Cisco | Networking Academy®
Mind Wide Open™

IT Essentials: PC Hardware and Software

Opportunity

The Internet is changing life as we know it—bringing new economic and social opportunities to communities throughout the world, and increasing the global demand for information and communication technology (ICT) skills. Innovations such as social networking, cloud computing, e-commerce, web conferencing, and desktop virtualization are changing the way we live, work, play, and learn. These capabilities are all powered by networks, and organizations around the world are experiencing a shortage of qualified ICT candidates to design, install, and manage these networks.

Solution

The Cisco Networking Academy® IT Essentials: PC Hardware and Software curriculum provides an introduction to the computer hardware and software skills needed to help meet the growing demand for entry-level ICT professionals. The curriculum covers the fundamentals of PC computer technology, networking, and security, and also provides an introduction to advanced concepts.

IT Essentials: PC Hardware and Software is a hands-on, career-oriented e-learning solution with an emphasis on practical experience to help students develop fundamental computer skills, along with essential career skills. The Cisco® IT Essentials curriculum helps students prepare for entry-level ICT career opportunities and the CompTIA A+ certification, which helps students differentiate themselves in the marketplace to advance their careers.

Standalone virtual learning tools supplement classroom instruction and provide opportunities for interactive "hands-on" learning. The Virtual Desktop and Virtual Laptop tools can support course delivery in environments with limited physical equipment by enabling students to virtually disassemble and reassemble desktops and laptops.

In addition, the course provides a learning pathway to the Cisco CCNA® Discovery and CCNA Exploration curricula.

Features

IT Essentials: PC Hardware and Software provides a comprehensive introduction to the ICT industry and interactive, hands-on exposure to personal computers, hardware, software, and operating systems. The curriculum offers the following features and benefits:

- Students develop working knowledge of how computers operate, how to assemble computers, and how to troubleshoot hardware and software issues
- Hands-on labs and virtual learning tools help students develop critical thinking and complex problem-solving skills
- The course emphasizes the practical application of skills and procedures needed for hardware and software installations, upgrades, and troubleshooting systems
- Cisco Packet Tracer simulation-based learning activities promote the exploration of networking and network security concepts and allow students to experiment with network behavior
- Interactive assessments provide immediate feedback to support the evaluation of knowledge and acquired skills

Who Should Enroll	Prerequisites
• Students seeking career-oriented, entry-level computer hardware, software, and networking skills • Students who want to gain fundamental PC hardware, software, and troubleshooting skills	• There are no prerequisites for this course

21st Century Skills

IT Essentials: PC Hardware and Software integrates practical skills training into the technical curriculum to help students succeed in future educational, entrepreneurial, and occupational endeavors.

In addition to learning the fundamentals of hardware, software, and operating systems, students develop problem solving, critical thinking, collaboration, communication, and negotiation skills, which can help them succeed in the 21st century global workplace.

Assessments

Innovative formative and summative assessments are integrated into the IT Essentials: PC Hardware and Software curriculum and supported by an advanced online delivery system. Immediate, rich feedback supports instructor and student evaluation of acquired knowledge and skills. Assessments can be as simple as a multiple choice question or as complex as troubleshooting a simulated network.

Packet Tracer

Packet Tracer is a powerful network simulation program developed by Networking Academy that allows students to experiment with network behavior and ask "what if" questions. As an integral part of the IT Essentials curriculum, Packet Tracer provides simulation, visualization, authoring, assessment, and collaboration capabilities and facilitates the process of teaching and learning computer technology concepts.

Packet Tracer supplements physical equipment by allowing students to create a network with an almost unlimited number of devices; encouraging open learning, practice, discovery, and troubleshooting. The simulation-based learning environment helps students develop 21st century skills such as decision making, creativity, critical thinking, and problem solving.

Course Description

The IT Essentials: PC Hardware and Software course covers the fundamentals of PC hardware and software as well as advanced concepts. It is designed for students who want to pursue careers in ICT and students who want to gain practical knowledge of how a computer works.

IT Essentials: PC Hardware and Software encourages students to explore networking concepts using tools such as Packet Tracer. Packet Tracer is a powerful network simulation tool developed by Cisco that allows students to experiment with network behavior and develop critical thinking, collaboration, and problem solving skills, while gaining practical knowledge.

Students who complete this course will be able to describe the internal components of a computer, assemble a computer system, install an operating system, and troubleshoot using system tools and diagnostic software. Students will also be able to connect to the Internet and share resources in a network environment. Additional topics covered include laptops and portable devices, wireless connectivity and basic implementation skills, Voice over Internet Protocol (VoIP), security, safety and environmental issues, applied network configuration and troubleshooting skills, and communication skills.

Hands-on lab activities and virtual learning tools are essential elements that are integrated into the curriculum. The Virtual Laptop and Virtual Desktop are standalone tools that enable students to virtually disassemble and reassemble desktop and laptop computers. Both tools are designed to supplement classroom learning and provide an interactive "hands-on" experience in environments with limited physical equipment.

Course Outline	
Part 1—Fundamentals Chapter Outline	**Goals**
1. Introduction to the Personal Computer	• Identify and describe the various components that make up a personal computer and define information technology
2. Safe Lab Procedures and Tool Use	• Identify and describe tools used for computer service and explain how to use those tools safely
3. Computer Assembly Step-by-Step	• Describe the assembly of a personal computer
4. Basics of Preventive Maintenance and Troubleshooting	• Describe the purpose of preventive maintenance and basic troubleshooting steps
5. Fundamental Operating Systems	• Describe operating system capabilities, the installation process, navigation, basic preventive maintenance, and troubleshooting
6. Fundamental Laptops and Portable Devices	• Identify and describe the main components of laptops and portable devices, basic preventive maintenance, and troubleshooting
7. Fundamental Printers and Scanners	• Identify and describe the differences between printers and scanners, installation and configuration, basic preventive maintenance, and troubleshooting
8. Fundamental Networks	• Identify and describe basic network components, technologies, basic preventive maintenance, and troubleshooting
9. Fundamental Security	• Identify and describe security threats, procedures, basic preventive maintenance, and troubleshooting
10. Communication Skills	• Describe professional skills and communication techniques

Course Outline (continued)	
Part 2—Advanced Chapter Outline	Goals
11. Advanced Personal Computers	• Describe the process for replacing or upgrading personal computer components and apply preventive maintenance and troubleshooting techniques
12. Advanced Operating Systems	• Describe the processes used to install, upgrade, configure, and optimize a computer operating system, and apply preventive maintenance and troubleshooting techniques
13. Advanced Laptops and Portable Devices	• Describe the process for replacing or upgrading laptop or portable device components, describe common wireless communication technologies, and apply preventive maintenance and troubleshooting techniques
14. Advanced Printers and Scanners	• Install and configure local and shared network printers and scanners, and apply preventive maintenance and troubleshooting techniques
15. Advanced Networks	• Design and implement a basic network based on customer requirements and apply preventive maintenance and troubleshooting techniques
16. Advanced Security	• Implement security measures based on customer requirements and apply preventive maintenance and troubleshooting techniques

Upon completion of the IT Essentials: PC Hardware and Software course, students will be able to perform the following tasks:

- Define information technology (IT) and describe the components of a personal computer
- Describe how to protect self, equipment, and the environment from accidents, damage, and contamination
- Perform a step-by-step assembly of a desktop computer and install and navigate an operating system
- Explain and perform preventive maintenance
- Explain the steps of the troubleshooting process and perform basic troubleshooting
- Upgrade or replace components of a laptop, printer, or scanner based on customer needs
- Configure computers to attach to an existing network
- Implement basic physical and software security principles
- Apply good communications skills and professional behavior while working with customers
- Assess customer needs, analyze possible configurations, and provide solutions or recommendations for hardware, operating systems, networking, and security

Learning Environment

IT Essentials: PC Hardware and Software can be delivered as an independent curriculum or integrated into a broader course of study, such as technology or continuing education programs. The curriculum can be offered in an in-person or a blended distance learning (BDL) environment.

Industry-Recognized Certification

As a CompTIA Authorized Quality Curriculum, IT Essentials: PC Hardware and Software helps students prepare for the CompTIA A+ certification (www.comptia.org). The fundamentals part of the course, chapters 1–10, helps students prepare for the CompTIA A+ Essentials exam (220-701), which covers the fundamentals of computer technology, networking, and security, and validates the communication skills and professionalism required of all entry-level IT professionals.

The advanced part of the course, chapters 11–16, helps students prepare for the CompTIA A+ Practical Application exam (220-702), which builds on the CompTIA A+ Essentials knowledge and skills, with more of a hands-on orientation and scenarios in which troubleshooting and tools must be applied to resolve problems. Students must pass both exams to earn the CompTIA A+ certification.

This course also aligns with the objectives in the first two modules of the European Certification of Informatics Professionals (EUCIP) IT Administrator certification (www.eucip.org): Module 1 PC Hardware, and Module 2 Operating Systems.

Careers

The IT Essentials: PC Hardware and Software curriculum supports students who want to prepare for entry-level positions in the ICT field. Job titles include enterprise technician, IT administrator, field service technician, call center technician, help desk technician, and PC or support technician.

Translated and Accessible

We are committed to making our courses and documentation accessible and usable by all students to help them achieve their goals. Translation of the IT Essentials: PC Hardware and Software curriculum improves student outcomes by facilitating learning success on a global scale. Our translation strategy is focused on the following United Nations (UN) languages: English, Arabic, French, Russian, and Spanish. These languages are spoken by more than 50 percent of the world's population.

IT Essentials: PC Hardware and Software is currently available in English, Arabic, French, Russian, and Spanish, and many other language versions have been developed by Networking Academy partners and community members.

IT Essentials: PC Hardware and Software is also compatible with screen readers for students with accessible needs—including those with visual and dexterity limitations.

Minimum System Requirements

For the optimal student learning experience, we recommend a typical lab size of 12 to 15 students and a ratio of one lab PC per student. A ratio of one lab PC for two students is the minimum acceptable for the hands-on lab activities. Some of the lab activities require the student lab PCs to be connected to a local network.

The student lab PCs will be in various states of assembly and repair during the course and therefore are not suitable for viewing the curriculum content.

Lab PC Hardware Requirements

Description	Qty
PC Tower Case with 300W power supply	1
PCI, PCIe, or AGP-compatible motherboard	1
Intel Pentium/Celeron family, AMD K6/Athlon/Duron family, or compatible processor, 300 MHz or faster recommended	1
Cooling fan and heat sink	1
128 MB memory modules (minimum) or 256 MB memory modules (recommended) • Some labs will require one module of RAM to be uninstalled or the simulation of a faulty module for troubleshooting purposes. • 128 MB is the minimum requirement to run the full functions of Windows XP Pro.	2
Floppy drive	1
15 GB hard drive (minimum), 20 GB or more (recommended) • The system must support a full install of Windows XP and two 5 GB partitions.	1
CD-ROM (minimum) or 24x CD/DVD-ROM (recommended)	1
Ethernet card	1
PCI, PCIe (recommended), or AGP video card	1
Ribbon cables to connect HDD/CD/Floppy	Varies
Mouse	1
Keyboard	1
Super VGA (800 x 600) or higher-resolution video monitor	1

Note: The equipment listed above is the minimum set and can be substituted with equal or higher specifications.

Lab PC Software Requirements

Microsoft Windows XP Professional (Media CD) is needed to complete the curriculum labs.

Microsoft offers programs for academic institutions to purchase software at a reduced cost. An example of such a program is the MSDN Academic Alliance, which can be found at http://msdn.microsoft.com/academic. Please visit the Microsoft website for your country or region to learn more.

Lab PC Repair Tools

The computer toolkit should include the following tools:

- Phillips screwdriver
- Flathead screwdriver
- Hex Socket Drivers (various sizes)
- Needle-nose pliers
- Electrostatic discharge (ESD) wrist strap and cord
- Electrostatic discharge (ESD) mat with a ground cord
- Safety glasses
- Lint-free cloth
- Electronics cleaning solution
- Flashlight
- Thermal compound
- Multimeter
- Compressed air service canister (optional due to globally varying classroom health and safety laws)
- Power supply tester (optional)
- Cable testers (optional)
- Network Loop back plugs (optional

Additional Requirements and Resources

Minimum:

- One Internet connection for Internet searches and driver downloads (this could be the instructor's workstation)
- One integrated printer/scanner/copier for the class to share
- One Linksys wireless router/switch or equivalent for the class to share, Linksys model WRT 300N preferred
- Two Wireless PCI network adapters (compatible with the above wireless router/switch) for the class to share

Recommended:

- One Internet connection for each student to conduct Internet searches and download drivers
- One integrated printer/scanner/copier per two lab PCs
- One Linksys wireless router/switch or equivalent per two lab PCs, Linksys model WRT 300N preferred
- One Wireless PCI network adapter (compatible with the above wireless router/switch) for each lab PC

Cisco Networking Academy

In partnership with schools and organizations around the world, the Cisco Networking Academy program delivers a comprehensive learning experience to help students develop ICT skills for entry-level career opportunities, continuing education, and globally recognized career certifications. The courses also help students build 21st century skills such as collaboration and problem solving by encouraging practical application of knowledge through hands-on activities and network simulations.

Networking Academy teaches ICT skills to students from virtually every socioeconomic background and region of the world. Students gain the skills needed to pursue networking careers in a variety of industries such as technology, healthcare, financial services, fashion, entertainment, and more. Students also gain access to a global support group, career developments tools, and social networking resources to help them become architects of the human network.

For More Information

Cisco Networking Academy www.cisco.com/go/netacad

Course and Certifications www.cisco.com/go/netacadcourses

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