

CO-AA+1 COMPTIA A+ CORE I



DURATION	LEVEL	TECHNOLOGY	DELIVERY METHOD	TRAINING CREDITS
5 Days	Foundation	Hardware & Software	Instructor-led	NA

INTRODUCTION

CompTIA A+ Certification is globally recognized, covering essential IT skills like hardware, networking, and security, with hands-on exams and comprehensive learning tools, opening doors to various IT support roles.

By completing two focused exams—Core 1 (220-1201) and Core 2 (220-1202)—candidates demonstrate their ability to solve every day IT challenges with confidence and precision. These individuals also gain more than just a certification—they join a global community of IT professionals dedicated to continuous learning and career advancement. This certification not only validates their ability to support today's technologies but also lays the foundation for future IT certifications and long-term career growth.

As a trusted certification by employers worldwide, CompTIA A+ opens doors to a variety of entry-level IT roles, including Help Desk Technician, Technical Support Specialist, and IT Support Administrator. It provides a competitive edge in the job market, ensuring candidates stand out to hiring managers and employers seeking skilled professionals to support today's core technologies.

AUDIENCE PROFILE

This course is designed for individuals who have basic computer user skills and who are interested in obtaining a job as an entry-level IT technician. This course is also designed for students who are seeking the CompTIA A+ certification and who want to prepare for the CompTIA A+ Core 1 (220-1201) Certification Exam.

PREREQUISITES

To ensure your success in this course, students should have 12 months of hands-on experience in an IT support specialist job role.

COURSE OBJECTIVES

In this course, students will install, configure, optimize, troubleshoot, repair, upgrade, and perform preventive maintenance on personal computers, digital devices, and operating systems.

Furthermore, students will:

- Support operating systems
- Install and configure PC system unit components and peripheral devices
- Install, configure, and troubleshoot display and multimedia devices
- Install, configure, and troubleshoot storage devices
- Install, configure, and troubleshoot internal system components
- Install, configure, and maintain operating systems
- Maintain and troubleshoot Microsoft Windows
- Explain network infrastructure concepts
- Configure and troubleshoot network connections

COURSE CONTENT

Lesson 1: What Does an IT Specialist Do?

1.1 The Hero of Problem Solving

- Role of an IT Specialist
- Skills and Abilities

1.2 The Troubleshooting Methodology

- Best Practice Methodology
- Identify the Problem
- Establish and Test a Theory
- Question the Obvious
- Establish a New Theory or Escalate

- Implement a Plan of Action
- Verify and Document

1.3 Additional Resources

- Troubleshooting Methodology

1.4 Module quiz

Lesson 2: Installing Motherboards and Connectors

2.1 Cables and Connectors

- Personal Computers
- Lab: Explore the Lab Interface
- Peripheral Devices

- Universal Serial Bus Cables
- USB Standards
- USB Cables and Standards
- Lab: Install USB Devices
- Display Types
- Display Components
- HDMI and DisplayPort Video Cables
- Thunderbolt Interface
- Lightning Interface
- Serial Advanced Technology Attachment Interface
- Molex Power Connectors
- External SATA

- Lab: Set Up a Desktop Computer
- Lesson Review

2.2 Motherboards

- Motherboard Functions
- Electrical Safety and ESD
- Motherboard CPU and System Memory Connectors
- Motherboard Storage Connectors
- Peripheral Component Interconnect Express Interface
- Peripheral Component Interconnect Interface
- Motherboard Form Factors
- Motherboard Installation
- Install a Motherboard
- Motherboard Headers and Power Connectors
- Lab: Choose and Install a Motherboard
- Video Cards
- Lab: Upgrade a Video Card
- Capture Cards
- Sound Cards
- Network Interface Cards
- Installing & Configuring Motherboards, CPUs & Add-on Cards
- Lesson Review

2.3 Legacy Cables

- DVI and VGA Video Cables
- Lab: Select and Configure Dual Monitors
- Serial Cables
- Adapter Cables
- Lesson Review

2.4 Lab: Set up an A/V Workstation

2.5 Additional Resources

- Cable Types
- Motherboards
- Exercise: History of Cables
- Exercise: Motherboard Diagram Creation
- Exercise: Legacy Cables Timeline
- Exercise: Build a Cable Chart Capstone

2.6 Module Quiz

Lesson 3: Installing System Devices

3.1 Power Supplies and Cooling

- Power Supply Units
- Lab: Install a Power Supply
- Wattage Rating
- Power Supply Connectors
- 20-pin to 24-pin Motherboard Adapter
- Modular Power Supplies
- Redundant Power Supplies

- Change the Power Supply
- Lab: Troubleshoot Power Supply Problems
- Fan Cooling Systems
- Heat Sinks and Thermal Paste
- Fans
- Liquid Cooling Systems
- Lesson Review

3.2 Storage Devices

- Mass Storage Devices
- Solid-State Drives
- Hard Disk Drives
- Redundant Array of Independent Disks
- RAID 0 and RAID 1
- RAID 5 and RAID 10
- RAID 6 (Striping with Double Parity)
- RAID Types
- Removable Storage Drives
- Optical Drives
- Lab: Install SATA Devices
- Lesson Review

3.3 System Memory

- System RAM and Virtual Memory
- RAM Types
- Memory Modules
- Lab: Select Memory by Sight
- Multi-channel System Memory
- Memory Troubleshooting
- Lab: Install Triple Channel Memory
- ECC RAM
- Lesson Review

3.4 CPUs

- CPU Architecture
- x86 CPU Architecture
- x64 CPU Architecture
- ARM CPU Architecture
- CPU Features
- CPU Socket Types
- CPU Types and Motherboard Compatibility
- Install a Processor
- Lesson Review

3.5 Challenge Lab: Troubleshoot Memory

3.6 Additional Resources

- System Memory
- Matching Computer Components
- Exercise: Cooling System Infographic
- Exercise: Memory Performance Experiment
- Exercise: Evolution of Storage Devices
- Exercise: Create a CPU Architecture Diagram
- Exercise: CPU Performance Experiment Capstone

3.7 Module Quiz

Lesson 4: Troubleshooting PC Hardware

4.1 BIOS and UEFI

- Lab: Find BIOS/UEFI Settings
- Boot and Device Options
- USB Permissions
- Fan Considerations
- Boot Passwords and Secure Boot
- Activity: Secure Boot Feedback
- Trusted Platform Modules
- Activity: TPM Hash Comparison
- Lab: Configure BIOS/UEFI Security
- Lesson Review

4.2 Power and Disk Issues

- Troubleshoot Power Issues
- Lab: Troubleshoot System Power
- Troubleshoot POST Issues
- Lab: Troubleshoot System Startup
- Troubleshoot Boot Issues
- Lab: Troubleshoot Boot Issues
- Troubleshoot Boot Sector Issues
- Troubleshoot OS Errors and Crash Screens
- Troubleshoot Drive Availability
- Lab: Troubleshoot Drive Availability
- Troubleshoot Drive Reliability and Performance
- Troubleshoot RAID Failure
- Troubleshooting Problems with Storage Drives & RAID Arrays
- Lesson Review

4.3 System and Display Issues

- Troubleshoot Component Issues
- Overheating
- Physical Damage
- Troubleshoot Performance Issues
- Troubleshoot Inaccurate System Date/Time
- Troubleshoot Missing Video Issues
- Troubleshoot Video Quality Issues
- Troubleshooting Video, Projector & Display Issues
- Lab: Troubleshoot GPU
- Lesson Review

4.4 Lab: Resolve PC Hardware Support Tickets

4.5 Lab: Troubleshoot a Malfunctioning Computer

4.6 Additional Resources

- BIOS and UEFI
- Troubleshooting Example: Video Issues

4.7 Module Quiz

4.8 Checkpoint Review

Lesson 5: Comparing Local Networking Hardware

5.1 Network Types

- LANs and WANs
- SOHO and Enterprise Networks
- Datacenters
- SOHO, Enterprise, and Personal Area Networks
- Lesson Review

5.2 Networking Hardware

- Network Interface Cards
- Lab: Select and Install a Network Adapter
- Patch Panels
- Wiring a Patch Panel
- Lab: Connect Patch Panel Cables
- Switches
- How Does an Access Switch Forward Data?
- Lab: Connect Computers with a Switch
- Unmanaged and Managed Switches
- Power over Ethernet
- Lesson Review

5.3 Network Cable Types

- Unshielded Twisted Pair
- Shielded Twisted Pair
- Activity: Identify Unshielded and Shielded Twisted Pair
- Cat Standards
- Copper Cabling Connectors
- Activity: Identify Copper Connectors
- Copper Cabling Installation Tools
- Copper Cabling Test Tools
- Network Taps
- Copper Cabling Installation Considerations
- Optical Cabling
- Activity: Identify Fiber Optic Connectors
- Coaxial Cabling
- Lesson Review

5.4 Wireless Networking Types

- Access Points
- Frequency Bands
- IEEE 802.11a
- IEEE 802.11b/g
- 802.11n
- Identify IEEE 802.11 Standards
- Wi-Fi 5 and Wi-Fi 6
- Wi-Fi 7 (802.11be)
- Wireless LAN Installation

- Considerations
- Wi-Fi Analyzers
- Long-Range Fixed Wireless
- Bluetooth, RFID, and NFC
- Lab: Secure a Small Wireless Network
- Lab: SOHO Wi-Fi configuration settings
- Lesson Review

5.5 Additional Resources

- Network Switches
- Building Wireless Networks - Part 1
- Building Wireless Networks - Part 2
- Exercise: Network Design Challenge
- Exercise: Hardware Comparison Chart
- Exercise: Network Cable Infographic
- Exercise: Wireless Networking Timeline
- Exercise: Create a Network Infographic Capstone

5.6 Module Quiz

Lesson 6: Configuring Network Addressing and Internet Connections

6.1 Internet Connection Types

- Internet Connection Types and Modems
- Digital Subscriber Line Modems
- Cable Modems
- Lab: Connect a Cable Modem
- Fiber to the Curb and Fiber to the Premises
- Lab: Connect Fiber Optic Cables
- Fixed Wireless Internet Access
- Cellular Radio Internet Connections
- Routers
- Firewalls
- Lesson Review

6.2 TCP/IP Concepts

- TCP/IP
- Link or Network Interface layer
- Internet Layer
- Transport Layer
- Application Layer
- IPv4 Addressing
- Lab: Configure IP Addresses
- Network Prefixes
- IPv4 Forwarding
- Public and Private Addressing
- IPv4 Host Address Configuration
- Static Versus Dynamic Host Address Configuration
- Static vs Dynamic
- SOHO Router Configuration
- IPv6 Addressing

- Lesson Review

6.3 Network Communications

- Protocols and Ports
- Transmission Control Protocol
- Network Packets
- User Datagram Protocol
- Wireshark
- Well-Known Ports
- Lesson Review

6.4 Network Configuration Concepts

- DHCP Functions
- Domain Name System
- DNS Queries
- DNS Record Types
- DNS Spam Management Records
- Virtual LANs
- Virtual Private Networks
- Lesson Review

6.5 Challenge Lab: Install a SOHO Network

- Additional Resources
- Ports and Protocols
- DHCP and DNS Services
- Exercise: Internet Connection History Timeline
- Exercise: Create a TCP-IP Infographic
- Exercise: Protocol Poster Project
- Exercise: Visualizing the DHCP Process
- Exercise: Protocol Timeline Capstone

6.6 Module Quiz

Lesson 7: Supporting Network Services

7.1 Networked Host Services

- File/Print Servers
- Database Servers
- Web Servers
- Hypertext Transfer Protocol Secure
- Mail Servers
- Mailbox Servers
- Navigate a Mailbox Server
- Directory and Authentication Servers
- Remote Terminal Access Servers
- Time Servers
- Network Monitoring Servers
- Lesson Review

7.2 Internet and Embedded Appliances

- Proxy Servers
- Lab: Use a Proxy Server
- Spam Gateways and Unified Threat Management
- Load Balancers

- Legacy Systems
- Embedded Systems and SCADA
- Internet of Things Devices
- Lesson Review

7.3 Troubleshoot Networks

- Troubleshoot Wired Connectivity
- Troubleshoot Network Speed Issues
- Lab: Fix a Network Connection
- Troubleshoot Wireless Issues
- Troubleshoot VoIP Issues
- Troubleshoot Limited Connectivity
- Lesson Review

7.4 Lab: Troubleshoot a Network Issue

7.5 Additional Resources

- Client Server Relationship
- Troubleshooting Networks - Part 1
- Troubleshooting Networks - Part 2
- Exercise: Server Comparison Project
- Exercise: Exploring Everyday Embedded Systems
- Exercise: Troubleshooting with Command-Line Tools
- Exercise: Build a Smart Home Device Capstone

7.6 Module Quiz

7.7 Checkpoint Review

Lesson 8: Summarizing Virtualization and Cloud Concepts

8.1 Client-Side Virtualization

- Hypervisors
- Uses for Virtualization
- Lab: Explore Virtualization
- Virtualization Resource Requirements
- Virtualization Security Requirements
- Lab: Create Virtual Hard Disks
- Lesson Review

8.2 Cloud Concepts

- Cloud Characteristics
- Cloud Deployment
- Common Cloud Deployment Models
- Use the Azure Interface
- Common Cloud Service Models
- Manage IaaS Virtual Machines (VMs) in Azure That Run Windows Server
- Cloud File Storage
- Content Delivery Networks (CDNs)
- Lesson Review

8.3 Additional Resources

- Virtualization
- Cloud Service Models
- Exercise: Exploring Hypervisors
- Exercise: Cloud Service Model Exploration
- Exercise: Exploring Cloud Provider Services Capstone

8.4 Module Quiz

Lesson 9: Supporting Mobile Devices

9.1 Mobile Devices and Peripherals

- Mobile Device Accessories
- Mobile Device Wired Connection Methods
- Port Replicators and Docking Stations
- Lab: Manage Mobile Devices
- Wi-Fi Networking
- Connect to a Wireless Network
- Cellular Data Networking
- Mobile Hotspots and Tethering
- Bluetooth Wireless Connections
- Near-Field Communication Wireless Connections
- Configure a Laptop Dock and External Peripherals
- Lesson Review

9.2 Mobile Apps and Data

- Mobile Apps
- Account Setup
- Types of Data to Synchronize
- Email Configuration Options
- Synchronization Methods
- Enterprise Mobility Management
- Location Services
- Lesson Review

9.3 Laptop Hardware

- Laptop Disassembly Processes
- Battery Replacement
- RAM and Adapter Replacement
- Disk Upgrades and Replacement
- Keyboard and Security Component Replacement
- Lesson Review

9.4 Troubleshoot Mobile Devices

- Power and Battery Issues
- Hardware Failure Issues
- Activity: Hardware Failure Issues
- Screen and Calibration Issues
- Connectivity Issues
- Malware Issues
- Lesson Review

9.5 Challenge Lab: Mobile Hardware Support

9.6 Additional Resources

- Troubleshooting Mobile Devices
- Exercise: Peripheral History Timeline
- Exercise: App Exploration and Categorization
- Exercise: Laptop Hardware Budgeting Activity
- Exercise: Troubleshooting Flowchart Creation
- Exercise: Peripheral Design Challenge Capstone

9.7 Module Quiz

Lesson 10: Supporting Print Devices

10.1 Printers and Multifunction Devices

- Printer Unboxing and Setup Location
- Firmware Management in MFDs and Printers
- Print Device Connectivity
- Lab: Select and install a printer
- Printer Drivers and Page Description Languages
- Printer Properties
- Printing Preferences
- Printer Sharing
- Connect to a Printer
- Lab: Configure Network Printing
- Printer Security
- Activity: Security Print and Badging
- Scanner Configuration
- Lesson Review

10.2 Print Device Maintenance

- Laser Printer Imaging Process
- Laser Printer Maintenance
- Inkjet Printer Imaging Process
- Inkjet Printer Maintenance
- Thermal Printer Maintenance
- Impact Printer Maintenance
- Printer Basics
- Replace a Printer Fuser
- Replace a Printer Toner
- Clear a Paper Jam in a Printer
- Lesson Review

10.3 Troubleshoot Print Devices

- Printer Connectivity Issues
- Print Feed Issues
- Print Quality Issues
- Finishing Issues
- Print Job Issues
- Activity: Character Encoding Explorer
- Lesson Review

10.4 Lab: Resolve Print Services Support Tickets

10.5 Additional Resources

- Connecting Printers
- Printer Troubleshooting

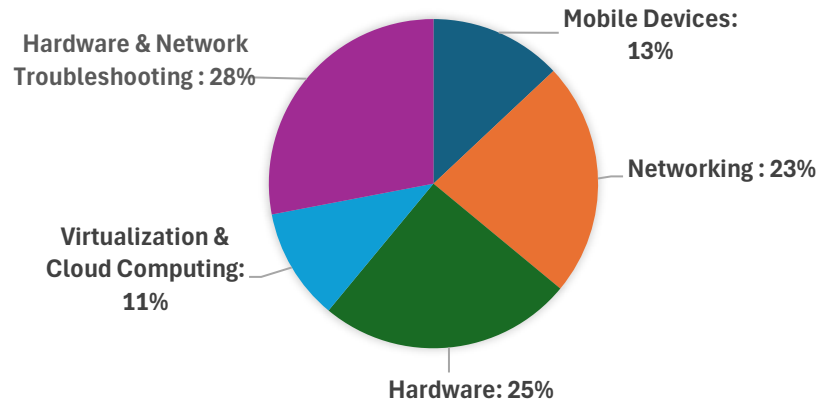
- Exercise: Compare Printer Types and Maintenance Practices
- Exercise: Printer Maintenance Best Practices

- Exercise: Troubleshooting Common Printer Problems
- Exercise: Printer Troubleshooting Flowchart Capstone

10.5 Module Quiz

10.6 Checkpoint Review

SKILLS AND COMPETENCIES COVERED



ASSOCIATED CERTIFICATIONS & EXAM

This course will prepare delegates to write the CompTIA Core 1 (220-1201) exam. Successfully passing this exam counts as a credit to attaining the CompTIA A+ Core Series certification.