Miami Dade College

Course Description

CTS1131 | A+ Computer Essentials & Support | 4.00 credits

This is an intermediate level course designed for students preparing for A+ certification as a support technician. Students will learn how to install, configure, upgrade and replace computer system components; how to troubleshoot processors, memory, storage devices, adapter cards, peripherals and other system components; how to install, configure and troubleshoot operating systems, laptops, portable devices, printers, scanners, network devices, security measures and virtualization and cloud computing; and how to provide professional IT support and customer service. Prerequisite: CGS1560

Course Competencies:

Competency 1: The student will demonstrate an understanding of computer fundamentals by:

1. Describing the architecture and operation of a typical computer system.
2. Describing the use of binary numbers to represent instructions and data and the hardware implications thereof.
3. Converting numbers into decimal, binary, and hexadecimal representation.
4. Identifying and manipulating various coding schemes, including ASCII and other data types.
5. Drawing a schematic of a typical computer system and describing components on a block diagram.
6. Discussing issues that affect system standards and designs, form factors, and construction.
7. Describing the principles of the supply chain, system procurement and deployment, end-of-life cycle, field replaceable unit, and replacement, repair, and disposal procedures.
8. Identifying emerging computer technologies and discussing their impacts on computer standards.

Competency 2: The student will demonstrate an understanding of how computers are designed and how computers function by:

1. Describing the fundamental principles of computer architecture.
2. Compare and contrast the types, functions and characteristics of computer components, including:
3. motherboards, BIOS, processors and memory
4. storage devices
5. adapter cards, expansion and peripheral devices
6. displays, input and output devices
7. ports, interfaces, connectors and cables
8. power supplies, cooling systems, cases and enclosures, and vii. SOHO
9. Constructing and configuring a computer system from individual components.
10. Installing, replacing, upgrading, and adding components to a computer system.
11. Testing, optimizing, and documenting a computer system.

Competency 3: The student will demonstrate the ability to troubleshoot and restore computer systems by:

1. Identifying tools, diagnostic equipment, procedures, and troubleshooting techniques for computer systems and their components.
2. Describing common problems with computer systems, displays, video, projectors, power supplies, I/O devices, peripherals, storage devices, RAID arrays, memory, processor, BIOS/UEFI, and system boards.
3. Performing system checks and troubleshooting to isolate computer system problems, including thermal issues, error codes, power problems, connectivity and compatibility issues, reduced
4. functionality, device driver problems, intermittent faults, and component failures.
5. Disassembling a computer system, replacing improperly functioning components, and tagging the failed parts for transport to the repair depot.
6. Performing preventive maintenance on computer systems, components, and peripheral devices.
7. Performing system management tasks, component inventory, system validation, and documentation.

Competency 4: The student will demonstrate an understanding of laptops and portable devices by:

1. Describing the operating principles of laptops and portable devices.
2. Installing, configuring, optimizing, and upgrading laptops and portable devices.
3. Identifying and discussing the tools, diagnostic procedures, and troubleshooting techniques for laptops and portable devices.
4. Performing preventive maintenance on laptops and portable devices.
5. Performing system management tasks, component inventory, and system documentation.
6. Compare and contrast accessories and ports of other mobile devices, including:
    a. NFC, Proprietary vendor-specific ports.
    b. Micro USB /mini USB, Lightning, Bluetooth, IR,
7. Memory/MicroSD, iii. Hotspot/tethering, and iv. Credit card readers.

Competency 5: The student will demonstrate an understanding of operating systems by:

1. Describing the operating systems currently in use, including architecture, feature set, user interface, system components, and function.
2. Installing, configuring, optimizing, and upgrading operating systems.
3. Performing file and system management tasks, system imaging, data backup, and documentation.
4. Using tools to inventory installed utilities, etc.
5. Using Windows programs and command-line utilities to manage and maintain a computer, its partitions, directories, and files.
6. Installing system updates, device drivers, anti-virus and anti-spyware software, and other management and monitoring software to the operating system.
7. Describing and using tools, utilities, diagnostic procedures and troubleshooting techniques for operating systems.
8. Performing preventive maintenance on operating systems applications, Sideloaded applications, device drivers,

Competency 6: The student will demonstrate an understanding of printers and scanners by:

1. Describing the operating principles of printers and scanners.
2. Performing the installation, configuration, optimization, and upgrading of printers and scanners.
3. Describing the tools and diagnostic procedures for troubleshooting printers and scanners.
4. Performing basic troubleshooting for printer and scanner problems.

Competency 7: The student will demonstrate an understanding of computer networks by:

1. Describing the fundamental principles, protocols, topologies, technologies, devices, and media of computer networks.
2. Installing, configuring, optimizing, and connecting co
3. Computers to a local area network.
4. Configuring the TCP/IP protocol stack.
5. Explain standard TCP and UDP ports, protocols, and their purpose.
6. Installing, configuring, optimizing, and connecting local area network devices.
7. Installing and configuring a router to access an Internet Service Provider.
8. Describing tools, diagnostic procedures, and troubleshooting techniques for maintaining computers on a local area network.

Competency 8: The student will demonstrate an understanding of computer and network security by:

1. Describing the fundamental principles of computer and network security.
2. Installing, configuring, upgrading, and optimizing security measures.
3. Describing the hardware and software tools, diagnostic procedures, and troubleshooting techniques for

securing computers and networks.

4. Applying access controls and security policies to users and groups.
5. Scanning systems for malicious software and suspicious activity.
6. Performing preventive maintenance and activity monitoring for computer and network security.
7. Compare and contrast various Wi-Fi networking standards and encryption types.

Competency 9: The student will demonstrate an understanding of safety and environmental issues by:

1. Discussing safety and environmental concerns regarding the use of computer systems.
2. Identify potential hazards and implement proper safety procedures, including electrostatic discharge (ESD) precautions and procedures, a safe work environment, and equipment handling.
3. Describing proper disposal procedures for batteries, display devices, system components, chemical solvents, cans, and other materials connected with computer systems.

Competency 10: The student will demonstrate an understanding of communication skills and professionalism by:

1. Applying good communication skills when listening and communicating with customers and colleagues in person, in correspondence, and over the telephone.
2. Discussing methods of handling difficult customer situations and achieving high customer satisfaction.
3. Practicing job-related professional behavior, including notation of privacy, confidentiality, and
4. respect for the customer and customers' property.
5. Maintaining customer and system documentation, resource libraries, and databases.
6. Performing research on computer support issues using Internet and database resources

Competency 11: The student will demonstrate an understanding of user support and workplace skills by:

1. Describing the role of the IT support specialist in a business enterprise.
2. Describing methods of understanding and
3. managing users' needs and expectations.
4. Describing methods of logging incidents and problem resolution.
5. Presenting and complying with oral and written instructions.
6. Participating in group discussions as an IT support team specialist.
7. Demonstrating self-motivation and responsibility to complete an assigned task.
8. Choosing appropriate actions in situations requiring effective time management.
9. Applying principles and techniques for being a productive, contributing member of a team.
10. Describing and discussing intellectual property rights and licensing issues.
11. Describing and discussing issues contained within professional codes of conduct.
12. Preparing, outlining, and delivering a short IT training presentation with visual materials to other support specialists.
13. Using appropriate communication skills, courtesy, manners, and dress in the workplace.

Learning Outcomes

1. Communication
2. Critical thinking
3. Ethical Issues
4. Computer / Technology Usage
5. Environmental Responsibility