Al-Mustaqbal University / College of Engineering & Technology

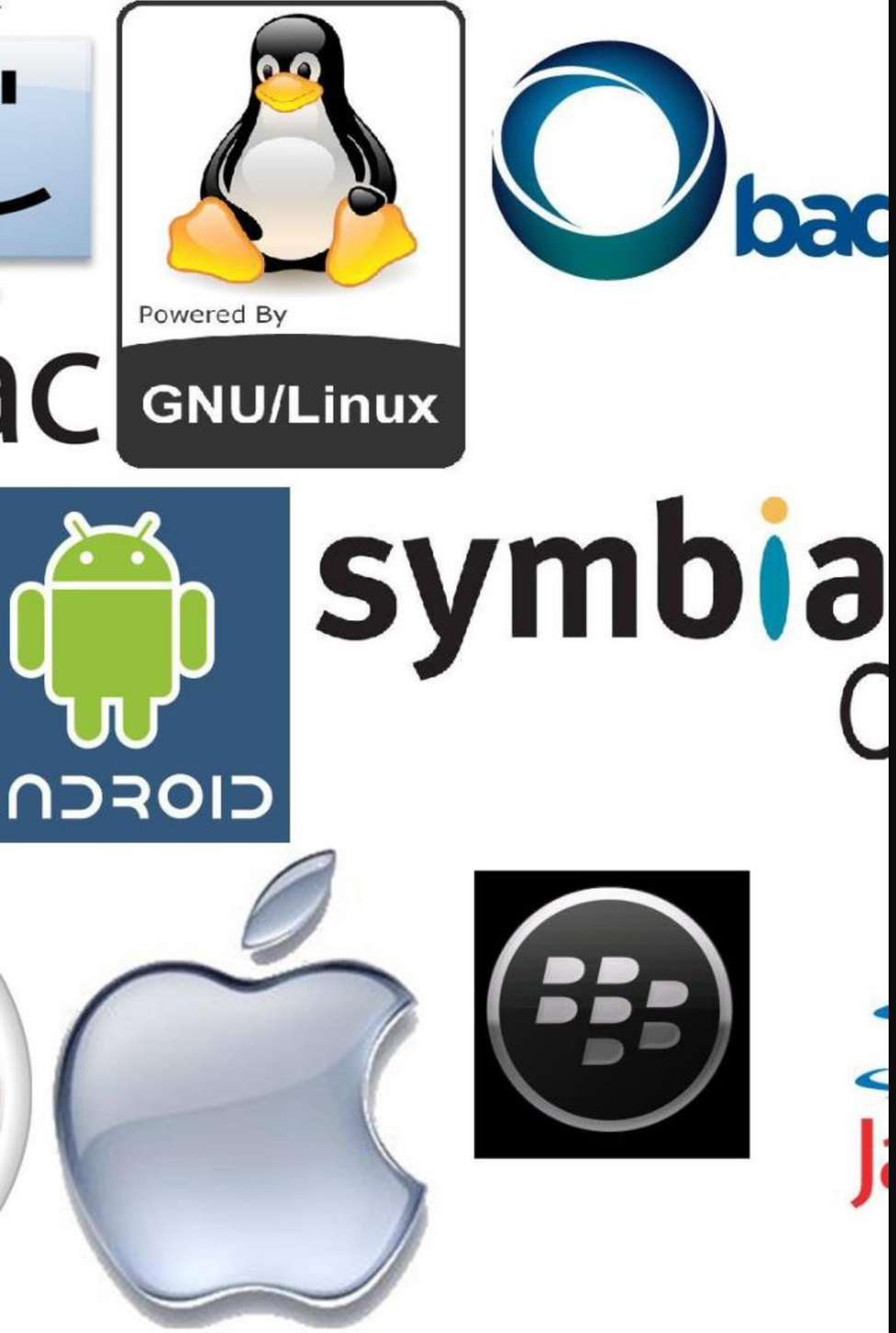
Department (prosthetics & orthotics engineering)

Class (1)

Subject (Computer Science)

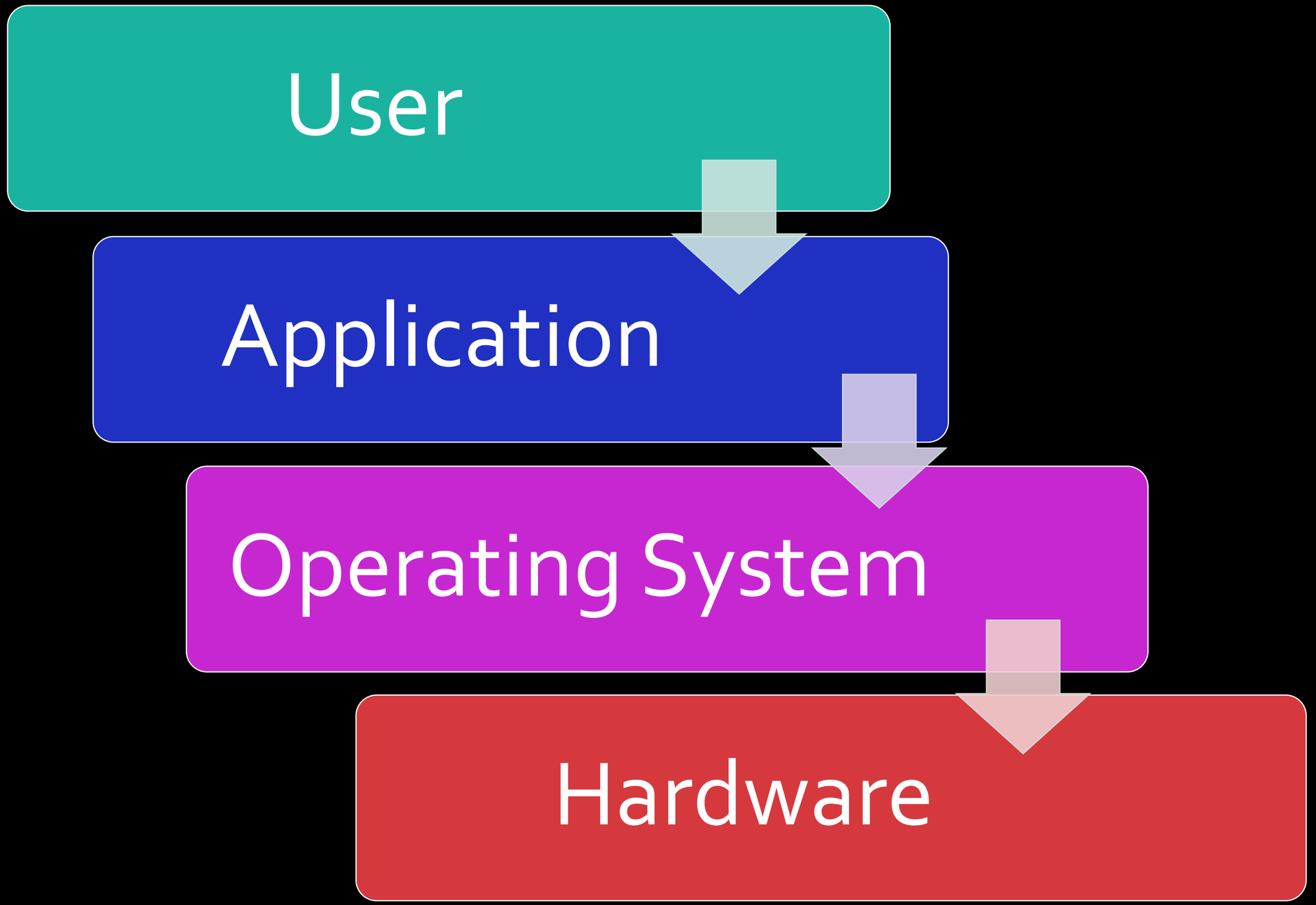
Lecturer (Assist.lect.Samah Ali)

1st term – Lecture No. 1 & Lecture Name (Introduction to Operating System)



Operating System OS

An **Operating System (OS)** is system software that manages computer hardware, software resources, and provides common services for computer programs.
It acts as an intermediary between the user and the computer hardware, allowing users to interact with the machine without needing to understand its complex inner workings.


User
Application
Operating System
Hardware

Importance of an OS in computer systems

An operating system (OS) is a crucial component of computer systems. It serves as the foundation that enables the hardware and software components to work together seamlessly. Here are some key reasons why an OS is important:

1

Resource Management:

An OS manages and allocates system resources such as CPU, memory, and storage, ensuring efficient utilization and preventing conflicts between different processes and applications.

2

User Interface:

An OS provides a user-friendly interface that enables users to interact with the computer system, allowing them to perform tasks, access files, and run applications.

3

Security and Privacy:

An OS incorporates security measures to protect the system from unauthorized access, malware, and other threats. It also ensures the privacy of user data.

4

Process Management:

An OS manages and schedules processes, allowing multiple applications to run concurrently and providing mechanisms for inter-process communication.

Types of Operating Systems

1 Real-time OS:

A real-time operating system prioritizes the execution of tasks based on their timing requirements and ensures that critical operations are completed within strict deadlines. It is commonly used in applications where timing and responsiveness are crucial, such as in aerospace, medical devices, and robotics.

2 Single-user/Multi-user

A single-user operating system is designed for individual users, providing a personal computing environment where a single user can perform tasks and run applications. On the other hand, a multi-user operating system allows multiple users to share the same system resources and run applications concurrently, making it suitable for environments like offices, universities, and servers.

3 Multi-tasking/Single-tasking OS:

A multi-tasking operating system enables users to run multiple tasks or processes simultaneously, allowing for efficient utilization of system resources and improved productivity. Users can switch between different applications and perform tasks concurrently. In contrast, a single-tasking operating system only allows one task to run at a time, requiring users to complete one task before moving on to the next.

Example of Operating Systems

Windows

Windows is a widely used operating system for personal computers. It's known for its user-friendly interface and compatibility with a wide range of software and hardware.

Linux

Linux is an open-source operating system that is known for its stability and security. It's popular among developers due to its flexibility and customizable features.

Android

Android is a mobile operating system that is widely used on smartphones and tablets. It's known for its customizable interface and the availability of a wide range of apps on the Google Play Store.

Differences Between OS and Software Applications

Definition of Operating System

An operating system (OS) is a software program that manages computer hardware and software resources and provides common services for computer programs.

Definition of Software Applications

Software applications, also known as applications or apps, are programs designed to perform specific tasks on a computer or other electronic devices.

Key Differences between OS and Software Applications

Operating System	Software Applications
An operating system is the foundation of a computer system.	Software applications are built on top of the operating system.
An operating system manages and controls the hardware resources of a computer.	Software applications perform specific tasks or provide specific functionalities.
An operating system provides a user interface and manages the execution of software applications.	Software applications interact with users and perform specific functions or operations.
An operating system is essential for the functioning of a computer.	Software applications are optional and can be installed or uninstalled based on user needs.
An operating system is responsible for the overall security and stability of a computer system.	Software applications may have their own security and stability considerations.

Powering On and Off a Computer

1

Power On

Press the power button to start the computer's booting process.

2

Operating System Loads

The OS initializes and loads all necessary components and drivers.

3

Power Off

Shut down the computer using the provided power options in the OS.

In Windows : press the start button > Power options > shutdown

Using a Mouse and Its Buttons

Left Button

- Primary button
- Mainly used for selection

Middle Button

- Scroll wheel
- Used for vertical scrolling

Right Button

- Secondary button
- Opens context menus with additional options

Thank you