Florida Department of Education
Curriculum Framework

Program Title: **Integrated Information Technology**
Program Type: **Career Preparatory**
Career Cluster: **Information Technology**

Secondary – Career Preparatory	
Program Number	9003500
CIP Number	0511010314
Grade Level	9-12
Standard Length	4 credits
Teacher Certification	Refer to the **Program Structure** section.
CTSO	FBLA BPA
SOC Codes (all applicable)	15-1151 – Computer User Support Specialists
CTE Program Resources	http://www.fldoe.org/academics/career-adult-edu/career-tech-edu/program-resources.stml

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 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 computer application skills including computer hardware, software applications, web applications, computer programming, webpage design and advanced web tools, systems support and maintenance, network concepts, relational database concepts, multimedia tools, cybersecurity ; extensive exploration of information technology careers; strategies for success including goal setting, study skills, organizing skills, learning styles, employability skills, and service learning; and core academic skills with a strong emphasis on effective communication skills.

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 four (4) credits.

To teach the courses listed below, instructors must hold at least one of the teacher certifications indicated for that course.

The following table illustrates the secondary program structure:

Course Number	Course Title	Teacher Certification	Length	SOC Code	Level	Graduation Requirement
9003510	IT Principles	BUS ED 1 @2 COMPU SCI 6 INFO TECH 7G	1 credit	15-1151	3	
9003520	Web Development Principles		1 credit	15-1151	3	
9003530	Database Principles		1 credit	15-1151	3	
9003540	Programming Principles		1 credit	15-1151	3	
9003550	Cloud Principles		1 credit	15-1151	3	

(Graduation Requirement Abbreviations- EQ= Equally Rigorous Science, PA= Practical Arts, EC= Economics)

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

01.0 Explain motherboard components, types and features.
02.0 Explain the purpose and characteristics of CPUs and their features.
03.0 Perform installation and configuration activities.
04.0 Demonstrate proficiency using computer networks.
05.0 Perform the process for problem diagnostics and problem resolution through wireless, infrared, telephone, e-mail, remote access, or direct contact.
06.0 Demonstrate knowledge of presentation production issues.
07.0 Demonstrate proficiency communicating over the Internet.
08.0 Demonstrate proficiency in troubleshooting, repair and maintenance of computers.
09.0 Demonstrate proficiency in the basic principles of security concepts and technologies.
10.0 Demonstrate proficiency in operational procedures as they relate to computer equipment and components.
11.0 Demonstrate proficiency in information technology tools.
12.0 Describe the roles within teams, work units, departments, organizations, inter-organizational systems, and the larger environment.
13.0 Describe the importance of professional ethics and legal responsibilities.
14.0 Demonstrate proficiency on the principles of design.
15.0 Demonstrate proficiency planning an effective website.
16.0 Demonstrate proficiency using web development tools and techniques.
17.0 Demonstrate proficiency using specialized web design software.
18.0 Demonstrate proficiency gathering and preparing web content.
19.0 Demonstrate an awareness of preparing a website for launch.
20.0 Demonstrate proficiency in using a WYSIWG editor, web design, or web animation software for wwebpage design.
21.0 Demonstrate proficiency in using digital photography and digital imaging.
22.0 Design and create webpages suitable for publishing to the Internet.
23.0 Describe how website performance is monitored and analyzed.
24.0 Demonstrate proficiency in hosting a website.
25.0 Demonstrate the ability to attract traffic for a website.
26.0 Develop the “big picture” of database design and how to best organize data according to business rules and/or client needs.
27.0 Develop the process of creating an entity by identifying relationships.
28.0 Formulate and assemble initial entity relationship by expanding on modeling concepts.
29.0 Consider the degree and optionality of relationships of entities.
30.0 Demonstrate proficiency in early construction stages of the data modeling process by using unique identifiers and many to many (M:M) relationships for building entity relationship diagrams.
31.0 Demonstrate proficiency in advanced data constructs by analyzing business requirements and diagramming entities and relationships.
32.0 Apply the complex ERM information by fine-tuning entities and the process for relating them.
33.0 Apply initial database design and normalization by following the set of house rules that determine how items are stored and retrieved.
34.0 Manipulate data.
35.0 Building and modifying tables.
36.0 Performing queries and filtering records.
37.0 Plan program design.

38.0 Code programs.
39.0 Test programs.
40.0 Perform program maintenance.
41.0 Create and maintain documentation.
42.0 Develop an awareness of software quality assurance.
43.0 Develop an understanding of programming techniques and concepts.
44.0 Design and organization of structured programs into components, modules and subsystems.
45.0 Evaluate and analyze cloud principles used in cloud computing.
46.0 Identify the components of cloud based services.
47.0 Evaluate cloud based services.
48.0 Use cloud-based services.
49.0 Evaluate and analyze techniques and methods of cloud deployment, and design principles of secure cloud computing.
50.0 Evaluate the risks of cloud-based systems.
51.0 Demonstrate an awareness of cloud implementation security concepts.

Florida Department of Education
Student Performance Standards

Course Title: **IT Principles**
Course Number: **9003510**
Course Credit: **1**

CTE Standards and Benchmarks	
01.0	Explain motherboard components, types and features. The student will be able to:
01.01	Identify different motherboard form factors.
01.02	Identify input/output interfaces.
01.03	Identify the different types of bus slots.
01.04	Identify the BIOS/CMOS/Firmware.
01.05	Define Assembler (asm) language and describe the purpose.
02.0	Explain the purpose and characteristics of CPUs and their features. The student will be able to:
02.01	Identify types of CPUs.
02.02	Define hyper threading.
02.03	Explain multi core.
02.04	Explain the difference between onboard cache.
02.05	Compare and contrast between real and actual speed.
02.06	Compare and contrast between 32 bit and 64 bit processing.
03.0	Perform installation and configuration activities. The student will be able to:
03.01	Install and configure software including device drivers.
03.02	Install and configure operating system software.
03.03	Install and configure application software.
03.04	Install and configure peripherals including device drivers.

CTE Standards and Benchmarks	
	03.05 Supervise the testing of operating system management systems.
	03.06 Prepare the hard disk and related issues for operating system installation.
	03.07 Format and partition the hard disk.
	03.08 Verify the proper operation of the system.
	03.09 Compare and contrast memory technologies.
	03.10 Demonstrate proficiency using various memory technologies.
	03.11 Demonstrate proper use of user interfaces, command utilities, and troubleshooting utilities.
	03.12 Explain the basics of boot sequences, methods and startup utilities.
04.0	Demonstrate proficiency using computer networks. The student will be able to:
	04.01 Define networking and describe the purpose of a network.
	04.02 Describe various types of networks and the advantages and disadvantages of each.
	04.03 Describe the use, advantages, and disadvantages of various network.
	04.04 Describe the function of various network devices.
	04.05 Describe the difference between the internet and intranet.
	04.06 Compare and contrast IP Version 6 and IP Version 4.
	04.07 Compare and contrast the different network types.
	04.08 Compare and contrast various implementation models.
	04.09 Describe an Ethernet network and the use of CSMA\CD.
05.0	Perform the process for problem diagnostics and problem resolution through wireless, infrared, telephone, e-mail, remote access, or direct contact. The student will be able to:
	05.01 Identify, troubleshoot and propose solutions for configuration problems.
	05.02 Identify, troubleshoot and propose solutions for software problems.
	05.03 Identify, troubleshoot and propose solutions for hardware malfunctions.

CTE Standards and Benchmarks	
	05.04 Identify, troubleshoot and propose solutions for network malfunctions.
	05.05 Plan and implement a system upgrade and downgrade.
	05.06 Evaluate data recovery using various techniques.
	05.07 Organize and perform system maintenance activities.
	05.08 Demonstrate corporate interaction proficiency.
06.0	Demonstrate knowledge of presentation production issues. The student will be able to:
	06.01 Demonstrate knowledge of copyright laws including copyright statute, disclaimers, and filing procedure.
	06.02 Demonstrate an understanding of graphic and other file and knowledge of image size when scanning and saving files for use in different presentation types.
	06.03 Identify display device connectors and types.
	06.04 Define refresh rate, resolution, multi-monitor and Degauss.
	06.05 Demonstrate knowledge of presentation vocabulary/terms.
	06.06 Compare and contrast and utilize various audio/video output solutions and devices.
	06.07 Compare and contrast removable storage.
07.0	Demonstrate proficiency communicating over the Internet. The student will be able to:
	07.01 Display understanding of how Internet Service Providers (ISP) operates and what role they play in enabling users to connect to the Internet.
	07.02 Explain how the Internet works and how documents are connected and transferred.
	07.03 Configure an email client for SMTP and POP3 servers, including port assignment.
	07.04 Explain how the primary modes of Internet communication are used.
08.0	Demonstrate proficiency in troubleshooting, repair and maintenance of computers. – The student will be able to:
	08.01 Determine the troubleshooting methods and tools for printers.
	08.02 Explain and interpret common laptop issues and basic troubleshooting methods.
	08.03 Integrate common preventative maintenance techniques.

CTE Standards and Benchmarks	
09.0	Demonstrate proficiency in the basic principles of security concepts and technologies. The student will be able to:
09.01	Evaluate encryption technologies, software firewall, authentication technologies, and data security.
09.02	Summarize the following security features.
10.0	Demonstrate proficiency in operational procedures as they relate to computer equipment and components. The student will be able to:
10.01	Compare and contrast ESD, EMI, RFI, and electrical safety.
10.02	Demonstrate proficiency in the use of state regulations for hazardous materials.
11.0	Demonstrate proficiency in information technology tools. The student will be able to:
11.01	Use personal information management (PIM) applications to increase workplace efficiency.
11.02	Employ technological tools to expedite workflow including word processing, databases, reports, spreadsheets, multimedia presentations, electronic calendar, contacts, email, and internet applications.
11.03	Employ computer operations applications to access, create, manage, integrate, and store information.
11.04	Employ collaborative/groupware applications to facilitate group work.
12.0	Describe the roles within teams, work units, departments, organizations, inter-organizational systems, and the larger environment. The student will be able to:
12.01	Describe the nature and types of business organizations.
12.02	Explain the effect of key organizational systems on performance and quality.
12.03	List and describe quality control systems and/or practices common to the workplace.
12.04	Explain the impact of the global economy on business organizations.
13.0	Describe the importance of professional ethics and legal responsibilities. The student will be able to:
13.01	Evaluate and justify decisions based on ethical reasoning.
13.02	Evaluate alternative responses to workplace situations based on personal, professional, ethical, legal responsibilities, and employer policies.
13.03	Identify and explain personal and long-term consequences of unethical or illegal behaviors in the workplace.
13.04	Interpret and explain written organizational policies and procedures.

Florida Department of Education
Student Performance Standards

Course Title: **Web Development Principles**
Course Number: **9003520**
Course Credit: 1

CTE Standards and Benchmarks	
14.0	Demonstrate proficiency on the principles of design. The student will be able to:
14.01	Identify industry best practices in visual design.
14.02	Determine the objectives and the audience for webpages.
14.03	Apply the principles of Human Computer Interface (HCI) to design and develop an effective look and feel for a website.
14.04	Design and create a webpage for optimal display in multiple browsers.
15.0	Demonstrate proficiency planning an effective website. The student will be able to:
15.01	Compare and contrast site maps and wireframes.
15.02	Develop an effective site map for a website.
15.03	Use storyboarding to plan a website.
15.04	Create page layout wireframes for a website.
15.05	Classify web development tasks according to when they are performed during the web development cycle.
15.06	Describe the different types of business requirements that apply to website design.
15.07	Design business requirements to help ensure success for a specific website.
15.08	Demonstrate ability to use effective designer-client communication skills.
16.0	Demonstrate proficiency using web development tools and techniques. The student will be able to:
16.01	Compare and contrast writing HTML using a text editor versus using a WYSIWYG editor.
16.02	Design and create an effective webpage template.
16.03	Create attractive, engaging, and efficient webpages using a WYSIWYG editor.

CTE Standards and Benchmarks	
	16.04 Create an appropriate directory structure, naming convention protocol, and file organization for a website.
	16.05 Create styles and other design elements.
	16.06 Create DHTML and XML documents using editors or converters.
17.0	Demonstrate proficiency using specialized web design software. The student will be able to:
	17.01 Compare and contrast various specialized web design software.
	17.02 Demonstrate proficiency using various specialized web design software.
	17.03 Demonstrate proficiency in adding Java scripts to webpages.
18.0	Demonstrate proficiency gathering and preparing web content. The student will be able to:
	18.01 Characterize effective writing styles and conventions for the web.
	18.02 Create effective written content for the web.
	18.03 Prepare various types of graphical content for use on a webpage.
	18.04 Access and digitize graphics through various resources.
	18.05 Identify and convert graphic formats.
	18.06 Create, edit and integrate images using image or graphic design software.
	18.07 Create, edit and integrate video files into a webpage.
	18.08 Insert audio files into a webpage.
	18.09 Compare and contrast static versus dynamic web content.
19.0	Demonstrate an awareness of preparing a website for launch. The student will be able to:
	19.01 Evaluate a website for basic usability and accessibility issues.
	19.02 List the steps that are necessary to determine when a website is ready to launch.
	19.03 Develop a User Testing Plan.
	19.04 Demonstrate the ability to organize and execute a user testing of a website.

CTE Standards and Benchmarks	
	19.05 Demonstrate proficiency in publishing to the Internet.
20.0	Demonstrate proficiency in using a WYSIWG editor, web design, or web animation software for webpage design. The student will be able to:
	20.01 Apply style sheets for consistent website design.
	20.02 Create and edit images and photographs for webpages using digital imaging software.
	20.03 Insert audio files into a webpage.
	20.04 Create, edit and integrate video files into a webpage.
	20.05 Create, edit and integrate animation files into a webpage.
	20.06 Demonstrate an understanding of photograph compression factors such as transmission speed, color reduction, and browser support.
	20.07 Demonstrate knowledge of image formats related to photos and graphics on the Internet, web formats.
	20.08 Save and export a photograph to the web in the format best for image quality and file size.
	20.09 Build, optimize, edit, and test webpages for publication.
	20.10 Create a webpage that utilizes plug-ins.
	20.11 Demonstrate an understanding of network and web implementation issues.
	20.12 Compare and contrast various methods by which information may be accessed on the Internet/Intranet.
	20.13 Demonstrate an understanding of file encryption methods.
21.0	Demonstrate proficiency in using digital photography and digital imaging. The student will be able to:
	21.01 Demonstrate knowledge of ethics related to digital imaging and legal and consent issues.
	21.02 Apply effective design principles in digital photography compositions.
	21.03 Illustrate the essence of an event, quote, or slogan through digital photography/imaging.
	21.04 Demonstrate skill in using digital imaging software for image manipulation, color correction, and special effects to creatively convey a message or literary interpretation.
	21.05 Demonstrate skill in scanning and cropping photographs.
22.0	Design and create webpages suitable for publishing to the Internet. The student will be able to:

CTE Standards and Benchmarks	
	22.01 Explain the need for web-based applications.
	22.02 Evaluate a website for basic usability and accessibility issues.
	22.03 Display an understanding of the purposes of site maps and wireframes.
	22.04 Develop an effective site map for a website.
	22.05 Develop effective wireframes for a website.
	22.06 Identify industry best practices in visual design.
	22.07 Explain the key concepts of meeting client needs.
	22.08 Develop an effective look and feel for a website.
	22.09 Develop an effective webpage template.
	22.10 Describe a correct directory structure, naming convention protocol, and file organization for a website.
	22.11 Characterize effective writing for the web.
	22.12 Create effective written content for the web.
	22.13 Decide how to best prepare various types of graphical content for use on a webpage.
	22.14 Develop a User Testing Plan.
	22.15 List the steps that are necessary to determine when a website is ready to launch.
	22.16 Demonstrate the ability to organize and execute a user testing of a website.
23.0	Describe how website performance is monitored and analyzed. The student will be able to:
	23.01 Identify issues related to website maintenance.
	23.02 Use webpage validation tools.
	23.03 Describe website performance metrics and discuss their design implications.
	23.04 Demonstrate knowledge of accessibility problems and solutions.
	23.05 Examine indexing, page ranking, basic Search Engine Optimization techniques.

CTE Standards and Benchmarks	
	23.06 Explore common website analytic tools.
	23.07 Construct webpages with streaming media content.
24.0	Demonstrate proficiency in hosting a website. The student will be able to:
	24.01 Apply professional guidelines to choose, search for, and register a domain name.
	24.02 Evaluate criteria upon which to select an appropriate web host.
	24.03 Make generalizations about optimal download speed for a particular website.
	24.04 Demonstrate the ability to upload and download files using FTP protocol.
	24.05 Develop a Maintenance Plan for a client.
25.0	Demonstrate the ability to attract traffic for a website. The student will be able to:
	25.01 Explain and describe the best practices for attracting traffic to websites.
	25.02 Evaluate an effective search engine optimization strategy.
	25.03 Describe tactics for building online credibility.
	25.04 Explain how to use standard techniques to gather and/or track site statistics.

Florida Department of Education
Student Performance Standards

Course Title: **Database Principles**
Course Number: **9003530**
Course Credit: **1**

CTE Standards and Benchmarks	
26.0	Develop the "big picture" of database design and how to best organize data according to business rules and/or client needs. The student will be able to:
26.01	Identify and analyze the phases of the database development process.
26.02	Explain what conceptual data modeling and database design involves.
26.03	Compare database development process with that of the application development process.
26.04	Identify the need for databases and why they are used.
26.05	Explain the various types of databases and the appropriate use of each.
26.06	Demonstrate proficiency in design methodology by completing appropriate tasks during the appropriate time of the developmental life cycle.
26.07	Demonstrate proficiency in design methodology by considering where the database will reside.
27.0	Develop the process of creating an entity by identifying relationships. The student will be able to:
27.01	Identify and model various types of entities.
27.02	Identify naming and drawing conventions for entities.
27.03	Sequence the steps that are necessary for creation of an entity.
27.04	Analyze and model the relationships between entities.
28.0	Formulate and assemble initial entity relationship by expanding on modeling concepts. The student will be able to:
28.01	Analyze and model attributes.
28.02	Identify unique identifiers for each entity.
28.03	Develop an entity relationship diagram tagging attributes with optionality.

CTE Standards and Benchmarks	
29.0	Consider the degree and optionality of relationships of entities. The student will be able to:
29.01	Create models and entity relationship information requirements and interviews.
29.02	Begin to differentiate between one-to-many, many-to-many and one-to-one relationships.
29.03	Identify relationship between two entities by reading a given diagram.
29.04	Create a relationship between instances of the same entity.
29.05	Read an entity relationship model in order to validate it.
30.0	Demonstrate proficiency in early construction stages of the data modeling process by using unique identifiers and many-to-many (M:M) relationships for building entity relationship diagrams. The student will be able to:
30.01	Identify the significance of an attribute that has more than one value for each entity instance.
30.02	Evaluate appropriate methods of storing validation rules for attributes.
30.03	Recognize unique identifiers inherited from other entities.
30.04	Sequence the steps involved in resolving a many-to-many relationship.
31.0	Demonstrate proficiency in advanced data constructs by analyzing business requirements and diagramming entities and relationships. The student will be able to:
31.01	Validate that an attribute is properly placed based upon its dependence on its entity's unique identifier (UID).
31.02	Model advanced data constructs including recursive relationships, subtypes, and exclusive relationships.
31.03	Enforce referential integrity.
32.0	Apply the complex ERM information by fine-tuning entities and the process for relating them. The student will be able to:
32.01	Describe a relational database and how it is different from other database systems.
32.02	Define primary keys and foreign keys and describe their purpose.
32.03	Describe what data integrity refers to and list some constraints.
32.04	Explain how database design fits into the database development process.
32.05	Translate an entity-relationship model into a relational database design.
33.0	Apply initial database design and normalization by following the set of house rules that determine how items are stored and retrieved. The student will be able to:

CTE Standards and Benchmarks	
	33.01 Recognize raw data and evaluate the steps for creating a data group in unnormalized form (UNF).
	33.02 Demonstrate proficiency in querying and accessing data.
	33.03 Demonstrate an understanding of the implications of storing sensitive information.
34.0	Manipulate data. The student will be able to:
	34.01 Determine appropriate data inputs and outputs for an existing database.
	34.02 Demonstrate proficiency in record management.
	34.03 Change the layout of a datasheet.
	34.04 Create forms, reports, mailing labels, and charts using a database.
	34.05 Export data to appropriate software applications.
	34.06 Demonstrate proficiency in coordinating databases with appropriate software applications.
35.0	Building and modifying tables. The student will be able to:
	35.01 Create a database table.
	35.02 Create table structures and establish table relationships.
	35.03 Determine fields and assign data types in a database table.
	35.04 Demonstrate appropriate manipulation of database tables.
	35.05 Modify a database table by adding, deleting, and removing fields.
	35.06 Demonstrate proficiency in the appropriate use of database wizards.
36.0	Performing queries and filtering records. The student will be able to:
	36.01 Design a query and extract specific data from a database table.
	36.02 Create a calculated field.
	36.03 Filter data in records by selection and by form.
	36.04 Modify a saved query.

Florida Department of Education
Student Performance Standards

Course Title: **Programming Principles**
Course Number: **9003540**
Course Credit: **1**

CTE Standards and Benchmarks	
37.0	Plan program design. The student will be able to:
37.01	Formulate a plan to determine program specifications individually or in groups.
37.02	Use a graphical representation or pseudocode to represent the structure in a program or subroutine.
37.03	Design programs to solve problems using problem-solving strategies.
37.04	Prepare proper input/output layout specifications.
37.05	Manually trace the execution of programs and verify that programs follow the logic of their design as documented.
37.06	Analyze problem statements.
37.07	Determine what kind of information the desired program must process.
37.08	Formulate concise descriptions of a program's task and purpose.
37.09	Formulate concise descriptions of task and purpose of a program's pieces.
37.10	Organize programs according to the problem analysis.
37.11	Recognize changes in the problem statement.
37.12	Suggest changes in the program organization.
38.0	Code programs. The student will be able to:
38.01	Write programs according to recognized programming standards.
38.02	Write internal documentation statements as needed in the program source code.
38.03	Code programs using logical statements.
38.04	Enter and modify source code using a program language editor.

CTE Standards and Benchmarks	
	38.05 Code routines within programs that validate input data.
	38.06 Code programs using object-oriented languages (techniques).
	38.07 Select the essential aspects of a problem statement.
	38.08 Find solutions to an extended problem statement.
	38.09 Utilize reference manuals and help systems.
	38.10 Use pre-defined functions within programs.
39.0	Test programs. The student will be able to:
	39.01 Develop a plan for testing programs.
	39.02 Develop data for use in program testing.
	39.03 Perform debugging activities.
	39.04 Distinguish among the different types of program and design errors.
	39.05 Evaluate program test results.
	39.06 Execute programs and subroutines as they relate to the total application.
	39.07 Develop examples that illustrate the core behavior of each program.
	39.08 Develop examples that illustrate the core behavior of each program component.
	39.09 Illustrate the behavior of boundary cases.
	39.10 Demonstrate an understanding that engineering artifacts requires rigorous and systematic testing.
	39.11 Use examples to show that the solution meets pre-determined criteria.
	39.12 Demonstrate understanding that testing can expose problems but not prove the correctness of the design in an absolute sense.
	39.13 Compile (interpret) and run programs.
40.0	Perform program maintenance. The student will be able to:
	40.01 Analyze output to identify and annotate errors or enhancements.

CTE Standards and Benchmarks	
41.0	Create and maintain documentation. The student will be able to:
41.01	Follow established documentation standards.
42.0	Develop an awareness of software quality assurance. The student will be able to:
42.01	Identify the legal and social consequences of errors in software.
42.02	Describe copyright and other laws that relate to software theft and misuse.
42.03	Develop an awareness of version control systems.
42.04	Develop an awareness of Open Source Software.
43.0	Develop an understanding of programming techniques and concepts. The student will be able to:
43.01	Identify the basic constructs used in structured programming.
44.0	Design and organization of structured programs into components, modules and subsystems. The student will be able to:
44.01	Design programs that model mathematical relationships from application areas.
44.02	Design programs that deal with multi-faceted objects.
44.03	Design programs that deal with mixed classes of objects.
44.04	Design programs that deal with objects of undetermined size.

Florida Department of Education
Student Performance Standards

Course Title: **Cloud Principles**
Course Number: **9003550**
Course Credit: **1**

CTE Standards and Benchmarks	
45.0	Evaluate and analyze concepts used in cloud computing. The student will be able to:
45.01	Demonstrate an understanding of the evolution of cloud computing.
45.02	Describe the four main deployment models for cloud computing, public, private, community, and hybrid.
45.03	Describe the three main service models for cloud computing (SaaS, Paas, and Laas).
45.04	Describe cloud computing roles (cloud computing customer, cloud service provider and cloud service partner).
45.05	Describe cloud characteristics (on-demand self-service, broad network access, multi-tenancy, rapid elasticity).
45.06	Describe the role of the Internet and Building Block Technologies of virtualization, storage, networking and databases in cloud computing.
45.07	Understand and identify managed services in cloud computing.
46.0	Identify the components of cloud-based services. The student will be able to:
46.01	Demonstrate proficiency in accessing web applications through web browser.
46.02	Describe, identify and use thin clients to complete business tasks.
46.03	Describe, identify and use thick clients to complete business tasks.
46.04	Describe, identify and use mobile clients to complete business tasks.
46.05	Demonstrate an awareness application hosting.
46.06	Demonstrate an awareness of multipurpose architecture.
47.0	Evaluate cloud-based services. The student will be able to:
47.01	Understand the economics of different cloud based models for an organization.
47.02	Compare and contrast cloud based services used in industry.

CTE Standards and Benchmarks	
	47.03 Identify the impacts to current and future staffing and operational needs.
	47.04 Evaluate performance of cloud-based solutions using performance indicators.
48.0	Use cloud-based services. The student will be able to:
	48.01 Compare and contrast outsourcing and cloud computing as alternatives for business.
	48.02 Identify and use cloud based services to improve productivity.
	48.03 Compare and contrast cloud based services for consumer and business.
	48.04 Use cloud based services to perform collaboration online.
	48.05 Demonstrate an awareness of the user experience in using a cloud-based service as compared to traditional business model.
49.0	Evaluate and analyze techniques and methods of cloud deployment, and design principles of secure cloud computing. The student will be able to:
	49.01 Demonstrate an awareness of networking for cloud-based solutions.
	49.02 Demonstrate an awareness of the role of automation and self-service in regard to cloud-based solutions & cloud security data lifecycle.
	49.03 Demonstrate understanding of the cloud based business continuity/ disaster recovery planning.
	49.04 Demonstrate an awareness of deployment and management of internal and external cloud services cost benefit analysis to complete business task.
	49.05 Demonstrate understanding of the functional security requirements (portability, interoperability, vendor lock-in).
	49.06 Demonstrate an awareness of the role standardization in cloud-based solutions.
	49.07 Demonstrate the impact of time to market, distribution over the Internet in cloud deployment.
50.0	Evaluate the risks of cloud-based systems. The student will be able to:
	50.01 Identify and evaluate compliance risks relating to software and vendors in cloud-based systems.
	50.02 Demonstrate an understanding of user privacy rights and privacy risks in cloud-based systems.
	50.03 Demonstrate understanding of system/subsystem product certifications (common criteria, FIPS I 40-2).
	50.04 Demonstrate an understanding of legal risks in cloud based systems.
	50.05 Understand the role of vendors and dependencies in cloud-based solutions.

CTE Standards and Benchmarks	
	50.06 Demonstrate an understating of the risks of hardware independence.
	50.07 Identify the main aspects of identity management.
51.0	Demonstrate an awareness of cloud implementation security concepts. The student will be able to:
	51.01 Describe the risk of connecting a local cloud network to the public Internet Cryptography (encryption, in motion, at rest, key management).
	51.02 Describe the use of a Virtual Private network access to Local Area Network.
	51.03 Identify and describe the components of cloud environment, data and media sanitization (overwriting, cryptographic erase).
	51.04 Demonstrate an understanding of networking topologies network security in cloud environment.
	51.05 Demonstrate an understanding of servers, switches, and routers in cloud-based architecture virtualization security (hypervisor security) and common threats.
	51.06 Demonstrate an understanding of the role of the datacenter in cloud-based architecture.

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.

Academic Alignment

Secondary Career and Technical Education courses are pending alignment to the B.E.S.T. (Benchmarks for Excellent Student Thinking) Standards for English Language Arts (ELA) and Mathematics that were adopted by the State Board of Education in February 2020. Academic alignment is an ongoing, collaborative effort of professional educators that provide clear expectations for progression year-to-year through course alignment. This initiative supports CTE programs by improving student performance through the integration of academic content within CTE courses.

Florida Standards for English Language Development (ELD)

English language learners communicate for social and instructional purposes within the school setting. ELD.K12.SI.1.1

English Language Development (ELD) Standards Special Notes:
Teachers are required to provide listening, speaking, reading and writing instruction that allows English language learners (ELL) to communicate for social and instructional purposes within the school setting. For the given level of English language proficiency and with visual, graphic, or interactive support, students will interact with grade level words, expressions, sentences and discourse to process or produce language necessary for academic success. The ELD standard should specify a relevant content area concept or topic of study chosen by curriculum developers and teachers which maximizes an ELL's need for communication and social skills. To access an ELL supporting document which delineates performance definitions and descriptors, please click on the following link: http://www.cpalms.org/uploads/docs/standards/eld/SI.pdf.
For additional information on the development and implementation of the ELD standards, please contact the Bureau of Student Achievement through Language Acquisition at sala@fldoe.org.

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.

MyCareerShines is an interactive resource to assist students in identifying their ideal career and to enhance preparation for employment. Teachers are encouraged to integrate this resource into the program curriculum to meet the employability goals for each student. Access MyCareerShines by visiting: www.mycareershines.org.

Career and Technical Student Organization (CTSO)

Future Business Leaders of America (FBLA) and Business Professionals of America (BPA) are the inter-curricular 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.

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 course or a modified course. 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 a Career and Technical Education (CTE) course. The student should work on different competencies and new applications of competencies each year toward completion of the CTE course. 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