SNS COLLEGE OF ENGINEERING

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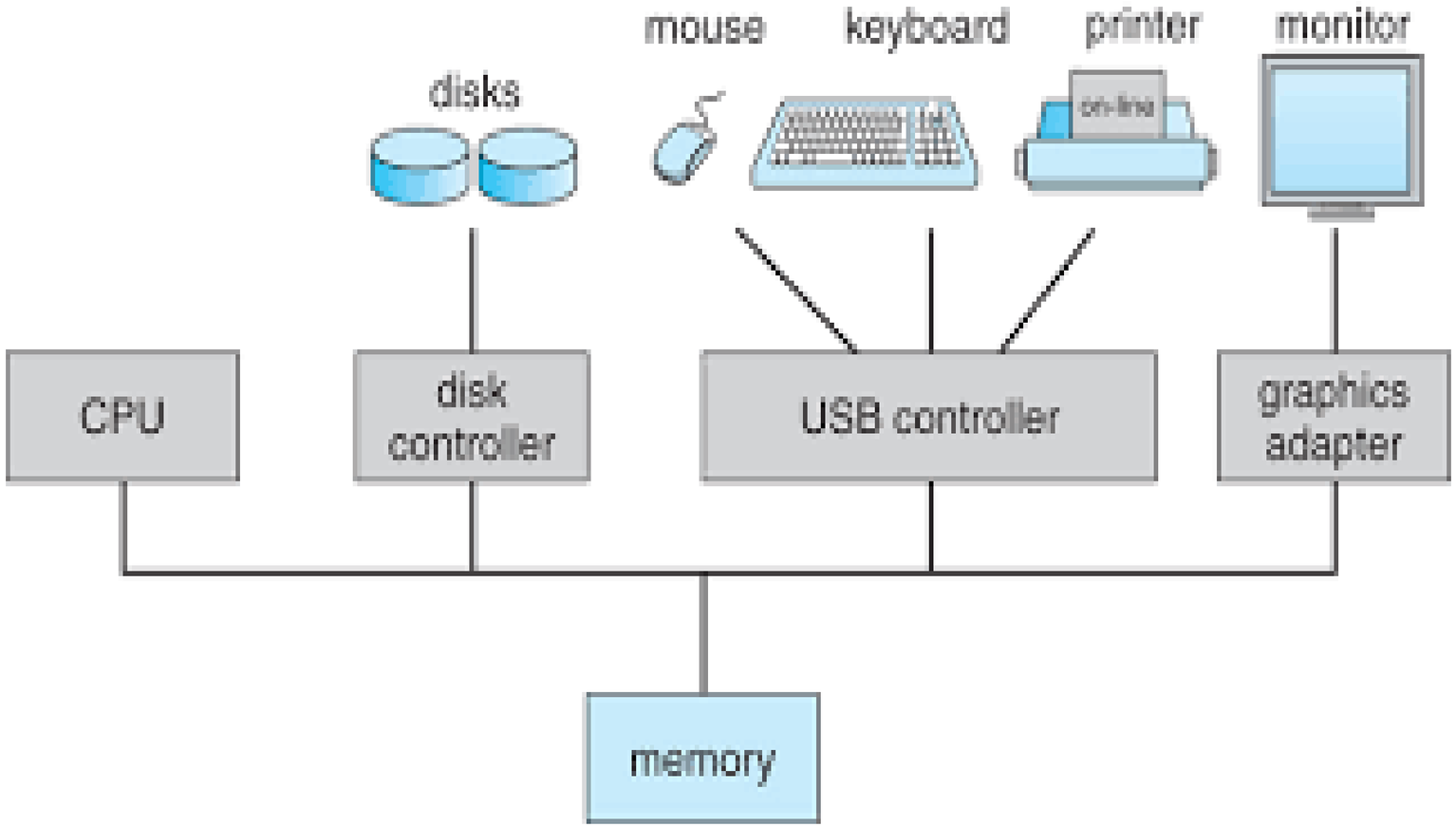
Department Of Artificial Intelligence and Data Science

Course Name – Operating Systems

II Year / IV Semester

Unit 1 COMPUTER SYSTEM OPERATIONS

A Modern Computer System



Computer System Operation

A modern general purpose computer system consists of a CPU and a number of device controllers that are connected to common system bus that provides access to shared memory

- ✓ Each device controller is in charge of specific types of device
- ✓The CPU and the device controllers can execute concurrently competing for memory cycles
- ✓To ensure orderly access to the shared memory, a memory controller is provided whose function is to synchronize access to the memory

Important terms

Bootstrap program :

- ✓ The initial program that runs when a computer is powered up or rebooted
- ✓ It is stored in the ROM
- ✓ It must know how to load the OS and start executing that system
- ✓ It must locate and load into memory the OS kernel

Interrupt:

- ✓ The occurrence of event is usually signaled by an interrupt from either hardware or software
- ✓ Hardware may trigger an interrupt at any time by sending a signal to the CPU usually by system bus

System call:

- ✓ The software may trigger an interrupt by executing a special operation called a system call (also called a monitor call)

- When the CPU is interrupted , it stops what it is doing and immediately transfers execution to a fixed location.

  - the fixed location contains the starting address where the service routine of the interrupt is loaded.

- The interrupt service routine executes
- On completion the CPU resumes the interrupted computation.

Common Functions of Interrupts

- Interrupt transfers control to the interrupt service routine generally, through the **interrupt vector**, which contains the addresses of all the service routines
- Interrupt architecture must save the address of the interrupted instruction
- Incoming interrupts are *disabled* while another interrupt is being processed to prevent a *lost interrupt*.
- A **trap** or **exception** is a software-generated interrupt caused either by an error or a user request
- An operating system is **interrupt driven**

The operating system preserves the state of the CPU by storing registers and the program counter
Determines which type of interrupt has occurred:

- **polling**
- **vectored** interrupt system

Separate segments of code determine what should be taken for each type of interrupt