Florida CTE

# Information & Commmunications Technology (ICT) Essentials 3 (2024)

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| **Use Web 2.0 or Internet-based collaborative technology (e.g., Wikis, Wimba, Moodle, Edmodo, Facebook, Schoology, Gaggle) to facilitate a web development or research project. The student will be able to:** 15ICT.0 | **15.01** Create and use a collaborative environment for communicating and sharing among project team members. 15ICT.1 |
| | **15.02** Create and use a social media page (e.g., Wikis, Wimba, Moodle, Edmodo, Facebook, Schoology, Gaggle) to share and publish project components (e.g., content, images, graphics, videos) for gauging visitor reaction and obtaining feedback. 15ICT.2 |
| **Demonstrate an understanding of computer networks. The student will be able to:** 16ICT.0 | **16.01** Define "network" and give examples of networks used at home, school, and work. 16ICT.1 |
| | **16.02** Compare types of networks, including LAN, WAN, MAN, VPN, intranet, extranet, the Internet. 16ICT.2 |
| | **16.03** Compare common network topologies, including bus, star, ring, mesh. 16ICT.3 |
| | **16.04** Compare various network models and their advantages, including client/server, mainframe/terminal, peer-to-peer. 16ICT.4 |
| | **16.05** Compare various methods and media for network connections, including broadband, wireless, Bluetooth, cellular, satellite. 16ICT.5 |
| | **16.06** Describe the functions of various network hardware devices, including NIC, hub, switch, router, bridge, gateway, access point. 16ICT.6 |
| | **16.07** Describe the purpose of protocols, and identify the protocols commonly used in networks, including TCP/IP, DHCP, DNS, HTTP, FTP, IMAP, POP, SMTP. 16ICT.7 |

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| | 16.08 | **Describe the purpose and function of IP addressing and distinguish between public and private IP addresses.** 16ICT.8 |
| | 16.09 | **Describe the OSI reference model and its layers, including tracing the flow of data between two network nodes through the OSI layers.** 16ICT.9 |
| **Demonstrate proficiency in webpage development. The student will be able to:** 17ICT.0 | 17.01 | **Identify website domains, and relate a site's domain to its purpose.** 17ICT.1 |
| | 17.02 | **Relate basic components of a webpage (e.g. color, space, written content, typography, images, links, multimedia) to aesthetic, functional and/or usable design principals.** 17ICT.2 |
| | 17.03 | **Define aesthetic design, and explain how aesthetics can affect a visitors' perception of a website's information.** 17ICT.3 |
| | 17.04 | **Demonstrate knowledge of color wheel concepts and effective use of color on a website.** 17ICT.4 |
| | 17.05 | **Compare functional and usable design principles, and explain how usability can affect a website's success.** 17ICT.5 |
| | 17.06 | **Critique the aesthetic design, usability and accessibility of sample websites.** 17ICT.6 |
| | 17.07 | **Define multimedia, and identify its role in webpage interactivity.** 17ICT.7 |
| | 17.08 | **Explain the primary steps of the website planning process.** 17ICT.8 |
| | 17.09 | **Apply the website planning process to plan the design for basic website.** 17ICT.9 |
| | 17.10 | **Build the site navigation scheme for a website.** 17ICT.10 |
| | 17.11 | **Compare webpage creation using an HTML text editor to using a graphical user interface (GUI) editor.** 17ICT.11 |
| | 17.12 | **Compare website creation using an online site builder, an offline site builder and a content management system (CMS).** 17ICT.12 |
| | 17.13 | **Modify an existing webpage template to create an effective look and feel for a website.** 17ICT.13 |
| | 17.14 | **Create a website using a template.** 17ICT.14 |
| | 17.15 | **Define "HTML (Hypertext Markup Language)" and related terms, including tag element, vs. container vs. empty tag, block-level vs. inline element, attribute value, semantic tag.** 17ICT.15 |
| | 17.16 | **Identify HTML elements required to create webpage structure.** 17ICT.16 |

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| | 17.17 | Create webpages using basic HTML tags (e.g., headings, lists, character styles, text alignment, tables, comments). 17ICT.17 |
| | 17.18 | Use HTML to create hyperlinks to external sites. 17ICT.18 |
| | 17.19 | Use HTML to insert common image file formats into webpages, and use an image as a hyperlink. 17ICT.19 |
| | 17.20 | Explain Cascading Style Sheet (CSS) technology. 17ICT.20 |
| | 17.21 | Apply CSS styles to an HTML page. 17ICT.21 |
| | 17.22 | Create and/or edit animation files, and integrate them into a webpage. 17ICT.22 |
| | 17.23 | Create and/or edit video files, and integrate them into a webpage 17ICT.23 |
| | 17.24 | Use Dynamic HTML (DHTML) to enhance webpage interactivity. 17ICT.24 |
| | 17.25 | Create and use a wiki or similar tool for collaborating among project team members. 17ICT.25 |
| | 17.26 | Create and use a social media page (e.g., Facebook, Wimba, Edmodo) and/or a blog to share content and collaborate on projects. 17ICT.26 |
| | 17.27 | Review webpage content, verify copyright restrictions, and create meta-data before publishing a site to the internet. 17ICT.27 |
| | 17.28 | Test webpages for display, functionality, and accessibility before publishing a site to the Internet. 17ICT.28 |
| | 17.29 | Validate webpage code using W3C validation tools before publishing a site to the Internet. 17ICT.29 |
| | 17.30 | Describe network issues relating to websites, including bandwidth, compression, streaming, web hosting. 17ICT.30 |
| | 17.31 | Explain the purpose of File Transfer Protocol (FTP) in accessing information on the Internet. 17ICT.31 |
| | 17.32 | Publish a website using FTP. 17ICT.32 |
| | 17.33 | Describe website security methods, including secure server vs. unsecured served, SSL, SSH, encryption. 17ICT.33 |
| **Demonstrate proficiency in game development. The student will be able to:** 18ICT.0 | 18.01 | Describe the role of games in modern society (e.g., education, task training, social networking, therapy, recreation). 18ICT.1 |
| | 18.02 | Identify various types of games (e.g., chance, skill, knowledge, role-playing, and storytelling). 18ICT.2 |

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| **18.03** | **Identify the steps of the design process for creating a game.** | 18ICT.3 |
| **18.04** | **Apply the design process to solving a problem.** | 18ICT.4 |
| **18.05** | **Analyze (deconstruct) existing games.** | 18ICT.5 |
| **18.06** | **Identify the tools and skills needed for creating games.** | 18ICT.6 |
| **18.07** | **Identify design criteria and constraints.** | 18ICT.7 |
| **18.08** | **Create storyboards to model a game's program flow and functionality.** | 18ICT.8 |
| **18.09** | **Identify the programmer's role in creating games.** | 18ICT.9 |
| **18.10** | **Identify common programming languages and applications used to create computer games.** | 18ICT.10 |
| **18.11** | **Compare sequential, iteration (loop) and selection programming structures.** | 18ICT.11 |
| **18.12** | **Define the term algorithm (i.e., a set of repeatable steps) and how it applies to problem solving.** | 18ICT.12 |
| **18.13** | **Create an algorithm to solve a problem or complete a task.** | 18ICT.13 |
| **18.14** | **Use pseudo-code to model a game program's flow.** | 18ICT.14 |
| **18.15** | **Define logic errors and identify them in a game program or model.** | 18ICT.15 |
| **18.16** | **Explain the types and uses of variables in game programming.** | 18ICT.16 |
| **18.17** | **Describe basic Boolean concepts, including logical operators, order of precedence, expressions.** | 18ICT.17 |
| **18.18** | **Describe the use of events, event handlers and functions in game programming.** | 18ICT.18 |
| **18.19** | **Describe the use of parameters and arguments in game programming.** | 18ICT.19 |
| **18.20** | **Describe the use of objects, classes and instances in game programming.** | 18ICT.20 |
| **18.21** | **Describe the use of properties and methods with objects in game programming.** | 18ICT.21 |
| **18.22** | **Write appropriate code to create a simple game using structured programming.** | 18ICT.22 |

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| | **18.23** | **Test and evaluate the game program you created.** 18ICT.23 |
| | **18.24** | **Modify the game program as needed to solve a problem.** 18ICT.24 |
| | **18.25** | **Create an animated object (i.e., sprite) to be used in a game program.** 18ICT.25 |
| | **18.26** | **Use programming code to control the behavior of an animated object (i.e., sprite) in a game program.** 18ICT.26 |
| **Demonstrate proficiency in basic programming. The student will be able to:** 19ICT.0 | **19.01** | **Define "programming" and discuss its role in computing.** 19ICT.1 |
| | **19.02** | **Explain the binary representation of data and programs in computers.** 19ICT.2 |
| | **19.03** | **Distinguish among the three types of programming languages (machine, assembly, high-level), and give examples.** 19ICT.3 |
| | **19.04** | **Compare and contrast languages that are usually compiled (e.g., C++, Java) and interpreted (e.g., JavaScript, Python).** 19ICT.4 |
| | **19.05** | **Describe the structure of a simple program, and explain why sequencing is important.** 19ICT.5 |
| | **19.06** | **Write a program design document using pseudo-code that shows program flow.** 19ICT.6 |
| | **19.07** | **Explain strategies used in problem-solving, and relate them to computer programming.** 19ICT.7 |
| | **19.08** | **Define the term "algorithm," and explain how it relates to problem-solving.** 19ICT.8 |
| | **19.09** | **Explain the three types of programming errors (i.e., logic, syntax, runtime), and describe the forms of testing that can be used to locate and debug errors.** 19ICT.9 |
| | **19.10** | **Solve a problem using logic by planning a strategy, designing and testing a hypothesis, and/or creating a set of step-by-step instructions to perform a task.** 19ICT.10 |
| | **19.11** | **Define "structured programming" and discuss the advantages of this approach.** 19ICT.11 |
| | **19.12** | **Define the three main programming control structures used in structured programming: sequential, selection (decision), and iteration (loops).** 19ICT.12 |

**19.13** **Describe iterative programming structures (e.g., while, do/while) and how they are used in programming.** `19ICT.13`

**19.14** **Describe selection programming structures (e.g., if/then, else) and explain the logic used for if statements.** `19ICT.14`

**19.15** **Write a simple program in pseudo-code that uses structured programming to solve a problem.** `19ICT.15`

**19.16** **Explain the types and uses of variables in programming.** `19ICT.16`

**19.17** **Explain basic object-oriented concepts.** `19ICT.17`

**19.18** **Describe fundamental Boolean concepts, including Boolean algebra, operators, logic.** `19ICT.18`

**19.19** **Create animated objects using a high-level programming environment (e.g., Alice, Greenfoot) to control their behavior.** `19ICT.19`

**19.20** **Create a simple program that uses animated objects.** `19ICT.20`

**19.21** **Convert a simple program from pseudo-code into a common high-level programming environment (e.g. Alice, Greenfoot).** `19ICT.21`

**19.22** **Troubleshoot and debug errors in code.** `19ICT.22`