

CNCT Competency Requirements 2007



Certified Network Computer Technician - CNCT

Certified Network Computer Technicians are expected to obtain knowledge of computer electronics basic concepts, Internet and networking technology applicable to various areas of the computer industry. Once the CNCT has acquired these skills, abilities and knowledge, he or she will be able to enter employment in any part of the computer industry. With minimal training in areas unique to the specific products, the CNCT should become a profitable and efficient part of the computer industry workforce. CNCTs are not required to pass the Associate, or basic electronics, technician examination. Journeyman CNCTs **may** pass the Associate exam and, by doing so, become a C.E.T. (showing the CNCT specialty area.)

Certified Network Computer Technicians must be knowledgeable and have abilities in the following technical areas:

Operating System

OS 1.0 Function, Structure, Operation, and File Management

- 1.1 MS-DOS
 - 1.1.1 MS-DOS Overview
 - 1.1.1.1 Primary Functions of DOS
 - 1.1.1.2 Installing DOS
 - 1.1.2 The System Files
 - 1.1.2.1 Required System Files
 - 1.1.2.2 Optional System Files
 - 1.1.2.3 Boot Order
 - 1.1.2.4 Clean Boot
 - 1.1.2.5 Internal and External Commands
 - 1.1.3 Using Dos Commands
 - 1.1.3.1 Entering Commands
 - 1.1.3.2 Setting the system date and time.
 - 1.1.3.3 Displaying the DOS version
 - 1.1.3.4 Controlling the Display
 - 1.1.3.5 Getting System Information
 - 1.1.3.6 Getting Help
 - 1.1.3.7 Redirectors
 - 1.1.4 Working With Directories
 - 1.1.4.1 Understanding the Directory Tree
 - 1.1.4.2 The Root Directory And Subdirectories
 - 1.1.4.3 Changing to Another Directory
 - 1.1.4.4 Making a New Directory
 - 1.1.4.5 Removing a Directory
 - 1.1.4.6 Deleting a Directory Tree
 - 1.1.4.7 Naming Directories
 - 1.1.4.8 Using Filename Extensions
 - 1.1.4.9 Using Wildcard Characters
 - 1.1.4.10 Listing a Directory
 - 1.1.4.11 Using Directory Paths
 - 1.1.4.12 Setting the Search Path
 - 1.1.5 Using File Commands
 - 1.1.5.1 Creating/Naming Files
 - 1.1.5.2 Displaying the Contents of Files
 - 1.1.5.3 Copying Files
 - 1.1.5.4 Copying Directories
 - 1.1.5.5 Duplicating an Entire Disk
 - 1.1.5.6 Renaming a File
 - 1.1.5.7 Moving Files

- 1.1.5.8 Renaming a Directory
- 1.1.5.9 Deleting/Recovering Files
- 1.1.5.10 File Attributes
- 1.1.6 Managing Disks
 - 1.1.1.1 Formatting Disks
 - 1.1.1.2 Making a Formatted Disk Bootable
 - 1.1.1.3 File Management Software
- 1.1.7 Automating DOS Commands
 - 1.1.7.1 Terminate and Stay Resident programs (TSRs)
 - 1.1.7.2 Recalling Previous Commands
 - 1.1.7.3 DOSKEY's
 - 1.1.7.4 Batch Files
 - 1.1.7.5 Editing the AUTOEXEC.BAT File
 - 1.1.7.6 Editing the CONFIG.SYS File
- 1.2 Windows 95/98
 - 1.2.1 Introduction
 - 1.2.1.1 Windows Overview
 - 1.2.1.2 Windows 3.1 vs Windows 95
 - 1.2.1.3 System Requirements.
 - 1.2.2 Starting Windows
 - 1.2.2.1 Boot Process
 - 1.2.2.2 Location of Key Windows 95 Files
 - 1.2.2.3 Logging on to Windows
 - 1.2.3 Using Windows 95
 - 1.2.3.1 The Start Button and Taskbar
 - 1.2.3.2 Shutting Down Your Computer
 - 1.2.3.3 Recycle Bin
 - 1.2.3.4 My Computer
 - 1.2.3.5 Explorer
 - 1.2.3.6 Shortcuts
 - 1.2.3.7 Briefcase
 - 1.2.3.8 Canceling A Print Job

OS 2.0 Installation, Configuration/Upgrading, Memory Management

- 2.1 DOS
 - 2.1.1 Managing Memory
 - 2.1.1.1 Main Memory Overview
 - 2.1.1.2 Optimizing Memory
 - 2.1.1.3 Memory Management Software (MEMMAKER)
 - 2.1.1.4 Upgrading Software
- 2.2 Windows 95/98
 - 2.2.1 Installation
 - 2.2.1.1 Pre-Installation Procedures
 - 2.2.1.2 Installation Procedures
 - 2.2.1.3 Installing New Applications.
 - 2.2.2 Memory Management
 - 2.2.2.1 Overview
 - 2.2.2.2 System Resources
 - 2.2.2.3 Virtual Memory
 - 2.2.2.4 Optimizing Your System
 - 2.2.3 Configuring & Customizing
 - 2.2.3.1 Changing System Settings
 - 2.2.3.2 The Registry
 - 2.2.3.3 Customize WIN95's Bootup

- 2.2.3.4 Hide Control Panel Icons
- 2.2.3.5 Hide the Taskbar
- 2.2.3.6 Recreate Standard Group Folders
- 2.2.3.7 Setting Up a Printer
- 2.2.3.8 Changing or Re-installing a Printer Driver
- 2.2.3.9 Installing Software
- 2.2.3.10 Creating a New Startup Disk
- 2.2.3.11 Installing Hardware Drivers
- 2.2.3.12 Change and Configuring Video

OS 3.0 Diagnosing and Troubleshooting

- 3.1 DOS
 - 3.1.1 Data Recovery Software
 - 3.1.2 Backup Utilities / Software
 - 3.1.3 Anti-Virus Software
 - 3.1.4 Troubleshooting DOS Boot Configuration
- 3.2 Troubleshooting Windows 95/98
 - 3.2.1 Windows Installation Troubleshooting
 - 3.2.2 Error Messages
 - 3.2.3 Generic Troubleshooting
 - 3.2.4 Improving overall performance:
 - 3.2.5 Troubleshooting Specific Startup Errors
 - 3.2.6 Bypassing Startup Files
 - 3.2.7 Booting with Diagnostic Switches
 - 3.2.8 System Properties Troubleshooting
 - 3.2.9 Using Help Troubleshooters
 - 3.2.10 Force Windows 3.1X Application Compatibility
 - 3.2.11 EXTRACT
 - 3.2.12 Printing Problems
 - 3.2.13 Video Problems
 - 3.2.14 Device Manager
 - 3.2.15 Checking Specific Driver Problems
 - 3.2.16 Closing Failed Programs

OS 4.0 Networks

- 4.1 The Concept of Networking
 - 4.1.1 Fundamental Requirements of Networking:
 - 4.1.2 Major Types of Networks
- 4.2 DOS for Networking
 - 4.2.1 Why DOS is important in network environments
 - 4.2.2 DOS commands used in the network environment
- 4.3 Windows 95/98
 - 4.3.1 Network Requirements
 - 4.3.2 Network Neighborhood
 - 4.3.3 Sharing Drives and Printers
- 4.4 Workstation Installation and Configuration
 - 4.4.1 Windows 95/98 peer-to-peer workstation.
 - 4.4.2 Windows 95/98 workstation.
 - 4.4.3 Windows NT workstation.
 - 4.4.4 Installing applications from the server.

OS 1.0 Internet

- 1.1 Internet overview
- 1.2 Internet Terms
- 1.3 Making an Internet Connection
 - 1.3.1 Windows 95/98 workstation.
- 1.4 Searching the Internet.
- 1.5 Locating Internet Resources
- 1.6 Troubleshooting Internet Connections

Hardware

HW 1.0 Installation, Configuration, and Upgrading

- 1.1 Understanding Computer Basics
 - 1.1.1 Hardware vs software?
 - 1.1.2 Basic Hardware Components
 - 1.1.3 Types of Computers
 - 1.1.4 How Computers Work
- 1.2 Identify PC Features
 - 1.2.1 Chip Package Types
 - 1.2.2 RAM vs ROM
 - 1.2.3 Floppy Disk Drives
 - 1.2.4 Hard Disk Drives
 - 1.2.5 Power Supply
 - 1.2.6 Keyboard
 - 1.2.7 Mouse
 - 1.2.8 Monitor
- 1.3 Basic Tools
 - 1.3.1 Hand Tools
 - 1.3.2 Spare Parts
 - 1.3.3 Documentation
 - 1.3.4 Drive Setup Software
 - 1.3.5 Disk Maintenance Software
- 1.4 Disassembling / Reassembling the PC
 - 1.4.1 General PC Disassembly
 - 1.4.2 General PC Reassembly
 - 1.4.3 Common Reassembly Mistakes
- 1.5 Installing Peripherals
 - 1.5.1 Configuring New Circuit Boards
 - 1.5.2 Resolving Device Conflicts
 - 1.5.3 Configuring Adapters with Software
 - 1.5.4 Plug and Play (PnP)
 - 1.5.5 Serial Ports
 - 1.5.6 Parallel Ports
 - 1.5.7 Universal Serial Bus (USB)
- 1.6 Managing Disks
 - 1.6.1 Hard Disk (and Floppy Disk) Preventive Maintenance
 - 1.6.2 Caring for Floppy Disks
 - 1.6.3 Caring for CD-ROM Discs
- 1.7 Installing Floppy Disk Drives
- 1.8 Hard Disk Drive Overview
 - 1.8.1 Hard Disk Terms
 - 1.8.2 IDE / EIDE Drive Interfaces
 - 1.8.3 SCSI
- 1.9 Hard Drive Installation
 - 1.9.1 IDE / EIDE Hard Disk Installation

- 1.9.2 Installing a Second IDE Drive
- 1.9.3 SCSI Drive Installation
- 1.9.4 Hard Disk Software Installation
- 1.10 CD-ROM Installation
 - 1.10.1 How a CD-ROM Drive Works
 - 1.10.2 How a DVD-ROM Drive Works
 - 1.10.3 Installing a CD-ROM or (DVD-ROM) Drive
- 1.11 MODEMS
 - 1.11.1 Terminology
 - 1.11.2 How modems work
 - 1.11.3 Installing a modem
- 1.12 Displays
 - 1.12.1 Specifications
 - 1.12.2 Power Management System
 - 1.12.3 LCD Displays
 - 1.12.4 Definitions
- 1.13 Power Supplies / Power Protection
 - 1.13.1 Form Factor (AT vs ATX, etc.)
 - 1.13.2 Uninterruptible Power Supplies (UPS)
 - 1.13.3 Surge Suppressors
 - 1.13.4 Batteries

HW 2.0 Diagnosing and Troubleshooting

- 2.1 Basic Tools
 - 2.1.1 Diagnostic Tools
 - 2.1.2 Digital Multi-Meter (DMM)
 - 2.1.3 Diagnostic Software
- 2.2 Troubleshooting Basics
 - 2.2.1 General Troubleshooting Rules
 - 2.2.2 The Boot Process
 - 2.2.3 POST Error Codes
 - 2.2.4 Clean Boot
 - 2.2.5 The Troubleshooting Process
 - 2.2.6 Common problems
- 2.3 Troubleshooting Image Problems
- 2.4 Troubleshooting Floppy Drive Problems
- 2.5 Troubleshooting Hard Drive Installation Problems
- 2.6 Troubleshooting CD-ROM Installation Problems
- 2.7 Troubleshooting MODEMS
- 2.8 Troubleshooting Power Supplies

HW 3.0 Safety and Preventive Maintenance

- 3.1 General Safety
 - 3.1.1 Electrical Safety
 - 3.1.2 Electrostatic Discharge (ESD)
 - 3.1.3 Electromagnetic Interference (EMI)
 - 3.1.4 Fire Safety
 - 3.1.5 Physical Safety
 - 3.1.6 Fiber Optic Cable
 - 3.1.7 Magnets
- 3.2 CD-ROM Safety and Maintenance Issues

HW 4.0 Motherboard/Processors/Memory

- 4.1 Identify function of Motherboard Components:

- 4.1.1 Central Processing Unit (CPU)
- 4.1.2 Numeric Processing Unit (NPU)
- 4.1.3 Basic Input/Output System (BIOS)
- 4.1.4 CMOS
- 4.1.5 Main Memory (RAM)
- 4.1.6 System Timer (System Clock)
- 4.1.7 Real Time Clock / Calendar
- 4.1.8 Expansion Bus
- 4.1.9 Expansion Cards
- 4.1.10 I/O Ports
- 4.2 CPUs and BUSES
 - 4.2.1 Types of CPUs
 - 4.2.2 Clock Speed
 - 4.2.3 CPU Speed
 - 4.2.4 Data Path
 - 4.2.5 CPU Performance
 - 4.2.6 Math Coprocessor
 - 4.2.7 CPU Cache
 - 4.2.8 CPU voltages
 - 4.2.9 Sockets and Slots
 - 4.2.10 CPU Operating Modes
 - 4.2.11 Expansion BUS Architecture
 - 4.2.12 BUS Performance
 - 4.2.13 BUS Mastering
- 4.3 Semiconductor Memory
 - 4.3.1 RAM / ROM
 - 4.3.2 Memory Chips
 - 4.3.3 Memory Organization
 - 4.3.4 Parity
 - 4.3.5 Access Time
 - 4.3.6 Memory Installation Rules
 - 4.3.7 SIMM/DIMM Capacities
 - 4.3.8 Cache
 - 4.3.9 Types of RAM

HW 5.0 Printers

- 5.1 Dot Matrix Operation, Troubleshooting and Preventative Maintenance
- 5.2 INKJET Operation, Troubleshooting and Preventative Maintenance
- 5.3 LASER Operation, Troubleshooting and Preventative Maintenance

HW 6.0 Portable Systems

- 6.1 Identify Laptop Components

HW 7.0 Basic Networking

- 7.1 Network Design and Architecture
 - 7.1.1 Standard Topologies
 - 7.1.2 Access Methods
 - 7.1.3 Communication
- 7.2 Connecting Network Components
 - 7.2.1 Transmission Media
 - 7.2.2 Common Characteristics
 - 7.2.3 Signal Transmission

- 7.2.4 Primary Cable Types
- 7.2.5 Common Network Problems
- 7.3 Hardware Considerations
 - 7.3.1 Buses
 - 7.3.2 RAM
 - 7.3.3 Network Interface Card (NIC)
 - 7.3.4 Hubs
 - 7.3.5 Hard drives
 - 7.3.6 Antivirus Protection
 - 7.3.7 Bottlenecks

(end of competencies listings)

Recommend a minimum of one-year experience in electronics or electronic equipment servicing and repair. High school level education or higher with basic mathematics skills.

Suggested Course Length (80 hours) theory and lab

Recommended study material:

A Guide to Designing and Implementing Local and Wide Area Networks, Michael Palmer and Robert B. Sinclair-Course Technology, ISBN-0-7600-1093-5

Mastering Local Area Networks-Christa Anderson and Mark Minasi, Sybex Network Press-ISBN 0-7821-2258-2

Systems and Networks-Ray Horak and Mark Miller, M&T Books-Network Technologies Series-ISBN 1-55851-485-6

Troubleshooting, Maintaining & Repairing PCs, Fourth Edition, 2000, McGraw-Hill, Bigelow, Stephan J. (ISBN-007-212-6868)

LAN Wiring, 2nd Ed; James Trulove; 500 pp; \$44.95; #135776-9; 1-800-2-MCGRAW

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