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COURSE	TITLE	DURATION
CompTIA	A+ Certification	40 H.

**Overview:**

The target student is anyone with basic computer user skills who is interested in:

- obtaining a job as an IT professional or PC technician. Possible job environments
- include mobile or corporate settings with a high level of face-to-face client interaction,
- remote-based work environments where client interaction, client training, operating
- systems, and connectivity issues are emphasized, or settings with limited customer
- interaction where hardware activities are emphasized. In addition, this course will help prepare students to achieve a CompTIA A+ Certification.

**Prerequisites:**

Students taking this course should have the following skills:

- End-user skills with Windows-based personal computers, including the ability to:
- Browse and search for information on the Internet.
- Start up, shut down, and log on to a computer and network.
- Run programs.
- Move, copy, delete, and rename files in Windows Explorer.
- Basic knowledge of computing concepts, including the difference between hardware and software; the functions of software components, such as the operating system, applications, and file systems; and the function of a computer network.

**Course Outline:**

**Lesson 1: Personal Computer Components**

- A. Personal Computer Components
  - Categories of Personal Computer Components
  - The System Unit
  - Display Devices
  - Input Devices
  - External Devices
- B. System Unit Components
  - The System Board
  - The Central Processing Unit (CPU)
  - Memory
  - The System Bus
  - Storage Devices
  - Power Supplies
  - Cooling Systems

- Adapter Cards
- Riser Cards
- System Board Form Factors
- C. Storage Devices
  - Floppy Disk Drives (FDD)
  - Hard Disk Drives (HDD)
  - Optical Disks
  - Types of Optical Disks and Drives
  - Tape Drives
  - Solid State Storage
- D. Personal Computer Connection Methods
  - Ports
  - Personal Computer Connections
    - Serial Connections
    - Parallel Connections
    - Universal Serial Bus (USB) Connections
    - IEEE 1394 and FireWire Connections
    - Small Computer Systems Interface (SCSI) Connections
    - ParallelATA(PATA) Connections
    - SerialATA(SATA) Connections

## **Lesson 2: Operating System Fundamentals**

- A. Personal Computer Operating Systems
  - Microsoft Windows
  - Microsoft Windows Versions
  - UNIX
  - Linux
  - Apple Macintosh Operating Systems
- B.Windows User Interface Components
  - The Windows Desktop
  - The Taskbar
  - The Start Menu
  - Windows Explorer
  - My Computer
  - The My Documents Folder
  - The Control Panel
  - The Command Prompt
  - My Network Places
- C.Windows File System Management
  - Directories and Folders
  - File Extensions
  - File Attributes
  - Windows File System Types
  - Permissions
    - NTFS File Permissions
    - NTFS Folder Permissions
  - Shares
    - Windows Shared Folder Permissions
- D.Windows System Management Tools
  - The Computer Management Console
  - The Registry

### **Lesson 3: PC Technician Professional Best Practices**

- A. Tools of the Trade
  - Multimeters
  - Loopback Plugs
  - Types of Hardware Toolkits
  - Software Diagnostic Tools
  - Firmware
  - The System BIOS
  - CMOS RAM
  - The Power-On Self Test (POST)
  - Hard Drive Self Tests
  - Software Diagnostics Tests
- B. Electrical Safety
  - Static Electricity
  - Electrostatic Discharge (ESD)
  - ESD Prevention Techniques
  - An ESD Toolkit
  - Electrical Hazards
- C. Environmental Safety and Materials Handling
  - Atmospheric Considerations
  - Situational Hazards
  - Physical Hazards
  - Safety Precautions for Physical Hazards
  - Equipment Moving Safety Recommendations
  - Chemical Hazards
  - Liquid Hazards
  - The Material Safety Data Sheet (MSDS)
  - Incident Reports
  - Hazardous Material Disposal Procedures
- D. Perform Preventative Maintenance
  - Preventative Maintenance Theory
  - Computer Component Maintenance Techniques
  - Cleaning Compounds and Materials
- E. Diagnostics and Troubleshooting
  - Troubleshooting Theory
  - The Troubleshooting Process
- F. Professionalism and Communication
  - Communication Skills
  - Professional Conduct

### **Lesson 4: Installing and Configuring Peripheral Components**

- A. Install and Configure Display Devices
  - Display Device Types
  - Display Settings
  - LCD Characteristics
  - Connector Types
  - Device Drivers
  - Display Device Selection Tips
  - Display Device Installation Considerations
- B. Install and Configure Input Devices

- Standard Input Device Types
- Biometric Input Device Types
- Specialized Input Device Types
- Input Device Selection Tips
- Input Device Installation Considerations
- C. Install and Configure Adapter Cards
  - Internal Bus Architectures
  - Adapter Card Types
  - Adapter Card Selection Tips
  - Adapter Card Installation Considerations
  - Adapter Card Configuration and Optimization Requirements
  - Hardware Resources
- D. Install and Configure Multimedia Devices
  - Multimedia Devices
  - Common Multimedia Devices
  - Multimedia Connectors
  - Multimedia Device Selection Tips
  - Multimedia Device Installation Considerations
  - Multimedia Device Configuration and Optimization Requirements

## **Lesson 5: Installing and Configuring System Components**

- A. Install and Configure Storage Devices
  - Hard Disk Drive Types
  - Floppy Disk Drives
  - Tape Drive Types
  - Optical Drive Types
  - Solid State Storage Types
  - Storage Device Power Connectors
  - Hot Swapping
  - Drive Images
  - Disk Partition Types
  - The Windows Disk Management Utility
  - Internal Storage Device Installation Considerations
  - Storage Device Configuration and Optimization
- B. Install and Configure Power Supplies
  - Power Supply Form Factors
  - Power Requirements
  - Power Supply Safety Recommendations
  - Power Supply Selection Tips
- C. Install and Configure Memory
  - Memory Modules
  - Memory Form Factors and Slot Types
  - Memory Types
  - Memory Selection Tips.
- D. Install and Configure CPUs
  - CPU Chip Types
  - Instruction Sets
  - Cache Memory
  - CPU Operational Characteristics
  - Processor Connections
  - CPU Selection Tips
  - CPU Installation Considerations

CPU Configuration and Optimization Requirements  
E. Install and Configure System Boards  
Integrated I/O Port Types .  
Chipsets .  
BIOS Types Complementary Metal Oxide Semiconductor (CMOS) Memory Settings  
System Board Selection Tips  
System Board Installation  
System Board Configuration and Optimization Requirements  
System Board Power Connectors

## **Lesson 6: Maintaining and Troubleshooting Peripheral**

Components  
A. Troubleshoot Display Devices  
Common Display Device Issues  
B. Maintain and Troubleshoot Input Devices  
Common Input Device Issues  
Input Device Maintenance Techniques  
C. Troubleshoot Adapter Cards  
Common Adapter Card Issues  
D. Troubleshoot Multimedia Devices  
Common Multimedia Device Issues

## **Lesson 7: Troubleshooting System Components**

A. Troubleshoot Storage Devices  
Common Storage Device Issues  
ATA Drive Troubleshooting Tips  
SCSI Drive Troubleshooting Tips  
B. Troubleshoot Power Supplies  
Common Power Problems  
Common Power Supply Issues  
C. Troubleshoot Memory  
Error Checking  
Common Memory Issues  
D. Troubleshoot CPUs  
Common CPU Issues  
E. Troubleshoot System Boards  
Common System Board Issues

## **Lesson 8: Installing and Configuring Operating Systems**

A. Install Microsoft Windows  
Windows System Requirements  
Hardware Compatibility  
Installation Methods  
Installation Options.  
Windows Update .  
Microsoft Product Activation.  
B. Upgrade Windows  
Supported Upgrade Paths

- Hardware Upgrade Compatibility
- Software Upgrade Compatibility
- C. Add Devices to Windows
  - Driver Signing
  - Unsigned Driver Installation Options
  - Installation Permissions
- D. OptimizeWindows
  - Virtual Memory
    - The Virtual Memory Process
  - Windows Services
  - The Windows XP Boot Process
  - Temporary Files
  - Windows Optimization Software Tools

## **Lesson 9: Maintaining and Troubleshooting MicrosoftWindows**

- A. Operating System Utilities
  - File Management Tools
  - Disk Management Tools
  - System Management Tools
- B. Maintain Microsoft Windows
  - Backup and Restore
    - The Windows Backup Utility
    - System State Data
- C. Troubleshoot Microsoft Windows
  - System Stop Errors
  - System Lockup Errors
  - Input/Output Device Issues
  - Application Errors
  - Boot Errors
  - Error and Warning Messages in Event Viewer
  - Registry Error Messages
  - Remote Diagnostic and Troubleshooting Tools
- D. Recover MicrosoftWindows
  - System Restore
  - Safe Mode
  - Last Known Good
  - Recovery Console
  - Windows Boot Disk
  - Automated System Recovery (ASR)
  - Repair Installations
  - Windows System Issues

## **Lesson 10: Network Technologies**

- A. Network Concepts
  - Networks
  - Network Models
  - Network Interface Card Characteristics
  - Twisted Pair Cables
  - RJ-45 Twisted Pair Connectors
  - Coaxial Cables
  - Coaxial Cable and Connector Types

- Fiber Optic Cables
- Fiber Optic Connectors
- Other Network Connection Types
- B. Network Communications
  - Network Protocols
  - Network Addresses
  - The TCP/IP Protocol
  - IPAddresses
  - Subnet Masks
  - IPAddress Classes
  - The IPX/SPX and NWLink Protocols
  - NetBIOS
  - NetBEUI
  - Network Bandwidth
  - Full and Half Duplex Communications
- C. Network Connectivity
  - Local Area Networks (LANs)
  - Wide Area Networks (WANs)
  - Ethernet
  - Dial-up Connections
  - Wireless Connections
  - 802.11 Wireless Standards
  - Wireless Access Points (WAPs)
  - Bluetooth Communications
  - Infrared Connections
  - CellularWAN Communications
  - Broadband Communications
  - Types of Broadband Communications
- D. Internet Technologies
  - Internet Service Providers (ISPs)
  - SMTP
  - POP3
  - IMAP4
  - HTML
  - HTTP
  - SSL
  - HTTPS
  - Telnet
  - FTP
  - Voice Over IP (VoIP)

## **Lesson 11: Installing and Managing Network Connections**

- A. Create Network Connections
  - IPAddress Configuration Methods
  - Name Resolution with the Domain Name System (DNS)
  - WINS
  - Workgroups
  - Directory Services
  - Active Directory Domains
  - Novell eDirectory
  - Network Client Options
- B. Install and Configure Web Browsers

- Web Browsers
- Web Browser Settings
- C. Maintain and Troubleshoot Network Connections
  - Preventative Maintenance Techniques
  - Networking Tools and Utilities
  - Cable Testers
  - Common Network Issues

## **Lesson 12: Supporting Laptops and Portable Computing Devices**

- A. Laptop and Portable Computing Device Components
  - Laptop Computers
  - Portable Computing Devices
  - Mobile System Boards
  - Mobile Processors
  - Mobile Hard Drive Form Factors
  - Mobile Memory Form Factors
  - Mobile Adapter Card Form Factors and Expansion Slots
  - Mobile Device Ports
  - Mobile Device Peripheral Components
  - Power Supplies and Batteries
  - Mobile Input Devices
  - Video Sharing
- B. Install and Configure Laptops and Portable Computing Devices
  - Power Management Technologies
  - Power Management Modes
  - Communication Connection Selection Tips
- C. Maintain and Troubleshoot Laptops and Portable Computing Devices
  - Maintenance and Handling Techniques
  - Operating Environment Best Practices
  - General Mobile Computing Device Issues
  - Common Stylus Issues
  - Common Laptop Keypad Issues
  - Common Wireless Connectivity Issues

## **Lesson 13: Supporting Printers and Scanners**

- A. Printer and Scanner Technologies
  - Printers
  - Scanners
  - Multi-function Devices
  - Laser Printers
  - Inkjet Printers
  - Thermal Printers
  - Types of Thermal Printers
  - Solid Ink Printers
  - Impact Printers
- B. Printer and Scanner Components
  - Printer and Scanner Memory
  - Printer and Scanner Drivers



- Printer and Scanner Firmware
- Printer and Scanner Interfaces
- Consumable Printer Components
- Flatbed Scanner Components
- C. Printer and Scanner Processes
  - The Laser Printing Process
  - The Inkjet Print Process
  - Thermal Print Processes
  - The Solid Ink Print Process
  - The Dot-Matrix Impact Print Process
  - The Scanning Process
- D. Install and Configure Printers and Scanners
  - Local and Network-based Printers
  - Network-Connected Printers
  - The Print Spooler
  - The Windows Print Process
  - Windows Print Permissions
  - Printer Configuration Options
  - Scanner Performance Factors
- E. Maintain and Troubleshoot Printers and Scanners
  - Preventative Maintenance Techniques
  - Common Printer Issues
  - Common Scanner Issues
  - Printer and Scanner Troubleshooting Resources

## **Lesson 14: Personal Computer Security Concepts**

- A. Security Fundamentals.
  - Corporate Security Policies
  - Security Incident Reports
  - Authentication
    - Authentication Methods
    - Biometric Authentication Methods
    - Password Management
  - Access Control
    - User Account Types
    - Groups
    - Access Control Measures
    - Rights
    - Auditing
- B. Security Protection Measures
  - Encryption
    - Data Encryption Methods
  - Malicious Software
    - Types of Malicious Software
    - Malicious Software Protection Techniques
  - Firewalls
  - File System Security Measures
- C. Data and Physical Security
  - Physical Access Controls
  - Data Access Policies
  - Workstation Protection
  - Backup Security

- Data Migration
- Data Removal
- Media and Hardware Disposal
- D. Wireless Security
  - Wireless Encryption Methods
  - Security Methods for Wireless Access Points
  - Wireless Client Configuration Options
- E. Social Engineering
  - Social Engineering Attacks
  - Social Engineering Prevention

## **Lesson 15: Supporting Personal Computer Security**

- A. Install and Configure Security Measures
  - Windows Security Policies
  - Windows Firewall
  - Software Firewall Configuration Settings
  - Computer Security Measures
- B. Maintain and Troubleshoot Security Measures
  - Common Computer Security Issues
  - Common Software Firewall Issues
  - Common Wireless Client Configuration Issues
  - Common Encryption Issues