IT Essentials 5.0
Scope and Sequence

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Target Audience

The Cisco® IT Essentials curriculum is designed for Cisco Networking Academy® students in upper secondary schools, technical schools, and colleges or universities who want to pursue careers in IT and learn how computers work, how to assemble computers, and how to troubleshoot hardware and software issues.

Prerequisites

There are no prerequisites for this course.

Certifications

The IT Essentials (ITE) 5.0 curriculum helps students prepare for the CompTIA A+ certification exams 220-801 and 220-802.

- CompTIA A+ 220-801 covers the fundamentals of computer technology, installation and configuration of PCs, laptops and related hardware, and basic networking.
- CompTIA A+ 220-802 covers the skills required to install and configure PC operating systems, as well as configuring common features such as network connectivity and email for Android and Apple iOS mobile operating systems.

Curriculum Description

This course covers the fundamentals of computer hardware and software and advanced concepts such as security, networking, and the responsibilities of an IT professional. 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 networked environment. New topics in this version include mobile devices such as tablets and smartphones and client side virtualization. Expanded topics include the Microsoft Windows 7 operating system, security, networking, and troubleshooting.

Hands-on lab activities are an essential element of the course. The Virtual Laptop and Virtual Desktop are standalone tools designed to supplement classroom learning and provide an interactive "hands-on" experience in learning environments with limited physical equipment.

Cisco Packet Tracer activities are designed for use with Packet Tracer 5.3. The use of Packet Tracer will support alignment with the new CompTIA A+ certification objectives.

Curriculum Objectives

The primary objective of this course is to help students prepare for entry-level IT positions in a variety of working environments:

- Corporate or mobile environments with a high level of face-to-face client interaction. Job titles include enterprise technician, IT administrator, field service technician, and PC technician.
- Remote work environments with an emphasis on client interaction, client training, operating systems, and connectivity issues. Job titles include remote support technician, help desk technician, call center technician, IT specialist, and IT representative.
- Settings with limited customer interaction where hardware-related activities are emphasized. Job titles include depot technician and bench technician.

In addition, students gain confidence with the components of desktop and laptop computers by learning the proper procedures for hardware and software installations, upgrades, and troubleshooting.

By the end of the course, students will be able to complete the following objectives:

- Define information technology (IT) and describe the components of a personal computer.
- Describe how to protect people, equipment, and environments from accidents, damage, and contamination.
- Perform a step-by-step assembly of a desktop computer.
- Explain the purpose of preventive maintenance and identify the elements of the troubleshooting process.
- Install and navigate an operating system.
- Configure computers to connect to an existing network.
- Upgrade or replace components of a laptop based on customer needs.
- Describe the features and characteristics of mobile devices.
- Install and share a printer.
- Implement basic physical and software security principles.
- Apply good communications skills and professional behavior while working with customers.
- Perform preventive maintenance and advanced troubleshooting.
- Assess customer needs, analyze possible configurations, and provide solutions or recommendations for hardware, operating systems, networking, and security.

Minimum System Requirements

For the best student learning experience, we recommend a typical lab size of 12 to 15 students and a ratio of one Lab PC per student. At most, two students can share one Lab PC for the hands-on activities. Some 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 and therefore are not suitable for viewing the curriculum.

Lab PC Hardware Requirements
- PC Tower Case with 450W power supply
- PCI, PCIe, or AGP-compatible motherboard
- 1 GHz or faster 32-bit (x86) or 64-bit (x64) processor
- CPU heat sink and cooling fan
- 1 GB RAM (Windows 7 32-bit) or 2 GB RAM (Windows 7 64-bit) (2 X 512 MB or 2 X 1GB suggested)

- Some labs will require one module of RAM to be uninstalled for the simulation of a faulty module for troubleshooting purposes.
- 1 GB is the minimum requirement to run the full functions of Windows 7 Professional
- Floppy drive
- 60 GB hard drive (minimum); 80 GB or more (recommended)
  - The system must support a full install of Windows 7 and two partitions of the same size.
- 1 DVD-ROM (minimum) or CD/DVD Burner (recommended)
- Ethernet card
- PCI, PCIe (recommended), or AGP video card
  - DirectX 9 graphics device with WDDM 1.0 or higher driver
- Cables to connect HDD/CD/Floppy
- Mouse
- Keyboard
- Super VGA (1024 X 768) or higher resolution video monitor

Note: The equipment listed above can be substituted with other models that meet or exceed the specifications.

Lab PC Software Requirements

ITE v5.0 online content focuses on Microsoft Windows 7, Windows Vista, and Windows XP operating systems to meet the CompTIA A+ Certification objectives. For successful completion of the labs, you must install Windows 7 on lab computers. The Windows Vista and Windows XP labs must be completed using the provided screenshots if these operating systems are not available on the lab computers.

Microsoft offers discount programs for academic institutions to purchase software at a reduced cost. 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 (optional)
- Compressed air service canister (optional due to varying classroom health and safety laws)

- Power supply tester (optional)
- Wire cutters
- Crimpers (RJ-45)
- Cable strippers
- Cable testers
- Network loop back plugs (optional)

Additional Required Lab Equipment

The ITE lab topologies require the following equipment and accessories:

- 1 Internet connection for Internet searches and driver downloads (this could be the instructor's workstation)
- 1 printer or integrated printer/scanner/copier for the class to share
- 1 Linksys wireless router/switch or equivalent for the class to share, Linksys E2500 recommended
- 2 wireless PCI network adapters (compatible with the above wireless router/switch) for the class to share

Android or IOS devices are optional for use with the labs in the Mobile Devices chapter.

Course Outline

This course provides a comprehensive introduction to the IT industry and in-depth exposure to personal computers, hardware, and operating systems. Students learn how various hardware and software components work and best practices in maintenance, safety, and security. Through hands-on lab activities, students learn how to assemble and configure computers, install operating systems and software, and troubleshoot hardware and software issues.

Chapter/Section	Goals/Objectives
Chapter 0: IT Essentials	**Introduce Canvas and the Information Technology Industry.**
0.0 Navigating the Course	Introduce Canvas navigation features.
0.1 Introduction to Information Technology	Introduce the chapter concepts.
0.2 IT Industry	Explain IT industry certifications and technician jobs.
Chapter 1: Introduction to the Personal Computer	**Review the components of a basic personal computer system**
1.1: Personal Computer Systems	Describe personal computer systems
1.2: Selecting Replacement Computer Components	Describe situations requiring replacement of computer components
1.3: Configurations for Specialized Computer Systems	Describe hardware configurations for task-specific computers
Chapter 2: Lab Procedures and Tool Use	**Demonstrate safe lab procedures, proper tool use, and how to assemble a personal computer**
2.1: Safe Lab Procedures	Explain the of safe working conditions and safe lab procedures
2.2: Proper Use of Tools	Identify tools and software used with personal

	computer components and their purposes
Chapter 3: Computer Assembly	**Assemble a desktop computer from compatible components and upgrade a computer system to meet requirements**
3.1: Computer Assembly	Build a computer
3.2: Boot the Computer	Boot the computer for the first time
3.3: Upgrading and Configuring a PC	Upgrade and configure components in a computer system to meet a customer's requirements
Chapter 4: Overview of Preventative Maintenance and Troubleshooting	**Explain the purpose of and basic rules of preventive maintenance and the troubleshooting process**
4.1: Preventive Maintenance	Describe the purpose and benefits of preventive maintenance for personal computers
4.2: Troubleshooting Process	Identify the steps of the troubleshooting process and perform basic PC troubleshooting
Chapter 5: Operating Systems	**Install and use an operating system**
5.1: Modern Operating Systems	Explain the purpose of an operating system
5.2: Operating System Installation	Perform an operating system installation
5.3: The Windows GUI and Control Panel	Explore common tools and applets of the Windows GUI
5.4: Client-Side Virtualization	Explain client-side virtualization
5.5: Common Preventive Maintenance Techniques for Operating Systems	Identify and apply common preventive maintenance techniques for operating systems
5.6: Basic OS Troubleshooting	Troubleshoot operating systems
Chapter 6: Networks	**Introduce network principles, standards, and purposes**
6.1: Principles of Networking	Explain the principles of networking
6.2: Identifying Networks	Describe types of networks
6.3: Basic Networking Concepts and Technologies	Describe basic networking concepts and technologies
6.4: Physical Components of a Network	Describe physical components of a network
6.5: Network Topologies	Describe network topologies
6.6: Ethernet Standards	Describe Ethernet standards
6.7: OSI and TCP/IP Data Models	Explain OSI and TCP/IP data models
6.8: Computer to Network Connection	Connect a computer to a wired network and a wireless network
6.9: Select an ISP Connection Type	Identify names, purposes, and characteristics of other technologies used to establish connectivity
6.10: Common Preventative Maintenance Techniques Used for Networks	Identify and apply common preventive

	maintenance techniques used for networks
6.11: Basic Troubleshooting Process for Networks	Troubleshoot networks
Chapter 7: Laptops	**Review the components of a basic laptop**
7.1: Laptop Components	Describe the purpose of laptop features
7.2: Laptop Display Components	Describe laptop display components
7.3: Laptop Power	Describe how to configure laptop power settings
7.4: Laptop Wireless Communication Technologies	Describe laptop wireless communication technologies
7.5: Laptop Hardware and Component Installation and Configuration	Describe the removal and installation of laptop components
7.6: Common Preventive Maintenance Techniques for Laptops	Identify common preventive maintenance techniques for laptops
7.7: Basic Troubleshooting for Laptops	Troubleshoot laptops
Chapter 8: Mobile Devices	**Describe the many features and capabilities of mobile devices**
8.1: Mobile Device Hardware Overview	Explain mobile device hardware
8.2: Mobile Device Operating Systems	Describe the features and characteristics of mobile operating systems
8.3: Network Connectivity and Email	Establish basic network connectivity and configure email
8.4: Methods for Securing Mobile Devices	Compare and contrast methods for securing mobile devices
8.5: Basic Troubleshooting for Mobile Devices	Troubleshoot mobile devices
Chapter 9: Printers	**Install, use, and share a printer**
9.1: Common Printer Features	Describe the features that are common to most printers
9.2: Types of Printers	Describe different types of printers
9.3: Installing and Configuring Printers	Install and configure a printer
9.4: Sharing Printers	Describe printer sharing procedures and share a printer
9.5: Preventive Maintenance Techniques for Printers	Describe preventive maintenance techniques for a printer
9.6: Basic Troubleshooting for Printers	Troubleshoot printers
Chapter 10: Security	**Describe attacks that threaten the security of computer equipment and data, and how to mitigate those threats**
10.1: Security Threats	Describe security threats
10.2: Security Procedures	Identify security procedures

10.3: Common Preventive Maintenance Techniques for Security	Identify common preventive maintenance techniques for security
10.4: Basic Troubleshooting Process for Security	Troubleshoot security
Chapter 11: The IT Professional	**Describe the roles and responsibilities of the IT professional**
11.1: Communication Skills and the IT Professional	Explain why good communication skills are a critical part of IT work
11.2: Ethical and Legal Issues in the IT Industry	Explain legal and ethical issues that arise in the IT industry and appropriate behaviors when faced with these issues
11.3: Call Center Technicians	Describe the call center environment and technician responsibilities
Chapter 12: Advanced Troubleshooting	**Diagnose and resolve advanced hardware and software problems**
12.1: Computer Components and Peripherals	Troubleshoot computer components and peripherals
12.2: Operating Systems	Troubleshoot operating systems
12.3: Networks	Troubleshoot networks
12.4: Laptops	Troubleshoot laptops
12.5: Printers	Troubleshoot printers
12.6: Security	Troubleshoot security

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