Florida Department of Education
Curriculum Framework

Program Title: Communications Technology
Program Type: Non-Career Preparatory
Career Cluster: Engineering & Technology Education

Secondary – Non-Career Preparatory	
Program Number	8601000
CIP Number	0821010600
Grade Level	9-12
Program Length	3 credits
Teacher Certification	Refer to the **Program Structure** section
CTSO	FL-TSA, SkillsUSA
CTE Program Resources	http://www.fldoe.org/academics/career-adult-edu/career-tech-edu/program-resources.stml

Purpose

The purpose of this program is to provide students with a foundation of knowledge and technically oriented experiences in the study of communications technology. This program focuses on transferable skills and stresses understanding and demonstration of the technological tools, machines, instruments, materials, processes and systems in business and industry. Communications Technology represents the current and expanding digital technology.

The content includes, but is not limited to a study of the processes, uses, and technical skills found in visual technologies (both conventional and digital procedures), multimedia production, computer animation and graphics, web page design, electronic media, and other new and emerging technologies.

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 credits.

To teach the course(s) 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	Level	Graduation Requirement
8601010	Communications Technology I	COMM ART @7 7G GRAPH ARTS @4 PRINTING @7 7G TEC ED 1 @2 ENG&TEC ED1@2	1 credit	3	CT
8601020	Communications Technology II		1 credit	3	CT
8601030	Communications Technology III		1 credit	3	CT

(Graduation Requirement Codes: CT=Career & Technical Education, EQ= Equally Rigorous Science, EC= Economics, MA=Mathematics, PL=Personal Financial Literacy)

In addition to the above courses, the Advanced Technology Applications (8601900) course is appropriate to be used for content area continuation in this program after all three credits of this program have been completed. The purpose of the Advanced Technology Applications course is to provide students with a capstone opportunity to develop a school-based project from "vision" to "reality," working in teams to design, engineer, manufacture, construct, test, redesign, test again; and then produce a finished "project". This would involve using ALL the knowledge previously learned, not only in Engineering & Technology Education but also across the curriculum. See the Advanced Technology Applications framework for more information.

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   Demonstrate an understanding of the role and its relationships that technology provides across various fields of study.
02.0   Demonstrate an understanding of the characteristics, scope, and influence of technology.
03.0   Demonstrate an understanding of the elements of design and the principles of composition and how it correlates to the design process.
04.0   Understand, select, and use information and communication technologies.
05.0   Demonstrate safe and appropriate use of tools, machines, and materials in communications technology.
06.0   Produce a visual representation of the project scope in forms of layouts, designs, blueprint and mock-ups/prototypes across various platforms that are associated with digital publishing.
07.0   Express technical knowledge and understanding of major printing processes.
08.0   Identify and demonstrate proficiency with common computer peripherals, including connections to standard input and output devices.
09.0   Demonstrate knowledge of computer file management.
10.0   Demonstrate proficiency using the Internet to locate information.
11.0   Demonstrate an understanding of Internet safety and ethics.
12.0   Develop and apply word processing and document manipulation skills.
13.0   Demonstrate an understanding of color theory and its role in communications design.
14.0   Demonstrate an understanding of the Elements of Art and the Principles of Design.
15.0   Demonstrate an understanding of typography.
16.0   Demonstrate basic proficiency and understanding of the differences between a moment in time, artwork and visual communications in the studies of photography.
17.0   Demonstrate proficiency in using a software application for digital imaging.
18.0   Develop an awareness of emerging technologies associated with communication design.
19.0   Demonstrate proficiency in using presentation software.
20.0   Demonstrate an understanding and application of the various approaches used in problem solving.
21.0   Demonstrate abilities to apply the design process.
22.0   Demonstrate technical knowledge and skills in the area of design process.
23.0   Demonstrate technical knowledge and skills in finishing, binding, and packaging.
24.0   Define, design, and complete digital publishing projects.
25.0   Demonstrate proficiency in using digital photography.
26.0   Demonstrate proficiency creating and manipulating digital images using software applications.
27.0   Use computer networks, internet and online resources to facilitate collaborative communication.
28.0   Compare and contrast various forms of digital media delivery systems.
29.0   Plan, organize, and carry out collaborative communication projects.
30.0   Demonstrate an understanding of the cultural, social, economic, and political effects of technology.
31.0   Demonstrate the abilities to use and maintain technological products and systems.
32.0   Demonstrate proficiency in the design of communication solutions involving motion or special effects.
33.0   Demonstrate proficiency in producing a communications product for delivery using mobile communication devices.
34.0   Demonstrate technical knowledge and skills in digital and electronic communication.

35.0   Demonstrate an understanding of how market research and audience data gathering methods are used to assess the impact of the product.

36.0   Demonstrate an understanding of career opportunities and requirements in the field of communications technology.

37.0   Demonstrate an understanding of the use of emerging technologies in communication and advertising.

38.0   Demonstrate advanced layout, mock-up, prototype, layout, project design associated with digital publishing.

39.0   Demonstrate advanced proficiency creating and manipulating digital images using software applications.

40.0   Organize and carry out project plans for creating various communications products.

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Student Performance Standards

Course Title: **Communications Technology I**
Course Number: **8601010**
Course Credit: **1**

Course Description:

This course provides students with instruction in the characteristics and evolution of technology, underlying principles of design, and fundamental knowledge and skills in the use of software used in communications design. Included in the content is the use of essential application software. The ultimate output of this course is a design portfolio created by the student. Each item or product included in the portfolio should include a narrative description and an explanation of the technical approach or techniques used to create the item. Consideration should be given to having students present the portfolio using presentation software.

CTE Standards and Benchmarks	
01.0	Demonstrate an understanding of the role and relationships that technology provides across various fields of study. The student will be able to:
01.01	Identify technology beyond its intended purpose.
01.02	Identify technological innovation resulting when ideas, knowledge, or skills are shared within a technology, among technologies, or across disciplines.
01.03	Identify the various types of intellectual properties and outline the procedures for patenting to protect a technological idea.
02.0	Demonstrate an understanding of the characteristics, scope, and influence of technology. The student will be able to:
02.01	Describe how technology is used to influence society's cultural, political, personal and economic aspects.
02.02	Describe the major technological developments that characterized the Industrial Revolution and their impact on society.
02.03	Describe the major technological developments that characterized the Information Age and their impact on society.
02.04	Conduct specific, goal-directed research related to inventions and innovations throughout history.
03.0	Demonstrate understanding of the elements of design and the principles of composition and how it correlates to the design process. The student will be able to:
03.01	Research and describe the implication of audience, purpose/message, intention, and timeframe constraints of a project.
03.02	Research historical applications and perspectives related to the project.
03.03	Identify the difference between being creative and creativity.

CTE Standards and Benchmarks

	03.04	Describe the sequence and associated activities involved in applying the design process starting with the problem, need/scope.
	03.05	Explain the relationship between design criteria and design constraints.
	03.06	Explain the forms of analysis used in evaluating potential solutions, particularly those forms associated with design principles, estimation, economics, and worst case scenario.
	03.07	Brainstorm potential solutions to a communication design problem.
	03.08	Evaluate proposed solutions to communications design problem selecting optimal solution.
	03.09	Produce thumbnail sketches/rough design and final designs.
	03.10	Evaluate solution to ensure the sustainability and effectiveness of a communications design (e.g., visual appeal, audience, media, and market research).
04.0		Understand, select, and use information and communication technologies. The student will be able to:
	04.01	Describe and give examples of human to human, human to machine, machine to human, and machine to machine communications.
	04.02	Select and use information and communication systems to inform, persuade, entertain, control, manage, and educate.
	04.03	Compare and contrast the means of communicating visual messages (i.e., graphically, electronically) and associated forms (e.g., digital, analog, and multimedia).
	04.04	Compare and contrast the forms for communicating technological information (e.g., symbols, icons, graphic, measurement, et al).
05.0		Demonstrate safe and appropriate use of tools, machines, and materials in communications technology. The student will be able to:
	05.01	Select appropriate tools, procedures, and/or equipment.
	05.02	Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment.
	05.03	Follow laboratory safety rules and procedures.
	05.04	Demonstrate good housekeeping at workstation within total laboratory.
	05.05	Identify American National Standards Institute (ANSI) color-coding safety standards.
	05.06	Explain fire prevention and safety precautions and appropriate practices for extinguishing fires.
	05.07	Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.
06.0		Produce a visual representation of the project scope in forms of layouts, designs, blueprint and mock-ups/prototypes across various platforms that are associated with digital publishing. The student will be able to:

CTE Standards and Benchmarks
06.01 Demonstrate an understanding of the elements and principles of design (e.g., line, shape, balance).
06.02 Develop a concessive plan of the project scope, demonstrating the processes needed to accomplish the end goal (e.g., audience, purpose, time limitations).
06.03 Describe the processes and implications of content preparation and editing/proofreading.
06.04 Develop and apply specifications for specific projects.
06.05 Demonstrate basic technical skills using a digital publishing application (e.g., InDesign, Scribus, and Microsoft Publisher).
06.06 Understand the differences between manual paste-up and electronic page layout.
06.07 Identify distinct components in a layout (e.g., headlines, subheads, body copy).
06.08 Demonstrate proper use of typography (Visual hierarchy, proximity, alignment, contrast, and repetition).
06.09 Compare and contrast methods of measurement used in desktop publishing (e.g., in, cm, mm, points, picas)
06.10 Produce a variety of designs using digital publishing applications (flyers, postcards, brochures, business cards, and letter head).
06.11 Incorporate clip art/images, borders, and other special effects into a layout.
06.12 Understand and comply with the legalities of using preexisting images (copyright/trademark).
06.13 Create a portfolio to showcase projects.
07.0 Express technical knowledge and understanding of major printing processes. The student will be able to:
07.01 Explain and demonstrate pre-press operations.
07.02 Demonstrate an understanding of printing processes (i.e., letterpress, gravure, screen, lithographic).
07.03 Demonstrate an understanding of digital printing processes (e.g., dye sublimation, direct print, and laser jet).
07.04 Demonstrate an understanding of the lithographic offset press process.
07.05 Explain the difference between printing and duplicating processes.
07.06 Explain and apply the different types of file formats used for the various printing methods.
08.0 Identify and demonstrate proficiency with common computer peripherals, including connections to standard input and output devices. The student will be able to:

CTE Standards and Benchmarks	
08.01	Identify the internal components of a computer (e.g., power supply, hard drive, mother board, I/O cards/ports, cabling, etc.).
08.02	Identify and demonstrate the types and functions of common and special input devices (e.g., mouse, keyboard, camera, microphone, scanner, cell phone, digital cameras, mobile devices, GPS devices).
08.03	Describe the types and purposes of various computer connection ports (e.g., USB, firewire, parallel, serial, and Ethernet).
08.04	Identify and connect an output device (e.g., printer, monitor, projector, et al) and verify proper operation.
08.05	Identify various storage devices (e.g., flash drive, iPod, phone, external hard drive, etc.).
09.0 Demonstrate knowledge of computer file management. The student will be able to:	
09.01	Describe and use conventional file naming conventions.
09.02	Demonstrate proficiency with file management tasks (e.g., folder creation, file creation, backup, copy, delete, open, save).
09.03	Be able to identify file types by extension and association (e.g., .doc, .txt, .psd, .ai, .png, jpeg, and etc.).
10.0 Demonstrate proficiency using the Internet to locate information. The student will be able to:	
10.01	Identify and use web terminology.
10.02	Define Universal Resource Locators (URLs) and associated protocols (e.g., http, ftp, telnet, mailto).
10.03	Compare and contrast the types of Internet domains (e.g., .com, .org, .edu, .gov, .net, and mil).
10.04	Demonstrate proficiency using search engines, including Boolean search techniques.
10.05	Apply the rules for properly citing works or other information obtained from the Internet.
10.06	Identify and apply Copyright Fair Use guidelines.
10.07	Evaluate online information for credibility and quality using basic guidelines and indicators (e.g., authority, affiliation, purpose, etc.).
11.0 Demonstrate an understanding of Internet safety and ethics. The student will be able to:	
11.01	Describe cyber-bullying and its impact on perpetrators and victims.
11.02	Differentiate between viruses and malware, specifically their sources, ploys, and impact on personal privacy and computer operation, and ways to avoid infection.
11.03	Describe risks associated with social networking sites and ways to mitigate these risks.

CTE Standards and Benchmarks

	11.04	Adhere to cyber safety practices with regard to conducting Internet searches, email, chat rooms, and other social network websites.
	11.05	Adhere to Acceptable Use Policies when accessing the Internet.
12.0	**Develop and apply word processing and document manipulation skills. The student will be able to:**	
	12.01	Apply and adjust page layouts (work with text; tables, pages, special features) to demonstrate graphic capabilities of software application.
	12.02	Create projects that contain a title page, text, and graphic images.
13.0	**Demonstrate an understanding of color theory and its role in communications design. The student will be able to:**	
	13.01	Describe the spectral colors in the visible light spectrum.
	13.02	Describe the difference between additive and subtractive color mixing.
	13.03	Compare and contrast the RGB and CYMK color modes used in communication design.
	13.04	Demonstrate knowledge in terms relating to color such as chroma, lightness, saturation, hue, intensity, luminance/value, shade, tint, etc.
	13.05	Demonstrate an understanding relating to the meanings of color (the psychology of color & the application of color in design).
	13.06	Demonstrate the application of color theory to design practices.
14.0	**Demonstrate an understanding of the Elements of Art and the Principles of Design. The student will be able to:**	
	14.01	Describe the Elements of Art (e.g., line, shape, form, mass etc.).
	14.02	Describe the Principles of Design (e.g., balance, unity, contrast, rhythm, proportion, emphasis, movement, scaling).
	14.03	Apply the Elements of Art and Principles of Design to enhance the message of the image/text and layout.
15.0	**Demonstrate an understanding of typography. The student will be able to:**	
	15.01	Describe character and line spacing (e.g., leading, kerning, tracking, baseline shift, ligature, line spacing).
	15.02	Identify characteristics and psychology of type, type families, type series, and type styles.
	15.03	Demonstrate an understanding of the history of typography
	15.04	Describe the principles of typographic design as they relate to communication design.

CTE Standards and Benchmarks
15.05 Compare and contrast the techniques for typographic communication relative to their appropriateness and effectiveness.
15.06 Demonstrate proficiency in incorporating typographic techniques into a communication design.
15.07 Identify and apply the various fonts as a form of controlling audience visual impact.
16.0 Demonstrate basic proficiency and understanding of the differences between a moment in time, artwork and visual communications in the studies of photography. The student will be able to:
16.01 Demonstrate typical features and operation of a digital camera. (modes)
16.02 Apply the concepts of Element of Art and the Principles of Design in visual communications.
16.03 Apply effective design principles in digital photography compositions.(rule of thirds)
16.04 Demonstrate an understanding between the various types of photography as it relates to its usage in the field of visual communications (e.g., photojournalism, quote, and slogan).
17.0 Demonstrate proficiency in using a software application for digital imaging. The student will be able to:
17.01 Differentiate between the various file formats (e.g., bitmap, raster, vector, GIF, and PNG).
17.02 Demonstrate a basic knowledge of the tools and techniques for using vector software application (e.g., Illustrator, Inkscape, and Corel Draw).
17.03 Create and edit various illustrations using vector software (e.g., line art, drawing basics, transforming/applying effects to objects, painting, type and type effects, and working with layers).
17.04 Demonstrate a basic knowledge of the tools and techniques for using a vector/raster software application (e.g., Photoshop, GIMP).
17.05 Create and edit images/photographs using digital imaging software (e.g., layers, images adjusting, adjustment layers, filters, and masking).
17.06 Demonstrate skill in image manipulation, color correction, and special effects to creatively convey a message using vector/raster software applications.
17.07 Demonstrate skill in scanning, cropping, and importing photographs.
17.08 Compare and contrast image formats (e.g., TIF, BMP, EPS, PNG, PDF, JPEG, GIF, Raw).
17.09 Demonstrate an understanding of image resolution and compression factors such as transmission speed, color reduction, and delivery media parameters.
17.10 Incorporate scanned or digitally taken photographs into documents comprising a visual communication design (e.g., poster, brochure, card, advertisement, and web).
18.0 Develop an awareness of emerging technologies associated with communication design. The student will be able to:

CTE Standards and Benchmarks	
18.01	Compare and contrast emerging technologies relative to their role in communication design (e.g., wireless, Clouds, wireless web, cell phones, portables, handhelds, kiosks).
18.02	Describe social media as an emerging communications technology.
18.03	Describe the emerging or evolving nature of software applications used in interactive design (e.g., Adobe InDesign, Creative Cloud Suite).
18.04	Explain how the use of advanced image sensing devices have altered the manner in which communication takes place, especially those employing Quick Response (QR) codes or other form of two-dimensional bar coding technologies.
19.0	Demonstrate proficiency in using presentation software. The student will be able to:
19.01	Create a slide presentation that includes pictures, text, video, digital images and audios.
19.02	Adjust presentation formats.

Florida Department of Education
Student Performance Standards

Course Title: **Communications Technology II**
Course Number: **8601020**
Course Credit: **1**

Course Description:

In this course, students learn more about the nature of design and development techniques for communication purposes. Students are also provided with instruction in a variety of technologies commonly used to communicate concepts and designs. Students are expected to continue collating their portfolio using exemplars of their work. As with previous portfolio pieces, each exemplar should include a narrative description of the item with an explanation of any special techniques used to create the item.

CTE Standards and Benchmarks
05.0   Demonstrate safe and appropriate use of tools, machines, and materials in communications technology. The student will be able to:
05.01   Select appropriate tools, procedures, and/or equipment needed to produce a product.
05.02   Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to manufacture a product.
05.03   Follow laboratory safety rules and procedures.
05.04   Demonstrate good housekeeping at workstation within total laboratory.
05.05   Identify color-coding safety standards.
05.06   Explain fire prevention and safety precautions and appropriate practices for extinguishing fires.
05.07   Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.
20.0   Demonstrate an understanding and application of the various approaches used in problem solving. The student will be able to:
20.01   Research a problem and determine the most appropriate problem-solving method to employ functional, economic, and ethical viability of a project.
20.02   Utilize a multiple approaches to solving technological problems.
21.0   Demonstrate abilities to apply the design process. The student will be able to:
21.01   Determine whether a communications design problem is worthy of being resolved or addressed.
21.02   Identify the criteria and constraints associated with a communications design problem and select the most appropriate solution based

CTE Standards and Benchmarks

	on these factors.
21.03	Evaluate the quality, efficiency, and productivity of an existing or proposed design and refine the design accordingly.
21.04	Evaluate an existing design using conceptual, physical, and mathematical models and note aspects for improvement. Does it meet criteria and constraints?
21.05	Select an appropriate brainstorming process (e.g., concept mapping, graphic organizers and explain its role in the design process.
21.06	Design and develop communications design solution using the design process.
21.07	Apply and evaluate the design process pertaining to a design solution.
22.0	**Demonstrate technical knowledge and skills in the area of design process. The student will be able to:**
22.01	Demonstrate how to represent concept.
22.02	Determine the most effective software applications for the design problem.
22.03	Use communication, analysis, and design skills to define project specifications that will meet client needs/desires, including purpose, mood and audience.
22.04	Complete projects according to plan using the most effective design.
22.05	Define, design, and complete digital projects and account for time and resources.
22.06	Create a portfolio to showcase projects.
23.0	**Demonstrate technical knowledge and skills in finishing, binding, and packaging. The student will be able to:**
23.01	Describe standard binding, finishing and packaging processes.
23.02	Describe the processes of imposition, pagination, scoring, folding, gathering, and collating.
23.03	Demonstrate proper packaging for a printed project (packaging, mounting, and framing).
24.0	**Define, design, and complete digital publishing projects. The student will be able to:**
24.01	Demonstrate increased proficiency using tools and techniques in digital publishing software applications (layout of a document, working with text, managing graphics, understanding color and transparency, basic output).
24.02	Use communication, analysis, and design skills to define project specifications that will meet client needs/desires.
24.03	Develop a client brief which includes all project scope and time constraints which result in the development of a final project.

CTE Standards and Benchmarks	
24.04	Develop an awareness of the history of digital photography.
24.05	Complete the project according to plan.
24.06	Create a portfolio to showcase the project.
25.0	**Demonstrate proficiency in using digital photography. The student will be able to:**
25.01	Demonstrate proficiency in adjusting the hardware features of a basic digital SLR camera, including manual settings, shutter speed, f-stops, et al.
25.02	Demonstrate an understanding of lighting in photographic composition.
25.03	Use imaging techniques (e.g., High Dynamic Range (HDR), panoramic, long exposure, stop motion, time lapse) to achieve different artistic effects.
25.04	Demonstrate knowledge of photography by creating various projects
25.05	Demonstrate effective presentation (mounting, display, etc.) of a thematic photograph or video portfolio of different types of photos.
25.06	Develop an awareness of the history of photography.
26.0	**Demonstrate proficiency creating and manipulating digital images using software applications. The student will be able to:**
26.01	Demonstrate proficiency using tools and techniques in raster-based software applications (e.g., layers, adjusting images, filters, special effects, selections, masks, channels).
26.02	Demonstrate proficiency using tools and techniques in vector-based software applications (line art, drawing, transforming/applying effects to objects, painting, type and type effects, working with layers).
27.0	**Use computer networks, internet and online resources to facilitate collaborative communication. The student will be able to**
27.01	Demonstrate how to connect to an online collaborative resource.
27.02	Discuss the ethics and copyright legalities of downloading or sharing music or videos from online collaborative environments (e.g., Google Docs).
27.03	Describe risks associated with using social networking sites for collaboration and ways to mitigate these risks.
27.04	Adhere to cyber safety practices with regard to conducting Internet searches, email, chat rooms, and other social network websites.
27.05	Use various web tools associated with online collaboration, including those used downloading files, transfer of files, telnet, FTP, PDF, plug-ins, and data compression.
27.06	Describe how communication is supported by interactive web applications, including real-time sharing of photos and video clips, messaging, chatting and collaborating.

CTE Standards and Benchmarks	
27.07	Describe appropriate use of social networking sites and applications, blogs and collaborative tools for information, images, etc.
28.0	**Compare and contrast various forms of digital media delivery systems. The student will be able to:**
28.01	Explain the benefits and constraints of fixed versus streaming digital media.
28.02	Describe the variations in design considerations between mass display and on-demand display of digital media.
28.03	Discuss the variations in design considerations related to digital signage.
28.04	Describe the implications to the design of digital images and/or graphics based on projected mobile and WiFi delivery media.
29.0	**Plan, organize, and carry out collaborative communication projects. The student will be able to:**
29.01	Apply the design process to determine the scope of a project.
29.02	Organize the team according to individual strengths.
29.03	Assign specific tasks within a team.
29.04	Determine project priorities and timeline.
29.05	Identify required resources.
29.06	Plan research, design, development, and evaluation activities as required.
29.07	Carry out the project plan to successful completion.
29.08	Create a presentation to articulate the problem, the solution, the process chosen, conclusions, and lessons learned (self-reflection).

Florida Department of Education
Student Performance Standards

Course Title: **Communications Technology III**
Course Number: **8601030**
Course Credit: **1**

Course Description:

In addition to exploring the implications of applying technologies, this course provides students with instruction in advanced techniques relative to both static and animated communication designs. In addition to learning more advanced techniques and emerging technologies, students will have an opportunity to research a project, design an appropriate solution, and present their results. The ultimate output of this course is the student's presentation of a completed portfolio illustrating their best exemplars. The portfolio should include a narrative description of the scenario, the approach to data collection, resulting renderings, and an interpretation of each chart/graph. Research references should be cited appropriately. Given the advanced nature of this course, students should be encouraged to produce the portfolio using presentation software suitable for dissemination via the Internet.

CTE Standards and Benchmarks
05.0   Demonstrate safe and appropriate use of tools, machines, and materials in communications technology. The student will be able to:
05.01   Select appropriate tools, procedures, and/or equipment needed to produce a product.
05.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to manufacture a product.
05.03 Follow laboratory safety rules and procedures.
05.04 Demonstrate good housekeeping at workstation within total laboratory.
05.05 Identify color-coding safety standards.
05.06 Explain fire prevention and safety precautions and appropriate practices for extinguishing fires.
05.07 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.
30.0   Demonstrate an understanding of the cultural, social, economic, and political effects of technology. The student will be able to:
30.01 Identify changes caused by the use of technology ranging from gradual to rapid and from subtle to obvious.
30.02 Classify the use of technology involving weighing the trade-offs between the positive and negative effects.
31.0   Demonstrate the abilities to use and maintain technological products and systems. The student will be able to:

CTE Standards and Benchmarks	
31.01	Document processes and procedures and communicate them to different audiences using appropriate oral and written techniques.
31.02	Diagnose a system that is malfunctioning and use tools, materials, machines, or knowledge to repair it.
31.03	Troubleshoot, analyze, and maintain systems to ensure safe and proper function and precision.
31.04	Operate systems so that they function in the way they were designed.
31.05	Use computers and calculators to access, retrieve, organize, process, maintain, interpret, and evaluate data and information in order to communicate.
32.0	Demonstrate proficiency in the design of communication solutions involving motion or special effects. The student will be able to:
32.01	Demonstrate an understanding of kinetic typography.
32.02	Design a communication solution that employs animation or motion (e.g., graphics, text, video) to achieve or enhance the intended message.
32.03	Demonstrate proficiency in the use of digital and editing software to create a product featuring special visual effects.
32.04	Design and create an interactive communication product featuring the use of rich media.
32.05	Describe the design constraints associated with optics and devices (e.g., tablet, kiosk, smart phone) used in delivering communication products.
33.0	Demonstrate proficiency in producing communications product for delivery using mobile communication devices. The student will be able to:
33.01	Design and create a communication product suitable for delivery via multiple media (e.g., smart phones, tablets, and laptop).
33.02	Discuss the design implications of products intended for delivery via Bluetooth enabled devices.
33.03	Compare and contrast the security and privacy issues associated with different delivery media, particularly those involving social media.
34.0	Demonstrate technical knowledge and skills in digital and electronic communication. The student will be able to:
34.01	Demonstrate effective use of the internet to locate and evaluate information.
34.02	Distribute information electronically.
34.03	Identify effective design methods for presenting information digitally.
34.04	Demonstrate ability to select appropriate media topics, equipment, and materials for an electronic media product.
34.05	Produce an electronic media project.

CTE Standards and Benchmarks	
35.0	Demonstrate an understanding of how market research and audience data gathering methods are used to assess the impact of the product. The student will be able to:
35.01	Collect information from various sources and evaluate its quality and legitimacy.
35.02	Evaluate data, analyze trends, and draw conclusions regarding the effect of technology on the individual, society, and environment.
35.03	Use assessment techniques, such as trend analysis and experimentation to make decisions about the future development of technology.
36.0	Demonstrate an understanding of career opportunities and requirements in the field of communications technology. The student will be able to:
36.01	Discuss individual interests related to a career in communications technology.
36.02	Explore career opportunities related to a career in communications technology.
36.03	Explore secondary education opportunities related to communications technology.
36.04	Conduct a job search.
36.05	Complete a job application form correctly.
36.06	Demonstrate competence in job interview techniques.
36.07	Create a professional resume and letter of introduction.
36.08	Solicit awards, letters of recommendation and recognition.
36.09	Organize work samples in a professional, presentable format. (portfolio)
37.0	Demonstrate an understanding of the use of emerging technologies in communication and advertising. The student will be able to:
37.01	Demonstrate an understanding of the principles of optics and how they relate to communications technology.
37.02	Discuss modern trends in digital signage and imprinted advertising specialties.
37.03	Explain the various technologies associated with these industries.
37.04	Compare and contrast imprinted and dye sublimation transfer processes.
38.0	Demonstrate advanced layout, mock-up, prototype, layout, project design associated with digital publishing. The student will be able to:
38.01	Demonstrate advanced proficiency in the use of tools and technical skills using digital publishing applications (layout of a document, working with text, managing graphics, understanding color, building interactive documents and preparing documents for final output)

CTE Standards and Benchmarks
39.0   Demonstrate advanced proficiency creating and manipulating digital images using software applications. The student will be able to:
39.01   Demonstrate advanced proficiency using tools and techniques in raster-based software applications (layers, adjusting images, adjustments, filters, special effects, selections, masks, channels).
39.02   Demonstrate advanced proficiency using tools and techniques in vector-based software applications (line art, drawing, transforming/applying effects to objects, painting, type and type effects, working with layers).
25.0   Demonstrate proficiency in using digital photography. The student will be able to:
25.01   Demonstrate advanced knowledge of photography by creating various projects based on themes.
25.02   Demonstrate the ability to plan, schedule, and conduct a photoshoot, producing a final project across various disciplines of media communication.
40.0   Organize and carry out project plans for creating various communications products. The student will be able to:
40.01   Apply the design process to determine the goal, scope, criteria, constraints, and timeline of the project.
40.02   Work as part of the project team, supporting project focus, direction, and progress.
40.03   Identify required resources.
40.04   Plan research, design, development, and evaluation activities as required.
40.05   Carry out the project plan to successful completion.
40.06   Create a presentation to articulate the problem, the solution, the process chosen, conclusions, and lessons learned. (self-reflections)

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.

Florida Standards for English Language Development (ELD)

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

It is recommended, though not required, that the optimal class size enrollment not exceed a 1:1 student/computer ratio.
Recommended minimum equipment:
    Presentation equipment
    Digital cameras
    Functional scanner(s) (e.g., flatbed, integrated within printer, etc.)
    Functional color printer(s)
    Up-to-date applicable software version (i.e., upgrades, updates, patches, etc.)

Career and Technical Student Organization (CTSO)

The Florida Technology Student Association (FL-TSA) and SkillsUSA are the co-curricular career and technical student organizations for providing leadership training and reinforcing specific career and technical skills. 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.

Work-Based Experience (8601800) is the appropriate course to provide Engineering & Technology Education students with the opportunity, as Student Learners, to gain real world practical, first-hand exposure in broad occupational clusters or industry sectors through a structured, compensated or uncompensated experience. Work-Based Experience (WBE) is also designed to give the Student Learners an opportunity to apply and integrate the knowledge, skills, and abilities acquired during their School-Based Experience to actual work situations independent of school facilities. At least one credit of Engineering & Technology Education program consisting of three credits must be completed before enrolling in WBE. See the Work-Based Experience framework for more information.

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.