

# CompTIA A+ (220-1101 & 220-1102)

## Course Overview

This course prepares students to take the CompTIA A+ 220-1101 & 220-1102 exams. Topics covered include hardware components, mobile devices, networking, operating systems, security, troubleshooting, and more.

### Chapter 1 - Introduction to Personal Computers and IT Certification

1h 17m

Instructor Introduction  
Course Introduction  
Introduction to Personal Computers and IT Certification  
Topic A: Personal Computer Concepts  
Hardware vs. Software  
PC Communication  
Hardware Requirements  
Hardware Requirements (cont.)  
Binary Numbering System  
Comparing Numbering Systems  
Demo - Numbering Systems  
Personal Computer Concepts  
Topic B: Becoming an IT Professional  
Becoming an IT Professional  
Advancing Your Skillset  
Soft Skills  
Working with End Users  
Dealing with Difficult Customers  
End User Communication  
Demo - IT Professional Soft Skills Part 1  
Demo - IT Professional Soft Skills Part 2  
Topic C: Certification Basics  
Certification 101  
Creating a Plan  
Certification Exam  
Chapter 1 Review

### Chapter 2 - Hardware Components

2h 35m

Hardware Components  
Topic A: Motherboards  
Motherboards  
Data Communication  
Chipsets  
Northbridge  
Southbridge  
Connector Types  
Form Factors

Demo - Examine Motherboards

Installing a Motherboard

Replacing Motherboards

Motherboard Compatibility

Topic B: Firmware

BIOS/CMOS

UEFI

POST

Configuring the BIOS

Fan Speed Considerations

Security Settings

Secure Boot

Demo - BIOS and CMOS Part 1

Demo - BIOS and CMOS Part 2

Demo - BIOS and CMOS Part 3

Topic C: Power Supplies

Power Supplies

Installation Considerations

Powering Drives

Motherboard Power

Choosing Power Supplies

Replacing Power Supplies

Topic D: Central Processing Unit (CPU)

Central Processing Unit

Central Processing Unit

CPU Architecture

Cooling

Liquid Cooling

Demo - Performing Installation of a Processor Part 1

Demo - Performing Installation of a Processor Part 2

Demo - Performing Installation of a Processor Part 3

Topic E: Memory

Memory

Memory Units

DDR RAM

Error Recovery

RAM Configurations

Installing RAM

Demo - Understanding Types of Memory Part 1

Demo - Understanding Types of Memory Part 2

Topic F: Storage

Storage Overview

Storage Overview (cont.)

Drive Architecture

Drive Speeds

SATA

eSATA

eSATA Cables and Connectors

Magnetic Drives

Hard Drive Geometry

- Hot Swappable
- SSD Overview
- SSD Overview (cont.)
- SSD Communications Interfaces
- Flash Drives
- Memory Cards
- Optical Drives
- Drive Components
- DVD
- DVD Types
- Blu-Ray
- Blu-Ray Types
- Installing Optical Drives
- RAID Technologies
- RAID Levels
- Demo - Hard Drives and Storage Devices Part 1
- Demo - Hard Drives and Storage Devices Part 2
- Demo - Hard Drives and Storage Devices Part 3
- Chapter 2 Review

### **Chapter 3 - Printers**

59m

- Printers
- Topic A: Printer Types
- Printers and Scanners Overview
- Dot Matrix
- Dot Matrix Components
- Dot Matrix Maintenance
- Inkjet Printers
- Inkjet Characteristics
- Installing Inkjet Printers
- Laser Printers
- Laser Printing Process
- Field Replaceable Units
- Laser Printer Maintenance
- Thermal Printers
- Thermal Printer Consumables
- 3D Printers
- 3D Consumables
- Topic B: Installing Printers
- Printer Connections
- Multifunction Devices
- Configuration Settings
- Network Printers
- Printer Security
- Network Scan Services
- Demo - Installing a Printer
- Demo - Managing Printers Part 1
- Demo - Managing Printers Part 2
- Demo - Managing Printers Part 3
- Demo - Managing Printers Part 4

Demo - Managing Printers Part 5  
Topic C: Troubleshooting Printing and Scanning  
Troubleshooting Inkjet  
Troubleshooting Laser  
Troubleshooting Laser (cont.)  
Chapter 3 Review

#### **Chapter 4 - Mobile Devices**

1h 43m

Mobile Devices  
Topic A: Mobile Devices Overview  
Mobile Devices Overview  
Mobile Hardware  
Batteries  
Power Management  
Demo - Power Options  
Topic B: Mobile Device Components  
Laptop RAM  
Laptop Drives  
Migrating Drives  
Input  
Function Keys  
Laptop Displays  
LCD Types  
Display Components  
Connection Methods  
Connection Methods (cont.)  
Docking Stations  
Topic C: Replacing Laptop Components  
Replacing Keyboards  
Replacing Hard Drives  
Replacing Memory  
Replacing Wireless Cards  
Replacing Batteries  
Demo - Mobile Devices, Multimedia, and Laptop Computers  
Demo - Mobile Device Maintenance  
Topic D: Smartphones and Tablets  
Alternative Mobile Devices  
Tablets  
Tablet Features  
Smartphones  
Wearable Technology  
Smartwatch Features  
Topic E: Ports and Connectors  
Mobile Device Ports and Connectors  
Near-Field Communication (NFC)  
Apple Lightning  
USB Types  
Bluetooth  
Additional Connection Types  
Accessories

Demo - Input and Output Devices Part 1  
Demo - Input and Output Devices Part 2  
Demo - Input and Output Devices Part 3  
Topic F: Network Connectivity and Application Support  
Mobile Device Synchronization  
Mobile Device Management  
Cellular Data Networks  
Chapter 4 Review

**Chapter 5 - Computer Networking**

2h 58m

Computer Networking  
Topic A: Networking Fundamentals  
Networking Fundamentals  
Network Models  
Workgroups  
Domains  
Networking Requirements  
Network Interface Card  
Network Clients  
Network Protocols  
Network Categories  
Internet Connection Types  
Topic B: Network Devices  
Network Devices  
Device Capabilities  
Hubs  
Network Switches  
Network Router  
Wireless Access Points  
Network Devices  
Modems  
Patch Panel  
Injectors  
Optical Network Terminal  
Software-Defined Networking  
Virtual Private Networks (VPN)  
Demo - VPN Connection  
Virtual LANs (VLAN)  
Network Hosts and Roles  
Internet Appliances  
Demo - Configuring SPAM Gateways  
Topic C: Cables and Connectors  
Twisted Pair Cabling  
UTP Categories  
Plenum  
EIA/TIA  
Coaxial Cables  
Fiber Optic Cables  
Fiber Types  
Fiber Connectors

Network Tools  
Topic D: TCP/IP Fundamentals  
TCP/IP Fundamentals  
Protocol Suite  
Protocols and Ports  
Routable Protocol  
IPv4 Addressing  
Classful Networking  
Demo - IP Addresses and Subnet Masks  
Basic IPv4 Configuration  
Network Configuration  
Classless Routing  
Advanced Configuration  
Demo - CIDR  
The Need for IPv6  
IPv6 Benefits  
IPv6 Address Space  
IPv6 Address Types  
Configuring IPv4  
Configuring Addresses  
DHCP Process  
Name Resolution  
DNS Name Resolution  
DNS Records  
SPAM Management  
Demo - Viewing Anti-Spam and DNS Configurations  
Topic E: Wireless Networks  
Wireless Networks  
Wireless Protocols  
802.11a Standards  
Wireless Networks  
Wireless Networks  
Demo - Configuring a Wireless Access Point  
Long-Range Fixed Wireless  
Chapter 5 Review

## **Chapter 6 - Hardware and Network Troubleshooting**

58m

Hardware and Network Troubleshooting  
Topic A: Troubleshooting Models  
Troubleshooting Models  
Troubleshooting Models  
Troubleshooting Models  
Troubleshooting Models  
Topic B: Troubleshooting Physical Issues  
Troubleshooting Hardware Issues  
Troubleshooting Power Issues  
Troubleshooting Motherboard Issues  
Troubleshooting CPU Issues  
Troubleshooting Memory Issues  
Troubleshooting Drive Issues

Drive Troubleshooting Tools  
Troubleshooting Display Issues  
Display Troubleshooting Tools  
Topic C: Troubleshooting Network Issues  
Troubleshooting Network Issues  
Common Network Symptoms  
Network Troubleshooting Tools  
Demo - Network Troubleshooting Tools  
Topic D: Troubleshooting Mobile Devices  
Mobile Device Common Symptoms  
Topic E: Troubleshooting Printer Issues  
Troubleshooting Printer Issues  
Troubleshooting Printer Issues  
Chapter 6 Review

### **Chapter 7 - Virtualization and Cloud Computing**

55m

Virtualization and Cloud Computing  
Topic A: Understanding Virtualization  
Understanding Virtualization  
Virtualization Benefits  
Hypervisors  
Demo - Virtualization Platforms  
Virtualization Components  
Virtual Machines  
Demo - Create and Configure Virtual Machines  
Client-side Virtualization  
Desktop Virtualization  
Topic B: Basic Cloud Concepts  
What is Cloud Computing?  
Physical Infrastructure Limitations  
Cloud Advantages  
Cloud Models  
Cloud Services Models  
Demo - Cloud Services Models  
Chapter 7 Review

### **Chapter 8 - Introduction to Operating Systems**

58m

Introduction to Operating Systems  
Topic A: Operating Systems Overview  
Introducing Operating Systems  
OS Types  
OS History  
Current Windows Operating Systems  
UNIX/Linux  
Macintosh  
Mobile Operating Systems  
Topic B: Operating System Functions  
Operating System Functions  
Reading and Writing Data  
Managing Applications

Managing Applications (cont.)  
Application Categories  
Controlling Hardware  
Managing Device Drivers  
Demo - PC Settings and Device Manager  
OS Considerations  
Topic C: Basic Navigation and Management  
Basic Navigation and Management  
Demo - Navigating the Operating System  
File Explorer  
Demo - File Explorer  
Basic Navigation and Management  
Chapter 8 Review

### **Chapter 9 - Installing Windows Operating Systems**

30m

Installing Windows Operating Systems  
Topic A: Pre-Installation Tasks  
Pre-Installation Tasks  
Installation Types  
Installation Best Practices  
Topic B: Clean Installations  
Choosing the File System  
Installation Methods  
Manual Attended Installation  
Disk Imaging  
Disk Imaging Process  
Best Practices  
Boot Methods  
Post-Installation Tasks  
Demo - Post-Installation Tasks  
Topic C: Performing Upgrades  
Performing Upgrades  
Pre-Upgrade Tasks  
Chapter 9 Review

### **Chapter 10 - Windows Configuration and Management**

2h 24m

Windows Configuration and Management  
Topic A: Introduction to Windows 10  
Windows 10 Versions  
Windows 10 Builds  
Feature Differences  
Topic B: Using Control Panel and Settings  
Management Overview  
Introducing Control Panel  
Using Control Panel and PC Settings  
Demo - Using Control Panel  
Settings App  
Demo - Using Settings App  
Topic C: Using Graphical Administrative Tools  
Using Graphical Administrative Tools



Computer Management  
Demo - Computer Management  
Additional Tools  
Demo - Additional Tools  
Event Viewer  
Task Manager  
Demo - Event Viewer and Task Manager  
Disk Management  
Disk Management (cont.)  
Demo - Using Disk Management  
The Registry  
Registry Keys  
Demo - Using Regedit  
Topic D: Using Command Line Administrative Tools  
Introduction to CLI  
Navigation using CLI  
Additional CLI Tools  
Topic E: Configuring Networking  
Windows Networking  
TCP/IP Configuration  
Alternate Configuration  
Network Types  
SOHO Networks  
Understanding Workgroups  
Understanding Domains  
Joining Domains  
Azure AD  
Remote Desktop  
Windows Defender Firewall  
Demo - Windows Firewall  
Establishing Network Connections  
Topic F: Operating System Security  
Operating System Security  
Workgroup Authentication  
Domain Authentication  
Creating Local Accounts  
Windows 10 Authentication Options  
Utilizing Groups  
Accessing Network Shares  
Understanding Permissions  
NTFS Permissions  
Shared Folder Permissions  
Permissions Rules  
Demo - Managing File Access  
Encrypting File System  
Encrypting File System (cont.)  
Encryption Process  
Demo - EFS  
BitLocker  
BitLocker to Go

BitLocker Modes  
Demo - Managing BitLocker  
User Account Control  
Configuring UAC  
Demo - Configuring UAC  
Chapter 10 Review

## **Chapter 11 - Macintosh and Linux Operating Systems**

31m

Macintosh and Linux Operating Systems  
Topic A: Mac and Linux Overview  
Mac and Linux Overview  
Mac OS X  
Linux  
Topic B: OS Features and Tools  
Multiple Desktops / Mission Control  
Multiple Desktops / Mission Control  
Keychain  
Spotlight  
iCloud  
Gestures and Finder  
Remote Disc  
Dock  
Backups  
TAR  
Time Machine  
Disk Maintenance  
Shell / Terminal  
Screen Sharing  
Screen Sharing (cont.)  
Force Quit  
Mac System Preferences  
Installing Applications  
Topic C: Best Practices using Alternative Operating Systems  
Best Practices using Alternative Operating Systems  
RSYNC  
Scheduled Disk Maintenance  
Linux Updates  
Mac Updates  
Driver / Firmware Updates  
Antivirus Updates  
Topic D: Basic Command Line Administration in Linux  
Overview of Linux CLI  
LS  
GREP  
CD  
Additional Linux Commands  
Demo - Linux Tools  
Chapter 11 Review

## **Chapter 12 - Security**

1h 50m

Security

Topic A: Understanding Threats to Security

Understanding Threats to Security

User Threats

Social Engineering

Phishing

Phishing (cont.)

Network Threats

Network Threats (cont.)

Password Attacks

Vulnerabilities

Malicious Code Attacks

Malware Types

Physical Threats

Topic B: Understanding Common Prevention Methods

Understanding Common Prevention Methods

Physical Access Restrictions

Physical Security

Defense in Depth

Antimalware

Demo - Antimalware

Anti-spyware

Best Practices

Firewalls

Hardware Firewalls

Firewall Functionality

Proxy Firewalls

Stateful Packet Inspection

Host-Based Firewalls

Windows Firewall with Advanced Security

User Authentication

Password Best Practices

Demo - Password Checker

Multifactor Authentication

Virtual Private Networks

Data Loss Prevention

System Hardening

Trusted / Untrusted Software

User Education

Topic C: Securing Workstations

Securing Workstations

Least Privilege

Password Best Practices

Account Management

Disabling Autorun

Data Encryption

Patch Management

Topic D: Securing Mobile Devices

Securing Mobile Devices

Screen Locks  
Screen Locks (cont.)  
Finding Mobile Devices  
Backup Mobile Devices  
Login Restrictions  
Antimalware and Updates  
Encryption and Biometrics  
Policies and Procedures  
Best Practices  
Topic E: Data Destruction and Disposal Methods  
Destruction and Disposal  
Physical Destruction  
Drilling  
Additional Physical Methods  
Recycling or Repurposing  
Repurposing Options  
Topic F: Security for SOHO and Wireless Networks  
SOHO Networks  
Wireless SOHO Networks  
Wireless Security Options  
Wireless Security Configuration  
Device Configuration  
Configuring IP and MAC Filters  
Configuring SOHO Firewalls  
Security for SOHO and Wireless Networks  
Demo - Security Configuration on Router  
Chapter 12 Review

### **Chapter 13 - Software Troubleshooting**

1h 34m

Software Troubleshooting  
Topic A: Troubleshooting Operating Systems  
Troubleshooting Operating Systems  
Common Symptoms  
Common Solutions  
Common Solutions (cont.)  
Demo - OS Troubleshooting Tools  
Topic B: Troubleshooting Mobile Devices  
Troubleshooting Mobile Devices  
Common Symptoms  
Common Security Issues  
Troubleshooting Tools for Mobile Devices  
Topic C: Troubleshooting Security Issues  
Troubleshooting Security Issues  
Common Symptoms  
Best Practices for Malware Removal  
Demo - Troubleshooting Procedures Part 1  
Demo - Troubleshooting Procedures Part 2  
Demo - Troubleshooting Procedures Part 3  
Demo - Troubleshooting Procedures Part 4  
Demo - Troubleshooting Procedures Part 5  
Chapter 13 Review

**Chapter 14 - Operational Procedures**

1h

Operational Procedures

Topic A: Change Management and Documentation

Change Management Best Practices

Organizational Documentation

Topic B: Disaster Recovery and Prevention

Backup and Recovery

Demo - Backup and Recovery

Topic C: Common Safety Procedures

Operational and Safety Procedures

Electrical Safety

Static Electricity

ESD Prevention

Personal Safety

Demo - Safety for You and Computer Components Part 1

Demo - Safety for You and Computer Components Part 2

Demo - Safety for You and Computer Components Part 3

Demo - Safety for You and Computer Components Part 4

Demo - Safety for You and Computer Components Part 5

Toxic Waste Handling

Environmental Impacts and Controls

Additional Considerations

Power Issues

Topic D: Privacy and Licensing

Incident Response

Licensing and Privacy

Chapter 14 Review

Course Closure

**Total Duration: 20h 11m**