APPENDIX A

Mapping to the CompTIA A+ Objectives

CompTIA A+ Essentials Objectives Map

Topic	Chapter(s)
Domain 1.0 Hardware	
1.1 Categorize storage devices and backup media	
FDD	3
HDD	3, 11
Solid state vs. magnetic	11
Optical drives	3, 13
CD / DVD / RW / Blu-Ray	3, 13
Removable storage	11, 13, 17
Tape drive	17
Solid state (e.g. thumb drive, flash, SD cards, USB)	13
External CD-RW and hard drive	13, 11
Hot swappable devices and non-hot swappable devices	13
1.2 Explain motherboard components, types and features	
Form Factor	9
ATX / BTX,	9
micro ATX	9
NLX	9
I/O interfaces	3, 18, 20, 22, 23, 25
Sound	3, 20
Video	3

Topic	Chapter(s)
USB 1.1 and 2.0	3, 18
Serial	3, 18
IEEE 1394 / Firewire	3, 18
Parallel	3, 22
NIC	3, 23
Modem	3, 25
PS/2	18
Memory slots	3, 6
RIMM	6
DIMM	3, 6
SODIMM	6
SIMM	6
Processor sockets	3, 5, 9
Bus architecture	5, 8
Bus slots	8, 9, 21
PCI	8, 9
AGP	8, 9
PCIe	8, 9
AMR	9
CNR	9
PCMCIA	21
PATA	11
IDE	11
EIDE	11
SATA, eSATA	3, 11
Contrast RAID (levels 0, 1, 5)	11, 12
Chipsets	5, 7, 9
BIOS / CMOS / Firmware	7
POST	7
CMOS battery	7
Riser card / daughterboard	9
1.3 Classify power supplies types and characteristics	
AC adapter	10
ATX proprietary	10
Voltage, wattage and capacity	10

Topic	Chapter(s)
Voltage selector switch	10
Pins (20, 24)	10
1.4 Explain the purpose and characteristics of CPUs and their features	
Identify CPU types	5
AMD	5
Intel	5
Hyper threading	5
Multi core	5
Dual core	5
Triple core	5
Quad core	5
Onchip cache	5
L1	5
L2	5
Speed (real vs. actual)	5
32bit vs. 64 bit	5
1.5 Explain cooling methods and devices	
Heat sinks	5
CPU and case fans	5, 10
Liquid cooling systems	5
Thermal compound	5
1.6 Compare and contrast memory types, characteristics and their purpose	
Types	5, 6
DRAM	5, 6
SRAM	5
SDRAM	6
DDR / DDR2 / DDR3	6
RAMBUS	6
Parity vs. Non-parity	6
ECC vs. non-ECC	6
Single sided vs. double sided	6
Single channel vs. dual channel	6
Speed	6
PC100	6
PC133	6

Topic	Chapter(s)
PC2700	6
PC3200	6
DDR3-1600	6
DDR2-667	6
1.7 Distinguish between the different display devices and their characteristics	
Projectors, CRT and LCD	19
LCD technologies	19
Resolution (e.g. XGA, SXGA+, UXGA, WUXGA)	19
Contrast ratio	19
Native resolution	19
Connector types	3, 19
VGA	3, 19
HDMi	3, 19
S-Video	19
Component / RGB	19
DVI pin compatibility	19
Settings	19
Refresh rate	19
Resolution	19
Multi-monitor	19
Degauss	19
1.8 Install and configure peripherals and input devices	
Mouse	18
Keyboard	18
Bar code reader	18
Multimedia (e.g. web and digital cameras, MIDI, microphones)	18
Biometric devices	18
Touch screen	18
KVM switch	18
1.9 Summarize the function and types of adapter cards	
Video	
PCI	8, 19
PCIe	8, 19
AGP	8, 19

Topic	Chapter(s)
Multimedia	20
Sound card	20
TV tuner cards	20
Capture cards	20
I/O	3, 11, 18, 22
SCSI	3, 11
Serial	3, 18
USB	3, 18
Parallel	3, 22
Communications	3, 23
NIC	23
Modem	23
1.10 Install, configure and optimize laptop components and features	
Expansion devices	21
PCMCIA cards	21
PCI Express cards	21
Docking station	21
Communication connections	21, 23, 24, 25
Bluetooth	21, 24
Infrared	21, 24
Cellular WAN	21, 24
Ethernet	21, 23
Modem	21, 25
Power and electrical input devices	10, 21
Auto-switching	10
Fixed input power supplies	10
Batteries	21
Input devices	21
Stylus / digitizer	21
Function keys	21
Point devices (e.g. touch pad, point stick / track point)	21
1.11 Install and configure printers	
Differentiate between printer types	22
Laser	22
Inkjet	22

Topic	Chapter(s)
Thermal	22
Impact	22
Local vs. network printers	22
Printer drivers (compatibility)	22
Consumables	22
Domain 2.0 Troubleshooting, Repair and Maintenance	
2.1 Given a scenario, explain the troubleshooting theory	
Identify the problem	23, 27
Question the user and identify user changes to computer and perform back-ups before making changes	23, 27
Establish a theory of probable cause (question the obvious)	23, 27
Test the theory to determine cause	23, 27
Once theory is confirmed determine next steps to resolve problem	27
If theory is not confirmed re-establish new theory or escalate	27
Establish a plan of action to resolve the problem and implement the solution	27
Verify full system functionality and if applicable implement preventative measures	27
Document findings, actions and outcomes	27
2.2 Given a scenario, explain and interpret common hardware and operating system symptoms and their causes	
OS related symptoms	
Bluescreen	6, 9, 17
System lock-up	6, 10, 17
Input/output device	18
Application install	4
Start or load	17
Windows specific printing problems	22
Print spool stalled	22
Incorrect / incompatible driver	22
Hardware related symptoms	5, 6, 8, 10, 12, 13, 19, 23, 27
Excessive heat	5, 10, 27
Noise	5, 12, 27
Odors	13, 27
Status light indicators	23
Alerts	5, 6, 8, 10, 17
Visible damage (e.g. cable, plastic)	5, 23, 27

Topic	Chapter(s)
Use documentation and resources	12, 17, 22
User / installation manuals	22
Internet / web based	12
Training materials	17
2.3 Given a scenario, determine the troubleshooting methods and tools for printers	
Manage print jobs	22
Print spooler	22
Printer properties and settings	22
Print a test page	22
2.4 Given a scenario, explain and interpret common laptop issues and determine the appropriate basic troubleshooting method	
Issues	21
Power conditions	21
Video	21
Keyboard	21
Pointer	21
Stylus	21
Wireless card issues	21
Methods	10, 21
Verify power (e.g. LEDs, swap AC adapter)	10, 21
Remove unneeded peripherals	21
Plug in external monitor	21
Toggle Fn keys or hardware switches	21
Check LCD cutoff switch	21
Verify backlight functionality and pixelation	21
Check switch for built-in WIFI antennas or external antennas	21
2.5 Given a scenario, integrate common preventative maintenance techniques	
Physical inspection	5, 11, 12, 22
Updates	4, 17
Driver	8, 17
Firmware	7
OS	17
Security	16, 26
Scheduling preventative maintenance	4, 17

Topic	Chapter(s)
Defrag	17
Scandisk	17
Check disk	17
Startup programs	4, 17
Use of appropriate repair tools and cleaning materials	5, 19, 21, 22
Compressed air	21, 22
Lint free cloth	19
Computer vacuum and compressors	5
Power devices	10
Appropriate source such as power strip, surge protector or UPS	10
Ensuring proper environment	21
Backup procedures	16
Domain 3.0 Operating Systems and Software - Unless otherwise noted, operating systems referred to within include Microsoft Windows 2000, Windows XP Professional, XP Home, XP MediaCenter, Windows Vista Home, Home Premium, Business and Ultimate.	
3.1 Compare and contrast the different Windows Operating Systems and their features	
Windows 2000, Windows XP 32bit vs. 64bit, Windows Vista 32 bit vs. 64bit	4, 5
Side bar, Aero, UAC, minimum system requirements, system limits	4
Windows 2000 and newer – upgrade paths and requirements	14
Terminology (32bit vs. 64bit – x86 vs. x64)	4, 5
Application compatibility, installed program locations (32bit vs. 64bit), Windows compatibility mode	4
User interface, start bar layout	4
3.2 Given a scenario, demonstrate proper use of user interfaces	
Windows Explorer	4
My Computer	4
Control Panel	4
Command prompt utilities	15
telnet	25
ping	23, 25
ipconfig	23, 25
Run line utilities	4, 15, 17, 19
msconfig	17
msinfo32	17
Dxdiag	19

Topic	Chapter(s)
Cmd	4, 15
REGEDIT	4
My Network Places	4
Task bar / systray	4
Administrative tools	4, 17, 26
Performance monitor, Event Viewer, Services, Computer Management	4, 17, 26
MMC	4
Task Manager	17
Start Menu	4
3.3 Explain the process and steps to install and configure the Windows OS	
File systems	12, 14
FAT32 vs. NTFS	4, 12, 14, 16
Directory structures	4, 14, 15
Create folders	15
Navigate directory structures	4, 15
Files	4, 14
Creation	14
Extensions	4, 15, 20
Attributes	15
Permissions	16
Verification of hardware compatibility and minimum requirements	14
Installation methods	14
Boot media such as CD, floppy or USB	13, 14
Network installation	14
Install from image	14
Recover CD	17
Factory recovery partition	17
Operating system installation options	12, 14
File system type	12, 14
Network configuration	14
Repair install	14
Disk preparation order	12, 14
Format drive	12, 14
Partition	12, 14
Start installation	12, 14

Topic	Chapter(s)
Device Manager	4, 7, 8
Verify	8
Install and update devices drivers	8
Driver signing	8, 17
User data migration – User State Migration Tool (USMT)	14
Virtual memory	4, 8
Configure power management	21
Suspend	21
Wake on LAN	23
Sleep timers	21
Hibernate	21
Standby	21
Demonstrate safe removal of peripherals	13
3.4 Explain the basics of boot sequences, methods and startup utilities	
Disk boot order / device priority	11
Types of boot devices (disk, network, USB, other)	11
Boot options	15, 17
Safe mode	15, 17
Boot to restore point	17
Recovery options	17
Automated System Recovery (ASR)	17
Emergency Repair Disk (ERD)	17
Recovery console	17
Domain 4.0 Networking	
4.1 Summarize the basics of networking fundamentals, including technologies, devices and protocols	
Basics of configuring IP addressing and TCP/IP properties (DHCP, DNS)	23
Bandwidth and latency	25
Status indicators	23
Protocols (TCP/IP, NETBIOS)	23
Full-duplex, half-duplex	23
Basics of workgroups and domains	23
Common ports: HTTP, FTP, POP, SMTP, TELNET, HTTPS	25
LAN / WAN	23
Hub, switch and router	23

Topic	Chapter(s)
Identify Virtual Private Networks (VPN)	25
Basics class identification	23
4.2 Categorize network cables and connectors and their implementations	
Cables	23
Plenum / PVC	23
UTP (e.g. CAT3, CAT5 / 5e, CAT6)	23
STP	23
Fiber	23
Coaxial cable	23
Connectors	23
RJ45	23
RJ11	23
4.3 Compare and contrast the different network types	
Broadband	25
DSL	25
Cable	25
Satellite	25
Fiber	25
Dial-up	25
Wireless	24
All 802.11 types	24
WEP	24
WPA	24
SSID	24
MAC filtering	24
DHCP settings	24
Bluetooth	24
Cellular	24
Domain 5.0 Security	
5.1 Explain the basic principles of security concepts and technologies	
Encryption technologies	12
Data wiping / hard drive destruction / hard drive recycling	16
Software firewall	26
Port security	26
Exceptions	26

Topic	Chapter(s)
Authentication technologies	16, 26
User name	16, 26
Password	16, 26
Biometrics	26
Smart cards	26
Basics of data sensitivity and data security	26
Compliance	26
Classifications	26
Social engineering	26
5.2 Summarize the following security features	
Wireless encryption	24
WEPx and WPAx	24
Client configuration (SSID)	24
Malicious software protection	26
Viruses	26
Trojans	26
Worms	26
Spam	26
Spyware	26
Adware	26
Grayware	26
BIOS Security	7, 26
Drive lock	7
Passwords	7, 26
Intrusion detection	7
TPM	7
Password management / password complexity	16, 26
Locking workstation	4, 26
Hardware	26
Operating system	16
Biometrics	26
Fingerprint scanner	26

Topic	Chapter(s)
Domain 6.0 Operational Procedure	
6.1 Outline the purpose of appropriate safety and environmental procedures and given a scenario apply them	
ESD	2
EMI	2
Network interference	2
Magnets	2
RFI	2
Cordless phone interference	2
Microwaves	2
Electrical safety	10
CRT	19
Power supply	10
Inverter	19
Laser printers	22
Matching power requirements of equipment with power distribution and UPSs	10
Material Safety Data Sheets (MSDS)	22
Cable management	2
Avoiding trip hazards	2
Physical safety	2
Heavy devices	2
Hot components	2
Environmental – consider proper disposal procedures	22
6.2 Given a scenario, demonstrate the appropriate use of communication skills and professionalism in the workplace	
Use proper language – avoid jargon, acronyms, slang	2
Maintain a positive attitude	2
Listen and do not interrupt a customer	2
Be culturally sensitive	2
Be on time	2
If late contact the customer	2
Avoid distractions	2
Personal calls	2
Talking to co-workers while interacting with customers	2
Personal interruptions	2

Topic	Chapter(s)
Dealing with a difficult customer or situation	2
Avoid arguing with customers and/or being defensive	2
Do not minimize customers' problems	2
Avoid being judgmental	2
Clarify customer statements	2
Ask open-ended questions to narrow the scope of the problem	2
Restate the issue or question to verify understanding	2
Set and meet expectations / timeline and communicate status with the customer	2
Offer different repair / replacement options if applicable	2
Provide proper documentation on the services provided	2
Follow up with customer / user at a later date to verify satisfaction	2
Deal appropriately with customers' confidential materials	2

CompTIA A+ Practical Application Objectives Map

Topic	Chapter(s)
Domain 1.0 Hardware	
1.1 Given a scenario, install, configure and maintain personal computer components	
Storage devices	11, 13
HDD	11
SATA	11
PATA	11
Solid state	11
FDD	13
Optical drives	13
CD / DVD / RW / Blu-Ray	13
Removable	13
External	11, 13
Motherboards	3, 5, 7, 8, 9, 18, 20, 22
Jumper settings	9
CMOS battery	7, 9
Advanced BIOS settings	7

Topic	Chapter(s)
Bus speeds	8
Chipsets	7
Firmware updates	7
Socket types	3, 5, 9
Expansion slots	8, 9
Memory slots	6
Front panel connectors	9
I/O ports	9, 18
Sound, video, USB 1.1, USB 2.0, serial, IEEE 1394 / Firewire, parallel, NIC, modem, PS/2)	3, 18, 19, 20, 22
Power supplies	10
Wattages and capacity	10
Connector types and quantity	10
Output voltage	10
Processors	3, 4, 5, 6, 8, 9
Socket types	3, 5, 9
Speed	5
Number of cores	5
Power consumption	5
Cache	5
Front side bus	5, 6, 8
32bit vs. 64bit	4, 5
Memory	6
Adapter cards	3, 8
Graphics cards	19
Sound cards	20
Storage controllers	3, 8, 9, 11, 12
RAID cards (RAID array – levels 0,1,5)	9, 11, 12
eSATA cards	3, 8, 11
I/O cards	3, 18
Firewire	3, 18
USB	3, 18
Parallel	3, 22
Serial	3, 18
Wired and wireless network cards	23, 24

Topic	Chapter(s)
Capture cards (TV, video)	20
Media reader	13
Cooling systems	
Heat sinks	5
Thermal compound	5
CPU fans	5
Case fans	5, 10
1.2 Given a scenario, detect problems, troubleshoot and repair/replace personal computer components	
Storage devices	11, 13
HDD	11
SATA	11
PATA	11
Solid state	11
FDD	13
Optical drives	13
CD / DVD / RW / Blu-Ray	13
Removable	13
External	13
Motherboards	3, 5, 7, 8, 9
Jumper settings	9
CMOS battery	7, 9
Advanced BIOS settings	7
Bus speeds	8
Chipsets	7
Firmware updates	7
Socket types	3, 5, 9
Expansion slots	8, 9
Memory slots	3, 6, 9
Front panel connectors	3, 9
I/O ports	3, 18, 19, 20, 22
Sound, video, USB 1.1, USB 2.0, serial, IEEE 1394 / Firewire, parallel, NIC, modem, PS/2)	3, 18, 19, 20, 22
Power supplies	10
Wattages and capacity	10
Connector types and quantity	10
Output voltage	10

Topic	Chapter(s)
Processors	2, 5, 6, 8, 9
Socket types	3, 5, 9
Speed	5
Number of cores	5
Power consumption	5
Cache	5
Front side bus	5, 6, 8
32bit vs. 64bit	5
Memory	6, 9
Adapter cards	8, 11, 13, 18, 19, 20, 22 23, 24
Graphics cards - memory	19
Sound cards	20
Storage controllers	8
RAID cards	11
eSATA cards	8, 11
I/O cards	
Firewire	18
USB	18
Parallel	22
Serial	18
Wired and wireless network cards	23, 24
Capture cards (TV, video)	20
Media reader	13
Cooling systems	5, 10
Heat sinks	5
Thermal compound	5
CPU fans	5
Case fans	5, 10
1.3 Given a scenario, install, configure, detect problems, troubleshoot and repair/ replace laptop components	
Components of the LCD including inverter, screen and video card	19
Hard drive and memory	21
Disassemble processes for proper re-assembly	21
Document and label cable and screw locations	21
Organize parts	21

Topic	Chapter(s)
Refer to manufacturer documentation	21
Use appropriate hand tools	21
Recognize internal laptop expansion slot types	21
Upgrade wireless cards and video card	19, 21
Replace keyboard, processor, plastics, pointer devices, heat sinks, fans, system board, CMOS battery, speakers	21
1.4 Given a scenario, select and use the following tools	
Multimeter	10, 22
Power supply tester	10
Specialty hardware / tools	2, 10, 22
Cable testers	23
Loop back plugs	23
Anti-static pad and wrist strap	2, 3, 8
Extension magnet	2
1.5 Given a scenario, detect and resolve common printer issues	
Symptoms	22
Paper jams	22
Blank paper	22
Error codes	22
Out of memory error	22
Lines and smearing	22
Garbage printout	22
Ghosted image	22
No connectivity	22
Issue resolution	22
Replace fuser	22
Replace drum	22
Clear paper jam	22
Power cycle	22
Install maintenance kit (reset page count)	22
Set IP on printer	22
Clean printer	22

Topic	Chapter(s)
Domain 2.0 Operating Systems - unless otherwise noted, operating systems referred to within include Microsoft Windows 2000, Windows XP Professional, XP Home, XP MediaCenter, Windows Vista Home, Home Premium, Business and Ultimate.	
2.1 Select the appropriate commands and options to troubleshoot and resolve problems	
MSCONFIG	17
DIR	15, 17
CHKDSK (/f /r)	12, 15, 17
EDIT	15
COPY (/a /v /y)	15, 17
XCOPY	15
FORMAT	15, 17
IPCONFIG (/all /release /renew)	23
PING (-t –l)	23
MD / CD / RD	15, 17
NET	23
TRACERT	23
NSLOOKUP	23
[command name] /?	15
SFC	15
2.2 Differentiate between Windows Operating System directory structures (Windows 2000, XP and Vista)	
User file locations	4
System file locations	4
Fonts	4
Temporary files	4
Program files	4
Offline files and folders	4
2.3 Given a scenario, select and use system utilities / tools and evaluate the results	
Disk management tools	
DEFRAG	12
NTBACKUP	17
Check Disk	12

Topic	Chapter(s)
Disk Manager	12
Active, primary, extended and logical partitions	12
Mount points	12
Mounting a drive	12
FAT32 and NTFS	12
Drive status	12
Foreign drive	12
Healthy	12
Formatting	12
Active unallocated	12
Failed	12
Dynamic	12
Offline	12
Online	12
System monitor	17
Administrative tools	4, 17, 26
Event Viewer	4, 17, 26
Computer Management	4
Services	4, 17
Performance Monitor	4, 17
Devices Manager	4, 8, 17, 19, 20
Enable	4
Disable	4
Warnings	4
Indicators	4
Task Manager	17
Process list	17
Resource usage	17
Process priority	17
Termination	17
System Information	4
System restore	4, 17
Remote Desktop Protocol (Remote Desktop / Remote Assistance)	4
Task Scheduler	4, 17
Regional settings and language settings	14

Topic	Chapter(s)
2.4 Evaluate and resolve common issues	
Operational Problems	17, 22
Windows specific printing problems	
Print spool stalled	22
Incorrect / incompatible driver / form printing	22
Auto-restart errors	17
Bluescreen error	17
System lock-up	17
Devices drivers failure (input / output devices)	17
Application install, start or load failure	17
Service fails to start	17
Error Messages and Conditions	4, 12, 14, 17, 26
Boot	14, 17
Invalid boot disk	14, 17
Inaccessible boot drive	14, 17
Missing NTLDR	12, 17
Startup	17
Device / service failed to start	17
Device / program in registry not found	17
Event viewer (errors in the event log)	17, 26
System Performance and Optimization	4, 17
Aero settings	4
Indexing settings	17
UAC	17
Side bar settings	4
Startup file maintenance	4, 17
Background processes	4, 17
Domain 3.0 Networking	
3.1 Troubleshoot client-side connectivity issues using appropriate tools	
TCP/IP settings	23, 25
Gateway	23
Subnet mask	23
DNS	23
DHCP (dynamic vs. static)	23, 25
NAT (private and public)	25

Topic	Chapter(s)
Characteristics of TCP/IP	23, 25
Loopback addresses	23
Automatic IP addressing	23, 25
Mail protocol settings	25
SMTP	25
IMAP	25
POP	25
FTP settings	25
Ports	25
IP addresses	25
Exceptions	25
Programs	25
Proxy settings	25
Ports	25
IP addresses	25
Exceptions	25
Programs	25
Tools (use and interpret results)	23, 25
Ping	23, 25
Tracert	23
Nslookup	23
Netstat	23
Net use	23
Net /?	23
Ipconfig	23
telnet	25
SSH	25
Secure connection protocols	22
SSH	22
HTTPS	22
Firewall settings	26
Open and closed ports	26
Program filters	26

Topic	Chapter(s)
3.2 Install and configure a small office home office (SOHO) network	
Connection types	23, 24, 25, 26
Dial-up	25
Broadband	25
DSL	25
Cable	25
Satellite	25
ISDN	25
Wireless	24
All 802.11	24
WEP	24
WPA	24
SSID	24
MAC filtering	24
DHCP settings	24
Routers / Access Points	23, 24
Disable DHCP	23
Use static IP	23
Change SSID from default	24
Disable SSID broadcast	24
MAC filtering	24
Change default username and password	24
Update firmware	24
Firewall	26
LAN (10/100/1000BaseT, Speeds)	23
Bluetooth (1.0 vs. 2.0)	24
Cellular	24
Basic VoIP (consumer applications)	25
Basics of hardware and software firewall configuration	25, 26
Port assignment / setting up rules (exceptions)	26
Port forwarding / port triggering	25
Physical installation	23
Wireless router placement	23
Cable length	23

Topic	Chapter(s)
Domain 4.0 Security	
4.1 Given a scenario, prevent, troubleshoot and remove viruses and malware	
Use antivirus software	26
Identify malware symptoms	26
Quarantine infected systems	26
Research malware types, symptoms and solutions (virus encyclopedias)	26
Remediate infected systems	26
Update antivirus software	26
Signature and engine updates	26
Automatic vs. manual	26
Schedule scans	26
Repair boot blocks	26
Scan and removal techniques	26
Safe mode	26
Boot environment	26
Educate end user	26
4.2 Implement security and troubleshoot common issues	
Operating systems	4, 14, 15, 16, 26
Local users and groups: Administrator, Power Users, Guest, Users	16, 26
Vista User Access Control (UAC)	4, 16
NTFS vs. Share permissions	26
Allow vs. deny	16
Difference between moving and copying folders and files	15
File attributes	15
Shared files and folders	16, 26
Administrative shares vs. local shares	16
Permission propagation	16, 26
Inheritance	16
System files and folders	14
Encryption (Bitlocker, EFS)	4
User authentication	16, 26
System	7, 26
BIOS security	7, 26
Drive lock	7
Passwords	7, 26
Intrusion detection	7
TPM	7