Computer Service Technology 3
Course Code: 5322

COURSE DESCRIPTION:

The Computer Service Technology course is designed to prepare the student to perform entry-level tasks under the supervision of an experienced technician. Students receive instruction in safety, communication skills, leadership skills, human relations and employability skills, effective work practices, and in the installation, operation, maintenance, and repair of personal computers. Associated peripheral equipment and data cabling construction and installation are also included. Laboratory activities provide instruction in installation, component replacement, operating systems, and upgrades in accordance with CompTIA A+ certification standards.

The most current listing of standards for this course/program can be found on the CompTIA Web site at http://www.comptia.org/certification/a/default.asp or the CompTIA home page http://www.comptia.org.

OBJECTIVE:

Given the necessary equipment, materials, and instruction, the student, on completion of the prescribed course of study, will be able to successfully accomplish the following standards.

COURSE CREDITS: 1 or 2 units

Prerequisite(s): Based on individual schools and school districts

Recommended Grade Level: 10-12

A. SAFETY AND ETHICS

1. Identify major causes of work-related accidents in offices.
2. Describe the threats to a computer network, methods of avoiding attacks, and options in dealing with virus attacks.
3. Identify potential abuse and unethical uses of computers and networks.
4. Explain the consequences of illegal, social, and unethical uses of information technologies, e.g., piracy; illegal downloading; licensing infringement; and inappropriate uses of software, hardware, and mobile devices.
5. Differentiate between freeware, shareware, and public domain software copyrights.
6. Discuss computer crimes, terms of use, and legal issues such as copyright laws, fair use laws, and ethics pertaining to scanned and downloaded clip art images, photographs, documents, video, recorded

sounds and music, trademarks, and other elements for use in Web publications.
7. Identify netiquette including the use of email, social networking, blogs, texting, and chatting.
8. Describe ethical and legal practices in business professions such as safeguarding the confidentiality of business-related information.

B. EMPLOYABILITY SKILLS

1. Identify positive work practices, e.g., appropriate dress code for the workplace, personal grooming, punctuality, time management, and organization.
2. Demonstrate positive interpersonal skills, e.g., communication, respect, and teamwork.

C. STUDENT ORGANIZATIONS

1. Explain how related student organizations are integral parts of career and technology education courses.
2. Explain the goals and objectives of related student organizations.
3. List opportunities available to students through participation in related student organization conferences/competitions, community service, philanthropy, and other activities.
4. Explain how participation in career and technology education student organizations can promote lifelong responsibility for community service and professional development.

D. ADVANCED PERSONAL COMPUTER COMPONENTS

1. Identify the fundamental principles of using personal computers.
   a. Identify the names, purposes, and characteristics of storage devices.
   b. Identify the names, purposes, and characteristics of motherboards.
2. Identify the names, purposes, and characteristics of power supplies, AC adapter, ATX, proprietary, voltage.
3. Identify the names, purposes, and characteristics of processor/CPUs.
   a. CPU chips (e.g., AMD, Intel)
   b. CPU technologies
4. Identify the names, purposes, and characteristics of memory.
   a. Types of memory (e.g., DRAM, SRAM, SDRAM, DDR/DDR2, RAMBUS)
   b. Operational characteristics
5. Identify the names, purposes, and characteristics of display devices such as projectors, CRT, and LCD.
   a. Connector types (e.g., VGA, DVI/HDMI, S-Video, Component/RGB)
   b. Settings (e.g., V-hold, refresh rate, resolution)

6. Identify the names, purposes, and characteristics of input devices such as mouse, keyboard, bar code reader, multimedia (e.g., web and digital cameras, MIDI, microphones), biometric devices, touch screen.
7. Identify the names, purposes, and characteristics of adapter cards.
    a. Video including PCI/PCI-E and AGP
    b. Multimedia
    c. I/O (SCSI, serial, USB, Parallel)
    d. Communications including network and modem
8. Identify the names, purposes, and characteristics of ports and cables such as USB 1.1 and 2.0, parallel, serial IEEE 1394/firewire, RJ45 and RJ11, PS2/MINI-DIN, centronics (e.g., mini, 36), and multimedia (e.g., 1/8 connector, MIDSI, COAX, SPDIF).
9. Identify the names, purposes, and characteristics of cooling systems such as heat sinks, CPU and case fans, liquid cooling systems, and thermal compound.
10. Install, configure, optimize, and upgrade personal computer components.
    a. Add, remove, and configure internal and external storage devices.
11. Install, configure, optimize, and upgrade personal computer components.
    a. Add, remove, and configure internal storage devices, motherboards, power supplies, processors/CPUs, memory, and adapter cards.
    b. Add, remove, and configure systems.
    c. Install display devices.
    d. Add, remove, and configure basic input and multimedia devices.
12. Identify tools, diagnostic procedures, and troubleshooting techniques for personal computer components.
    a. Recognize the basic aspects of troubleshooting theory.
    b. Identify and apply basic diagnostic procedures and troubleshooting techniques.
    c. Recognize and isolate issues with display, power, basic input devices, storage, memory, thermal, POST errors (e.g., BIOS, hardware).
    d. Apply basic troubleshooting techniques to check for problems (e.g., thermal issues, error codes, power, connections including cables and/or pins, compatibility, functionality, software/drivers) with components.
    e. Recognize the names, purposes, characteristics, and appropriate application of tools such as BIOS, self-test, hard drive self-test, and software diagnostics test, multimeter, antistatic pad/wrist strap, specialty hardware/tools, loop back plugs and cleaning products.
13. Perform preventative maintenance on personal computer components.
    a. Identify and apply basic aspects of preventative maintenance theory.
    b. Identify and apply common preventative maintenance techniques for devices.

E. ADVANCED OPERATING SYSTEMS (Unless otherwise noted, operating systems referred to within include Microsoft Windows 2000, XP Professional, XP Home and Media Center.)

1. Identify the fundamentals of using operating systems.
    a. Identify differences between operating systems (e.g., Mac, Windows, Linux) and describe operating system revision levels including GIU, system requirements, application, and hardware compatibility.
    b. Identify names, purposes, and characteristics of the primary operating system components including registry, virtual memory, and file system.
    c. Use command-line functions and utilities to manage operating systems, including proper syntax and switches.
    d. Describe features of operating system interfaces.
    e. Identify the names, locations, purposes, and characteristics of operating system files.
    f. Use diagnostic utilities and tools to resolve operational problems.
    g. Identify concepts and procedures for creating, viewing, managing disks, directories, and files in operating systems.
2. Install, configure, optimize, and upgrade operating systems – references to upgrading from Windows 95 and NT may be made.
    a. Identify procedures for installing operating systems.
    b. Identify procedures for upgrading operating systems.
    c. Install/add a device including loading, adding device drivers, and required software.
    d. Identify procedures and utilities used to optimize operating systems (e.g., virtual memory, hard drives, temporary files, service, startup, and applications).
3. Identify tools, diagnostic procedures, and troubleshooting techniques for operating systems.
    a. Identify basic boot sequences, methods, and utilities for recovering operating systems.
    b. Identify and apply diagnostic procedures and troubleshooting techniques.
    c. Recognize and resolve common operational issues such as bluescreen, system lock-up, input/output device, application install, start or load, and Windows-specific printing problems (e.g., print spool stalled, incorrect/incompatible driver for print).
    d. Explain common error messages and codes.
    e. Identify the names, locations, purposes, and characteristics of operating system utilities.
    f. Disk management tools (e.g., DEFRAG, NTBACKUP, CHKDSK, Format).
    g. System management tools (e.g., device and task manager, MSCONFIG.EXE).
    h. File management tools (e.g., Windows Explorer, ATTRIB.EXE).
4. Perform preventative maintenance on operating systems.

a. Describe common utilities for performing preventative maintenance on operating systems. For example, software and Windows updates (e.g., service packs), scheduled backups/restore, and restore points.

F. ADVANCED LAPTOPS AND PORTABLE DEVICES

1. Identify the fundamental principles of using laptops and portable devices.
   a. Identify names, purposes, and characteristics that are laptop-specific.
   b. Identify and distinguish between mobile and desktop motherboards and processors including throttling, power management, and WiFi.
2. Install, configure, optimize, and upgrade laptops and portable devices.
   a. Describe how video sharing affects memory upgrades.
   b. Configure power management.
   c. Demonstrate safe removal of laptop-specific hardware such as peripherals, hot-swappable devices, and non-hot-swappable devices.
3. Identify tools, basic diagnostic procedures, and troubleshooting techniques for laptops and portable devices.
   a. Use procedures and techniques to diagnose power conditions, video, keyboard, pointer, and wireless card issues.
4. Perform preventative maintenance on laptops and portable devices.
   a. Identify and apply common preventative maintenance techniques for laptops and portable devices, cooling devices, hardware and video cleaning materials, operating environments including temperature and air quality, storage, transportation, and shipping.

G. SAFETY AND ENVIRONMENTAL ISSUES

1. Describe the aspects and importance of safety and environmental issues.
   a. Identify potential safety hazards and take preventative action.
   b. Use Material Safety Data Sheets (MSDS) or equivalent documentation and appropriate equipment documentation.
   c. Use appropriate repair tools.
   d. Describe methods to handle environmental and human (e.g., electrical, chemical, physical) accidents including incident reporting.
2. Identify potential hazards and implement proper safety procedures including ESD precautions and procedures, safe work environment, and equipment handling.
3. Identify potential hazards and proper safety procedures including power supply, display devices, and environment (e.g., trip, liquid, situational, atmospheric hazards and high-voltage and moving equipment).
4. Identify proper disposal procedures for batteries, display devices, and chemical solvents and cans.