**Prepared by the State Board of Education TEKS Review Committees**

**Final Recommendation, October 2014**

These draft proposed revisions reflect the changes to the career and technical education (CTE) Texas Essential Knowledge and Skills (TEKS) that have been recommended by State Board of Education-appointed TEKS review committees for courses in the **Information Technology Career Cluster**. Proposed additions are shown in green font with underlines (additions) and proposed deletions are shown in red font with strikethroughs (~~deletions~~).

Comments in the right-hand column provide explanations for the proposed changes. The following notations were used as part of the explanations:

**CRS**—information added or changed to align with the Texas College and Career Readiness Standards (CCRS)

**MV**—multiple viewpoints from within the committee

**VA**—information added, changed, or deleted to increase vertical alignment

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| §130.272. Principles of Information Technology (~~One-Half to~~ One Credit). | | |
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| | TEKS with edits | Committee Comments |
| (a) | General requirements. This course is recommended for students in Grades 9-10. Students shall be awarded 1 credit for successful completion of this course. | |
| (b) | **Introduction.** ~~Students develop computer literacy skills to adapt to emerging technologies used in the global marketplace. Students implement personal and interpersonal skills to prepare for a rapidly evolving workplace environment. Students enhance reading, writing, computing, communication, and reasoning skills and apply them to the information technology environment.~~ | |
| (1) | CTE instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions. In accordance with Texas Administrative Code (TAC) §74.3(b)(1) regarding curriculum arrangement options. | (1) |
| (2) | The Information Technology Career Cluster focuses on building linkages in IT occupations for entry level, technical and professional careers related to the design, development, support and management of hardware, software, multimedia and systems integration services. | |
| (3) | Students develop computer literacy skills to adapt to emerging technologies used in the global marketplace. Students implement personal and interpersonal skills to prepare for a rapidly evolving workplace environment. Students enhance reading, writing, computing, communication, and reasoning skills and apply them to the information technology environment | |
| (4) | Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations. | |
| (5) | Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples. | |
| (c) | **Knowledge and skills.** | |
| (1) | ~~The student demonstrates the necessary skills for career development, employability, and successful completion of course outcomes~~ ~~The student is expected to:~~ The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to: | Streamline |
| (A) | identify and demonstrate positive work behaviors and personal qualities that enhance employability and job advancement such as regular attendance, ~~promptness,~~ attention to proper attire, maintenance of a clean and safe work environment~~, effective appropriate voice~~, and pride in work, flexibility, initiative, employ effective verbal and nonverbal communication skills | Combined and streamlined |
| ~~(B)~~ | ~~identify and demonstrate positive personal qualities such as flexibility, open-mindedness, initiative, listening attentively to speakers, and willingness to learn new knowledge and skills;~~ | See 1A |

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| ~~(C)~~(B) | employ effective reading and writing skills; | |
| ~~(D)~~ | ~~employ effective verbal and nonverbal communication skills;~~ | See 1A |
| ~~(E)~~(C) | solve problems and think critically; | |
| ~~(F)~~(D) | demonstrate leadership skills and function effectively as a team member; | |
| ~~(G)~~(E) | identify and implement proper safety procedures; | |
| ~~(H)~~ | ~~demonstrate an understanding of legal and ethical responsibilities in relation to the field of information technology; and~~ | TEK 13A - 13F |
| ~~(I)~~(F) | demonstrate planning and time-management skills such as project management and storyboarding. | |
| (2) | **The student identifies various employment opportunities in the information technology field. The student is expected to:** | |
| (A) | identify job opportunities and accompanying job duties and tasks; | |
| (B) | research careers of personal interest along with the education, job skills, and experience required to achieve personal career goals; and | |
| (C) | describe understanding of the functions of resumés and portfolios. | |
| (3) | **The student uses** evolving and **emerging technologies to exchange information. The student is expected to:** | |
| (A) | identify and describe functions of various ~~new~~ evolving and emerging technologies; | |
| (B) | send and receive text information and file attachments using electronic methods such as email, electronic bulletin boards, and instant message services; | |
| (C) | demonstrate effective Internet search strategies, including keywords and Boolean logic using various available search engines; | |
| (D) | ~~dissect and~~ identify the various components of a Uniform Resource Locator; | too high level concept for intro course |
| (E) | demonstrate ability to effectively test acquired information from the Internet for accuracy, relevance, and validity; | |
| (F) | explain issues concerning ~~Internet security protocols~~ computer based threats such as computer viruses, malware, ~~online predators~~, and hacking, ~~and identity theft~~; | |
| (G) | explain issues concerning internet safety such as identity theft, online predators, cyber-bullying, and phishing | Added to identify personal concerns of exchanging information electronically |
| ~~(G)~~ | ~~define and identify unethical practices such as hacking, phone fraud, online piracy, and data vandalism; and~~ | Moved to the ethics strand |

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| ~~(H)~~ | ~~demonstrate ethical use of Internet and online resources, including citation of source.~~ | |
| (4) | **The student demonstrates knowledge of the hardware components associated with information systems. The student is expected to:** | |
| ~~(A)~~ | ~~identify the different computer classifications such as minicomputer, mainframe, and microcomputer;~~ | Not 21st century relevant |
| ~~(B)~~(A) | identify major hardware components and their functions ~~such as the central processor unit, input and output peripherals, and storage systems and devices~~; | Updating for 21st century as technology changes too rapidly |
| ~~(C)~~(B) | use available reference tools ~~such as user manuals, both online and written,~~ as appropriate; | 21st (many modern applications don't have manuals) |
| ~~(D)~~ | ~~demonstrate understanding of the process of connecting peripheral devices; and~~ | Streamlining |
| ~~(E)~~(C) | ~~demonstrate proficiency in the~~ connect and use ~~of~~ a variety of ~~input~~ peripheral devices such as mouse, keyboard, microphone, digital camera, and printer, ~~scanner, and optical disk reader~~. | Streamlining |
| (5) | **The student demonstrates knowledge of the different software associated with information systems. The student is expected to:** | |
| (A) | differentiate between systems and application software; | |
| (B) | identify and ~~understand~~ explain major operating system fundamentals and components such as disk operations, graphical user interface components, and hardware drivers; | |
| ~~(C)~~ | ~~Identify the function and operation of compilers and interpreters;~~ | Clarity |
| ~~(D)~~ | ~~identify various computer languages and how the languages are used in software development;~~ | |
| ~~(E)~~ | ~~recognize data representation in software development such as string, numeric, character, integer, and date;~~ | |
| ~~(F)~~(C) | ~~demonstrate understanding of file extensions and~~ explain the purpose of file types across software products; | 21st century systems often obfuscate file extensions |
| ~~(G)~~(D) | ~~recognize~~ demonstrate use of computer numbering systems and internal data representation such as identifying the hexadecimal value of a color; | Clarifying verbiage |
| ~~(H)~~ | ~~identify appropriate use of application software;~~ | |
| ~~(I)~~ | ~~identify new and emerging classes of software;~~ | Redundant |
| ~~(J)~~(E) | ~~identify~~ compare and contrast open source and proprietary ~~licenses~~ software; | Clarifying |
| ~~(K)~~(F) | ~~demonstrate~~ explain ~~proper~~ use of system management tools; ~~and~~ | Clarifying |
| ~~(L)~~(G) | ~~demonstrate~~ use proper file management techniques such as creating, naming, organizing, copying, moving, and deleting files; | Clarifying |

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| (H) | use file protection and security; and | Moved from word processing strand for clarity |
| (I) | explain the process for discovering, quarantining and removing viruses from a computer system. | |
| (6) | **The student analyzes network systems. The student is expected to:** | |
| (A) | identify hardware associated with telecommunications and data networking such as servers, routers, switches, ~~hubs,~~ and network connectors; | |
| (B) | identify and describe various types of networks such as peer-to-peer, local area networks, wide area networks, wireless ~~token ring~~, and Ethernet; | |
| (C) | identify functions of network operating systems; and | |
| (D) | explain troubleshooting techniques for various network connection issues. | |
| (7) | **The student applies word-processing technology. The student is expected to:** | |
| (A) | identify the terminology associated with word-processing software ~~and its functions~~; | |
| ~~(B)~~ | ~~improve the touch system skill using the keyboard and keypad to input data;~~ | Redundant (addressed in a previous TEK) Addressed in TEK 4C |
| ~~(C)~~(B) | edit a variety of text documents using functions such as pagination, appropriate white space, tab settings, and font style, size, and color; | |
| ~~(D)~~(C) | create professional ~~letters~~ documents using advanced word-processing features such as memorandums, technical manuals, or proposals ; | Better aligned to IT |
| ~~(E)~~ | ~~apply formatting techniques to a multipage research paper using approved publication standards such as American Psychological Association and Modern Language Association;~~ | Addressed in English standards |
| ~~(F)~~ | ~~produce desktop publishing documents incorporating both text and graphics such as business cards, newsletters with mastheads, and advertisement flyers; and~~ | Better aligned to IT |
| ~~(G)~~ | ~~demonstrate file protection and security.~~ | Moved to software strand |
| (8) | **The student applies spreadsheet technology. The student is expected to:** | |
| (A) | identify the terminology associated with spreadsheet software ~~and its functions;~~ | |
| (B) | ~~format and organize numerical content to perform mathematical processes such as addition, subtraction, multiplication, and division; percentages and decimals; and order of operations principle~~<br>use numerical content to perform mathematical calculations; | Simplifying |
| (C) | ~~employ~~ use ~~both~~ student-created ~~formulas~~ and preprogrammed functions to produce documents such as budget, payroll, statistical tables, and personal checkbook register; | Clarifying |

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| (D) | identify, generate and describe the function of comma separated value files; | Skill for later courses |
| ~~(D)~~(E) | create and analyze spreadsheets incorporating advanced features such as lookup tables, nested IF statements, subtotals, cell protection conditional formatting, charts, and graphs; ~~and~~ | |
| ~~(E)~~(F) | ~~edit a variety of spreadsheets by performing data management procedures using simple and multiple search parameters to locate, sort, search, and filter data.~~<br>perform sorting, searching, and data filtering in documents. | Simplifying |
| (9) | The student explores computer programming concepts. The student is expected to: | |
| (A) | Identify the function of compilers and interpreters; | Moved from software strand |
| (B) | Explain the difference between the operation of compilers and interpreters; | 9A and 9B were split to avoid confusion and to make the TEKs easier to assess and identify |
| (C) | identify various computer languages and how the languages are used in software development; | |
| (D) | recognize data representation in software development such as string, numeric, character, integer, and date; | |
| (E) | identify and explain the concept of algorithms; and | |
| (F) | describe the flow of a structured algorithm including linear and iterative instructions such as using a flow chart; | |
| (10) | **The student ~~applies~~ explores database technology. The student is expected to:** | |
| (A) | identify the terminology associated with database software and ~~its~~ database functions; | |
| ~~(B)~~ | ~~create, populate, edit, maintain, and save database files;~~ | Not cost effective, also inappropriate for most students at this level. |
| (B) | explore the application of databases; | |
| (C) | identify and explain the purpose and elements of a query language; | |
| ~~(C)~~(D) | ~~differentiate the nature and interrelationships of fields and records;~~<br>Identify and explain the purpose of fields and records; and | |
| ~~(D)~~ | ~~perform data management procedures such as locating, sorting, searching, querying, organizing, and outputting data;~~ | Not cost effective, also inappropriate for most students at this level. |
| (E) | ~~use data management procedures using multiple search parameters; and~~<br>describe the process of constructing a query including multiple search parameters | Clarification and relevance |
| ~~(F)~~ | ~~produce organized reports with calculated figures.~~ | |

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| (11) | **The student applies presentation management technology. The student is expected to:** | |
| (A) | ~~identify the terminology associated with presentation software and its functions~~; identify the terminology and functions of presentation software; and | clarification |
| (B) | create, save, edit, and produce presentations incorporating advanced features such as links, hyperlinks, audio and graphics. ~~with appropriate handouts and speaker notes; and~~ | Streamlining |
| ~~(C)~~ | ~~create a non-linear presentation incorporating links, hyperlinks, audio, and graphics.~~ | |
| (12) | **The student applies design and web publishing techniques. The student is expected to:** | |
| (A) | identify the terminology associated with web page development and interactive media ~~editing software and its functions~~; | Broadens scope, reduces limitation |
| ~~(B)~~ | ~~identify the terminology associated with interactive media;~~ | Streamlining |
| ~~(C)~~(B) | ~~identify and describe~~ ~~explain design principles such as typeface, contrast, repetition, alignment, and proximity;~~<br>identify and explain design elements such as typeface, color, shape, texture, space and form | |
| (C) | identify and explain design principles such as unity, harmony, balance, scale and contrast | |
| (D) | identify and explain common elements of HTML such as tags, stylesheets, and hyperlinks; and | Improved lead in to follow on course |
| ~~(D)~~ | ~~identify and describe types and styles of typeface used for publications such as serif and sans serif; and~~ | Streamlining |
| (E) | create a web page containing links, graphics, and text using appropriate design principles. | Levelling rigor |
| (13) | **The student understands and demonstrates legal and ethical procedures as they apply to the use of information technology. The student is expected to:** | |
| (A) | explain and demonstrate ethical use of technology and online resources; | |
| (B) | adhere to ~~copyright rules~~ intellectual property laws ~~and regulations~~; | |
| ~~(C)~~ | ~~differentiate between copyright and trademarks;~~ | |
| ~~(D)~~(C) | explain the concept of intellectual property laws including copyright, trademarks and patents and consequences of violating each type of law; | |
| ~~(E)~~(D) | examine the consequences of plagiarism; ~~and~~ | |
| (E) | Identify and explain unethical practices such as hacking, online piracy, and data vandalism; and | |
| (F) | demonstrate ethical use of online resources, including citation of source. | |
| ~~(F)~~ | ~~describe the function of a non-disclosure agreement.~~ | Too early |

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| §130.278. Digital ~~and Interactive~~ Media (~~One-Half to~~ One Credit). | | |
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| | TEKS with edits | Committee Comments |
| (a) | **General requirements**. This course is recommended for students in Grades 9 ~~10~~-12. ~~Recommended prerequisite: Principles of Information Technology.~~ Students shall be awarded 1 credit for successful completion of this course. | |
| (b) | **Introduction**. ~~Through the study of digital and interactive media and its application in information technology, students will analyze and assess current and emerging technologies, while designing and creating multimedia projects that address customer needs and resolve a problem. Students implement personal and interpersonal skills to prepare for a rapidly evolving workplace environment. The knowledge and skills acquired and practiced will enable students to successfully perform and interact in a technology-driven society. Students enhance reading, writing, computing, communication, and critical thinking and apply them to the information technology environment.~~ | |
| (1) | CTE instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions. | |
| (2) | The Information Technology Career Cluster focuses on building linkages in IT occupations for entry level, technical and professional careers related to the design, development, support and management of hardware, software, multimedia and systems integration services. | |
| (3) | Through the study of digital media and its application in information technology, students will analyze and assess current and emerging technologies, while designing and creating multimedia projects that address customer needs and resolve a problem. Students implement personal and interpersonal skills to prepare for a rapidly evolving workplace environment. The knowledge and skills acquired and practiced will enable students to successfully perform and interact in a technology-driven society. Students enhance reading, writing, computing, communication, and critical thinking and apply them to the information technology environment. | |
| (4) | Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations. | |
| (5) | Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples. | |
| (c) | **Knowledge and skills**. | |
| (1) | ~~The student demonstrates the necessary skills for career development, maintenance of employability, and successful completion of course outcomes. The student is expected to:~~ The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to: | |
| (A) | identify and demonstrate positive work behaviors and personal qualities that enhance employability and job advancement such as regular attendance, ~~promptness,~~ attention to proper attire, maintenance of a clean and safe work environment, effective ~~appropriate voice~~, and pride in work, flexibility, initiative, employ effective verbal and nonverbal communication skills | Combined |

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| ~~(B)~~ | ~~identify and demonstrate positive personal qualities such as flexibility, open-mindedness, initiative, listening attentively to speakers, and willingness to learn new knowledge and skills;~~ | See 1A |
| ~~(C)~~(B) | employ effective reading and writing skills; | |
| ~~(D)~~ | ~~employ effective verbal and nonverbal communication skills;~~ | See 1A |
| ~~(E~~ (C) | solve problems and think critically; | |
| (D) | demonstrate leadership skills and function effectively as a team member; | |
| ~~(C)~~ | ~~identify and implement proper safety procedures;~~ | Consistency |
| ~~(H)~~ (E) | demonstrate an understanding of legal and ethical responsibilities in relation to the field of information technology; and | |
| ~~(I)~~(F) | demonstrate planning and time-management skills such as project management and storyboarding. | |
| (2) | The student identifies employment opportunities in the information technology field with a focus in the area of ~~interactive~~ digital media. The student is expected to: | |
| (A) | identify job opportunities and accompanying job duties and tasks; | |
| (B) | research careers of personal interest along with the education, job skills, and experience required to achieve personal career goals; | |
| (C) | ~~examine the role of certifications, resumés, and portfolios in the information technology profession; and~~<br>demonstrate an understanding of the functions of resumés and portfolios; and | Consistency |
| (D) | create a digital portfolio. | Clarifying |
| (3) | The student uses emerging technologies to exchange and gather information and resources. The student is expected to: | |
| (A) | collaborate using various electronic technologies such as email, blogs, chat rooms, discussion threads, social media, podcasting and wikis; | 21st century |
| (B) | ~~use Internet resources for research purposes; and~~<br>demonstrate appropriate search strategies for finding resources or assets on the Internet; | |
| (C) | ~~research technologies that have surfaced within the last three years in the area of interactive media.~~<br>discuss recent digital media technologies; and | |
| (D) | evaluate and select appropriate software for the development of projects. | Tech APPS update |
| (4) | The student complies with standard practices and behaviors that meet legal and ethical responsibilities. The student is expected to: | |

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| (A) | explain and demonstrate ethical use of technology and online resources; | |
| (B) | compare and contrast fair use, open source and creative commons; | |
| (C) | adhere to intellectual property laws and regulations; | |
| (D) | differentiate between copyright and trademarks; | |
| (E) | explain the concept of intellectual property laws including copyright, trademarks and patents and consequences of violating each type of law; | |
| (F) | define and identify unethical practices such as hacking, online piracy, and data vandalism; | |
| (G) | demonstrate ethical use of Internet and online resources, including citation of source; and | |
| (H) | describe the function of a non-disclosure agreement and intellectual property agreement. | |
| ~~(A)~~ | ~~examine copyright and fair use guidelines in the digital media industry;~~ | |
| ~~(B)~~ | ~~model ethical and legal acquisition of digital information, including the correct citing of sources through the use of established methods; and~~ | |
| ~~(C)~~ | ~~demonstrate proper netiquette and acceptable use policies when using networks.~~ | |
| (5) | The student analyzes and applies design and layout principles in digital media. The student is expected to: | |
| (A) | compare and contrast printed and digital communications products that demonstrate appropriate and inappropriate use of design and layout principles; | |
| (B) | identify and apply ~~use~~ perspective such as backgrounds, light, shades, shadows, and scale to capture a focal point and create depth; | |
| (C) | identify and apply ~~use~~ principles of proportion, balance, variety, emphasis, harmony, symmetry, unity, and repetition in type, color, size, line thickness, shape, and space; | |
| (D) | identify and apply ~~use~~ three-dimensional effects such as foreground, middle distance, and background images; | |
| (E) | identify and apply concepts of ~~use~~ typography; | |
| (F) | identify and apply ~~use~~ color theory; and | |
| (G) | ~~re~~create and improve ~~existing multimedia~~ digital products by applying the appropriate design and layout principles. | |
| (6) | The student designs and creates digital graphics. The student is expected to: | |
| (A) | compare and contrast the characteristics of raster-based bitmap graphics and vector-based graphics; | |
| (B) | create and modify digital graphics using appropriate vector-based and raster-based software | |

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| | following standard design principles; | |
| (C) | export and set graphics to be used in both print and digital formats. | |
| ~~(B)~~ (D) | demonstrate ~~appropriate file storage and file size management skills;~~<br>knowledge of graphic resolution, file size, file formats and file management; | |
| ~~(C)~~ (E) | ~~recognize the various file extensions used in digital and interactive media such as compression, conversion, and use and modification;~~<br>determine the type of data stored in a file based on its file extension and select appropriate software to modify, create and view the file; and | Clarity |
| ~~(D)~~ | ~~identify and choose appropriate software applications for specific digital media types such as photo, graphics, video, audio, and animation editing software; and~~ | |
| ~~(E)~~ (F) | differentiate between the color mode selections in determining product output. | |
| (7) | The student demonstrates appropriate use of digital photography equipment and techniques. The student is expected to: | |
| (A) | demonstrate proper use of safety procedures while using digital photography equipment; | |
| (B) | capture still shot images using digital photography equipment incorporating various photo composition techniques such as lighting, perspective, candid versus posed, rule of thirds, and level of horizon; | |
| (C) | transfer still shot images from equipment to the computer; and | |
| (D) | demonstrate photographic enhancement techniques such as feathering, layering, masking, and color enhancement using appropriate ~~digital manipulation~~ photo editing software. | |
| ~~(8)~~ | ~~The student demonstrates appropriate use of digital graphics. The student is expected to:~~ | |
| ~~(A)~~ | ~~create and modify digital graphics using appropriate vector-based and raster-based software following standard design principles; and~~ | Moved to digital graphics TEK above |
| ~~(B)~~ | ~~export and set graphics to be used in both print and digital formats.~~ | |
| ~~(9)~~(8) | The student demonstrates appropriate use of video equipment and techniques. The student is expected to: | |
| (A) | demonstrate proper use of safety procedures while using digital video equipment; | |
| (B) | demonstrate proper use of terminology in relation to video technology; | |
| (C) | demonstrate proper ethics in the use of digital video photography equipment to capture video images; | |
| (D) | transfer video images from equipment to the computer; | |

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| (E) | demonstrate videographic enhancement and editing techniques such as panning, transitions, zooming, content editing, and synchronizing audio and video using appropriate digital manipulation software; and | |
| (F) | export video files in digital formats to be used in various delivery systems such as podcasting, downloadable media, social media and streaming. | updating |
| ~~(10)~~(9) | The student demonstrates appropriate use of audio equipment and techniques. The student is expected to: | |
| (A) | demonstrate proper use of safety procedures while using digital audio equipment; | |
| (B) | demonstrate proper use of terminology and concepts in relation to audio technology; | |
| (C) | demonstrate proper use of digital audio equipment to capture audio files; | |
| (D) | transfer audio files from equipment to the computer; | |
| (E) | demonstrate proper use of audio editing software such as adding effects, fading, volume control, and manipulation of waveforms using appropriate digital manipulation software; and | |
| (F) | export audio files to be used in digital formats in various delivery systems such as podcasting, downloadable files, social media and streaming. | updating |
| ~~(11)~~(10) | The student demonstrates appropriate use of animation. The student is expected to: | |
| (A) | ~~Use~~ plan and create a linear and non-linear animation ~~the principles of motion graphics~~ using accepted standards such as design principles, frames and key frames, integration of audio into an animation, and user interactive controls; | clarification |
| ~~(B)~~ | ~~create and modify a linear and a nonlinear animation using appropriate software following standard design principles; and~~ | Combined above |
| (C) (B) | ~~Export~~ deploy ~~and set~~ animation to be used in various digital formats and on various video animation players. | |
| (C) | create an interactive animation | 21st century |
| ~~(12)~~(11) | The student demonstrates appropriate project management in the creation of digital media projects. The student is expected to: | |
| (A) | Identify the purpose, audience and audience needs for design plans. | |
| (B) | develop a plan for a media project such as a storyboard, stage development, and identification of equipment and resources; and | |
| (C) | evaluate a project plan along its timeline and make suggested revisions until completion of the project. | |
| ~~(13)~~(12) | The student deploys digital media into print, web-based, and video products. The student is expected to: | |

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| (A) | incorporate video, audio, text, graphics, and ~~motion graphics~~ animations into a~~n existing~~ web page; | |
| (B) | incorporate various digital media products into an electronic ~~printed~~ document such as a newsletter, social media outlet, poster, or report; and | |
| (C) | incorporate various digital media products into an interactive product such as an animation, computer program, simulation, interactive website or application.<br>~~develop an interactive medium such as a compact disk or digital video disk to display video, audio, and animation products; and~~ | |
| ~~(D)~~ | ~~collect and organize student created products to build an individual portfolio.~~ | redundant |

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| §130.279. Web Technologies (~~One-Half to~~ One Credit). | | |
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| | TEKS with edits | Committee Comments |
| (a) | **General requirements**. This course is recommended for students in Grades 10-12.<br>Recommended prerequisite: Principles of Information Technology. Students shall be awarded 1 credit for successful completion of this course. | |
| (b) | **Introduction**. ~~Through the study of web technologies and design, students learn to make informed decisions and apply the decisions to the field of information technology. Students implement personal and interpersonal skills to prepare for a rapidly evolving workplace environment. The knowledge and skills acquired and practiced will enable students to successfully perform and interact in a technology-driven society. Students enhance reading, writing, computing, communication, and critical thinking and apply them to the information technology environment.~~ | |
| (1) | CTE instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions. | |
| (2) | The Information Technology Career Cluster focuses on Building linkages in IT occupations for entry level, technical and professional careers related to the design, development, support and management of hardware, software, multimedia and systems integration services. | |
| (3) | Introduction. Through the study of web technologies and design, students learn to make informed decisions and apply the decisions to the field of information technology. Students implement personal and interpersonal skills to prepare for a rapidly evolving workplace environment. The knowledge and skills acquired and practiced will enable students to successfully perform and interact in a technology-driven society. Students enhance reading, writing, computing, communication, and critical thinking and apply them to the information technology environment. | |
| (4) | Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations. | |
| (5) | Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples. | |
| (c) | Knowledge and skills. | |
| (1) | ~~The student demonstrates the necessary skills for career development, maintenance of employability, and successful completion of course outcomes. The student is expected to:~~ The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to: | |
| (A) | identify and demonstrate positive work behaviors and personal qualities that enhance employability and job advancement such as regular attendance, ~~promptness,~~ attention to proper attire, maintenance of a clean and safe work environment, ~~effective~~ ~~appropriate voice~~, and pride in work, flexibility, initiative and employ effective verbal and nonverbal communication skills | Combined and streamlined |

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| ~~(B)~~ | ~~identify and demonstrate positive personal qualities such as flexibility, open-mindedness, initiative, listening attentively to speakers, and willingness to learn new knowledge and skills;~~ | See 1A |
| ~~(C)~~ (B) | examine the role of certifications, resumés, and portfolios in the web technology profession; | |
| ~~(D)~~ | ~~employ effective verbal and nonverbal communication skills;~~ | See 1A |
| ~~(E)~~ (C) | solve problems and think critically; | |
| ~~(F)~~ (D) | demonstrate leadership skills and function effectively as a team member; | |
| ~~(G)~~ | ~~identify and implement proper safety procedures;~~ | Irrelevant |
| ~~(H)~~ | ~~demonstrate an understanding of legal and ethical responsibilities in relation to the field of information technology; and~~ | Taught in Ethics Strand |
| ~~(I)~~ (E) | demonstrate planning and time-management skills such as project management and storyboarding. | |
| (2) | The student identifies employment opportunities in the information technology field with a focus in the area of interactive media. The student is expected to: | |
| (A) | identify job opportunities and accompanying job duties and tasks; | |
| (B) | research careers of personal interest along with the education, job skills, and experience required to achieve personal career goals; | |
| (C) | demonstrate an understanding of the functions of resumés and portfolios; and | |
| (D) | create a portfolio. | |
| (3) | The student demonstrates knowledge and appropriate use of hardware, software, and connectivity technologies. The student is expected to: | |
| ~~(A)~~ | ~~explain the fundamentals of operating systems;~~ | Addressed in Prin of IT and does not extend skills |
| ~~(B)~~ | ~~explain the key functions and applications of software programs;~~ | Addressed in Productivity Tools strand |
| ~~(C)~~ (A) | Identify ~~telecommunications and~~ networking components and define the impact of networking components on web development; | Value added over TEKS from Principles of IT |
| ~~(D)~~ (B) | evaluate the various input, processing, output, ~~and~~ ,storage devices and storage services; | 21st century |
| ~~(E)~~ (C) | identify current and future Internet protocols such as hypertext transfer protocol, file transfer protocol, telnet, and email; and | |
| ~~(F)~~ (D) | ~~identify new web technology trends~~ describe new trends in web technology and evaluate their impact on web development. | Higher order thinking skills |
| (4) | The student complies with practices and behaviors that meet legal and ethical responsibilities. The | |

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| | student is expected to: | |
| (A) | explain and demonstrate ethical use of technology and online resources; | |
| (B) | differentiate between copyright and trademarks; | |
| (C) | explain the concept of intellectual property laws including copyright, trademarks and patents and consequences of violating each type of law; | |
| (D) | examine the consequences of plagiarism; | |
| (E) | adhere to copyright and trademark intellectual property laws and regulations, including demonstrating correct acquisition and citation of sources; | 21st century |
| (F) | discuss the process of acquiring rights to use copyrighted and trademarked content in a web site; | 21st century |
| (G) | demonstrate appropriate behavior and adherence to acceptable use policies when accessing and using online resources; | 21st century |
| (H) | explain the importance of information privacy such as securing credit card information, passwords, and personal information; | 21st century |
| (I) | describe the function of a non-disclosure agreement; and | 21st century |
| (J) | discuss website accessibility concerns. | |
| ~~(A)~~ | ~~examine copyright and licensing issues in the software industry;~~ | Restated for clarity |
| ~~(B)~~ | ~~model ethical and legal acquisition of digital information, including the correct citing of sources through the use of established methods; and~~ | Restated for clarity |
| ~~(C)~~ | ~~demonstrate proper netiquette and acceptable use policies when using networks.~~ | Restated for clarity |
| ~~(5)~~ | ~~The student acquires electronic information in a variety of formats, using research skills and electronic communication to create new knowledge, with appropriate supervision. The student is expected to:~~ | Implied |
| ~~(A)~~ | ~~demonstrate appropriate use of navigation of network resources for information acquisition and sharing;~~ | Addressed above reducing redundancy |
| ~~(B)~~ | ~~acquire information in electronic formats such as text, audio, video, and graphics, citing the source;~~ | Addressed above reducing redundancy |
| ~~(C)~~ | ~~identify, create, modify, and use available file formats such as text, image, video analog and digital, and audio files; and~~ | Streamlining |
| ~~(D)~~ | ~~synthesize information from data acquired from electronic and telecommunications resources.~~ | Streamlining |
| ~~(6)~~ (5) | The student evaluates electronic information. The student is expected to: | |
| (A) | identify appropriate methods to analyze the design and functionality of web pages; and | |

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| (B) | demonstrate skill in testing the accuracy and validity of information acquired.; and | |
| (C) | synthesize information from data acquired from online resources. | Streamlining |
| ~~(7)~~(6) | The student ~~evaluates and employs computer-based productivity tools to create and modify~~ creates and modifies web and digital media designs. The student is expected to: | |
| (A) | implement functional design ~~criteria~~ elements such as proximity, repetition, contrast, alignment, color theory, consistency, image file size, and typography; | |
| (B) | identify, create, modify, and use common file formats such as text, image, video analog and digital, and audio files; | |
| ~~(B)~~(C) | select, create, modify, and integrate effective ~~multimedia~~ digital content such as vector-based and raster graphics, motion graphics, video, and audio; | |
| ~~(C)~~(D) | create web pages ~~in accordance with~~ utilizing current web standards ~~using~~ and web development skills such as version control, documentation, web application security, validation, accessibility, and compatibility across multiple browsers and devices; | |
| ~~(D)~~(E) | demonstrate proper use of folder structure hierarchy; and | |
| (F) | use web coding standards to evaluate the design and functionality of web pages such as the W3C (World Wide Web Consortium) guidelines. | |
| ~~(8)~~(7) | The student demonstrates and employs knowledge of Internet programming strategies to develop and maintain web applications. The student is expected to: | |
| (A) | ~~recognize~~ explain the importance of Internet programming standards; | |
| (B) | differentiate among various web coding standards such as HyperText Markup Language, ~~Extensible HyperText Markup Language~~, and cascading style sheets; | |
| (C) | use standard applications to develop web applications such as text-based editing programs, word processors; and web authoring software; ~~and~~ | Adding specificity |
| (D) | compare and contrast the impact of different browsers on web development~~.~~; | |
| ~~(9)~~ | ~~The student employs knowledge of web programming to develop and maintain web applications. The student is expected to:~~ | Streamlining |
| ~~(A)~~ | ~~explain the purpose of current web content delivery enablers;~~ | Response to informal feedback. Term is confusing. |
| ~~(B)~~(E) | explain client-server applications and describe the process of a client-server transaction; | |
| ~~(C)~~(F) | identify the advantages and disadvantages to client-side processing; | Lowered wording from articulate to identify per informal feedback |
| ~~(D)~~(G) | identify security issues related to client-side processing; | |

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| ~~(E)~~(H) | use standard scripting languages to ~~facilitate interactivity~~ produce interactive web applications; | |
| ~~(F)~~(I) | identify characteristics of various scripting languages; and | |
| ~~(G)~~(J) | ~~demonstrate the ability~~ explain the process to construct secure transaction interfaces from the web server to the customer. | Most schools would not have the permissions or access to accomplish the TEK as originally written |
| ~~(10)~~(8) | The student employs knowledge of web administration to develop and maintain web applications. The student is expected to: | |
| (A) | compare the advantages and disadvantages of running a personal server versus using a server provider; | |
| ~~(B)~~ | ~~explain how to use advanced communication protocols;~~ | Ambiguous |
| ~~(C)~~(B) | ~~demonstrate an understanding of and compliance with~~ explain the ~~Transport~~ Transmission Control Protocol/Internet Protocol; | Spell Check |
| ~~(D)~~(C) | identify hardware and software requirements for web servers; | |
| ~~(E)~~(D) | evaluate server providers; | |
| ~~(F)~~(E) | ~~participate in~~ describe the process of establishing a domain name; | Feasibility |
| ~~(G)~~(F) | simulate the administration of web servers, including uploading and managing files; | |
| ~~(H)~~(G) | collect and analyze usage statistics; | |
| ~~(I)~~(H) | maintain documentation of the server environment such as specifications, passwords, and software versions; | |
| ~~(J)~~(I) | ~~understand~~ summarize the process of server backup and restoration of software features; | |
| ~~(K)~~(J) | propose security measures to protect web servers from electronic threats such as unauthorized access and negative intentions; and | |
| ~~(K)~~(K) | evaluate security measures such as using a firewall, SSL (Secure Socket Layer) connections and HTTPS (Hypertext Transfer Protocol Secure) transactions. | |
| ~~(11)~~(9) | The student evaluates a problem and creates a ~~written~~ project management plan ~~of action~~ for meeting client requirements. The student is expected to: | |
| (A) | communicate with clients to analyze requirements to meet the needs of the client and target audience; | Clarify |
| (B) | document ~~all necessary~~ design properties, necessary tools and resources, and identify and address risks; | Streamlining |
| ~~(C)~~ | ~~identify tools and resources to complete the job;~~ | |

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| ~~(D)~~ | ~~identify and address risks;~~ | |
| ~~(E)~~(C) | develop and use a timeline task list such as critical milestones, potential challenges, and interdependencies; and | |
| ~~(F)~~(D) | use various methods to evaluate the progress of the plan and modify as necessary. | |
| ~~(12)~~(10) | The student creates and implements a ~~written plan of action in the development of a~~ web product using a project management plan. The student is expected to: | |
| (A) | create and simulate the publication of a multipage web product using client required content and web design concepts; | |
| (B) | develop a test plan for a multipage web product for testing usability, effectiveness, reliability, and customer acceptance; | |
| (C) | explain the quality assurance process; and | |
| (D) | develop and implement a quality assurance plan. | |

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| §130.280. ~~Research~~ Practicum in Information Technology ~~Solutions~~ (Two to Three Credits). | | |
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| | TEKS with edits | Committee Comments |
| (a) | **General requirements**. This course is recommended for students in Grade 12. Prerequisite: a minimum of two high school information technology courses. | |
| (1) | A student shall be awarded two credits for successful completion of this course, when the student participates in at least an average of 10 hours, but less than 15 hours, per week of a paid or unpaid, laboratory- or work-based application of previously studied knowledge and skills related to the Information Technology Career Cluster. | |
| (2) | A student shall be awarded three credits for successful completion of this course, when the student participates in an average of 15 hours per week of a paid or unpaid, laboratory- or work-based application of previously studied knowledge and skills related to the Information Technology Career Cluster. | |
| (b) | **Introduction**. ~~Students gain advanced knowledge and skills in the application, design, production, implementation, maintenance, evaluation, and assessment of products, services, and systems. Knowledge and skills in the proper use of analytical skills and application of information technology concepts and standards are essential to prepare students for success in a technology-driven society. Critical thinking, information technology experience, and product development may be conducted in a classroom setting with an industry mentor, as an unpaid internship, or as career preparation.~~ | |
| (1) | CTE instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions. | |
| (2) | The Information Technology Career Cluster focuses on building linkages in IT occupations for entry level, technical and professional careers related to the design, development, support and management of hardware, software, multimedia and systems integration services. | |
| (3) | Students gain advanced knowledge and skills in the application, design, production, implementation, maintenance, evaluation, and assessment of products, services, and systems. Knowledge and skills in the proper use of analytical skills and application of information technology concepts and standards are essential to prepare students for success in a technology-driven society. Critical thinking, information technology experience, and product development may be conducted in a classroom setting with an industry mentor, as an unpaid or paid internship, capstone project or as career preparation. | |
| (4) | Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations. | |
| (5) | Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples. | |

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| (c) | **Knowledge and skills**. | |
| (1) | ~~The student demonstrates the necessary skills for career development, maintenance of employability, and successful completion of course outcomes. The student is expected to:~~ The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to: | |
| (A) | identify and demonstrate positive work behaviors that enhance employability and job advancement such as regular attendance, promptness, attention to proper attire, maintenance of a clean and safe work environment, appropriate voice, and pride in work; | |
| (B) | identify and demonstrate positive personal qualities such as flexibility, open-mindedness, initiative, listening attentively to speakers, and willingness to learn new knowledge and skills; | |
| (C) | employ effective reading and writing skills; | |
| (D) | employ effective verbal and nonverbal communication skills; | |
| (E) | solve problems and think critically; | |
| (F) | demonstrate leadership skills and function effectively as a team member; | |
| (G) | identify and implement proper safety procedures; | |
| (H) | demonstrate an understanding of legal and ethical responsibilities in relation to the field of information technology; and | |
| (I) | demonstrate planning and time-management skills such as project management and storyboarding. | |
| (2) | The student identifies various employment opportunities in the information technology field. The student is expected to: | |
| (A) | improve on a personal career plan along with education, job skills, and experience necessary to achieve career goals; | |
| (B) | develop a resumé and portfolio appropriate to chosen career plan, including letters of recommendation; and | |
| (C) | illustrate interview skills for successful job placement. | |
| (3) | The student applies ~~communication, mathematics, English, and science~~ academic knowledge and skills to research and develop projects. The student is expected to: | |
| (A) | demonstrate proper use of written, verbal, and visual communication techniques consistent with information technology industry standards; | |
| (B) | demonstrate proper use of mathematics concepts in the development of products or services; and | |
| (C) | demonstrate proper use of science principles in the development of products or services. | |
| (4) | The student ~~uses a systems~~ selects an approach for conducting ~~technological~~ research to discover a | |

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| | problem in the field of information technology with the appropriate supervision and guidance. The student is expected to: | |
| (A) | identify a problem relating to information technology; and | |
| (B) | describe and use ~~the~~ an approach, such as top-down or bottom-up, for conducting a research activity. | |
| (5) | The student creates a technological solution for a problem in the field of information technology. The student is expected to: | |
| (A) | apply critical-thinking strategies to develop a solution using appropriate technologies and resources, information technology concepts, and industry standards; | |
| (B) | apply decision-making techniques to the selection of technological solutions; and | |
| (C) | explain how the proposed technological solution will resolve the problem. | |
| (6) | The student designs, creates, and implements a product or service that addresses a problem in the field of information technology and incorporates the solution. The student is expected to: | |
| (A) | work closely with a mentor throughout the design, creation, and implementation process; | |
| (B) | develop a product or service that meets a specified need following a problem-solving strategy; | |
| (C) | identify areas where quality, reliability, and safety can be designed into a product or service; | |
| (D) | develop and implement a security management plan to address security requirements; | |
| (E) | develop a sustainability plan for the product or service; | |
| (F) | develop an evaluation method for analyzing the effect of the product or service on client satisfaction and problem resolution; | |
| (G) | develop a project portfolio that documents the research and development process; and | |
| (H) | present the portfolio to a panel of professionals using formal presentation skills. | |
| (7) | The student creates a personal portfolio. The student is expected to: | |
| (A) | create a portfolio that documents all projects and accomplishments such as academics, volunteer experience, employment experience, awards, and certifications; | |
| (B) | organize and prioritize information within the portfolio; and | |
| (C) | use written, verbal, and visual communication techniques consistent with information technology industry standards. | |

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| §130.273. Computer Maintenance (One Credit). | | |
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| | TEKS with edits | Committee Comments |
| (a) | **General requirements**. This course is recommended for students in Grades 10-12. Recommended prerequisite: Principles of Information Technology. Requires enrollment in co-requisite Computer Maintenance Lab §130.274. Enrollment in co-requisite may be concurrent or consecutive; however; districts are strongly encouraged to block the course and the lab. In accordance with 19 Texas Administrative Code (TAC) §74.3(b)(1), a district may provide instruction in a variety of arrangements and settings including programs designed to permit flexible learning arrangements to support student attainment of course standards. | Changed to reflect ability of local districts to maintain flexibility in scheduling.<br><br>Co-requisite justification –<br>This course is designed to be taught at an advanced level with students attaining both 'theoretical knowledge' and 'hands-on' skills. They must be able to enter the workforce with the ability to apply all that they have learned in this course. Entry level certifications are equivalent to roughly 2000 hours of 'hands-on' work experience. For these reasons this course should be paired with the co-requisite lab for full attainment of all student outcomes. |
| (b) | **Introduction**. | Incorrect class identified<br>Moved to (b)3 |
| 1 | CTE instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions | |
| 2 | The Information Technology Career Cluster focuses on Building linkages in IT occupations for entry level, technical and professional careers related to the design, development, support and management of hardware, software, multimedia and systems integration services. | |
| 3 | Students acquire knowledge of computer maintenance and creating appropriate documentation. Students analyze the social responsibility of business and industry regarding the significant issues relating to the environment, ethics, health, safety, and diversity in society and in the workplace as it relates to computer maintenance. Students apply technical skills to address the IT industry and emerging technologies | Reworded |
| 4 | Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations. | |
| 5 | Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples. | |
| (c) | **Knowledge and skills**. | |
| (1) | The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to: | Changed to reflect standardized wording |
| ~~(A)~~ | ~~identify and demonstrate positive work behaviors that enhance employability and job advancement such as regular attendance, promptness, attention to proper attire, maintenance of a~~ | Covered in Principles of Technology |

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| | ~~clean and safe work environment, appropriate voice, and pride in work;~~ | |
| ~~(B)~~ | ~~identify and demonstrate positive personal qualities such as flexibility, open-mindedness, initiative, listening attentively to speakers, and willingness to learn new knowledge and skills;~~ | |
| ~~(C)~~ (A) | employ effective reading and writing skills; | |
| ~~(D)~~ (B) | employ effective verbal and nonverbal communication skills; | |
| ~~(E)~~ (C) | solve problems and think critically; | |
| ~~(F)~~ (D) | demonstrate leadership skills and function effectively as a team member; | |
| ~~(G)~~ (E) | identify and implement proper safety procedures; | |
| ~~(H)~~ (F) | demonstrate an understanding of legal and ethical responsibilities in relation to the field of information technology; and | |
| ~~(I)~~ (G) | demonstrate planning and time-management skills such as project management. | Not applicable to field |
| (2) | The student identifies various employment opportunities in the information technology field. The student is expected to: | |
| (A) | identify job opportunities and accompanying job duties and tasks; and | |
| | | Covered in Principles of Information Technology |
| (B) | examine the role of certifications, resumes, and portfolios in the information technology profession. | |
| (3) | The student applies academic skills to the requirements of computer technologies. The student is expected to: | |
| (A) | demonstrate effective verbal and written communication skills with individuals from varied cultures such as fellow workers, management, and customers; and | |
| ~~(B)~~ | ~~complete work orders for repair and installation;~~ | Moved to Computer Maintenance Lab |
| ~~(C)~~ | ~~estimate supplies, materials, and labor costs for installation, maintenance, and repair work orders; and~~ | |
| ~~(D)~~ (B) | interpret appropriate documentation such as schematics, drawings, charts, diagrams, technical manuals, and bulletins. | |
| (4) | The student acquires an understanding of computer hardware technologies. The student is expected to: | |
| (A) | explain the fundamentals of microprocessor theory; | |
| (B) | define the use of Boolean and Binary logic in computer technologies; | Wording |

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| (C) | explain the theories of magnetism, electricity, and electronics as related to computer technologies; | |
| (D) | explain proper troubleshooting techniques as related to computer hardware; | |
| (E) | differentiate among digital, analog, and input and output electronics theory; | |
| (F) | explain the relationships relative to data-communications theory; | |
| (G) | describe the architecture of various computer systems; | |
| (H) | describe the function of computer components such as central processing units, storage devices, and peripheral devices; | |
| (I) | explain computer system environmental requirements and related control devices; and | Wording |
| ~~(5)~~ | ~~The student knows the proper function and application of the tools, equipment, and materials used in computer technologies. The student is expected to:~~ | Moved to Computer Maintenance Lab |
| ~~(A)~~ | ~~demonstrate safe use of equipment in computer technologies such as hand and power tools;~~ | |
| ~~(B)~~ | ~~employ available reference documentation such as tools, materials, and Internet sources to access information as needed;~~ | |
| ~~(C)~~ | ~~demonstrate proper handling and disposal of environmentally hazardous materials used in computer technologies; and~~ | |
| ~~(D)~~ (J) | identify new and emerging technologies that may affect the field of computer technology. | Wording<br>Renumbered to (4)(J) |
| ~~(6)~~ | ~~The student applies the concepts and skills of the trade in simulated work situations. The student is expected to:~~ | Moved to Computer Maintenance Lab |
| ~~(A)~~ | ~~use electronic test equipment to measure current, voltage, power, and resistance;~~ | |
| ~~(B)~~ | ~~describe digital circuits design;~~ | |
| ~~(C)~~ | ~~identify the operational features and proper terminology related to computer systems;~~ | |
| ~~(D)~~ | ~~identify the various components of a computer system such as the central processor, basic input and output system, read-only memory, and random access memory; and~~ | |
| ~~(E)~~ | ~~troubleshoot computer peripheral devices.~~ | Moved to Computer Maintenance Lab and Computer Technician Courses |
| ~~(7)~~ (5) | The student uses hardware design, operation, and maintenance knowledge and skills to identify major computer components.. The student is expected to: | Reword |
| (A) | identify the purpose and function of computer components in the operation of the computer system such as central processing unit, mother board, sockets, chipsets, basic input and output system and their drivers, memory, hard drive technologies, video cards, input and output devices | |

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| | and ports, and modem and network interface cards (NIC); | |
| (B) | identify the operation of mobile devices such as personal data assistants and cell phones; | |
| (C) | identify how mobile devices such as personal data assistants and cell phones connect and share data; | |
| ~~(D)~~ | ~~assemble and install a basic computer system; and~~ | Moved to Computer Maintenance Lab |
| ~~(E)~~ | ~~install and configure computer components and peripherals.~~ | |
| ~~(8)~~ | ~~The student uses troubleshooting skills with hardware knowledge to solve client problems. The student is expected to:~~ | Moved to Computer Maintenance Lab |
| ~~(A)~~ (D) | understand the rationale behind error messages and symptoms of hardware failures; | Consolidate with 5<br>Renumber<br>Reword (5)(E) – manufacturer provides reference manuals |
| ~~(B)~~ (E) | know how to research interrupt sequences and beep codes; and | |
| ~~(C)~~ (F) | identify priorities and interrupts at the system level. | |
| ~~(D)~~ | ~~test system using diagnostic tools and software;~~ | Moved to Computer Maintenance Lab |
| ~~(E)~~ | ~~identify problems in the operating systems;~~ | |
| ~~(F)~~ | ~~differentiate between hardware and software failure;~~ | |
| ~~(G)~~ | ~~update flash memory;~~ | |
| ~~(H)~~ | ~~demonstrate hard drive maintenance procedures such as defrag scan and clear caches;~~ | |
| ~~(I)~~ | ~~gather information from user;~~ | |
| ~~(J)~~ | ~~repair malfunctioning hardware systems;~~ | |
| ~~(K)~~ | ~~reinstall software as needed;~~ | |
| ~~(L)~~ | ~~demonstrate backup and recovery; and~~ | |
| ~~(M)~~ | ~~restore a system to various states such as safe modes and previous.~~ | |
| ~~(9)~~ (6) | The student acquires knowledge of operating system design, including operation and maintenance. The student is expected to: | Reworded based on creation of Computer Maintenance Lab |
| (A) | explain the fundamentals of an operating system; ~~and~~ | |
| (B) | compare and contrast different operating systems; and | |
| (C) | identify the operating systems of mobile devices. | Added to reflect industry needs |
| ~~(10)~~ (7) | The student acquires knowledge of the theory behind the installation, configuration of software programs and updates in information technology systems. The student is expected to: | Reword based on creation of Computer Maintenance Lab |

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| (A) | identify the operational features and proper terminology related to computer software systems; | |
| ~~(A)~~ (B) | evaluate application software packages ~~and test the functionality of a proposed software configuration~~; | Reword<br>Move reference to testing functionality to Computer Maintenance Lab |
| ~~(B)~~ (C) | verify software is properly licensed prior to installation; | |
| (D) | differentiate between types of software such as Software as a Service, single-user, per-seat, enterprise, freeware, shareware, and open-source licensing; and | Added to reflect industry needs |
| (E) | explain proper troubleshooting techniques as related to computer software. | Added to reflect industry needs |
| ~~(C)~~ | ~~install application and systems software using available resources as needed;~~ | Moved to Computer Maintenance Lab |
| ~~(D)~~ | ~~resolve problems with installation if any occur, including recovery from system error;~~ | |
| ~~(E)~~ | ~~perform software customization as requested;~~ | |
| ~~(F)~~ | ~~document all procedures; and~~ | |
| ~~(G)~~ | ~~install and maintain security software.~~ | |
| ~~(11)~~ | ~~The student installs, configures, and verifies active network connection. The student is expected to:~~ | |
| ~~(A)~~ | ~~demonstrate an understanding of network connection and interface requirements;~~ | |
| ~~(B)~~ | ~~install and configure a computer on a network; and~~ | |
| ~~(C)~~ | ~~verify and troubleshoot network connectivity.~~ | |
| ~~(12)~~ | ~~The student provides support to computer users to maintain service. The student is expected to:~~ | |
| ~~(A)~~ | ~~develop a written disaster recovery plan; and~~ | |
| ~~(B)~~ | ~~develop a written preventive maintenance plan.~~ | |
| (8) | The student acquires knowledge of the installation and configuration, of network connections. The student is expected to: | Added to reflect industry needs |
| (A) | explain the fundamentals of network connections and interface requirements; | |
| (B) | explain the steps required to install and configure a computer on a network; and | |
| (C) | Identify the steps to troubleshoot network connectivity. | |

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| §130.273. Computer Maintenance Lab (One Credit). | | |
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| TEKS with edits | | Committee Comments |
| **(a)** | General requirements. This course is recommended for students in Grades 10-12. Recommended prerequisite: Principles of Information Technology. Requires enrollment in co-requisite Computer Maintenance §130.274. Enrollment in co-requisite may be concurrent or consecutive; however, districts are strongly encouraged to block the course and the lab. In accordance with 19 Texas Administrative Code (TAC) §74.3(b)(1), a district may provide instruction in a variety of arrangements and settings including programs designed to permit flexible learning arrangements to support student attainment of course standards. | Co-requisite justification –<br><br>This course is designed to be taught at an advanced level with students attaining both 'theoretical knowledge' and 'hands-on' skills. They must be able to enter the workforce with the ability to apply all that they have learned in this course. Entry level certifications are equivalent to roughly 2000 hours of 'hands-on' work experience. For these reasons this course should be paired with the co-requisite lecture for full attainment of all student outcomes. |
| **(b)** | **Introduction** | |
| 1 | CTE instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions | |
| 2 | The Information Technology Career Cluster focuses on Building linkages in IT occupations for entry level, technical and professional careers related to the design, development, support and management of hardware, software, multimedia and systems integration services. | |
| 3 | Students acquire knowledge of computer maintenance and creating appropriate documentation. Students analyze the social responsibility of business and industry regarding the significant issues relating to the environment, ethics, health, safety, and diversity in society and in the workplace as it relates to computer maintenance. Students apply technical skills to address the IT industry and emerging technologies | |
| 4 | Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations. | |
| 5 | Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples. | |
| (c) | Knowledge and skills. | |
| (1) | The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to: | |

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| (A) | demonstrate positive work behaviors that enhance employability and job advancement such as regular attendance, promptness, attention to proper attire, maintenance of a clean and safe work environment, appropriate voice, and pride in work; | |
| (B) | demonstrate positive personal qualities such as flexibility, open mindedness, initiative, listening attentively to speakers, and willingness to learn new skills; | |
| (C) | employ effective reading and writing skills; | |
| (D) | employ effective verbal and nonverbal communication skills; | |
| (E) | solve problems and think critically; | |
| (F) | demonstrate leadership skills and function effectively as a team member; | |
| (G) | identify and implement proper safety procedures; | |
| (H) | demonstrate an understanding of legal and ethical responsibilities in relation to the field of information technology; and | |
| (I) | demonstrate planning and time-management skills such as project management. | |
| (2) | The student applies academic skills to the requirements of computer technologies. The student is expected to: | |
| (A) | complete work orders for repair and installation; | |
| (B) | estimate supplies, materials, and labor costs for installation, maintenance, and repair work orders; and | |
| (C) | locate and interpret appropriate documentation such as schematics, drawings, charts, diagrams, technical manuals, and bulletins. | |
| (3) | The student demonstrates the proper function and application of the tools, equipment, and materials used in computer technologies. The student is expected to: | |
| (A) | demonstrate safe use of equipment in computer technologies such as hand and power tools; | |
| (B) | employ available reference documentation such as tools, materials, and Internet sources to access information as needed; | |
| (C) | demonstrate proper handling and disposal of environmentally hazardous materials used in computer technologies; and | |
| (D) | research new and emerging technologies that may affect the field of computer technology. | |

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| (4) | The student applies the concepts and skills of the trade in simulated work situations. The student is expected to: | |
| (A) | use electronic test equipment to measure current, voltage, power, and resistance; | |
| (B) | describe digital circuits and bus design; | |
| (C) | demonstrate the operational features and proper terminology related to computer systems; | |
| (D) | demonstrate proper usage of the various components of a computer system such as the central processor, basic input and output system, read-only memory, and random access memory; and | |
| (E) | troubleshoot computer peripheral devices. | |
| (5) | The student uses hardware design, operation, and maintenance knowledge and skills to identify major computer components.. The student is expected to: | |
| (A) | assemble and install a basic computer system; and | |
| (B) | install and configure computer components such as printers and other peripherals. | |
| (6) | The student uses troubleshooting skills to solve client problems. The student is expected to: | |
| (A) | diagnose error messages and symptoms of hardware failures; | |
| (B) | research and identify interrupt sequences and beep codes; | |
| (C) | identify priorities and interrupts at the system level; | |
| (D) | test system using diagnostic tools and software; | |
| (E) | diagnose problems in operating systems; | |
| (F) | differentiate between hardware and software failure; | |
| (G) | update system BIOS; | |
| (H) | demonstrate hard drive maintenance procedures such as defrag scan and clear caches; | |
| (I) | gather information from user; | |
| (J) | repair malfunctioning hardware systems; | |

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| (K) | reinstall software as needed; | |
| (L) | demonstrate system backup and recovery; | |
| (M) | restore a system to various states such as safe modes and previous; | |
| (N) | demonstrate knowledge of operating system design such as operation and maintenance; and | |
| (O) | apply knowledge of operating system design to perform information support and service tasks of different operating systems. | |
| (7) | The student installs and configures software programs and updates information technology systems. The student is expected to: | |
| (A) | evaluate application software packages and test the functionality of a proposed software configuration; | |
| (B) | verify software is properly licensed prior to installation; | |
| (C) | install application and systems software using available resources as needed; | |
| (D) | resolve problems with installation if any occur, such as recovery from system error; | |
| (E) | perform software customization as requested; | |
| (F) | document all procedures; and | |
| (G) | install and maintain security software. | |
| (8) | The student installs, configures, and verifies active network connection. The student is expected to: | |
| (A) | demonstrate an understanding of network connection and interface requirements; | |
| (B) | install and configure a computer on a network; and | |
| (C) | verify and troubleshoot network connectivity. | |
| (9) | The student provides support to computer users to maintain service. The student is expected to: | |
| (A) | develop a written disaster recovery plan; and | |
| (B) | develop a written preventive maintenance plan. | |

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| §130.274. ~~Telecommunications and~~ Networking (One ~~to Two~~ Credits). | | |
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| | TEKS with edits | Committee Comments |
| (a) | **General requirements** This course is recommended for students in Grades 10-12. Recommended prerequisites: Principals of Information Technology, ~~and~~ Computer Maintenance and Computer Maintenance Lab.<br>Requires enrollment in co-requisite Networking Lab §130.274. Enrollment in co-requisite may be concurrent or consecutive; however; districts are strongly encouraged to block the course and the lab. In accordance with 19 Texas Administrative Code (TAC) §74.3(b)(1), a district may provide instruction in a variety of arrangements and settings including programs designed to permit flexible learning arrangements to support student attainment of course standards. | Extend to 10th grade.<br>Course name change for pre-requisites<br>Added language to reference scheduling options for districts.<br>Co-requisite justification –<br>This course is designed to be taught at an advanced level with students attaining both 'theoretical knowledge' and 'hands-on' skills. They must be able to enter the workforce with the ability to apply all that they have learned in this course. Entry level certifications are equivalent to roughly 2000 hours of 'hands-on' work experience. For these reasons this course should be paired with the co-requisite lab for full attainment of all student outcomes. |
| (b) | Introduction | |
| (1) | CTE instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions | |
| (2) | The Information Technology Career Cluster focuses on building linkages in IT occupations for entry level, technical and professional careers related to the design, development, support and management of hardware, software, multimedia and systems integration services. | |
| (3) | Students develop knowledge of the concepts and skills related to telecommunications and data networking technologies and practices in order to apply them to personal or career development. To prepare for success, students will have opportunities to reinforce, apply, and transfer knowledge and skills to a variety of settings and problems. | |
| (4) | Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations. | |
| (5) | Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples. | |
| (c) | Knowledge and skills. | |

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| (1) | ~~The student demonstrates the necessary skills for career development, employability, and successful completion of course outcomes. The student is expected to:~~The student demonstrates the professional standards/employability skills as required by business and industry. The student is expected to: | |
| (A) | identify and demonstrate positive work behaviors that enhance employability and job advancement such as regular attendance, promptness, attention to proper attire, maintenance of a clean and safe work environment, appropriate voice, and pride in work; | |
| (B) | identify and demonstrate positive personal qualities such as flexibility, open-mindedness, initiative, listening attentively to speakers, and willingness to learn new knowledge and skills; | |
| (C) | employ effective reading and writing skills; | |
| (D) | employ effective verbal and nonverbal communication skills; | |
| (E) | solve problems and think critically; | |
| (F) | demonstrate leadership skills and function effectively as a team member; | |
| (G) | identify and implement proper safety procedures; | |
| (H) | demonstrate an understanding of legal and ethical responsibilities in relation to the field of information technology; and | |
| (I) | demonstrate planning and time-management skills such as project management. ~~and storyboarding.~~ | Storyboarding N/A wording |
| (2) | The student identifies various employment opportunities in the information technology field. The student is expected to: | |
| (A) | select and research a specific job area with its accompanying duties and tasks; | |
| (B) | formulate a personal career plan along with the education, job skills, and experience necessary to achieve career goals; and | |
| (C) | develop a resumé. | |
| (3) | The student relates core academic skills to the requirements of telecommunications and data network services. The student is expected to: | |
| (A) | demonstrate effective verbal and written communication skills with individuals from varied cultures such as fellow workers, management, and customers; | |
| (B) | complete work orders for repair and installation; | |
| (C) | estimate supplies, materials, and labor costs on installation, maintenance, and repair work orders; and | |
| (D) | interpret technical documentation such as schematics, drawings, charts, diagrams, technical | |

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| | manuals, and bulletins. | |
| (4) | The student acquires an understanding of telecommunications and data network services. The student is expected to: | |
| ~~(A)~~ | ~~explain the theories of electricity and electronics;~~ | Covered in Computer Maintenance |
| ~~(B)~~ | ~~explain proper troubleshooting techniques for alternating and direct current electronics;~~ | N/A as worded |
| ~~(C)~~ (A) | explain digital and analog electronics theory; | |
| ~~(D)~~ | ~~explain microcomputer processor theory;~~ | Covered in Computer Maintenance |
| ~~(E)~~ ( B) | ~~define the use of Boolean logic in computer technologies;~~ demonstrate knowledge of binary in relation to IP addressing; | |
| ~~(F)~~ ( C) | distinguish the differences between a data packet and voice communications; | |
| ~~(G)~~ ( D) | define the layers and functions of the Open System Interconnection model; | |
| ~~(H)~~ ( E) | explain Transport Control Protocol and Internet Protocol fundamentals, including subnetting; | |
| ~~(I)~~ (F) | distinguish between public and private networks; | |
| ~~(J)~~ (G) | describe the standards and operations of wireless technologies in telecommunications and data networks; | |
| ~~(K)~~ ( H) | differentiate between ~~local area networks and wide area networks;~~ types of networks; | Broadened statement |
| ~~(L)~~ (I) | identify national standards for ~~voice and~~ data communication; and | Not typically addressed in Networking courses |
| ~~(M)~~ (J) | identify the potential benefits and problems for the future of telecommunications and data networking. | |
| (5) | The student analyzes various types of configurations and upgrading. The student is expected to: | |
| (A) | ~~identify the attributes, purposes, and functions of the various~~ demonstrate understanding of components of telecommunications and data networks; | Reword for simplicity |
| (B) | identify major network operating systems; | |
| (C) | distinguish between different types of cables used in the telecommunications and data networking; | |
| (D) | describe telecommunications and data networking media and connectors; | |
| (E) | ~~recognize the differences~~ differentiate among computer network topologies; | Reword |
| (F) | explain the distinction between connectionless and connection transport; | |
| (G) | explain ~~how and when~~ to use ~~the~~ of Transport Control Protocol and Internet Protocol utilities; | Reword |

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| (H) | explain how ~~and when~~ to test, validate, and troubleshoot Internet Protocol connectivity; and | Reword |
| (I) | identify good practices to ensure network security. | |
| (6) | The student recognizes and recommends the various types of network components to address industry needs. The student is expected to: | |
| (A) | analyze various types and components of networks; | |
| (B) | analyze the characteristics of networks ~~used~~ to select the optimum configuration for an industry solution. | Reword |
| ~~(C)~~ | ~~recommend telecommunications and data network solutions based on scenario-driven problems such as budget restrictions and knowledge of relative costs of the technologies.~~ | Redundancy see 3(c) |
| (7) | The student develops a network design plan. The student is expected to: | |
| (A) | produce ~~the network~~ planning documentation required prior to network implementation ~~such as administrative and test accounts, passwords, Internet Protocol addressing, and configurations;~~ | Reword for simplicity |
| (B) | explain the impact of environmental factors on computer networks; | |
| (C) | identify common peripheral ports and common network components such as hubs, routers and switches; | Expansion for clarification |
| (D) | develop an addressing scheme, including a subnetting chart; | |
| (E) | specify the tools that are commonly used to resolve network equipment problems; | |
| (F) | identify vendor testing documentation such as patches, fixes, and upgrades; | |
| (G) | demonstrate ~~awareness of~~ standard backup procedures and backup media storage practices; and | Reword for performance |
| ~~(H)~~ | ~~distinguish between common types of telecommunications and data network cabling;~~ | Redundancy see 5(c) |
| ~~(I)~~ (H) | identify the factors that might affect performance in a network environment such as logic or frequency spectrum interference. | |
| ~~(J)~~ | ~~identify new and emerging technologies that may affect the field of telecommunications and data networking services.~~ | Redundancy see 4(m) |
| ~~(8)~~ | ~~The student implements a data network plan. The student is expected to:~~ | Removed and placed in new Network Lab course. |
| ~~(A)~~ | ~~demonstrate in an installation scenario awareness of compatibility and cabling issues;~~ | |
| ~~(B)~~ | ~~implement an addressing scheme, including a subnetting chart;~~ | |
| ~~(C)~~ | ~~connect various types of data connectors and cabling used in computer networking and data communications;~~ | |
| ~~(D)~~ | ~~employ a systematic approach to identify the extent of a network problem, distinguish between~~ | |

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| | ~~operator or system error, and select the appropriate steps to correct the error;~~ | |
| ~~(E)~~ | ~~analyze networking scenarios and demonstrate awareness of the need to check for physical and logical indicators of trouble;~~ | |
| ~~(F)~~ | ~~determine the cause of a problem and select the appropriate corrective action for the network problem; and~~ | Removed and placed in new Network Lab course. |
| ~~(G)~~ | ~~create a folder or hierarchical structure for the storing and organizing of data on networks.~~ | |
| ~~(9)~~ | ~~The student implements network security systems. The student is expected to:~~ | |
| ~~(A)~~ | ~~assess potential security threats to information systems;~~ | |
| ~~(B)~~ | ~~identify the range of security needs and the problems that can occur on a data network due to security lapses;~~ | |
| ~~(C)~~ | ~~define and identify unethical practices such as hacking, phone fraud, online piracy, and data vandalism;~~ | |
| ~~(D)~~ | ~~evaluate issues related to privacy, depersonalization, and government control of telecommunications;~~ | |
| ~~(E)~~ | ~~develop and implement a network security plan; and~~ | |
| ~~(F)~~ | ~~identify the role that network components such as routers, firewalls, intrusion detection systems, and virtual private networks play in security.~~ | |
| ~~(10)~~ | ~~The student knows the function and application of the tools, equipment, technologies, and materials used in telecommunications services. The student is expected to:~~ | |
| ~~(A)~~ | ~~demonstrate safe use of equipment commonly employed in telecommunications services such as hand and power tools; and~~ | |
| ~~(B)~~ | ~~demonstrate proper handling and disposal of environmentally hazardous materials used in telecommunications services.~~ | |
| ~~(11)~~ (8) | The student provides support to computer users to maintain service. The student is expected to: | |
| (A) | develop a written disaster recovery plan; and | |
| (B) | develop a written preventive maintenance plan. | |

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| Networking Lab (One Credit). | | |
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| | TEKS with edits | Committee Comments |
| (a) | General requirements. This course is recommended for students in Grades 10-12.. Recommended prerequisites: Principles of Information Technology, Computer Maintenance, and Computer Maintenance Lab.<br>Requires enrollment in co-requisite Networking Lecture §130.274. Enrollment in co-requisite may be concurrent or consecutive; however; districts are strongly encouraged to block the course and the lab. In accordance with 19 Texas Administrative Code (TAC) §74.3(b)(1), a district may provide instruction in a variety of arrangements and settings including programs designed to permit flexible learning arrangements to support student attainment of course standards. | Pre-requisite course name change<br><br>Extend to 10th grade<br>Added wording for districts to reference scheduling flexibility.<br><br>Co-requisite justification –<br>This course is designed to be taught at an advanced level with students attaining both 'theoretical knowledge' and 'hands-on' skills. They must be able to enter the workforce with the ability to apply all that they have learned in this course. Entry level certifications are equivalent to roughly 2000 hours of 'hands-on' work experience. For these reasons this course should be paired with the co-requisite lecture for full attainment of all student outcomes. |
| (b) | Introduction | |
| (1) | CTE instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions | |
| (2) | The Information Technology Career Cluster focuses on Building linkages in IT occupations for entry level, technical and professional careers related to the design, development, support and management of hardware, software, multimedia and systems integration services. | |
| (3) | Students develop knowledge of the concepts and skills related to telecommunications and data networking technologies and practices in order to apply them to personal or career development. To prepare for success, students must have opportunities to reinforce, apply, and transfer knowledge and skills to a variety of settings and problems. | |
| (4) | Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations. | |
| (5) | Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples. | |
| (c) | Knowledge and skills. | |

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| (1) | The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to: | |
| (A) | identify and demonstrate positive work behaviors that enhance employability and job advancement such as regular attendance, promptness, attention to proper attire, maintenance of a clean and safe work environment, appropriate voice, and pride in work; | |
| (B) | identify and demonstrate positive personal qualities such as flexibility, open-mindedness, initiative, listening attentively to speakers, and willingness to learn new knowledge and skills; | |
| (C) | employ effective reading and writing skills; | |
| (D) | employ effective verbal and nonverbal communication skills; | |
| (E) | solve problems and think critically; | |
| (F) | demonstrate leadership skills and function effectively as a team member; | |
| (G) | identify and implement proper safety procedures; | |
| (H) | demonstrate an understanding of legal and ethical responsibilities in relation to the field of information technology; and | |
| (I) | demonstrate planning and time-management skills such as project management | |
| (2) | The student identifies various employment opportunities in the information technology field. The student is expected to: | |
| (A) | select and research a specific job area with its accompanying duties and tasks; | |
| (B) | formulate a personal career plan along with the education, job skills, and experience necessary to achieve career goals; and | |
| (C) | develop a resumé. | |
| (3) | The student applies related core academic skills to the requirements of telecommunications and data network services. The student is expected to: | |
| (A) | demonstrate effective verbal and written communication skills with individuals from varied cultures such as fellow workers, management, and customers; | |
| (B) | complete work orders for repair and installation; | |
| (C) | estimate supplies, materials, and labor costs on installation, maintenance, and repair work orders; and | |
| (D) | interpret technical documentation such as schematics, drawings, charts, diagrams, technical manuals, and bulletins. | |
| (4) | The student recognizes and recommends the various types of network components to address industry needs. The student is expected to: | |

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| (A) | analyze various types and components of networks; | |
| (B) | utilize knowledge of the characteristics of networks to select the optimum configuration for an industry solution; and | |
| (C) | recommend data network solutions based on scenario-driven problems. | |
| (5) | The student develops a network design plan. The student is expected to: | |
| (A) | produce necessary documentation required prior to network implementation such as administrative and test accounts, passwords, Internet Protocol addressing, and configurations; | |
| (B) | analyze the impact of environmental factors on computer networks; | |
| (C) | indicate common peripheral ports and common network components; | |
| (D) | develop an addressing scheme, including a subnetting chart; | |
| (E) | specify the tools that are commonly used to resolve network equipment problems; | |
| (F) | identify vendor testing documentation such as patches, fixes, and upgrades; | |
| (G) | demonstrate awareness of standard backup procedures and backup media storage practices; | |
| (H) | distinguish between common types of telecommunications and data network cabling; | |
| (I) | identify the factors that might affect performance in a network environment such as logic or frequency spectrum interference; and | |
| (J) | research new and emerging technologies that may affect the field of telecommunications and data networking services. | |
| (6) | The student implements a data network plan. The student is expected to: | |
| (A) | demonstrate awareness of compatibility and cabling issues; | |
| (B) | implement an addressing scheme, including a subnet; | |
| (C) | install various types of data connectors and cabling used in computer networking and data communications; | |
| (D) | connect various types of data connectors and cabling used in computer networking and data communications; | |
| (E) | troubleshoot physical and logical indicators of trouble; | |
| (F) | employ a systematic approach to identify a network problem, distinguish between operator or system error, and select the appropriate steps to correct the error; | |
| (G) | determine the cause of a problem and select the appropriate corrective action for the network problem; and | |

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| (H) | maintain a hierarchical structure for the storing and organizing of data on networks. | |
| (7) | The student implements network security systems. The student is expected to: | |
| (A) | assess potential security threats to information systems; | |
| (B) | identify the range of security needs and the problems that can occur on a data network due to security lapses; | |
| (C) | define and identify unethical practices such as hacking, phone fraud, online piracy, and data vandalism; | |
| (D) | evaluate issues related to privacy, depersonalization, and government control of data communications; | |
| (E) | develop and implement a network security plan; and | |
| (F) | identify the role that network components such as routers, firewalls, intrusion detection systems, and virtual private networks play in security. | |
| (8) | The student knows the function and application of the tools, equipment, technologies, and materials used in telecommunications services. The student is expected to: | |
| (A) | demonstrate safe use of equipment commonly employed in telecommunications services such as hand and power tools; and | |
| (B) | demonstrate proper handling and disposal of environmentally hazardous materials used in telecommunications services. | |
| (9) | The student provides support to computer users to maintain service. The student is expected to: | |
| (A) | develop a written disaster recovery plan; and | |
| (B) | develop a written preventive maintenance plan. | |

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| §130.275. Computer Technician Practicum (Two or Three Credits). | | |
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| TEKS with edits | | Committee Comments |
| (a) | General requirements: This course is recommended for students in Grades ~~11~~ 10-12. Recommended prerequisites: Principles of Information Technology ~~and Telecommunications and Networking,~~ Computer Maintenance, Computer Maintenance Lab, Networking and Networking Lab. | |
| (1) | A student shall be awarded two credits for successful completion of this course, when the student participates in at least an average of 10 hours, but less than 15 hours, per week of a paid or unpaid, laboratory- or work-based application of previously studied knowledge and skills related to the Information Technology Career Cluster. | |
| (2) | A student shall be awarded three credits for successful completion of this course, when the student participates in an average of 15 hours per week of a paid or unpaid, laboratory- or work-based application of previously studied knowledge and skills related to the Information Technology Career Cluster. | |
| (b) | Introduction | |
| (1) | CTE instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions | |
| (2) | The Information Technology Career Cluster focuses on Building linkages in IT occupations for entry level, technical and professional careers related to the design, development, support and management of hardware, software, multimedia and systems integration services. | |
| (3) | Students gain knowledge and skills in the area of computer technologies, including advanced knowledge of electrical and electronic theory, computer principles, and components related to the installation, diagnosis, service, and repair of computer-based technology systems. Students will reinforce, apply, and transfer their knowledge and skills to a variety of settings and problems. Proper use of analytical skills and application of information technology concepts and standards are essential to prepare students for success in a technology-driven society. The critical thinking, information technology experience, and product development may be conducted either in a classroom setting with an instructor, with an industry mentor, or both. | |
| (4) | Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations. | |
| (5) | Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples. | |
| (c) | Knowledge and skills. | |
| (1) | ~~The student demonstrates the necessary skills for career development, employability, and successful completion of course outcomes. The student is expected to:~~The student demonstrates professional standards/employability skills required by business and industry. The student is expected to: | Added to reflect standardized employability TEKs |
| (A) | identify and demonstrate positive work behaviors that enhance employability and job advancement such as | |

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| | regular attendance, promptness, attention to proper attire, maintenance of a clean and safe work environment, appropriate voice, and pride in work; | |
| (B) | identify and demonstrate positive personal qualities such as flexibility, open-mindedness, initiative, listening attentively to speakers, and willingness to learn new knowledge and skills; | |
| (C) | employ effective reading and writing skills; | |
| (D) | employ effective verbal and nonverbal communication skills; | |
| (E) | solve problems and think critically; | |
| (F) | demonstrate leadership skills and function effectively as a team member; | |
| (G) | identify and implement proper safety procedures; | |
| (H) | demonstrate an understanding of legal and ethical responsibilities in relation to the field of information technology; and | |
| (I) | demonstrate planning and time-management skills such as project management and storyboarding. | |
| (2) | The student identifies various employment opportunities in the information technology field. The student is expected to: | |
| (A) | improve on a personal career plan along with education, job skills, and experience necessary to achieve career goals; | |
| (B) | develop a resumé appropriate to chosen career plan, including letters of recommendation; and | |
| (C) | illustrate interview skills for successful job placement. | |
| (3) | The student relates core academic skills to the requirements of computer technologies. The student is expected to: | |
| (A) | demonstrate effective verbal and written communication skills with individuals from varied cultures such as fellow workers, management, and customers; | |
| (B) | complete work orders and related paperwork for repair and installation; | |
| (C) | estimate supplies, materials, and labor costs for installation, maintenance, and repair work orders; and | |
| (D) | read and interpret technical documentation such as schematics, drawings, charts, diagrams, technical manuals, and bulletins. | |
| (4) | The student applies communication, mathematics, English, and science knowledge and skills to research and develop projects. The student is expected to: | |
| (A) | demonstrate proper use of written, verbal, and visual communication techniques consistent with information technology industry standards; | |
| (B) | demonstrate proper use of mathematics concepts as they apply to the development of products or services; and | |

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| (C) | demonstrate proper use of science principles to the development of products or services. | |
| (5) | The student knows the concepts and skills that form the basis of computer technologies. The student is expected to: | |
| (A) | explain microprocessor theory; | |
| (B) | define the use of Boolean logic in computer technologies; | |
| (C) | describe the theories of magnetism, electricity, and electronics as they apply to computer systems; | |
| (D) | identify proper troubleshooting techniques; | |
| (E) | differentiate among digital, analog, and input and output electronics theories; | |
| (F) | describe the architecture of various computer systems; | |
| (G) | describe the function of central processing units, storage devices, peripheral devices, and microprocessor units; and | |
| (H) | explain computer system environmental requirements and related control devices. | |
| (6) | The student knows the proper function and application of the tools, equipment, technologies, and materials used in computer technologies. The student is expected to: | |
| (A) | demonstrate safe use of equipment in computer technologies such as hand and power tools; | |
| (B) | employ available reference tools, materials, and Internet sources to access information as needed; | |
| (C) | demonstrate the proper handling and disposal of environmentally hazardous materials used in computer technologies; and | |
| (D) | identify new and emerging technologies that may affect the field of computer technology such as quantum computing, photonics, and nanotechnology. | |
| (7) | The student applies the essential knowledge and skills for computer technologies to career preparation, job shadowing, mentoring, or apprenticeship training in simulated and actual work situations. The student is expected to: | |
| (A) | identify a problem relating to information technology; | |
| (B) | develop a solution using appropriate technologies, information technology concepts, and information technology industry standards; | |
| (C) | explain how the proposed technological solution will resolve the problem and the methodologies involved; | |
| (D) | apply decision-making techniques to the selection of technological solutions; | |
| (E) | identify areas where quality, reliability, and safety can be designed into a product or service; | |
| (F) | apply critical-thinking strategies to the analysis and evaluation of the proposed technological solution; | |
| (G) | develop a sustainability plan for the product or service; | |

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| (H) | select and use the appropriate technological resources to conduct research, design, and development activities; | |
| (I) | develop the documentation of the research and development process; and | |
| (J) | present the solution to a panel of professionals using formal presentation skills. | |
| (8) | The student employs project management knowledge to oversee information technology projects. The student is expected to: | |
| (A) | implement project methodologies to manage information system projects; | |
| (B) | define the scope of work to achieve individual and group goals; | |
| (C) | develop time and activity plans to achieve objectives; | |
| (D) | implement or participate with cross-functional teams to achieve information technology project goals; | Added to broaden options and add more flexibility for students |
| (E) | develop and implement quality assurance test plans; and | |
| (F) | create a contingency plan. | |
| (9) | The student recognizes and analyzes potential information technology security threats to develop and maintain security requirements. The student is expected to: | |
| (A) | describe potential security threats to information systems; | |
| (B) | identify the range of security needs and the problems that can occur due to security lapses; | |
| (C) | develop and implement plans to address security threats; | |
| (D) | document security procedures; and | |
| (E) | describe the use of computer forensics in countering security threats such as information technology crimes and security breaches. | |
| (10) | The student provides support to computer users to maintain service. The student is expected to: | |
| (A) | employ effective listening skills when working with clients to identify support needs; | |
| (B) | identify customer need and formulate a support plan; | |
| (C) | create queries and reports and assess critical system information; | |
| (D) | employ problem-solving skills in performing support, maintenance, and repair; | |
| (E) | use hardware and software diagnostics; ~~and~~ | |
| (F) | report to the user the cause of and solution to the problem; and | |

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| (G) | create written documentation indicating cause of and solution to the problem. | Reinforce industry documentation standards |
| (11) | The student demonstrates and applies knowledge of security risks and safeguards. The student is expected to: | Added to reinforce and enhance concepts learned in Computer Maintenance |
| (A) | install security software; | |
| (B) | update security software; and | |
| (C) | use security software to clean an infected machine. | |
| (12) | The student provides support to computer users to maintain service. The student is expected to: | |
| (A) | develop a written disaster recovery plan; and | |
| (B) | develop a written preventive maintenance plan. | |
| ~~(11)~~ (13) | The student creates a personal portfolio. The student is expected to: | |
| (A) | create a portfolio that documents all projects and accomplishments such as academics, volunteer experience, employment experience, awards, and certifications; | |
| (B) | organize and prioritize information within the portfolio; and | |
| (C) | use written, verbal, and visual communication techniques consistent with information technology industry standards. | |

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| §130.276. Computer Programming I (~~One-Half to~~ One Credit). | | |
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| | TEKS with edits | Committee Comments |
| (a) | General requirements. This course is recommended for students in Grades 10-12. Recommended prerequisite: Principles of Information Technology and Algebra I. This course satisfies the high school language other than English graduation requirement. | To ensure the continuity between Computer Programming and Computer Science, it is recommended that Tech App teachers participate in additional Professional Development courses that will enhance their knowledge of CTE coursework. |
| (b) | Introduction. | |
| (1) | CTE instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions | |
| (2) | The Information Technology Career Cluster focuses on Building linkages in IT occupations for entry level, technical and professional careers related to the design, development, support and management of hardware, software, multimedia and systems integration services. | |
| (3) | Students acquire knowledge of structured programming techniques and concepts appropriate to developing executable programs and creating appropriate documentation. Students analyze the social responsibility of business and industry regarding the significant issues relating to the environment, ethics, health, safety, and diversity in society and in the workplace as it relates to computer programming. Students apply technical skills to address business applications of emerging technologies. | |
| (4) | Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations. | |
| (5) | Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples. | |
| (c) | Knowledge and skills. | |
| (1) | The student demonstrates the necessary skills for career development, maintenance of employability, and successful completion of course outcomes. The student is expected: | |
| ~~(A)~~ | ~~identify and demonstrate positive work behaviors that enhance employability and~~ | We feel these two topics are well covered |

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| | ~~job advancement such as regular attendance, promptness, attention to proper attire, maintenance of a clean and safe work environment, appropriate voice, and pride in work;~~ | in the basic Principle Classes taken before Computer Programming. We do not believe they needed to be addressed again in Computer Programming. |
| ~~(B)~~ | ~~identify and demonstrate positive personal qualities such as flexibility, open-mindedness, initiative, listening attentively to speakers, and willingness to learn new knowledge and skills;~~ | |
| ~~(C)~~ (A) | employ effective reading and writing skills; | |
| ~~(D)~~ (B) | employ effective verbal and nonverbal communication skills; | |
| ~~(E)~~ (C) | solve problems and think critically; | |
| ~~(F)~~ (D) | demonstrate leadership skills and function effectively as a team member; | |
| ~~(G)~~ | ~~demonstrate and implement proper safety procedures in handling and disposing of equipment and materials;~~ | Should be included in Computer Maintenance |
| ~~(H)~~ (E) | demonstrate an understanding of legal and ethical responsibilities in relation to the field of information technology; | |
| ~~(I)~~ (F) | demonstrate planning and time-management skills such as project management ~~and storyboarding~~; and | Inappropriate term |
| ~~(J)~~ (G) | identify job opportunities and accompanying job duties and tasks. | |
| ~~(2)~~ | ~~The student identifies various employment opportunities in the information technology field. The student is expected to:~~ | |
| ~~(A)~~ | ~~identify job opportunities and accompanying job duties and tasks;~~ | Moved to TEK 1 |
| ~~(B)~~ | ~~research careers of personal interest along with the education, job skills, and experience required to achieve personal career goals; and~~ | We feel these two topics are well covered in the basic Principle Classes taken before Computer Programming. We do not believe they needed to be addressed again in Computer Programming. |
| ~~(C)~~ | ~~examine the role of certifications, resumés, and portfolios in the information technology profession.~~ | |
| ~~(3)~~ (2) | The student differentiates the concepts of integrity and confidentiality as related to technology in the business environment. The student is expected to: | |
| (A) | define business ethics; | |
| (B) | distinguish between honest and dishonest business practices; | |
| (C) | examine copyright and licensing issues in the software industry; and | |
| (D) | analyze the effects of unethical practices on a business. | |
| ~~(4)~~ (3) | The student identifies and analyzes the client project software needs and requirements. | |

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| | The student is expected to: | |
| (A) | gather data to identify client and project requirements; | |
| (B) | identify input and output requirements; | |
| (C) | identify system processing requirements; and | |
| (D) | develop ~~software~~ program requirements and specifications. | |
| ~~(5)~~ (4) | The student develops an information technology-based project plan to solve a specific problem. The student is expected to: | |
| (A) | define scope of work to meet client-based project needs; | |
| (B) | identify software development processes and issues; and | |
| (C) | explain the software system life cycle approach. | |
| ~~(6)~~ (5) | The student designs a software application plan. The student is expected to: | |
| (A) | articulate the principles of system design such as procedural, object-oriented, and event-driven processes; | |
| (B) | perform a logical design using appropriate software tools; | |
| (C) | use algorithmic and data structure concepts; | |
| (D) | identify constraints; | |
| (E) | identify modular design concepts; and | |
| (F) | document the design specification using a defined procedure. | |
| ~~(7)~~ (6) | The student solves problems using different types and levels of programming languages and quality assurances. The student is expected to: | We felt Quality Assurance should be included under problem solving. |
| (A) | differentiate among the concepts of data such as procedural, object-oriented, and event-driven representation; | |
| (B) | identify current programming languages and the environment in which each is used; | |
| (C) | produce procedural and object-oriented programs using structured coding with appropriate style and clarity of expression; | |
| (D) | demonstrate skill in program testing; | |
| (E) | compare computed results with anticipated results to determine the reasonableness of the solutions; ~~and~~ | |
| (F) | troubleshoot technological problems. | |

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| (G) | explain the software quality assurance process; and | These two items we felt were more appropriate under TEK 7 |
| (H) | follow established quality assurance procedures for testing, identifying problems, and tracking resolutions. | |
| ~~(8)~~ | ~~The student performs quality assurance tasks. The student is expected to:~~ | We felt Quality Assurance should be included under problem solving. |
| ~~(A)~~ | ~~explain the software quality assurance process; and~~ | Moved to TEK 7 G & H |
| ~~(B)~~ | ~~follow established quality assurance procedures for testing, identifying problems, and tracking resolutions.~~ | |
| ~~(9)~~ (7) | The student recognizes issues and complies with procedures for maintaining the security of computerized information. The student is expected to: | |
| (A) | identify risks to information systems facilities, data communications systems, and applications; | |
| (B) | comply with federal and state legislation pertaining to computer crime, fraud, and abuse; | |
| (C) | identify and select controls for information systems facilities, data communications, and applications appropriate to specific risks; and | |
| (D) | apply procedures used to recover from situations such as system failure and computer virus. | |

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| §130.277. ~~Advanced~~ Computer Programming II (One ~~to Two~~ Credit~~s~~). | | |
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| TEKS with edits | | Committee Comments |
| (a) | General requirements. This course is recommended for students in Grades 11-12. Recommended prerequisites: Principles of Information Technology and Computer Programming I. This course satisfies the high school language other than English graduation requirement. | |
| (b) | Introduction. | |
| (1) | CTE instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions. | |
| (2) | The Information Technology Career Cluster focuses on Building linkages in IT occupations for entry level, technical and professional careers related to the design, development, support and management of hardware, software, multimedia and systems integration services. | |
| (3) | Students expand their knowledge and skills in structured programming techniques and concepts by addressing more complex problems and developing comprehensive programming solutions. Students analyze the social responsibility of business and industry regarding the significant issues relating to environment, ethics, health, safety, and diversity in society and in the workplace as it relates to computer programming. Students apply technical skills to address business applications of emerging technologies. | |
| (4) | Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations. | |
| (5) | Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples. | |
| (c) | Knowledge and skills. | |
| ~~(1)~~ | ~~The student demonstrates the necessary skills for career development, maintenance of employability, and successful completion of course outcomes. The student is expected to:~~ | |
| (1) | The student demonstrates professional standards/employability skills as required by business and industry. The student is expected: | |
| ~~(A)~~ | ~~identify and demonstrate positive work behaviors that enhance employability and job advancement such as regular attendance, promptness, attention to proper attire, maintenance of a clean and safe work environment, appropriate voice, and pride in~~ | We feel these two topics are well covered in the basic Principle of IT class taken before Computer Programming. We do not |

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| | ~~work;~~ | believe they needed to be addressed again in Computer Programming |
| ~~(B)~~ | ~~identify and demonstrate positive personal qualities such as flexibility, open-mindedness, initiative, listening attentively to speakers, and willingness to learn new knowledge and skills;~~ | |
| ~~(C)~~ (A) | employ effective reading and writing skills; | |
| ~~(D)~~ (B) | employ effective verbal and nonverbal communication skills; | |
| ~~(E)~~ (C) | illustrate interview skills for successful job placement; | Moved from TEK 2 (fit better here) |
| ~~(F)~~ (D) | solve problems and think critically; | |
| ~~(G)~~ (E) | demonstrate leadership skills and function effectively as a team member; | |
| ~~(H)~~ (F) | identify and implement proper safety procedures; | Employability Breakout Decision |
| ~~(I)~~ (G) | demonstrate an understanding of legal and ethical responsibilities in relation to the field of information technology; and | |
| ~~(J)~~ (H) | demonstrate planning and time-management skills such as project management ~~and storyboarding~~. | Inappropriate term |
| (2) | The student identifies various employment opportunities in the information technology field. The student is expected to: | |
| (A) | ~~review a~~ create a personal career plan along with education, job skills, and experience necessary to achieve career goals; and | |
| (B) | develop a resumé appropriate to chosen career plan, including letters of recommendation. | |
| ~~(C)~~ | ~~illustrate interview skills for successful job placement.~~ | Moved to TEK 1C-- better fit. |
| (3) | The student identifies project software needs and requirements. The student is expected to: | |
| (A) | identify input and output requirements; | |
| (B) | identify system processing requirements; | |
| (C) | identify hardware, networking, and software system functional requirements; | |
| (D) | conduct project needs analysis; | |
| (E) | define a problem to be solved by created application; | |
| (F) | analyze requirements specifications using current approaches; | |
| (G) | identify project constraints; and | |

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| (H) | use advanced modeling and analysis of functional requirements. | |
| (4) | The student produces an information technology based strategy and project plan to solve a provided class problem. The student is expected to: | |
| (A) | identify key functions and subsystem capabilities of modern software products; | |
| (B) | identify software resources and individual product risks; and | |
| (C) | identify software development methodologies. | |
| (5) | The student demonstrates knowledge of the software development environment. The student is expected to: | |
| (A) | use prototyping techniques; | |
| (B) | use appropriate configuration management tools; | |
| (C) | apply language-specific programming techniques; | |
| (D) | develop programs using appropriate language; | |
| (E) | use the appropriate development environment for each selected language such as the compiler, debugger, test generator, and analyzer; | |
| (F) | use appropriate modeling and analysis tools; and | |
| (G) | use appropriate requirement tracking tools. | |
| (6) | The student demonstrates knowledge of the software development process. The student is expected to: | |
| (A) | articulate the information system life cycle; | |
| (B) | identify system analysis issues related to design, testing, implementation, and maintenance; | |
| (C) | identify the use of program design tools in a software development process; and | |
| (D) | identify current information life cycle models. | |
| (7) | The student designs a software application. The student is expected to: | |
| (A) | use principals of system design such as structured, object-oriented, and event-driven processes; | |
| (B) | ~~perform~~ develop a logical design; | Wording |
| (C) | document design specifications according to a defined procedure; | |
| (D) | design system input, output, processing, and interfaces; | |

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| (E) | identify the characteristics and uses of data processing such as batch, interactive, event driven, and object oriented; | |
| (F) | explain algorithmic and data structure concepts; | |
| (G) | identify constraints; | |
| (H) | identify modular design concepts; | |
| (I) | identify the features, functions, and architectures of client server computing; | |
| (J) | articulate database management concepts; | |
| (K) | define the objectives of a client server application; | |
| (L) | design static and dynamic online processing systems; and | |
| (M) | employ interface techniques. | |
| (8) | The student codes a ~~computer~~ software application. The student is expected to: | Wording |
| (A) | apply programming language concepts; | |
| (B) | identify the hardware software connection; | |
| (C) | articulate the concept of data representation; | |
| (D) | use structured, object-oriented, and event-driven programming techniques; | |
| (E) | articulate how a programming language can support multitasking and exception handling; | |
| (F) | identify how current key programming languages work in different operating system environments; | |
| (G) | translate data structures and program design into code in an appropriate language; | |
| (H) | demonstrate key constructs and commands specific to a language; | |
| (I) | identify current programming ~~the range of~~ languages used in software development; | Wording |
| (J) | explain how to resolve program implementation issues such as debugging, documentation, and auditing; | |
| (K) | articulate software-development issues such as correctness, reliability, and productivity; | |
| (L) | explain code analysis issues related to design, testing, implementation, and maintenance; | |
| (M) | demonstrate how to design and implement programs in a top-down manner; | |

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| (N) | demonstrate how to translate algorithmic and modular design into computer code; | |
| (O) | explain how programming control structures are used to verify correctness; | |
| ~~(P)~~ | ~~use appropriate programming language in writing computer code;~~ | Already address |
| ~~(Q)~~ (P) | compile and debug computer code; and | |
| ~~(R)~~ (Q) | ~~prepare code documentation~~; prepare appropriate commenting within code. | Clarifying the statement |
| ~~(S)~~ | ~~prepare a project testing plan; and~~ | Address in TEK (9) |
| ~~(T)~~ | ~~conduct unit testing and bug fixes of computer code.~~ | |
| (9) | The student demonstrates knowledge of software testing. The student is expected to: | |
| (A) | develop a test plan; | |
| (B) | define test procedures; | |
| (C) | develop test cases; and | |
| (D) | perform software testing. | |
| (10) | The student performs quality assurance testing. The student is expected to: | |
| (A) | explain the software quality assurance process; | |
| (B) | use standard requirements for software quality assurance; | |
| (C) | perform software quality assurance tasks to determine a quality software product; and | |
| (D) | conduct code inspection. | |
| ~~(11)~~ | ~~The student performs maintenance and customer support functions: The student is expected to:~~ | This should be a Computer Maintenance or Computer Technician course requirement not a computer programming TEKS |
| ~~(A)~~ | ~~identify maintenance and support requirements;~~ | |
| ~~(B)~~ | ~~perform system-tuning functions; and~~ | |
| ~~(C)~~ | ~~implement corrections to the code and documentation.~~ | |
| ~~(12)~~ (11) | The student applies procedures for maintaining the security of computerized information. The student is expected to: | |
| (A) | identify risks to information systems facilities, data, communication systems, and applications; | |
| (B) | comply with federal and state legislation pertaining to computer crime, fraud, and abuse; | |

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| (C) | identify and select controls for information systems facilities, data communications, and applications appropriate to specific risks; and | |
| (D) | apply procedures used to recover from situations such as system failure and computer virus. | |

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| Mobile Application Development (One Credits). | | |
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| | TEKS with edits | Committee Comments |
| (a) | General requirements This course is recommended for students in Grades 10-12. Recommended prerequisites: Web Technologies and/or Computer Programming. Both are recommended. In accordance with 19 Texas Administrative Code (TAC) §74.3(b)(1), a district may provide instruction in a variety of arrangements and settings including programs designed to permit flexible learning arrangements to support student attainment of course standards. | New Proposed IT course |
| (b) | Introduction | |
| (1) | CTE instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions | |
| (2) | The Information Technology Career Cluster focuses on Building linkages in IT occupations for entry level, technical and professional careers related to the design, development, support and management of hardware, software, multimedia and systems integration services. | |
| (3) | Mobile Application Development will foster students' creativity and innovation by presenting opportunities to design, implement, and deliver meaningful projects using mobile computing devices and web delivered applications. Students will collaborate with one another, their instructor, and various electronic communities to solve problems presented throughout the course. Through data analysis, students will identify task requirements, plan search strategies, and use software development concepts to access, analyze, and evaluate information needed to program mobile devices. By using software design knowledge and skills that support the work of individuals and groups in solving problems, students will select the technology appropriate for the task, synthesize knowledge, create solutions, and evaluate the results. Students will learn digital citizenship by researching current laws and regulations and by practicing integrity and respect. Students will gain an understanding of the principles of mobile application development through the study of development platforms, programming languages, and software design standards. | |
| (4) | Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations. | |
| (5) | Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible | |

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| | illustrative examples. | |
| (c) | Knowledge and skills. | |
| (1) | The student demonstrates professional standards/employability skills required by business and industry. The student is expected to: | |
| (A) | identify and demonstrate positive work behaviors that enhance employability and job advancement such as regular attendance, promptness, attention to proper attire, maintenance of a clean and safe work environment, appropriate voice, and pride in work; | |
| (B) | identify and demonstrate positive personal qualities such as flexibility, open-mindedness, initiative, listening attentively to speakers, and willingness to learn new knowledge and skills; | |
| (C) | employ effective reading and writing skills; | |
| (D) | employ effective verbal and nonverbal communication skills; | |
| (E) | solve problems and think critically; | |
| (F) | demonstrate leadership skills and function effectively as a team member; | |
| (G) | identify and implement proper safety procedures; | |
| (H) | demonstrate an understanding of legal and ethical responsibilities in relation to the field of information technology; and | |
| (I) | demonstrate planning and time-management skills such as project management and storyboarding. | |
| (2) | The student identifies various employment opportunities in the information technology field. The student is expected to: | |
| (A) | improve on a personal career plan along with education, job skills, and experience necessary to achieve career goals; | |
| (B) | develop a resumé appropriate to chosen career plan, including letters of recommendation; and | |
| (C) | illustrate interview skills for successful job placement. | |
| (3) | The student relates core academic skills to the requirements of mobile application development. The student is expected to: | |
| (A) | demonstrate effective verbal and written communication skills with individuals from varied cultures such as fellow workers, management, and | |

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| | customers; | |
| (B) | apply mathematics by demonstrating skills such as: use of whole numbers, decimals, fractions, and knowledge of arithmetic operations. | |
| (4) | The student applies communication, mathematics, English, and science knowledge and skills to research and develop projects. The student is expected to: | |
| (A) | demonstrate proper use of written, verbal, and visual communication techniques consistent with information technology industry standards; | |
| (B) | demonstrate proper use of mathematics concepts as they apply to the development of products or services; and | |
| (C) | demonstrate proper use of science principles to the development of products or services. | |
| (5) | The student knows the concepts and skills that form the basis of mobile application development. The student is expected to: | |
| (A) | create effective user interfaces appropriate for a specified mobile device that is best suited for an identified purpose; | |
| (B) | create effective user interfaces for browser-based, native, and hybrid mobile applications; | |
| (C) | create mobile application components appropriate for identified needs; | |
| (D) | create browser-based applications for mobile devices; | |
| (E) | create native applications that can reside on specified mobile devices; and | |
| (F) | create mobile applications that combine native and hybrid components. | |
| (6) | The student applies the essential knowledge and skills for mobile application development to career preparation, job shadowing, mentoring, or apprenticeship training in simulated and actual work situations. The student is expected to: | |
| (A) | analyze, identify, and describe mobile application project stakeholders and their perspectives; | |
| (B) | collect and analyze available data to identify mobile application project requirements; | |
| (C) | analyze, identify, and describe input, output, and processing requirements; and | |

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| (D) | apply critical-thinking strategies to the analysis and evaluation of the proposed projects | |
| (7) | Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to: | |
| (A) | compare and contrast design decisions based on the hardware considerations of a mobile device; | |
| (B) | compare and contrast available mobile technologies, including platforms and their operating systems; | |
| (C) | compare and contrast available development approaches, including application to specific technologies and platforms; | |
| (D) | determine the most appropriate solution for the development of a given mobile application, including browser-based, native, and hybrid approaches; | |
| (E) | compare and contrast available programming languages and how their use might be applied to specific technologies and platforms; | |
| (F) | select an appropriate program development environment; | |
| (G) | identify and use available libraries; | |
| (H) | evaluate and justify the selection of appropriate options and components; | |
| (I) | compare and contrast available networks and their implications for mobile application development; and | |
| (J) | compare and contrast design strategies related to mobile network and device security. | |
| (8) | The student explores and understands safety, legal, cultural, and societal issues relating to the use of technology and information as it applies to Digital Citizenship. The student is expected to: | |
| (A) | discuss copyright laws and issues; | |
| (B) | model ethical acquisition and use of digital information; | |
| (C) | cite sources using established methods; | |
| (D) | demonstrate proper digital etiquette and knowledge of acceptable use policies; | |
| (E) | investigate mobile device security measures such as passwords, virus | |

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| | detection, and virus prevention; | |
| (F) | describe potential risks and benefits associated with the use of a mobile application; | |
| (G) | identify current and emerging technologies related to mobile applications; and | |
| (H) | evaluate technologies and assess their applicability to current mobile applications. | |
| (9) | The student understands technology concepts, systems, and operations as they apply to Mobile Application Development. The student is expected to: | |
| (A) | demonstrate an understanding of the difference between desktop and mobile applications; | |
| (B) | demonstrate an understanding of hardware and software structures and requirements in the design of mobile applications; | |
| (C) | recognize multiple platforms and demonstrate an understanding of their associated requirements; | |
| (D) | recognize various program development environments; | |
| (E) | demonstrate an understanding of event-based programming and its appropriate use; | |
| (F) | describe how memory management affects mobile application design; | |
| (G) | demonstrate an understanding of how low bandwidth and the mobility of a device affect on the design of mobile applications; | |
| (H) | identify applications that are best suited for mobile devices; | |
| (I) | demonstrate an understanding of the use of libraries when designing mobile applications; | |
| (J) | use a simulation tool to emulate a mobile device's functionality; and | |
| (K) | use actual mobile devices to test mobile applications. | |

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