Computer Service and Repair, 4th Edition: A Guide to Upgrading, Configuring, Troubleshooting, and Networking Computers
Course Outline and Text Materials

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This textbook meets or exceeds the requirements of the CompTIA Authorized Quality Curriculum (CAQC) program for A+ Certification Exams. Students do not need prior PC technical experience to benefit from the text. Topics include building and upgrading PCs, peripheral, plus troubleshooting. A chapter is desiccated to employment, including an overview of additional CompTIA, Microsoft and other certifications that can propel careers. This outline includes major headings as well as subheadings for more insight to the textbook.

In recent years, many new operating systems have been issued by various companies. This text includes Windows XP, Windows Vista, Windows, 7 and Window 8/8.1, as well as addressing those from other vendors.

- End-o- the-chapter questions mimic the style used on the CompTIA A+ Certification exams to help prepare students for these career-supporting texts.
- Skill-building, step-by-step lab activities provide students the hands-on experience needed to become proficient in PC repair and upgrade.
- Correlations between the text and the CompTIA A+ test objectives are available on www.g-w.com.

Course Outline (Textbook) Basics Include:

Chapter 1 Introduction to a Typical PC

The Role of Computers
Digital Electronics
What is a Computer?
Computer Data Codes
Bit, Bytes, and Words
Serial and Parallel Data Transfer
Computer Numerical Values
Take a Tour Outside the Computer Case
Take a Tour Inside the Computer Case

How the Major Parts Work Together
Integrated Circuits
Tool Kit
Safety

Chapter 2 Operating Systems
What Is an Operating System?
Operating System Characteristics
Microsoft Windows Operating System
Microsoft Windows Installation
Microsoft Widows Boot Sequence
Common Mobile Device Operating Systems
Cloud Computing
Common Operating System Terminology

Chapter 3 Motherboards
Motherboard Construction
Form Factors
Motherboard Bus System Architecture
Expansion Card Slots
System Resources
Installing Software Drivers
Setup Utility
Identifying Motherboard Components
Troubleshooting Motherboards

Chapter 4 Central Processing Unit (CPU)
Instructions and Data
CPU Operation
Enhancing CPU Operation
Processor Descriptive Features
Processor Manufacturers
Processor Evolution
Multi-core Processors
Processor Affinity
Processor Sockets
Processor Performance
Questions to Ask Before Upgrading a CPU
Installing the Processor
Cooling the Processor

Chapter 5 Power Supplies
What Is Electrical Energy?
Using a Digital Multi-meter
Branch Circuits
The PC Power Supply
Surge Protection Devices
Batteries
Power Maintenance Standards

Chapter 6 Memory
Questions to Ask Before Upgrading Memory
Physical Memory Packages
Rom and Ram Memory
Installing Ram Modules
Matching Ram Characteristics
Flash Memory Devices
Memory Map Structure and Development
Virtual Memory
Troubleshooting Memory

Chapter 7 Input Devices
USB Implementers Forum
Keyboard
Optical Mouse
Other Input Devices
Touch Screens
Wireless Input Devices
Managing Input Devices

Chapter 8 Video and Audio Systems
Video System and Display Aspects
Types of Video Displays
Troubleshooting Video Displays
Cleaning Video Displays
Video Adapter Cards
Installing a Video Adapter Card
Personalizing Display Properties
Television and Computers
Graphic Coding
What Is Sound?

Audio Devices
Installing a Sound Card
Multimedia
Building a Custom Computer

Chapter 9 Magnetic and Solid-State Storage Devices

Magnetic Storage Devices
Disk Geometry
Disk Partitions Systems
File System Formats
PATA and SATA Hard Disk Interface
Solid-State Drives
Virtual Hard Disk

Chapter 10 Optical Storage Technology

CD
Magneto-Optical
DVD
HD-DVD and Blu-Ray Disc
Disc Drive Interface
Digital Rights Management
Troubleshooting CD DVD and BD

Chapter 11 Printers

Laser Printer Operation
LED Printer Operation
Color Inkjet Printer Operation
Dot Matrix Printers
Color Thermal Printer Operation
Dye-Sublimation Printer Operations
Solid Ink Color Printer Operation
All-in-One Products
Printer Installation and Configuration
Printer Spooling
Printer Memory
Troubleshooting Printers
Fonts

Chapter 12 Laptops and Mobile Devices

- Mobile Devices
- Portable PC Parts
- Power Management
- Mobile Operating Systems
- Windows Mobility Center
- Wireless Connections
- Security
- Exchanging Data with Full-Size PCs
- Upgrading the Laptop
- Disassembling the Laptop
- Laptop Preventive Maintenance

Chapter 13 Modems and Transceivers

- Public Telephone System
- Residential Telephone Wiring System
- Modems
- Integrated Services Digital Network
- Digital Subscriber Lines
- Cable
- Satellite
- T-Carrier Lines
- Mobile Broadband
- Setting Up a Residential Internet Connection
- MacAfee Internet Connection Speedometer
- Troubleshooting Modems

Chapter 14 Physical and Digital Security

- Physical Security
- Authentication
- Microsoft Security Applications
- Malicious Software
- Firewall

Chapter 15 PC Troubleshooting

- Common Sense Practices
- Troubleshooting Overview
- Typical Startup Problems
- Hard Drive Failures
- Additional Mechanical Problems

Recovering from System Startup Failure
Windows Diagnostic Utilities
Boot Sequences
Data Recovery Techniques
Preparation for Installing or Upgrading an Operating System
Preventive Maintenance
CompTIA A+ Troubleshooting Objectives

Chapter 16 Introduction to Networking

Networks – What are They?
Network Administrative Models
Network Classifications
Network Topologies
How Networks Communicate
Network Media
Cable Tools
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Installing a Typical Network Interface Card
Diskless Workstations
Thin Client
Network Operating Systems (NOS)
OSI Model
IEEE 802 Standards

Chapter 17 Network Administration

Peer-to Peer Network Administration
Centralized Network Administration
A Quick Tour of Windows Server 2012
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RAID Systems
Storage Spaces and Storage Pools

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Special WAN Equipment
Network Diagnostic Utilities
The Internet Structure
E-mail Communications
Internet Protocols
Cloud Services
Network Troubleshooting

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Internet Access and SOHO Design
SOHO Administration
SOHO Security
Configuring the SOHO Network with Window XP
Configuring the SOHO Network with Windows Vista or Later
Troubleshooting the SOHO Network
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Sample CompTIA A+ 220-802 Exam
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Appendix B – Binary Math

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