Course Outline

- Identifying Computer Hardware
- Identifying Computer Software
- Setting Up a Basic Workstation
- Configuring Network Access
- Working with Files, Folders, and Applications
- Configuring and Using Wireless Devices
- Securing Computing Devices
- Supporting Computers and Users
Identifying Computer Hardware

- Identify Types of Computing Devices
- Identify Internal Computer Components
- Common Computer Connector Types
- Identify Common Peripheral Devices
Computing Devices

- Desktop system
  - System Unit
  - Display Device
  - External Device
  - Input Devices

- Smartphone
- Tablet
- Laptop
Personal Computers

- Computing device for one
- Used in offices, homes, and schools
- Used for a variety of functions
  - Run software applications
  - Access the Internet
  - Communicate with others via email
  - Create new applications
  - Play games
  - Conduct research
- Only limited by imagination and hardware computing power
Desktop Computers
Laptops
Tablets

- Apple's iPad® and iPod® touch
- Amazon™ Kindle Fire™
- Samsung™ Galaxy tablets
- Toshiba Excite™
- Acer® ICONIA TAB
- ASUS Eee Slate
- Samsung™ Series 7 tablet
- Microsoft® Surface™
- BlackBerry® PlayBook™
Smartphones

- Apple iPhone®
- Samsung™ Galaxy® Note
- Motorola® Moto X
- HTC One™
- Google™ Nexus
- Nokia™ Lumia Icon
- Blackberry® Z30
Servers

General purpose

Dedicated
Other Computing Devices

- Super computers
- Mainframes
- eBook readers
- PDAs
- Media players
The Motherboard
CPUs
Power Supply

External view

- Power switch
- Voltage switch
- Socket for power cord
- Fan

Internal view

Wires from the power supply to the system board and drives
RAM
## Memory Measurement Units

<table>
<thead>
<tr>
<th>Memory Unit</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Byte</td>
<td>One character. A byte consists of 8 bits.</td>
</tr>
<tr>
<td>Kilobyte (KB)</td>
<td>1,024 bytes or 8,192 bits constitute 1 KB.</td>
</tr>
<tr>
<td>Megabyte (MB, Meg, or M)</td>
<td>1,048,576 bytes or 1,024 KB constitute 1 MB.</td>
</tr>
<tr>
<td>Gigabyte (GB)</td>
<td>1,073,741,824 bytes or 1,024 MB constitute 1 GB.</td>
</tr>
<tr>
<td>Terabyte (TB)</td>
<td>1,099,511,627,776 bytes or 1,024 GB constitute 1 TB.</td>
</tr>
</tbody>
</table>
### Storage Devices

<table>
<thead>
<tr>
<th>Storage Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hard Disk Drive (HDD)</strong></td>
<td>Devices that store data digitally on non-removable magnetic coated disks that are rotated underneath a read/write head.</td>
</tr>
<tr>
<td><strong>Solid State Drive (SSD)</strong></td>
<td>Devices, such as flash drives, contain no moving parts and store data in non-volatile memory instead magnetic drives.</td>
</tr>
<tr>
<td><strong>Optical Drives</strong></td>
<td>Devices, such as CDs, DVDs, or Blu-ray discs, that store data optically rather than magnetically.</td>
</tr>
</tbody>
</table>
Expansion Cards

- Cooling Fan
- Ports
- Connector
Cooling Systems

Fan

Heat sink
Computer Connections

USB Connector

Cable
PS/2 Ports

Mouse and Keyboard Ports
Serial Connections

25-pin serial port on a serial device

25-pin end of serial cable connects to modem and 9-pin end connects to computer’s serial port
Parallel Connections

Parallel Connector

Parallel Cable
Power Connectors

ATX

Berg

Molex

SATA
USB Connections

Type B connector connects to USB device

Type A connector connects to USB port on the computer or on a hub
IEEE 1394 and FireWire Connections

FireWire Port

FireWire Device

FireWire 6-Pin Connector
Thunderbolt Connections

- Developed by Apple and Intel
- Carries data and display on a single cable
- Works with PCI and DisplayPort
- Can power peripherals with 10 watts of power
- Data transfer rate of about 10 Gbps
- Peripherals can be daisy-chained together
Audio Ports and Connections

- Single-core/shielded cable
- One pair/shielded cable
- TS and TRS connectors
- 3-pin XLR connectors
Video Ports and Connectors

- VGA
- DVI
- HDMI
- Mini-HDMI
- S-Video
- Component/RGB
- Composite video
- Coaxial
- DisplayPort
- RCA
- BNC
eSATA

- External interface for SATA connections
- Connects external storage devices
- Provides fast data transfer rates
- Storage devices require their own power connector
RJ-11 Connector

- Used for telephones
- Has 4 or 6 pins
- Not suitable for network connectivity
Peripheral Devices

- **Input**
  - Mouse
  - Keyboard

- **Output**
  - Display
  - Speakers
  - Printer

- **Storage Devices**
  - Flash Drive
  - External Hard Drive
Input Devices
Keyboards

- Standard Keyboards
- Ergonomic Keyboard
- Dvorak Keyboard
Other Input Devices
Output Devices
Types of Printers

- Laser
- Inkjet
- Thermal
Types of Display Devices

- CRT
- LCD
- LED
- OLED
- Plasma
- Projector
Input/Output Devices

- Fax devices
- External storage devices
  - Flash drive
  - External hard drive
  - Optical discs and drives
  - Network attached storage
  - Memory card
  - Mobile media
  - Smartphone
- Touchscreens
Reflective Questions

1. How many of the personal computer components described are familiar to you?

2. Which of the device connections discussed have you worked with before? Which were new?
Identify Computer Software

- Compare Functions and Features of Common Operating Systems
- Identify Application Software
Operating System Functions

- Provides a user-friendly environment to work with system features and applications
- Converts user input and sends it to the monitor or other display device
- Controls peripheral devices
- Provides the structure for files and folders
- Monitors the operating system’s health and functionality
Licensing

- Open source
- Freeware
- Commercial
- Copyleft
- Shareware
Types of Operating Systems for Workstations

- Windows
- Mac OS X
- Linux
- Chrome OS
Types of Operating Systems for Mobile Devices

- Apple iOS
- Android OS
- Blackberry OS
- Firefox OS
- Windows Phone OS
Operating System Compatibility Issues

- **Hardware**
  - Windows Upgrade Assistant
- **Architecture (32-bit and 64-bit)**
  - Hardware
  - Applications
  - Drivers
Application Platforms

- Mobile
- Desktop
- Web-based
Productivity Software

- Word processing
- Spreadsheet
- Email
- Database
- PDF
- Presentation
- Desktop publishing
- Personal information managers
- Remote desktop
Collaboration Software

- Online workspace
- Document storage/sharing
- Screen sharing
- Video conferencing
- Instant messaging
- Email
Utility Software

- Anti-malware
- Firewalls
- Diagnostic/Maintenance
- Compression
Specialized Software

- Computer-aided design (CAD)
- Graphic design
- Medical
- Scientific
- Financial
- Gaming
- Entertainment
Common File Types and Extensions

- **Documents**

- **Audio**
  - .aac, .flac, .m4a, .mp3, .wav

- **Images**
  - .bmp, .gif, .jpg/.jpeg, .png, .tiff/.tif

- **Video**
  - .avi, .flv, .mp4, .mpg/.mpeg, .wmv

- **Executables**
  - .app, .bat, .com, .exe, .msi, .scexe

- **Compression formats**
  - .iso, .dmg, .gzip/.gz, .jar, .rar, .7zip/.7z, .tar, .zip
Reflective Questions

1. With which type of operating system (mobile, desktop, or web-based) do you have the most experience? Which do you have the least experience using?

2. List one software application that you use most frequently. Which of its features do you like the most?
Setting Up a Basic Workstation

- Connect Hardware
- Install and Configure Operating Systems
- Install and Configure Applications
- Configure Accessibility Options
1. Gather and connect hardware components.
2. Power on computer.
3. Run the operating system setup utility as needed.
4. Configure peripherals as needed.
5. Configure and verify the Internet connection as needed.
6. Install security software.
7. Install and remove applications as needed.
8. Update operating system, security, and application software as needed.
9. Configure user accounts as needed.
10. Manage cables.
Cable Management

- Computer cords and cables can be a possible safety hazard, and can become disorganized and unsightly.
- **Cable management tips:**
  - Use cord protectors when cords and cables must be on the floor where people need to walk.
  - Use Velcro strips, twist ties, or binder clips to gather cables so that they take up less space in your work area.
Operating System Hardware Requirements

- Minimum RAM
- Minimum hard disk space
- Minimum display resolution
- Any required hardware
  - Keyboard
  - Mouse
Operating System Installation Programs

- Window setup wizard
- System image
  - ISO file
  - Virtual machine
  - USB stick image
Common OS Configuration Parameters

- Date
- Time zone
- Language
- Keyboard type
- Screen resolution
- Audio settings
Multiple User Accounts

- A user account is an information profile that uniquely identifies a user on a computer.
- Require a user name and password.
- A user account can have different rights and permissions than other users.
Peripheral Configuration

- Control Panel
  - Devices and Printers
  - Display
  - Keyboard
  - Mouse
  - Sound
  - Speech Recognition
OS Updates

• Address security flaws and performance issues
• Often free of cost
• Types of updates
  • Patches
  • Hotfixes
  • Service Packs
  • Rollups
• Automatic updates
  • Automatic download
  • Automatic installation or manual installation
  • Disable automatic updates
Bundled Applications

- **Software suites**
  - Productivity tools
- **Programs sold with an OS or new computer**
  - Security programs
Software Inventory

- A list of all applications installed on a computer
- Manual or software-assisted
Desired Applications

- Web browser
- Email client
- Word processing software
- Security software
- Software updates, including updates to the OS
Bloatware

- Software that has lots of features and requires considerable disk space and RAM to install and run
Application Sharing

- Application sharing applies to multiple users on the same computer.
- The installer might prompt you to install “For current user” only.
- Usually, applications are available to any account that has the proper permissions.
Guidelines for Ensuring a Computer Contains Only the Necessary Applications

- Conduct a manual inventory or purchase an inventory utility and run it.
- Identify one application for each of the following:
  - A web browser
  - An email client
  - Word processing software
  - Security software
  - Software updates, including OS updates
- Remove unnecessary applications.
- Install any other necessary applications.
Accessibility

- The use of assistive technology to make computers available and easier to use
Examples of Accessibility in Other OSs

- **Mac OS X**
  - VoiceOver
  - Zoom and Cursor Size
  - Dictation
  - Invert Colors
  - Close Captions
  - Screen Flash
  - Mono Audio
  - Switch Control
  - Slow Keys
  - Sticky Keys
  - Speakable Items
  - Simple Finder
  - Text to Speech

- **Chrome OS**
  - ChromeVOX
  - Accessibility settings

- **Android OS**
  - TalkBack
  - Explore by Touch
Examples of Adaptive Technologies

- Braille translation software to convert text to Braille
- Eye-tracking devices to enable input capabilities with eye movements
- Tobii EyeMobile software to control a Windows 8 tablet with your eyes
Reflective Questions

1. If you have experience with installing and configuring operating systems, what problems did you encounter and how did you address them?

2. What applications do you feel are important to include in your personal required software list?
Configuring Network Access

- Network Connection Types
- Install and Configure a SOHO Router
- Network and Alternative Technologies
- Sharing and Storage Methods
Computers connect to communicate and share resources
Network Connection Methods

- Wireless
- Wired
- Cellular
Wired Network Connections

- Use Ethernet
- Communicate over small distances
Wireless Network Connections
Cellular Network Connections
<table>
<thead>
<tr>
<th>Network</th>
<th>Mobility Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wired</td>
<td>Low to None</td>
</tr>
<tr>
<td>Wireless</td>
<td>Medium</td>
</tr>
<tr>
<td>Cellular</td>
<td>High</td>
</tr>
</tbody>
</table>
### Availability Comparison

<table>
<thead>
<tr>
<th>Network</th>
<th>Availability Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wired</td>
<td>Medium to High</td>
</tr>
<tr>
<td>Wireless</td>
<td>Medium to High</td>
</tr>
<tr>
<td>Cellular</td>
<td>High</td>
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## Bandwidth and Throughput Comparison

<table>
<thead>
<tr>
<th>Network</th>
<th>Bandwidth and Throughput Level</th>
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</thead>
<tbody>
<tr>
<td>Wired</td>
<td>High</td>
</tr>
<tr>
<td>Wireless</td>
<td>Medium</td>
</tr>
<tr>
<td>Cellular</td>
<td>Low</td>
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</table>
## Reliability Comparison

<table>
<thead>
<tr>
<th>Network</th>
<th>Reliability Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wired</td>
<td>High</td>
</tr>
<tr>
<td>Wireless</td>
<td>Medium</td>
</tr>
<tr>
<td>Cellular</td>
<td>Low</td>
</tr>
</tbody>
</table>
## Concurrent Connections Comparison

<table>
<thead>
<tr>
<th>Network</th>
<th>Concurrent Connection Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wired</td>
<td>Medium</td>
</tr>
<tr>
<td>Wireless</td>
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