



قسم الادلة الجنائية

Introduction to computers

First lecture



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CS101 FUNDAMENTALS

Introduction to Computers

LECTURE 1

 Course Module

Fundamentals of Computer Science

 Learning Objective

Understanding Functions, Characteristics & Uses

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Why Computers Matter Today

Computers have become an essential part of our modern world, revolutionizing how we live, work, and connect with one another.

⚡ CORE ADVANTAGE

Computers help us **store data** and **process it quickly and accurately** compared to traditional manual methods.



Education



Medicine



Business



Engineering



Communication



Entertainment

What is a Computer?

FORMAL DEFINITION

An electronic device that receives **data** (input), **processes** the data, produces **information** (output), and **stores** it for future use.

THE SIMPLE CONCEPT


Computer

=


Device

that
turns


Data




Info

Data vs. Information



Raw facts or numbers that are not yet processed and lack specific meaning alone.

RAW INPUT

50

70

90

Just numbers

PROCESS



(CPU)



Data that has been processed, organized, and structured to provide context and meaning.

MEANINGFUL OUTPUT

STUDENT AVERAGE GRADE

70

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The Four Basic Functions of a Computer



1 Input

Entering data into the computer system using devices like keyboards, mice, or scanners.

1



2 Processing

Changing raw data into useful information. This is the primary job of the CPU.

2



3 Output

Displaying the processed results to the user via screens, printers, or speakers.

3



4 Storage

Saving data and information permanently for later retrieval and use.

4

Function 1: Input

THE STARTING POINT

Entering Data

Input refers to the process of entering data and instructions into the computer system. It is the first step in the information processing cycle.

Key Concept

Without input, the computer has nothing to process.



Keyboard



Mouse



Scanner



Microphone

Function 2: Processing

THE TRANSFORMATION

Converting Data

Processing is the action of manipulating raw input data to transform it into meaningful information. It involves complex calculations, logical comparisons, and data organization.

The "Brain" of the Computer

This work is primarily performed by the **CPU (Central Processing Unit)**.



CPU Execution



Calculations



Sorting Data



Logic Operations

Functions 3 & 4: Output and Storage



FUNCTION 3

Output

Output is the process of presenting the processed results to the user in a human-readable format.



Monitor (Screen)



Printer



Speakers



FUNCTION 4

Storage

Storage involves saving data, instructions, and information permanently for future retrieval and use.



Hard Disk Drive (HDD/SSD)



USB Flash Drive



CD / DVD / Blu-ray

Characteristics of a Computer

Speed

Computers perform millions of calculations in a single second, far surpassing human capabilities.

⚡ Example: Solving complex equations instantly

Accuracy

Computers provide consistent, error-free results, provided the input data and program instructions are correct.

✓ GIGO: Garbage In, Garbage Out

Storage Capacity

Capable of storing vast amounts of data including documents, images, and videos in a very small physical space.

📁 Example: Storing thousands of books

Reliability

Computers do not get tired, bored, or lose concentration like humans. They can work continuously for days.

🕒 Zero fatigue factor

Automation

Once programmed, a computer can perform a series of tasks automatically without human intervention.

⚙️ Program execution

Multitasking

Modern computers can execute multiple programs simultaneously, allowing users to do many things at once.

🎧 Music + Browsing + Typing

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Uses of Computers

Computers have permeated every aspect of modern society, enhancing efficiency and enabling new possibilities.

UNIVERSAL TOOL

From **complex calculations** to **creative arts**, computers act as the backbone for diverse industries worldwide.



Education

Facilitating e-learning platforms, digital classrooms, and extensive scientific research.



Medicine

Assisting in precise disease diagnosis, patient monitoring, and medical image analysis.



Business

Streamlining company management, inventory control, and accounting processes.



Banking

Managing secure accounts, online transfers, and complex financial transactions.



Communication

Connecting the world through email, social media, and global internet networks.



Entertainment

Powering video games, streaming services, and digital media production.

Example: Computer Operation Cycle



Real-world Scenario: A teacher calculates final grades for students.



Lecture Summary & Review

Key Takeaways

- ✓ Definition of a computer and its role
- ✓ Distinction between raw Data and processed Information
- ✓ The 4 Functions: Input, Processing, Output, Storage
- ✓ Key Characteristics: Speed, Accuracy, Reliability
- ✓ Applications in various modern fields

Review Questions

- 1 What is the formal definition of a computer?
- 2 What is the main difference between data and information?
- 3 List the four basic functions of a computer system.
- 4 Mention three key characteristics of a computer.
- 5 Name three fields where computers are essential today.



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This the End ^-^

See you in Second Lecture

