

Sir Syed University of Engineering & Technology Computer Engineering Department University Road, Karachi-75300, PAKISTAN Compiled By:

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CE - 119 : Computing Fundamentals (CF)

Course Objectives:

■ This course covers the concepts and fundamentals of computing and programming. Topics includes history, components of computers, hardware, software, operating systems, database, networks, number systems and logic gates. Also it includes programming topics such as basic building blocks, loop, decision making statements.

CE - 119 : Computing Fundamentals (CF)

Course Learning Outcomes (CLO)

CLO No.	Outcome Statement	Level
1	Explain the fundamental knowledge and concepts about computing infrastructure including hardware, software, database and networks.	C2
2	Applying and Implementing number systems and logic gates.	C3
3	Applying and Implementing problem solving skills and solve problems incorporating the concept of programming.	C3

^{*}Bloom's taxonomy level. C: Cognitive, P: Psychomotor, A: Affective

Books

Text Books

- 1. Introduction to Computers, *Peter Norton*, 6th Edition, McGraw-Hill
- 2. Introduction to Programming using Python, Daniel Liang
- 3. Computing Essentials, Timothy O'Leary and Linda O'Leary

Reference Books:

- 1. Discovering Computers, Misty Vermaat and Susan Sebok, Cengage Learning
- 2. Using Information Technology: A Practical Introduction to Computers & Communications, *Williams Sawyer*, 9th Edition, McGraw-Hill
- 3. Introduction to Python, Paul Deitel, Harvey Deitel

Marks Distribution

■ Total Marks (Theory)	100
Mid Term	30
Assignments + Quizzes + Presentation _	20
Semester Final Examination Paper	50
■ Total Marks (Laboratory)	50
Lab File	15
Lab Exam/Quiz	20
Lab Exam/Quiz (Theory Teacher)	15

Course Instructors

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CE – 119: Computing Fundamentals

Chapter 1



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Learning Objectives

- 1. What is a Computer
- 2. Input Processing Output
- 3. Parts of Computer
- 4. Types of Computer
- 5. Internet
- 6. Communication and Networks
- 7. Technology Uses and Users

Today's Technology

- Because technology changes,
 you must keep up with the
 changes to remain digitally
 literate
- Digital literacy involves having

 a current knowledge and
 understanding of computers,
 mobile devices, the web, and
 related technologies



- A data processing machine operated automatically under the control of a list of the instructions (called a program) stored in its main memory.
- A Computer is a smart or intelligent machine, which can work only on certain instructions given by a human being.



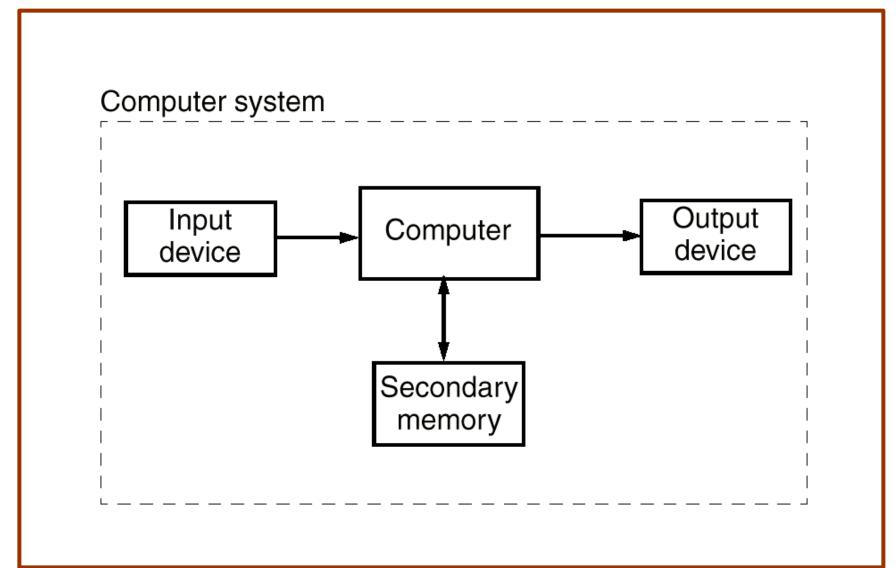


• A **computer** is an electronic device, operating under the control of instructions stored in its own memory

Collects data (input)

Processing

Produces information (output)



Components of a Computer

Input Device

• Allows you to enter data and instructions into a computer

Output Device

• Hardware component that conveys information to one or more people

System Unit

• Case that contains the electronic components of the computer that are used to process data

Storage Device

• Holds data, instructions, and information for future use

Communications Device

 Enables a computer to send and receive data, instructions, and information to and from one or more computers or mobile devices

Input

What you type, read, or enter into computer

Devices

Keyboard, Mouse, Scanner, Sensors, etc

Processing

Changes the input data via formatting, sorting, and calculations

Devices

Components on the motherboard, CPU, ALU, Memory

Output

Results of computer processing

Devices

Screen, Printer, Plotter, Signals, etc.

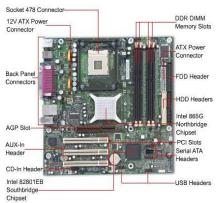
Storage

Save information for later processing

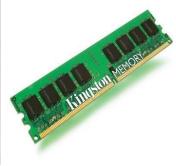
Devices

Memory, Hard Disk Tape Disk, USB, etc.













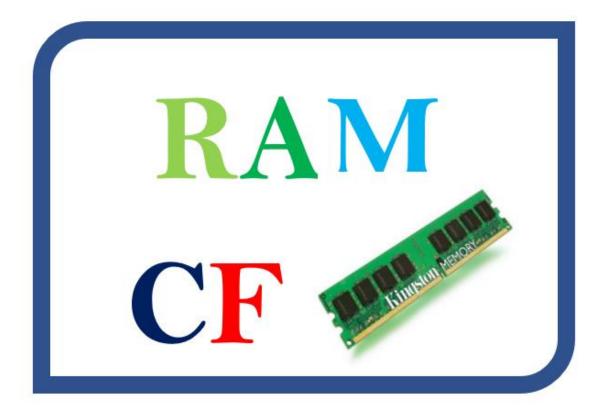


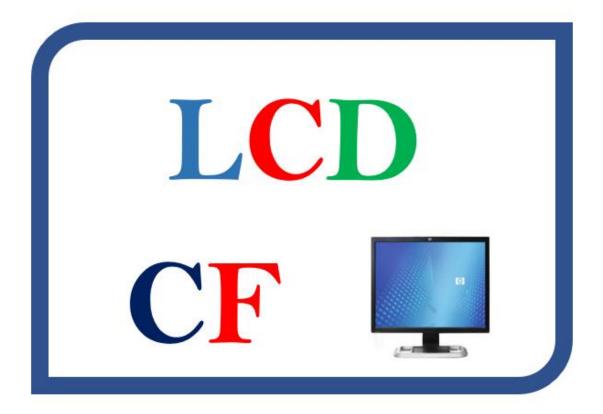












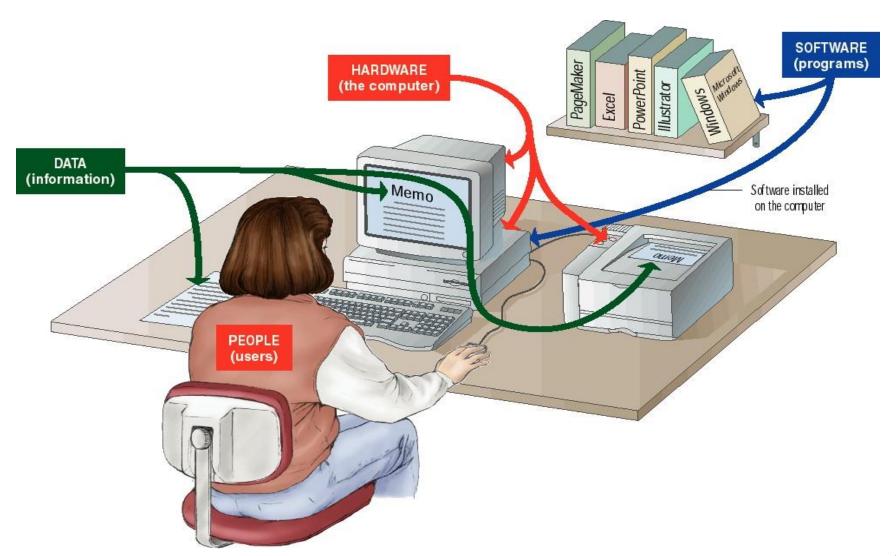






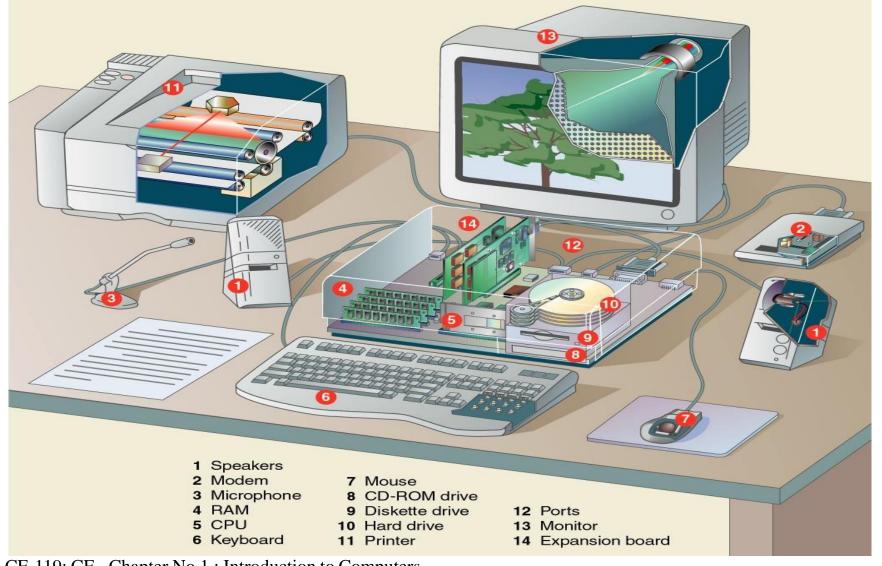
What is a Computer?

- A computer is an electronic device used to process data.
- A computer can convert data into information that is useful to people.
- A complete computer system includes 4 distinct parts:
 - 1. Hardware
 - 2. Software
 - 3. Data
 - 4. Users



Hardware

- A computer's hardware consists of electronic devices; the parts you can see and touch.
- The term "device" refers to any piece of hardware used by the computer, such as a keyboard, monitor, modem, mouse, etc.



Software

- Software also called Programs consists of organized sets of instructions for controlling the computer.
- Some programs exist for the computer's use, to help it manage its own tasks and devices.
- Other programs exist for the user, and enable the computer to perform tasks for you, such as creating documents.

Data

- Data consists of raw facts, which the computer can manipulate and process into information that is useful to people.
- Computerized data is digital, meaning that it has been reduced to digits, or numbers. The computer stores and reads all data as numbers.
- Although computers use data in digital form, they convert data into forms that people can understand, such as text, numerals, sounds, and images.

People

- People are the computer's operators, or users.
- Some types of computers can operate without much intervention from people, but personal computers are designed specifically for use by people.

- Computers are of four types:
 - 1. Micro Computers
 - 2. Mini Computers
 - 3. Main Frames
 - 4. Super Computers

1. Micro Computers

- This most widely used computer generally employs a microprocessor, "computer on a chip" and are desktop sized or less
- Two main types
 - Desktop (PC's & Workstations)
 - Portable (Notebooks, Palmtops)

1. Micro Computers

Desktop

(PC's & Workstations)

- Small enough for a desktop, but not easily portable
- Personal computers
 (PC's) run general
 purpose software and
 are employed by a
 wide spectrum of
 users





1. Micro Computers

Portable

(Notebooks, Palmtops)

- Easily transported from one place to another
- Four categories
 - 1. Laptops
 - 2. Notebooks
 - 3. Palmtops
 - 4. Personal Digital Assistants (PDA)





2. Mini Computers

- Desk-sized
- More processing speed and storage capacity than microcomputers
- General dataprocessing needs at small companies
- Larger companies use them for specific purposes





3. Main Frames

- Larger machines with special wiring and environmental controls
- Faster processing and greater storage than minicomputers
- Typical machine in large organizations





4. Super Computers

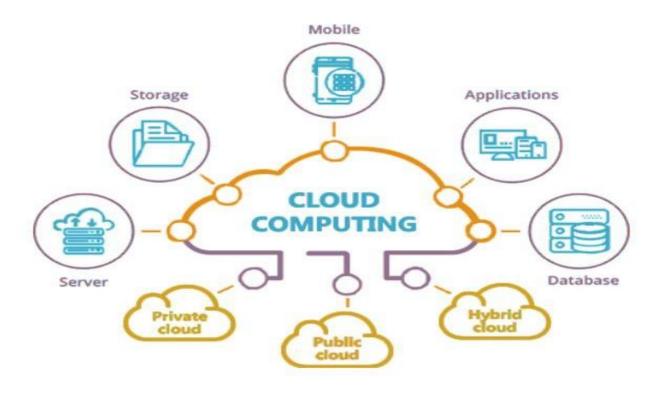
- The most powerful of the four categories
- Used by very large
 organizations,
 particularly for very
 math-intensive types of
 tasks



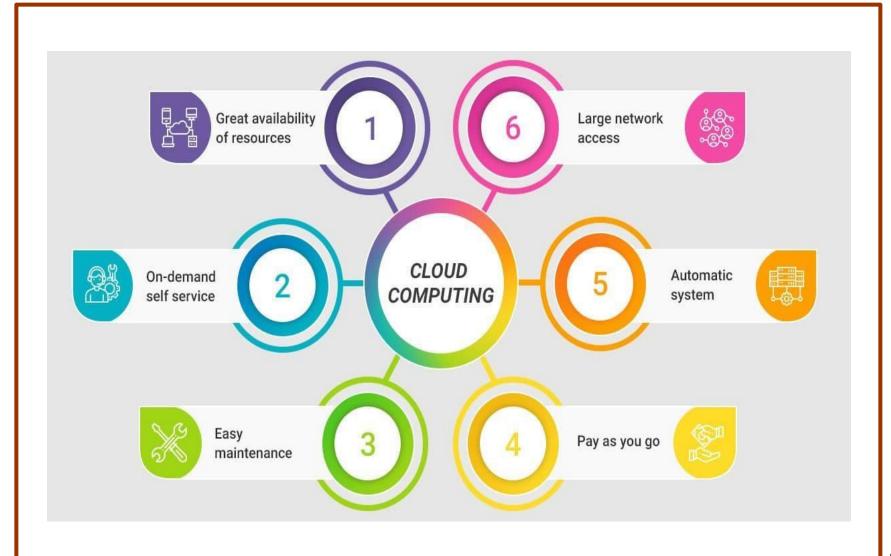


Cloud Computing

■ Cloud Computing refers to an environment that provides resources and services accessed via the Internet.



Cloud Computing



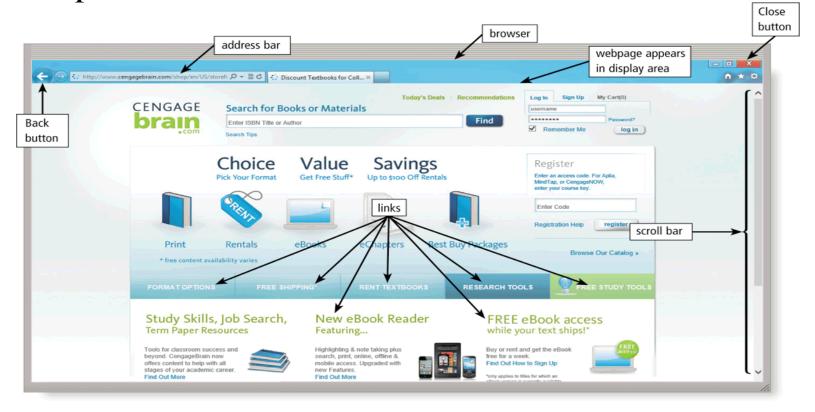
Internet

■ The **Internet** is a worldwide collection of computer networks that connects millions of businesses, government agencies, educational institutions, and individuals.



Internet

■ A **browser** is software that enables users with an Internet connection to access and view webpages on a computer or mobile device

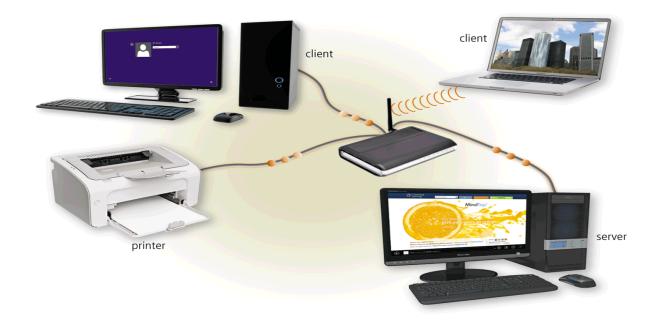


■ A **communications device** is hardware capable of transferring items from computers and devices to transmission media and vice versa





■ A **network** is a collection of computers and devices connected together, often wirelessly, via communications devices and transmission media





Home Networks

- Connect to the Internet
- Share a single high-speed Internet connection
- Access photos, music, videos, and other content
- Share devices
- Play multiplayer games
- Connect game consoles to the Internet
- Subscribe to and use VoIP
- Interact with other devices in a smart home

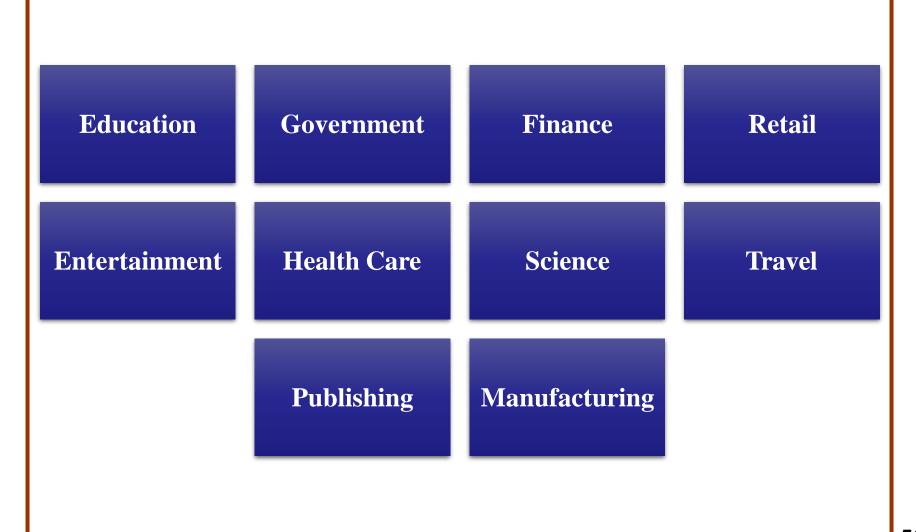
Business Networks

- Facilitate communications
- Share hardware
- Share data, information, and software

Almost all of us use, or use information generated by,
 one or more of these communications technologies



Technology Uses



Technology Users



Home User



Small / Home Office User



Mobile User



Power User



Enterprise User