.RST.1.2	
01.01.3	Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text. LAFS.910.RST.1.3	
01.02 Craft and Structure		
01.02.1	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics. LAFS.910.RST.2.4	
01.02.2	Analyze the structure of the relationships among concepts in a text, including relationships among key terms (e.g., force, friction, reaction force, energy). LAFS.910.RST.2.5	
01.02.3	Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, defining the question the author seeks to address. LAFS.910.RST.2.6	
01.03 Integration of Knowledge and Ideas		
01.03.1	Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words. LAFS.910.RST.3.7	
01.03.2	Assess the extent to which the reasoning and evidence in a text support the author's claim or a recommendation for solving a scientific or technical problem. LAFS.910.RST.3.8	
01.03.3	Compare and contrast findings presented in a text to those from other sources (including their own experiments), noting when the findings support or contradict previous explanations or accounts. LAFS.910.RST.3.9	
01.04 Range of Reading and Level of Text Complexity		
01.04.1	By the end of grade 9, read and comprehend literature [informational texts, history/social studies texts, science/technical texts] in the grades 9–10 text complexity band proficiently, with scaffolding as needed at the	

Florida Standards		Correlation to CTE Program Standard #
01.04.2	high end of the range. By the end of grade 10, read and comprehend literature [informational texts, history/social studies texts, science/technical texts] at the high end of the grades 9–10 text complexity band independently and proficiently. LAFS.910.RST.4.10	
02.0	Methods and strategies for using Florida Standards for grades 09-10 writing in Technical Subjects for student success in Game/Simulation/Animation Visual Design.	
02.01	Text Types and Purposes	
02.01.1	Write arguments focused on discipline-specific content. LAFS.910.WHST.1.1	
02.01.2	Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes. LAFS.910.WHST.1.2	
02.02	Production and Distribution of Writing	
02.02.1	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. LAFS.910.WHST.2.4	
02.02.2	Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience. LAFS.910.WHST.2.5	
02.02.3	Use technology, including the Internet, to produce, publish, and update individual or shared writing products, taking advantage of technology's capacity to link to other information and to display information flexibly and dynamically. LAFS.910.WHST.2.6	
02.03	Research to Build and Present Knowledge	
02.03.1	Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation. LAFS.910.WHST.3.7	
02.03.2	Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the usefulness of each source in answering the research question; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation. LAFS.910.WHST.3.8	
02.03.3	Draw evidence from informational texts to support analysis, reflection, and research.	

Florida Standards		Correlation to CTE Program Standard #
	LAFS.910.WHST.3.9	
02.04	Range of Writing	
02.04.1	Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences. LAFS.910.WHST.4.10	
03.0	Methods and strategies for using Florida Standards for grades 09-10 Mathematical Practices in Technical Subjects for student success in Game/Simulation/Animation Visual Design.	
03.01	Make sense of problems and persevere in solving them. MAFS.K12.MP.1.1	
03.02	Reason abstractly and quantitatively. MAFS.K12.MP.2.1	
03.03	Construct viable arguments and critique the reasoning of others. MAFS.K12.MP.3.1	
03.04	Model with mathematics. MAFS.K12.MP.4.1	
03.05	Use appropriate tools strategically. MAFS.K12.MP.5.1	
03.06	Attend to precision. MAFS.K12.MP.6.1	
03.07	Look for and make use of structure. MAFS.K12.MP.7.1	
03.08	Look for and express regularity in repeated reasoning. MAFS.K12.MP.8.1	

**Abbreviations:**

FS-M/LA = Florida Standards for Math/Language Arts

NGSSS-Sci = Next Generation Sunshine State Standards for Science

CTE Standards and Benchmarks		FS-M/LA	NGSSS-Sci
27.0	Create a working game or simulation individually or as part of a team. – The student will be able to:		SC.912.N.1.1
27.01	Create a storyboard describing the essential elements, plot, flow, and functions of the game/simulation.	MAFS.912.G-MG.1.3	
27.02	Create a design specification document to include interface and delivery choices, rules of play, navigation functionality, scoring, media choices, start and end of play, special features, and development team credits.		
27.03	Using a simple game development tool, create a game or simulation.		SC.912.N.3.5

CTE Standards and Benchmarks	FS-M/LA	NGSSS-Sci
27.04 Present the game or simulation.		SC.912.N.3.5
28.0 Describe the game development life cycle. – The student will be able to:		SC.912.P.10.13; 10.14; 10.15; 10.18
28.01 Identify steps in the pre-production process including the proof of concept and market research.		
28.02 Describe the iterative prototyping process – Alpha, Beta, RTM.		
28.03 Determine platform, technology and scripting requirements.		
28.04 Implement techniques of scenario development, levels, and missions.		
28.05 Discuss game testing requirements and methods.		SC.912.N.1.1
28.06 Identify and describe maintenance, upgrade and sequel issues.		
29.0 Identify hardware constraints on video games including processors and I/O devices. – The student will be able to:		
29.01 Identify the different control systems for video games.		
29.02 Compare and contrast personal computer and video game console hardware, including display systems.	MAFS.912.S-CP.1.1	
29.03 Explain the factors that can limit the game-playing ability of personal computers.		SC.912.L.17.5
30.0 Understand the general principles of storytelling. – The student will be able to:		
30.01 Identify the essential elements of a story.		
30.02 Describe how creative writing is used as a game design tool.		
30.03 Compare and contrast methods of delivering a story in a game.		
31.0 Understand character archetypes and character design. – The student will be able to:		
31.01 Research and identify common character archetypes used in computer games.		
31.02 Design character prototypes to physically match archetype.		
31.03 Apply symbolize and semiotic design elements within character design to convey meaning.		
31.04 Create character backstory and profile.		

CTE Standards and Benchmarks	FS-M/LA	NGSSS-Sci
32.0 Understand the use of storyboarding in game design. – The student will be able to:		
32.01 Assess the techniques used in the gaming industry for rendering basic Game Design Art.		
32.02 Describe how game layout charts are used in game design.		
32.03 Describe how storyboards in the game design process can be used as a pre-development sales tool.		
32.04 Analyze and compare the use of storyboards in the game design industry with regard to environmental illustrations, level designs, character designs, model sheets and GUI Designs.		
33.0 Develop a game design document or cut. – The student will be able to:		
33.01 Evaluate and discuss the choice of delivery system.		
33.02 Evaluate and discuss choices of genre, game design software, art, digital media, and animation software.		
33.03 Create a game strategy overview, character overview, and storyboard overview.		
33.04 Define the rules of play and multi-player options.		
33.05 Create the layout and interfaces overview and digital media overview.	MAFS.912.G-MG.1.3	
33.06 Determine the gameplay interaction requirements and create the progression levels overview.		
33.07 Define strategic positioning of game immersion dynamics and psychological effect.		SC.912.N.1.1
33.08 Identify hardware and software constraints.		SC.912.L.17.5
34.0 Understand outlining in game designs. – The student will be able to:		
34.01 Assess techniques of goal design in gaming.		
34.02 Describe the concept of nested victories.		
34.03 Discuss the use of players as agents of change.		
34.04 Compare and contrast examples of understandable context in gaming.		
34.05 Discuss the principles underlying the creation of understandable rules.		
34.06 Describe how skill building is used in game design.		

CTE Standards and Benchmarks	FS-M/LA	NGSSS-Sci
34.07 Describe conventional techniques of positive feedback.		
34.08 Discuss functional consistency as it relates to the use of interfaces.		
35.0 Explore elements of puzzle design. – The student will be able to:		SC.912.P.10.14; 10.15.
35.01 Describe the essential elements of a puzzle.		
35.02 Identify the different types of puzzles.		
35.03 Describe the basic principles of high-level puzzle design.		
35.04 Describe the basic principles of low-level puzzle design.		
36.0 Discuss game designer strategy considerations. – The student will be able to:		SC.912.L.17.15
36.01 Describe the use of artificial intelligence challenges in game design and the need for giving the player rest time between challenges.		
36.02 Evaluate the impact of randomness in game design especially as it pertains to pattern recognition.	MAFS.912.S-MD.1.1 MAFS.912.S-MD.1.2	
36.03 Identify techniques used in the industry to help the player to navigate.		
36.04 Explain the use of “just barely” victories and failures as an exciting and immersive technique.		
36.05 Assess techniques used to provide a range of challenges and appeal to a wide range of abilities.		
36.06 Describe the psychological cost of failure in games as it pertains to immersion and psychological effect.		
36.07 Identify methods of preparing the player for greater challenge while allowing for plot development as the story serves the game.		
37.0 Understand the process of creating and designing player choice. – The student will be able to:		
37.01 Discuss the principles of player-centric design.		
37.02 Research and correlate game complexity level to appropriate age group such that content matches user skill set required.		SC.912.N.1.1
37.03 Examine and discuss design elements that encourage continuous active engagement both mental and physical.		
37.04 Analyze design elements that maintain player interest and vary the degree of challenge.		SC.912.N.1.1
37.05 Discuss the need for a balance of design elements for the purpose of rewarding and frustrating players.		

CTE Standards and Benchmarks	FS-M/LA	NGSSS-Sci
38.0 Create and design the game flow as it relates to story and plot. – The student will be able to:		
38.01 Identify techniques of introducing the story plot and beginning play.		
38.02 Describe story plot development techniques for the middle of play in game design.		
38.03 Analyze and discuss planning techniques for climax and finale of games.		
39.0 Assess common principles and procedures in game flow design. – The student will be able to:		
39.01 Assess missions and scenarios game flow techniques.		
39.02 Describe common use of mission design and campaigns.		
39.03 Evaluate usage of static versus dynamic campaigns.		
40.0 Describe player challenge rule creation elements. – The student will be able to:		
40.01 Research common design methods for clearing obstacles or series of obstacles.		SC.912.N.1.1
40.02 Describe common design elements introducing skill, luck and combinations including escalating challenges to games.		
40.03 Identify common design elements used to vary weapons, characters and tools.		
40.04 Discuss the incorporation of risk reward and adaptive challenges (AI).		
40.05 Evaluate industry use of boss encounters in games.		
40.06 Analyze and discuss design considerations from the perspective of other players and multi-player environments.		
41.0 Identify tools and software commonly used in game development. – The student will be able to:		
41.01 Identify and discuss the popular game development tools currently used in the industry.		
41.02 Identify and discuss popular gaming engines.		
41.03 Identify and discuss popular world building tools.		
42.0 Understand the technical methodologies for integrating digital media into a game or simulation. – The student will be able to:		
42.01 Survey and discuss the use of naming conventions and temp sounds.		
42.02 Analyze and discuss methods of matching sound effects to art assets.		

CTE Standards and Benchmarks	FS-M/LA	NGSSS-Sci
42.03 Identify and categorize commonly used technology sound engine integration equipment.		
42.04 Identify and discuss resources such as sound effects libraries.		SC.912.P.10.21
42.05 Examine methods of sound implementation and associated software.		
42.06 Describe how and why digital video may be integrated into a game or simulation design.		
42.07 Describe how special effects differ from animation.		
43.0 Identify commonly used art and animation production tools in the game design industry. – The student will be able to:		
43.01 Identify, categorize and discuss art and animation tools commonly used in game design.		
44.0 Understand the general concepts of environmental design. – The student will be able to:		
44.01 Survey and evaluate commonly used concept art.		
44.02 Create a world sketch with particular attention to maintaining continuity of style.		
44.03 Describe the emotional/psychological aspects of environmental design that signify mood, façade of freedom, and resource struggling.		
45.0 Describe how environmental design is used in conjunction with game level design. – The student will be able to:		
45.01 Examine and evaluate examples of focus on a theme.		
45.02 Describe methods of creating a purposeful architecture giving consideration to continuity and themes and taking advantage of revisiting.		
45.03 Consider and discuss environmental design elements for multi-player or single player games.		
45.04 Describe the history of creating shifts in game design environments and embracing novel ideas.		
45.05 Identify and discuss environmental design pitfalls such as red herrings and cookie-cutter layouts.		
46.0 Describe pertinent issues facing game designers. – The student will be able to:		
46.01 Discuss the meaning of simulation and give examples of simulation and complexity including architecture, exposure, concealment and heuristics.		
46.02 Describe applied event modeling including goal discovery, map making, event exploration, developing incentives and learning in event modeling for games.		
46.03 Explain the concepts of modes of understanding, inductive and iconic logic, significance and saturation in event modeling for game design.		

CTE Standards and Benchmarks	FS-M/LA	NGSSS-Sci
47.0 Describe Monte Carlo simulation as it relates to game design. – The student will be able to:		SC.912.P.8.7; 10.1; 10.2; 10.4; 10.5; 10.10; 12.3; 12.4; 12.5; 12.6; SC.912.L.14.16; 17.5; 17.15; SC.912.N.1.7
47.01 Discuss the process of specifying events including contexts of simulation, translating event models to simulations, formalizing thematic objectives, prototyping, interface design and use cases with modeling.		
47.02 Discuss the process of designing entities including behavior and entity graphics.		
47.03 Describe the implementation of entities including enumerating animations, playing with time, creating events, adding an entity class, and creating entity events and behaviors.		
47.04 Analyze event modeling in creating a world including the creation of a world class, adding and removing entities, accessing entities, updating and rendering, adding scene hierarchies and handling world events.		
47.05 Assess and discuss AI and physics issues for simulation including AI event contexts, adding intelligence and gravity, adding collision detection, updating for collisions and applying mass and force.		SC.912.P.10.6, SC.912.P.12.2, SC.912.P.12.3, SC.912.P.12.4, SC.912.P.12.5
47.06 Discuss environmental elements of simulation including logic, cognitive saturation, systems and interpretation, context of reality, shadows and lighting.		
47.07 Discuss the simulation of physical systems such as trees and forests and related events such as fires, or insect swarms such as beehives, bird flocks or anthills.		
47.08 Describe the simulation of social and economic systems including practical applications, historical precedents, modeling for community events, creation of communities including structures, states events and rendering and altering building states, population behaviors, and controlling influences.		
47.09 Describe the process of testing simulations and event models including effectiveness, diagrammatic systems evaluation, context influence, path transitions and assessing messages.		SC.912.N.1.1
48.0 Understand the use of inventory systems in game design. – The student will be able to:		
48.01 Discuss the various methods of describing items in player’s inventory in contemporary game design.		
48.02 Review and discuss industry methods of communicating how inventory items can have an effect on game play.		
49.0 Use information technology tools. – The student will be able to:		
49.01 Employ technological tools to expedite workflow including word processing, databases, reports, spreadsheets, multimedia presentations, electronic calendar, contacts, email,		SC.912.N.1.1

CTE Standards and Benchmarks	FS-M/LA	NGSSS-Sci
and internet applications.		
49.02 Employ computer operations applications to access, create, manage, integrate, and store information.		
49.03 Employ collaborative/groupware applications to facilitate group work.		
50.0 Describe the roles within a game studio. – The student will be able to:		
50.01 Describe the nature and types of business organizations.		
50.02 Explain the effect of key organizational systems on performance and quality.		
50.03 List and describe quality control systems and/or practices common to the workplace.		
50.04 Explain the impact of the global economy on business organizations.		SC.912.N.4.2
51.0 Describe the importance of professional ethics and legal responsibilities. – The student will be able to:		
51.01 Evaluate and justify decisions based on ethical reasoning.		SC.912.L.16.10
51.02 Evaluate alternative responses to workplace situations based on personal, professional, ethical, legal responsibilities, and employer policies.		
51.03 Identify and explain personal and long-term consequences of unethical or illegal behaviors in the workplace.		
51.04 Interpret and explain written organizational policies and procedures.		

**Florida Department of Education  
Student Performance Standards**

**Course Title:** Game & Simulation Programming  
**Course Number:** 8208330  
**Course Credit:** 1

**Course Description:**

This course is focused on students acquiring the appropriate programming skills for rendering a game or simulation product, including program control, conditional branching, memory management, score-keeping, timed event strategies and methodologies, and implementation issues.

Standards included in this course of instruction have been aligned to the academic courses shown below. This table shows the number of aligned benchmarks, the total number of academic benchmarks, and the percentage of alignment.

<b>Florida Standards</b>		<b>Correlation to CTE Program Standard #</b>
52.0	Methods and strategies for using Florida Standards for grades 11-12 reading in Technical Subjects for student success in Game/Simulation/Animation Programming.	
52.01	Key Ideas and Details	
52.01.1	Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.  LAFS.1112.RST.1.1	
52.01.2	Determine the central ideas or conclusions of a text; trace the text’s explanation or depiction of a complex process, phenomenon, or concept; provide an accurate summary of the text.  LAFS.1112.RST.1.2	
52.01.3	Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.  LAFS.1112.RST.1.3	
52.02	Craft and Structure	
52.02.1	Determine the meaning of symbols key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics.  LAFS.1112.RST.2.4	
52.02.2	Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.  LAFS.1112.RST.2.5	
52.02.3	Analyze the author’s purpose in providing an explanation, describing a	

Florida Standards		Correlation to CTE Program Standard #
	procedure, or discussing an experiment in a text, identifying important issues that remain unresolved. LAFS.1112.RST.2.6	
<b>52.03 Integration of Knowledge and Ideas</b>		
52.03.1	Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g. quantitative data, video, multimedia) in order to address a question or solve a problem. LAFS.1112.RST.3.7	
52.03.2	Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information. LAFS.1112.RST.3.8	
52.03.3	Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible. LAFS.1112.RST.3.9	
<b>52.04 Range of Reading and Level of Text Complexity</b>		
52.04.1	By the end of grade 11, read and comprehend literature [informational texts, history/social studies texts, science/technical texts] in the grades 11–CCR text complexity band proficiently, with scaffolding as needed at the high end of the range. By the end of grade 12, read and comprehend literature [informational texts, history/social studies texts, science/technical texts] at the high end of the grades 11–CCR text complexity band independently and proficiently. LAFS.1112.RST.4.10	
52.04.2		
<b>53.0 Methods and strategies for using Florida Standards for grades 11-12 writing in Technical Subjects for student success in Game/Simulation/Animation Programming.</b>		
<b>53.01 Text Types and Purposes</b>		
53.01.1	Write arguments focused on discipline-specific content. LAFS.1112.WHST.1.1	
53.01.2	Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes. LAFS.1112.WHST.1.2	
<b>53.02 Production and Distribution of Writing</b>		
53.02.1	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. LAFS.1112.WHST.2.4	
53.02.2	Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.	

Florida Standards		Correlation to CTE Program Standard #
	LAFS.1112.WHST.2.5	
53.02.3	Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.	
	LAFS.1112.WHST.2.6	
53.03	Research to Build and Present Knowledge	
53.03.1	Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.	
	LAFS.1112.WHST.3.7	
53.03.2	Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.	
	LAFS.1112.WHST.3.8	
53.03.3	Draw evidence from informational texts to support analysis, reflection, and research.	
	LAFS.1112.WHST.3.9	
53.04	Range of Writing	
53.04.1	Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.	
	LAFS.1112.WHST.4.10	
54.0	Methods and strategies for using Florida Standards for grades 11-12 Mathematical Practices in Technical Subjects for student success in Game/Simulation/Animation Programming.	
54.01	Make sense of problems and persevere in solving them.	
	MAFS.K12.MP.1.1	
54.02	Reason abstractly and quantitatively.	
	MAFS.K12.MP.2.1	
54.03	Construct viable arguments and critique the reasoning of others.	
	MAFS.K12.MP.3.1	
54.04	Model with mathematics.	
	MAFS.K12.MP.4.1	
54.05	Use appropriate tools strategically.	
	MAFS.K12.MP.5.1	
54.06	Attend to precision.	
	MAFS.K12.MP.6.1	

Florida Standards	Correlation to CTE Program Standard #
54.07 Look for and make use of structure.	MAFS.K12.MP.7.1
54.08 Look for and express regularity in repeated reasoning.	MAFS.K12.MP.8.1

**Abbreviations:**

FS-M/LA = Florida Standards for Math/Language Arts

NGSSS-Sci = Next Generation Sunshine State Standards for Science

CTE Standards and Benchmarks	FS-M/LA	NGSSS-Sci
55.0 Identify functions of information processing. – The student will be able to:	MAFS.912.S-IC.2	
55.01 Identify characteristics of high-level languages.		
55.02 Identify characteristics of operating systems.		
55.03 Identify characteristics of a network.		
55.04 Identify needs for software development in the game/simulation industry.		
55.05 Identify causes of software development problems in the game/simulation industry.		
55.06 Identify most appropriate languages for solving game/simulation industry problems.		
55.07 Manipulate data between numbering systems.		SC.912.N.1.1
55.08 Identify how numeric and non-numeric data are represented in memory.		
55.09 Distinguish among integer, fixed-point, and floating-point calculations.		
56.0 Test programs. – The student will be able to:		
56.01 Develop a plan for testing programs.		
56.02 Develop test harnesses for use in program testing.		
56.03 Perform debugging activities.		
56.04 Distinguish among the different types of program and design errors.		
56.05 Evaluate program test results.		

CTE Standards and Benchmarks	FS-M/LA	NGSSS-Sci
56.06 Execute programs and subroutines as they relate to the total application.		
56.07 Use trace routines of compilers to assist in program debugging.		
56.08 Compile and run programs.		
56.09 Create a stable code base.		
57.0 Plan program design. – The student will be able to:		SC.912.N.1.1
57.01 Formulate a plan to determine program specifications individually or in groups.		
57.02 Use a graphical representation or pseudo code to represent the structure in a program or subroutine.		SC.912.N.1.1
57.03 Design programs to solve problems using problem-solving strategies.		
57.04 Prepare proper input/output layout specifications.		
57.05 Examine existing utility programs and subroutines for use with other programs.		
57.06 Manually trace the execution of programs and verify that programs follow the logic of their design as documented.		
58.0 Code programs. – The student will be able to:		
58.01 Utilize reference manuals.		SC.912.N.1.1
58.02 Write programs according to recognized programming standards.		
58.03 Write internal documentation statements as needed in the program source code.		
58.04 Code programs in high-level languages for game/simulation applications.		
58.05 Write code that accesses sequential, random, and direct files.		
58.06 Code programs using logical statements (e.g., If-Then-Else, Do...While).		
58.07 Enter and modify source code using a program language editor.		
58.08 Code routines within programs that validate input data.		
58.09 Use the rounding function in calculations within programs.		
58.10 Write programs as part of a development team.		

CTE Standards and Benchmarks	FS-M/LA	NGSSS-Sci
58.11 Write event-driven programs.		
58.12 Write programs using timed-event strategies and methodologies.		
58.13 Write programs that include score keeping.		
59.0 Perform program maintenance. – The student will be able to:		SC.912.N.1.1
59.01 Review requested modification of programs and establish a plan of action.		
59.02 Design needed modifications in conformance with established standards.		
59.03 Code, test, and debug modifications prior to updating production code.		SC.912.N.1.1
59.04 Update production programs and documentation with changes.		
59.05 Analyze output to identify and annotate errors or enhancements.		SC.912.N.1.1
60.0 Create and maintain documentation. – The student will be able to:		SC.912.N.1.1
60.01 Write documentation to assist operators and end-users.		
60.02 Follow established documentation standards.		
60.03 Update existing documentation to reflect program changes.		
61.0 Evaluate assigned game programming tasks. – The student will be able to:		
61.01 Estimate the time necessary to write a program.		
62.0 Implement enhanced program structures. – The student will be able to:		
62.01 Write programs that include tables or arrays and routines for data entry and lookup.		SC.912.N.1.1
62.02 Write programs to import/export data from external sources.		SC.912.N.1.1
62.03 Write programs that use iteration.		SC.912.N.1.1
62.04 Write routines that incorporate “help” text.		
62.05 Write programs that read and write random files.		
62.06 Write interactive programs.		
62.07 Design screen layouts for use in interactive programs.		

CTE Standards and Benchmarks	FS-M/LA	NGSSS-Sci
62.08 Write programs using object-oriented languages.		
62.09 Write programs that include data structures (e.g., stacks, queues, trees, linked lists).		
62.10 Write programs that are event-driven to support player goals and actions.		
63.0 Demonstrate the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance. – The student will be able to:		
63.01 Describe personal and jobsite safety rules and regulations that maintain safe and healthy work environments.		SC.912.N.1.1
63.02 Explain emergency procedures to follow in response to workplace accidents.		SC.912.N.1.1
63.03 Create a disaster and/or emergency response plan.		SC.912.N.1.1
64.0 Demonstrate leadership and teamwork skills needed to accomplish team goals and objectives. – The student will be able to:		
64.01 Employ leadership skills to accomplish organizational goals and objectives.		
64.02 Establish and maintain effective working relationships with others in order to accomplish objectives and tasks.		
64.03 Examine licensing, certification, and industry credentialing requirements.		
64.04 Maintain a career portfolio to document knowledge, skills, and experience.		
64.05 Evaluate and compare employment opportunities that match career goals.		
64.06 Identify and exhibit traits for retaining employment.		
64.07 Identify opportunities and research requirements for career advancement.		
64.08 Research the benefits of ongoing professional development.		
64.09 Examine and describe entrepreneurship opportunities as a career planning option.		
65.0 Demonstrate personal money-management concepts, procedures, and strategies. – The student will be able to:		
65.01 Identify and describe the services and legal responsibilities of financial institutions.		
65.02 Describe the effect of money management on personal and career goals.		
65.03 Develop a personal budget and financial goals.		

CTE Standards and Benchmarks	FS-M/LA	NGSSS-Sci
65.04 Complete financial instruments for making deposits and withdrawals.		
65.05 Maintain financial records.		
65.06 Read and reconcile financial statements.		
65.07 Research, compare and contrast investment opportunities		SC.912.N.1.1

**Florida Department of Education  
Student Performance Standards**

**Course Title:** Multi-User Game & Simulation Programming  
**Course Number:** 8208340  
**Course Credit:** 1

**Course Description:**

This course is focused on students acquiring the appropriate programming skills for rendering a game or simulation product, including program control, conditional branching, score-keeping, timed event strategies and methodologies, and implementation issues specific to multi-user game/simulation products.

<b>Florida Standards</b>		<b>Correlation to CTE Program Standard #</b>
52.0	Methods and strategies for using Florida Standards for grades 11-12 reading in Technical Subjects for student success in Game/Simulation/Animation Programming.	
52.01	Key Ideas and Details	
52.01.1	Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account. LAFS.1112.RST.1.1	
52.01.2	Determine the central ideas or conclusions of a text; trace the text’s explanation or depiction of a complex process, phenomenon, or concept; provide an accurate summary of the text. LAFS.1112.RST.1.2	
52.01.3	Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text. LAFS.1112.RST.1.3	
52.02	Craft and Structure	
52.02.1	Determine the meaning of symbols key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics. LAFS.1112.RST.2.4	
52.02.2	Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas. LAFS.1112.RST.2.5	
52.02.3	Analyze the author’s purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, identifying	

Florida Standards		Correlation to CTE Program Standard #
	important issues that remain unresolved. LAFS.1112.RST.2.6	
52.03	Integration of Knowledge and Ideas	
52.03.1	Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g. quantitative data, video, multimedia) in order to address a question or solve a problem. LAFS.1112.RST.3.7	
52.03.2	Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information. LAFS.1112.RST.3.8	
52.03.3	Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible. LAFS.1112.RST.3.9	
52.04	Range of Reading and Level of Text Complexity	
52.04.1	By the end of grade 11, read and comprehend literature [informational texts, history/social studies texts, science/technical texts] in the grades 11–CCR text complexity band proficiently, with scaffolding as needed at the high end of the range.	
52.04.2	By the end of grade 12, read and comprehend literature [informational texts, history/social studies texts, science/technical texts] at the high end of the grades 11–CCR text complexity band independently and proficiently. LAFS.1112.RST.4.10	
53.0	Methods and strategies for using Florida Standards for grades 11-12 writing in Technical Subjects for student success in Game/Simulation/Animation Programming.	
53.01	Text Types and Purposes	
53.01.1	Write arguments focused on discipline-specific content. LAFS.1112.WHST.1.1	
53.01.2	Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes. LAFS.1112.WHST.1.2	
53.02	Production and Distribution of Writing	
53.02.1	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. LAFS.1112.WHST.2.4	

Florida Standards		Correlation to CTE Program Standard #
53.02.2	Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience. LAFS.1112.WHST.2.5	
53.02.3	Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information. LAFS.1112.WHST.2.6	
<b>53.03 Research to Build and Present Knowledge</b>		
53.03.1	Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation. LAFS.1112.WHST.3.7	
53.03.2	Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation. LAFS.1112.WHST.3.8	
53.03.3	Draw evidence from informational texts to support analysis, reflection, and research. LAFS.1112.WHST.3.9	
<b>53.04 Range of Writing</b>		
53.04.1	Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences. LAFS.1112.WHST.4.10	
<b>54.0</b>	<b>Methods and strategies for using Florida Standards for grades 11-12 Mathematical Practices in Technical Subjects for student success in Game/Simulation/Animation Programming.</b>	
54.01	Make sense of problems and persevere in solving them. MAFS.K12.MP.1.1	
54.02	Reason abstractly and quantitatively. MAFS.K12.MP.2.1	
54.03	Construct viable arguments and critique the reasoning of others. MAFS.K12.MP.3.1	
54.04	Model with mathematics. MAFS.K12.MP.4.1	
54.05	Use appropriate tools strategically.	

Florida Standards	Correlation to CTE Program Standard #
	MAFS.K12.MP.5.1
54.06 Attend to precision.	MAFS.K12.MP.6.1
54.07 Look for and make use of structure.	MAFS.K12.MP.7.1
54.08 Look for and express regularity in repeated reasoning.	MAFS.K12.MP.8.1

**Abbreviations:**

FS-M/LA = Florida Standards for Math/Language Arts

NGSSS-Sci = Next Generation Sunshine State Standards for Science

CTE Standards and Benchmarks	FS-M/LA	NGSSS-Sci
66.0 Identify and describe basic network terminology and network security. – The student will be able to:		
66.01 Define networking and describe the purpose of a network.		
66.02 Identify the purposes and interrelationships among the major components of networks (e.g., servers, clients, transmission media, network operating system, network boards).		SC.912.L.17.9
66.03 Describe the various types of network topologies.		
66.04 Describe the various types of game protocols		
66.05 Demonstrate knowledge of general security concepts.		
66.06 Develop an awareness of communication security concepts.		
66.07 Develop an awareness of network infrastructure security.		
66.08 Describe the various types of multiplayer game architectures		
66.09 Identify networking and server design requirements for multi-player games		
66.10 List and describe performance metrics for networked games		
67.0 Game configuration. – The student will be able to:		SC.912.N.1.1; 1.2; 1.4; 4.1; 4.2
67.01 Create a window to run a game.		
67.02 Describe and use appropriate game libraries to run a windowed game.		
67.03 Use reference materials such as on-line help, vendor bulletin boards, tutorials, and manuals available		SC.912.N.1.4

CTE Standards and Benchmarks	FS-M/LA	NGSSS-Sci
67.04 Troubleshoot problems with computer hardware based on different graphic modes of the game		
67.05 Describe ethical issues and problems associated with computer games.		SC.912.L.16.10, SC.912.N.4.2
67.06 Read and comprehend technical and non-technical reading assignments related to course content including trade journals, books, magazines and electronic sources.		
67.07 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.		SC.912.N.1.4
67.08 Explore, design, implement, and evaluate organizational structures and cultures for managing project teams.		SC.912.N.1.1
67.09 Identify characteristics of operating systems and graphics pipeline		
67.10 Distinguish among integer and floating-point bounding box collision calculations...		
67.11 Illustrate various configurations of software libraries.		
<b>68.0 Test programs. – The student will be able to:</b>		
68.01 Develop data for use in program testing.		SC.912.N.1.1
68.02 Perform debugging activities.		
68.03 Distinguish among the different types of program and design errors.		
68.04 Evaluate program test results.		SC.912.N.1.1
68.05 Execute programs and subroutines as they relate to the total application.		
68.06 Use trace routines of compilers to assist in program debugging.		
68.07 Compile and run programs.		
<b>69.0 Plan program design. – The student will be able to:</b>		SC.912.N.1.3; 1.7
69.01 Formulate a plan to determine program specifications individually or in groups.		SC.912.N.1.1
69.02 Use a graphical representation or pseudo code to represent the structure in a program or subroutine.		SC.912.N.1.1
69.03 Design programs to solve problems using problem-solving strategies.		SC.912.N.1.3
69.04 Prepare proper input/output layout specifications.		

CTE Standards and Benchmarks	FS-M/LA	NGSSS-Sci
69.05 Examine existing utility programs and subroutines for use with other programs.		
69.06 Manually trace the execution of programs and verify that programs follow the logic of their design as documented.		
70.0 Create and maintain documentation. – The student will be able to:		
70.01 Write documentation to assist operators and end-users.		SC.912.N.1.1
70.02 Follow established documentation standards.		SC.912.N.1.1
70.03 Update existing documentation to reflect program changes.		
71.0 Code programs. – The student will be able to:		SC.912.P.12.1; 12.2; 12.3; 12.5; 12.6; 10.18; 10.20; 10.22.
71.01 Utilize reference manuals.		SC.912.N.1.1, SC.912.N.1.4
71.02 Write programs according to recognized programming standards.		
71.03 Write internal documentation statements as needed in the program source code.		
71.04 Code programs in high-level languages for gaming and simulation applications.		
71.05 Write code that accesses sequential, indexed sequential, random, and direct files.		
71.06 Code programs using logical statements (e.g., if-then-else, do...while).		
71.07 Enter and modify source code using a program language editor.		
71.08 Code routines within programs that validate input data.		
71.09 Use the rounding function in calculations within programs.		
71.10 Write programs that display text		
71.11 Demonstrate proficiency in drawing lines using graphic primitive functions.		
71.12 Demonstrate proficiency in drawing rectangles using graphic primitive functions.		
71.13 Demonstrate proficiency in drawing circles using graphic primitive functions.		
71.14 Demonstrate proficiency in drawing ellipses using graphic primitive functions.		

CTE Standards and Benchmarks	FS-M/LA	NGSSS-Sci
71.15 Demonstrate proficiency in drawing polygons using graphic primitive functions.		
71.16 Write programs that use composite graphic objects		
71.17 Write programs that load a bitmap for background		
71.18 Write programs that use a sprite handler		
71.19 Write programs that use animation		
71.20 Write programs that use scrolling		
71.21 Write programs that use transparency		
72.0 Demonstrate an understanding of operating systems, environments, and platforms. – The student will be able to:		
72.01 Identify various types of operating systems/environments for different computer hardware platforms.		
72.02 Assess and analyze the functions of different operating systems.		SC.912.N.1.1
72.03 Distinguish between different types of computer hardware platforms.		
73.0 Implement enhanced program structures. – The student will be able to:		SC.912.N.1.1
73.01 Write programs that include tables or arrays and routines for data entry and lookup.		
73.02 Write routines to sort arrays.		
73.03 Write programs that sort records in files.		
73.04 Write programs to process transactions.		
73.05 Write programs that use iteration.		
73.06 Write programs that read and write sequential files.		
73.07 Write programs that read and write random files.		
74.0 Implement multimedia programming. – The student will be able to:		SC.912.P.10.1; 10.2; 10.5; 12.4; 12.5; 12.6.
74.01 Demonstrate proficiency in creating multiple composite objects.		
74.02 Demonstrate proficiency in moving composite graphics objects.		

CTE Standards and Benchmarks		FS-M/LA	NGSSS-Sci
74.03	Demonstrate proficiency in rotating composite graphics objects by hand.		
74.04	Distinguish between flock and flee artificial intelligence algorithms.		
74.05	Write programs that use blitting.		
74.06	Simulate circular game board.		
74.07	Demonstrate proficiency in creating a firing simulation.		
74.08	Identify the basic constructs used in bounding box collision algorithm.		
74.09	Identify the basic constructs used in truer bounding box collision.		
74.10	Demonstrate proficiency in creating a creating a bouncing simulation.		
74.11	Simulate pattern based movement.		
74.12	Simulate multiple sprites movement.		
74.13	Identify the basic constructs used in keyboard input.		
74.14	Identify the basic constructs used in mouse input.		
74.15	Identify the basic constructs used in double buffering.		
75.0	Develop an understanding of programming techniques and concepts. – The student will be able to:		SC.912.N.1.1
75.01	Identify the basic constructs used in structured programming.		
75.02	Distinguish between top-down and bottom-up design.		
75.03	Distinguish between iteration and recursion.		
75.04	Evaluate Boolean expressions.		
75.05	Distinguish between interpreters and compilers.		

## **Additional Information**

### **Laboratory Activities**

Laboratory investigations that include scientific inquiry, research, measurement, problem solving, emerging technologies, tools and equipment, as well as, experimental, quality, and safety procedures are an integral part of this career and technical program/course. Laboratory investigations benefit all students by developing an understanding of the complexity and ambiguity of empirical work, as well as the skills required to manage, operate, calibrate and troubleshoot equipment/tools used to make observations. Students understand measurement error; and have the skills to aggregate, interpret, and present the resulting data. Equipment and supplies should be provided to enhance hands-on experiences for students.

### **Special Notes**

The occupational standards and benchmarks outlined in this secondary program correlate to the standards and benchmarks of the postsecondary program with the same Classification of Instructional Programs (CIP) number.

### **Career and Technical Student Organization (CTSO)**

Future Business Leaders of America (FBLA) and Business Professionals of America (BPA) are the intercurricular career and technical student organizations providing leadership training and reinforcing specific career and technical skills for secondary students. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered. The activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, F.A.C.

### **Cooperative Training – OJT**

On-the-job training is appropriate but not required for this program. Whenever offered, the rules, guidelines, and requirements specified in the OJT framework apply.

### **Accommodations**

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's Individual Educational Plan (IEP) or 504 plan or postsecondary student's accommodations' plan to meet individual needs and ensure equal access. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

In addition to accommodations, some secondary students with disabilities (students with an IEP served in Exceptional Student Education (ESE)) will need modifications to meet their needs. Modifications change the outcomes or what the student is expected to learn, e.g., modifying the curriculum of a secondary career and technical education course. Note: postsecondary curriculum and regulated secondary programs cannot be modified.

Some secondary students with disabilities (ESE) may need additional time (i.e., longer than the regular school year), to master the student performance standards associated with a regular Occupational Completion Point (OCP) or a Modified Occupational Completion Point (MOCP). If needed, a student may enroll in the same career and technical course more than once. Documentation should be included in the IEP that clearly

indicates that it is anticipated that the student may need an additional year to complete an OCP/MOCP. The student should work on different competencies and new applications of competencies each year toward completion of the OCP/MOCP. After achieving the competencies identified for the year, the student earns credit for the course. It is important to ensure that credits earned by students are reported accurately. The district's information system must be designed to accept multiple credits for the same course number for eligible students with disabilities.

### **Additional Resources**

For additional information regarding articulation agreements, Bright Futures Scholarships, Fine Arts/Practical Arts Credit and Equivalent Mathematics and Equally Rigorous Science Courses please refer to:

<http://www.fldoe.org/academics/career-adult-edu/career-tech-edu/program-resources.stml>

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## **Information**

### **Additional Information**

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The BTE Core, which is part of this program, will undergo major changes in the **2016 – 2017** school year. Please access the [BTE Core](#) document for more information.

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