COMPUTER TECHNOLOGY 40

Description

This course will build upon the topics covered in Intermediate Computer Technology 30. Topics will include: in-depth troubleshooting of hardware and software, installation of system software and utilities, memory management and optimization for DOS and Windows. Network wiring and the building of a network server will be covered. Students will repair/setup school computer equipment.

Course Overview

Course Objectives

Students should be able to:

- install, configure and maintain personal computer components.
- detect problems, troubleshoot and repair/replace personal computer components.
- install, configure, detect problems, troubleshoot and repair/ replace laptop components.
- select and use computer repair tools.
- detect and resolve common printer issues.
- select the appropriate commands and options to troubleshoot and resolve problems.
- differentiate between Windows Operating System directory structures.
- given a scenario, select and use system utilities / tools and evaluate the results.
- troubleshoot client-side connectivity issues using appropriate tools.
- install and configure a small office home office (SOHO) network.
- given a scenario, prevent, troubleshoot and remove viruses and malware.
- implement security and troubleshoot common issues.

Essential Questions

- What knowledge, skills, tools and safety practices are required to apply computer analysis and repair?
- How do the installation, configuration and maintenance of a computer system impact the work environment?
- What is the value of staying current with new technologies/hardware in the world of computing?
- Why should a technician understand the relationships of application software, operating systems, BIOS, and system hardware components?
- How do the developed skills of a technician impact the successful installation, configuration, and upgrading of computer security systems?
- Why is it important to be proactive in prevention of damage which can viruses can do to a computer system?
- Why is it essential for a technician to understand how networks function and communicate?

Assessments

- Quizzes and Test on Unit material

Lab Activities

- Computer Hardware install, configure and maintenance.
- Computer Operating system troubleshooting and resolving issues
- Networking build and settings
- Security: detection, intervention, remediation of common issues

Content Outline

I. Unit 1 - Hardware
II. Unit 2 - Operating Systems
III. Unit 3 - Networking
IV. Unit 4 - Security

Standards

A+ Correlation Chart Authorized Curriculum Program

- ***CompTIA A+ 220–702***

Pacing Guide			
1st Marking Period	2nd Marking Period	3rd Marking Period	4th Marking Period
Unit 1 **Hardware** 9 weeks	Unit 2 **Operating Systems** 9 weeks	Unit 3 **Networking** 9 weeks	Unit 4 **Security** 9 weeks

Unit 1- Hardware, 9 weeks top

Standards

CompTIA A+ 220–702

Domain 1.0 Hardware

1.1 Given a scenario, install, configure and maintain personal computer components

1.2 Given a scenario, detect problems, troubleshoot and repair/replace personal computer components

1.3 Given a scenario, install, configure, detect problems, troubleshoot and repair/ replace laptop components

1.4 Given a scenario, select and use the following tools: Multimeter, Power supply tester, Specialty hardware / tools, Cable testers, Loop back plugs, Anti-static pad and wrist strap, Extension magnet

1.5 Given a scenario, detect and resolve common printer issues

Unit Objectives

Students will be able to:

- install, configure and maintain personal computer components.
- detect problems, troubleshoot and repair/replace personal computer components.
- install, configure, detect problems, troubleshoot and repair/ replace laptop components.
- select and use computer repair tools:.
- detect and resolve common printer issues.

Essential Questions

- What knowledge, skills, tools and safety practices are required to apply computer analysis and repair?
- How do the installation, configuration and maintenance of a computer system impact the work environment?

Focus Questions

- Why do I need to check for hardware compatibility?
- What kind of safety is involved in working with electrical devices?
- What methods are used to detect problems, troubleshoot and repair/replace hardware?

Assessments

- Quizzes and Test on Unit material

Lab Activities

- Computer Hardware install, configure and maintenance

Skill Objectives

Students will:

- install, configure and maintain: Storage devices, Motherboards, Power supplies, Processors, Memory, Graphics cards, Sound cards, Storage controllers, I/O cards, Cooling systems
- detect problems, troubleshoot and repair/replace: Storage devices, Motherboards, Power supplies, Processors, Memory, Adapter cards, Cooling systems, Components of the LCD including inverter, screen and video card.
- install, configure, detect problems, troubleshoot and repair/replace laptop components: Components of the LCD including inverter, screen and video card, Hard drive and memory, Identify Disassemble processes for proper re-assembly, Recognize internal laptop expansion slot types, Upgrade wireless cards and video card, Replace keyboard, processor, plastics, pointer devices, heat sinks, fans, system, board, CMOS battery, speakers.
- select and use the following tools: Multimeter, Power supply tester, Specialty hardware / tools, Cable testers, Loop back plugs, Anti-static pad and wrist strap, Extension magnet.
- detect and resolve common printer issues: clear paper jam, power cycle, install maintenance kit and reset page count, set IP on printer, clean printer)

Unit 2-Operating Systems , 9 weeks top

Standards

CompTIA A+ 220–702

Domain 2.0 Operating Systems

2.1 Select the appropriate commands and options to troubleshoot and resolve problems
2.2 Differentiate between Windows Operating System directory structures
2.3 Given a scenario, select and use system utilities / tools and evaluate the results
2.4 Evaluate and resolve common issues

Unit Objectives

Students will be able to:

- select the appropriate commands and options to troubleshoot and resolve problems.
- differentiate between Windows Operating System directory structures.
- given a scenario, select and use system utilities / tools and evaluate the results.
- evaluate and resolve common issues.

Essential Questions

- Why should a technician understand the relationships of application software, operating systems, BIOS, and system hardware components?
- What is the value of staying current with new technologies/hardware in the world of computing?

Focus Questions

- What is the value of a boot disk?
- What are the differences between Windows operating systems?
- What is the value of knowing and understanding basic text line commands in the Windows operating system?
- What is a graphical user interface**?**
- Why is it important to know commands and options to troubleshoot and resolve problems?

Assessments

- Quizzes and Test on Unit material

Lab Activities

- Computer Operating system troubleshooting and resolving issues

Skill Objectives

Students will:

- Select the appropriate commands and options to troubleshoot and resolve problems: MSCONFIG, DIR, CHKDSK, EDIT, COPY, XCOPY, FORMAT, IPCONFIG, PING, MD / CD / RD, NET, TRACERT, NSLOOKUP, [command name] /?, SFC.
- Differentiate between Windows Operating System directory structures: User file locations, System file locations, Fonts, Temporary files, Program files, Offline files and folders.
- select and use system utilities / tools and evaluate the results: Disk Manager, System monitor, Administrative tools, Device Manager, Task Manager, System Information, System restore, Remote Desktop Protocol, Task Scheduler, Regional settings and language settings.
- Evaluate and resolve common issues: Operational problems, Error messages and conditions, Boot, Startup, Event Viewer, System Performance and Optimization.

Unit 3 - Networking, 9 weeks top

Standards
CompTIA A+ 220–702
Domain 3.0 Networking
3.1 Troubleshoot client-side connectivity issues using appropriate tools
3.2 Install and configure a small office home office (SOHO) network

Unit Objectives
Students will be able to:
- troubleshoot client-side connectivity issues using appropriate tools.
- install and configure a small office home office (SOHO) network.

Essential Question
- Why is it essential for a technician to understand how networks function and communicate?

Focus Questions
- What is important about understanding client-side connectivity issues?
- Why must a technician be able to reason through the problems involved in troubleshooting?
- What processes are involved in the proper installation and configuration of a small office home office network?
- What are TCP/IP settings and what do they control?

Assessments
- Quizzes and Test on Unit material

Lab Activities
- Networking build and settings

Skill Objectives
Students will:
- troubleshoot client-side connectivity issues using appropriate tools: TCP/IP settings, Characteristics of TCP/IP, Mail protocol settings, FTP settings, Proxy settings, Tools (ping, tracert, nslookup, netstat, netuse, net /?, ipconfig, telnet, SSH), Secure connection protocols, Firewall settings.
- install and configure a small office home office (SOHO) network:
  Connection types, Basics of hardware and software firewall configuration.
- demonstrate Physical installation (wireless router placement, cable length).

Unit 4 – Security, 9 weeks top

Standards
CompTIA A+ 220–702
Domain 4.0 Security
4.1 Given a scenario, prevent, troubleshoot and remove viruses and malware
4.2 Implement security and troubleshoot common issues

Unit Objectives
Students will be able to:
- given a scenario, prevent, troubleshoot and remove viruses and malware.
- implement security and troubleshoot common issues.

Essential Questions
- How do the developed skills of a technician impact the successful installation, configuration, and upgrading of computer security systems?
- Why is it important to be proactive in prevention of damage which viruses can do to a computer system?

Focus Questions
- When working in a network environment, what methods can be employed in defending a system from attack?

Assessments
- Quizzes and Test on Unit material

Lab Activities
- Security: detection, intervention, remediation of common issues

Skill Objectives
Students will:
- prevent, troubleshoot and remove viruses and malware.
- use antivirus software.
- identify malware symptoms.
- quarantine infected systems.
- research malware types, symptoms and solutions.
- remediate infected systems.
- update antivirus software.
- schedule scans.
- repair boot blocks.
- use scan and removal techniques (safe mode, boot environment).
- implement security and troubleshoot common issues with operating systems and System (BIOS security such as drive lock, passwords, intrusion detection, TPM).