IT Essentials 6.0
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.

Target Certifications

The IT Essentials (ITE) 6.0 curriculum helps students prepare for the CompTIA A+ certification exams 220-901 and 220-902.

- CompTIA A+ 220-901 covers the fundamentals of computer technology, installation and configuration of PCs, laptops and related hardware, and basic networking.
- CompTIA A+ 220-902 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 operating systems, OS X, Linux, and client side virtualization. Expanded topics include Microsoft Windows operating systems, security, networking, and troubleshooting.

Cisco Packet Tracer activities are designed for use with Packet Tracer 6.2. The use of Packet Tracer will support alignment with the new CompTIA A+ certification objectives.

Curriculum Objectives

The goal of this course is to introduce the student to computer hardware and software, as well as operating systems, networking concepts, mobile devices, IT security, and troubleshooting. The online course materials will

assist the student in developing the skills necessary to work as a technician in the field of IT. The specific skills covered in each chapter are described at the start of each chapter.

Upon completion of the IT Essentials v6.0 course, students will be able to perform the following tasks:

- Select the appropriate computer components to build, repair, or upgrade personal computers.
- Explain how to correctly use tools and safely work in a lab.
- Install components to build, repair, or upgrade personal computers.
- Explain how to perform preventive maintenance and troubleshooting on personal computers.
- Install Windows operation systems.
- Perform management and maintenance of Windows operating systems.
- Configure computers to communicate on a network.
- Configure devices to connect to the Internet and Cloud services.
- Explain how to use, configure, and manage laptops and mobile devices.
- Explain how to configure, secure and troubleshoot mobile, OS X, and Linux operating systems.
- Install and share a printer to meet requirements.
- Implement basic host, data, and network security.
- Explain the roles and responsibilities of the IT professional.
- Troubleshoot advanced hardware and software problems.

Minimum System Requirements

For the best learning experience, we recommend a typical class 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 labs. 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

In order to be able to implement the different topologies that are used in the lab exercises of the ITE curricula, Academies teaching the course will require the following equipment (at a minimum):

- Windows Vista, Windows 7, or Windows 8
- 1 PC Case with 300W power supply
- 1 PCI, PCIe, or AGP-compatible motherboard
- Intel or AMD CPU, 1 gigahertz (GHz) or faster with support for PAE, NX, and SSE2
- 1 CPU heat sink and cooling fan
- 1 gigabyte (GB) RAM (32-bit) or 4 GB RAM (64-bit) (2 X 1GB or 2 X 2GB suggested)

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

Lab PC Software Requirements

IT Essentials 6.0 content focuses on Microsoft Windows Vista, Windows 7, and Windows 8 and 8.1 Only one Microsoft operating system installation media is required to complete the curriculum labs.

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) (optional)
- Electrostatic discharge (ESD) wrist strap and cord
- Electrostatic discharge (ESD) mat with a ground cord
- Safety glasses
- Lint-free cloth
- Electronics cleaning solution (optional)
- Flashlight
- Thermal compound
- Multimeter (optional)
- Compressed air service canister (optional due to globally varying classroom health and safety laws)

- Power supply tester (optional)

- Wire cutters

- RJ-45 Crimpers

- Cable strippers

- Modular cable tester

- Network Loop back plugs (optional)

Additional Required Lab Equipment

In addition to the equipment specified above, the lab topologies of ITE require the use of 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 wireless router with WPA2 support for the class to share

- 2 Wireless network adapters (compatible with the above wireless router) for the class to share

- Various USB flash drives for moving files between computers in the labs

IT Essentials v6.0 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 Outline

Table 1.   Chapter Outline

Chapter /Section	Goals/Objectives
Chapter 1. Introduction to the Personal Computer	**Select the appropriate computer components to build, repair, or upgrade personal computers.**
1.1 Personal Computer Systems	Explain how personal computer system components work together.
1.2 Select Computer Components	Select the appropriate computer components.
1.3 Configurations for Specialized Computer Systems	Explain how hardware is configured for task-specific computers.
Chapter 2. Lab Procedures and Tool Use	**Introduction**
2.1 Safe Lab Procedures	Explain the purpose of safe working conditions and safe lab procedures.

Chapter /Section	Goals/Objectives
2.2 Proper Use of Tools	Explain how to use tools and software with personal computer components.
Chapter 3. Computer Assembly	**Install components to build, repair, or upgrade personal computers.**
3.1 Assemble the Computer	Build a computer.
3.2 Boot the Computer	Explain how to verify BIOS and UEFI settings.
3.3 Upgrade and Configure a Computer	Explain how to upgrade components in a computer system to meet requirements.
Chapter 4. Overview of Preventive Maintenance and the Troubleshooting Process	**Explain how to perform preventive maintenance and troubleshooting on personal computers.**
4.1 Preventive Maintenance	Explain why preventive maintenance must be performed on personal computers.
4.2 Troubleshooting Process	Explain how to troubleshoot computer problems.
Chapter 5. Windows Installation	**Perform installation of Microsoft Windows operation systems.**
5.1 Modern Operating Systems	Explain operating system requirements.
5.2 Operating System Installation	Install a Microsoft Windows operating system.
Chapter 6. Windows Configuration and Management	**Perform configuration, management, maintenance, and troubleshooting of Microsoft Windows operating systems.**
6.1 Windows Desktop, Tools, and Applications	Perform routine system management tasks with common Microsoft Windows tools.
6.2 Client-Side Virtualization	Configure virtualization on a computer.
6.3 Common Preventive Maintenance Techniques for Operating Systems	Use common preventive maintenance techniques for Microsoft Windows operating systems.
6.4 Basic Troubleshooting Process for Operating Systems	Explain how to troubleshoot Microsoft Windows operating systems.
Chapter 7. Network Concepts	**Explain the operation of networks**
7.1 Principles of Networking	Explain components and types of computer networks.
7.2 Networking Standards	Explain the purpose and characteristics of networking standards.
7.3 Physical Components of a Network	Explain the purpose of physical components of a network.
7.4 Basic Networking Concepts and Technologies	Configure network connectivity between PCs.
Chapter 8. Applied Networking	**Configure devices to connect to LANs, the Internet, and Cloud services.**
8.1 Computer to Network Connection	Connect a computer to wired and wireless networks.
8.2 ISP Connection Technologies	Explain the purpose and characteristics of ISP connection technologies.
8.3 Internet Technologies	Explain Cloud concepts and networked-host services.

Chapter /Section	Goals/Objectives
8.4 Common Preventive Maintenance Techniques Used for Networks	Explain how to perform preventive maintenance on networks using common techniques.
8.5 Basic Troubleshooting Process for Networks	Explain how to troubleshoot networks.
Chapter 9. Laptops and Mobile Devices	**Explain how to configure, repair, upgrade, maintain and troubleshoot laptops and mobile devices.**
9.1 Laptop Components	Explain the purpose and characteristics of laptops.
9.2 Laptop Configuration	Explain how to configure laptop power settings and wireless settings.
9.3 Laptop Hardware and Component Installation and Configuration	Explain how to remove and install laptop components.
9.4 Mobile Device Hardware Overview	Explain the purpose and characteristics of mobile devices.
9.5 Common Preventive Maintenance Techniques for Laptops and Mobile Devices	Explain how to perform common preventive maintenance techniques for laptops and mobile devices.
9.6 Basic Troubleshooting Process for Laptops and Mobile Devices	Explain how to troubleshoot laptops and mobile devices.
Chapter 10. Mobile, Linux, and OS X Operating Systems	**Explain how to configure, secure and troubleshoot mobile, Mac, and Linux operating systems.**
10.1 Mobile Operating Systems	Explain the purpose and characteristics of mobile operating systems.
10.2 Methods for Securing Mobile Devices	Explain methods for securing mobile devices.
10.3 Network Connectivity and Email	Explain how to configure network connectivity and email on mobile devices.
10.4 Linux and OS X Operating Systems	Explain the purpose and characteristics of Linux and OS X operating systems.
10.5 Basic Troubleshooting Process for Mobile, Linux, and OS X Operating Systems	Explain how to troubleshoot Mobile, Linux, and OS X operating systems.
Chapter 11. Printers	**Install a printer to meet requirements.**
11.1 Common Printer Features	Explain the purpose and characteristics of different types of printers.
11.2 Installing and Configuring Printers	Install a printer.
11.3 Sharing Printers	Configure printer sharing.
11.4 Maintaining and Troubleshooting Printers	Explain how to improve printer availability
Chapter 12. Security	**Implement basic host, data, and network security.**
12.1 Security Threats	Explain security threats.
12.2 Security Procedures	Configure IT security.
12.3 Common Preventive Maintenance Techniques for	Manage IT security on an ongoing basis.

Chapter /Section	Goals/Objectives
Security	
12.4 Basic Troubleshooting Process for Security	Explain how to troubleshoot basic security problems.
Chapter 13. The IT Professional	**Explain the roles and responsibilities of the IT professional.**
13.1 Communication Skills and the IT Professional	Explain why good communication skills are a critical part of IT work
13.2 Ethical and Legal Issues in the IT Industry	Explain appropriate behavior when faced with the legal and ethical issues that arise in the IT industry
13.3 Call Center Technicians	Explain the call center environment and technician responsibilities.
Chapter 14. Advanced Troubleshooting	**Troubleshoot advanced hardware and software problems.**
14.1 Computer Components and Peripherals	Troubleshoot computer components and peripherals.
14.2 Operating Systems	Troubleshoot operating systems.
14.3 Networks	Troubleshoot networks.
14.4 Security	Troubleshoot security.