Ministry of Higher Education and Scientific Research

Al-Mustaqbal University

College of Engineering

Medical Instrumentation Techniques Engineering Department

Computer Application

One Class

Weeks 1

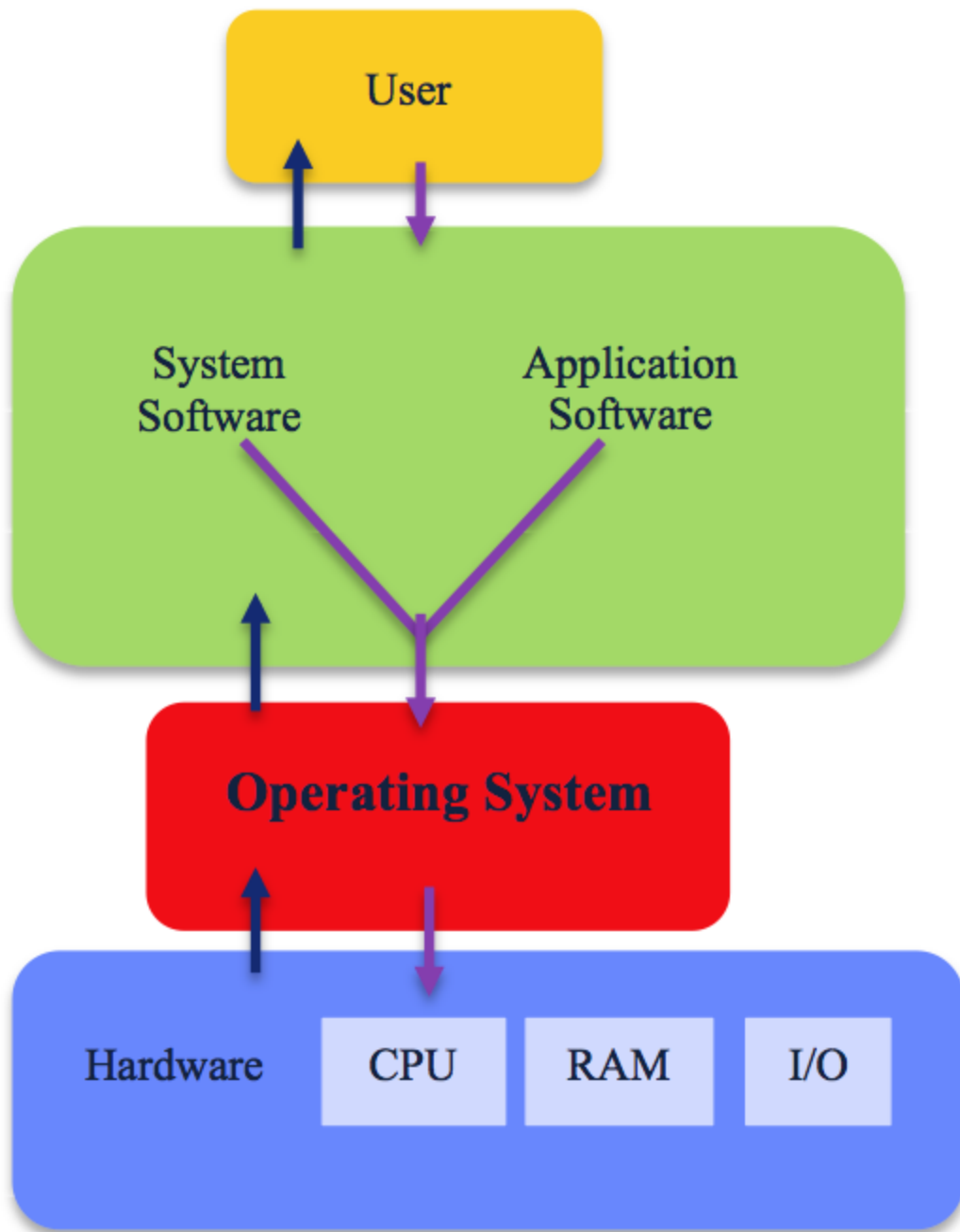# Operating System

BY M.Sc. Ali Kareem AL-Juhaishi

Introduction

An operating system is a program that acts as an interface between the computer user and computer hardware, and controls the execution of programs.

The operating system's job

The operating system (OS) manages all of the software and hardware on the computer. It performs basic tasks such as file, memory and process management, handling input and output, and controlling peripheral devices such as disk drives and printers.

Most of the time, there are several different computer programs running at the same time, and they all need to access your computer's central processing unit (CPU), memory and storage. The operating system coordinates all of this to make sure each program gets what it needs

In the image above the **User** interfaces with the **System & Application software**. The System & Application software interfaces with the **Operating System**. The Operating system interfaces with the **Hardware**. Each of these interfaces are two way transactions with each sending and receiving data

Operating systems usually come pre-loaded on any computer you buy. Most individuals use the operating system that already comes with their computer however it is possible to upgrade or change the initial operating system to suit your preference.

Different operating systems will work in different ways. They may appear visually different, have different terms for common functions and organise programs in different ways. Do not be alarmed if you find yourself using a computer at university that you are unfamiliar with – a bit of practice and you'll be well on your way

Functions of operating system :

The operating system (OS) serves as the crucial software that manages computer hardware and provides various services to both users and other software applications. Key functions include:

1. Process Management:

   - Allocating resources to running processes.

   - Managing process scheduling and execution.

2. Memory Management:

   - Allocating and deallocating memory space for programs and data.

   - Handling virtual memory and ensuring efficient use of RAM.

3. File System Management:

   - Organizing and managing files on storage devices.

   - Providing mechanisms for file storage, retrieval, and organization.

4. Device Management:

   - Managing input and output devices.

   - Handling communication with peripheral devices.

5. Security and Protection:

   - Implementing user authentication and authorization.

   - Ensuring data security and protecting against unauthorized access.

6. User Interface:

   - Providing a user-friendly interface for interaction.

   - Managing graphical user interfaces (GUI) and command-line interfaces.

7. Networking:

   - Facilitating communication between different devices in a network.

   - Managing network protocols and connections.

8. Error Handling:

   - Detecting and responding to errors that occur during operation.

   - Implementing mechanisms for fault tolerance.

9. Control over System Performance:

   - Monitoring system performance and resource usage.

   - Optimizing resource allocation for efficiency.

10. Job Scheduling:

   - Managing the execution sequence of various tasks or jobs.

   - Ensuring efficient utilization of system resources.

In summary, the operating system acts as an intermediary between hardware and software, providing a unified environment for efficient and secure computing.

Differences between operating systems and software applications:

System Software	Application Software
• System software are mainly designed for managing system resources.	• Application software are designed to accomplish tasks for specific purposes.
• Programming of system software is complex.	• Programming of application software is comparatively easy.
• A computer cannot run without system software.	• A computer can easily run without application software.
• System software do not depend on application software.	• Application software depend on system software and cannot run without system software.