

## Computer Repair and Maintenance

### Course Description

This course helps students to become a successful PC Technician. It concentrates on understanding terminology, how to do fundamental tasks, and advanced configuration and troubleshooting, including using command line to accomplish technical tasks.

This course contains lab content that includes technical concepts and terminology of the PC's internal and external components and operating systems.

Upon successful completion, the student can apply the acquired knowledge towards completing the “A+ Certification for IT Technician” accreditation from the Computing Technology Industry Association ([comptia.org](http://comptia.org)).

### Course Learning Outcomes

Upon successful completion, students will be able to:

1. Distinguish the major hardware components of a microcomputer system used for input, output, processing, and communication.
2. Interact with customers.
3. Protect yourself and equipment against electricity when working inside a computer case.
4. Install configure, and maintain motherboard and CPU.
5. Install, upgrade and solve problems related to processors and memory.
6. Know how a computer communicates with a hard disk and how to select install and troubleshoot hard disks.
7. Install, configure and troubleshoot I/O devices.
8. Demonstrate the ability to use command-line functions and utilities and write batch files.
9. Develop a preventive maintenance and what to include in it.
10. Install and share printers.
11. Support, upgrade, and troubleshoot notebooks.

## Essential Employability Skills

The student will reliably demonstrate the ability to:

1. Apply a systematic approach to solve problems.
2. Locate, select, organize, and document information using appropriate technology and information systems.
3. Analyze, evaluate, and apply relevant information from a variety of sources.
4. Interact with others in groups or teams in ways that contribute to effective working relationships and the achievement of goals.

## Text & Learning Materials

Andrews, J. 2012. CompTIA A+ Guide to Managing and Maintaining your PC - Seventh Edition  
ISBN-10: 1-435-49778-3  
ISBN-13: 978-1-435-49778-8

## Course Outline

Class	Topics	Readings	Outcomes	Instruction	Evaluation
1	Introducing Hardware	Chapter 1	Students will be able to: 1) Explain why the computer needs both hardware & software to work (1, 2) 2) Examine the many different hardware components inside of & connected to a computer (1,2)	1) Teacher led instructions 2) Lab work	Lab 1: Motherboards 1) Gather & Record System Information 2) Identify Computer Parts 3) Use Software to Examine Computers 4) Compare Costs 5) Plan an Ideal System
2	Working with People in a Technical Word	Chapter 3	Student will be able to: 1) Describe some job roles and responsibilities of those who sell, fix or support personal computers 2) Determine what customers want and expect beyond your technical abilities 3) Interact with customers when selling, servicing, and supporting personal computers	1) Teacher led instructions 2) Lab work	Lab 2: Assembly /Disassembly 1) Observe The Boot Process 2) Disassembly/ Reassembly 3) Check System Compatibility 4) Evaluate An Upgrade
3	Form Factors, Power Supplies and Working Inside a Computer	Chapter 4	Student will be able to: 1) Classify form factors used for computer cases,motherboards, and power supplies 2) Select a power supply 3) Apply security procedures against the dangers of electricity to protect humans and equipment (3) 4) Work inside a computer case 5) Troubleshoot electrical problems	1) Teacher led instructions 2) Lab work	Lab 3: Power 1) Identify Form Factors 2) Measure The Output Of Your Power Supply 3) Choose The Right Power Supply
4	All About Motherboards	Chapter 5	Student will be able to: 1) Analyze the different types and features of motherboards (4) 2) Describe how firmware on the motherboard controls what happens when you first turn on a PC before the OS is loaded 3) Install, configure, and maintain a motherboard	1) Teacher led instructions 2) Lab work 3) Videos	Lab 4: CMOS 1) Examine And Adjust CMOS Settings 2) Use A Hardware Information Utility 3) Identify A Motherboard And FindDocumentation On The Internet 4) Identify Motherboard Components And Form Factors 5) Flashing BIOS Lab 5: Memory 1) Research RAM On The Internet 2) Upgrade RAM 3) Troubleshoot Memory Problems

Class	Topics	Readings	Outcomes	Instruction	Evaluation
5	Supporting Processors	Chapter 6	Student will be able to: 1) Explain the characteristics and purposes of Intel and AMD processors 2) Control system's temperature 3) Install and upgrade a processor (4) 4) Diagnose problems with the processor, the motherboard, overheating, and booting the PC	1) Teacher led instructions 2) Lab work	Lab 6: Installing And Supporting I/O Devices 1) Gather Information On Your System 2) Identify Hardware Conflicts Using Device Manager 3) Diagnose Simple Hardware Problems 4) Install Dual Monitors In Windows XP
6	Upgrading Memory	Chapter 7	Student will be able to: 1) Categorize the different kinds of physical memory and how they work (5) 2) Perform memory upgrade(5) 3) Troubleshoot memory (5)	1) Teacher led instructions 2) Lab work 3) Videos	Lab 7: Partitioning 1) Test Hard Drive Performance 2) Use Disk Management 3) Use Hard Drive Utilities 4) Partitioning And Formatting Hard Drives
7	Hard Drives	Chapter 8	Student will be able to: 1) Discuss the technologies used inside a hard drive and how data is organized on the drive (6) 2) Explain how a computer communicates with a hard drive (6) 3) Explain how hard drives can work together in a RAID array 4) Select and troubleshoot a hard drive (6)	1) Teacher led instructions 2) Lab work	Lab 8 : Boot Disks 1) Slipstream Windows XP and SP2 2) Create a Bootable USB
8	Installing And Supporting I/O Devices	Chapter 9	Student will be able to: 1) Plan for I/O installation and support devices(7) 2) Examine the types of I/O devices and their characteristics (7) 3) Troubleshoot I/O devices	1) Teacher led instructions 2) Lab work	Lab 8 : Boot Disks (Cont.) 1) Create an Emergency Windows Rescue CD
9	Multimedia Devices And Mass Storage	Chapter 10	Student will be able to: 1) Select multimedia adapters (7) 2) Discuss optical storage technologies and removable storage 3) Troubleshoot multimedia devices	1) Teacher led instructions 2) Lab work	Lab 9: Troubleshooting 1) Introduce Problems And Observe Errors
10	Maintenance & Troubleshooting Strategies	Chapter 11	Student will be able to: 1) Plan operational procedures to keep you, other people and the environment safe (3, 9) 2) Develop a preventive maintenance plan (9) 3) Diagnose and solve PC problem (9)	1) Teacher led instructions 2) Lab work	Lab 10: Command line 1) Use common command line commands

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11, 12	DOS Commands		Student will be able to: 1) Explain the DOS Startup 2) Use the command prompt 3) Use DOS Commands (8) 4) Write and run batch files	1) Teacher led instructions 2) Lab work	Lab 11: Batch Files
13	Supporting Printers	Chapter 22	Student will be able to: 1) Install and share a printer over a local area network (10) 2) Plan for routine maintenance tasks necessary to support printers 3) Troubleshoot Printers (10)	1) Teacher led instructions 2) Lab work	Lab 12: Printers
14	Review				Comprehensive Lab Review

\* Numbers in parentheses refer to Course Learning Outcomes