

## CompTIA A+ Certification: IT Technician

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**Course Length:** 7-days (36 hours)

**Prerequisites:** Students taking this course should have existing technical knowledge and support experience with networked desktop and notebook computers running Windows 2000 Professional or any version of the Windows XP operating system. Computer Literacy, basic use of Windows, office applications, Internet and email is advantageous.

**What's in A+ Certification: Essentials, 2nd Edition + MeasureUp & CertBlaster Instructor Guide:**

This ILT Series course, rated 4.9/5.0 in overall quality by ProCert Labs, will prepare students for the CompTIA A+ Essentials certification exam (2006 Objectives). Students will obtain the skills and knowledge necessary to install, build, upgrade, repair, configure, troubleshoot, and performing preventative maintenance on personal computer hardware and operating systems. Comes with MeasureUp and CertBlaster exam prep software.

### Objectives:

- Measure and describe the characteristics of electricity; understand and follow safe practices when working with electricity; describe the purpose and features of power supplies, and install a new power supply into a PC; install power conditioning equipment and configure systems to minimize power consumption; and troubleshoot faulty power supplies.
- Describe the function and features of CPUs; describe the techniques used to cool CPUs and other PC components; describe motherboards and identify the typical components they contain; install a CPU onto a motherboard and install a motherboard into a case; and identify the symptoms of, probable causes of, and potential solutions to motherboard- and CPU-related problems.
- Describe the function of memory and describe various amounts of memory; differentiate between different types of memory chips; install RAM into a system while handling it properly and meeting your PC installation requirements; test memory with a memory-testing application; and troubleshoot memory problems.
- Define interrupt, IRQ, I/O address, DMA, and base memory address, and describe how those resources are involved with device interaction with system resources; install and configure an expansion card, laptop expansion devices, and legacy expansion adapters; and troubleshoot expansion-card problems.
- Install hard drives into a PC; partition and format drives to prepare them for use; install and use optical drives and discs; install floppy drives and use floppy disks to store data; connect, use, and troubleshoot USB and FireWire external drives; describe, install, use, and troubleshoot tape drives; and back up and restore data.
- Identify features of dot-matrix printers; install, use, and troubleshoot inkjet printers and laser printers; identify other printer types; identify steps in the Windows printing process and configure a Windows printer; identify printer options and upgrades; install scanners; and troubleshoot scanner problems.
- Describe, install, and troubleshoot CRT and LCD displays; and troubleshoot and maintain display devices.
- Identify features of, use of, and ways to troubleshoot problems with laptop and notebook computers; replace internal components in a notebook computer; and identify features of, connect, and troubleshoot handheld computer devices.
- Manage directories and files; monitor and manage the operating system; monitor events on the computer; and manage the Registry.

### Topic-Level Outline

#### Unit 1 : Electricity and power systems

*Topic A: \* Electricity and electronics*

A-1: Examining the characteristics of electricity

A-2: Considering electrical safety

A-3: Measuring electrical values

*Topic B: \* Static electricity*

B-1: Opening the computer case while following proper ESD precautions

*Topic C: \* Power supplies*

C-1: Examining a power supply and connectors

C-2: Installing a new power supply

*Topic D: \* Power conditioning and management*

D-1: Installing power conditioning equipment

D-2: Minimizing power use

*Topic E: \* Power supply troubleshooting*

E-1: Troubleshooting problems

E-2: Troubleshooting power supply problems

#### Unit 2 : CPUs and motherboards

*Topic A: \* Central processing units*

A-1: Identifying CPUs

*Topic B: \* Packaging, slots, and cooling techniques*

B-1: Identifying the socket and package type of your CPU

B-2: Examining the cooling systems in your PC

*Topic C: \* Motherboards and system cases*

C-1: Examining motherboard components and form factor

C-2: Examining system cases

*Topic D: \* Motherboard troubleshooting*

D-1: Replacing a CPU (optional)

D-2: Replacing a motherboard (optional)

D-3: Troubleshooting motherboard and CPU problems

#### Unit 3 : Basic Input/Output System

*Topic A: \* BIOS and CMOS*

A-1: Updating your PC's BIOS settings

*Topic B: \* The POST process*

B-1: Observing the POST process

*Topic C: \* Firmware updates*

C-1: Updating the BIOS in your PC (optional)

*Topic D: \* BIOS and POST troubleshooting*

D-1: Replacing the CMOS battery

D-2: Troubleshooting BIOS- and POST-related problems

#### Unit 4 : Memory systems

*Topic A: \* Memory*

A-1: Identifying memory characteristics

*Topic B: \* Memory packaging*

B-1: Comparing RAM packaging

*Topic C: \* RAM installation*

C-1: Adding memory to a desktop computer

C-2: Adding memory to a notebook computer

C-3: Adding memory to a handheld computer

*Topic D: \* Memory troubleshooting*

D-1: Monitoring memory usage

D-2: Changing the size of the Windows page file

D-3: Testing memory with Memtest86

D-4: Troubleshooting memory

#### Unit 5 : Bus structures

*Topic A: \* Buses*

A-1: Examining buses

*Topic B: \* Host system interaction*

B-1: Examining running processes and IRQ assignments

B-2: Viewing your computer's I/O address assignments

B-3: Viewing your computer's DMA channel assignments

B-4: Viewing your computer's base memory address assignments

B-5: Identifying the typical usage of system resources

*Topic C: \* The PCI bus*

C-1: Installing a PCI card

*Topic D: \* Video buses*

D-1: Installing an AGP adapter

#### Unit 6 : Expansion cards

*Topic A: \* Drive adapters*

A-1: Distinguishing among drive controllers

A-2: Installing a drive controller

*Topic B: \* Video cards*

B-1: Installing a video adapter

*Topic C: \* Sound cards*

C-1: Installing a sound card

*Topic D: \* Internal modems*

D-1: Installing an internal modem

D-2: Testing your modem

*Topic E: \* Legacy device installation*

E-1: Installing a non-PnP device

E-2: Overriding Plug and Play settings

*Topic F: \* Expansion card troubleshooting*

F-1: Searching for and installing updated drivers

F-2: Troubleshooting expansion card-related problems

#### Unit 7 : Ports, connectors, and cables

*Topic A: \* Serial and parallel ports, cables, and connectors*

A-1: Examining serial ports, cables, and connectors

A-2: Examining parallel ports, cables, and connectors

*Topic B: \* Keyboards, mice, and pointing devices*

B-1: Examining keyboard and mouse ports

*Topic C: \* USB ports, cables, and connectors*

C-1: Examining the USB

*Topic D: \* FireWire ports, cables, and connectors*

D-1: Examining the FireWire bus

*Topic E: \* Infrared and Bluetooth wireless ports*

E-1: Exploring wireless communications technologies

*Topic F: \* Multimedia ports, cables, and connectors*

F-1: Examining multimedia connections

*Topic G: \* Port, cable, and connector troubleshooting*

G-1: Troubleshooting port, cable, and connector problems

**Unit 8 : Data storage devices**

*Topic A: \* Hard drives*

- A-1: Choosing a file system
- A-2: Physically installing a hard drive
- A-3: Partitioning and formatting a hard drive
- A-4: Changing the file system
- A-5: Converting to a dynamic disk

*Topic B: \* Optical drives*

- B-1: Installing an optical drive
- B-2: Using an optical drive

*Topic C: \* Removable storage devices*

- C-1: Installing a USB flash drive
- C-2: Examining floppy disks
- C-3: Installing a floppy drive
- C-4: Formatting a floppy diskette

*Topic D: \* Tape drives and backup systems*

- D-1: Discussing types of tape drives
- D-2: Installing an external SCSI tape drive
- D-3: Backing up your computer
- D-4: Restoring data to your computer

*Topic E: \* Storage device troubleshooting*

- E-1: Maintaining your hard drive
- E-2: Troubleshooting data storage device problems

**Unit 9 : Video and multimedia input/output devices**

*Topic A: \* Cathode ray terminals*

- A-1: Examining how CRTs produce images
- A-2: Comparing monitor specifications
- A-3: Installing a CRT
- A-4: CRT preventive maintenance and cleaning
- A-5: Troubleshooting CRT problems

*Topic B: \* LCDs and other video technologies*

- B-1: Examining how LCDs produce images
- B-2: Installing an LCD monitor
- B-3: LCD preventative maintenance and cleaning
- B-4: Troubleshooting LCD problems

*Topic C: \* Sound input and output devices*

- C-1: Connecting speakers
- C-2: Using a microphone
- C-3: Connecting musical instruments to a computer

*Topic D: \* Scanners and cameras*

- D-1: Connecting a scanner
- D-2: Optimizing a scanner
- D-3: Troubleshooting scanner problems
- D-4: Connecting a digital camera
- D-5: Troubleshooting digital camera connection problems

**Unit 10 : Printers**

*Topic A: \* Dot matrix printers*

- A-1: Describing impact printers

*Topic B: \* Inkjet and related printer technologies*

- B-1: Examining how inkjet printers work
- B-2: Installing an inkjet printer

*Topic C: \* Laser printers*

- C-1: Describing laser printers
- C-2: Installing a laser printer

*Topic D: \* Other types of printers*

- D-1: Identifying other printer technologies

*Topic E: \* Printer maintenance and troubleshooting*

- E-1: Examining the Windows printing process
- E-2: Configuring a Windows printer
- E-3: Installing printer add-ons and upgrades
- E-4: Performing printer maintenance
- E-5: Troubleshooting printer problems

**Unit 11 : Portable computers and devices**

*Topic A: \* Notebook computers*

- A-1: Identifying the components and integrated peripherals in a notebook
- A-2: Comparing wireless networking standards
- A-3: Adding peripherals
- A-4: Docking and undocking a notebook

*Topic B: \* Component replacement*

- B-1: Adding and removing hot-swappable components
- B-2: Replacing an internal component in a notebook

*Topic C: \* Handheld computers*

- C-1: Using a PDA
- C-2: Connecting a PDA to a personal computer

*Topic D: \* Portable computer problems*

- D-1: Troubleshooting notebook problems
- D-2: Identifying power problems
- D-3: Troubleshooting handheld computer problems
- D-4: Maintaining a notebook

**Unit 12 : Operating system management**

*Topic A: \* Directory and file management*

- A-1: Using the Command Prompt
- A-2: Navigating a directory tree
- A-3: Creating directories
- A-4: Copying a directory and its contents
- A-5: Removing directories

- A-6: Creating a text file

- A-7: Modifying file attributes

- A-8: Editing a text file

- A-9: Managing temporary files

*Topic B: \* System management*

- B-1: Configuring Windows XP services

- B-2: Managing the Startup program group

- B-3: Configuring environment variables

*Topic C: \* The Registry*

- C-1: Viewing Registry information

- C-2: Searching the Registry

- C-3: Backing up Registry files

**Unit 13 : Operating system monitoring**

*Topic A: \* System monitoring*

- A-1: Running Windows Diagnostics

- A-2: Running msinfo32 from a command line

- A-3: Managing applications

- A-4: Ending a process

- A-5: Monitoring network utilization

- A-6: Managing users

- A-7: Disabling error reporting

- A-8: Enabling error reporting for specific programs

*Topic B: \* Event Viewer*

- B-1: Viewing the event logs

- B-2: Viewing the event logs of a remote computer

- B-3: Controlling the display of an event log

- B-4: Clearing an event log

- B-5: Changing event log options

**Unit 14 : Operating system maintenance**

*Topic A: \* Windows Backup OBack*

- A-1: Backing up files using Wizard mode

- A-2: Restoring information from a backup

- A-3: Scheduling a backup

- A-4: Backing up System State data

*Topic B: \* Hot fixes and service packs*

- B-1: Installing a Windows XP service pack

- B-2: Using Windows Update to install hotfixes

- B-3: Configuring Automatic Updates

**Unit 15 : Operating system troubleshooting**

*Topic A: \* The Windows boot process*

- A-1: Identifying phases in the startup process

- A-2: Observing the Windows XP startup process

- A-3: Troubleshooting operating system startup problem

- A-4: Booting the computer in different startup modes

*Topic B: \* Operating system troubleshooting*

- B-1: Managing general protection faults

- B-2: Creating an MS-DOS startup disk

- B-3: Using the System Configuration Utility

- B-4: Creating a system restore point

- B-5: Booting to System Restore

- B-6: Creating an ASR recovery set

- B-7: Running the Recovery Console

- B-8: Using System File Checker

- B-9: Using Microsoft Knowledge Base to research a problem

*Topic C: \* Remote administration*

- C-1: Enabling Remote Desktop

- C-2: Making a Remote Desktop connection

- C-3: Using Remote Assistance

**Unit 16 : Connecting computers**

*Topic A: \* Networking concepts*

- A-1: Describing networking models and protocols

- A-2: Identifying the components of a network

*Topic B: \* Wired network connections*

- B-1: Examining coaxial cable and connectors

- B-2: Examining twisted pair cables and connectors

- B-3: Discussing fiber optic cables and connectors

- B-4: Examining the IEEE 1394/Firewire connection

- B-5: Installing a NIC

*Topic C: \* Wireless network connections*

- C-1: Comparing wireless networking standards

*Topic D: \* Network architectures*

- D-1: Identifying the characteristics of the various physical architectures

- D-2: Discussing WAN bandwidth technologies

**Unit 17 : Networking computers**

*Topic A: \* LAN configuration*

- A-1: Viewing installed network protocols

- A-2: Examining addresses

- A-3: Configuring an IP address and subnet mask

- A-4: Configuring additional TCP/IP properties

- A-5: Installing and configuring NWLink

*Topic B: \* Resource sharing*

- B-1: Joining a Windows domain

- B-2: Viewing network resources

- B-3: Sharing a folder

- B-4: Setting access permissions

- B-5: Connecting to a shared folder

- B-6: Sharing a printer

- B-7: Connecting to a shared printer

- B-8: Installing the NetWare client

*Topic C: \* Internet connections*

- C-1: Selecting a connection technology

- C-2: Discussing WAN bandwidth technologies

- C-3: Configuring a browser to use a proxy server

- C-4: Creating a connection object

- C-5: Creating a dial-up connection

- C-6: Configuring TCP/IP for a dial-up connection

- C-7: Repairing a TCP/IP connection

*Topic D: \* Wireless nodes*

- D-1: Adding a wireless node to your network

**Unit 18 : Troubleshooting network connections**

*Topic A: \* Network troubleshooting*

- A-1: Troubleshooting cable problems

- A-2: Verifying the NIC device in Device Manager

- A-3: Identifying TCP/IP utilities used for troubleshooting

- A-4: Using Ipconfig to display TCP/IP settings

- A-5: Testing TCP/IP connectivity

- A-6: Using Nslookup and Tracert to verify settings

- A-7: Determining effective NTFS permissions

**Unit 19 : Security**

*Topic A: \* Operating system security*

- A-1: Securing access to the operating system

- A-2: Choosing the correct file system for security

- A-3: Configuring file access restrictions

- A-4: Encrypting files

- A-5: Understanding authentication technologies

- A-6: Using local security policies to set password restrictions

*Topic B: \* Auditing and logging*

- B-1: Enabling an auditing policy

- B-2: Auditing an event

*Topic C: \* Security hardware*

- C-1: Installing a fingerprint reader

- C-2: Installing a card reader

- C-3: Installing the IdentiPHI Basic software

- C-4: Configuring IdentiPHI Basic to accept smart cards

- C-5: Enrolling a smart card with IdentiPHI Basic

- C-6: Using a smart card

- C-7: Uninstalling the smart card reader and software

*Topic D: \* The human aspects of security*

- D-1: Implementing physical access restrictions

- D-2: Examining data destruction techniques

- D-3: Considering corporate security policies

- D-4: Managing social engineering attacks

*Topic E: \* Network protection*

- E-1: Configuring Windows Firewall

- E-2: Creating a DMZ

- E-3: Installing protection software

- E-4: Blocking pop-ups

- E-5: Installing a spyware checker

- E-6: Controlling cookies

- E-7: Setting security zones

- E-8: Identifying the technology used to implement WLANs

- E-9: Configuring a wireless access point (instructor demo)

- E-10: Configuring a wireless client (instructor demo)

**Unit 20 : Windows installation and upgrades**

*Topic A: \* Installation*

- A-1: Identifying pre-installation tasks

- A-2: Installing Windows 2000 Professional

- A-3: Searching for and installing device drivers

- A-4: Configuring driver signing

*Topic B: \* Upgrades*

- B-1: Upgrading to Windows XP

**Unit 21 : Safety**

*Topic A: \* Safety and hazards*

- A-1: Identifying typical office and computer-related hazards

- A-2: Finding sources of static electricity and interference

- A-3: Reading a material safety data sheet

*Topic B: \* Safe work practices*

- B-1: Avoiding injury and strain when working with PCs

*Topic C: \* Disposing of computer equipment*

- C-1: Selecting the proper methods for computer equipment disposal</

- B-1: Performing preventative maintenance tasks
- B-2: Cleaning computer equipment

**Unit 23 : Professionalism and communication**

*Topic A: \* Customer satisfaction*

- A-1: Maintaining professionalism
- A-2: Ensuring customer satisfaction

*Topic B: \* Problem and resolution tracking*

- B-1: Tracking problems and resolutions

Appendix A : PC hardware support basics

*Topic A: \* Computer components overview*

*Topic B: \* Hardware, software, and firmware*

*Topic C: \* Operating system fundamentals*

Appendix B : Certification exam objectives map

*Topic A: \* CompTIA A+ Essentials 2006*

*comprehensive exam objectives*

*Topic B: \* CompTIA A+ 220-602 2006 comprehensive exam objectives*

Appendix C : CompTIA A+ acronyms

*Topic A: \* Acronyms list*