Computers

Intro to computers
• Hardware
• Operating System,
• Communication

Power → Hardware → Software

OS
Application

COMMUNICATION
Components of a desktop computer.

- **Power Supply** - An electrical transformer regulates the electricity used by the computer.
- **Central processing unit (CPU)** - The microprocessor "brain" of the computer system.
- **Memory** - RAM - Used to temporarily store information that the computer is currently working with or ROM - A permanent type of memory storage used by the computer for important data that does not change.
- **Motherboard (aka; Mainboard)** This is the main circuit board that all of the other internal components connect to.
- **Hard Disk (fixed)** - permanent storage
- **Removable Storage** (floppy, CDROM, DVD, Zip, JAZZ, MicroCards)
- **Graphics Card** - translates image data to human format (monitor display)
Computer POST Cycle

BIOS → VIDEO

COLD

YES → System Check

NO → Display Info

Load OS

BOOT
OS

Basic software that allows the user to interface with the computer.

- Manage Resources
- Consistent Application Interface

**Categories**
- Real-time operating system
- Single-user, single task
- Single-user, multi-tasking
- Multi-user

**Tasks**
- Processor management
- Memory management
- Device management
- Storage management
- Application interface
- User interface
**Processor management**

The heart of managing the processor comes down to two related issues: Ensuring that each process and application receives enough of the processor's time to function properly and using as many processor cycles for real work as is possible.

**Memory & Storage management**

- Ensure enough memory to execute, and it MUST NOT run into the memory space of another process or run into by another process.
- The different types of memory must be effectively used.
OS Details (cont.)

**Device management**

The operating system and virtually all hardware (not on the computer's motherboard) uses a special program called a **DRIVER**.

**Application interface (App/OS & App/User)**

Application Program Interfaces (APIs) let programmers use functions of the computer and operating system without having to directly track all the details CPU's operation.

Just as the API provides a consistent way for applications to use the resources of the computer system, a user interface (UI) brings structure to the interaction between a user and the computer.
Communication

Hierarchy & Structure
Switching vs. Digital
Devices
- Node (computer in our case) – NIC – Cable – Switch – Cable – Router.
- Node – NIC – Access Point (wireless) – Cable – Amplifier – Tower – Satellite
- Node (Cell Phone) – Tower – Cable – Tower / Satellite

Protocol (TCP/IP) IP Address
DNS Servers
Web Servers