

Chapter (1)

REVIEW TO THE COURSE CSC-206

1-1 Computer System: Hardware (H/W) + Software (S/W).

1-2 Computer system components

1-2-1 Central processing Unit “CPU”

- Arithmetic/Logic Unit “ALU”.
- Control Unit.

1-2-2 Main (or Primary) Memory:

- RAM.
- ROM (PROM, EPROM, EEPROM).

Criteria: - Capacity [MB= 10^6 B, GB= 10^9 B]*; - Access Time [ns= 10^{-9} s].

* Main Memory Capacity: Actually up to 8 GB.

1-2-3 Input Devices (Units)

- Keyboard - Mouse - Scanner,...
- Touch screen - Camera - Optical Character Reader,...

1-2-4 Output Devices (Units)

- **Monitors:** - CRTs - Flat Screens

Resolution: Pixels “Picture elements”: ~ 1600 pixels/column x 1200 pixels/row $\approx 2 \times 10^6$ pixels.
Dot (pixel) pitch: the distance between 2 pixels ≈ 0.3 mm. Refresh rate = 75 Hz.

- **Printers:** - Ink-jet - Laser - Thermal - Others*

Speed: Characters Per Second- [CPS]. 1 PPM (one page per minute) is about 48 CPS.

- **Other Devices:** Plotters, voice units,...

Combination Input & Output Devices: Many devices combine input and output capabilities:

- Fax Machines.
- Multifunctional Devices: They combine the capabilities of a scanner, printer, fax, and copy machine.
- Internet Telephones.
- Terminals.

* Dot-matrix, Photo printers, portable printers.

1-2-5 Auxiliary (or Secondary) Storage Devices (Units)

- o **Magnetic Disks:**

- Hard Disks (HD): up to 1 TB (for Desktops)*.
- Floppy Disks (FD): 1.44 MB.
- Compact Disks (CD-ROM): 700 MB.
- DVD (Digital Versatile Disks): 4.7 up to 17 GB.
- HI-Definition Discs: Capacity: up to 50 GB**.

Criteria: – Capacity [MB, GB], – Access Time [$\text{ms}=10^{-3} \text{ s}$],
– Transfer Rate [Mb/Sec], – Cost & Size.

- o **Other Types of Secondary Storage:** – Solid-State Storage: Flash Memory Cards; – Key Chain Flash Memory Devices. – Internet Hard Drives. – Magnetic Tape.

1-3 Types of computers

- Microcomputers or Personal Computers “PC” that involve: Desktop, Notebook (known also as Laptop) that are portable, and Handheld Computers (The Personal Digital Assistants “PDA” are the most widely used).
- Workstations
- Minicomputers.
- Mainframe Computers.
- Supercomputers.

* & up to 500 GB (for Laptops).

** 2 types: **HD DVD** with capacity: 15 to 30 GB & **Blu-Ray** (or **BDs**) with capacity: 15 to 50 GB.

1-4 Evaluation of Computer Architecture

Processing power:

- Processor speed or Clock [MHZ= 10^6 HZ, GHZ= 10^9 HZ]*.
- Number of Instructions per second [MIPS: Million Instructions per Second].

1-5 Some Selection Criteria for Computer Systems

- Software availability.
- Speed.
- Main memory capacity & other memories capacity.
- Auxiliary memory capacity.
- Availability of some options.
- Number and type of input/output devices.
- Cost & Size.
- Quality (vender or manufacture's reputation).
- Vender or manufacturer's support and service.
- Quality of the documentation or user's manuals.

* Processor speed or Clock: Actually up to 4.6 GHZ.