

Computer Service and Repair: A Guide to Upgrading, Configuring, Troubleshooting, and Networking Personal Computers, 3rd Edition

Course Outline & Text Materials

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This textbook, and related instructional materials, presents the most up-to-date information in the rapidly changing world of computers and their software. Preparation for the CompTIA A+ Certification Exams is emphasized throughout the textbook. This textbook meets the requirements of the CompTIA Authorized Quality Curriculum Program, covering all objectives of the A+ Certification Exams.

Most chapters open with descriptions of A+ Key Points, which identify chapter content that is likely to be represented on the examination. A+ Notes are used wherever appropriate in the text to highlight specific areas for exam preparation. At the end of most chapters, students take a 10-question quiz consisting of sample A+ exam items relating to the chapter content. This textbook also includes a complete chapter devoted to CompTIA A+ exam preparation.

This outline is provided as a basic outline. You may download the outline in Word format and adjust it to your needs. Just add days, dates, times and you're in business.

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
- ASCII Code
- Bits, 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
- Laboratory Activity – Part Identification*

Chapter 2 Operating Systems

What Is an Operating System?
Operating System Characteristics
A Closer Look at DOS
A closer Look at Microsoft Windows
Operating System Boot Sequences
Dual-Boot and Multiple-Boot Systems
Virtual Machines
The History of the Windows Family
Introduction to Windows Vista\
Additional Non-Windows Operating Systems
Common Operating System Terminology
Laboratory Activity – Installing Windows Vista

Chapter 3 Motherboards

Motherboard Construction
Form Factors
Motherboard Buss System Architecture
Expansion Card Slots
System Resources
Chipsets
Plug and Play Motherboard Component Identification
Trouble shooting Motherboards
Laboratory Activity – Identifying PC BIOS and Operating Systems

Chapter 4 CPU

Instructions and Data
CPU Operation
Processor Speed
Enhancing CPU Operation
Processor Descriptive Features
CPU Voltages
Cooling the CPU
Processor Manufacturers
Processor Evolution
Multi-Core Processors
Processor Performance Sixty-Four and Thirty-Two Bit Technology
Socket and Slot Styles
Questions to Ask before Upgrading a CPU
Laboratory Activity – Installing a Pentium 4 Processor

Chapter 5 Power Supplies

What Is Electrical Energy?

AC and DC

Voltage and Current

Resistance

Checking Power Outlets

Clean Electrical Power

Power

Parts of a Digital Multimeter

Procedures for Reading Voltage

Procedures for Reading Resistance

Checking Fuses, Cables, and Switches

Branch Circuits

Dedicated Circuit

Grounding

The PC Power Supply

Power Management Standards

Troubleshooting the Power Supply

Replacing a Power Supply

Surge Protection Devices

Batteries

Laboratory Activity – Exploring and Replacing the Power Supply

Chapter 6 Memory

Questions to Ask before Upgrading Memory

Physical Memory Packages

ROM and RAM Memory

Installing RAM Modules

Matching RAM Characteristics

Buffered Chips

Registered Memory

Flash Memory Devices

Memory Map Structure and Development

Real Mode, Protected Mode, and Safe Mode

Virtual Memory

Windows Memory Diagnostics Tool

Gold vs Tin Edge Connectors

Memory and Heat

Laboratory Activity – Viewing RAM and Virtual Memory Information

Chapter 7 Input Devices

Keyboard

Troubleshooting Keyboards

Mouse

Troubleshooting the Mouse

Game Controllers

Digitizer Pad

Bar Code Readers

Scanners and Digital Cameras

Light Pen

Touch Screens

Wireless Input Devices

Wireless Technology Standards

Synchronizing the wireless Device

Wireless Device Failure

Virtual Keyboard

Laboratory Activity – Windows Vista Keyboard Properties

Chapter 8 Video Display and Audio Systems

Display Aspects

Types of Video Displays

Troubleshooting Video Displays

Cleaning Video Displays

Video Adapter Cards

Installing a Video Adapter Card

Changing Display Properties

Television and Computers

Bitmapped Graphics Vector Graphics

Graphic Compression

Audio

Audio Devices

Installing a Sound Card

Multimedia

Audio and Video Players

Laboratory Activity – Display Properties

Chapter 9 Magnetic Storage Devices

- Electromagnetic Principles
- Hard Disk Structure
- Disk Geometry
- Disk Partitions and Fdisk
- File Allocation Tables
- Format
- File Fragmentation
- Scan Disk
- Chkdsk
- DiskPart
- Computer Management Console
- Performance Measures
- ATA (IDE and EIDE) Hard Disk Interface
- SCSI Interface System
- SCSI ID
- Solid State drives
- Tape Drive
- Floppy Disk Drive Repairs
- LS-120 Drive
- Zip Drives
- Laboratory Activity – Typical ATA (EIDE) Hard Drive Installation*

Chapter 10 CD Technology

- CD-ROM
- CD-R
- CD-RW
- CD Specifications
- CD-ROM Formatting
- Disc System Standards
- Magneto – Optical Drives
- DVD
- HD-DVD and Blue Ray Disc
- CD and DVD Interface
- Laboratory Activity – CD/DVD Drive Installation*

Chapter 11 Printers

- Laser Printer Operation
- Color Inkjet Printer Operation
- Dot Matrix Printers
- Color Thermal Printer Operation
- Dye-Sublimation Printer Operation
- Solid Ink Color Printer Operation
- All-In-One Products
- Common Printer Connections
- Local Printer Installation
- Sharing Printers
- Printer Spooling
- Printer Memory
- Error Codes
- Paper Jams
- Toner Spills
- Recycling Toner Cartridges
- Diagnosing Laser Printer Problems
- Diagnosing USB Printer Problems
- Fonts
- Laboratory Activity – Installing a Printer*

Chapter 12 Portable PCs

- Laptops, Notebooks, and Palmtops
- Parts of Portable PCs
- Power Management
- Portable Operating Systems
- Personal Digital Assistants
- Bluetooth Standard
- Wireless Data Transfer
- Security Exchanging Data with Full-Size PCs
- Upgrading the Laptop
- Troubleshooting the Laptop
- Preventive Maintenance
- Laboratory Activity – Wireless Ad-Hoc Installation and Configuration*

Chapter 13 Modems and Transceivers

- Public Telephone System
- Residential Telephone Wiring System
- Modems
- Integrated Services Digital Network
- Digital Subscriber Lines
- Cable Internet Service
- Satellite
- T-Carrier Lines
- Setting Up a Residential Internet Connection
- MacAfee Internet Connection Speedometer
- Modem Signaling Standards
- Basic AT Commands
- Modem Troubleshooting
- Laboratory Activity – Modem Installation*

Chapter 14 Viruses

- What Is a Computer virus?
- Virus Classifications
- Creation of Viruses
- Well-Known Viruses
- Virus Prevention
- Virus Removal
- Legal Aspects
- Mistaken Identifications (or Oops)
- Laboratory Activity – Virus Test Software*

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 and Operating System
- Preventive Maintenance
- Laboratory Activity – Advanced Boot Options*

Chapter 16 Introduction to Networking

Networks – What Are They?

Network administrative Models

Network Classifications – LAN, MAN, WAN

Topologies – Bus, Ring, Star, Hybrid, Mesh, Wireless

How Networks Communicate

Network Media

Network Cable Classifications

Network Interface Cards

Diskless Workstations

Hubs

Network Operating Systems (NOS)

OSI Model

IEEE 802 Standards

Laboratory Activity – Installing and Configuring a PCI Network Adapter

Chapter 17 Network Administration

Peer-to-Peer Network Administration

Typical Centralized Network Administration

System Administrator

Network Administration Models

A Quick Tour of Windows .NET Server 2003

RAID Systems

Laboratory Activity – Creating a Network Share in Window XP

Chapter 18 WAN

TCP/IP Addressing

Special WAN Equipment

Network Diagnostic Utilities

The Internet Structure

Development of the Internet

E-mail Communication

Internet Protocols

Network Troubleshooting

Laboratory Activity – IP Address Verification with IPconfig

Chapter 19 Small-Office/Home-Office (SOHO) Networking

Designing the SOHO Network

Configuring the SOHO Network with Windows XP

Windows Vista Network Features

Troubleshooting the SOHO Network

Laboratory Activity – Using the Windows XP Network Setup Wizard

Chapter 20 Customer Support, Communication and Professionalism

Customer Support

Customer Skills

Professionalism

Chapter 21 CompTIA A+ Certification Exam Preparation

A+ Certification Exam

A+ Certification Exam Requirements

Exam Preparation

Sample CompTIA A+ Essentials Exam

Scoring the Exam

Chapter 22 Employment and Advanced Education

A Career Working with Computers

Job Search Ideas

Job Interviews

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