

A+ IT Technician

Course Outcome Summary

Course Information

Organization	Madison Area Technical College
Developers	Ronald Koci
Development Date	5/23/2008
Course Number	10-154-191
Instructional Level	One-Year Technical Diploma
Instructional Area	Computer Information Systems
Division	Agriscience and Technology
Department	Information Technology
Potential Hours of Instruction	72
Total Credits	3

Description

CompTIA's A+ Certification is a widely accepted IT industry standard certification for PC technology. This course presents an in-depth exposure to computer operating systems and hardware. Students learn the functionality of operating systems and hardware components as well as suggested best practices in support roles. Through hands-on activities and labs, students learn how to configure a computer, install operating systems and computer software, and troubleshoot hardware problems. This course prepares students for CompTIA's A+ Essentials exam (CompTIA A+ exam 220-601) and CompTIA's IT Technician exam (CompTIA 220-602) Prerequisite: 154-189 Computer Hardware Essentials

Program Outcomes:

Troubleshoot computer workstations using best practices.
 Install and configure Microsoft Windows operating systems.
 Develop advanced methods of troubleshooting.
 Solve problems individually and in a team environment.

Types of Instruction

Instruction Type	Contact Hours	Credits
Classroom Presentation	36	2
On-Campus Lab	36	1

Textbooks

Jean Andrews. *A+ Guide to Managing & Maintaining Your PC*. Thomson Course Technology. 2006. **Edition:** Sixth. **Pages:** 1400. **ISBN:** 978-0-619-21758-7. **Source:** Course.com.

Prerequisites

Computer Hardware Essentials 10-154-189

Exit Learning Outcomes

Core Abilities

- A. Communication
- B. Critical thinking
- C. Science and Technology

Program Outcomes

- A. Troubleshoot computer workstations using best practices.
- B. Install and configure Microsoft Windows operating systems.
- C. Develop advanced methods of troubleshooting.
- D. Solve problems individually and in a team environment.

External Standards

Competencies

1. Summarize PC repair fundamentals

You will demonstrate your competence:

- o by completing the assigned lab exercise(s)
- o by participating in the class session
- o by attaining a 70% or better on unit test
- o by completing out of class assignments.

Your performance will be successful when:

- o you successfully identified support technician tools
- o you complete a preventive maintenance plan
- o you enter into class discussions on how a computer boots
- o you successfully troubleshoot a failed boot

Learning Objectives

- a. Determine the tools you'll need to use.
- b. Define a presentive maintenance plan.
- c. Summarize the boot process of a computer.
- d. Determine how to troubleshoot a failed boot.

2. Analyze form factors and power supplies

You will demonstrate your competence:

- o by completing the assigned lab exercises(s)
- o by attaining a 70% or better on unit test
- o by participating in class.
- o by completing out of class assignments

Your performance will be successful when:

- o you successfully complete installation of a power supply
- o you successfully identify current form factors
- o you enter into class discussions on format factors and power supplies
- o you successfully troubleshoot electrical problems
- o you successfully determining the energy star specifications of your computer

Learning Objectives

- a. Summarize the different format factors and computer cases.
- b. Determine how electricity is measured.
- c. Explain the Energy Star specifications
- d. Resolve Electrical problems in a computer.

3. Analyze processors and chipsets

You will demonstrate your competence:

- o by completing the lab exercise(s)
- o by attaining a 70% or better on unit test
- o by participating in class discussion

- o by completing out of class assignments

Your performance will be successful when:

- o you successfully complete installation of heat sink/fan assembly and processor
- o you enter into class discussions of the various type of processors available on the market
- o you enter into class discussions of chipsets and their functions
- o you successfully solve the support issues to processors

Learning Objectives

- a. Summarize the different processors used in computers.
- b. Summarize what are and how chipsets work.
- c. Support installation and upgrading of a processor.
- d. Explain the function of heat sinks and cooling mechanisms for processors.

4. Perform diagnostic procedures and troubleshooting techniques for motherboards

You will demonstrate your competence:

- o by completing the lab exercise(s)
- o by attaining a 70% or better on unit test
- o by participating in the class
- o by completing out of class assignments

Your performance will be successful when:

- o you successfully install a motherboard
- o you successfully troubleshoot end-user problems with motherboards
- o you enter into class discussions about the types of motherboards and the selection process
- o you successfully configure the motherboard BIOS
- o you successfully resolve issues relating to motherboards and processors

Learning Objectives

- a. Summarize the different types of motherboards.
- b. Support the motherboard configuration and installation.
- c. Summarize the troubleshooting of a motherboard and processor.

5. Investigate upgrading of system memory

You will demonstrate your competence:

- o by completing the lab exercise(s)
- o by attaining a 70% or better on unit test
- o by participating in the class discussions
- o by completing out of class assignments

Your performance will be successful when:

- o you successfully install memory modules
- o you enter into class discussion about different memory styles and their technology
- o you successfully basic RAM troubleshooting
- o you successfully determine memory requirements of a system

Learning Objectives

- a. Summarize the different kinds of physical memory and how they work.
- b. Complete the upgrading process of system memory.
- c. Support troubleshooting problems with memory.

6. Investigate diagnostic procedures and troubleshooting techniques for hard drives.

You will demonstrate your competence:

- o by completing the lab exercise(s)
- o by attaining a 70% or better on unit test
- o by participating in class discussion
- o by completing out of class assignments

Your performance will be successful when:

- o you successfully explain how data is stored in a magnetic hard drive and floppy disk
- o you successfully identify and explain the ATA hard drive interfaces
- o you successfully identify and explain the SCSI hard drive interfaces
- o you successfully install a hard drive
- o you successfully solve hard drive installation problems

Learning Objectives

- a. Summarize how data is stored on floppy drives and hard drives.
- b. Summarize the technologies used in hard drive storage.
- c. Determine how a hard drive communicates with a computer.
- d. Complete the installation of a hard drive.
- e. Determine how to solve hard drive problems.
- f. Support tools to resolve hard drive failures.

7. Analyze installation and support of input/output devices.**You will demonstrate your competence:**

- o by completing the lab exercise(s)
- o by attaining a 70% or better on unit test
- o by participating in the class discussions
- o by completing out of class assignments

Your performance will be successful when:

- o you enter into class discussions about installation issues surrounding I/O devices
- o you successfully identify the various I/O devices and their interfaces
- o you complete the installation of video adapters and monitors
- o you successfully identify the various ports and expansion slots
- o you successfully solve support issues for I/O devices

Learning Objectives

- a. Summarize the installation of I/O devices.
- b. Determine how to work with keyboards, mice and other pointing devices.
- c. Summarize how monitors and video work and how they relate to the system.
- d. Summarize the use of ports and expansion slots for add-on devices.
- e. Complete the troubleshooting of I/O devices.

8. Support multimedia devices and mass storage strategies.**You will demonstrate your competence:**

- o by completing the lab exercise(s)
- o by attaining a 70% or better on a unit test
- o by participating in the class discussion
- o by completing out of class assignments

Your performance will be successful when:

- o you successfully troubleshoot floppy drives
- o you complete installation of optical drives
- o you successfully solve installation issues
- o you enter into class discussions relating to optical storage technologies
- o you enter into class discussions relating to backups and fault tolerances.

Learning Objectives

- a. Define multimedia devices.
- b. Summarize optical storage technologies.
- c. Complete troubleshooting of multimedia and mass storage devices.

9. Explore installation of windows operating systems.

You will demonstrate your competence:

- o by completing the lab exercise(s)
- o by attaining a 70% or better on unit test
- o by participating in class discussions
- o by completing out of class assignments

Your performance will be successful when:

- o you enter into class discussions about the features and architecture of Windows operating system
- o you successfully complete a plan for a Windows installation
- o you successfully perform the steps to install Windows operating system
- o you successfully configure the operating system after installation

Learning Objectives

- a. Summarize the features and architecture of Windows operating system.
- b. Summarize the planning for a Windows installation.
- c. Complete the steps to install Windows operating system.
- d. Summarize the process after Windows is installed.

10. Analyze maintenance of Windows operating systems.**You will demonstrate your competence:**

- o by completing the lab exercise(s)
- o by attaining a 70% or better on unit test
- o by participating in the class discussion
- o by completing out of class assignments

Your performance will be successful when:

- o you enter into class discussions on installation and managing hardware and applications
- o you successfully demonstrate the usage of device manager
- o you successfully demonstrate the usage of computer management snap-in
- o you can successfully complete modifications to windows registry
- o you can successfully update drivers
- o you can successfully complete system restore
- o you can successfully use task manager, system configuration utility and services console

Learning Objectives

- a. Summarize the installation and managing of hardware and applications in Windows.
- b. Explain how to protect and maintain Windows system files.
- c. Summarize the Windows registry.
- d. Explain how to optimize the Windows environment for best performance.

11. Explain tools used to protect user accounts and their data.**You will demonstrate your competence:**

- o by completing the lab exercise(s)
- o by attaining a 70% or better on unit test
- o by participating in the class discussions
- o by completing out of class assignments

Your performance will be successful when:

- o you successfully set up user accounts and profiles
- o you successfully transfer user files and preferences to a new pc
- o you successfully complete routine hard drive maintenance tasks

Learning Objectives

- a. Determine how to set up and support Windows users accounts.
- b. Determine tools useful when supporting users and their data.
- c. Summarize how to maintain a hard drive and keeping good backups.

12. Troubleshooting Windows boot failures.**You will demonstrate your competence:**

- o by completing the lab exercise(s)
- o by attaining a 70% or better on unit test
- o by participating in the class discussion
- o by completing out of class assignments

Your performance will be successful when:

- o you enter into class discussions about the process on Windows startup
- o you successfully troubleshoot Windows boot failures
- o you successfully customize the way Windows boots
- o you successfully identify the tools available to solve booting problems
- o you demonstrate the usage of the command-line prompt

Learning Objectives

- a. Explain what happens when Windows starts up.
- b. Summarize the tools that can help you when Windows fails to boot.
- c. Summarize the operation of the command-line interface.
- d. Explain the manipulation of files and folders from the command line.
- e. Determine the strategies that you can use to solve Windows booting problems.

13. Support Windows GUI failures and use of remote utilities.**You will demonstrate your competence:**

- o by completing the lab exercise(s)
- o by attaining a 70% or better on unit test
- o by participating in the class discussions
- o by completing out of class assignments

Your performance will be successful when:

- o you successfully demonstrate usage of recovery console
- o you enter into class discussions relating to troubleshooting utilities
- o you successfully perform a system repair
- o you successfully perform a remote control and remote assistance in Windows XP

Learning Objectives

- a. Summarize how to troubleshoot GUI failures.
- b. Determine how to troubleshooting utilities.
- c. Summarize strategies to support Windows remotely.

14. Summarize how computers operate on a network.**You will demonstrate your competence:**

- o by completing the lab exercise(s)
- o by attaining a 70% or better on unit test
- o by participating in the class discussions
- o by completing out of class assignments

Your performance will be successful when:

- o you enter into class discussions about network topologies and physical architectures
- o you successfully demonstrate the installation of network interface cards and connect to a network
- o you successfully demonstrate the sharing of resources
- o you successfully connect a laptop or desktop to a wireless network
- o you successfully identify and solve end-user connectivity issues
- o you successfully recognize and fix basic network problems

Learning Objectives

- a. Summarize the different types of physical network architectures.

- b. Determine how networking works with Windows.
- c. Complete the installation of a network card and connect to a network.
- d. Determine how to share resources on a network.
- e. Summarize how to setup up and secure a wireless network.
- f. Summarize troubleshooting tools and tips for network connections.

15. Summarize how computers connect to the internet.

You will demonstrate your competence:

- o by completing the lab exercise(s)
- o by attaining a 70% or better on unit test
- o by participating in the class discussions
- o by completing out of class assignments

Your performance will be successful when:

- o you enter into class discussions relating to TCP/IP protocols
- o you enter into class discussions relating to how the internet works
- o you enter into class discussions relating to how computer connect to the internet
- o you successfully troubleshoot connect problems
- o you successfully configure a browser and a firewall
- o you enter into class discussions relating to e-mail clients, file transfer software and internet telephone

Learning Objectives

- a. Summarize the TCP/IP suite of protocols.
- b. Explain how to connect to the internet using cable modem, DSL, and dial-up connections and how to share those connections.
- c. Explain how to use a router to enhance and secure a network connection to the internet.
- d. Summarize how to support common internet clients such as web browsers, e-mail clients, file transfer software, internet telephone, and Windows remote desktop.

16. Analyze how to secure from threats to computers and their data.

You will demonstrate your competence:

- o by completing the lab exercises(s)
- o by attaining a 70% or better on unit test
- o by participating in the class discussion
- o by completing out of class assignments

Your performance will be successful when:

- o you successfully explain the threats to your computer and data
- o you successfully identify the steps to secure a computer
- o you enter into class discussions on how to control the local computing environment
- o you successfully configure Windows security center
- o you successfully configure wireless security

Learning Objectives

- a. Explain how to secure a desktop or notebook computer.
- b. Explain how to secure a local wired or wireless network.
- c. Summarize how malicious software works and how to clean an infected system.