

CompTIA® A+® Certification: A Comprehensive Approach for All 2009 Exam Objectives

Course Specifications

Course number: 085050

Course length: 7.0 day(s)

Course Description

Course Objective: You will install, upgrade, repair, configure, optimize, troubleshoot, and perform preventative maintenance on basic personal computer hardware and operating systems.

Target Student: The target student is anyone with basic computer user skills who is interested in obtaining a job as an IT professional or PC technician. In addition, this course will help prepare students to achieve a CompTIA A+ Certification.

Prerequisites: Students taking this course should have the following skills: end-user skills with Windows®-based personal computers, including the ability to: browse and search for information on the Internet; start up, shut down, and log on to a computer and network; run programs; and move, copy, delete, and rename files in Windows Explorer. Students should also have basic knowledge of computing concepts, including the difference between hardware and software; the functions of software components, such as the operating system, applications, and file systems; and the function of a computer network.

An introductory course in a Windows operating system, or equivalent skills and knowledge, is required. Students can take any one of the following Element K courses: Introduction to Personal Computers: Using Windows XP or Introduction to Personal Computers: Using Windows Vista™.

The following Element K courses are recommended: Windows XP: Introduction or Microsoft® Windows Vista™: Level 1.

Hardware Requirements

Each student and the instructor will require one computer. The class is designed for each pair of students to work at a student lab station that should consist of one desktop computer, one laptop/portable computer, and one printer. If you do not have enough laptop computers to have one per lab station, provide as many as you can and provide the remaining students with desktop computers. If you do not have enough physical printers to have one per lab station, provide sufficient printers so that students can have adequate hands-on access to the printer mechanisms and components. You will also need to provide other hardware items for students to install; wherever possible, provide enough components so that each lab station can install each device. The specifications for the desktop and laptop computers, as well as a list of other hardware items you will need to provide, follow.

- Desktop computers should be ATX-based systems with PCI-e slots. For demonstration purposes, additional bus types, such as ISA slots, are a plus. The system should also include the following ports: parallel, VGA, PS/2 keyboard port, PS/2 mouse port, serial, USB, and, if possible, sound ports including Line In, Line Out, Mic, and Game. Any additional ports are a plus. Desktop systems should have bootable DVD-ROM drives and floppy drives.
- Portable computers should have a CD/DVD drive (these can be swappable in a single drive bay, or separate components); at least one PC card slot; a mini-PCI card bay; and an empty memory slot.
- All computers should be 1 GHz Pentium® systems or higher.

- All computers should have 40 GB hard disks or larger.
- All computers should have 2 GB of RAM or more.
- All computers should have a keyboard and mouse.
- All computers should have a 800 x 600-capable display adapter and monitor.
- Laptop computers should have a docking station or port replicator to support the standard peripherals (keyboard, mouse, monitor).
- All computers should have network adapters and appropriate network cabling.
- Provide printing devices of your choice. You might wish to have different printer types, such as laser printers and inkjet printers, if available.
- The instructor's computer should have a projection system so the students can follow activities and demonstrations and so the instructor can display the course slide presentation.
- Each student should have a basic computer toolkit including an anti-static wrist strap, screwdrivers, tweezers and other small tools, and a multimeter. You may wish to provide other sample tools to the students, such as a power supply tester, as well as masking tape and pens. (Some of these items are included in the basic toolkit that is provided with the full courseware kit.)
- Each lab station should have a cleaning kit that includes monitor cleaning wipes, keyboard cleaning wipes, lint-free cloths, rubbing alcohol, cotton swabs, a lens cloth, window cleaner, toothpicks, a paint brush, a compressed air canister, and a computer vacuum.
- A classroom Internet connection.
- Each PC should contain the following internal devices that students can remove and reinstall, examine for troubleshooting purposes, or use to perform maintenance techniques: a hard disk; memory modules; power supply; one or more adapter cards; and cooling systems.
- If the computers do not have integrated sound support, install sound cards.
- Provide a second, compatible 20 GB hard drive and a cable that will enable a second hard drive to be added to student computers.
- Provide a multimedia device of some type for students to install.
- Provide the appropriate cabling for all devices.
- Provide as many other samples of different types of computer components as possible to display for the students. This can include adapter cards for various bus types; SCSI, PATA, and SATA storage devices; a variety of ports and cable; USB devices or hubs; multimedia devices such as digital cameras or microphones; gaming devices such as joysticks; various network cables and connectors; different display device types; different printer types; internal or external modems; examples of different motherboards, CPUs, and chipsets; portable drives; and so on. Although you cannot work hands-on with every conceivable type of PC component within the confines of the classroom, the more component types students can see and handle, the more beneficial their learning experience will be.
- Some activities and labs might require or suggest additional materials, so be sure to review the activity-specific setup requirements throughout the course prior to teaching this class.

Software Requirements

Each computer requires the following software:

- Windows Vista® Business with appropriate licenses.
- Classroom Internet access. Please configure Internet access and TCP/IP settings as appropriate for your classroom environment.
- Windows Vista Business Service Pack 1 or later and all current security patches. The setup instructions assume that you will obtain these through an Internet connection. Otherwise, you must download all current Windows Vista Business critical updates prior to installation.
- Device drivers and software manuals for each device the students will install. You should be able to obtain this live from the Internet during class; if not, you can download the drivers and burn them to a CD-ROM or place them on a network share, or provide the manufacturers' original disks.

Course Objectives

Upon successful completion of this course, students will be able to:

- identify the components of standard desktop personal computers.
- identify fundamental components and functions of personal computer operating systems.
- identify best practices followed by professional personal computer technicians.
- install and configure computer components.
- install and configure system components.
- maintain and troubleshoot peripheral components.
- troubleshoot system components.
- install and configure operating systems.
- maintain and troubleshoot installations of Microsoft Windows.
- identify network technologies.
- install and manage network connections.
- support laptops and portable computing devices.
- support printers.
- identify personal computer security concepts.
- support personal computer security.

Course Content

Lesson 1: Personal Computer Components

- Topic 1A: Personal Computer Components
- Topic 1B: System Unit Components
- Topic 1C: Storage Devices
- Topic 1D: Personal Computer Connection Methods

Lesson 2: Operating System Fundamentals

- Topic 2A: Personal Computer Operating Systems
- Topic 2B: Windows User Interface Components
- Topic 2C: Windows File System Management
- Topic 2D: Windows System Management Tools

Lesson 3: PC Technician Professional Best Practices

- Topic 3A: Tools of the Trade
- Topic 3B: Electrical Safety
- Topic 3C: Environmental Safety and Materials Handling
- Topic 3D: Perform Preventative Maintenance
- Topic 3E: Diagnostics and Troubleshooting
- Topic 3F: Professionalism and Communication

Lesson 4: Installing and Configuring Peripheral Components

- Topic 4A: Install and Configure Display Devices
- Topic 4B: Install and Configure Input Devices
- Topic 4C: Install and Configure Adapter Cards
- Topic 4D: Install and Configure Multimedia Devices

Lesson 5: Installing and Configuring System Components

- Topic 5A: Install and Configure Storage Devices
- Topic 5B: Select and Install Power Supplies
- Topic 5C: Select and Install Memory
- Topic 5D: Select, Install, and Configure CPUs and Cooling System Units

Topic 5E: Install and Configure System Boards

Lesson 6: Maintaining and Troubleshooting Peripheral Components

Topic 6A: Troubleshoot Display Devices

Topic 6B: Maintain and Troubleshoot Input Devices

Topic 6C: Troubleshoot Adapter Cards

Topic 6D: Troubleshoot Multimedia Devices

Lesson 7: Troubleshooting System Components

Topic 7A: Troubleshoot Storage Devices

Topic 7B: Troubleshoot Power Supplies

Topic 7C: Troubleshoot Memory

Topic 7D: Troubleshoot CPUs and Cooling Systems

Topic 7E: Troubleshoot System Boards

Lesson 8: Installing and Configuring Operating Systems

Topic 8A: Install Microsoft Windows

Topic 8B: Upgrade Windows

Topic 8C: Add Devices to Windows

Topic 8D: Optimize Windows

Lesson 9: Maintaining and Troubleshooting Microsoft Windows

Topic 9A: Operating System Utilities

Topic 9B: Back Up Microsoft Windows

Topic 9C: Troubleshoot Microsoft Windows

Topic 9D: Recover Microsoft Windows

Lesson 10: Network Technologies

Topic 10A: Network Concepts

Topic 10B: Network Communications

Topic 10C: Network Connectivity

Topic 10D: Internet Technologies

Lesson 11: Installing and Managing Network Connections

Topic 11A: Create Network Connections

Topic 11B: Install and Configure Web Browsers

Topic 11C: Maintain and Troubleshoot Network Connections

Lesson 12: Supporting Laptops and Portable Computing Devices

Topic 12A: Laptop and Portable Computing Device Components

Topic 12B: Install and Configure Laptops and Portable Computing Devices

Topic 12C: Maintain and Troubleshoot Laptops and Portable Computing Devices

Lesson 13: Supporting Printers

Topic 13A: Printer Technologies

Topic 13B: Printer Components

Topic 13C: Printer Processes

Topic 13D: Install and Configure Printers

Topic 13E: Maintain and Troubleshoot Printers

Lesson 14: Personal Computer Security Concepts

Topic 14A: Security Fundamentals

Topic 14B: Security Protection Measures

Topic 14C: Data and Physical Security

Topic 14D: Wireless Security

Topic 14E: Social Engineering

Lesson 15: Supporting Personal Computer Security

Topic 15A: Install and Configure Security Measures

Topic 15B: Maintain and Troubleshoot Security Measures

Appendix A: Mapping Course Content to the CompTIA A+ Essentials 220-701 Exam Objectives

Appendix B: Mapping Course Content to the CompTIA A+ Practical Application 220-702 Exam Objectives

Appendix C: CompTIA A+ Acronyms

Appendix D: A Brief History of Personal Computers