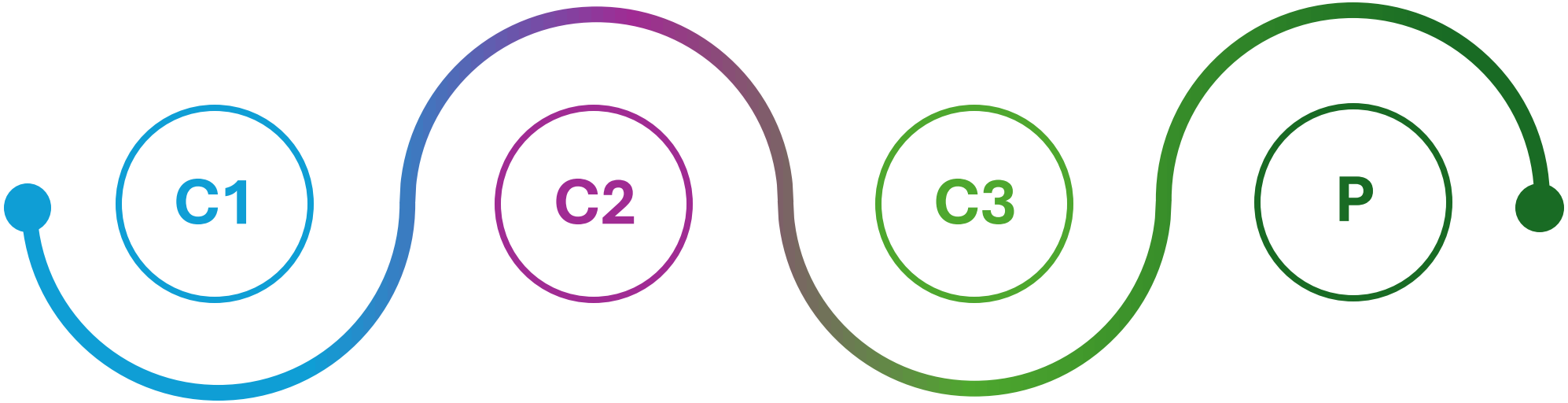
Subject Roadmap



INTRODUCTION OF COMPUTER

COMPUTER SYSTEMS

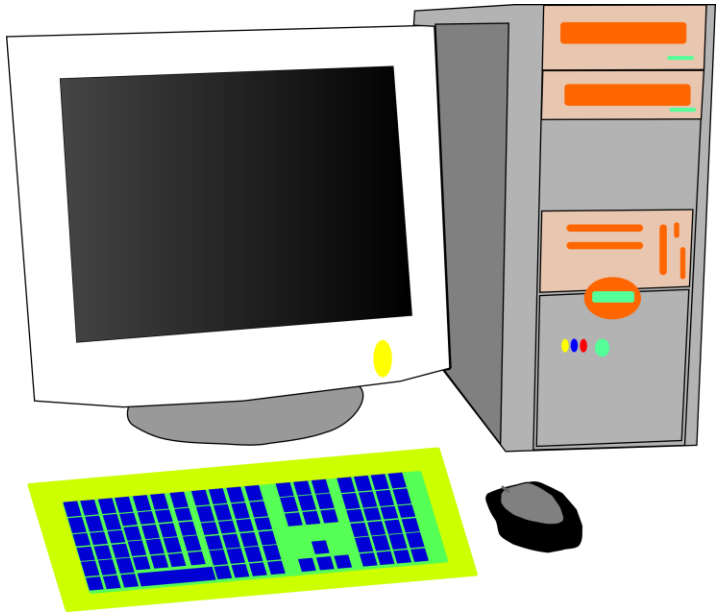
CONCEPT OF INTERNET AND OFFICE AUTOMATION PACKAGE

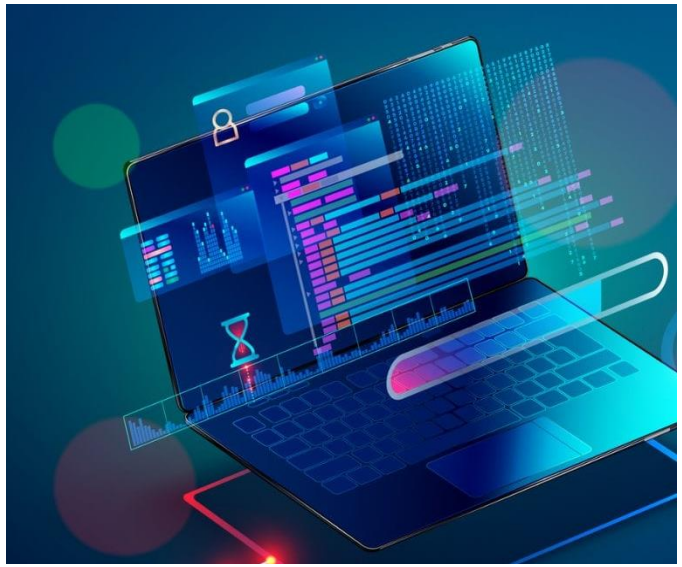
PRACTICAL

Chapter : 1 Introduction

What is a Computer?

A **computer** is an **electronic machine** that can **receive data (input), process it, store it, and produce results (output)**. It operates under instructions (software) to perform a variety of tasks quickly and accurately.





Prepared by Ranjit Kumar Das

Features of Computers:

- **Speed**: Executes billions of instructions per second.
- **Accuracy**: Very low chance of errors when instructions are correct.
- **Automation**: Works on its own once given commands.
- **Storage**: Stores massive amounts of data.
- **Diligence**: No fatigue or distraction.
- **Multitasking**: Handles multiple tasks simultaneously.
- **Versatility**: Can be used in multiple domains like education, business, medicine.

Applications/Uses of Computers:

- **Education**: E-learning platforms (Moodle, Google Classroom), research, programming.
- **Banking**: ATMs, online banking, database management.
- **Medicine**: Diagnosing diseases, robotic surgery, maintaining patient records.
- **Engineering**: Design using CAD/CAM software.
- **Government**: Record-keeping, public service automation.
- **Home**: Entertainment, learning, e-commerce.

Importance of Computers in Medical Field

Computers play a vital role in healthcare. There are the following important key as follows:

Key Uses:

- **Electronic Health Records (EHRs)**: Store and access patient histories instantly.
- **Medical Imaging**: X-rays, MRI, CT scans use computer processing.
- **Telemedicine**: Remote consultation and monitoring.
- **Lab Testing**: Automated blood tests, virus detection.
- **Hospital Information Systems (HIS)**: Manages staff, billing, reports.
- **Research**: Drug discovery, disease modeling.
- **Wearable Devices**: Track heart rate, oxygen, sleep, etc.

Computer Ergonomics & Health

Computer Ergonomics

The science of designing the computer workspace to minimize discomfort and injury.

Health Problems Due to Computers:

- **Eye strain** (from screen glare)
- **Repetitive Strain Injury (RSI) –** from typing/mouse overuse
- **Back and neck pain –** due to bad posture
- **Stress –** from continuous usage without breaks

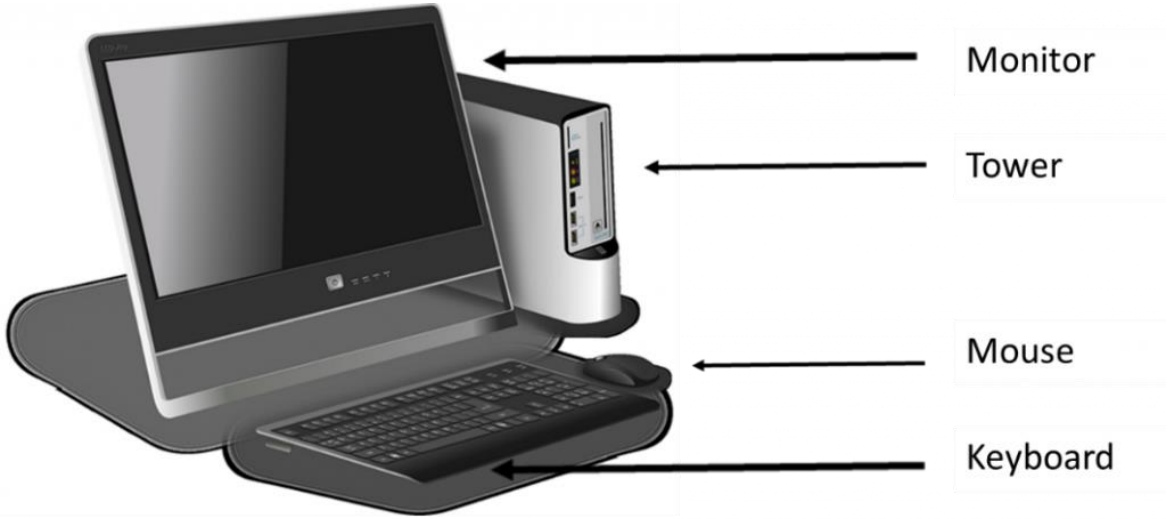
Precautions:

- Maintain **correct posture**
- Use **adjustable chairs and tables**
- Use **anti-glare screen filters**
- Take **frequent short breaks** (20-20-20 rule: every 20 mins, look 20 feet away for 20 seconds)
- Use **wrist rests and ergonomic mouse**

Computer Systems

Main Parts of Computer System:

- **Hardware –** Physical components
- **Software –** Set of programs/instructions
- **Users –** People who operate the computer
- **Data –** Information input and processed



Desktop Computer System


Power Supply
PS/2 Ports
Serial Port
Parallel Port
VGA Video
USB Ports
RJ45 NIC
Audio Jacks
56K Modem


Vacuum Tube
Transistors
Integrated Circuit
Microprocessor
Quantum Computer
1st Generation Computer
2nd Generation Computer
3rd Generation Computer
4th Generation Computer
5th Generation Computer

Basic Hardware Components (Used to enter data into the computer.)

Device	Function
Keyboard	Typing text and commands
Mouse	Pointer control
Joystick	Used in gaming or flight simulations
Trackball	Cursor movement with a ball
Light pen	Draws directly on screen
Touch Pad	Used in laptops
Touch Screen	Finger-based interaction (mobiles, ATMs)
Digital Camera	Captures photos/videos
Scanner	Scans documents or images
OCR	Converts printed text to digital
OMR	Reads shaded areas (exams, surveys)
Digitizing Tablet	Used by artists for drawing

Processing Hardware:

- **CPU (Central Processing Unit)**: Brain of the computer
  - ALU: Performs math/logical tasks
  - CU: Controls operations
  - Registers: Temporary fast-access memory

Storage Devices:

Stores data permanently or temporarily.

- **Primary**: RAM, ROM
- **Secondary**: HDD, SSD, Optical discs, Pen drives

Output Devices:

Device	Function
CRT Monitor	Old monitor with vacuum tube
LCD Monitor	Flat and energy-efficient display
LED Monitor	Latest tech, clear picture, energy-saving
Dot Matrix Printer	Low-quality, impact type printer
Inkjet Printer	Prints high-res colored images
Laser Printer	Fast, high-quality print, non-impact
Thermal Printer	Used in receipts, quiet
Projector	Enlarges screen for presentations
Speakers	Plays audio output

System Software

- OS like Windows, Linux, macOS – Manages hardware/software
- Device Drivers – Controls specific devices
- BIOS – Loads OS from boot disk

Application Software

- Microsoft Office, Photoshop, Tally
- Helps users perform tasks

Utility Software

- Antivirus, disk cleaners, compression tools
- Maintains system health and efficiency

Memory Unit

Primary Memory:

- **RAM (Volatile) –** Stores running programs, cleared on shutdown
- **ROM (Non-volatile) –** Stores startup instructions
- **Cache –** Small memory close to CPU, very fast

Secondary Memory:

- **HDD –** Large storage, mechanical parts
- **SSD –** Faster, no moving parts
- **Magnetic Storage –** Floppy disks, tapes (obsolete)
- **Optical Storage –** CDs/DVDs using lasers
- **Flash Memory –** Pen drives, memory cards

Ports and Interfaces

Port Types	Use
USB	Connects peripherals, plug-and-play
VGA	Connects monitor
HDMI	High-def video/audio output
Serial Port	Connects old mouse, modem
Parallel	Old printers
PS/2	Keyboard/mouse (old style)
DVI	Digital video output
IDE/SATA	For internal hard drives
PATA	Parallel ATA, older than SATA

Internet and Office Automation

Browsers:

- Software to access web pages. Examples:
  - Google Chrome
  - Mozilla Firefox
  - Safari
  - Microsoft Edge

Uses of Internet:

- **Internet Telephony** – Voice/video calls (Zoom, Skype)
- **E-commerce** – Shopping, payments (Amazon, Daraz)
- **E-Government** – Passport, citizenship online services
- **E-Education** – Online classes, e-books
- **E-Health** – Online consultations, health apps
- **Video Conferencing** – Online meetings (Google Meet)

Internet and Office Automation

Search Engines:

- Tools to search information online.
  - Google, Bing, Yahoo
  - Use keywords to find info on websites

Email Services:

- Create and use an email account for communication.
- Key Features:
  - Inbox, Sent, Drafts, Spam
  - Attach files
  - Send/receive instantly

Office Automation Packages

MS Word (Word Processor):

- Create documents, letters, reports
- Formatting, tables, images
- Save in .docx, .pdf formats

MS Excel (Spreadsheet):

- Data storage, calculations
- Formulas, charts, financial data
- Used in business, accounts

Office Automation Packages

MS PowerPoint (Presentation Tool):

- Create slideshows
- Add text, images, animations
- Used in seminars, classrooms

Importance of Office Automation:

- Saves time
- Reduces human error
- Ensures neat and professional results
- Essential for modern jobs and documentation