

# **CompTIA A+ 2009 Training Course outline**

## Session 1

### Section A: Technician Professionalism

Introduction

Hygiene

What to Wear

Operational Procedures

Professional Appearance

Honesty and Integrity

Dependability and Responsibility

Authorization of Work

Adaptability and Versatility

Sensitivity

### Section B: Successful Communication

What Not to Do

Assertive Communication

Computer Technician Etiquette

Electrostatic Discharge

Antistatic Mats and Wrist Straps

Antistatic Bags

Electromagnetic and RF Interference

Physical Safety

Building Services

### Section C: The Visible PC

The System Unit

Standard Peripherals

Connecting the Monitor

USB and FireWire

Network Connections

Audio Connections

Additional Connections

Legacy Connectors

VGA Connectors

PC Tips

### Section D: Inside the System Unit

Working in the System Unit

CPU and RAM

Motherboard

Power Supply and Connections

Drives

Cooling the System

System Unit Tips

## Section E: Visible Windows

Windows Only

Workgroups and Domains

Window Tips

Windows 2000 Pro

Windows XP Versions

Windows Vista Versions

Media Center

## Section F: 64-Bit Windows

64-Bit Computing

Measuring CPU/RAM Capacity

32-Bit vs. 64-Bit

64-Bit Versions of Windows

64-Bit Tips Session 2

## Section A: Windows: The Grand Tour

Mouse Clicking

Modern Login Screens

Windows Desktop

Task Manager

Compatibility Mode

Desktop Icons

Windows Explorer

Windows XP Desktop

Windows Vista Desktop

## Section B: Hot Keys, Function Keys, and Aero

Function Keys and Hot Keys

Windows Logo Key

Function Keys

CTRL+ESC

ALT and SHIFT Key Combinations

Cut, Copy, Paste, and Undo

## Section C: Critical System Files

System Folder Location

Fonts and Offline Items

System32 Folder

Temp Folder

Program Files

Documents and Settings

Common User Folders

My Documents

Application Data

Start Menu

Vista System Files

Vista Users Folder  
Folder Memorization

#### Section D: Registry and System Tools

System Registry  
User Account Control  
Registry Keys  
Other Registry Items  
Registry Editor 32  
The Control Panel  
Administrative and System Tools  
Disk Management and Services  
MMC  
System Tools

#### Section E: Understanding Microprocessors

Man in the Box  
Code Book and Registers  
Binary

#### Section F: Machine Language

Machine Language Introduction  
Program Commands  
Clock Speed  
RAM  
Bits and Bytes  
What RAM Is  
The Data Bus and RAM  
The MCC and RAM  
Determining RAM Size  
Address Registers

#### Section G: Pipelines

Four-Stage Pipeline  
Prefetch and Decode  
Execute and Write  
The Pipeline at Work  
Pipeline Stalls  
Modern Pipelines  
Caching  
RAM Cache  
L1 Cache  
L2 Cache  
L3 Cache  
RAM Caches at Work Session 3

#### Section A: Clock Multiplier

System Crystal

- Clock Multiplier
- Front Side Bus
- Multiple Pipelines
- Processes
- Threads
- Hyperthreading
- Tips

#### Section B: CPUs

- CPU Overview
- Sockets
- CPU History - Intel®
- CPU History - AMD®
- Socket Types
- Intel® Information
- Multiple Cores Concept
- AMD® Information
- Dual-Core Families
- Phenom™ CPUs
- Core™ i7 and i5
- Mobile Processors
- Server Processors

#### Section C: Installing and Upgrading CPUs

- Installing a CPU
- Fan Installation
- Connecting the Fan
- Additional Considerations
- Fins, Fans, and Heat Pipes
- Liquid Cooling
- Phase Change Cooling
- CPU Troubleshooting Tips
- CPU Fan Troubleshooting Tips
- Upgrade Troubleshooting Tips
- CPU-Z

#### Section D: RAM

- Transistors and Capacitors
- RAM Tech Tip
- Memory Chips
- Synchronous Dynamic RAM (SDRAM)
- RAMBUS
- DDR
- DDR2 and DDR3
- Motherboard RAM Capacity
- Installing RAM
- Dual Channel
- Triple Channel

Recap  
Upgrading RAM  
Specialized Memory  
Single vs. Double-Sided  
Maintaining and Repairing RAM  
RAM Count  
Testing RAM

Section E: BIOS and CMOS  
Chipset  
BIOS  
BIOS, POST, and CMOS  
CMOS Setup  
Advanced Chipset Features  
Power Management  
Frequency and Voltage Control  
Discard/Save Changes  
BIOS Security  
TPM  
CMOS Battery  
BIOS Version  
POST  
Beep Error Codes  
Text Error Codes

Section F: Expansion Bus  
Beyond the EDB  
Northbridge  
PCI  
AGP  
PCIe  
AMR and CNR  
Session 4

Section A: Motherboards and Cases  
Form Factors  
ATX  
MicroATX  
BTX  
NLX  
Motherboard and Accessories  
Inside the Case  
Front Panel Connections  
The Motherboard Book  
Coarse/Fine  
Installing the Motherboard  
Attaching Front Panel Connections  
Expansion Card Tips

## Section B: Powering the PC

Electricity

Measuring Electricity

Wattage Ratings

DC/AC

Testing Tools

ATX Power Supply

P4 Connector

Standard Power Cable

Soldering Irons

ATX 12 V Connectors

Additional Connectors

Larger Power Supply

Modular Connections

Power Supply Rails

AC Adapters

Power Supply Maintenance

Intermittent Rebooting

Power Supply Tips

Testing Power Supplies

Surges/Sags

UPS

## Section C: The Physical Hard Drive

Inside the Hard Drive

Read/Write Armatures

Data Scale

Flux Reversal

CHS Values

## Section D: Understanding ATA

ATA

IDE

Connecting ATA/IDE Drives

Master/Slave Drives

DMA

ATA-2

Logical Block Addressing

ATA-3 and S.M.A.R.T.

ATA-4

ATA-5 and Ultra DMA

ATA-6

ATA-7 and SATA

Hard Drive Configuration/Boot Priority

Attaching Multiple Drives

Warning Sounds

Section E: Advanced ATA  
IDE/EIDE/ATA Tips  
Drive Sizes  
Solid-State Drives  
eSATA Session 5

Section A: The World of SCSI  
SCSI  
Termination  
SCSI IDs

Section B: RAID  
RAID Overview  
RAID 0  
RAID 1  
Parity  
RAID 5  
RAID 0+1  
RAID Controllers  
Motherboard RAID Support  
Configuring RAID  
RAID Array  
Hardware RAID vs. Software RAID  
Swapping Drives in RAID  
Expansion Cards

Section C: Partitioning  
Partitioning Overview  
Disk Management  
Change Drive Letters  
Boot Sector  
File Formats  
NTFS

Section D: Mounting and Formatting  
Mount Points  
Formatting the Drive  
Allocation Units  
Quick vs. Standard Formatting  
Dynamic Disks  
Simple Volumes  
Spanned Volumes  
Striped Volumes  
Extending and Shrinking Volumes

Section E: Managing and Maintaining Drives  
Defragmenting  
Defragmentation Defined

Check Disk  
Missing and Failed Drives

#### Section F: Removable Media

Removable Media  
Floppy Drives  
Optical Media  
CD-ROM  
CD-R  
CD-RW and DVD  
DVD+/-R and DVD+/-RW  
Double-Sided and Dual-Layer DVD  
Optical Media and the A+ Exam  
Blu-ray  
Installing Optical Drives  
Cleaning Optical Media  
Flash Media Session 6

#### Section A: Installing and Configuring Windows

Installation Steps  
Requirements  
Compatibility  
Backup/Restore  
Installation Methodologies  
Automation of Installation  
Image Installation  
Partitions  
Network Options  
Region and Language  
Post Install Jobs  
Set Up During Install  
Windows Update  
Activation  
Third Party Device Tips

#### Section B: Troubleshooting Windows

Boot Files  
Boot.ini  
Boot Manager  
Troubleshooting Boot Problems  
Blue Screen of Death  
XP Recovery Console  
Vista System Recovery  
Windows Startup Problems  
MSConfig  
Windows Advanced Boot Options  
Event Viewer  
Services

- Restore Points
- Safely Remove Hardware
- Troubleshooting Applications
- Recovery Partitions

#### Section C: Command Prompt

- The Command Prompt
- Directory Commands
- Creating and Removing Directories
- MSConfig Via Command Prompt
- DOS Command: EDIT
- DOS Command: COPY
- Switches
- Copy by Extension
- Copying as an ASCII File
- Verify
- Overwrite Without Prompting
- DOS Command: XCOPY
- Formatting from Command Prompt

#### Section D: Users and Groups

- Authentication and Authorization
- SIDs in Action
- Biometric Devices
- Smart Cards
- Creating Users
- Administrators
- Groups and Users
- Power Users
- Managing Users and Groups
- Creating Groups

#### Section E: NTFS

- NTFS Permissions
- Networking Shares
- Folder Permissions
- Setting User Permissions
- Inheritance
- NTFS File Attributes
- File Encryption
- UAC/Create Password

#### Section F: Backing Up the System

- File Attributes
- Backups
- Full Backup
- Incremental vs. Differential Backup
- ERD/Automated System Recovery

Performing Backups  
Vista Backup and Restore Center  
Migrating Data  
Migration and Recycling  
Session 7

#### Section A: General Purpose I/O

Serial Ports  
USB  
Human Interface Devices  
FireWire  
Keyboards  
Regional/Language Options  
ASCII/Unicode  
Accessibility Options  
Repeat Settings/Typematic Buffer  
The Mouse  
Windows Mobile Devices  
KVM Switch

#### Section B: Video

Video Cards  
CRT Monitors  
Refresh Rates  
Pixel Aspect Ratio  
Safety Considerations  
Degaussing  
Carrying a CRT  
LCD Monitors  
Polarity of Light  
How an LCD Works  
LCD Pixels  
CCFL  
Brightness/Contrast

#### Section C: Managing and Maintaining Video

Resolution  
Color Depth  
Native Resolution  
Video Card Considerations  
CrossFire/SLI  
Installing Cards/Drivers  
DirectX  
Drivers  
Display Settings  
Dual Monitors  
Troubleshooting Video Problems  
VGA/DVI

HDMI

Analog Video Connections

Monitor Cleaning

Section D: Multimedia

Sound Waves/Compression

MIDI/FM Synthesis

Codecs/Player Association

SC Standards/Initial Outputs

Surround 5.1

Additional Outputs

S/PDIF

Video/Compression

Video Capture Devices

Windows Media Center

Personal Video Recorders

Web Cams

Multimedia Installation Processes

Sound Card Drivers

Port Assignment within Device Manager

Sound Settings

Headsets

Front Panel Connectors

Individual Application Considerations

Volume Control Session 8

Section A: Computer Assembly

Parts Checklist

Motherboard/CPU Assembly

POST

Assembling within the Case

Second Self Test

Installing Drives

Additional Considerations

CMOS Clear Jumper

Installing Windows

Drive Lock

Post-Installation Tips

Section B: Network Cabling

Cabling

Coaxial Cable

Twisted-Pair Cable

Category Levels

Fiberoptic Cable

Fire Ratings

Network Connections

Cable Nomenclature Tips

Section C: Ethernet  
Early Networks  
Ethernet Recipe Book  
Packets  
Physical Addresses  
Addressing a Packet  
10Base-T  
100Base-T  
Switch  
1000Base-T  
Link Lights  
Speed Indications

Section D: Network Protocols and TCP/IP  
NetBIOS/Broadcasting  
TCP/IP  
Logical Addressing  
Network IDs  
Default Gateway  
Subnet Mask  
Configuring a Static IP Address  
ipconfig Commands  
Ping  
DHCP  
Configuring a Dynamic IP Address  
DCHP Issues  
Repair

Section E: Getting Online  
IP Class Tips  
Class A, B, and C  
Dial-up  
DSL  
ADSL  
Cable  
Satellite  
ISDN  
Fiber  
WAN/LAN Connections  
DNS  
DNS Server  
IP Address Resolution  
DNS Troubleshooting  
nslookup  
DIG  
Configuring a Router  
Private IP Addresses/NAT

## Section F: Troubleshoot Networking Connections

First Rule of Problems on the Internet

Loopback Plugs

Cable Testers

Other Troubleshooting Options

Troubleshooting Commands

Ping -l

Traceroute Session 9

## Section A: Internet Applications Part I

Ports

Netstat

Using TCPView

Proxy Server

Configuring a Proxy Server

Pop-ups and Filters

HTTPS

## Section B: Internet Applications Part II

Well-Known Port Tips

E-mail

Configuring E-mail Accounts

File Transfer Protocol

Telnet

Secure Shell

VoIP

Single Inline Package

Remote Desktop Protocol

Shared Folders

## Section C: Threats and Firewalls

Malware

Viruses

Trojans and Worms

Spam

Spyware

Phishing

Configuring a Software Firewall

Open Ports

Hardware and Software Firewalls

Configuring a Hardware Firewall

Port Forwarding

DMZ

## Section D: Anti-Malware

Anti-Malware Tips

Microsoft Security Essentials

System File Checker  
Remediation  
Social Engineering/Phishing Tips

Section E: Wireless  
Wireless Technologies  
802.11  
802.11b  
802.11a  
802.11g  
802.11n  
Configuring a Wireless Access Point  
Configuring SSIDs  
Wireless Encryption Options  
Wireless Setup Considerations  
Physical Placement  
Installing NICs and Drivers  
Netbook and Laptop Considerations  
Configuring a Wireless Client  
Connection Control  
WLAN/DHCP Server Configuration  
Bluetooth  
Types/Profile Functions  
Configuring Bluetooth

Section F: Printers  
Dot Matrix  
Ink-Jet  
Laser  
Toner  
Laser Printer Diagram  
Thermal and Solid Ink Printers  
Parallel Cables and Ports  
Port Modes  
USB Printers and Cables  
Network Printer Connections  
Outdated Connection Tips  
Session 10

Section A: Installing and Maintaining Printers  
Print Drivers and Languages  
Adding Printers  
Printer Properties  
Sharing Printers  
Printer Maintenance  
Material Safety Data Sheets  
Troubleshooting Printers  
Paper Jams

Drum Issues  
Lines  
Smearing and Garbage Printout

Section B: Portable Computing  
Portable Computing Options  
External and Video Ports  
Function Key  
Docking Stations  
ExpressCards and PC Cards  
Media and USB Ports  
Wireless  
Laptop Batteries  
AC Adapters

Section C: Laptop Repair and Power Management  
Power Management  
CMOS Power Settings  
Wake On Settings  
Power On Alarm  
Windows Power Management  
Power Management Tip  
Laptop Repair  
Laptop Repair Tools  
Laptop RAM  
Mini PCI  
Fans and Hard Drives  
Screens and Keyboards  
Touch Pads  
CPUs and Motherboards  
CMOS Batteries and Speakers