# ICT Computing Essentials Objectives Matrix

The *ICT Computing Essentials* course focuses on fundamentals of computers and their functionality. Students will define the functions and uses of computers, and learn about various types of computers. They will study the basic computer system components and their roles. They will learn about computer hardware, including storage, processing, and input and output devices. They will also study software to learn about the various types and functions of applications, including operating systems, user interfaces, and open-source vs. commercial licenses. Students will learn techniques for efficient file management, including the use of file name extensions. Finally, they will study the basics of computer networking, including network topologies and models, protocols, connectivity, IP addressing and the OSI reference model.

| **ICT Computing Essentials Objective** | ***ICT Computing Essentials* Courseware Lesson(s) and Section(s)** |
|---|---|
| **Domain 1.1: Demonstrate fundamental knowledge of computers and their uses, including functions of the computing cycle, types of computers and parts of a computer system** | |
| 1.1.1: Define "computer," and explain why it is important to have a basic understanding of how computers work. | **Lesson 1: Introduction to Computers**<br>- What Is a Computer? |
| 1.1.2: Describe the four functions of the computing cycle (i.e., input, processing, output, storage). | **Lesson 1: Introduction to Computers**<br>- What Is a Computer? |
| 1.1.3: Describe how people use computers at home, school and work. | **Lesson 1: Introduction to Computers**<br>- How Computers Are Used |
| 1.1.4: Identify the main types of computers, including supercomputer, mainframe, microcomputer, notebook, tablet, handheld. | **Lesson 1: Introduction to Computers**<br>- Types of Computers |
| 1.1.5: Describe the four parts of a computer system (i.e., hardware, software, data, user). | **Lesson 1: Introduction to Computers**<br>- Computer Systems |
| **Domain 1.2: Identify internal computer hardware components and their functions, and demonstrate proficiency using common computer peripherals including input devices, output devices, storage devices and connection ports.9.2: Identify database components and functions, including fields vs. records, basic data types, table vs. query, primary and foreign keys, table relationships, reports, Structured Query Language (SQL), and popular database applications.** | |
| 1.2.1: Identify internal components of a computer, including case, CPU, RAM, motherboard, power supply, hard drive, expansion cards. | **Lesson 2: Computer Hardware**<br>- System Components |
| 1.2.2: List various computer input devices (including mouse, keyboard, scanner, camera, microphone) and describe their uses. | **Lesson 2: Computer Hardware**<br>- Input Devices |
| 1.2.3: Identify the types and purposes of specialized input devices, including game controller, stylus, barcode reader, fingerprint scanner, GPS device. | **Lesson 2: Computer Hardware**<br>- Input Devices |

 

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| 1.2.4: List various computer output devices (including monitor, printer, projector, speakers) and describe their uses. | **Lesson 2: Computer Hardware**<br>- Output Devices |
| 1.2.5: Compare various data storage devices, including flash drive, external hard drive, memory card, discs. | **Lesson 2: Computer Hardware**<br>- Data Storage Devices |
| 1.2.6: Identify various computer connection ports, including USB, FireWire, parallel, serial, Ethernet (RJ-45), RJ-11, HDMI, audio. | **Lesson 2: Computer Hardware**<br>- Input/Output (I/O) Ports |
| 1.2.7: Connect an input device (e.g., mouse, keyboard, mobile phone, camera) and verify proper operation. | **Lesson 2: Computer Hardware**<br>- Input Devices |
| 1.2.8: Connect an output device (e.g., printer, monitor, projector) and verify proper operation. | **Lesson 2: Computer Hardware**<br>- Output Devices |
| **Domain 1.3: Describe various types of computer software (including software types, interfaces, licenses, operating systems vs. applications, and cloud computing), and manage files in an operating system (including file name extensions, and file and folder naming conventions).** | |
| 1.3.1: Define "software," including software types (system vs. application), software interfaces (GUI vs. command-line) and software licenses (commercial vs. open). | **Lesson 3: Computer Software**<br>- Software Essentials |
| 1.3.2: Compare the most common computer operating systems (i.e., Windows, Apple, UNIX). | **Lesson 3: Computer Software**<br>- Software Essentials |
| 1.3.3: Compare the most common operating systems used in mobile devices (i.e., iOS, Android, Windows Phone). | **Lesson 3: Computer Software**<br>- Software Essentials |
| 1.3.4: Compare common types of application software, including browser, e-mail client, word processor, presentation, spreadsheet. | **Lesson 3: Computer Software**<br>- Application Software |
| 1.3.5: Define the term "cloud computing." | **Lesson 3: Computer Software**<br>- Application Software |
| 1.3.6: Describe and use common file-naming conventions. | **Lesson 3: Computer Software**<br>- File Management |
| 1.3.7: Identify file types by file name extension, including .doc, .txt, .wav, xls. | **Lesson 3: Computer Software**<br>- File Management |
| 1.3.8: Perform file management tasks, including folder creation, file creation, backup, copy, delete, open, save. | **Lesson 3: Computer Software**<br>- File Management |
| **Domain 1.4: Demonstrate knowledge of computer networking, including network types, network topologies, network models, connection media, hardware devices, protocols, IP addressing and the OSI reference model.** | |
| 1.4.1: Define "network," and give examples of networks used at home, school and work. | **Lesson 4: Computer Networking**<br>- What Is a Network? |
| 1.4.2: Compare types of networks, including LAN, WAN, MAN, VPN, intranet, extranet, the Internet. | **Lesson 4: Computer Networking**<br>- What Is a Network? |

 

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|---|---|
| 1.4.3: Compare common network topologies, including bus, star, ring, mesh. | **Lesson 4: Computer Networking**<br>- Network Topologies |
| 1.4.4: Compare various network models and their advantages, including client/server, mainframe/terminal, peer-to-peer. | **Lesson 4: Computer Networking**<br>- Network Models |
| 1.4.5: Compare various methods and media for network connections, including broadband, wireless, Bluetooth, cellular, satellite. | **Lesson 4: Computer Networking**<br>- Connecting to a Network |
| 1.4.6: Describe the functions of various network hardware devices, including NIC, hub, switch, router, bridge, gateway, access point. | **Lesson 4: Computer Networking**<br>- Connecting to a Network |
| 1.4.7: Describe the purpose of protocols, and identify the protocols commonly used in networks, including TCP/IP, DHCP, DNS, HTTP, FTP, IMAP, POP, SMTP. | **Lesson 4: Computer Networking**<br>- Connecting to a Network |
| 1.4.8: Describe the purpose and function of IP addressing, and distinguish between public and private IP addresses. | **Lesson 4: Computer Networking**<br>- Connecting to a Network |
| 1.4.9: Describe the OSI reference model and its layers, including tracing the flow of data between two network nodes through the OSI layers. | **Lesson 4: Computer Networking**<br>- The OSI Reference Model |

 