EET-1035: OPERATING SYSTEMS AND SOFTWARE FOR PC TECHNICIANS

Cuyahoga Community College

Viewing: EET-1035 : Operating Systems and Software for PC Technicians

Board of Trustees:
2013-05-23

Academic Term:
Fall 2019

Subject Code
EET - Electrical/Electronic Engineer

Course Number:
1035

Title:
Operating Systems and Software for PC Technicians

Catalog Description:
Hands-on course provides both theoretical and practical training with computer operating system setup, maintenance, upgrading, troubleshooting and support. Lab activities provide direct experience with techniques and tools used to install, configure, operate, secure and troubleshoot operating system software in desktop and mobile devices. Fundamental career training for computer service technicians.

Credit Hour(s):
4

Lecture Hour(s):
3

Lab Hour(s):
2

Requisites

Prerequisite and Corequisite
EET-1015 Introduction to Computer Maintenance and Repair, or concurrent enrollment.

Outcomes

Course Outcome(s):
Identify, install, configure, operate and troubleshoot various Microsoft Operating Systems

Objective(s):
1. Compare and contrast the features and requirements of various Microsoft Operating Systems.
2. Given a scenario, install, and configure the operating system using the most appropriate method.
3. Given a scenario, use appropriate command line tools.
4. Given a scenario, use appropriate operating system features and tools.
5. Given a scenario, use Control Panel utilities.
6. Setup and configure Windows networking on a client/desktop.
7. Perform preventive maintenance procedures using appropriate tools.
8. Explain the differences among basic OS security settings.
9. Explain the basics of client-side virtualization.

Course Outcome(s):
Identify, select, install, configure and implement security methods and applications

Objective(s):
1. Apply and use common prevention methods.

2. Compare and contrast common security threats.
3. Implement security best practices to secure a workstation.
4. Given a scenario, use the appropriate data destruction/disposal method.
5. Given a scenario, secure a Small Office/Home Office (SOHO) wireless network.
6. Given a scenario, secure a Small Office/Home Office (SOHO) wired network.

Course Outcome(s):

Identify, install, configure, operate/maintain and troubleshoot mobile electronic devices

Objective(s):

1. Explain the basic features of mobile operating systems.
2. Establish basic network connectivity and configure email.
3. Compare and contrast methods for securing mobile devices.
4. Compare and contrast hardware differences in regards to tablets and laptops.
5. Execute and configure mobile device synchronization.

Course Outcome(s):

Describe, explain and utilize troubleshooting procedures employed in computer maintenance occupations as related to operating systems and software applications

Objective(s):

1. Given a scenario, explain the troubleshooting theory.
2. Given a scenario, troubleshoot common problems related to motherboards, RAM, CPU and power with appropriate tools.
3. Given a scenario, troubleshoot hard drives and Redundant Arrays of Independent Disks (RAID) with appropriate tools.
4. Given a scenario, troubleshoot common video and display issues.
5. Given a scenario, troubleshoot wired and wireless networks with appropriate tools.
6. Given a scenario, troubleshoot operating system problems with appropriate tools.
7. Given a scenario, troubleshoot common security issues with appropriate tools and best practices.
8. Given a scenario, troubleshoot, and repair common laptop issues while adhering to the appropriate procedures.
9. Given a scenario, troubleshoot printers with appropriate tools.

Methods of Evaluation:

Recommended list: Quizzes, exams, labs and assignments.

Course Content Outline:

1. Operating Systems
    a. Compare and contrast the features and requirements of various Microsoft Operating Systems.
        i. DOS x.x, Windows x.x and other archived operating systems
        ii. Windows XP Home, Windows XP Professional, Windows XP Media Center, Windows XP 64-bit Professional
        iii. Windows Vista Home Basic, Windows Vista Home Premium, Windows Vista Business, Windows Vista Ultimate, Windows Vista Enterprise
        iv. Windows 7 Starter, Windows 7 Home Premium, Windows 7 Professional, Windows 7 Ultimate, Windows 7 Enterprise
        v. Windows 8 and any other current operating system
            1. Features
                a. 32-bit vs. 64-bit
                b. Surface, Metro, Aero, gadgets, user account control, bit-locker, shadow copy, system restore, ready boost, sidebar, compatibility mode, XP mode, easy transfer, administrative tools, defender, Windows firewall, security center, event viewer, file structure and paths, category view vs. classic view
                c. Upgrade paths – differences between in place upgrades, compatibility tools, Windows upgrade OS advisor
    b. Given a scenario, install, and configure the operating system using the most appropriate method.
        i. Boot methods
            1. USB
            2. CD-ROM
            3. DVD
            4. Network
        ii. Type of installations
            1. Creating image
            2. Unattended installation
            3. Upgrade
            4. Clean install

        5. Repair installation
        6. Multiboot
        7. Remote network installation
        8. Image deployment
- c. Partitioning
    - i. Dynamic
    - ii. Primary
    - iii. Extended
    - iv. Logical
- d. File system types/formatting
    - i. FAT
    - ii. FAT32
    - iii. NTFS
    - iv. CDFS
- e. Quick format vs. full format
- f. Load alternate third party drivers when necessary
- g. Workgroup vs. Domain setup
- h. Time/date/region/language settings
- i. Driver installation, software and windows updates
- j. Factory recovery partition

2. Given a scenario, use appropriate command line tools.
- a. Networking
    - i. PING
    - ii. TRACER
    - iii. NETSTAT
    - iv. IPCONFIG
    - v. NET
    - vi. NSLOOKUP
    - vii. NBTSTAT
- b. OS
    - i. TASKKILL
    - ii. BOOTREC
    - iii. SHUTDOWN
    - iv. TASKLIST
    - v. MD
    - vi. RD
    - vii. CD
    - viii. DEL
    - ix. FDISK
    - x. FORMAT
    - xi. COPY
    - xii. XCOPY
    - xiii. ROBOCOPY
    - xiv. DISKPART
    - xv. SFC
    - xvi. CHKDSK
    - xvii. [command name] /?
- c. Recovery console
    - i. Fixboot
    - ii. Fixmbr

3. Given a scenario, use appropriate operating system features and tools.
- a. Administrative
    - i. Computer management
    - ii. Device manager
    - iii. Users and groups
    - iv. Local security policy
    - v. Performance monitor
    - vi. Services

       vii. System configuration
      viii. Task scheduler
       ix. Component services
        x. Data sources
       xi. Print management
      xii. Windows memory diagnostics
     xiii. Windows firewall
     xiv. Advanced security

  b. MSCONFIG
        i. General
       ii. Boot
      iii. Services
      iv. Startup
       v. Tools

  c. Task Manager
        i. Applications
       ii. Processes
      iii. Performance
      iv. Networking
       v. Users

  d. Disk management
        i. Drive status
       ii. Mounting
      iii. Extending partitions
      iv. Splitting partitions
       v. Assigning drive letters
      vi. Adding drives
     vii. Adding arrays

  e. Other
        i. User State Migration tool (USMT), File and Settings Transfer Wizard, Windows Easy Transfer and new utilities

  f. Run line utilities
        i. MSCONFIG
       ii. REGEDIT
      iii. CMD
      iv. SERVICES.MSC
       v. MMC
      vi. MSTSC
     vii. NOTEPAD
     viii. EXPLORER
      ix. MSINFO32
       x. DXDIAG

4. Given a scenario, use Control Panel utilities.
  a. Common to all Microsoft Operating Systems
        i. Internet options
          1. Connections
          2. Security
          3. General
          4. Privacy
          5. Programs
          6. Advanced
       ii. Display/Display Settings
          1. Resolution
      iii. User accounts
      iv. Folder options
          1. View hidden files
          2. Hide extensions
          3. General options
          4. View options

    v. System
        1. Performance (virtual memory)
        2. Remote settings
        3. System protection
        4. Windows firewall
    vi. Power options
  b. Applets unique to each operating system
      i. name and function of each applet
5. Setup and configure Windows networking on a client/desktop
  a. HomeGroup, file/print sharing
  b. WorkGroup vs. domain setup
  c. Network shares/mapping drives
  d. Establish networking connections
  e. Proxy settings
  f. Remote desktop
  g. Home vs. Work vs. Public network settings
  h. Firewall settings
  i. Configuring an IP address in Windows
      i. static vs. dynamic
6. Perform preventive maintenance procedures using appropriate tools.
  a. Best practices
      i. Schedules backups
      ii. Scheduled check disks
      iii. Scheduled defragmentation
      iv. Windows updates
      v. Patch management
      vi. Driver/firmware updates
      vii. Antivirus updates
  b. Tools
      i. Backup
      ii. System restore
      iii. Check disk
      iv. Recovery image
      v. Defrag
7. Explain the differences among basic OS security settings.
  a. User and groups
  b. NTFS vs. Share permissions
  c. Moving vs. copying folders and files
  d. File attributes
  e. Shared files and folders
  f. Administrative shares vs. local shares
  g. System files and folders
  h. User authentication
  i. Single sign-on
8. Explain the basics of client-side virtualization.
  a. Purpose of virtual machines
  b. Resource requirements
  c. Emulator requirements
  d. Security requirements
  e. Network requirements
  f. Hypervisor
9. Apply and use common security methods.
  a. Physical security
      i. Lock doors
      ii. Tailgating
      iii. Securing physical documents/passwords/shredding
      iv. Biometrics
      v. Badges

      vi. Key fobs
     vii. RFID badge
    viii. Privacy filters
  b. Digital security
      i. Antivirus
     ii. Firewalls
    iii. Antispyware
    iv. User authentication/strong passwords
     v. Directory permissions
    vi. User education
  c. Compare and contrast common security threats.
      i. Social engineering
     ii. Malware
    iii. Rootkits
    iv. Phishing
     v. Shoulder surfing
    vi. Spyware
    vii. Viruses
        1. Worms
        2. Trojans
  d. Implement security best practices to secure a workstation.
      i. Setting strong passwords
     ii. Requiring passwords
    iii. Restricting user permissions
    iv. Changing default user names
     v. Disabling guest account
    vi. Screensaver required password
    vii. Disable autorun
  e. Given a scenario, use the appropriate data destruction/disposal method.
      i. Low level format vs. standard format
     ii. Hard drive sanitation and sanitation methods
    iii. Overwrite
    iv. Drive wipe
  f. Given a scenario, secure a Small Office/Home Office (SOHO) wireless network.
      i. Change default user-names and passwords
     ii. Changing SSID
    iii. Setting encryption
    iv. Assign static IP addresses
     v. DHCP basic settings

10. Explain the basic features of mobile operating systems.
  a. Open source vs. closed source/vendor specific
  b. App source
  c. Screen orientation (accelerometer/gyroscope)
  d. Screen calibration
  e. GPS and geotracking
  f. Firmware

11. Compare and contrast current and historical mobile operating system technologies.
  a. Apple
  b. Microsoft
  c. Blackberry
  d. Android
  e. any open or closed sourced current operating system

12. Given a scenario, explain the troubleshooting theory.
  a. Identify the problem
      i. Question the user and identify user changes to computer and perform backups before making changes
  b. Establish a theory of probable cause (question the obvious); scientific method.
  c. Test the theory to determine cause

    i. Once theory is confirmed determine next steps to resolve problem
    ii. If theory is not confirmed re-establish new theory or escalate
  d. Establish a plan of action to resolve the problem and implement the solution
  e. Verify full system functionality and if applicable implement preventive measures
  f. Document findings, actions and outcomes

* significant portions of this outline map out exactly to the CompTIA 802 A+ objectives.

Resources

Andrews, J. *A+ guide to managing and maintaining your PC.* 7th. Boston:Course Technology, 2010.

Pyles, J. *CompTIA A+ complete lab manual.* 1st. Hoboken:Wiley, 2012.

Meyers, M. *Mike Meyer's CompTIA A+ guide to managing and troubleshooting PCs.* 4th. NY:McGraw Hill, 2013.

Beisse, F. *A guide to computer user support for help desk and support specialists.* 5th. Boston:Course Technology, 2013.

Dale, Nell and John Lewis. *Computer Science Illuminated.* 5th. Burlington, MA : Jones and Bartlett Learning, 2012.

Resources Other

http://www.microsoft.com
http://www.comptia.org

Top of page
Key: 1596