

CISCO INFORMATION TECHNOLOGY [IT] ESSENTIALS  
GRADES 10-12

THE EWING PUBLIC SCHOOLS  
1331 Lower Ferry Road  
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BOE Approval Date: 12/20/10  
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In accordance with The Ewing Public Schools' Policy 2230, Course Guides, this curriculum has been reviewed and found to be in compliance with all policies and all affirmative action criteria.
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## TABLE OF CONTENTS

	Page
Preface	1
Scope of Essential Learning:	
Unit 1: Introduction to the Personal Computer	3
Unit 2: Safe Lab Procedures and Tool Use	5
Unit 3: Computer Assembly Step by Step	7
Unit 4: Basics of Preventive Maintenance and Troubleshooting	9
Unit 5: Fundamental Operating Systems	11
Unit 6: Fundamental Laptops and Portable Devices	14
Unit 7: Fundamental Printers and Scanners	17
Unit 8: Fundamental Networks	19
Unit 9: Fundamental Security	22
Unit 10: Communication Skills	24
Unit 11: Advanced Personal Computers	27
Unit 12: Advanced Operating Systems	30
Unit 13: Advanced Laptops and Portable Devices	32
Unit 14: Advanced Printers and Scanners	35
Unit 15: Advanced Networks	37
Unit 16: Advanced Security	40
CISCO IT Essentials Exam Information	42

## **PREFACE**

### **Cisco Academy Program: Cisco IT Essentials:**

This course covers the fundamentals of computer hardware and software as well as advanced concepts. 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 stand-alone 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 included to help students learn and practice concepts introduced in the fundamental and advanced chapters. The Packet Tracer activities will be designed for use with Packet Tracer 5.2. The inclusion of Packet Tracer activities provides learning experiences that align with the new CompTIA A+ certification objectives without requiring academies to purchase extra networking equipment.

### **Purpose:**

The primary objective of this course is to help students 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. In addition, the curriculum helps students gain confidence with the components of desktop and laptop computers by teaching the proper procedures for hardware and software installations, upgrades, and troubleshooting.

After completing the IT Essentials: PC Hardware and Software course, students will be able to complete 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

## **UNIT 1: INTRODUCTION TO THE PERSONAL COMPUTER (5 DAYS)**

### **Why Is This Unit Important?**

This chapter introduces the IT industry, options for training and employment, and some of the industry-standard certifications. This chapter also covers the components that comprise a personal computer system. Much of the content in this chapter will help the student throughout this course.

### **Enduring Understandings:**

1. Students will be able to identify the parts of a personal computer (overarching)
2. Students will understand why the computer components are essential for a personal computer to function (overarching)
3. Students will be able to determine how the Cisco IT Essentials program is able to help at home, in a business, and/or their future careers in the IT industry (overarching)

### **Essential Questions:**

1. Why is it important to know the different names and functions of the components inside a personal computer? (topical)
2. Why are these skills important to know? (overarching)
3. How will these skills benefit me in future? (overarching)

### **Acquired Knowledge:**

1. Information Technology encompasses the use of computers, network hardware, and software to process, store, transmit, and retrieve information.
2. A personal computer system consists of hardware components and software applications.
3. The computer case and power supply must be chosen carefully to support the hardware inside the case and allow for the addition of components.
4. The internal components of a computer are selected for specific features and functions. All internal components must be compatible with the motherboard.
5. You should use the correct type of ports and cables when connecting devices.
6. Typical input devices include the keyboard, mouse, touch screen, and digital cameras.
7. Typical output devices include monitors, printers, and speakers.
8. System resources must be assigned to computer components. System resources include IRQs, I/O port addresses, and DMAs.

**Acquired Skills:**

1. Explain IT industry certifications.
2. Describe a computer system.
3. Identify the names, purposes and characteristics of cases and power supplies.
4. Identify the names, purposes and characteristics of internal components.
5. Identify the names, purposes and characteristics of ports and cables.
6. Identify the names, purposes and characteristics of input devices.
7. Identify the names, purposes and characteristics of output devices.
8. Explain system resources and their purposes.

**Major Assessments:**Formative Assessments

1. Open Discussion: How can a CompTIA A+ Certification help you with job opportunities?
2. Practice Quiz
3. 1.1.2 Worksheet: Job Opportunities
4. 1.4.7 Worksheet: Research Computer Components

Summative Assessments

1. Unit 1 Test: Online exam - multiple choice

**Instructional Materials:**

- Cisco Net Academy Online Curriculum: Chapter 1 [cisco.netacad.net]
- Cisco Instructor PowerPoint: chapter 1

**NJCC Standards:**

- 8.1.12.A.3
- 8.1.12.F.2

## **UNIT 2: SAFE LAB PROCEDURES AND TOOL USE (2 DAYS)**

### **Why Is This Unit Important?**

This chapter discusses safe lab procedures, correct tool usage, and the proper disposal of computer components and supplies. The student will familiarize their selves in the lab with many of the tools used to build, service, and clean computer and electronic components. They will also learn the importance of organizational tools and how these tools help you work more efficiently.

### **Enduring Understandings:**

2. Students will be able to identify tools and software used with personal computer component and their purposes (overarching)
3. Students will be able to explain the purpose of safe working conditions and procedures (topical)
4. Students will be able to implement proper tool use (overarching)

### **Essential Questions:**

1. Why is it important to know safe work procedures? (topical)
2. How will knowing safe work procedures benefit me in future? (overarching)
3. Why are these skills important to know? (overarching)

### **Acquired Knowledge:**

1. Work in a safe manner to protect both users and equipment.
2. Follow all safety guidelines to prevent injuries to yourself and to others.
3. Know how to protect equipment from ESD damage.
4. Know about and be able to prevent power issues that can cause equipment damage or data loss.
5. Know which products and supplies require special disposal procedures.
6. Familiarize yourself with MSDS sheets for both safety issues and disposal restrictions to help protect the environment.
7. Be able to use the correct tools for the task.
8. Know how to clean components safely.
9. Use organizational tools during computer repairs.

### **Acquired Skills:**

1. Explain the purpose of safe working conditions and procedures.
2. Identify tools and software used with personal computer components and their purposes.
3. Implement proper tool use.

**Major Assessments:**Formative Assessments

1. Open Discussion: How do you address safety in the workplace as an employee?  
[MSDS]
2. Practice Quiz
3. 2.2.2 Worksheet: Diagnostic Software
4. 2.3.4 Hands-on Lab: Computer Disassembly

Summative Assessments

1. Unit Test: Online exam - multiple choice

**Instructional Materials:**

- Cisco Net Academy Online Curriculum: Chapter 2 [cisco.netacad.net]
- Cisco Instructor PowerPoint: Chapter 2

**NJCC Standards:**

- 8.1.12.A.3
- 8.1.12.F.2



### **UNIT 3: COMPUTER ASSEMBLY STEP BY STEP (5 DAYS)**

#### **Why Is This Unit Important?**

Assembling computers is a large part of a technician's job. As a technician, you will need to work in a logical, methodical manner when working with computer components. This chapter details the steps used to assemble a computer and to boot the system for the first time. As with any learned trade, computer assembly skills will improve dramatically with practice.

#### **Enduring Understandings:**

2. Students will be able to disassemble a computer (overarching)
3. Students will be able to assemble a computer (overarching)
4. Students will be able to implement proper tool use (overarching)

#### **Essential Questions:**

1. Why is it important to plan ahead and to work in a step by step process when disassembling or assembling a computer? (overarching)
2. Why are these skills important to know? (overarching)
3. How will these skills benefit me in future? (overarching)

#### **Acquired Knowledge:**

1. Computer cases come in a variety of sizes and configurations. Many of the components of the computer must match the form factor of the case.
2. The CPU is installed on the motherboard with a heat sink/fan assembly.
3. RAM is installed in RAM slots found on the motherboard.
4. Adapter cards are installed in PCI and PCIe expansion slots found on the motherboard.
5. Hard disk drives are installed in 3.5-inch drive bays located inside the case.
6. Optical drives are installed in 5.25-inch drive bays that can be accessed from outside the case.
7. Floppy drives are installed in 3.5-inch drive bays that can be accessed from outside the case.
8. Power supply cables are connected to all drives and the motherboard.
9. Internal data cables transfer data to all drives.
10. External cables connect peripheral devices to the computer.
11. Beep codes signify when hardware malfunctions.
12. The BIOS setup program is used to display information about the computer components and allows the user to change system settings.

### **Acquired Skills:**

1. Open the case.
2. Install the power supply.
3. Attach the components to the motherboard and install the motherboard.
4. Install internal drives.
5. Install drives in external bays.
6. Install adapter cards.
7. Connect all internal cables.
8. Re-attach the side panels and connect external cables to the computer.
9. Boot the computer for the first time.

### **Major Assessments:**

#### Formative Assessments

1. Open Discussion: How do you address safety in the workplace as an employee? [MSDS]
2. Practice Quiz
3. 3.2 Hands-on Lab: Install the Power Supply
4. 3.2 Optional Virtual Desktop Activity
5. 3.3.3 Hands-on Lab: Install the Motherboard
6. 3.3.3 Optional Virtual Desktop Activity
7. 3.4 Optional Virtual Desktop Activity
8. 3.5.2 Hands-on Lab: Install the Drives
9. 3.5.2 Optional Virtual Desktop Activity
10. 3.6.3 Hands-on Lab: Install Adapter Cards
11. 3.6.3 Optional Virtual Desktop Activity
12. 3.7.2 Hands-on Lab: Install Internal Cables
13. 3.7.2 Optional Virtual Desktop Activity
14. 3.8.2 Hands-on Lab: Complete the Computer Assembly
15. 3.8.2 Optional Virtual Desktop Activity
16. 3.9.2 Hands-on Lab: Boot the Computer

#### Summative Assessments

1. Unit 3 Test: Online exam - multiple choice

### **Instructional Materials:**

- Cisco Net Academy Online Curriculum: Chapter 3 [cisco.netacad.net]
- Cisco Instructor PowerPoint: Chapter 3

### **NJCC Standards:**

- 8.1.12.A.3
- 8.1.12.F.2

## **UNIT 4: BASICS OF PREVENTIVE MAINTENANCE AND TROUBLESHOOTING (2 DAYS)**

### **Why Is This Unit Important?**

This chapter introduces preventive maintenance and the troubleshooting process. Preventive maintenance is a regular and systematic inspection, cleaning, and replacement of worn parts, materials, and systems. Preventive maintenance helps to prevent failure of parts, materials, and systems by ensuring that they are in good working condition. Troubleshooting is a systematic approach to locating the cause of a fault in a computer system. With fewer faults, there is less troubleshooting to do, thus saving an organization time and money.

### **Enduring Understandings:**

2. Students will be able to explain the purpose of preventive maintenance.(topical)
3. Students will be able to identify the steps of the troubleshooting process.(overarching)
4. Students will be able to implement proper tool use (overarching)

### **Essential Questions:**

1. Why is it important to be proactive in system maintenance? (topical)
2. Why is it important to work in a step by step process when troubleshooting a computer? (overarching)
3. Why are these skills important to know? (overarching)
4. How will these skills benefit me in future? (overarching)

### **Acquired Knowledge:**

1. Explain the purpose of preventive maintenance.
2. Identify the steps of the troubleshooting process.

### **Acquired Skills:**

1. Troubleshoot computers using the troubleshooting process and personal experience.
2. Compare computer problems to solve issues with software and hardware.

### **Major Assessments:**

#### Formative Assessments

1. Open Discussion: How do you address safety in the workplace as an employee? [MSDS]
2. Practice Quiz

Summative Assessments

1. N/A

**Instructional Materials:**

- Cisco Net Academy Online Curriculum: Chapter 4 [[cisco.netacad.net](http://cisco.netacad.net)]
- Cisco Instructor PowerPoint: Chapter 4

**NJCC Standards:**

- 8.1.12.A.3
- 8.1.12.F.2

## **UNIT 5: FUNDAMENTAL OPERATING SYSTEMS (2 DAYS)**

### **Why Is This Unit Important?**

This chapter introduces computer operating systems. As a technician, you should be skilled at installing, configuring, and troubleshooting an operating system. The operating system (OS) controls almost all functions on a computer. In this chapter, the students will learn about the components, functions, and terminology related to the Windows 2000, Windows XP, and Windows Vista operating systems.

### **Enduring Understandings:**

1. Students will be able to install, troubleshoot, and repair operating systems (topical)
2. Students will be able to explain the purpose of operating systems and GUI environments (topical)
3. Students will be able to establish a maintenance s (overarching)

### **Essential Questions:**

1. Why is it important to be familiar with multiple operating systems? (topical)
2. Why is it important to have GUI operating systems? (topical)
3. Why are these skills important to know? (overarching)
4. How will these skills benefit me in future? (overarching)

### **Acquired Knowledge:**

1. Several different operating systems are available, and you must consider the customer's needs and environment when choosing an operating system.
2. The main steps in setting up a customer's computer include preparing the hard drive, installing an operating system, creating user accounts, and configuring installation options.
3. A GUI shows icons of all files, folders, and applications on the computer. A pointing device, such as a mouse, is used to navigate in a GUI desktop.
4. You should establish a backup strategy that allows for the recovery of data. Normal, copy, differential, incremental, and daily backups are all optional backup tools available in Windows operating systems.
5. Preventive maintenance techniques help to ensure optimal operation of the operating system.
6. Some of the tools available for troubleshooting an operating system problem include Windows Advanced Options menu, event logs, device manager, and system files.

### Acquired Skills:

1. Explain the purpose of an operating system.
2. Describe and compare operating systems to include purpose, limitations, and compatibilities.
3. Determine the operating system based on customer needs.
4. Install an operating system.
5. Navigate a Graphical User Interface (GUI).
6. Identify and apply common preventive maintenance techniques for operating systems.
7. Troubleshoot operating systems.

### Major Assessments:

#### Formative Assessments

1. Open Discussion: How do you address safety in the workplace as an employee? [MSDS]
2. Practice Quiz
3. 5.2.2 Worksheet: NOS Certifications and Jobs
4. 5.3.2 Worksheet: Upgrade Hardware Components
5. 5.4.2 Lab: Install Windows XP
6. 5.4.2 Optional Lab: Install Windows Vista
7. 5.4.5 Lab: Create Accounts and Check For Updates in Windows XP
8. 5.4.5 Optional Lab: Create Accounts and Check For Updates in Windows Vista
9. 5.4.8 Lab: Managing System Files with Built-in Utilities in Windows XP
10. 5.4.8 Optional Lab: Managing System Files with Built-in Utilities in Windows Vista
11. 5.4.9 Worksheet: Answer NTFS and FAT32 Questions
12. 5.5.1 Lab: Run Commands in Windows XP
13. 5.5.1 Optional Lab: Run Commands in Windows Vista
14. 5.5.3 Lab: Managing Administrative Settings and Snap-ins in Windows XP
15. 5.5.3 Optional Lab: Managing Administrative Settings and Snap-ins in Windows Vista
16. 5.5.4 Lab: Install Third-Party Software in Windows XP
17. 5.5.4 Optional Lab: Install Third-Party Software in Windows Vista
18. 5.6.2 Lab: Restore Points in Windows XP
19. 5.6.2 Optional Lab: Restore Points in Windows Vista
20. 5.6.3 Lab: Registry Backup and Recovery in Windows XP
21. 5.7.2 Lab: Managing Device Drivers with Device Manager in Windows XP
22. 5.7.2 Optional Lab: Managing Device Drivers with Device Manager in Windows Vista

#### Summative Assessments

1. Unit 5 Test: Online exam - multiple choice

**Instructional Materials:**

- Cisco Net Academy Online Curriculum: Chapter 5 [[cisco.netacad.net](http://cisco.netacad.net)]
- Cisco Instructor PowerPoint: Chapter 5

**NJCC Standards:**

- 8.1.12.A.3
- 8.1.12.F.2

## **UNIT 6: FUNDAMENTAL LAPTOPS AND PORTABLE DEVICES (4 DAYS)**

### **Why Is This Unit Important?**

This chapter discussed the features of laptops, portable devices, and smartphones. Laptops, Personal Digital Assistants (PDAs), and smartphones are becoming more popular as their prices decrease and technology continues to progress. As a computer technician, you need to have knowledge of portable devices of all kinds. This chapter focuses on the differences between laptops and desktops and describes the features of PDAs and smartphones.

### **Enduring Understandings:**

1. Students will describe laptops and other portable devices (overarching)
2. Students will identify and describe the components of a laptop.
3. Students will compare and contrast desktop and laptop components.

### **Essential Questions:**

1. Why is it important to know the different names and functions of the components inside a laptop?
2. How are laptops and other portable devices used in the commercial industry?
3. Why are these skills important to know?
4. How will these skills benefit me in future? (overarching)

### **Acquired Knowledge:**

1. Laptops and PDAs are becoming increasingly popular due to reduced costs, lighter weights, increased capabilities, and battery power for portability.
2. PDAs and smartphones are small, handheld devices with many of the capabilities of a computer, such as an address book, calendar, e-mail, and Internet access.
3. Laptops and desktops have ports that are virtually the same; therefore, the peripherals are interchangeable. Laptops can use docking stations or port replicators to quickly connect to desktop peripherals and AC power.
4. Desktop and laptop components, such as motherboards, are not interchangeable. Additionally, laptop components tend to be proprietary to each manufacturer and designed with unique form factors.
5. The laptop CPU is designed to use less power and create less heat than the desktop computer. It uses CPU throttling to reduce power consumption and heat.
6. Functionality of the laptop can be expanded by adding components via PC Card or Express Card slots and USB, FireWire, or parallel ports.
7. An important component of laptop portability is the ability to run on battery power. The current method of managing power is through the operating system with the Advanced Configuration and Power Interface (ACPI). The ACPI



- standard defines six power management states.
8. Some components of a laptop might need to be replaced. Steps are defined to replace the battery, optical drive, hard drive, memory, and PC Cards.
  9. Cell phone standards were developed in the 1980s. The current third-generation standards enable cell phones to share some laptop functions, such as e-mail, Internet access, address, and calendar functions. Standards have not been adopted worldwide.
  10. Preventive maintenance will ensure optimal operation of the laptop. It is important to keep the laptop clean and in safe environments. It is critical to use the correct materials and techniques when cleaning the various components of a laptop. Procedures for cleaning the components are presented.
  11. Dust, temperature, and humidity can affect laptop performance. Basic guidelines are to keep the laptop clean, with good ventilation, and room temperature between 45 and 90 degrees F (7 to 32 degrees C) and humidity levels in the range of 10 to 80 percent.  
Always verify that repair of a laptop is cost-effective.
  12. Troubleshooting laptop problems requires the technician to identify, repair, and document the problem. Troubleshooting steps include: Gather data from customer, verify the obvious issues, try quick solutions first, gather data from the computer, evaluate the problem, implement the solution, and close with the customer.
  13. When troubleshooting wireless-capable devices, check all status LEDs and signal strength indicators. Remove all unnecessary peripherals to isolate the problem.
  14. Check for external problems, such as connection errors, power errors, and function key errors. Connection errors can often be solved by removing and reinserting components. Check in the Device Manager for errors. Power errors can be caused by the use of incorrect adaptors, damaged batteries, damaged AC adaptors, or dead wall outlets. Check components controlled by function keys.
  15. Try quick solutions first to solve laptop problems. Reboot and verify the BIOS settings, start the laptop in safe mode, and use the Last Known Good Configuration option.
  16. For problem resolution, gather information from the computer from the Device Manager, Network Settings, Power Options, Event Viewer, and System Configuration.
  17. Resources for troubleshooting should include other technicians, Internet resources, manufacturers' FAQs, and online forums.
  18. The final steps in the troubleshooting process are to test the laptop in all scenarios, discuss the solution with the customer, fill out all necessary paperwork and billing documents, and document the solution.

### **Acquired Skills:**

1. Describe laptops and other portable devices.
2. Identify and describe the components of a laptop.

3. Compare and contrast desktop and laptop components.
4. Explain how to configure laptops.
5. Compare the different mobile phone standards.
6. Identify common preventive maintenance techniques for laptops and portable devices.
7. Describe how to troubleshoot laptops and portable devices

### **Major Assessments:**

#### Formative Assessments

1. 6.1.2 Worksheet: Research Laptops, Smartphones, and PDAs
2. 6.2.3 Worksheet: Complete Docking Stations True or False Questions
3. 6.3.4 Worksheet: Answer Laptop Expansion Questions
4. 6.4.1 Worksheet: Match ACPI Standards
5. 6.7.2 Worksheet: Research Laptop Problems
6. Chapter 6 Quiz

#### Summative Assessments

1. Chapter 6 Test: Online exam - multiple choice

### **Instructional Materials:**

- Cisco Net Academy Online Curriculum: Chapter 6 [cisco.netacad.net]
- Cisco Instructor PowerPoint: Chapter 6

### **NJCC Standards:**

- 8.1.12.A.3
- 8.1.12.F.2

## **UNIT 7: FUNDAMENTAL PRINTERS AND SCANNERS (5 DAYS)**

### **Why Is This Unit Important?**

This chapter provides essential information about printers and scanners. You will learn how printers operate, what to consider when purchasing a printer, and how to connect printers to an individual computer or to a network. The student will learn that there are many different types and sizes of printers and scanners, each with different capabilities, speeds, and uses. They also will learn that both printers and scanners can be connected directly to computers, as well as shared across a network. The chapter will also introduce the different types of cables and interfaces available to connect a printer or scanner. You must understand the operation of various types of printers and scanners to be able to install and maintain them, as well as troubleshoot any problems that arise.

### **Enduring Understandings:**

1. Students will describe the types of printers currently available.
2. Students will describe the installation and configuration process for printers.
3. Students will describe the types of scanners currently available.
4. Students will describe the installation and configuration process for scanners.
5. Students will identify and apply common preventive maintenance techniques for printers and scanners.

### **Essential Questions:**

1. How can understanding about the functions of a printer help in a home or office? (topical)
2. Why are certain printers best suited for particular applications and industries? (topical)
3. Why is it important to following the local and state EPA regulations for printers? ((topical)
4. How will these skills benefit you in future? (overarching)

### **Acquired Knowledge:**

1. Some printers and scanners have low output and are adequate for home use, whereas other printers and scanners have high output and are designed for commercial use.
2. Printers can have different speeds and quality of print.
3. Older printers and scanners use parallel cables and ports. Newer printers and scanners typically use USB or FireWire cables and connectors.
4. Larger printers and scanners might also have an NIC port to connect to a network.
5. Newer printers and scanners are PnP. The computer automatically installs the

necessary drivers.

6. If the device drivers are not automatically installed by the computer, you must supply the drivers on a CD or download them from the manufacturer's website.
7. Most optimization is done through software drivers and utilities.
8. After you have set up the printer or scanner, you can share the device with other users on the network. This arrangement is cost-efficient because there is no need for every user to have a printer or scanner.
9. A good preventive maintenance program extends the life of the printer and scanner and keeps them performing well.
10. Troubleshooting printer and scanner problems requires the technician to identify, repair, and document the problem.
11. Troubleshooting steps include: identify the problem, establish a theory of probable causes, determine an exact cause, implement a solution, verify solution and full system functionality, and document findings.

### **Acquired Skills:**

1. Describe the types of printers currently available.
2. Describe the installation and configuration process for printers.
3. Describe the types of scanners currently available.
4. Describe the installation and configuration process for scanners.
5. Identify and apply common preventive maintenance techniques for printers and scanners.
6. Troubleshoot printers and scanners.

### **Major Assessments:**

#### Formative Assessments

1. Open Discussion: How do you address safety in the workplace as an employee? [MSDS]
2. Quiz
3. Lab: Install All-in-One Device and Software

#### Summative Assessments

1. Unit 7 Test: Online exam - multiple choice

### **Instructional Materials:**

- Cisco Net Academy Online Curriculum: Chapter 7 [cisco.netacad.net]
- Cisco Instructor PowerPoint: Chapter 7

### **NJCC Standards:**

- 8.1.12.A.3
- 8.1.12.F.2

## **UNIT 8: FUNDAMENTAL NETWORKS (7 DAYS)**

### **Why Is This Unit Important?**

This chapter provides an overview of network principles, standards, and purposes. The different types of network topologies, protocols, and logical models as well as the hardware needed to create a network will also be discussed in this chapter. Configuration, troubleshooting, and preventive maintenance will be covered. You will also learn about network software, communication methods, and hardware relationships.

### **Enduring Understandings:**

1. Students will define computer networks.
2. Students will explain the benefits of networking.

### **Essential Questions:**

1. What attributes of home or office determine the best network logical topology? (topical)
2. How can a home benefit with an implemented network? (topical)
3. Are there new configurations of network in recent years?
4. How has networking devices evolved and improved over the past 10 years?
5. Why are these skills important to know? (overarching)
6. How will these skills benefit me in future? (overarching)

### **Acquired Knowledge:**

1. A computer network is composed of two or more computers that share data and resources.
2. A LAN refers to a group of interconnected computers that are under the same administrative control.
3. A WAN is a network that connects LANs in geographically separated locations.
4. In a peer-to-peer network, devices are connected directly to each other. A peer-to-peer network is easy to install, and no additional equipment or dedicated administrator is required. Users control their own resources, and a network works best with a small number of computers. A client/server network uses a dedicated system that functions as the server. The server responds to requests made by users or clients connected to the network.
5. A LAN uses a direct connection from one computer to another. It is suitable for a small area, such as in a home, building, or school. A WAN uses point-to-point or point-to-multipoint, serial communications lines to communicate over greater distances. A WLAN uses wireless technology to connect devices together.
6. The network topology defines the way in which computers, printers, and other devices are connected. Physical topology describes the layout of the wire and

devices, as well as the paths used by data transmissions. Logical topology is the path that signals travel from one point to another. Topologies include bus, star, ring, and mesh.

7. Networking devices are used to connect computers and peripheral devices so that they can communicate. These include hubs, bridges, switches, routers, and multipurpose devices. The type of device implemented depends on the type of network.
8. Networking media can be defined as the means by which signals, or data, are sent from one computer to another. Signals can be transmitted either by cable or wireless means. The media types discussed were coaxial, twisted-pair, fiber-optic cabling, and radio frequencies.
9. Ethernet architecture is now the most popular type of LAN architecture. Architecture refers to the overall structure of a computer or communications system. It determines the capabilities and limitations of the system. The Ethernet architecture is based on the IEEE 802.3 standard. The IEEE 802.3 standard specifies that a network implement the CSMA/CD access control method.
10. The OSI reference model is an industry-standard framework that is used to divide the functions of networking into seven distinct layers. These layers include Application, Presentation, Session, Transport, Network, Data Link, and Physical. It is important to understand the purpose of each layer.
11. The TCP/IP suite of protocols has become the dominant standard for the Internet. TCP/IP represents a set of public standards that specify how packets of information are exchanged between computers over one or more networks.
12. A NIC is a device that plugs into a motherboard and provides ports for the network cable connections. It is the computer interface with the LAN.
13. A modem is an electronic device that is used for computer communications through telephone lines. It allows data transfer between one computer and another. The modem converts byte-oriented data to serial bit streams. All modems require software to control the communication session. The set of commands that most modem software uses is known as the Hayes-compatible command set.
14. The three transmission methods to sending signals over data channels are simplex, half-duplex, and full-duplex. Full-duplex networking technology increases performance because data can be sent and received at the same time. DSL, two-way cable modem, and other broadband technologies operate in full-duplex mode.
15. Network devices and media, such as computer components, must be maintained. It is important to clean equipment regularly and use a proactive approach to prevent problems. Repair or replace broken equipment to prevent downtime.
16. When troubleshooting network problems, listen to what your customer tells you so that you can formulate open-ended and closed-ended questions that will help you determine where to begin fixing the problem. Verify obvious issues and try quick solutions before escalating the troubleshooting process.

**Acquired Skills:**

1. Explain the principles of networking.
2. Describe types of networks.
3. Describe basic networking concepts and technologies.
4. Describe the physical components of a network.
5. Describe LAN topologies and architectures.
6. Identify standards organizations.
7. Identify Ethernet standards.
8. Explain OSI and TCP/IP data models.
9. Describe how to configure a NIC and a modem.
10. Identify names, purposes, and characteristics of other technologies used to establish connectivity.
11. Identify and apply common preventive maintenance techniques used for networks.
12. Troubleshoot a network.

**Major Assessments:**Formative Assessments

1. Open Discussion: How do you address safety in the workplace as an employee? [MSDS]
2. Practice Quiz
3. Worksheet: Identify IP Address Classes
4. 8.4.2 Packet Tracer Activity: Cabling a Simple Network
5. 8.9.1 Worksheet: Internet Search for NIC Drivers
6. 8.9.2 Lab: Configure an Ethernet NIC to use DHCP in Windows XP
7. 8.9.2 Optional Lab: Configure an Ethernet NIC to use DHCP in Windows Vista
8. 8.9.2 Packet Tracer Activity: Adding Computers to an Existing Network
9. 8.10.3 Worksheet: Answer Broadband Questions
10. 8.12.2 Worksheet: Diagnose a Network Problem

Summative Assessments

1. Unit 8 Test: Online exam - multiple choice

**Instructional Materials:**

- Cisco Net Academy Online Curriculum: Chapter 8 [cisco.netacad.net]
- Cisco Instructor PowerPoint: Chapter 8

**NJCC Standards:**

- 8.1.12.A.3
- 8.1.12.F.2

## **UNIT 9: FUNDAMENTAL SECURITY (4 DAYS)**

### **Why Is This Unit Important?**

Technicians need to understand computer and network security. Failure to implement proper security procedures can have an impact on users, computers, and the general public. Private information, company secrets, financial data, computer equipment, and items of national security are placed at risk if proper security procedures are not followed. Security protects computers, network equipment, and data from loss and physical danger.

### **Enduring Understandings:**

1. Students will explain why security is important.
2. Students will describe security threats.
3. Students will identify security procedures.
4. Students will identify common preventive maintenance techniques for security.
5. Students will troubleshoot security.

### **Essential Questions:**

1. What are the most common reason for securing data and networks? (topical)
2. Why should a home network be secure? (topical)
3. What regular security maintenance procedures should be implemented? (topical)
4. Why are these skills important to know? (overarching)
5. How will these skills benefit me in future? (overarching)

### **Acquired Knowledge:**

1. Security threats can come from inside or outside of an organization.
2. Viruses and worms are common threats that attack data.
3. Develop and maintain a security plan to protect both data and physical equipment from loss.
4. Keep operating systems and applications up to date and secure with patches and service packs.

### **Acquired Skills:**

1. Explain why security is important.
2. Describe security threats.
3. Identify security procedures.
4. Identify common preventive maintenance techniques for security.
5. Troubleshoot security.



**Major Assessments:**Formative Assessments

1. Chapter 9 Quiz
2. 9.1 Worksheet: Security Attacks
3. 9.2.1 Worksheet: Third-Party Anti-Virus Software
4. 9.3.4 Packet Tracer Activity: Connecting Wireless PCs to a Linksys WRT300N
5. 9.4.2 Worksheet: Operating System Updates
6. 9.5.2 Worksheet: Gather Information from the Customer

Summative Assessments

1. Unit 9 Test: Online exam - multiple choice

**Instructional Materials:**

- Cisco Net Academy Online Curriculum: Chapter 9 [cisco.netacad.net]
- Cisco Instructor PowerPoint: Chapter 9

**NJCC Standards:**

- 8.1.12.A.3
- 8.1.12.F.2

## **UNIT 10: COMMUNICATION SKILLS (3 DAYS)**

### **Why Is This Unit Important?**

As a computer technician, you will not only fix computers but will also interact with people. In fact, troubleshooting is as much about communicating with the customer as it is about knowing how to fix a computer. The student will learn that these two skills need to be combined to make you a successful technician. They also will learn about the legal aspects and ethics of dealing with computer technology and the property of the customer.

### **Enduring Understandings:**

2. Students will explain the relationship between communication and troubleshooting.
3. Students will describe good communication skills and professional behavior.
4. Students will explain ethics and legal aspects of working with computer technology.
5. Students will describe the call center environment and technician responsibilities.

### **Essential Questions:**

1. Beyond communicating with potential customers, what other careers and industries can these communication skill be applicable to and how?
2. What is the purpose of netiquette?
3. Can netiquette it be applied to personal life as well professional? Why or why not?
4. Why are these skills important to know?
5. How will these skills benefit me in future?

### **Acquired Knowledge:**

1. To be a successful technician, you must practice good communication skills with customers and co-workers. These skills are as important as technical expertise.
2. You should always conduct yourself in a professional manner with your customers and co-workers. Professional behavior increases customer confidence and enhances your credibility. You should also learn to recognize the classic signs of a difficult customer and learn what to do and what not to do when you are on a call with this customer.
3. There are a few techniques that you can use to keep a difficult customer focused on the problem during a call. Primarily, you must remain calm and ask pertinent questions in an appropriate fashion. These techniques keep you in control of the call.
4. There is a right way and a wrong way to put a customer on hold, or transfer a customer to another technician. Learn and use the right way every time. Doing

either of these operations incorrectly can cause serious damage to your company's relationship with its customers.

5. Netiquette is a list of rules to use whenever you communicate through e-mail, text messaging, instant messaging, or blogs. This is another area where doing things the wrong way can cause damage to your company's relationship with its customers.
6. You must understand and comply with your customer's SLA. If the problem falls outside the parameters of the SLA, you need to find positive ways of telling the customer what you can do to help, and not what you cannot do. In special circumstances, you might decide to escalate the work order to management.
7. In addition to the SLA, you must follow the business policies of the company. These policies include how your company prioritizes calls, how and when to escalate a call to management, and when you are allowed to take breaks and lunch.
8. A computer technician's job is stressful. You rarely meet a customer who is having a good day. You can alleviate some of the stress by setting up your workstation in the most ergonomically beneficial way possible. You should practice time and stress management techniques every day.
9. There are ethical and legal aspects of working in computer technology. You should be aware of your company's policies and practices. In addition, you might need to familiarize yourself with your state or country's trademark and copyright laws.
10. The call center is a fast-paced environment. Level-one technicians and level-two technicians each have specific responsibilities. These responsibilities might vary slightly from one call center to another.

### **Acquired Skills:**

1. Explain the relationship between communication and troubleshooting.
2. Describe good communication skills and professional behavior.
3. Explain ethics and legal aspects of working with computer technology.
4. Describe the call center environment and technician responsibilities.

### **Major Assessments:**

#### Formative Assessments

1. Quiz
2. 10.1 Worksheet: Technician Resources

#### Summative Assessments

1. Unit 10 Test: Online exam - multiple choice

### **Instructional Materials:**

- Cisco Net Academy Online Curriculum: Chapter 10 [cisco.netacad.net]
- Cisco Instructor PowerPoint: Chapter 10

**NJCC Standards:**

- 8.1.12.A.3
- 8.1.12.F.2

## **UNIT 11: ADVANCED PERSONAL COMPUTERS (5 DAYS)**

### **Why Is This Unit Important?**

This chapter discusses the importance of component compatibility across hardware and software. It also covers the need for adequate system resources to efficiently run the customer's hardware and software.

In your career as a technician, you may have to determine if a component for a customer's computer should be upgraded or replaced. It is important that you develop advanced skills in installation procedures, troubleshooting techniques, and diagnostic methods for computers.

### **Enduring Understandings:**

2. Students will give an overview of field, remote, and bench technician jobs.
3. Students will explain safe lab procedures and tool use.
4. Students will describe situations requiring replacement of computer components.
5. Students will upgrade and configure personal computer components and peripherals.
6. Students will identify and apply common preventive maintenance techniques for personal computer components.
7. Students will troubleshoot computer components and peripherals.

### **Essential Questions:**

1. If you had to choose between field, remote, and bench technician, which would best suite your personality traits in your opinion?
2. When is it not cost effective to upgrade a computer (hardware/software)?
3. Why are these skills important to know?
4. How will these skills benefit me in future?

### **Acquired Knowledge:**

1. You learned about the roles of the field, remote, and bench technicians and the job possibilities that are available to those who enter the workforce with some knowledge of advanced troubleshooting skills.
2. You are able to explain and perform safe lab procedures and tool use. You can describe basic electrical safety, especially as it applies to monitors and laser printers. You understand the purpose and enforcement of worker safety standards.
3. You know the safe disposal procedures for various types of computer batteries and types of hardware, such as monitors.
4. You can advise customers of ways to protect their computers by using good preventive maintenance practices.

5. You can describe ways to clean the external components of a computer, including the monitor, case, printer, and peripherals. You can describe how to clean internal components of a computer, such as the motherboard, CPU and cooling system, RAM, and adapter cards.
6. You can advise customers when it is best to upgrade a computer and components and when it is best to buy new products.
7. You can explain the steps involved in adding and configuring a second hard drive. You can describe the steps involved in updating various computer components, such as cases, power supplies, the CPU and cooling system, RAM, hard drives, and adapter cards.
8. You can demonstrate the use of open- and closed-ended questions that are appropriate for a level-two technician to determine the problem.
9. You can describe the troubleshooting steps, including gathering data from the customer, verifying obvious issues, trying quick solutions first, evaluating problems, and implementing solutions until the problem is fixed.
10. You understand the role of the level-two technician, and how to build on the troubleshooting efforts of a level-one technician.

### **Acquired Skills:**

1. Give an overview of field, remote, and bench technician jobs.
2. Explain safe lab procedures and tool use.
3. Describe situations requiring replacement of computer components.
4. Upgrade and configure personal computer components and peripherals.
5. Identify and apply common preventive maintenance techniques for personal computer components.
6. Troubleshoot computer components and peripherals.

### **Major Assessments:**

#### Formative Assessments

1. Open Discussion: How do you address safety in the workplace as an employee? [MSDS]
2. Practice Quiz
3. 11.1 Worksheet: Job Opportunities
4. 11.2.2 Lab: Using a Multimeter and a Power Supply Tester
5. 11.2.2 Lab: Testing UTP Cables Using a Loopback Plug and a Cable Meter
6. 11.3.7 Worksheet: Research Computer Components
7. 11.4.1 Lab: Install a NIC in Windows XP
8. 11.4.1 Optional Lab: Install a NIC in Windows Vista
9. 11.4.3 Lab: Install Additional RAM in Windows XP
10. 11.4.3 Optional Lab: Install Additional RAM in Windows Vista
11. 11.4.4 Lab: BIOS File Search
12. 11.4.5 Lab: Install, Configure, and Partition a Second Hard Drive in Windows XP
13. 11.4.5 Optional Lab: Install, Configure, and Partition a Second Hard Drive in Windows Vista

14. 11.6.3 Lab: Repair Boot Problem
15. 11.6.3 Lab: Remote Technician: Repair Boot Problem
16. 11.6.3 Lab: Troubleshooting Hardware Problems in Windows XP
17. 11.6.3 Optional Lab: Troubleshooting Hardware Problems in Windows Vista

#### Summative Assessments

1. Unit 11 Test: Online exam - multiple choice

#### **Instructional Materials:**

- Cisco Net Academy Online Curriculum: Chapter 11 [[cisco.netacad.net](http://cisco.netacad.net)]
- Cisco Instructor PowerPoint: Chapter 11

#### **NJCC Standards:**

- 8.1.12.A.3
- 8.1.12.F.2

## **UNIT 12: ADVANCED OPERATING SYSTEMS (7 DAYS)**

### **Why Is This Unit Important?**

This chapter discussed how to select an operating system based on the needs of the customer. You have learned the differences between operating systems and network operating systems. The labs have helped you become familiar with Windows, creating partitions, customizing virtual memory, and scheduling tasks. You have also learned some optimization tips for operating systems, as well as how to troubleshoot a computer problem from the perspective of a level-two technician.

### **Enduring Understandings:**

1. Students will select the appropriate operating system based on customer needs.
2. Students will install, configure, and optimize an operating system.
3. Students will describe how to upgrade operating systems.
4. Students will describe preventive maintenance procedures for operating systems.
5. Students will troubleshoot operating systems.

### **Essential Questions:**

1. When is it appropriate to install and desktop operating system compared to a network operating system?
2. How can upgrading an operating system effect a person's needs both positive and negative?
3. Why are these skills important to know?
4. How will these skills benefit me in future?

### **Acquired Knowledge:**

1. Ensure that you fully understand the technology needs of the customer.
2. Know the differences between common operating systems.
3. Match the customer needs to the proper technologies.
4. Know the different methods to install an operating system.
5. Know how to upgrade different operating systems.
6. Understand how preventive maintenance can stop problems before they start.
7. Know which preventive maintenance procedures are appropriate for the customer.
8. Know how to troubleshoot operating system problems.

### **Acquired Skills:**

1. Select the appropriate operating system based on customer needs.
2. Install, configure, and optimize an operating system.



3. Describe how to upgrade operating systems.
4. Describe preventive maintenance procedures for operating systems.
5. Troubleshoot operating systems.

### **Major Assessments:**

#### Formative Assessments

1. Open Discussion: How do you address safety in the workplace as an employee? [MSDS]
2. Practice Quiz
3. Lab: Advanced Installation of Windows XP
4. Optional Lab: Advanced Installation of Windows Vista
5. Lab: Create a Partition in Windows XP
6. Optional Lab: Create a Partition in Windows Vista
7. Lab: Customize Settings in Windows XP
8. Optional Lab: Customize Settings in Windows Vista
9. Optional Lab: Install an Alternate Browser
10. 12.4.1 Lab: Schedule Task Using GUI and “at” Command in Windows XP
11. 12.4.1 Optional Lab: Schedule Task Using GUI and “at” Command in Windows Vista
12. Lab: Advanced Installation of Windows XP
13. Optional Lab: Advanced Installation of Windows Vista
14. Lab: Create a Partition in Windows XP
15. Optional Lab: Create a Partition in Windows Vista
16. Lab: Customize Settings in Windows XP
17. Optional Lab: Customize Settings in Windows Vista
18. Optional Lab: Install an Alternate Browser
19. 12.4.1 Lab: Schedule Task Using GUI and “at” Command in Windows XP
20. 12.4.1 Optional Lab: Schedule Task Using GUI and “at” Command in Windows Vista

#### Summative Assessments

1. Unit 12 Test: Online exam - multiple choice

### **Instructional Materials:**

- Cisco Net Academy Online Curriculum: Chapter 12 [cisco.netacad.net]
- Cisco Instructor PowerPoint: Chapter 12

### **NJCC Standards:**

- 8.1.12.A.3
- 8.1.12.F.2

## **UNIT 13: ADVANCED LAPTOPS AND PORTABLE DEVICES (3 DAYS)**

### **Why Is This Unit Important?**

With the increase in demand for mobility, the popularity of laptops and portable devices will continue to grow. During the course of your career, you will be expected to know how to configure, repair, and maintain these devices. The knowledge you acquire about desktop computers will help you service laptops and portable devices. However, there are important differences between the two technologies.

To facilitate mobility, laptops and portable devices use wireless technologies more than desktops. All laptops use batteries when they are disconnected from a power source. Docking stations are commonly used to connect a laptop to peripheral devices. As a computer technician, you will be required to configure, optimize, and troubleshoot these docking stations and accessories, as well as the laptop or portable device that they accompany. Many laptop components are proprietary, so some manufacturers require that you complete specialized certification training to perform laptop repairs.

Servicing laptops can be very challenging. Mastering the skills necessary to work on laptops is important to your career advancement.

### **Enduring Understandings:**

1. Students will describe wireless communication methods for laptops and portable devices.
2. Students will describe repairs for laptops and portable devices.
3. Students will select laptop components.
4. Students will describe preventive maintenance procedures for laptops.
5. Students will describe how to troubleshoot a laptop.

### **Essential Questions:**

1. How does the natural proprietary design of laptops and portable devices affect a technician's ability and skills to troubleshoot? (topical)
2. How does changing technologies of portable devices hinder or benefit the decision making process for a home or office individual? (topical)
3. Why are these skills important to know?
4. How will these skills benefit me in future?

### **Acquired Knowledge:**

1. Bluetooth creates a small wireless PAN for connected cell phones, printers, and laptops.
2. An IR network uses infrared light to create short-range networks that are primarily used to control input devices and mobile devices.

3. A cellular WAN allows you to use your cell phone and laptop for voice and data communications.
4. The most popular wireless technology is Wi-Fi. There are four major Wi-Fi releases, each with different speed and bandwidth ratings: IEEE 802.11 a, b, g, and n.
5. Satellite networks are faster than modems, but slower than DSL and cable networks. Satellite networks are primarily used in remote locations.
6. A CRU is a component that a user can easily install without technical training.
7. An FRU is a component that a trained service technician may install at a remote location.
8. Most repairs can be done at customers' sites or at any local repair center. However, there are occasions when a laptop must be sent directly to the manufacturer for repairs.
9. Professional technicians follow preventive maintenance schedules to keep their equipment at optimal performance levels.
10. Laptops are more susceptible to contamination and damage. A well-maintained laptop will reduce repair costs.
11. A docking station allows a laptop to easily connect to peripheral devices similar to those found on desktop computers. A port replicator can be added to a laptop if the user needs more I/O ports.
12. Know how to troubleshoot laptop problems.

### **Acquired Skills:**

1. Describe wireless communication methods for laptops and portable devices.
2. Describe repairs for laptops and portable devices.
3. Select laptop components.
4. Describe preventive maintenance procedures for laptops.
5. Describe how to troubleshoot a laptop.

### **Major Assessments:**

#### Formative Assessments

1. 13.2 Worksheet: Investigating Repair Centers
2. 13.3.1 Worksheet: Laptop Batteries
3. 13.3.2 Worksheet: Docking Station
4. 13.3.3 Worksheet: Research DVD Drive
5. 13.3.4 Worksheet: Laptop RAM
6. 13.5.3 Worksheet: Verify Work Order Information
7. 13.5.3 Worksheet: Investigating Support Websites and Repair Companies
8. 13.5.3 Optional Lab: Troubleshooting Laptop Problems in Windows XP
9. 13.5.3 Optional Lab: Troubleshooting Laptop Problems in Windows Vista
10. Chapter 13 Quiz

#### Summative Assessments

1. Unit 13 Test: Online exam - multiple choice

**Instructional Materials:**

- Cisco Net Academy Online Curriculum: Chapter 13 [[cisco.netacad.net](http://cisco.netacad.net)]
- Cisco Instructor PowerPoint: Chapter 13

**NJCC Standards:**

- 8.1.12.A.3
- 8.1.12.F.2

## **UNIT 14: ADVANCED PRINTERS AND SCANNERS (5 DAYS)**

### **Why Is This Unit Important?**

This chapter explores the functionality of printers and scanners. You will learn how to maintain, install, and repair these devices in both local and network configurations. The chapter discusses safety hazards, configuration procedures, preventive maintenance, and printer and scanner sharing.

### **Enduring Understandings:**

1. Students will describe the potential safety hazards and safety procedures associated with printers and scanners.
2. Students will install and configure a local printer and scanner.
3. Students will describe how to share a printer and a scanner on a network.
4. Students will upgrade and configure printers and scanners.
5. Students will describe printer and scanner preventive maintenance techniques.
6. Students will troubleshoot printers and scanners.

### **Essential Questions:**

1. How would a shared printer or scanner benefit a home or office? (topical)
2. When is it necessary to upgrade a printer?
3. How is a printer to be disposed of properly and according to local and state regulations?
4. Why are these skills important to know?
5. How will these skills benefit me in future?

### **Acquired Knowledge:**

1. Always follow safety procedures when working with printers and scanners. Many parts inside printers contain high voltage or become very hot with use.
2. Use the device manual and software to install a printer or scanner. After the installation, update the drivers and firmware to fix problems and increase functionality.
3. Use the Windows interface to share printers and scanners across the network.
4. Consult the customers to determine how best to upgrade and configure printers and scanners to meet their needs.
5. Keep printers, scanners, and supplies clean and dry. Keep supplies in their original packaging. Develop a maintenance schedule to clean and check devices on a regular basis.
6. Use a sequence of steps to fix a problem. Start with simple tasks before you decide on a course of action. Call a certified printer technician when a problem is too difficult for you to fix.

**Acquired Skills:**

1. Describe potential safety hazards and safety procedures associated with printers and scanners.
2. Install and configure a local printer and scanner.
3. Describe how to share a printer and a scanner on a network.
4. Upgrade and configure printers and scanners.
5. Describe printer and scanner preventive maintenance techniques.
6. Troubleshoot printers and scanners.

**Major Assessments:**Formative Assessments

1. 14.2.4 Lab: Install an All-in-one Printer/Scanner
2. 14.3.2 Lab: Share the All-in-one Printer/Scanner in Windows XP
3. 14.3.2 Optional Lab: Share the All-in-one Printer/Scanner in Windows Vista
4. 14.4.2 Lab: Optimize Scanner Output
5. 14.5.1 Worksheet: Search for Certified Printer Technician Jobs
6. 14.6.3 Lab: Fix a Printer Problem
7. 14.6.3 Lab: Remote Technician: Fix a Printer Problem
8. 14.6.3 Lab: Troubleshooting Printer Problems in Windows XP
9. 14.6.3 Optional Lab: Troubleshooting Printer Problems in Windows Vista
10. Chapter 14 Quiz

Summative Assessments

1. Unit 14 Test: Online exam - multiple choice

**Instructional Materials:**

- Cisco Net Academy Online Curriculum: Chapter 14 [cisco.netacad.net]
- Cisco Instructor PowerPoint: Chapter 14

**NJCC Standards:**

- 8.1.12.A.3
- 8.1.12.F.2

## **UNIT 15: ADVANCED NETWORKS (7 DAYS)**

### **Why Is This Unit Important?**

This chapter focuses on advanced networking topics, including network design, network component upgrades, and e-mail server installations. Basic networking topics, such as safety, network components, and preventive maintenance, are also discussed.

To meet the expectations and needs of your customers and network users, you must be familiar with networking technologies. You must understand the basics of how a network is designed and why some components affect the flow of data on a network. Troubleshooting advanced network situations is also described in this chapter.

The advanced networks chapter discussed the planning, implementation, and upgrading of networks and network components. The following are some of the important concepts to remember from this chapter:

### **Enduring Understandings:**

1. Students will identify potential safety hazards and implement proper safety procedures related to networks.
2. Students will design a network based on the customer's needs.
3. Students will determine the components for your customer's network.
4. Students will implement the customer's network.
5. Students will upgrade the customer's network.
6. Students will describe the installation, configuration, and management of a simple mail server.
7. Students will describe preventive maintenance procedures for networks.
8. Students will troubleshoot the network.

### **Essential Questions:**

1. When is it necessary to upgrade a network?
2. How does preventive maintenance help or hinder a technician?
3. Why are these skills important to know?
4. How will these skills benefit me in future?

### **Acquired Knowledge:**

1. Many safety hazards are associated with network environments, devices, and media. You should follow proper safety procedures at all times.
2. Make network design decisions that will meet the needs and the goals of your customers.
3. Select network components that offer the services and capabilities necessary to implement a network based on the needs of the customer.

4. Plan network installations based on the needed services and equipment.
5. Upgrading a network may involve additional equipment or cabling. Discuss how upgrading can help to enhance the future usability of the network.
6. Plan for an e-mail installation before deployment. Consult a specialist to make sure that the installation and configuration of an e-mail server goes smoothly.
7. Prevent network problems by developing and implementing a comprehensive preventive maintenance policy.
8. Follow a logical methodology to troubleshoot advanced network problems.

### **Acquired Skills:**

1. Identify potential safety hazards and implement proper safety procedures related to networks.
2. Design a network based on the customer's needs.
3. Determine the components for your customer's network.
4. Implement the customer's network.
5. Upgrade the customer's network.
6. Describe installation, configuration, and management of a simple mail server.
7. Describe preventive maintenance procedures for networks.
8. Troubleshoot the network.

### **Major Assessments:**

#### Formative Assessments

1. 15.2.2 Worksheet: Protocols
2. 15.3.2 Worksheet: ISP Connection Types
3. 15.4.2 Lab: Configure Browser Settings in Windows XP
4. 15.4.2 Optional Lab: Configure Browser Settings in Windows Vista
5. 15.4.2 Lab: Share a Folder, Share a Printer, and Set Share Permissions in Windows XP
6. 15.4.2 Optional Lab: Share a Folder, Share a Printer, and Set Share Permissions in Windows Vista
7. 15.5.1 Lab: Install a Wireless NIC in Windows XP
8. 15.5.1 Optional Lab: Install a Wireless NIC in Windows Vista
9. 15.5.1 Packet Tracer Activity: Install a Wireless NIC
10. 15.5.2 Lab: Configure a Wireless Router
11. 15.5.3 Lab: Test the Wireless NIC in Windows XP
12. 15.5.3 Optional Lab: Test the Wireless NIC in Windows Vista
13. 15.5.3 Packet Tracer Activity: Test a Wireless Connection
14. 15.8.3 Lab: Fix a Network Problem
15. 15.8.3 Lab: Remote Technician: Fix a Network Problem
16. 15.8.3 Lab: Troubleshooting Network Problems in Windows XP
17. 15.8.3 Optional Lab: Troubleshooting Network Problems in Windows Vista
18. Chapter 15 Quiz



Summative Assessments

1. Unit 15 Test: Online exam - multiple choice

**Instructional Materials:**

- Cisco Net Academy Online Curriculum: Chapter 15 [[cisco.netacad.net](http://cisco.netacad.net)]
- Cisco Instructor PowerPoint: Chapter 15

**NJCC Standards:**

- 8.1.12.A.3
- 8.1.12.F.2

## **UNIT 16: ADVANCED SECURITY (3 DAYS)**

### **Why Is This Unit Important?**

This chapter reviews the types of attacks that threaten the security of computers and the data contained on them. A technician is responsible for the security of data and computer equipment in an organization. This chapter describes how you can work with customers to ensure that the best possible protection is in place.

Risks to computers and network equipment come from both internal and external sources. Risks include physical threats, such as theft or damage to equipment, and data threats, such as the loss or corruption of data.

This chapter discussed computer security and why it is important to protect computer equipment, networks, and data. Threats, procedures, and preventive maintenance relating to data and physical security were described to help you keep computer equipment and data safe. Security protects computers, network equipment, and data from loss and physical danger.

### **Enduring Understandings:**

1. Students will outline security requirements based on customer needs.
2. Students will select security components based on customer needs.
3. Students will implement the customer's security plan.
4. Students will perform preventive maintenance on security.
5. Students will troubleshoot security.

### **Essential Questions:**

1. What technologies and devices would be needed to a secure not only digital assets but the physical facility itself? How do network components of the same type differ from each other?
2. Why are these skills important to know?
3. How will these skills benefit me in future?

### **Acquired Knowledge:**

1. Security threats can come from inside or outside of an organization.
2. Viruses and worms are common threats that attack data.
3. Develop and maintain a security plan to protect both data and physical equipment from loss.
4. Keep operating systems and applications up to date and secure with patches and service packs.

**Acquired Skills:**

1. Outline security requirements based on customer needs.
2. Select security components based on customer needs.
3. Implement customer's security plan.
4. Perform preventive maintenance on security.
5. Troubleshoot security.

**Major Assessments:**Formative Assessments

1. Worksheet: Answer Security Policy Questions
2. 16.2.3 Worksheet: Research Firewalls
3. 16.3.1 Lab: Configure Wireless Security
4. 16.3.2 Lab: Configure Windows XP Firewall
5. 16.3.2 Optional Lab: Configure Windows Vista Firewall
6. 16.4.3 Lab: Data Backup and Recovery in Windows XP
7. 16.4.3 Optional Lab: Data Backup and Recovery in Windows Vista
8. 16.5.3 Lab: Fix a Security Problem
9. 16.5.3 Lab: Remote Technician: Fix a Security Problem
10. 16.5.3 Lab: Troubleshooting Access Security with Windows XP
11. 16.5.3 Optional Lab: Troubleshooting Access Security with Windows Vista
12. Chapter 16 Quiz

Summative Assessments

1. Unit 16 Test: Online exam - multiple choice

**Instructional Materials:**

- Cisco Net Academy Online Curriculum: Chapter 16 [cisco.netacad.net]
- Cisco Instructor PowerPoint: Chapter 16

**NJCC Standards:**

- 8.1.12.A.3
- 8.1.12.F.2

## **CISCO IT ESSENTIALS EXAM INFORMATION**

Units 1:10: The exam is 1 hour and 15 minutes in length and consists of 49 multiple choice questions. The multiple-choice section covers Units 1–10.

Units 11-16: The exam is 1 hour and 15 minutes in length and consists of 34 multiple choice questions. The multiple-choice section covers Units 11–16.