

LAST REVIEW: 2008-2009
(i.e. 2003-2004)

NEXT REVIEW: 2014-2015
(i.e. 2008-2009)

STATUS: A
(A, I, D)

COURSE TITLE: A+ Practical

COMMON COURSE NUMBER:

CREDIT HOURS: 3

CONTACT HOUR BREAKDOWN
(per 16 week term)

CLOCK HOURS:
(Voc. Course ONLY)

Lecture: 36 Lab: 12

Clinic: 0 Other: 0

PREREQUISITE(S): CTS1133C (with a grade of C or higher)

COREQUISITE(S):

PRE/COREQUISITE(S):

COURSE DESCRIPTION *(750 characters, maximum):*

This course provides students with the skills required to install, configure, upgrade, and maintain PC workstations, the Windows OS and SOHO networks, in addition the student will be able to will utilize troubleshooting techniques and tools to effectively and efficiently resolve PC, OS, and network connectivity issues and implement security practices.

General Education Requirements – Associate of Arts Degree (AA), meets Area(s): Area
General Education Requirements – Associate in Science Degree (AS), meets Area(s): Area
General Education Requirements – Associate in Applied Science Degree (AAS), meets Area(s): Area

UNIT TITLES

- 1. Advanced Hardware**
- 2. Advanced Operating Systems**
- 3. Advanced Networking**
- 4. Advanced Security**

EVALUATION:

Please provide a brief description (250 characters maximum) that details how students will be evaluated on the course outcomes.

Evaluation instruments will include written and/or skills-based examination and individual in-class and/or take-home assignments. Evaluation methods may also include group in-class and/or take-home assignments.

Common Course Number: CTS2131C

UNITS

Unit 1

General Outcome:

1.0 The student shall: Understand advanced hardware

Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the student shall be able to:

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

- Storage devices
 - HDD
 - SATA
 - PATA
 - Solid state
 - FDD
 - Optical drives
 - CD / DVD / RW / Blu-Ray
 - Removable
 - External
- Motherboards
 - Jumper settings
 - CMOS battery
 - Advanced BIOS settings
 - Bus speeds
 - Chipsets
 - Firmware updates
 - Socket types
 - Expansion slots
 - Memory slots
 - Front panel connectors
 - I/O ports
 - Sound, video, USB 1.1, USB 2.0, serial, IEEE 1394 / Firewire, parallel, NIC, modem, PS/2)

- Power supplies
 - Wattages and capacity
 - Connector types and quantity
 - Output voltage
- Processors
 - Socket types
 - Speed
 - Number of cores
 - Power consumption
 - Cache
 - Front side bus
 - 32bit vs. 64bit
- Memory
- Adapter cards
 - Graphics cards
 - Sound cards
 - Storage controllers
 - RAID cards (RAID array – levels 0,1,5)
 - eSATA cards
 - I/O cards
 - Firewire
 - USB
 - Parallel
 - Serial
 - Wired and wireless network cards
 - Capture cards (TV, video)
 - Media reader
- Cooling systems
 - Heat sinks
 - Thermal compound
 - CPU fans
 - Case fans

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

- Storage devices
 - HDD
 - SATA
 - PATA
 - Solid state
 - FDD
 - Optical drives
 - CD / DVD / RW / Blu-Ray
 - Removable
 - External

- Motherboards
 - Jumper settings
 - CMOS battery
 - Advanced BIOS settings
 - Bus speeds
 - Chipsets
 - Firmware updates
 - Socket types
 - Expansion slots
 - Memory slots
 - Front panel connectors
 - I/O ports
 - Sound, video, USB 1.1, USB 2.0, serial, IEEE 1394 / Firewire, parallel, NIC, modem, PS/2)
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 - 32bit vs. 64bit
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- Adapter cards
 - Graphics cards
 - Sound cards
 - Storage controllers
 - RAID cards (RAID array – levels 0,1,5)
 - eSATA cards
 - I/O cards
 - Firewire
 - USB
 - Parallel
 - Serial
 - Wired and wireless network cards
 - Capture cards (TV, video)
 - Media reader
- Cooling systems
 - Heat sinks
 - Thermal compound
 - CPU fans
 - Case fans

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

- Components of the LCD including inverter, screen and video card
- Hard drive and memory
- Disassemble processes for proper re-assembly
 - Document and label cable and screw locations
 - Organize parts
 - Refer to manufacturer documentation
 - Use appropriate hand tools
- 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

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

- Symptoms
 - Paper jams
 - Blank paper
 - Error codes
 - Out of memory error
 - Lines and smearing
 - Garbage printout
 - Ghosted image
 - No connectivity
- Issue resolution
 - Replace fuser
 - Replace drum
 - Clear paper jam
 - Power cycle
 - Install maintenance kit (reset page count)
 - Set IP on printer
 - Clean printer

Common Course Number: CTS2131C

Unit 2

General Outcome:

2.0 The student shall: Understand advanced operating systems

Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the student shall be able to:

2.1 Select the appropriate commands and options to troubleshoot and resolve problems

- MSCONFIG
- DIR
- CHKDSK (/f /r)
- EDIT
- COPY (/a /v /y)
- XCOPY
- FORMAT
- IPCONFIG (/all /release /renew)
- PING (-t -l)
- MD / CD / RD
- NET
- TRACERT
- NSLOOKUP
- [command name] /?
- SFC

2.2 Differentiate between Windows Operating System directory structures (Windows 2000, XP and Vista)

- User file locations
- System file locations
- Fonts
- Temporary files
- Program files
- Offline files and folders

2.3 Given a scenario, select and use system utilities / tools and evaluate the results

- Disk management tools
 - DEFRAG
 - NTBACKUP
 - Check Disk

- Disk Manager
 - Active, primary, extended and logical partitions
 - Mount points
 - Mounting a drive
 - FAT32 and NTFS
 - Drive status
 - Foreign drive
 - Healthy
 - Formatting
 - Active unallocated
 - Failed
 - Dynamic
 - Offline
 - Online
- System monitor
- Administrative tools
 - Event Viewer
 - Computer Management
 - Services
 - Performance Monitor
- Devices Manager
 - Enable
 - Disable
 - Warnings
 - Indicators
- Task Manager
 - Process list
 - Resource usage
 - Process priority
 - Termination
- System Information
- System restore
- Remote Desktop Protocol (Remote Desktop / Remote Assistance)
- Task Scheduler
- Regional settings and language settings

2.4 Evaluate and resolve common issues

- Operational Problems
 - Windows specific printing problems
 - Print spool stalled
 - Incorrect / incompatible driver / form printing
 - Auto-restart errors
 - Bluescreen error
 - System lock-up
 - Devices drivers failure (input / output devices)
 - Application install, start or load failure
 - Service fails to start

- Error Messages and Conditions
 - Boot
 - Invalid boot disk
 - Inaccessible boot drive
 - Missing NTLDR
 - Startup
 - Device / service failed to start
 - Device / program in registry not found
 - Event viewer (errors in the event log)
 - System Performance and Optimization
 - Aero settings
 - Indexing settings
 - UAC
 - Side bar settings
 - Startup file maintenance
 - Background processes

Common Course Number: CTS2131C

Unit 3

General Outcome:

3.0 The student shall: Understand advanced networking

Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the student shall be able to:

3.1 Troubleshoot client-side connectivity issues using appropriate tools

- TCP/IP settings o Gateway
 - o Subnet mask
 - o DNS
 - o DHCP (dynamic vs.static)
 - o NAT (private and public)
- Characteristics of TCP/IP
 - o Loopback addresses
 - o Automatic IP addressing
- Mail protocol settings
 - o SMTP
 - o IMAP
 - o POP
- FTP settings
 - o Ports
 - o IP addresses
 - o Exceptions
 - o Programs
- Proxy settings
 - o Ports
 - o IP addresses
 - o Exceptions
 - o Programs
- Tools (use and interpret results)
 - o Ping
 - o Tracert
 - o Nslookup
 - o Netstat
 - o Net use
 - o Net /?
 - o Ipconfig
 - o telnet
 - o SSH
- Secure connection protocols
 - o SSH
 - o HTTPS

- Firewall settings
 - Open and closed ports
 - Program filters

3.2 Install and configure a small office home office (SOHO) network

- Connection types
 - Dial-up
 - Broadband
 - DSL
 - Cable
 - Satellite
 - ISDN
 - Wireless
 - All 802.11
 - WEP
 - WPA
 - SSID
 - MAC filtering
 - DHCP settings
 - Routers / Access Points
 - Disable DHCP
 - Use static IP
 - Change SSID from default
 - Disable SSID broadcast
 - MAC filtering
 - Change default username and password
 - Update firmware
 - Firewall
 - LAN (10/100/1000BaseT, Speeds)
 - Bluetooth (1.0 vs. 2.0)
 - Cellular
 - Basic VoIP (consumer applications)
- Basics of hardware and software firewall configuration
 - Port assignment / setting up rules (exceptions)
 - Port forwarding / port triggering
- Physical installation
 - Wireless router placement
 - Cable length

Common Course Number: CTS2131C

Unit 4

General Outcome:

4.0 The student shall: Understand advanced security

Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the student shall be able to:

4.1 Given a scenario, prevent, troubleshoot and remove viruses and malware

- Use antivirus software
- Identify malware symptoms
- Quarantine infected systems
- Research malware types, symptoms and solutions (virus encyclopedias)
- Remediate infected systems
- Update antivirus software
 - Signature and engine updates
 - Automatic vs. manual
- Schedule scans
- Repair boot blocks
- Scan and removal techniques
 - Safe mode
 - Boot environment
- Educate end user

4.2 Implement security and troubleshoot common issues

- Operating systems
 - Local users and groups: Administrator, Power Users, Guest, Users
 - Vista User Access Control (UAC)
 - NTFS vs. Share permissions
 - Allow vs. deny
 - Difference between moving and copying folders and files
 - File attributes
 - Shared files and folders
 - Administrative shares vs. local shares
 - Permission propagations
 - Inheritance
 - System files and folders
 - Encryption (Bitlocker, EFS)
 - User authentication
- System
 - BIOS security
 - Drive lock
 - Passwords
 - Intrusion detection
 - TPM