UNIVERSITY OF CENTRAL PUNJAB | ADP-BA | FIRST SEMESTER

ICT MADE SIMPLE

A Practical Guide to Information and Communication Technologies

From Zero Knowledge to Digital Confidence

Applications of Information and Communication Technologies

Course Code: ICT-1013 | Credit Hours: 3

Associate Degree Programme in Business Administration (ADP-BA)

First Semester | 16 Weeks / 32 Sessions

Professor Muhammad Umar Naheed

Author and Course Instructor

University of Central Punjab

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ADP-BA Programme and Department of Computer Science

University of Central Punjab (UCP)

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ICT Made Simple: A Practical Guide to Information and Communication Technologies
Prepared for ICT-1013, Applications of Information and Communication Technologies
Associate Degree Programme in Business Administration (ADP-BA), University of Central Punjab (UCP)

Author: Professor Muhammad Umar Naheed, Author and Course Instructor.

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Academic disclaimer. This handbook is a learning resource that supports the course; it does not replace the official university course outline, announcements or instructions of the instructor. Where the official university policy and this book differ, the official policy applies. Course policies and the weekly schedule reproduced here are those provided by the university at the time of writing.

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Health, legal and financial topics. Chapters on health, finance and ethics provide general educational information only. They are not medical, legal or financial advice. Consult a qualified professional for personal decisions.

Prescribed textbooks. This handbook was written as a companion to the prescribed textbooks listed in Appendix J. It uses original explanations and does not reproduce their text.

Author's Note

Dear students,

Every semester I meet students who sit in the first ICT class with the same worry: "Sir, I have never really used a computer properly. Will I be able to follow?" The honest answer is yes, and this book is my way of proving it.

I wrote these notes after listening to the questions my students ask: What is the difference between the Internet and the Web? Why did my formula show an error? Is it safe to pay online? When is a copied sentence plagiarism? Those everyday questions shaped every chapter.

My approach is simple. We start from the very beginning, we use examples from your own life in Pakistan, and we practise with our own hands. If you can read this book, repeat the activities, and revise using the summaries, you will walk out of this course with real skills and, more importantly, confidence.

Please do not memorise blindly. Understand each idea, try it on your device, and explain it to a friend in your own words. If you can teach it, you know it.

I wish you curiosity, patience and success.

Professor Muhammad Umar Naheed
Author and Course Instructor

About the Author

Professor Muhammad Umar Naheed is the author of this handbook and the instructor of the course *Applications of Information and Communication Technologies* (ICT-1013) in the Associate Degree Programme in Business Administration (ADP-BA) at the University of Central Punjab. He is associated with the ADP-BA Programme and the Department of Computer Science.

His interest lies in technology education: helping students who are new to computers understand technology without fear. He believes that complex ideas can be explained in simple language when they are connected to what students already see around them, such as mobile wallets, online shopping, university portals and social media.

His teaching philosophy is built on three convictions. First, **learning must begin where the student is**, not where the textbook assumes the student should be. Second, **practice matters as much as theory**: a student learns Excel by building a marksheet, not by reading about it. Third, **digital literacy includes character**: knowing how to use technology goes together with using it honestly, safely and respectfully.

Through this handbook he aims to help students develop confidence in using modern ICT tools, to carry that confidence into their other courses, and to become responsible digital citizens in their professional lives.

Preface

Information and Communication Technologies have become part of nearly every profession a business student will enter. Accounts are kept in spreadsheets, marketing is done through social media, customers pay with mobile wallets, and meetings take place on video calls. A graduate who is hesitant with these tools starts at a disadvantage.

This handbook, *ICT Made Simple*, has been designed for first-semester ADP-BA students who may have little or no previous experience. It follows the university's course outline and the 16-week schedule, covering thirteen chapters from the basics of ICT to digital ethics and information accuracy.

Each chapter follows the same pattern: an opening page with objectives; clear explanations that start from zero; real-life and Pakistani examples; step-by-step guidance; diagrams and comparison tables; common mistakes; practical activities; discussion questions; and revision material with questions. Answers and explanations are placed in a separate section so that you can first attempt questions on your own.

The handbook is a companion to, not a replacement for, the prescribed textbooks. Please read the recommended textbooks for deeper study and consult official help pages of software for up-to-date instructions.

How to Use This Book

Read each chapter before the class in which it is taught, as the course asks. Then attempt the practical activities on your own device or in the computer lab, answer the questions, and check your answers in the Instructor/Revision Support section.

You will meet these learning features throughout the book:

REMEMBER THIS
Essential facts you should memorise.

SIMPLE EXPLANATION
A difficult idea explained in everyday language.

REAL-LIFE CONNECTION
How the idea is used in practical life.

PROFESSOR'S TIP
A short teaching tip from the professor.

COMMON MISTAKE
A mistake that beginners commonly make.

EXAM FOCUS
What is likely to matter in examinations.

QUICK REVISION
A concise summary for rapid revision.

PRACTICAL CORNER
A hands-on task you can try immediately.

Study plan suggestion: read the chapter (30–40 minutes), perform the activities (30–45 minutes), revise using the summary and quick revision notes (15 minutes), and attempt questions without looking at the answers (20 minutes).

Please note: software screens and menus change over time. If your screen looks different from an illustration, search for the command by its name.

Learning Methodology

The book follows a method called **Zero to Confident**. Every new topic is taught in the same nine steps, so that you always know what to expect and can revise systematically.

Table P.1: The nine-step teaching sequence

Step	Question answered	Why it helps
1	What is it?	Gives a clear, simple definition
2	Why do we need it?	Builds motivation
3	Where do we see it in everyday life?	Connects to your experience
4	How does it work?	Develops understanding instead of memorising
5	What are its main components?	Organises the topic into parts
6	How can a student use it?	Moves from knowing to doing
7	What is a practical example?	Makes the idea concrete
8	What mistakes should students avoid?	Prevents common errors
9	What should I remember for examinations?	Focuses revision

How to learn effectively: do the practical work, explain ideas aloud, revise the day you studied and again after a week, and ask questions in class. Simple English is used on purpose, but definitions are accurate and examinable.

Course Information

Table P.2: Course information

Item	Details
University	University of Central Punjab (UCP)
Programme	Associate Degree Programme in Business Administration (ADP-BA)
Semester	First Semester
Course title	Applications of Information and Communication Technologies
Course code	ICT-1013
Credit hours	3
Duration	16 weeks / 32 sessions (each class lasts 90 minutes)
Prerequisites	None
Author and instructor	Professor Muhammad Umar Naheed

Course Introduction

This course is designed to provide students with an exploration of the practical applications of Information and Communication Technologies (ICT) and software tools in various domains.

Course Objectives

- Students will gain hands-on experience with a range of software applications, learning how to leverage ICT to solve daily-life problems, enhance productivity, and innovate in different fields.
- Through individual and interactive exercises and discussions, students will develop proficiency in utilizing software for communication, creativity, and more.

Course Learning Outcomes

By the end of this course, students will be able to:

1. Explain the fundamental concepts, components, and scope of Information and Communication Technologies.
2. Identify uses of various ICT platforms and tools for different purposes.
3. Apply ICT platforms and tools for different purposes to address basic needs in different domains of daily, academic, and professional life.
4. Understand the ethical and legal considerations in the use of ICT platforms and tools.

Course Structure and 16-Week Academic Roadmap

The schedule below reproduces the university-provided calendar exactly, including the final examination in Week 17 as listed in the course outline. The last column shows the chapters of this handbook that support each week.

Table P.3: Official course calendar

Week	Course contents	Activities	Handbook
1	Introduction to ICT, components, scope, emerging technologies	Introduction	Ch 1
2	Search engines, WWW, formal communication, email etiquette	Practice	Ch 2
3	Microsoft Office and Google Workspace	Assignment 1	Ch 3
4	Cloud storage, Google Drive, Dropbox, OneDrive, Evernote, OneNote	Quiz 1	Ch 4
5	Video conferencing and social media	Practice	Ch 5
6	ICT in Education, LMS, online courses, virtual classrooms	Assignment 2	Ch 6
7	ICT in Health and Well-being, fitness applications, telemedicine	Quiz 2	Ch 7
8	ICT in Personal Finance and Shopping, digital payments, e-commerce	Practice	Ch 8
9	Mid-Term Examination	Mid-Term	Ch 9 (revision)
10	Digital Citizenship, digital identity, online reputation, netiquette	Discussion	Ch 10
11	Cyberbullying and online harassment	Assignment 3	Ch 10
12	ICT Ethics, intellectual property, copyright	Quiz 3	Ch 11
13	Originality, plagiarism, authorized use of information	Practice	Ch 11
14	Content accuracy, information integrity, misinformation, fake news	Assignment 4	Ch 12
15	Complete course review	Quiz 4	Ch 13 (revision)
16	Project presentations	Final Project	Final project guide
17	Final Examination	Final Exam	Ch 13 (revision)

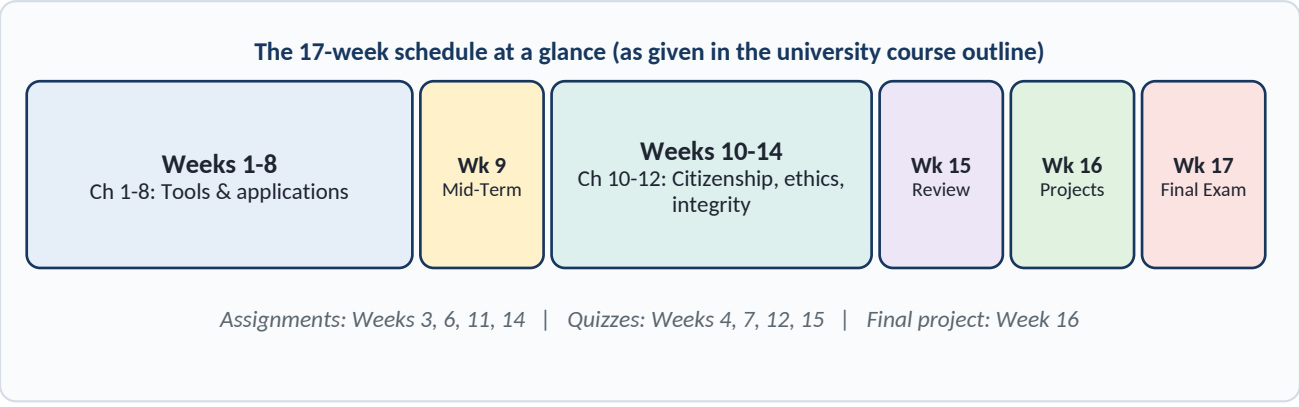


Figure P.1: The course schedule at a glance

Assessment and Academic Honesty Policy

Assessment activities listed in the roadmap are four assignments, four quizzes, a mid-term examination, a final project and a final examination. The weightage of marks is announced by the university and the instructor; refer to the official course outline for it.

Academic Honesty Policy. If any two projects or assignments are identical or partially identical, a zero will be awarded. Repetition of such conduct may lead to an F grade in the course.

This means that you must prepare your own work. You may discuss ideas with classmates, but you must write and design your own submission. Chapter 11 explains plagiarism and referencing in detail.

Attendance and Classroom Expectations

- Class attendance is mandatory.
- Students may miss up to six class sessions. On the seventh absence, the student will be withdrawn from the course.
- Each class lasts 90 minutes. Students should arrive on time and be seated before class begins.
- Cell phones should be powered off.
- Eatables are not allowed in class.
- Disruptive behavior is not tolerated.
- The prescribed dress code must be observed.
- Violators may be asked to leave the class and consequently be marked absent.

Participation Guidelines

Students are required to attend all classes and read assigned material in advance. Advanced preparation and meaningful participation are important. The instructor may take note of insightful and useful contributions during discussions.

PROFESSOR'S TIP

Prepare one question or one example from each chapter before class. Insightful contributions are noticed, and preparation makes lectures much easier to follow.

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CHAPTER 01

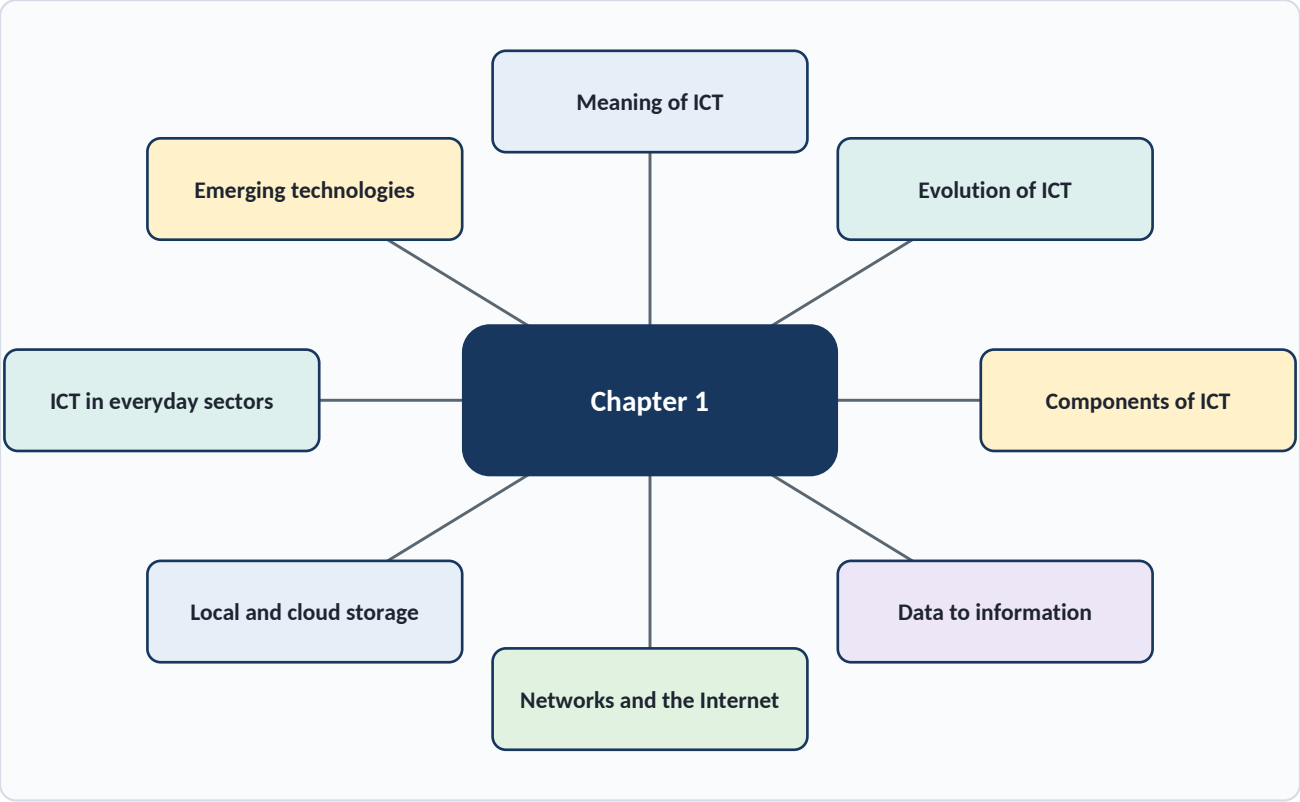
Introduction to Information and Communication Technologies

Before you use any software, you need a clear picture of what ICT is, what it is made of, and why it has become part of nearly everything you do, from paying a bill to submitting an assignment.

Chapter Learning Objectives

After studying this chapter, you will be able to:

- Define Information Technology, Communication Technology and ICT in simple words.
- Explain the difference between IT and ICT.
- Describe the main components of ICT: hardware, software, people, data and networks.
- Explain the data processing cycle: data, processing, information and communication.
- Distinguish the Internet, the World Wide Web and local versus cloud storage.
- Give examples of ICT in education, business, governance, healthcare and media.
- Recognise emerging technologies such as AI, IoT, cloud computing, Big Data, blockchain, VR and AR.



Chapter map: the main topics of this chapter

1.1 Why This Chapter Matters

Everything else in this course, Word, Excel, email, cloud storage, online banking, even digital ethics, rests on the ideas in this chapter. If you understand what a computer system is made of and how data becomes useful information, every later chapter will feel like a natural next step instead of a list of unfamiliar buttons.

1.2 Introduction: Technology in a Student's Day

Think about the first hour of your morning. Your phone alarm wakes you. You check WhatsApp, glance at a weather forecast, perhaps book a ride, and look at the class timetable on your university portal. Without noticing, you have already used a computer (the phone), software (apps), a network (mobile data or Wi-Fi), and stored information somewhere far away (the cloud). All of this together is what we call **Information and Communication Technologies**, or **ICT**.

This book assumes that you are starting from zero. We will take each idea slowly: what it is, why it matters, where you see it, and how you can use it yourself.

1.3 Meaning and Definitions

Information Technology (IT)

Information Technology is the use of computers, software and related equipment to create, store, process, protect and retrieve information. When a bank keeps your account record on a computer, or when you save an assignment on a USB drive, you are using IT.

Communication Technology

Communication Technology is any technology that helps people send and receive messages over distance: telephones, mobile networks, email, video calls, radio and television. Its purpose is to move information from one person or place to another.

Information and Communication Technologies (ICT)

ICT combines the two. It is the collection of devices, programs, networks and services used to capture, store, process, transmit and present information. A video lecture on your laptop shows ICT clearly: the laptop (hardware), the video player (software), the Internet (network), the recorded lecture (data), and you and your teacher (people).

> **SIMPLE EXPLANATION**
> IT is about **handling** information (storing and processing it). Communication technology is about **moving** information. ICT is both together, which is why modern life depends on it.

Table 1.1: Difference between IT and ICT

Point	Information Technology (IT)	ICT
Main focus	Computers, software, data storage and processing	IT plus communication systems and networks
Scope	Narrower: usually inside one system or organisation	Wider: connects people and systems anywhere
Typical examples	Spreadsheet, database, accounting software	Email, video calls, online banking, social media, cloud services
Emphasis	Processing and storing	Processing, storing and sharing

EXAM FOCUS
A very common short question: "Differentiate between IT and ICT." Answer in two lines: IT deals with computing and information processing; ICT adds communication technologies and networks, so it is broader.

1.4 Evolution of ICT

ICT did not appear overnight. Each stage made information easier to create, copy and share.

Table 1.2: Milestones in the evolution of ICT

Stage	Development	Effect on society
Early communication	Writing, printing press, postal service	Knowledge could be recorded and copied
Electrical age	Telegraph, telephone, radio, television	Messages travelled over distance in seconds
Computer age	Large mainframes, then personal computers	Businesses and homes began to process data electronically
Internet age	Internet, email, World Wide Web, search engines	Global sharing of information
Mobile and cloud age	Smartphones, mobile data, cloud services, social media	Access to information anywhere, anytime
Intelligent age	AI, Internet of Things, Big Data	Devices and software that learn, sense and automate

REAL-LIFE CONNECTION
In Pakistan, paying a utility bill once meant standing in a queue at a bank branch. Today many people pay through a banking app or a mobile wallet in under a minute. That change is ICT at work.

1.5 Importance of ICT in Modern Society

- **Speed:** information reaches people in seconds.
- **Access:** a student in a small town can watch the same lecture as a student in a big city.
- **Efficiency:** tasks such as calculating marks or printing certificates take minutes, not days.
- **Accuracy:** software reduces human calculation mistakes.
- **Connection:** families, teams and customers stay in touch across cities and countries.
- **Opportunity:** new jobs and businesses, such as freelancing and online selling, depend on ICT.

1.6 Components of ICT

Any ICT system, from a smartphone to a university network, is built from the same basic components. Learn these first; they appear again in every chapter.

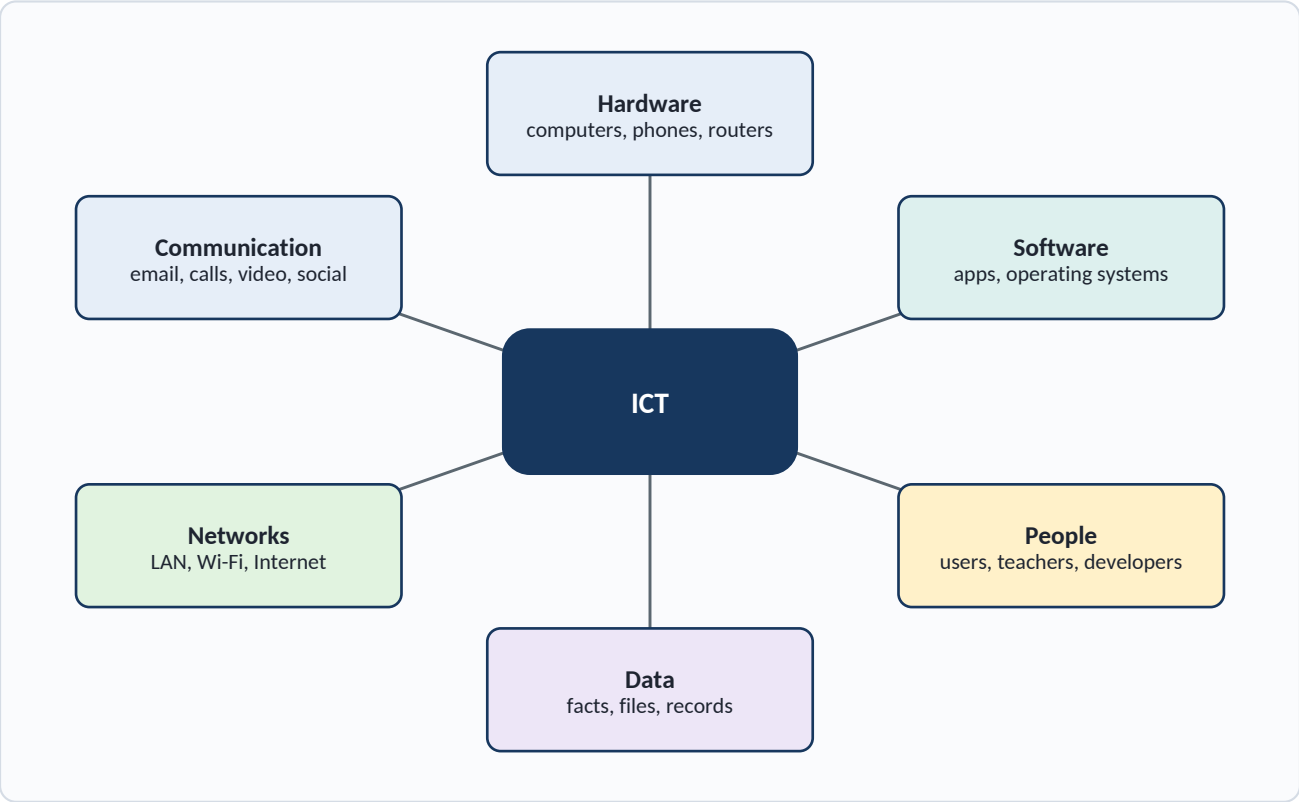


Figure 1.1: The ICT ecosystem: six components that work together

Figure 1.1 shows that ICT is not one thing but a system. Remove any one component and the system stops being useful: a computer without software does nothing, and software without people has no purpose.

Hardware

Hardware means the physical parts of a computer that you can touch: keyboard, mouse, screen, printer, the processor (CPU), memory (RAM) and storage devices. A computer system has four basic jobs: take input, process it, produce output, and store data.

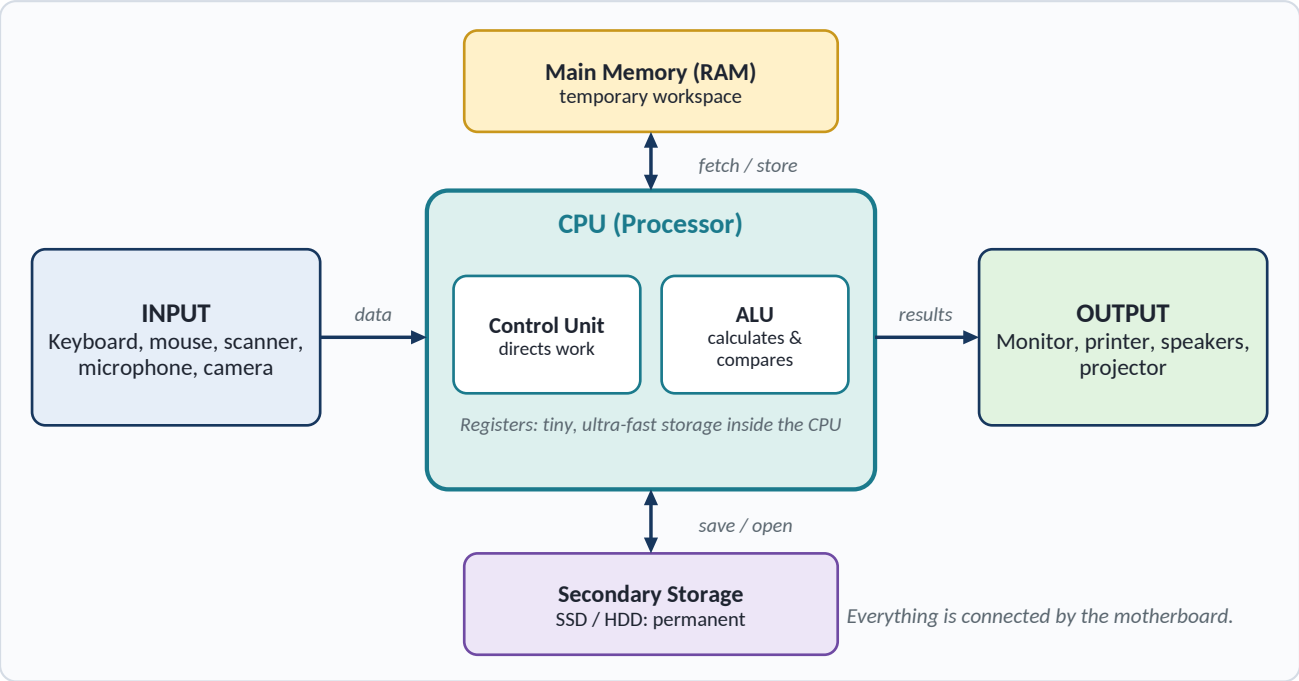


Figure 1.2: Basic architecture of a computer system

In Figure 1.2, you type on the keyboard (input). The **CPU** carries out instructions; its control unit directs the work and its ALU (Arithmetic Logic Unit) performs calculations and comparisons. **RAM** holds the data and programs currently in use, and disappears when the power is switched off. **Secondary storage** (SSD or hard disk) keeps files permanently. The result appears on the monitor (output).

Table 1.3: Common hardware by function

Function	Devices	Everyday example
Input	Keyboard, mouse, touchscreen, scanner, microphone, camera	Typing an email, scanning an ID card
Processing	CPU (processor)	Calculating your total marks
Memory	RAM	Keeping open apps ready while you work
Storage	SSD, hard disk, USB drive, memory card	Saving an assignment
Output	Monitor, printer, speakers, projector	Printing a notice, playing a lecture

Software

Software is the set of instructions that tells hardware what to do. You cannot touch it. There are two main types.

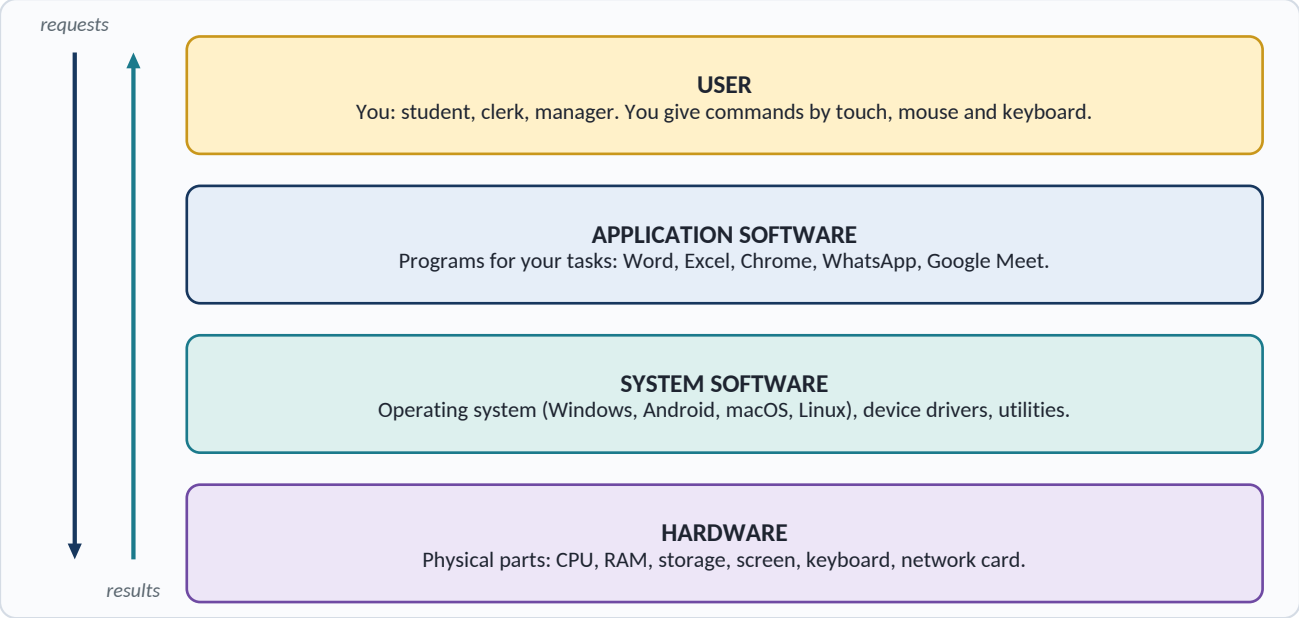


Figure 1.3: Relationship between user, software and hardware

Table 1.4: System software and application software

Type	Purpose	Examples
System software	Runs and manages the computer	Windows, Android, macOS, Linux, device drivers, antivirus
Application software	Helps you do a task	Microsoft Word, Excel, Google Chrome, WhatsApp, Zoom

SIMPLE EXPLANATION

Hardware is the **body**; software is the **instructions** the body follows. A mobile phone with no operating system is just a glass and metal brick.

Peopleware, Data and Communication

People (sometimes called *peopleware*) are the users, teachers, technicians, programmers and managers who operate and benefit from ICT systems. **Data** are raw facts such as numbers, names or images. **Communication systems** carry data between devices using cables, Wi-Fi, mobile networks or satellites.

1.7 From Data to Information

Data are raw, unorganised facts. On their own, "62, 71, 85, 90" tell us little. **Information** is data that has been processed so it has meaning: "The average mark of the class is 77." Information helps us make decisions.

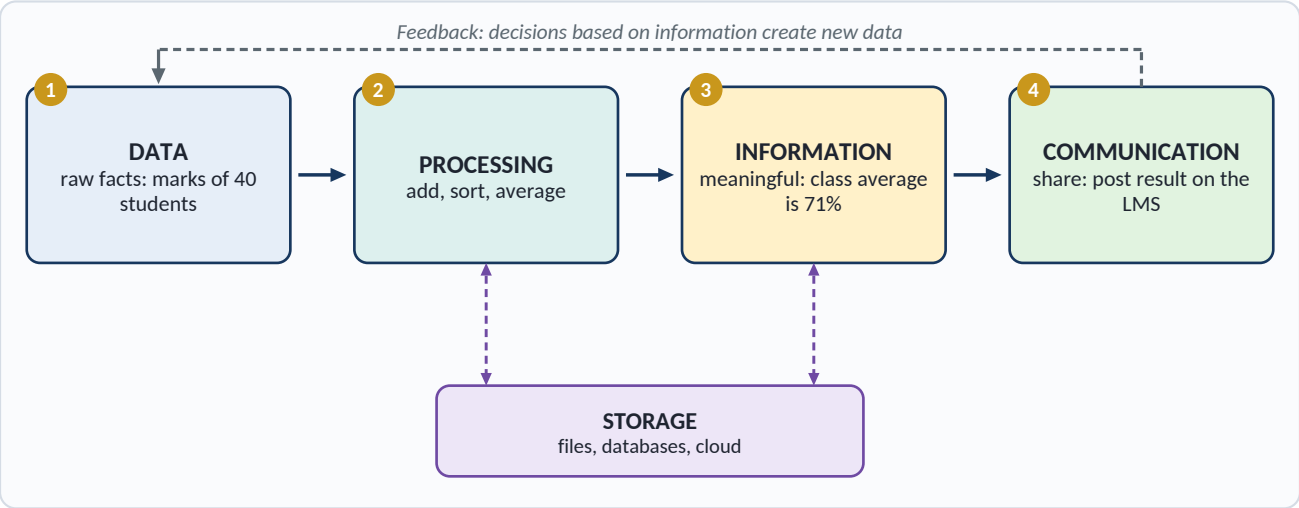


Figure 1.4: The data processing cycle

Figure 1.4 shows four steps: data is collected, processed, turned into information and then communicated to those who need it. Storage supports the cycle, and the decisions people take create new data, so the cycle continues.

Table 1.5: Data compared with information

Data	Information
Raw facts	Processed, meaningful facts
Little value alone	Useful for decisions
Example: 45, 60, 80	Example: "Class average is 61.7"

1.8 Computer Networks, the Internet and the Web

A **computer network** is a group of devices connected so they can share data and resources, such as files or a printer. Networks are described by size.

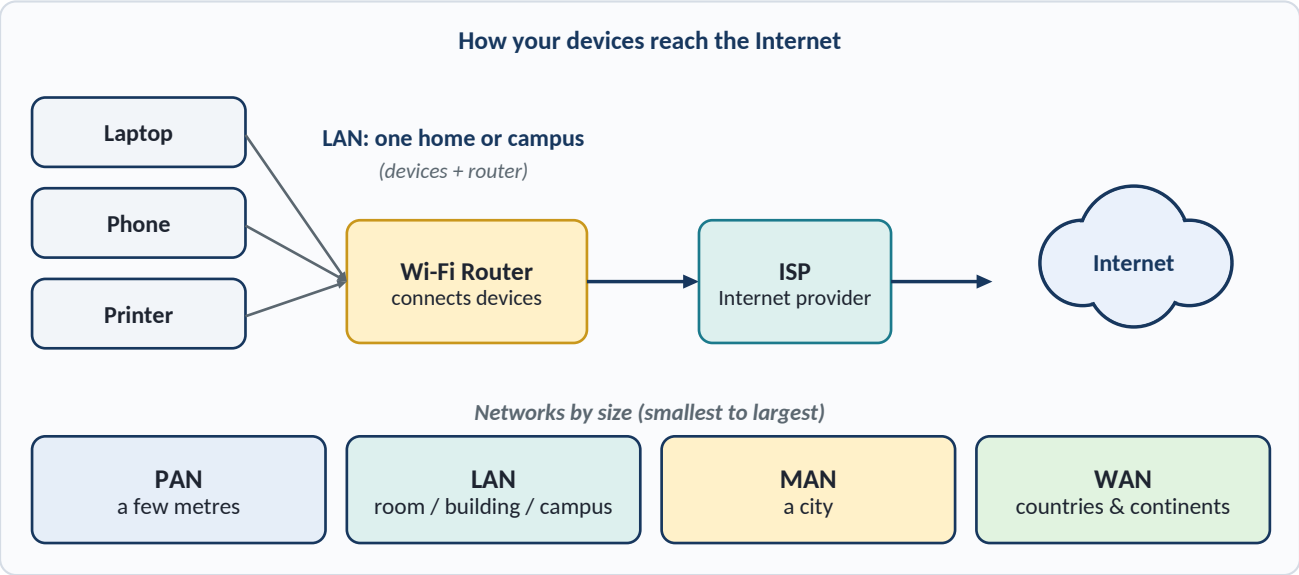


Figure 1.5: Network types and how devices reach the Internet

Table 1.6: Types of networks

Network	Full name	Coverage	Example
PAN	Personal Area Network	A few metres	Phone linked to wireless earbuds
LAN	Local Area Network	Room, building or campus	University computer lab
MAN	Metropolitan Area Network	A city	A city-wide cable network
WAN	Wide Area Network	Countries or continents	The Internet itself

The **Internet** is a worldwide network of networks. The **World Wide Web (WWW)** is a collection of web pages and websites that you view through a browser. The Web is only one service that runs on the Internet; email, video calls and cloud sync are others. Chapter 2 explains this in more detail.

1.9 Local Storage and Cloud Storage

Local storage keeps your files on a device you own, such as a laptop disk or USB drive. **Cloud storage** keeps files on remote servers owned by a provider such as Google or Microsoft, and you reach them through the Internet. Chapter 4 covers cloud storage in depth.

Table 1.7: Local storage versus cloud storage

Feature	Local storage	Cloud storage
Where files live	On your device	On provider servers
Internet needed?	No	Yes, for most actions
Access from other devices	Not automatic	Yes, after login
Risk	Lost, stolen or damaged device	Account hacking; weak password
Backup	You must do it	Often automatic

1.10 Scope of ICT

Table 1.8: ICT in major sectors

Sector	How ICT is used	Pakistani / university example
Education	LMS, online lectures, digital libraries, e-exams	University LMS, online classes, HEC digital resources
Business	Accounting software, e-commerce, digital marketing, online payments	Daraz sellers, Excel-based inventory, mobile wallets
Governance	Online records, digital services, e-filing	NADRA identity services, online tax filing
Healthcare	Electronic records, telemedicine, wearables	Online doctor consultations, appointment apps
Media and entertainment	Streaming, social media, online news, gaming	YouTube channels, online news sites

1.11 Emerging Technologies and Future Trends

The following technologies are changing ICT. You do not need to master them in this course; you should recognise them and know what they do.

Table 1.9: Emerging technologies

Technology	Simple meaning	Example
Artificial Intelligence (AI)	Software that performs tasks needing human-like judgement, such as understanding language or recognising images	Voice assistants, spam filters, chatbots
Internet of Things (IoT)	Everyday objects with sensors connected to the Internet	Smart meters, smart doorbells
Cloud computing	Using remote servers for storage and computing instead of your own machine	Google Drive, Microsoft OneDrive
Big Data	Extremely large collections of data analysed to find patterns	Online shops studying buying behaviour
Blockchain	A shared digital record that is very hard to alter	Used in some cryptocurrencies and record-keeping systems
Virtual Reality (VR)	A fully computer-created environment, usually with a headset	Virtual science labs, training simulations
Augmented Reality (AR)	Digital objects displayed over the real world	Phone apps that place furniture in your room

COMMON MISTAKE

Beginners often think "Internet" and "Web" mean the same thing, or that AI means robots. AI is mostly software, and the Web is only one part of the Internet.

PROFESSOR'S TIP

Do not try to memorise tables word for word. Learn each row with one personal example from your own phone or university life; examiners accept correct examples in your own words.

PRACTICAL CORNER

Look at your phone. Name three pieces of hardware, three apps (application software) and one example of cloud storage you use. This is Activity 1.

1.12 Important Terminology

Table 1.10: Key terms of Chapter 1

Term	Meaning
ICT	Technologies used to capture, store, process, transmit and present information.
Hardware	The physical parts of a computer system.
Software	Programs that instruct hardware what to do.
Data	Raw facts and figures.
Information	Data processed into a meaningful form.
Network	Connected devices that share data and resources.
Internet	The global network of networks.
WWW	Web pages and websites accessed through a browser.
Cloud storage	Storing files on remote servers accessed via the Internet.
CPU	The processor that executes instructions.

1.13 Common Mistakes

COMMON MISTAKE

- Using "data" and "information" as if they mean the same thing.
- Saying the Internet and the World Wide Web are identical.
- Treating software as something you can touch.
- Forgetting that people are also a component of an ICT system.

1.14 Practical Activities

Complete these hands-on activities on your own device or in the computer lab. Interfaces change with updates, so if a button has moved, look for the same command by its name.

Activity 1: Identify hardware and software around you	
Learning objective	Distinguish hardware from software and identify ICT components in everyday devices.
Required tools	Your smartphone, a pen and paper (or the Notes app).
Step-by-step instructions	**1.** Pick your phone and write the heading "Hardware" and "Software" on a page. **2.** List at least five hardware items you can see or touch (screen, charging port, camera, speaker, buttons). **3.** Open your phone and list five apps; mark each as system software (for example, the operating system) or application software. **4.** Open Settings and note the operating system name and version. **5.** Draw a simple diagram showing input, processing, output and storage for your phone.
Expected outcome	A one-page table of hardware and software with a labelled diagram.
Self-check questions	a Which items are input devices? Which are output devices? b Is the phone's operating system hardware or software? c Where does the phone store your photos?

Activity 2: Trace data to information	
Learning objective	Show how raw data becomes information using a real example.
Required tools	Pen and paper or a spreadsheet.
Step-by-step instructions	**1.** Write down the marks of five quizzes you attempted (or invented marks). **2.** Label this list "Data". **3.** Calculate the total and average. **4.** Write one sentence that interprets the result, for example "My average is 72%, so I should improve in Quiz 3." **5.** Label the sentence "Information".
Expected outcome	A short note showing data, processing and information.
Self-check questions	a What was the processing step? b How would you communicate this information to a teacher?

1.15 Classroom Discussion Questions

1. Which ICT tool do you use most each day? What would your day look like without it?
2. Is the Internet more useful for students or for businesses? Give reasons.
3. Do you think ICT creates more opportunities or more risks? Defend your view.

1.16 Chapter Summary

- ICT combines information technology (processing and storing) and communication technology (sending and receiving).
- ICT systems have six components: hardware, software, people, data, networks and communication.
- Data become information after processing; information supports decisions.
- Networks range from PAN to WAN; the Internet is the largest.
- The Web is a service on the Internet.
- Cloud storage keeps files on remote servers; local storage keeps them on your device.
- AI, IoT, cloud, Big Data, blockchain, VR and AR are emerging technologies.

1.17 Quick Revision Notes

QUICK REVISION

- ICT = IT + Communication
- Hardware (touch) vs Software (instructions)
- Data (raw) to Information (meaningful)
- PAN < LAN < MAN < WAN
- Internet = network of networks; WWW = web pages

1.18 Key Points to Remember

REMEMBER THIS

- Define IT, communication technology and ICT.
- Name and explain the six ICT components.
- Draw the data processing cycle.
- State two differences between local and cloud storage.
- Give one example of each emerging technology.

1.19 Short Questions

1. Define ICT.
2. Differentiate between hardware and software.
3. What is the difference between data and information?
4. Define a computer network and name its four types.
5. Differentiate between the Internet and the WWW.
6. What is cloud storage?
7. Name three emerging technologies.

1.20 Long Questions

1. Explain ICT and describe its main components with a labelled diagram.
2. Discuss the importance of ICT in education, business and healthcare with examples.
3. Describe the evolution of ICT from early communication to the intelligent age.
4. Explain the data processing cycle with an example from your university life.

1.21 Multiple-Choice Questions

Choose the best answer. Attempt all questions first; then check your answers and explanations in the Instructor/Revision Support section at the end of this book.

1. Which of the following is application software?

   (A) Windows
   (B) Android
   (C) Microsoft Word
   (D) Device driver

2. Raw facts and figures are called:

   (A) Information
   (B) Data
   (C) Knowledge
   (D) Software

3. Which network usually covers a university campus?

   (A) PAN
   (B) LAN
   (C) WAN
   (D) None

4. Which statement is correct?

   (A) The Web and the Internet are identical
   (B) The Web is one service on the Internet
   (C) The Internet is a web page
   (D) Email is part of the Web only

5. RAM is best described as:

   (A) Permanent storage
   (B) Temporary working memory
   (C) An output device
   (D) An operating system

6. Which is an example of IoT?

   (A) A smart electricity meter
   (B) A printed book
   (C) A calculator without batteries
   (D) A paper notice

1.22 Self-Assessment Exercise

Tick each statement you can honestly say is true. Revisit the relevant section for any statement you cannot tick.

- ■ I can define ICT in my own words.
- ■ I can list the six components of ICT.
- ■ I can explain data versus information with an example.
- ■ I can name the four network types.
- ■ I can explain the difference between local and cloud storage.

CHAPTER 02

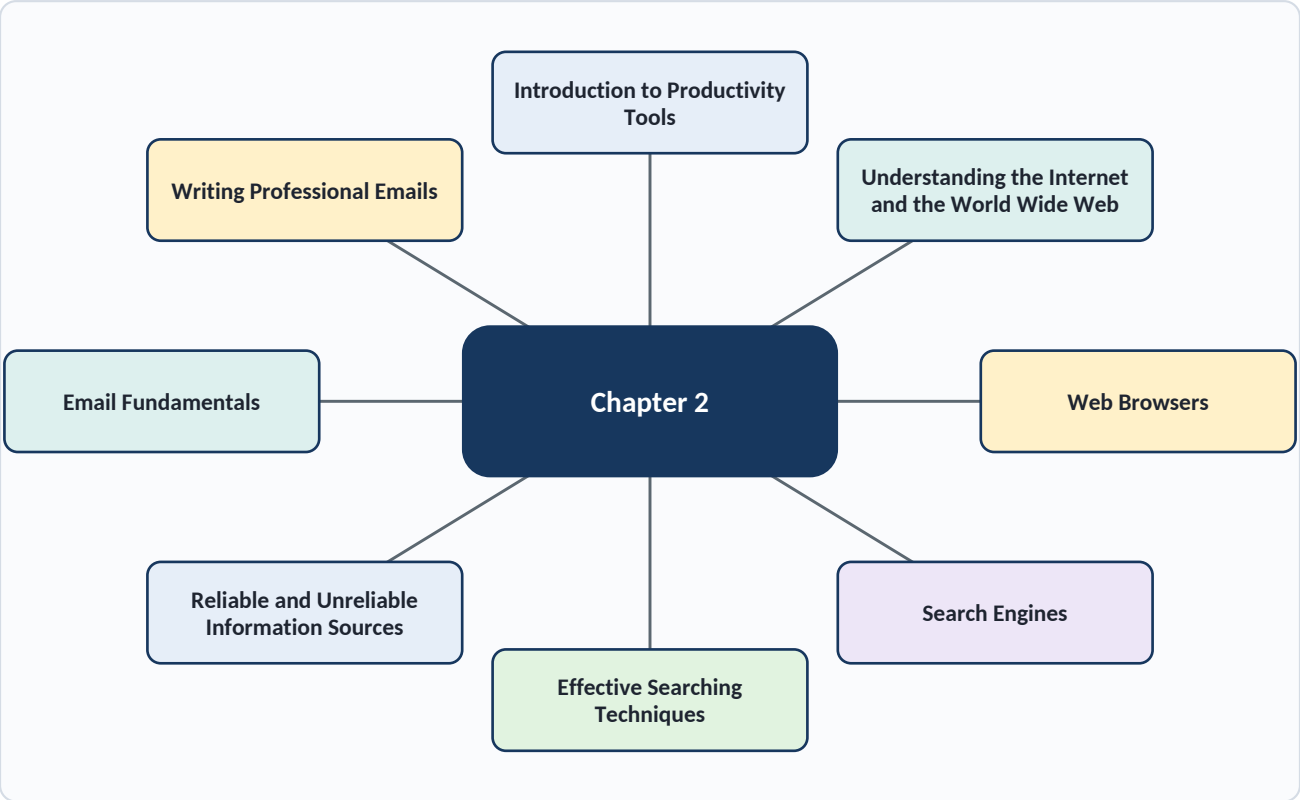
Basic ICT Productivity Tools and Internet Skills

The Internet is your library, your post office and your marketplace. This chapter teaches you to use it with skill: to find reliable information quickly, and to write and send email like a professional.

Chapter Learning Objectives

After studying this chapter, you will be able to:

- Explain what productivity tools are and name the main categories.
- Differentiate between the Internet and the World Wide Web.
- Identify the parts of a web browser and use it confidently.
- Explain how a search engine works and search effectively using keywords, quotation marks and operators.
- Evaluate whether an online source is reliable.
- Create and use a professional email account.
- Write a formal email using To, CC, BCC, subject line and attachments correctly.
- Recognise phishing emails and protect your account.



Chapter map: the main topics of this chapter

2.1 Why This Chapter Matters

In your university life you will search for study material, submit work by email and communicate with teachers daily. Poor searching wastes time and leads to unreliable information; a careless email can create a bad impression. These skills are small, but they are used every single day.

2.2 Introduction to Productivity Tools

A **productivity tool** is any software that helps you complete work faster, better or with less effort. You do not need to be a computer expert to use them. In this course we group them into four families.

Table 2.1: Families of productivity tools

Family	Purpose	Examples
Document tools	Write and format text	Microsoft Word, Google Docs
Number tools	Calculate, organise and chart data	Microsoft Excel, Google Sheets
Presentation tools	Present ideas visually	PowerPoint, Google Slides
Communication and storage tools	Exchange messages and keep files	Gmail, Outlook, Google Drive, OneDrive

Chapter 2 starts with the foundation of all online productivity: the Internet itself, the browser you use to reach it, and the email you use to communicate.

2.3 Understanding the Internet and the World Wide Web

The **Internet** is the worldwide system of connected networks that carries data between computers. Think of it as the road network of the digital world: cables under the sea, mobile towers, satellites and routers. The **World Wide Web (WWW)** is the collection of web pages and sites that you open using a browser. Think of the Web as the shops and buildings along those roads.

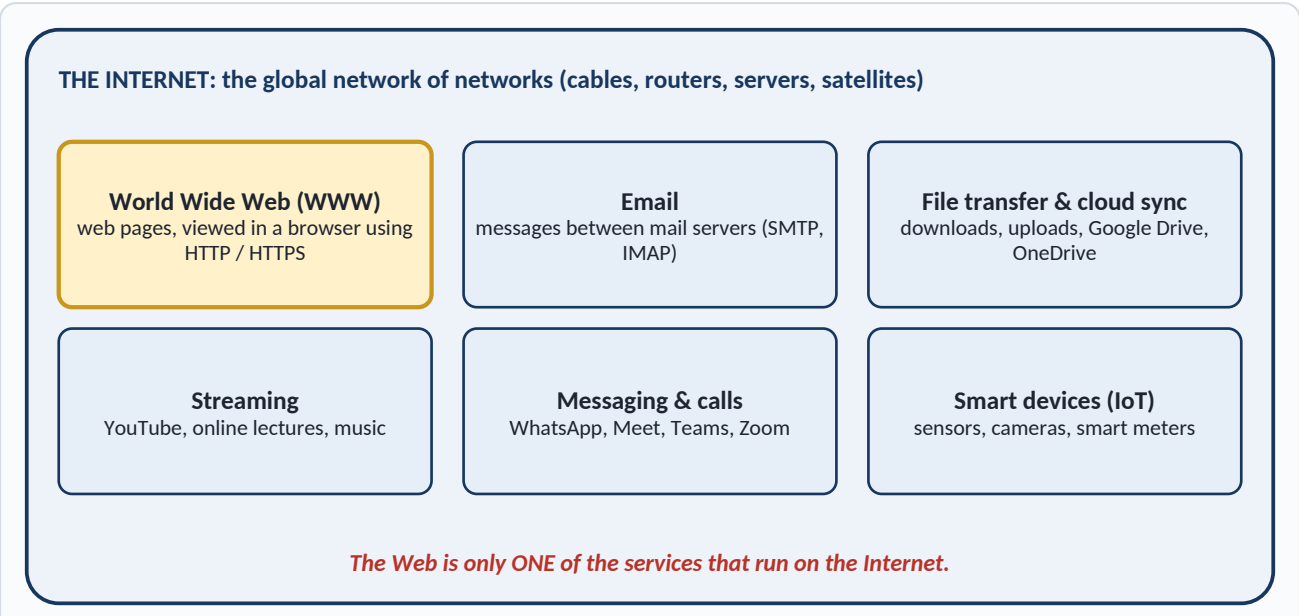


Figure 2.1: The Internet and its services; the Web is only one of them

Table 2.2: Internet versus World Wide Web

Point	Internet	World Wide Web
Nature	Global network (infrastructure)	Information service (web pages) on that network
Invented as	Network of computer networks	System of linked pages, viewed in browsers
Needs	Cables, routers, servers, ISP	Internet, browser, web servers
Includes	Web, email, streaming, file transfer, calls	Websites and web applications only
Example	Sending an email or a WhatsApp message	Opening a news website in Chrome

EXAM FOCUS

Frequently asked: "Differentiate between the Internet and the WWW." Remember: **Internet = network; WWW = content on the network**.

When you type a web address (URL) such as **https://www.example.com**, the browser sends a request over the Internet to a **web server**, which sends back the page. The letters **HTTPS** mean the connection is encrypted, so others cannot easily read what you send. Always look for the padlock symbol before entering passwords.

2.4 Web Browsers

A **web browser** is the software that requests, receives and displays web pages. Popular browsers include Google Chrome, Microsoft Edge, Mozilla Firefox and Apple Safari. A browser is not a search engine; it is the program, and a search engine is a website opened inside it.

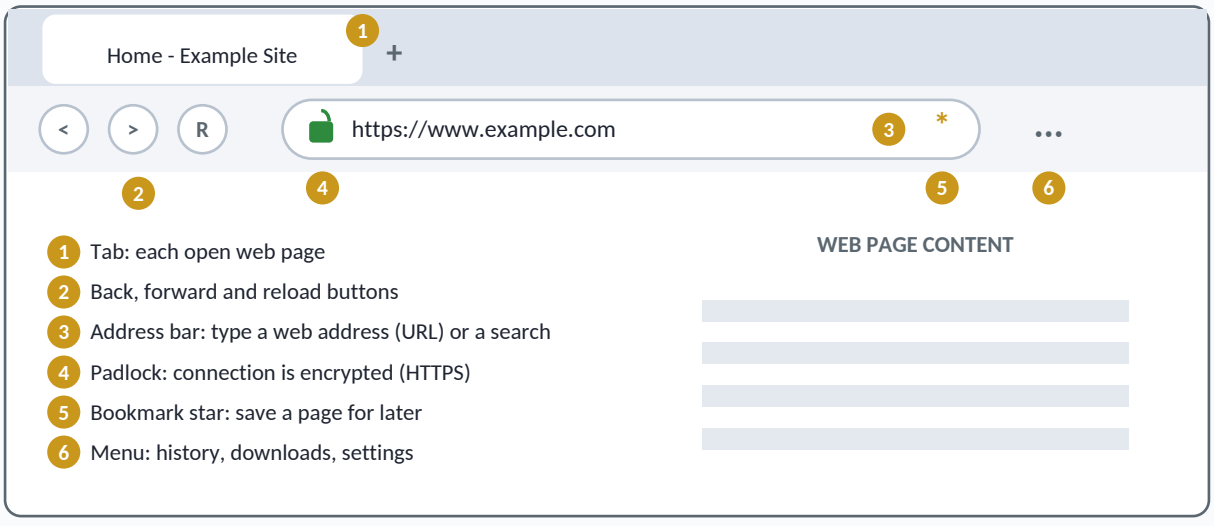


Figure 2.2: Parts of a typical web browser window

Figure 2.2 is an illustrative recreation. Real browsers look slightly different, but all have tabs, an address bar, navigation buttons, bookmarks and a menu. Learn these six parts and you can use any browser.

- **Tabs:** keep several pages open at once. Close those you do not need.
- **Bookmarks:** save favourite pages such as the university portal.
- **History:** a list of pages you visited; clear it on shared computers.
- **Downloads:** where files you saved from the Web are listed.

- **Private (incognito) window:** does not save history on that device, but it does not make you invisible online.

> **PROFESSOR'S TIP**
> On any shared lab computer, always log out of your accounts and close the browser. Many accidental account misuse cases begin with a forgotten login.

2.5 Search Engines

A **search engine** is a website that helps you find web pages by typing words. The best known are **Google Search** and **Microsoft Bing**. A search engine does not search the live Web when you press Enter; it searches its own enormous catalogue (an *index*) that it built earlier.

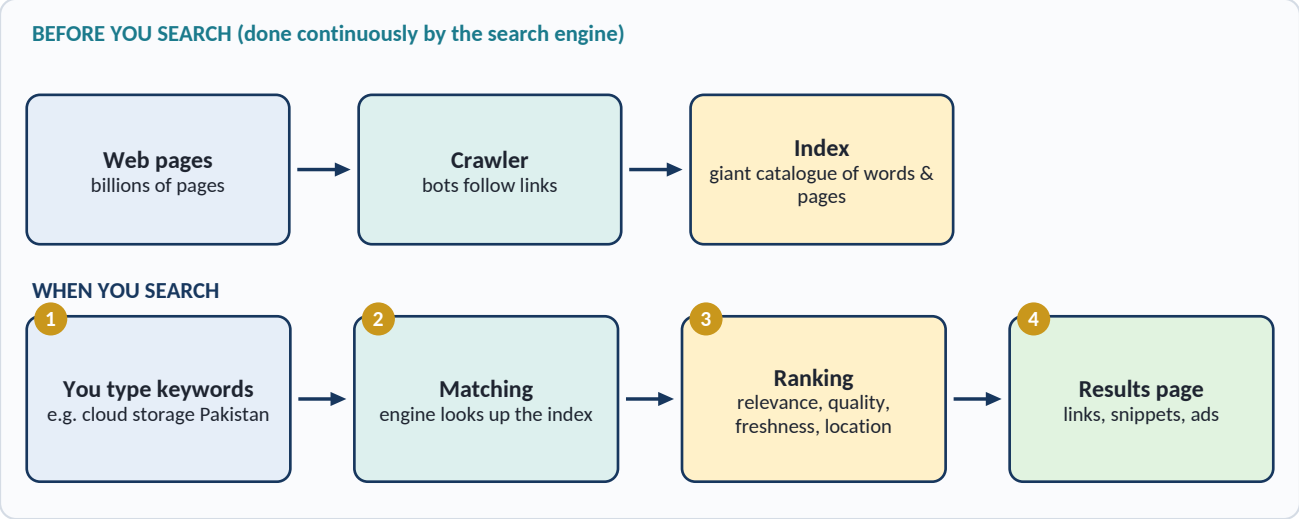


Figure 2.3: How a search engine works

In Figure 2.3, special programs called crawlers follow links from page to page and record what they find in the index. When you search, the engine matches your keywords against the index and ranks the results by relevance, quality and other signals. Results may include paid advertisements, which are usually labelled.

Table 2.3: Google Search compared with Microsoft Bing

Feature	Google Search	Microsoft Bing
Owner	Google	Microsoft
Where used	Most browsers and phones (default on many Android phones)	Default in Microsoft Edge
Special features	Maps, Scholar, Images, News	Images, Maps, integration with Microsoft services
Cost	Free for users	Free for users

Both are good tools. Features and layouts change often, so explore the current version yourself.

2.6 Effective Searching Techniques

A **keyword** is an important word that describes what you want. A **search query** is the whole phrase you type. Short, specific queries work better than long sentences.

Table 2.4: Weak and strong queries

Weak query	Better query	Why better
how to make assignment	Word assignment format margins headers	Names the tool and the topic
internet	difference between internet and WWW	Matches your actual need
best laptop	laptop under 100000 PKR for students	Adds purpose and budget

Exact phrase and other search operators

Placing words inside **quotation marks** tells the search engine to look for that exact phrase in that order, for example “data processing cycle”. Other helpful operators are listed below. Operators can change over time, so test them yourself.

Table 2.5: Useful search tips

Tip	Example	What it does
Quotation marks	“cloud storage”	Finds the exact phrase
Minus sign	java -coffee	Excludes a word from results
site:	site:edu.pk scholarship	Limits results to one website or domain
filetype:	filetype:pdf ICT notes	Finds a specific file type
OR	Word OR Docs tutorial	Finds either word

PRACTICAL CORNER

Search “cloud storage” without quotes, then with quotes. Compare the first five results. Which set is closer to what you meant? (Activity 3)

2.7 Reliable and Unreliable Information Sources

Anyone can publish on the Web, so a page appearing in search results does not make it true. Before you rely on information, ask five questions.

Table 2.6: Five questions to evaluate a source

Question	What to check
Who wrote it?	Is the author or organisation named and qualified?
Is it current?	Check the date; old information may be outdated.
Is it supported?	Does it give evidence or links to reliable sources?
Why was it written?	To inform, sell, persuade or entertain?
Do others agree?	Do other reputable sources report the same facts?

Table 2.7: Examples of source reliability

Generally more reliable	Use with caution
Government and university websites, official organisation pages	Anonymous blogs and unsigned posts
Textbooks and peer-reviewed journals	Social media posts with no source
Established news organisations with named reporters	Pages full of advertisements and sensational headlines

COMMON MISTAKE

Copying the first search result into an assignment. The first result is often the most popular or the most advertised, not necessarily the most accurate.

2.8 Email Fundamentals

Email (electronic mail) is a method of sending messages and files over the Internet. Each person has an address of the form **name@domain**, for example ali.raza@example.com. The part before @ is the username; the part after is the email provider's domain.

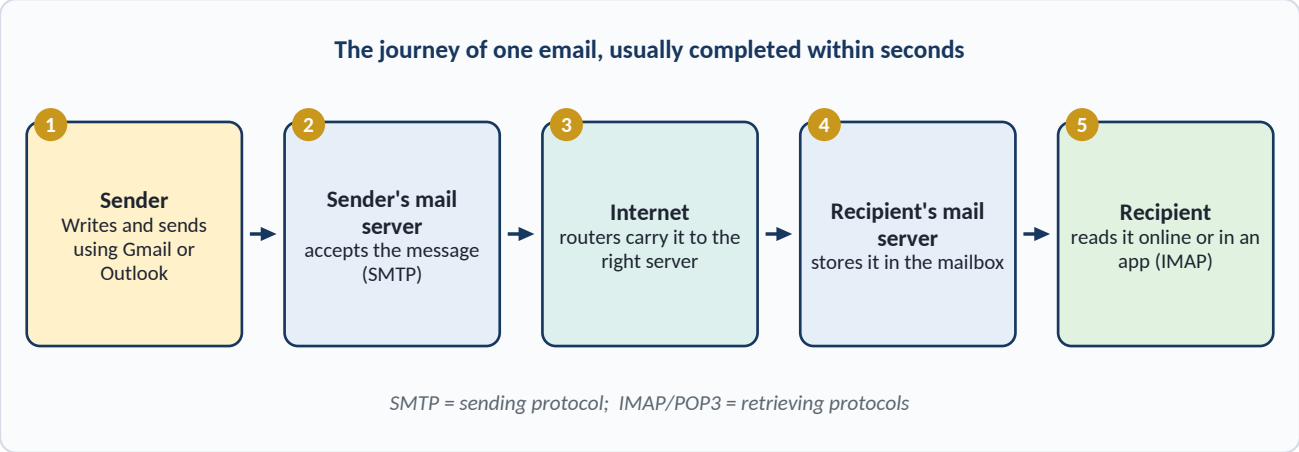


Figure 2.4: Journey of an email from sender to recipient

Figure 2.4 shows that your message travels from your email program to your provider's server, across the Internet to the recipient's provider, and finally into the recipient's mailbox. The recipient can read it whenever they log in.

Gmail and Microsoft Outlook

Table 2.8: Gmail and Outlook at a glance

Feature	Gmail	Microsoft Outlook
Provider	Google	Microsoft
Typical use	Personal and many student accounts	Workplaces, universities using Microsoft 365
Storage tied to	Google account (shared with Drive and Photos)	Microsoft account or organisation account
Extra tools	Calendar, Meet, Docs	Calendar, Teams, Word, Excel

Your university may give you an official email address. Use that for academic communication when instructed. For personal accounts, choose a professional address.

PROFESSOR'S TIP

Choose an email username based on your real name, such as ali.raza.2025, not nicknames such as "cool_boy786" or "queen_princess". Your email address is part of your professional identity.

Creating a Gmail account (guidance)

Screens change over time, so follow the general steps and read each screen carefully.

1. Open a browser and go to the Google account creation page.
2. Enter your first and last name.
3. Choose a basic information step (date of birth and gender) as requested.
4. Choose a professional username and check that it is available.
5. Create a strong password: at least 12 characters mixing words, numbers and symbols. Do not reuse passwords from other sites.
6. Add a recovery phone number or email so you can regain access.
7. Review the terms, accept, and sign in.
8. Turn on 2-Step Verification in your account security settings.

REAL-LIFE CONNECTION

Many Pakistani students first use an email address when they create an online admission or scholarship form. A messy address can make a poor first impression on an admission office or employer.

2.9 Writing Professional Emails

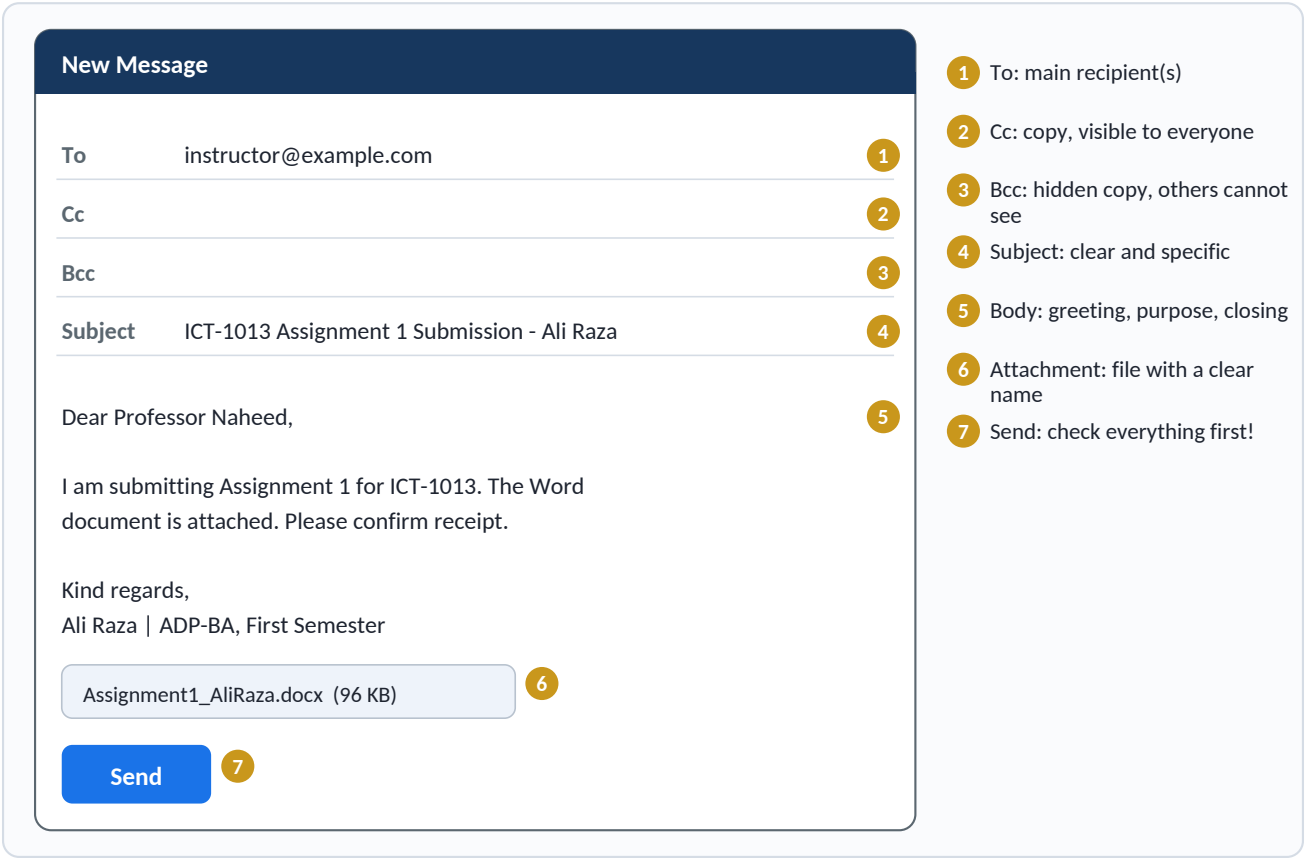


Figure 2.5: Anatomy of a formal email

Figure 2.5 shows a short formal email. Study the parts: the recipient in To, a clear subject line, a greeting, a purpose in the first sentence, a polite closing, your name and class details, and a clearly named attachment.

To, CC and BCC

Table 2.9: To, CC and BCC

Field	Meaning	Who sees it	Use when
To	Main recipient(s)	Everyone	The person who must act or reply
CC (carbon copy)	People kept informed	Everyone sees CC recipients	Informing a supervisor or group
BCC (blind carbon copy)	Hidden recipients	Only you and that person see it	Sending to many people without exposing their addresses

COMMON MISTAKE

Using “Reply All” unnecessarily. Before pressing Reply All, ask: does everyone on this list need to see my message?

Email etiquette

- Write a **specific subject**: “ICT-1013 Assignment 1 Submission - Ali Raza” is better than “Assignment”.
- Begin with a polite greeting such as “Dear Professor Naheed,”.
- State your purpose in the first one or two sentences.
- Use short paragraphs and correct spelling. Avoid ALL CAPITALS, which look like shouting.
- Avoid slang, emojis and text-message abbreviations in formal emails.
- End politely (“Kind regards,”) and sign with full name, programme and section.
- Proofread before sending, and check the attachment is attached.
- Respond within a reasonable time; do not expect instant replies late at night.

Email attachments

An **attachment** is a file sent with an email. Name files clearly (for example Assignment1_AliRaza.docx), keep size reasonable, and mention the attachment in the message. For large files, upload to cloud storage and share a link (Chapter 4). Never open an unexpected attachment, especially files ending in .exe or .zip from unknown senders.

2.10 Email Security and Phishing Awareness

Phishing is an attempt to trick you into revealing passwords, bank details or personal data by pretending to be a trusted organisation. Phishing emails, SMS and fake websites are common in Pakistan, often imitating banks, couriers or mobile wallet providers.

Table 2.10: Signs of a phishing message

Warning sign	Example
Urgent threat	"Your account will be blocked in 2 hours!"
Requests private data	Asks for a password, PIN or one-time code by email or call
Suspicious sender address	A bank message from a free email address
Strange links	The link text and the real address differ
Poor spelling or generic greeting	"Dear customer" and spelling errors
Unexpected prize or refund	"You have won a cash prize"

REMEMBER THIS

No genuine bank, mobile wallet or university will ask for your password, PIN or one-time verification code. Never share them with anyone.

PROFESSOR'S TIP

When in doubt, do not click. Open the official website by typing its address yourself, or contact the organisation using a number you already trust.

2.11 Important Terminology

Table 2.11: Key terms of Chapter 2

Term	Meaning
URL	The web address of a page.
Browser	Software used to view web pages.
Search engine	A website that finds pages from its index.
Keyword	An important word used in a search.
Crawler	A program that discovers web pages for the index.
HTTPS	Secure version of the web protocol, using encryption.
Email attachment	A file sent with an email message.
CC / BCC	Visible copy / hidden copy of an email.
Phishing	Fraud that tricks people into revealing private data.
2-Step Verification	A second proof of identity, such as a code, in addition to the password.

2.12 Common Mistakes

COMMON MISTAKE

- Using vague search queries and accepting the first result.
- Leaving the subject line blank or writing “hello”.
- Using BCC when the recipient should be visible, or CC for everyone.
- Clicking links in unexpected messages.
- Using a weak or reused password.
- Forgetting to attach the file you promised.

2.13 Practical Activities

Complete these hands-on activities on your own device or in the computer lab. Interfaces change with updates, so if a button has moved, look for the same command by its name.

Activity 3: Perform an effective Google search	
Learning objective	Use keywords, exact phrases and operators to find reliable information.
Required tools	Computer or phone with a browser and Internet.
Step-by-step instructions	**1.** Open Google Search or Bing. **2.** Search for: cloud storage. Note the first three results. **3.** Search for: “cloud storage” advantages students. Note what changed. **4.** Search for: “cloud storage” filetype:pdf. See how results differ. **5.** Pick one result and apply the five source questions from this chapter. **6.** Write two lines: why you would or would not trust the source.
Expected outcome	A short note listing three queries, what improved each time, and your judgement of one source.
Self-check questions	a Which query gave the most useful results? b How can you tell who wrote the page? c What does the padlock symbol mean?

Activity 4: Create a professional Gmail account	
Learning objective	Create a secure email account with a professional address.
Required tools	Phone number or alternate email, browser, Internet.
Step-by-step instructions	**1.** Open the Google account creation page. **2.** Enter your name and choose a professional username (name plus digits is acceptable). **3.** Create a strong password and write the rule you used (not the password) in your notes. **4.** Add a recovery phone or email. **5.** Open Security settings and switch on 2-Step Verification. **6.** Send a test email to a classmate.
Expected outcome	A working Gmail account with 2-Step Verification and a sent test message.
Self-check questions	a Why is a professional username important? b What is 2-Step Verification? c What would you do if you forgot the password?

Activity 5: Compose a formal university email	
Learning objective	Write a clear, polite email with correct fields and an attachment.
Required tools	Email account, a sample Word or text file.
Step-by-step instructions	**1.** Write an email to your instructor (or a classmate acting as the instructor). **2.** Write a specific subject line that includes course code and your name. **3.** Write a greeting, a one-sentence purpose, one more detail sentence and a polite closing. **4.** Attach a small file named clearly (Assignment1_YourName). **5.** Add one classmate in CC. Explain why that person is in CC. **6.** Proofread, then send.
Expected outcome	A sent formal email with a clear subject, attachment and appropriate CC.
Self-check questions	a Did you say what you want in the first two lines? b Did you proofread spelling and the recipient's name? c Who would be hidden with BCC, and why?

2.14 Classroom Discussion Questions

1. Should students trust the first result of a search? Why or why not?
2. Have you ever received a suspicious message? What made it suspicious?
3. Which is better for a university student: Gmail or the university email? Explain.

2.15 Chapter Summary

- The Internet is the global network; the Web is one service on it.
- A browser displays web pages; a search engine finds them.
- Good searching uses specific keywords, quotation marks and operators.
- Evaluate sources by author, date, evidence, purpose and agreement with other sources.
- Professional email needs a clear subject, polite tone, and correct use of To, CC and BCC.
- Phishing tricks people; protect yourself with strong passwords, 2-Step Verification and caution.

2.16 Quick Revision Notes

> **QUICK REVISION**
> - Internet = network, WWW = pages
> - Browser ≠ search engine
> - "Quotes" = exact phrase
> - To = main, CC = visible copy, BCC = hidden copy
> - Never share password, PIN or OTP

2.17 Key Points to Remember

REMEMBER THIS

- Differentiate Internet and WWW.
- Explain how a search engine works in three steps.
- Write a good subject line.
- List three signs of phishing.
- State the purpose of CC and BCC.

2.18 Short Questions

1. Differentiate between a browser and a search engine.
2. What is a URL?
3. What is the use of quotation marks in a search?
4. List four email etiquette rules.
5. Differentiate CC and BCC.
6. Define phishing and give two warning signs.
7. What is 2-Step Verification?

2.19 Long Questions

1. Explain how a search engine works, with a diagram.
2. Describe five techniques for searching effectively, with examples.
3. Explain how to judge whether an online source is reliable.
4. Write a formal email to your instructor requesting an extension and explain each part of it.

2.20 Multiple-Choice Questions

Choose the best answer. Attempt all questions first; then check your answers and explanations in the Instructor/Revision Support section at the end of this book.

1. Which software displays web pages?

   (A) Search engine
   (B) Web browser
   (C) Router
   (D) Operating system

2. Which search puts words in an exact order?

   (A) Using a minus sign
   (B) Using quotation marks
   (C) Using capital letters
   (D) Using spaces

3. In an email, who can see BCC recipients?

   (A) Everyone
   (B) Only the sender and that BCC recipient
   (C) Only the To recipient
   (D) Nobody, not even the sender

4. Which is a sign of phishing?

   (A) A message that asks you to share your PIN urgently
   (B) A clear sender and no links
   (C) A message you expected
   (D) An email with the university name in the signature

5. HTTPS means the connection is:

   (A) Faster
   (B) Encrypted
   (C) Free of viruses
   (D) Always trustworthy content

6. Which is the best subject line?

   (A) Hello
   (B) Urgent!!!
   (C) ICT-1013 Assignment 1 Submission - Ali Raza
   (D) Please check

2.21 Self-Assessment Exercise

Tick each statement you can honestly say is true. Revisit the relevant section for any statement you cannot tick.

- ■ I can explain the difference between the Internet and the Web.
- ■ I can use quotation marks and operators in a search.
- ■ I can judge a source using the five questions.
- ■ I can write a formal email with correct fields.
- ■ I can recognise a phishing message.

CHAPTER 03

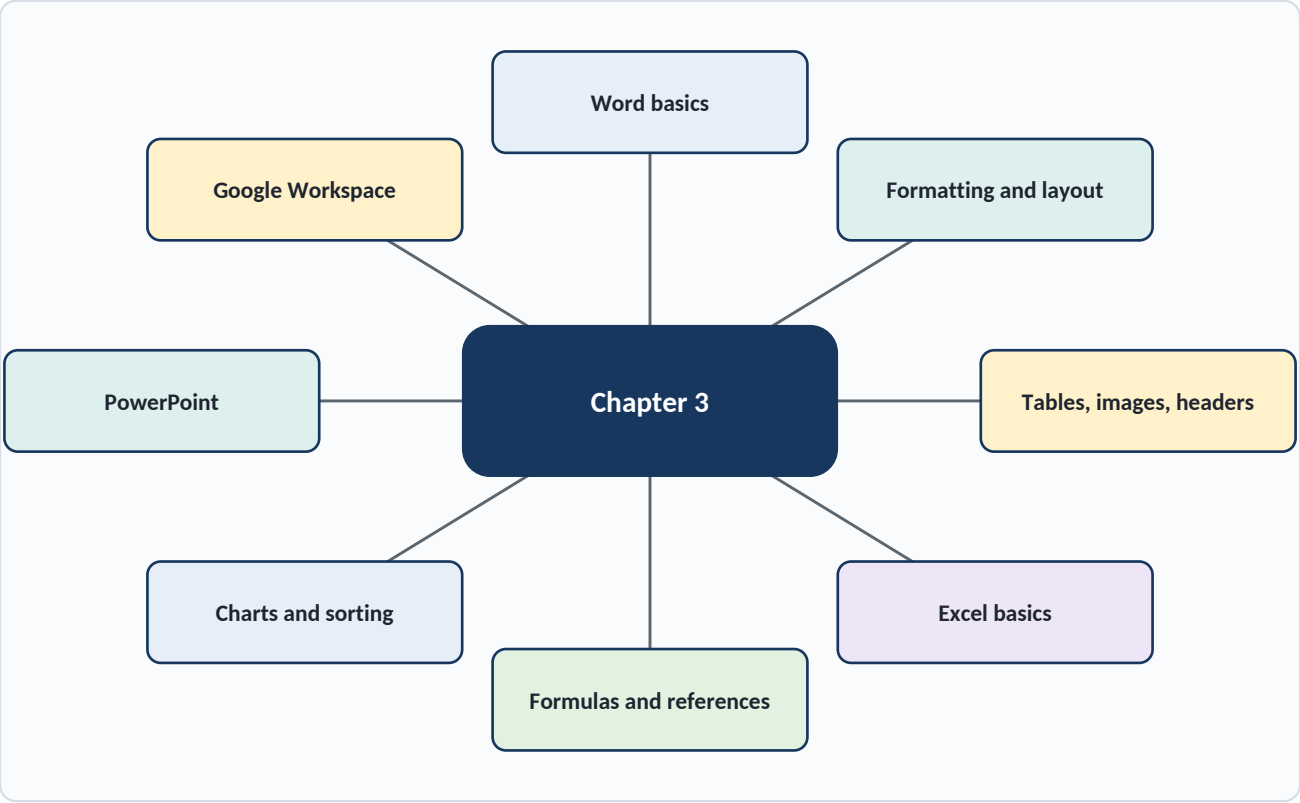
Microsoft Office and Google Workspace

Word, Excel and PowerPoint are the working tools of the modern office. This chapter shows you how to use them step by step, and how Google's free online equivalents let you do the same work together with others.

Chapter Learning Objectives

After studying this chapter, you will be able to:

- Create, format, save and print a Word document and prepare a professional assignment.
- Describe the Word interface: ribbon, tabs, groups and commands.
- Explain workbook, worksheet, row, column, cell and range in Excel.
- Use SUM, AVERAGE, MIN, MAX and COUNT, and explain relative and absolute references.
- Sort, filter and chart data and prepare a student marksheet.
- Create a clear PowerPoint presentation with slides, layouts, themes, images and transitions.
- Use Google Docs, Sheets and Slides for sharing and real-time collaboration.
- Compare Microsoft Office and Google Workspace.



Chapter map: the main topics of this chapter

3.1 Why This Chapter Matters

Assignments, reports, marksheets and presentations will be part of every semester and every office job. Students who can format a document neatly, calculate with a spreadsheet and present clearly save hours of effort and earn better marks for presentation quality.

3.2 Before You Begin: How Office Software Is Organised

Microsoft Word, Excel and PowerPoint belong to **Microsoft Office** (now sold mainly through a subscription called Microsoft 365). Their screens share one design: a **ribbon** at the top contains **tabs**; each tab contains **groups**; each group contains **commands** (buttons). If you can find a command in one program, you can usually find it in the others.

> NOTE
> Menus and button positions change between versions of Microsoft Office and Google Workspace. This book teaches the idea and the command names; if a button looks different on your screen, search for its name using the "Tell me" or search box in the program, or consult the official help of the software.

3.3 Part A: Microsoft Word

What is word processing?

Word processing means creating, editing, formatting, saving and printing text documents using software. Word is used for assignments, letters, reports, CVs and notices. Unlike a typewriter, you can correct mistakes, change fonts and rearrange text without retyping.

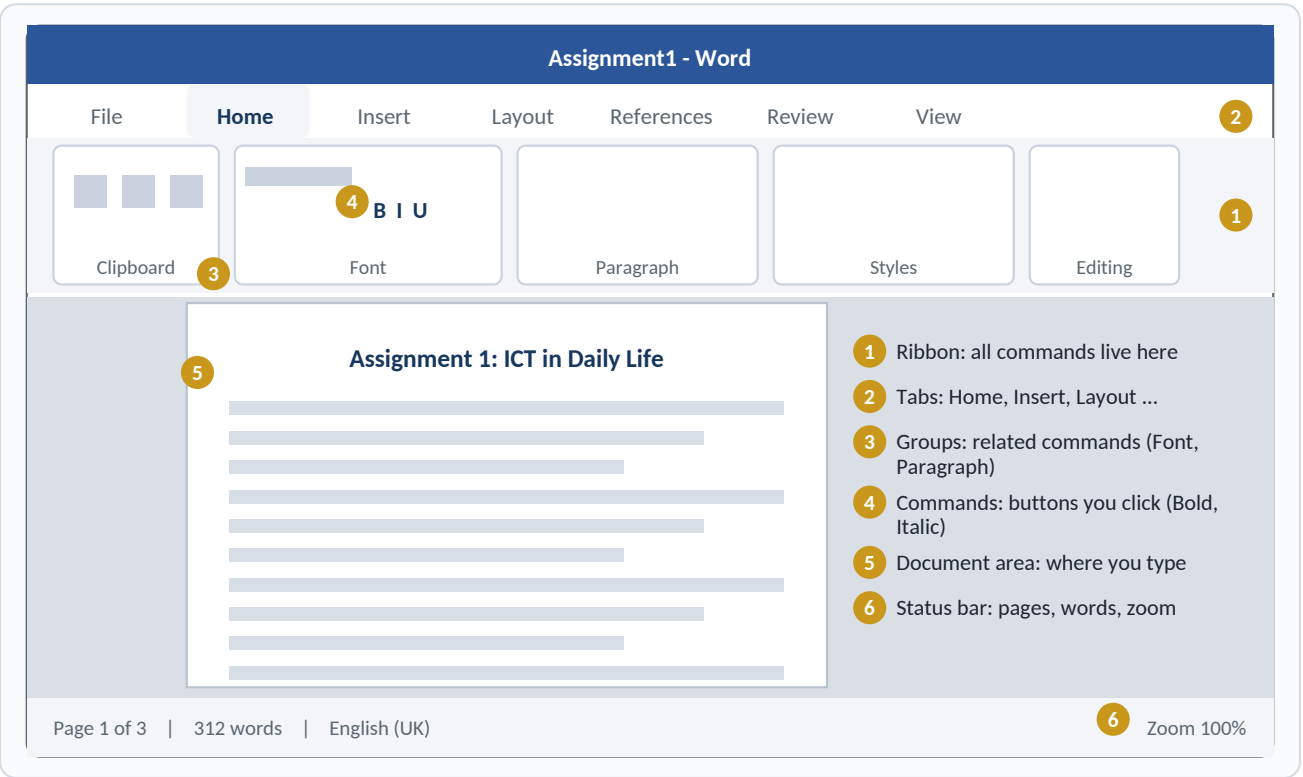


Figure 3.1: Illustrative Microsoft Word interface

In Figure 3.1, the ribbon holds the commands; the Home tab contains the groups you will use most (Clipboard, Font, Paragraph, Styles and Editing). The page appears in the document area, and the status bar below shows page count, word count and zoom.

Creating and saving documents

1. Open Word and choose **Blank document**.
2. Type your text. Press Enter only at the end of a paragraph, not at the end of every line.
3. Press **Ctrl+S** to save. Choose a folder and give a meaningful file name such as Assignment1_AliRaza.
4. Save often. Word documents use the extension .docx.

> COMMON MISTAKE
> Saving as "Document1" in a random folder, then being unable to find the file. Always choose the folder and a clear name.

Text and paragraph formatting

Table 3.1: Common formatting commands (Home tab)

Task	Where	Shortcut
Bold, italic, underline	Font group	Ctrl+B, Ctrl+I, Ctrl+U
Font type and size	Font group	
Align left, centre, right, justify	Paragraph group	Ctrl+L, Ctrl+E, Ctrl+R, Ctrl+J
Bullets and numbering	Paragraph group	
Line spacing	Paragraph group	
Copy, cut, paste	Clipboard group	Ctrl+C, Ctrl+X, Ctrl+V
Undo, redo	Quick Access Toolbar	Ctrl+Z, Ctrl+Y

Character formatting changes selected letters (font, size, colour). **Paragraph formatting** changes a whole paragraph (alignment, spacing, indentation). First select the text, then apply the format.

Page layout

- **Margins** are the blank spaces around the text. Many universities use about 2.5 cm (1 inch) on all sides unless instructed otherwise. Find them under **Layout > Margins**.
- **Orientation** can be Portrait (vertical) or Landscape (horizontal).
- **Size** should usually be A4 in Pakistan.
- **Headers and footers** repeat text at the top or bottom of every page; use them for your name, course code and **page numbers** (**Insert > Page Number**).

Tables, images and shapes

Use **Insert > Table** to arrange data in rows and columns. Use **Insert > Pictures** for images and **Insert > Shapes** for arrows and boxes. Always add a short caption and make sure pictures do not hide text. Right-click a picture and choose **Wrap Text** if you want text to flow around it.

Spell check, Find and Replace, printing and PDF

- **Spell check:** Review > Spelling and Grammar (or press F7). Red lines show spelling issues; blue or other marks suggest grammar and style. Always read suggestions before accepting them.
- **Find and Replace:** press **Ctrl+F** to find, **Ctrl+H** to replace a word everywhere.
- **Printing:** File > Print. Check the preview, page range and number of copies.
- **Export to PDF:** File > Save As or Export, and choose PDF. A PDF keeps your layout fixed so it looks the same on every device.

Preparing a professional university assignment

Table 3.2: Assignment checklist

Element	Recommended practice
Cover page	Title, course code, your name, roll number, section, instructor, date
Font	A clean font such as Times New Roman, Calibri or Cambria, size 11–12
Spacing	1.15 to 1.5 line spacing; space after paragraphs
Headings	Consistent heading styles (Home > Styles)
Page numbers	Bottom centre or right
References	List every source you used (see Chapter 11)
Final check	Spell check, read aloud, save as PDF if asked

PROFESSOR'S TIP

Use the built-in Styles (Heading 1, Heading 2) instead of manually enlarging text. Styles make your document consistent and allow an automatic table of contents.

3.4 Part B: Microsoft Excel

Introduction to spreadsheets

A **spreadsheet** is a grid for organising, calculating and analysing data. Excel is the most widely used spreadsheet program in offices, shops and universities. Its power is that when you change a number, every formula that depends on it updates automatically.

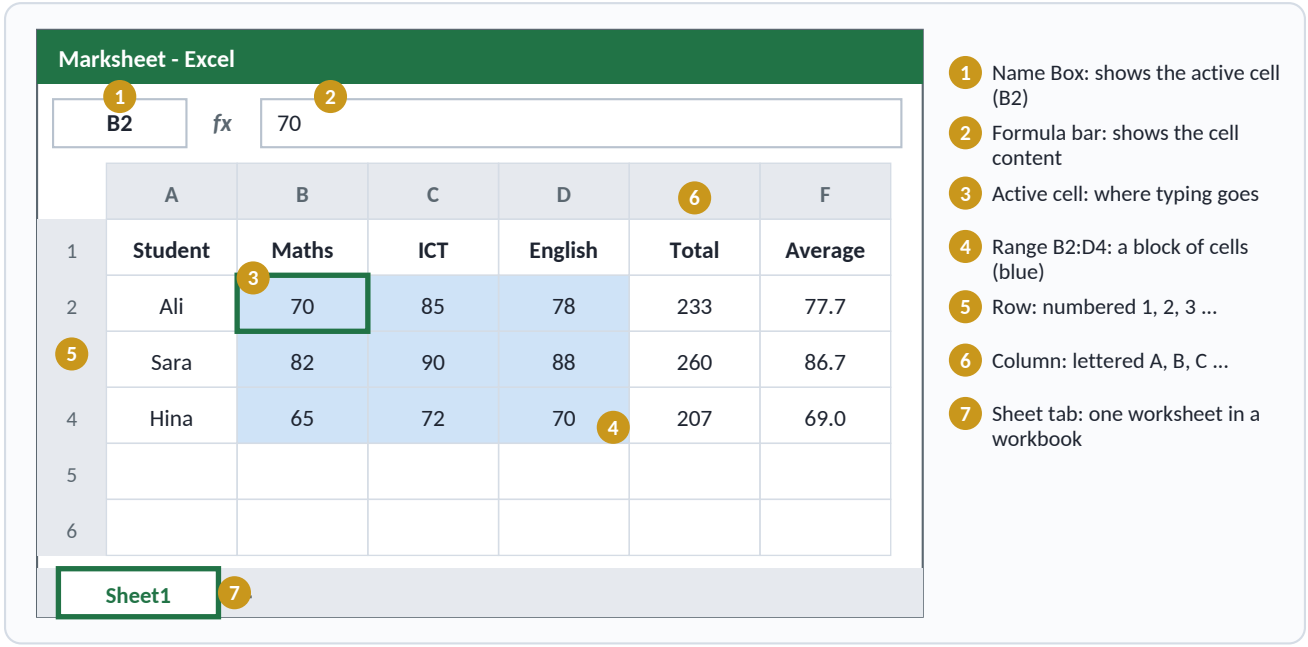


Figure 3.2: Illustrative Excel worksheet

Table 3.3: Excel vocabulary

Term	Meaning	Example
Workbook	An Excel file containing worksheets	Marksheet.xlsx
Worksheet	A single sheet (tab) in a workbook	Sheet1
Column	Vertical line labelled with letters	Column B
Row	Horizontal line labelled with numbers	Row 2
Cell	Box where a row and column meet	B2
Range	A group of cells	B2:D4
Formula bar	Shows the content or formula of the active cell	=SUM(B2:D2)

Figure 3.2 shows these parts. Notice that the Name Box shows B2, the cell address. Every cell has an address made from its column letter and row number.

Entering data and formatting cells

- Click a cell and type. Press **Enter** to move down, **Tab** to move right.
- To edit, double-click the cell or press **F2**.
- Use Home > Number group to format as number, percentage or currency.
- Use Home > Font and Fill Colour to emphasise headings. Use Borders to make tables clear.
- Double-click the line between two column headers to auto-fit the width.

Basic formulas and functions

Every formula begins with an **equals sign (=)**. A **function** is a ready-made formula.

Table 3.4: Five essential functions

Function	Purpose	Example	Result on 70, 85, 78
SUM	Adds numbers	=SUM(B2:D2)	233
AVERAGE	Arithmetic mean	=AVERAGE(B2:D2)	77.7
MIN	Smallest value	=MIN(B2:D2)	70
MAX	Largest value	=MAX(B2:D2)	85
COUNT	Counts cells containing numbers	=COUNT(B2:D2)	3

Formulas (type in row 2, then copy down)

Student	Maths	ICT	Eng.	Total	Avg.
Ali	70	85	78	233	77.7
Sara	82	90	88	260	86.7
Hina	65	72	70	207	69.0
Usman	58	66	61	185	61.7

E2: =SUM(B2:D2) F2: =AVERAGE(B2:D2)
SUM adds the three marks. AVERAGE divides the total by 3. Drag the fill handle down to copy the formulas to rows 3-5; Excel adjusts the row numbers (relative references).

Chart: Total Marks by Student

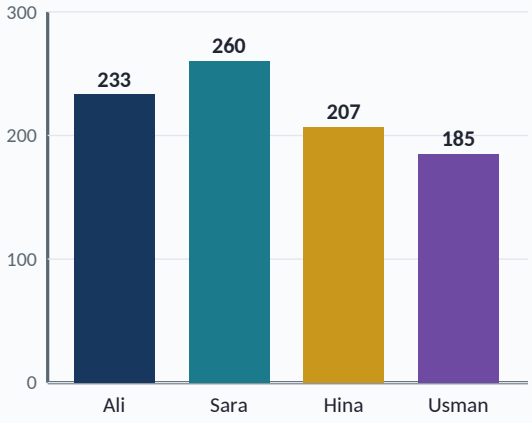


Figure 3.3: Formulas for a marksheet and a column chart of totals

Figure 3.3 shows a small marksheet. The formula in E2 adds the three subjects, and the formula in F2 finds the average. Drag the small square (fill handle) at the corner of the cell downward to copy the formula to the other students.

Relative and absolute cell references

A **relative reference** such as B2 changes when you copy the formula to another row or column. An **absolute reference** such as **B2** stays fixed because the dollar signs "lock" the column and row. Example: if total marks are in cell H1 and you want each student's percentage, write **=E2/H1*100** and copy down. E2 changes to E3, E4, and so on, but H1 does not change.

Table 3.5: Relative and absolute references

Type	Written as	When copied down one row
Relative	E2	Becomes E3
Absolute	H1	Stays H1
Mixed	E$2 or $E2	Only the unlocked part changes

EXAM FOCUS
Typical question: "Differentiate between relative and absolute cell references." Mention the dollar sign and show one formula example.

Sorting, filtering and charts

- **Sort** rearranges rows, for example highest to lowest marks: select your data, then Data > Sort. Always include the heading row and all columns so that rows stay together.
- **Filter** shows only rows that meet a condition, for example students with total above 200: Data > Filter, then use the arrow in the column heading.
- **Chart:** select the data, then Insert > Chart (Column, Line or Pie). Add a title and axis labels. Use column charts to compare, line charts for trends and pie charts for parts of a whole.

COMMON MISTAKE
Sorting only one column. This breaks the connection between each student and their marks. Select the whole table before sorting.

Business applications

A small shop owner can use Excel for daily sales, expenses, stock lists and profit calculation: **Profit = Sales - Expenses**. A student can use it for a monthly budget, attendance tracking or GPA calculation.

3.5 Part C: Microsoft PowerPoint

Presentation software helps you present ideas as a series of slides. PowerPoint is used in classrooms, business meetings and conferences. A good presentation supports the speaker; it does not replace the speaker.

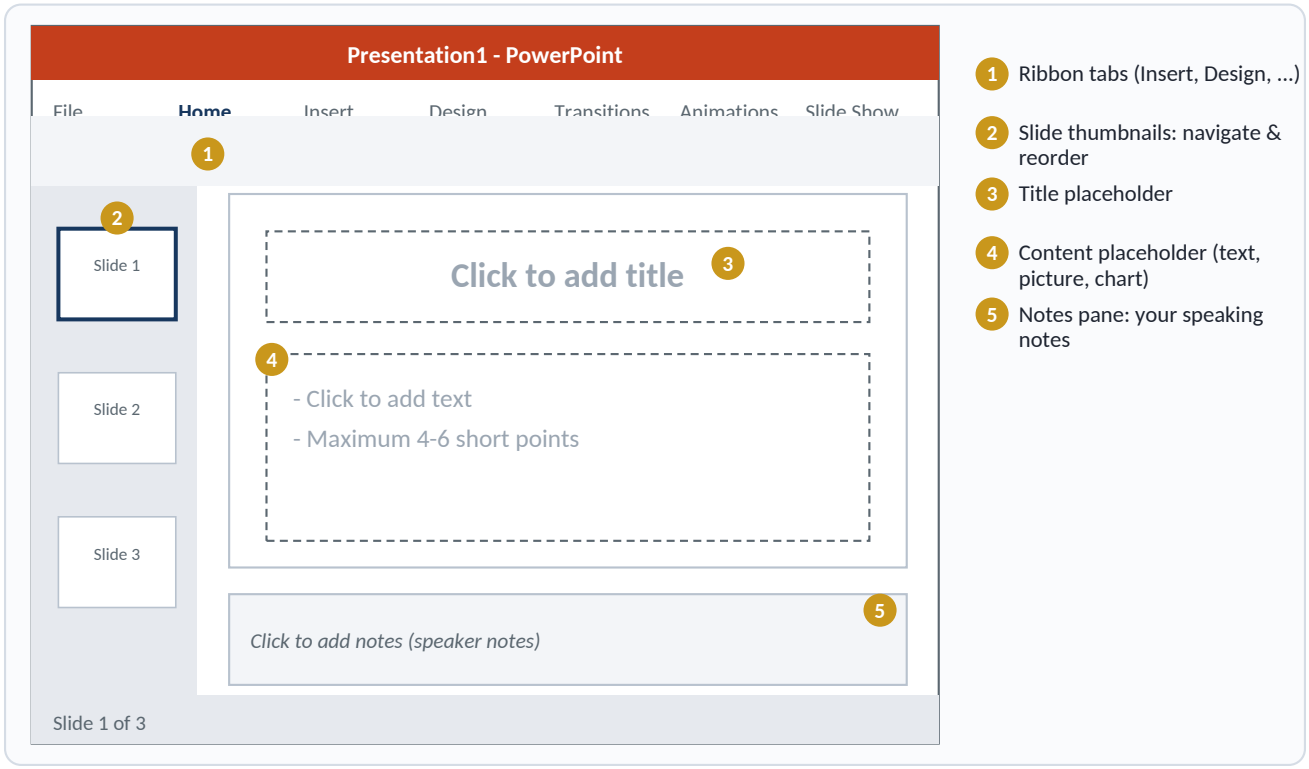


Figure 3.4: Illustrative PowerPoint window

Slides, layouts, themes and content

- A **slide** is one page of a presentation. A **layout** (Home > Layout) defines where the title and content boxes sit.
- A **theme** (Design tab) gives the whole presentation a consistent colour and font set. Choose one clear theme and keep it.
- Add **text** in placeholders, and **pictures, shapes, tables and charts** from the Insert tab.
- **SmartArt** converts a list into a diagram such as a process or hierarchy (Insert > SmartArt).
- **Transitions** control how one slide changes to the next; **animations** control how objects appear on a slide. Use them lightly.
- Press **F5** to start the slide show from the first slide; press **Esc** to exit.

Table 3.6: Good and poor slide design

Good practice	Poor practice
Short bullet points (about 4–6 per slide)	Paragraphs copied from a textbook
Large readable font (24 pt or more for body)	Tiny text and crowded slides
High contrast colours	Light text on a light background
One idea per slide	Many topics on one slide
Relevant images and charts	Decorative images with no meaning
Rehearsed delivery with eye contact	Reading every word from the slide

Presentation delivery skills

- **Prepare:** know your opening, three main points and closing.
- **Practise aloud** and time yourself.
- **Speak clearly** and look at the audience, not only at the screen.
- **Check technology** before class: file, projector, internet, backup copy on a USB drive or cloud.
- **Invite questions** at the end and thank the audience.

3.6 Part D: Google Workspace

Google Workspace is Google's set of online productivity tools. **Google Docs** is similar to Word, **Google Sheets** to Excel and **Google Slides** to PowerPoint. They run in a browser and save automatically to Google Drive, so you rarely lose work.

Table 3.7: Microsoft Office compared with Google Workspace

Feature	Microsoft Office	Google Workspace
Word processor	Word	Docs
Spreadsheet	Excel	Sheets
Presentation	PowerPoint	Slides
Main working style	Strong desktop programs; also online versions	Browser-based and mobile-friendly
Real-time collaboration	Available with online storage	Built in, easy to use
Advanced features	More powerful for large or complex work	Simpler, good for everyday work
Offline use	Full	Possible when set up in advance
Cost	Subscription or university licence	Free personal use with limits

Sharing and collaboration

- **Share:** use the Share button and choose people and permission (Viewer, Commenter, Editor).
- **Real-time editing:** several people can edit the same document together and see each other's changes.
- **Comments:** select text, add a comment and tag a person with @ to ask a question.
- **Suggesting mode:** propose edits that the owner can accept or reject.
- **Version history:** restore an earlier version if something goes wrong.

Table 3.8: Advantages and limitations of Google Workspace

Advantages	Limitations
Free to start, accessible on any device	Needs Internet for most features
Excellent group work features	Fewer advanced formatting and formula features than desktop Office
Automatic saving and version history	Privacy and sharing settings must be managed carefully
Easy to export to Word, Excel, PowerPoint or PDF	Formatting may change when converting files

REAL-LIFE CONNECTION

A group of four ADP-BA students working on one presentation from different homes can all edit one Google Slides file at the same time, add comments and see changes instantly, instead of emailing different versions of the same file.

PROFESSOR'S TIP

For group assignments, agree on one master file and one person responsible for final formatting. Too many editors working with different styles produce messy documents.

3.7 Important Terminology

Table 3.9: Key terms of Chapter 3

Term	Meaning
Ribbon	The strip of tabs and commands at the top of an Office program.
Style	A saved set of formatting, such as Heading 1.
Margin	Blank space between text and page edge.
Workbook	An Excel file.
Worksheet	One sheet inside a workbook.
Cell reference	The address of a cell, such as B2.
Function	A built-in formula such as SUM.
Absolute reference	A reference locked with $ signs.
Layout	Arrangement of boxes on a slide.
Real-time collaboration	Several users editing the same file at once.

3.8 Common Mistakes

COMMON MISTAKE

- Pressing Enter at the end of every line instead of using word wrap.
- Using spaces to align text instead of tabs, tables or alignment tools.
- Typing numbers as text with extra characters, which breaks formulas.
- Forgetting the = sign at the start of a formula.
- Overcrowding slides with text.
- Using many fonts, colours and animations in one presentation.
- Sharing a Google file as “Anyone with the link can edit” without needing to.

3.9 Practical Activities

Complete these hands-on activities on your own device or in the computer lab. Interfaces change with updates, so if a button has moved, look for the same command by its name.

Activity 6: Create and format a Word document	
Learning objective	Practise typing, formatting and saving a document.
Required tools	Microsoft Word or Google Docs.
Step-by-step instructions	**1.** Open a blank document and type a title: “My ICT Journey”. **2.** Write three short paragraphs about how you use ICT. **3.** Format the title: centre, bold, size 16. Format the body: size 12, justified, 1.15 spacing. **4.** Add a bulleted list of three apps you use daily. **5.** Save the file with a proper name, then save a copy as PDF.
Expected outcome	A formatted one-page document saved as DOCX and PDF.
Self-check questions	a How did you apply paragraph formatting? b What is the difference between Save and Save As? c Why is PDF useful?

Activity 7: Prepare a professional assignment

Learning objective	Produce a neatly structured assignment using headings, page numbers and a header.
Required tools	Word or Google Docs.
Step-by-step instructions	**1.** Create a cover page: title, your name, roll number, course, instructor and date. **2.** Start a new page; add Heading 1 “Introduction”, Heading 2 subheadings, and two paragraphs under each. **3.** Insert a small table of two columns and three rows. **4.** Insert page numbers and a header containing the course code. **5.** Add a “References” heading and list two sources. **6.** Run spell check and export to PDF.
Expected outcome	A three-page assignment with a cover page, headings, a table, header and page numbers.
Self-check questions	a Are all headings styled consistently? b Are page numbers correct? c Did you list your sources?

Activity 8: Create an Excel marksheet and calculate total and average

Learning objective	Build a marksheet with formulas.
Required tools	Excel or Google Sheets.
Step-by-step instructions	**1.** In A1:F1 type Student, Maths, ICT, English, Total, Average. **2.** Enter five student names and three marks each. **3.** In E2 type =SUM(B2:D2) and press Enter. In F2 type =AVERAGE(B2:D2). **4.** Select E2:F2 and drag the fill handle down to row 6. **5.** Format the headings with colour and borders; set Average to one decimal place. **6.** In a cell below, use =MAX(E2:E6) and =MIN(E2:E6) to find the highest and lowest total.
Expected outcome	A formatted marksheet showing totals, averages, highest and lowest totals.
Self-check questions	a What happens to a formula when copied down? b Which function counts the number of students? c Why must formulas begin with =?

Activity 9: Generate an Excel chart

Learning objective	Turn marksheet data into a column chart.
Required tools	Excel or Google Sheets and your marksheet.
Step-by-step instructions	**1.** Select the Student and Total columns (hold Ctrl to select separate columns). **2.** Choose Insert > Column Chart. **3.** Add a chart title: “Total Marks by Student”. **4.** Add axis titles and data labels. **5.** Sort the data from highest to lowest and watch the chart update.
Expected outcome	A clear column chart with title and labels.
Self-check questions	a Which chart type best compares students? b What changes when you sort the data? c Which labels make the chart easier to read?

Activity 10: Prepare a PowerPoint presentation	
Learning objective	Create a short, professional presentation.
Required tools	PowerPoint or Google Slides.
Step-by-step instructions	**1.** Choose a topic such as “ICT in Pakistan’s Education”. **2.** Create five slides: title, three content slides, summary. **3.** Apply one theme; use short bullet points and at least one picture or chart. **4.** Add simple transitions only. **5.** Add speaker notes and rehearse for three minutes. **6.** Present to a classmate and ask for feedback.
Expected outcome	A five-slide presentation delivered within three minutes.
Self-check questions	a Did every slide have one main idea? b Is the text readable from the back of the class? c What feedback did you get?

3.10 Classroom Discussion Questions

1. When is Google Docs a better choice than Word, and when is Word better?
2. What makes a presentation slide boring or confusing?
3. Why is it risky to rely on the first version of a file instead of keeping version history?

3.11 Chapter Summary

- Office programs share the ribbon–tab–group–command structure.
- Word is for documents: format text and paragraphs, set margins, add headers, page numbers, tables and images; export to PDF.
- Excel is for calculations: workbooks contain worksheets of cells; formulas start with =.
- SUM, AVERAGE, MIN, MAX and COUNT are the essential functions.
- Absolute references use $ to stay fixed when copied.
- PowerPoint supports presenting; keep slides short and clear.
- Google Docs, Sheets and Slides are free browser-based tools with excellent real-time collaboration.

3.12 Quick Revision Notes

QUICK REVISION

- Ribbon → Tabs → Groups → Commands
- Ctrl+S save, Ctrl+C/X/V, Ctrl+Z undo, Ctrl+F find, Ctrl+H replace
- Cell = column + row (B2); range = B2:D4
- =SUM, =AVERAGE, =MIN, =MAX, =COUNT
- H1 = absolute; E2 = relative
- F5 starts slide show

3.13 Key Points to Remember

REMEMBER THIS

- Name five Home tab groups in Word.
- Write the formula for the total of B2 to D2.
- Explain absolute reference with an example.
- State three rules of good slide design.
- List two advantages and two limitations of Google Workspace.

3.14 Short Questions

1. What is a ribbon?
2. Differentiate between a workbook and a worksheet.
3. Write the formulas to find sum and average of cells B2 to D2.
4. What is a cell range?
5. Define relative and absolute references.
6. Why do we use headers and footers?
7. Name the Google equivalents of Word, Excel and PowerPoint.

3.15 Long Questions

1. Explain the steps to prepare a professional university assignment in Word.
2. Describe the main Excel functions with examples and show how to prepare a student marksheet.
3. Explain how to create an effective PowerPoint presentation and deliver it confidently.
4. Compare Microsoft Office and Google Workspace in a table and discuss collaboration features.

3.16 Multiple-Choice Questions

Choose the best answer. Attempt all questions first; then check your answers and explanations in the Instructor/Revision Support section at the end of this book.

1. Which formula adds the values in B2 to B6?

   (A) =ADD(B2:B6)
   (B) =SUM(B2:B6)
   (C) =TOTAL(B2-B6)
   (D) SUM B2:B6

2. Which reference stays fixed when copied?

   (A) B2
   (B) B2
   (C) B2:B3
   (D) Sheet1

3. Which shortcut saves a file?

   (A) Ctrl+P
   (B) Ctrl+S
   (C) Ctrl+C
   (D) Ctrl+Z

4. Which Excel function finds the largest value?

   (A) SUM
   (B) MIN
   (C) MAX
   (D) COUNT

5. A PowerPoint transition controls:

   (A) How objects appear on a slide
   (B) How one slide changes to the next
   (C) The slide size
   (D) The font

6. A major advantage of Google Docs is:

   (A) It needs no account
   (B) Real-time collaboration
   (C) It never needs the Internet
   (D) It has more features than every desktop program

3.17 Self-Assessment Exercise

Tick each statement you can honestly say is true. Revisit the relevant section for any statement you cannot tick.

- ■ I can create, format and save a Word document.
- ■ I can set margins, headers and page numbers.
- ■ I can build a marksheet with SUM and AVERAGE.
- ■ I can explain absolute and relative references.
- ■ I can create a chart.
- ■ I can prepare and deliver a short presentation.
- ■ I can share a Google document with the right permission.

CHAPTER 04

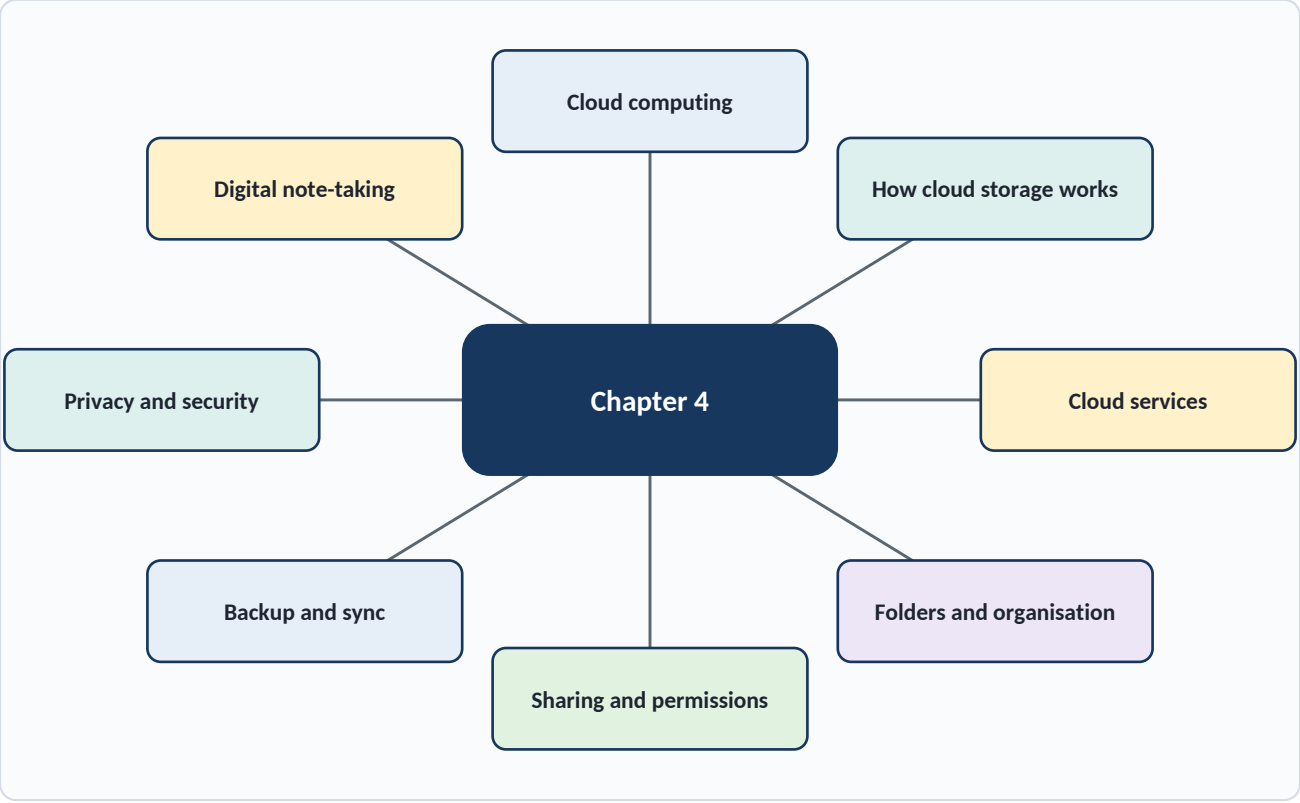
Cloud Storage and Digital Note-Taking

Your phone may be lost, your laptop may fail, but your work does not have to disappear. Cloud storage keeps your files safe and reachable from anywhere, and digital notes keep your study material organised.

Chapter Learning Objectives

After studying this chapter, you will be able to:

- Explain cloud computing and cloud storage in simple words.
- Describe how cloud storage works and compare it with local storage.
- Use Google Drive, OneDrive and Dropbox to upload, download, organise and share files.
- Choose correct sharing permissions: view, comment or edit.
- Explain backup and synchronisation.
- Identify privacy and security risks and protect your cloud account.
- Use OneNote, Evernote or Google Docs to take and organise academic notes.



Chapter map: the main topics of this chapter

4.1 Why This Chapter Matters

Students lose assignments every semester because a USB drive was damaged or a laptop was stolen. Cloud storage and well-organised notes protect your effort, allow group work and make revision easier.

4.2 Understanding Cloud Computing

Cloud computing means using computers, storage and software that are located elsewhere and accessed over the Internet, instead of owning and maintaining them yourself. The “cloud” is not a mysterious place; it is a large collection of servers in secure buildings called **data centres**, owned by companies such as Google, Microsoft and Amazon.

> **SIMPLE EXPLANATION**
> Think of electricity. You do not run your own power station; you use the supply and pay for what you need. Cloud computing is similar: you use storage and software from a provider without owning the machines.

4.3 Cloud Storage and How It Works

Cloud storage is a service that lets you save files on a provider’s servers and reach them from any device after you log in. Your file is usually copied to more than one location, so a single hardware failure does not destroy it.

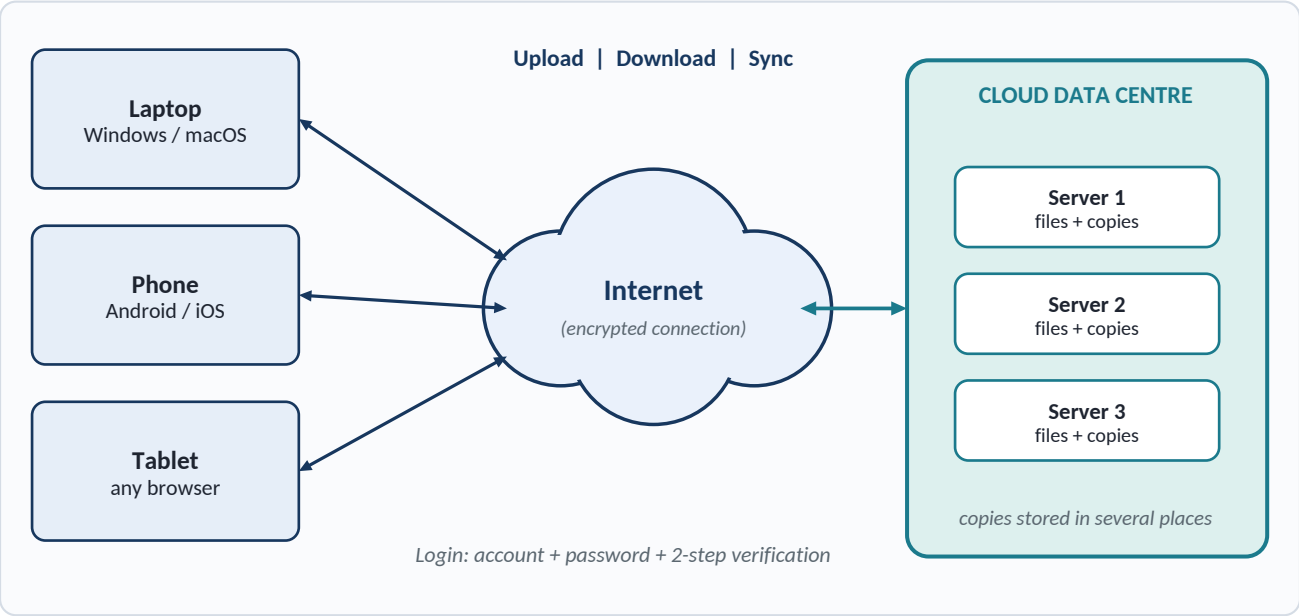


Figure 4.1: Cloud storage architecture

In Figure 4.1, your laptop, phone and tablet connect to the Internet and log in. When you upload a file, it travels through an encrypted connection to the data centre. Copies are stored on servers, and when you open the same account on another device, the same file is delivered to it.

Table 4.1: Local storage versus cloud storage

Feature	Local storage	Cloud storage
Location	Your laptop, USB drive, memory card	Provider's data centres
Access	Only where the device is	Any device with Internet and login
Sharing	Send a copy or hand over the device	Share a link or invite people
Safety against device loss	Low unless you back up	High (copy kept online)
Running cost	Buy the device	Free limit, then paid plans
Main risk	Loss, theft, damage	Hacked account, weak passwords, accidental sharing

4.4 Popular Cloud Storage Services

Table 4.2: Google Drive, OneDrive and Dropbox

Feature	Google Drive	Microsoft OneDrive	Dropbox
Provider	Google	Microsoft	Dropbox
Works best with	Google Docs, Sheets, Slides, Gmail	Windows, Word, Excel, PowerPoint	Simple file sync across many devices
Free storage	Usually 15 GB shared across Google services	Usually 5 GB	Usually a small free plan (about 2 GB)
Collaboration	Excellent real-time editing	Strong with Microsoft 365	File sharing and some collaboration tools

NOTE

Free storage limits and plan names change often. Always check the provider's official page for current details before choosing a plan.

4.5 Working with Files and Folders

- **Upload:** click New or Upload (or drag and drop files into the browser window).
- **Download:** right-click a file and choose Download.
- **Create folders:** New > Folder. Use clear names such as "ADP-BA Sem1 ICT-1013".
- **Move or rename:** drag files between folders; right-click to rename.
- **Delete:** deleted items usually go to Trash/Bin first and can be restored for a limited time.

Table 4.3: A simple folder structure for a student

Level	Example name
Main folder	ADP-BA Semester 1
Course folder	ICT-1013 Applications of ICT
Sub-folders	Assignments, Quizzes, Lecture Notes, Project
File name	ICT1013_Assignment1_AliRaza_v2.docx

PROFESSOR'S TIP

Name files so that you can understand them one year later: course code, content, your name and version. "final final new 2.docx" is not a system.

4.6 Sharing Files and Permissions

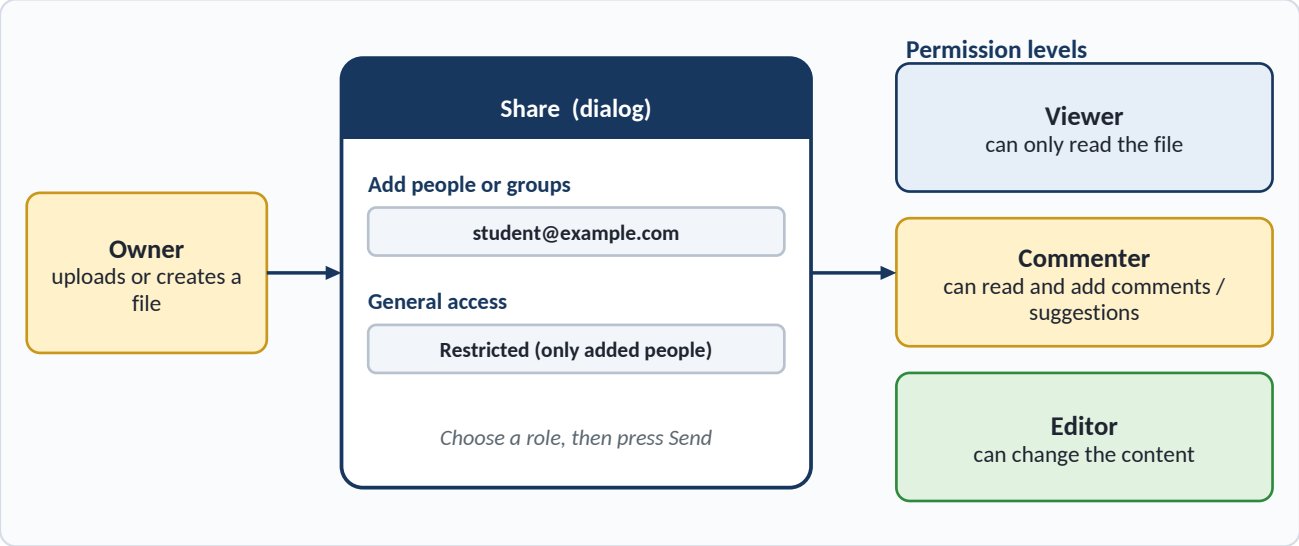


Figure 4.2: The file-sharing process in Google Drive

Figure 4.2 shows the process: the owner opens Share, adds people (or creates a link) and chooses a permission level. The recipient receives an email or opens the link.

Table 4.4: Sharing permissions

Permission	What the person can do	Use when
Viewer	Open and read only	Sending notes or a finished report
Commenter	Read and add comments or suggestions	Asking a teacher or friend for feedback
Editor	Change content (and sometimes share it)	Working on a group project together

- **Restricted access** means only the people you add can open the file. This is the safest option.
- **Anyone with the link** means that anyone who receives the link can open it, even if you did not intend it. Use only when needed and set Viewer permission.
- Review who has access from time to time and remove people who no longer need it.

> **COMMON MISTAKE**
> Setting an assignment to “Anyone with the link can edit”. Others can then change or copy your work, which can create academic honesty problems.

4.7 Backup and Data Synchronisation

A **backup** is an extra copy of your data kept in a different place so you can recover it after loss or damage. **Synchronisation (sync)** keeps the same files up to date on several devices automatically: when you change a file on your laptop, the updated version appears on your phone.

> **REMEMBER THIS**
> Sync is not the same as backup. If you delete a file on one device, sync may delete it everywhere. A good habit is the **3-2-1 rule**: keep 3 copies of important data, on 2 different types of storage, with 1 copy away from the main location (for example, in the cloud).

4.8 Privacy and Security of Cloud Data

- Use a **strong, unique password** and turn on 2-Step Verification.
- Do not store scans of sensitive documents (ID card, passport, bank details) unprotected or share them casually.
- Log out on public or shared computers.
- Beware of fake “file shared with you” emails that lead to fake login pages.
- Review which apps have access to your account.
- Remember that the provider stores your data; read its privacy policy for basic understanding.

4.9 Digital Note-Taking

Digital note-taking means recording and organising notes with software instead of (or together with) paper. Digital notes can be searched, edited, shared and kept in one place.

Table 4.5: Evernote, OneNote and Google Docs for notes

Tool	Strengths	Good for
Microsoft OneNote	Notebook, section and page structure; typing, drawing and images; part of the Microsoft 365 family	Organising a full semester of subjects
Evernote	Quick capture, tags, web clipping; plan limits apply	Collecting ideas and articles
Google Docs	Simple, real-time shared notes, headings give an outline	Group notes and shared study guides

Organising academic notes

1. Create one notebook (or folder) per semester.
2. Create one section (or document) per subject, such as ICT-1013.
3. Create one page per lecture, titled with the date and topic.
4. Use headings, bullet points and bold for definitions.
5. Add tags such as “exam”, “important”, “assignment”.
6. Review and summarise each page within 24 hours.

> **PROFESSOR'S TIP**
> Write notes in your own words. Copying the slide word for word feels productive but does not help memory. Add one example from your own life to every new idea.

4.10 Important Terminology

Table 4.6: Key terms of Chapter 4

Term	Meaning
Cloud storage	Saving files on a provider's remote servers.
Data centre	A secure facility housing many servers.
Synchronisation	Keeping files identical across devices.
Backup	An extra copy kept for recovery.
Permission	The level of access given to someone (view, comment, edit).
Encryption	Scrambling data so that only authorised people can read it.
2-Step Verification	A second proof of identity in addition to a password.
Notebook (OneNote)	A collection of sections and pages for notes.

4.11 Common Mistakes

COMMON MISTAKE

- Keeping the only copy of an assignment on one USB drive.
- Sharing with "Anyone with the link" for convenience.
- Using the same password for email and cloud storage.
- Confusing sync with backup.
- Naming files carelessly so they cannot be found.

4.12 Practical Activities

Complete these hands-on activities on your own device or in the computer lab. Interfaces change with updates, so if a button has moved, look for the same command by its name.

Activity 11: Create and organise Google Drive folders	
Learning objective	Build an organised folder structure for your semester.
Required tools	Google account and browser.
Step-by-step instructions	**1.** Open Google Drive (or OneDrive). **2.** Create a folder "ADP-BA Semester 1". **3.** Inside it, create one folder for each subject, including "ICT-1013". **4.** In the ICT folder, create Assignments, Quizzes and Notes. **5.** Upload one file into Assignments and rename it using the convention in this chapter. **6.** Move one file to another folder using drag and drop.
Expected outcome	A clear folder tree with at least one correctly named file.
Self-check questions	a How can you search for a file quickly? b What happens when you delete a file? c Why is a naming convention useful?

Activity 12: Share a document with appropriate permissions	
Learning objective	Share a file safely with specific people.
Required tools	A document in Drive, a classmate's email address.
Step-by-step instructions	**1.** Right-click the document and choose Share. **2.** Add your classmate's email address. **3.** Set the role to Commenter and send. **4.** Ask your classmate to add a comment. **5.** Change the role to Viewer; then remove the person's access. **6.** Open Share settings and confirm that general access is "Restricted".
Expected outcome	A document shared with the right role and later made private again.
Self-check questions	a What is the difference between Commenter and Editor? b Why is "Restricted" safer? c How do you stop sharing?

Activity 13: Create digital notes	
Learning objective	Create a structured set of notes for a lecture.
Required tools	OneNote, Evernote or Google Docs.
Step-by-step instructions	**1.** Create a notebook (or folder) for ICT-1013. **2.** Create a page titled with today's date and topic. **3.** Write headings, bullet points and at least three important terms in bold. **4.** Add a table or a picture if useful. **5.** Add tags or labels such as "exam". **6.** Search for one word to test how quickly you can find it.
Expected outcome	A well-organised, searchable page of notes.
Self-check questions	a Which structure did you choose? b How would you share this page with a friend? c What are the advantages over paper notes?

4.13 Classroom Discussion Questions

1. What would you lose if your phone were stolen today, and how could the cloud help?
2. Is cloud storage safe enough for personal documents? Discuss both sides.
3. Do you prefer digital or handwritten notes? Which helps you remember better?

4.14 Chapter Summary

- Cloud computing delivers storage and software over the Internet.
- Cloud storage keeps copies of your files on remote servers accessible from any device.
- Google Drive, OneDrive and Dropbox are popular services.
- Organise files with a clear structure and file naming convention.
- Share files with the least permission needed: Viewer, Commenter, then Editor.
- Backup protects against loss; sync keeps devices up to date.
- Use strong passwords and 2-Step Verification to protect your account.
- OneNote, Evernote and Google Docs help organise notes.

4.15 Quick Revision Notes

QUICK REVISION

- Cloud = remote servers via Internet
- Viewer < Commenter < Editor
- Sync ≠ Backup; follow 3-2-1
- Restricted sharing is safest
- Notebook → Section → Page

4.16 Key Points to Remember

REMEMBER THIS

- Define cloud storage and give two advantages.
- List the three sharing permissions.
- Explain the difference between backup and sync.
- Name three cloud storage services.
- State two cloud security practices.

4.17 Short Questions

1. What is cloud computing?
2. Define cloud storage.
3. Differentiate local and cloud storage.
4. What is synchronisation?
5. What does “Viewer” permission mean?
6. Name two note-taking apps.
7. Why should you enable 2-Step Verification?

4.18 Long Questions

1. Explain how cloud storage works with a diagram and compare it with local storage.
2. Compare Google Drive, OneDrive and Dropbox.
3. Describe how to share a file safely, explaining each permission level.
4. Explain how you would organise academic notes digitally for a whole semester.

4.19 Multiple-Choice Questions

Choose the best answer. Attempt all questions first; then check your answers and explanations in the Instructor/Revision Support section at the end of this book.

1. The “cloud” is mainly:

   (A) A weather system
   (B) Remote servers accessed over the Internet
   (C) A type of USB drive
   (D) An operating system

2. Which permission allows only reading?

   (A) Editor
   (B) Commenter
   (C) Viewer
   (D) Owner

3. Sync differs from backup because sync:

   (A) Never copies files
   (B) May delete files everywhere if you delete one
   (C) Is always offline
   (D) Only works with USB

4. Which is the safest sharing setting?

   (A) Anyone with the link can edit
   (B) Restricted to named people
   (C) Public on the Internet
   (D) Shared in a social group

5. In OneNote, pages are organised inside:

   (A) Sections
   (B) Ribbons
   (C) Slides
   (D) Formulas

6. The 3-2-1 rule suggests keeping:

   (A) One copy only
   (B) Three copies on two types of storage with one off-site
   (C) Two copies on the same disk
   (D) No cloud copies

4.20 Self-Assessment Exercise

Tick each statement you can honestly say is true. Revisit the relevant section for any statement you cannot tick.

- ■ I can explain cloud storage in simple words.
- ■ I can upload, download and organise files.
- ■ I can choose safe sharing permissions.
- ■ I can explain backup versus sync.
- ■ I can protect my cloud account.
- ■ I can organise notes digitally.

CHAPTER 05

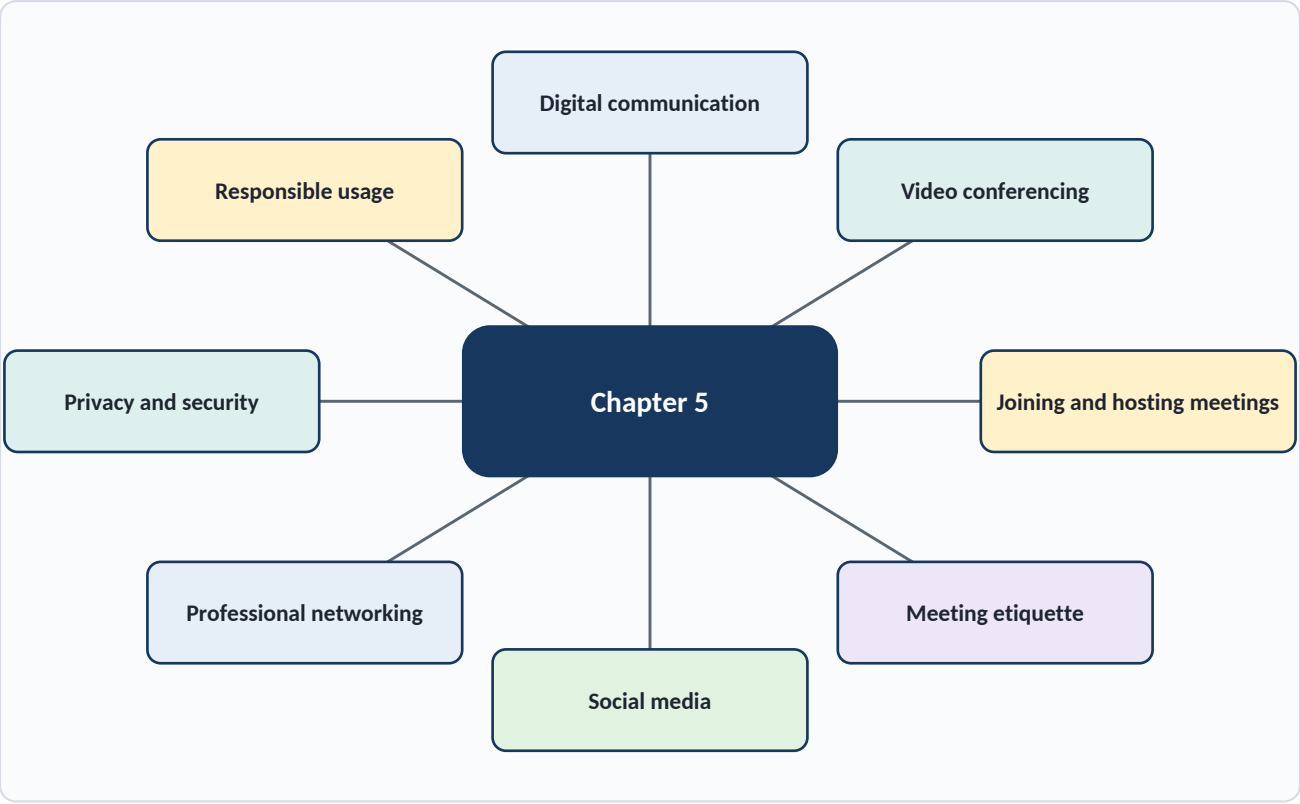
Digital Communication and Social Media

Classes, meetings and friendships now happen on screens. This chapter shows you how to join and host online meetings, how the main social platforms differ, and how to build a respectful, professional presence online.

Chapter Learning Objectives

After studying this chapter, you will be able to:

- Explain digital communication and its forms.
- Use video conferencing tools: Google Meet, Microsoft Teams and Zoom.
- Join and host a meeting, control microphone and camera, and share a screen.
- Follow online meeting etiquette.
- Compare Facebook, Instagram and LinkedIn.
- Build a professional digital identity and LinkedIn profile.
- Explain advantages, disadvantages and privacy settings of social media.
- Use social media responsibly.



Chapter map: the main topics of this chapter

5.1 Why This Chapter Matters

Online classes, interviews and group work happen in video meetings, and employers look at LinkedIn and other profiles. Knowing the tools, and behaving professionally, protects your reputation and makes you more employable.

5.2 Meaning of Digital Communication

Digital communication is the exchange of information using digital devices and networks. It can be **synchronous** (at the same time, such as a video call) or **asynchronous** (at different times, such as email or a discussion forum).

Table 5.1: Forms of digital communication

Form	Type	Example
Email	Asynchronous	Sending an assignment to a teacher
Instant messaging	Mostly synchronous	WhatsApp group of classmates
Voice and video calls	Synchronous	Google Meet class
Discussion forum	Asynchronous	LMS discussion board
Social media post	Asynchronous	LinkedIn update

5.3 Video Conferencing

Video conferencing lets people in different places see and hear one another in real time over the Internet. It is used for online classes, interviews, business meetings and family calls.

Table 5.2: Google Meet, Microsoft Teams and Zoom

Feature	Google Meet	Microsoft Teams	Zoom
Provider	Google	Microsoft	Zoom Communications
Often used for	Classes using Google accounts	Organisations and universities using Microsoft 365	Webinars, meetings and classes
Join using	Link or code in browser or app	Link or app	Link or Meeting ID in app or browser
Common features	Screen sharing, chat, captions, recording (plan limits apply)	Chat, files, channels, screen sharing, recordings	Breakout rooms, screen sharing, chat, recordings

> NOTE
> Features, free limits and screens change often. Use the official help centre of each service for the latest details.

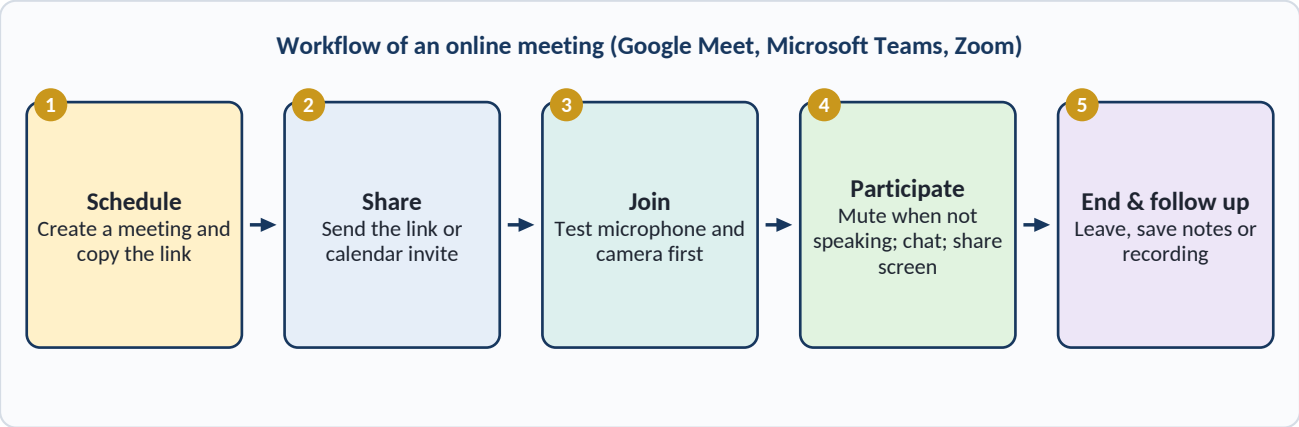


Figure 5.1: Workflow of a video conference

5.4 Joining and Hosting Meetings

Joining a meeting

1. Click the meeting link sent by your teacher, or enter the meeting code or ID in the app.
2. Check your name; use your real name as instructed.
3. Test your microphone and camera in the preview screen.
4. Join the meeting and keep your microphone muted until you speak.

Hosting a meeting

1. Create a new meeting or schedule one in the calendar.
2. Copy the link and send it to participants.
3. Join early and test your equipment.
4. Control access (waiting room or invited only) when available.
5. Use the participant list and chat to manage the class; end the meeting for everyone at the finish.

Controls you must know

Table 5.3: Meeting controls

Control	Purpose	Tip
Microphone	Turn your voice on or off	Mute when not speaking
Camera	Turn video on or off	Face the light, keep a neat background
Screen sharing	Show a window or the whole screen	Close private tabs and notifications first
Chat	Type messages	Use for questions and links
Raise hand	Ask to speak	Wait to be called
Leave / End	Exit or finish the meeting	Use Leave if you are not the host

Online meeting etiquette

- Join on time and use a quiet place with a stable connection.
- Dress and behave as you would in class.
- Keep your microphone muted when not speaking.
- Do not record or screenshot others without permission.
- Do not share the meeting link publicly.
- Respect others, do not interrupt, and use chat for short questions.
- Check what is visible on your screen before sharing it.

> **COMMON MISTAKE**
> Forgetting that your microphone is on, or sharing the entire screen with private tabs open. Always check before you speak or share.

5.5 Social Media Fundamentals

Social media are online platforms where users create profiles, share content and interact with others. Each platform has a different purpose and audience.

Table 5.4: Facebook, Instagram and LinkedIn

Feature	Facebook	Instagram	LinkedIn
Main purpose	Friends, family, groups, pages	Photos, videos, stories, reels	Professional networking and careers
Typical content	Posts, events, groups	Visual content and short videos	Résumé, achievements, job posts, articles
Main audience	General public	Younger and visual audiences	Professionals, students, employers
Business use	Pages and ads, community groups	Brand and product promotion	Recruitment, B2B contacts, personal branding
Best for ADP-BA students	Class groups, community events	Showing creative work responsibly	Internships and jobs

5.6 Professional Networking and Digital Identity

Professional networking means building relationships with people who can support your career. **Digital professional identity** is the image others form of you from what they find online. LinkedIn is built for this purpose.

Table 5.5: Elements of a good LinkedIn profile

Section	What to write
Photo	Clear, simple, professional photo
Headline	Not just “Student”; for example “ADP-BA Student | Interested in Marketing and Digital Skills”
About	Three to five lines about your goals and strengths
Education	University, programme, expected completion
Skills	Microsoft Office, communication, teamwork, and others you genuinely have
Activities	Projects, presentations, volunteering

PROFESSOR'S TIP
Never claim skills, degrees or experience you do not have. A profile must be accurate; employers often verify.

5.7 Advantages and Disadvantages of Social Media

Table 5.6: Social media: benefits and risks

Advantages	Disadvantages
Connects people across the world	Time wasting and distraction
Supports learning communities and business promotion	Cyberbullying and harassment
Fast news and awareness	Fake news and misinformation
Career networking	Privacy loss and data collection
Free expression and creativity	Comparison, stress and anxiety

5.8 Privacy, Security and Responsible Usage

- Review **privacy settings**: choose who can see your posts, friend list and contact details.
- Use strong passwords and 2-Step Verification.
- Accept connection requests only from people you know or can verify.
- Think before posting: once shared, content can be copied and may stay online.
- Do not share personal details such as home address, CNIC number or financial information.
- Report abusive accounts and content using the platform's report tools.
- Verify before you share news or messages (see Chapter 12).
- Take breaks; protect your digital well-being (see Chapter 10).

REAL-LIFE CONNECTION
A fresh graduate applying for an internship may be searched online by the employer. A professional LinkedIn profile helps, while old offensive posts can harm the chances.

EXAM FOCUS
Be able to name two uses of each platform and to give two privacy settings you should check.

5.9 Important Terminology

Table 5.7: Key terms of Chapter 5

Term	Meaning
Video conferencing	Real-time audio and video meeting over the Internet.
Synchronous	Communication at the same time.
Asynchronous	Communication at different times.
Screen sharing	Showing your screen to meeting participants.
Social media	Online platforms for sharing and interacting.
LinkedIn	A professional networking platform.
Digital identity	How you appear online.
Privacy settings	Controls over who sees your information.

5.10 Common Mistakes

COMMON MISTAKE

- Joining a meeting late with the microphone unmuted.
- Sharing the entire screen with private notifications visible.
- Posting angry or personal content without thinking.
- Using a casual or inappropriate profile photo on LinkedIn.
- Accepting every friend or connection request.

5.11 Practical Activities

Complete these hands-on activities on your own device or in the computer lab. Interfaces change with updates, so if a button has moved, look for the same command by its name.

Activity 14: Join a Google Meet session	
Learning objective	Join an online meeting and use the basic controls.
Required tools	Google account, device with camera and microphone, a meeting link from your teacher or friend.
Step-by-step instructions	**1.** Open the meeting link in a browser or the Meet app. **2.** Check your name, microphone and camera in the preview. **3.** Join with the microphone muted. **4.** Unmute to say hello; mute again. **5.** Open chat and send a message. **6.** Share a presentation window for one minute, then stop sharing and leave.
Expected outcome	A successful meeting session in which you used mute, camera, chat and screen sharing.
Self-check questions	a How do you mute the microphone? b What should you check before sharing the screen? c Why join with microphone muted?

Activity 15: Create a professional LinkedIn profile	
Learning objective	Create a profile that shows your education and goals honestly.
Required tools	LinkedIn account or a draft in Word.
Step-by-step instructions	**1.** Create an account using your real name. **2.** Add a clear photo and a headline. **3.** Write a three-line About section. **4.** Add your education and two real skills. **5.** Review privacy settings. **6.** Ask a classmate to review your draft for spelling and tone.
Expected outcome	A complete professional profile (or a Word draft) with accurate content.
Self-check questions	a Is everything accurate? b Does the headline say more than "Student"? c Which privacy settings did you change?

5.12 Classroom Discussion Questions

1. How does your behaviour on video calls differ from a classroom? What should remain the same?
2. Which platform is the most useful for your future career? Why?
3. Is it ethical for employers to check applicants' social media? Discuss.

5.13 Chapter Summary

- Digital communication may be synchronous or asynchronous.
- Meet, Teams and Zoom support online meetings with similar controls.
- Mute when not speaking, check what you share, and follow meeting etiquette.
- Facebook, Instagram and LinkedIn serve different purposes.
- A professional digital identity is accurate, respectful and consistent.
- Review privacy settings and think before you post.

5.14 Quick Revision Notes

> **QUICK REVISION**
> - Meet / Teams / Zoom: join, mute, camera, chat, share
> - Sync vs Async
> - LinkedIn = career; Instagram = visual; Facebook = community
> - Think before posting
> - Check privacy settings

5.15 Key Points to Remember

REMEMBER THIS

- List five meeting etiquette rules.
- Compare Facebook, Instagram and LinkedIn in two lines each.
- Name four parts of a LinkedIn profile.
- State three social media risks.

5.16 Short Questions

1. Define digital communication.
2. What is video conferencing?
3. Name four meeting controls.
4. Differentiate synchronous and asynchronous communication.
5. What is professional networking?
6. List two disadvantages of social media.
7. What are privacy settings?

5.17 Long Questions

1. Explain the workflow of an online meeting and the controls a participant should know.
2. Compare Google Meet, Microsoft Teams and Zoom.
3. Compare Facebook, Instagram and LinkedIn and explain how a student can use each.
4. Discuss the advantages and disadvantages of social media and ways to use it responsibly.

5.18 Multiple-Choice Questions

Choose the best answer. Attempt all questions first; then check your answers and explanations in the Instructor/Revision Support section at the end of this book.

1. Which is asynchronous communication?

   (A) Video call
   (B) Email
   (C) Live voice call
   (D) Live webinar

2. Which platform is mainly for professional networking?

   (A) Instagram
   (B) Facebook
   (C) LinkedIn
   (D) WhatsApp

3. Before sharing your screen you should:

   (A) Open private messages
   (B) Close private tabs and notifications
   (C) Turn off your microphone only
   (D) Do nothing

4. Which is a good meeting habit?

   (A) Stay unmuted all the time
   (B) Join on time and mute when not speaking
   (C) Record without permission
   (D) Share the link publicly

5. Privacy settings help you:

   (A) Increase followers
   (B) Control who sees your content
   (C) Download videos
   (D) Speed up the Internet

5.19 Self-Assessment Exercise

Tick each statement you can honestly say is true. Revisit the relevant section for any statement you cannot tick.

- ■ I can join and host an online meeting.
- ■ I can use microphone, camera, chat and screen sharing.
- ■ I can describe the main uses of each social platform.
- ■ I can build a professional profile.
- ■ I can adjust privacy settings.

CHAPTER 06

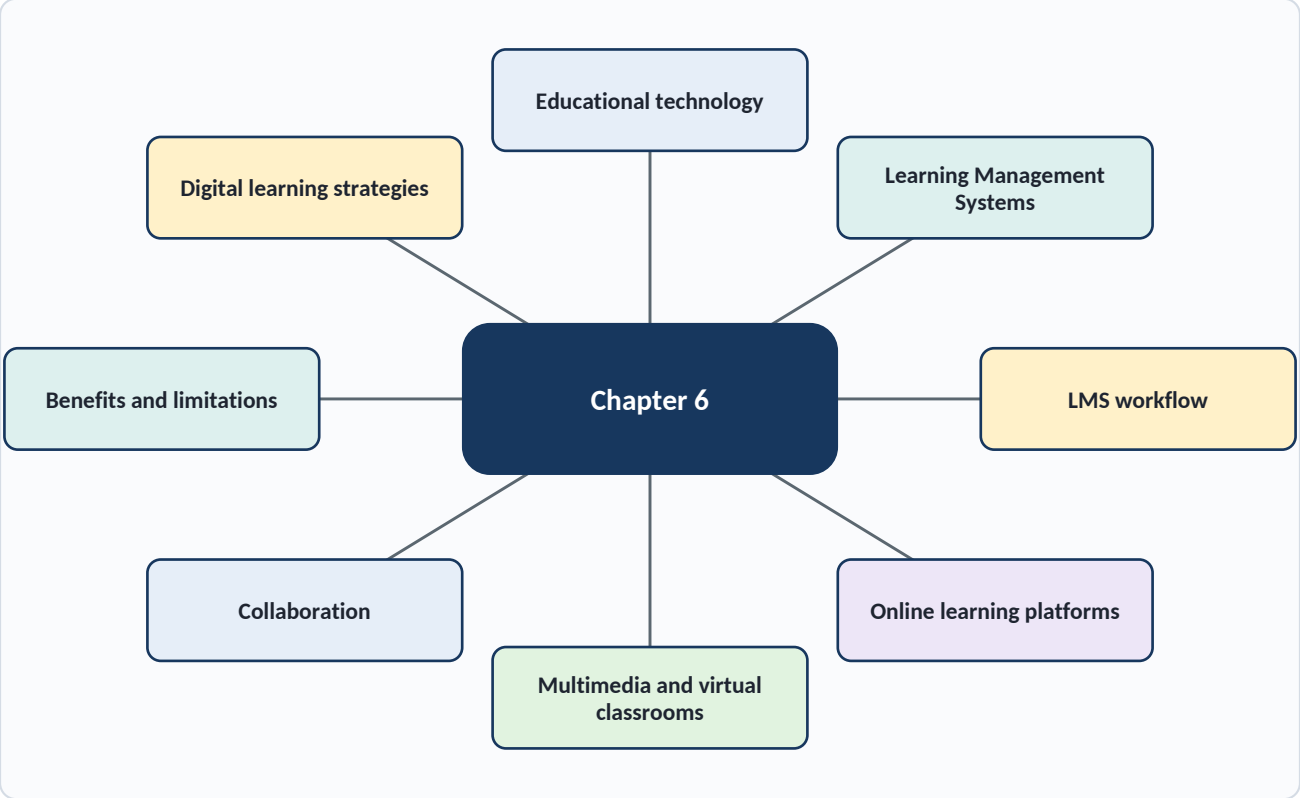
ICT in Education

Education is no longer limited to the classroom. This chapter explores how digital tools, learning management systems and online platforms are changing how students learn, submit work and build skills.

Chapter Learning Objectives

After studying this chapter, you will be able to:

- Explain educational technology and digital learning.
- Describe a Learning Management System (LMS) and name examples: Moodle, Canvas and Google Classroom.
- Follow a student workflow: access, read, submit assignments and take quizzes online.
- Describe online learning platforms: Coursera, edX, Udemy and Khan Academy.
- Explain interactive multimedia, virtual classrooms and online collaboration.
- List benefits and limitations of e-learning.
- Apply effective strategies for digital learning.



Chapter map: the main topics of this chapter

6.1 Why This Chapter Matters

Whether your classes are on campus, online or blended, you will submit assignments, take quizzes and learn extra skills digitally. Knowing how these systems work saves marks and stress, and opens the door to free or low-cost courses that can strengthen your résumé.

6.2 Introduction to Educational Technology

Educational technology (EdTech) means using ICT tools to support teaching and learning. **Digital learning** is learning that uses digital devices, content and the Internet. It may be fully online, fully face-to-face with digital support, or **blended** (a mix of both).

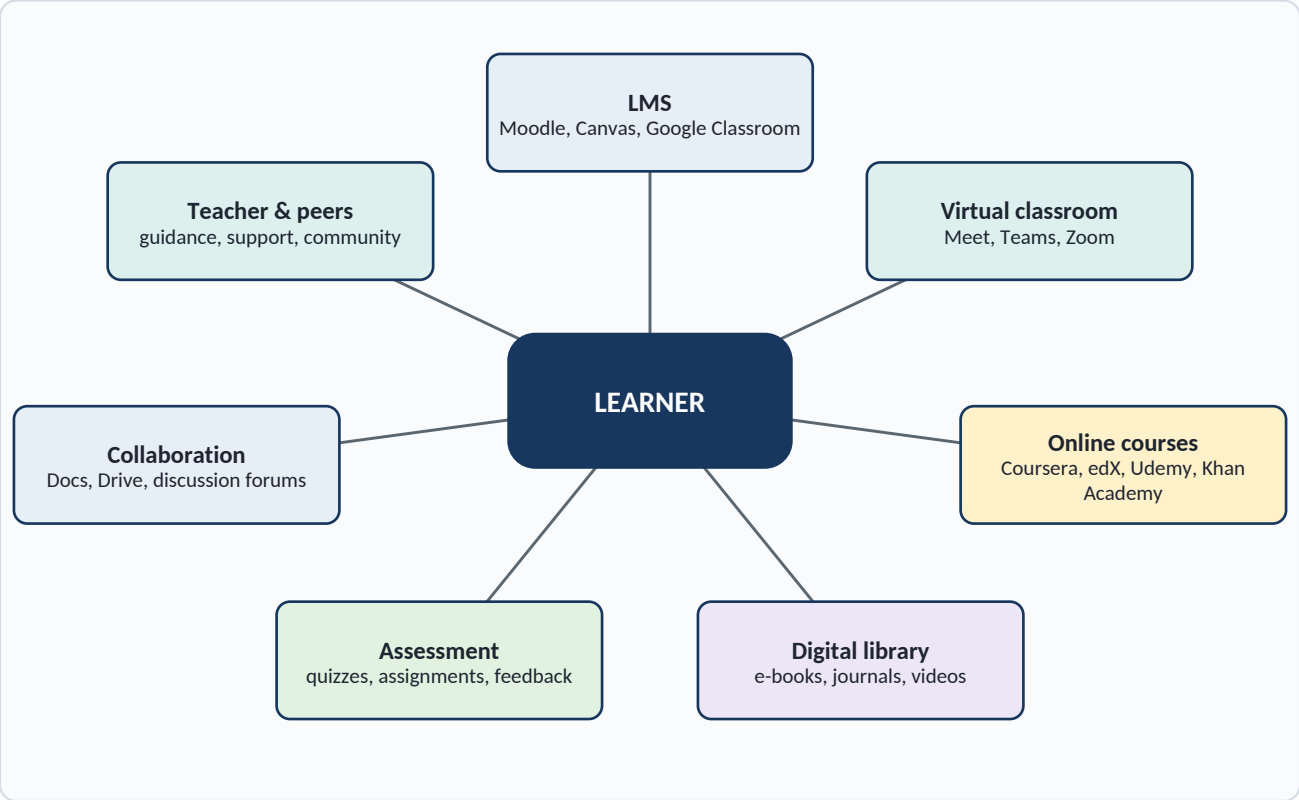


Figure 6.1: The digital learning ecosystem around a learner

Figure 6.1 shows the learner at the centre of many digital resources: a Learning Management System, virtual classrooms, online courses, digital libraries, assessments, collaboration tools and, importantly, teachers and peers. Technology supports learning; it does not replace the effort of learning.

6.3 Learning Management Systems (LMS)

A **Learning Management System** is a web-based system where a university or school places course material, announcements, assignments, quizzes, discussions and grades in one place. Your teacher creates a course page; you log in with your university account and see everything about that course.

Table 6.1: Moodle, Canvas and Google Classroom

Feature	Moodle	Canvas	Google Classroom
Type	Open-source LMS widely used by institutions	Commercial LMS used by many universities	Simple classroom tool within Google Workspace for Education
Course content	Pages, files, links, lessons	Modules, pages, files, media	Classwork, materials, announcements
Assessment	Quizzes, assignments, grading tools	Quizzes, assignments, rubrics	Assignments, quizzes (via Forms), grading
Communication	Forums, messages	Discussions, inbox	Stream posts, comments, Meet link
Best for	Customisable institutional courses	Large structured programmes	Everyday classroom coordination

> NOTE
> Your university may use one of these or its own portal. The ideas are the same everywhere: log in, find the course, read, do and submit.

6.4 A Student LMS Workflow

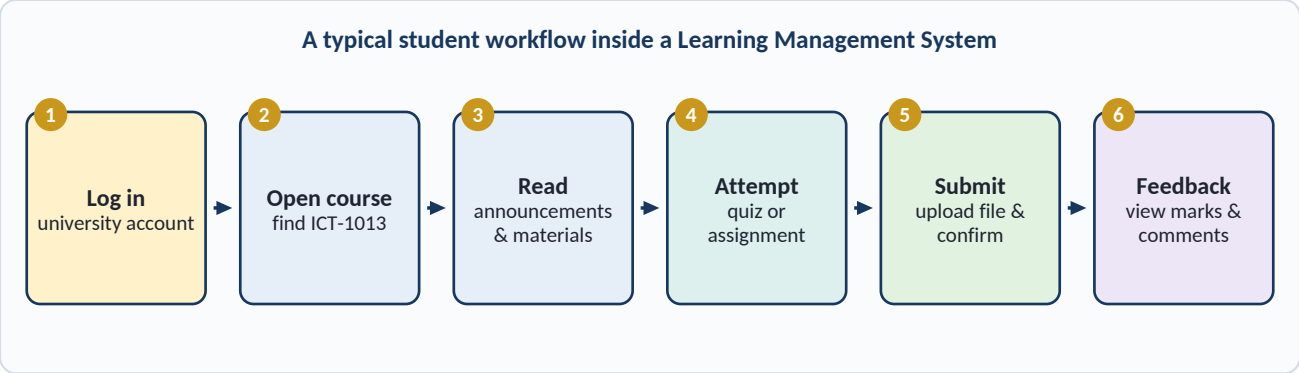


Figure 6.2: Typical student workflow in an LMS

Online assignments and digital submissions

1. Open the assignment page and read the instructions, deadline and marks.
2. Prepare your file in the format asked (for example, one PDF or DOCX).
3. Name it clearly (Assignment1_RollNo_Name).
4. Upload the file and press the final Submit/Save button if the system requires it.
5. Check the confirmation message or status (for example, “Submitted for grading”).
6. Keep a copy and a screenshot of the confirmation.
7. After grading, read the feedback carefully.

COMMON MISTAKE

Uploading a file but not pressing “Submit”, so it remains a draft. Always check the status after submitting, and never wait until the last minute because of Internet failure or system load.

Online quizzes

- Check the start time, duration and number of attempts.
- Use a stable Internet connection and a charged device.
- Do not refresh or close the browser unless instructed.
- Read each question fully before answering and save your answers as required.
- Follow academic honesty rules strictly; quiz systems may log activity.

6.5 Online Educational Platforms

Table 6.2: Coursera, edX, Udemy and Khan Academy

Platform	Type of content	Typical features	Notes
Coursera	University and industry courses, specialisations	Video lectures, quizzes, optional certificates	Some content free to audit; certificates usually paid
edX	University-style courses and programmes	Video lessons, assessments, certificates in some courses	Check current availability and fees
Udemy	Skill-based courses by individual instructors	Video courses with lifetime access after purchase	Quality varies; check ratings and reviews
Khan Academy	School and early university subjects	Free videos and practice exercises	Free, non-profit learning

NOTE

Platforms change policies, pricing and names. Confirm the current details on the official site before enrolling.

PROFESSOR'S TIP

Complete one short course in a useful skill (for example, Excel or digital marketing) during your semester break. Employers value consistent self-learning, and you can list it honestly on your CV.

6.6 Interactive Multimedia and Virtual Classrooms

Interactive multimedia combines text, images, audio, video and activities that the learner can respond to, such as animations, simulations, and quizzes. These make abstract ideas easier to understand: a short animation of how data travels across a network can explain more than a paragraph.

A **virtual classroom** is an online space where teacher and students meet in real time using video conferencing tools (Chapter 5) plus tools such as chat, polls, whiteboards and breakout rooms.

6.7 Online Collaboration

Group assignments can be completed online using shared documents (Google Docs, Word online), cloud folders (Chapter 4), group chats and video meetings. Good collaboration needs clear roles, deadlines and respect for each member's contribution.

Table 6.3: Roles in an online group project

Role	Responsibility
Coordinator	Plans tasks, sets deadlines, keeps group on track
Researcher	Finds and checks sources
Writer / Designer	Prepares text, tables and slides
Editor	Checks formatting, spelling and references

6.8 Benefits and Limitations of E-Learning

Table 6.4: E-learning: benefits and limitations

Benefits	Limitations
Flexible time and place	Needs reliable Internet and a device
Access to many courses and experts	Less face-to-face contact
Learn at your own pace and repeat lessons	Requires self-discipline; easy to get distracted
Cost-effective in many cases	Practical skills and labs are harder to teach online
Instant feedback in quizzes	Cheating and plagiarism risks need management
Learning materials stored for revision	Digital divide: not every student has equal access

REAL-LIFE CONNECTION

During periods when campuses were closed, many Pakistani universities moved to online classes using LMS and video meetings. Students with limited Internet access found it difficult. This shows both the power and the limits of e-learning.

6.9 Effective Digital Learning Strategies

- Create a fixed study schedule and treat online classes like real classes.
- Choose a quiet space; turn off distracting notifications.
- Take notes actively and summarise each session.
- Ask questions in chat or forum; contact teachers politely by email.
- Test your Internet, device and login before a quiz or exam.
- Download key files in advance in case of connection failure.
- Back up your work in the cloud.
- Take short breaks; protect your eyes and posture.

EXAM FOCUS

Be ready for: "Explain LMS with examples and describe the student workflow." Mention Moodle, Canvas and Google Classroom, then give the steps: log in, open course, read, submit, receive feedback.

6.10 Important Terminology

Table 6.5: Key terms of Chapter 6

Term	Meaning
EdTech	Technology used to support education.
LMS	Learning Management System for courses, assignments and grades.
Blended learning	Mix of face-to-face and online learning.
Virtual classroom	Online live class environment.
MOOC	Massive Open Online Course available to large numbers of learners.
E-learning	Learning using electronic media and the Internet.
Digital divide	Unequal access to technology and the Internet.

6.11 Common Mistakes

COMMON MISTAKE

- Ignoring announcements and deadlines in the LMS.
- Submitting the wrong file or forgetting the final submit step.
- Starting a quiz without testing the Internet.
- Joining many online courses and finishing none.
- Copying answers from friends or websites during online assessments.

6.12 Practical Activities

Complete these hands-on activities on your own device or in the computer lab. Interfaces change with updates, so if a button has moved, look for the same command by its name.

Activity 16: Submit an assignment through an LMS	
Learning objective	Practise a complete digital submission.
Required tools	Your university LMS (or Google Classroom, Moodle demo or practice course), a small file.
Step-by-step instructions	**1.** Log in with your university account. **2.** Open the course ICT-1013 (or the practice course). **3.** Locate the assignment and read the instructions. **4.** Upload your file, named correctly. **5.** Press Submit and confirm the status. **6.** Take a screenshot of the confirmation and save it in your Drive folder.
Expected outcome	A successfully submitted assignment with confirmation.
Self-check questions	a How do you know the assignment was submitted? b What file name did you choose? c What would you do if the system failed near the deadline?

Activity 17: Explore an online learning platform	
Learning objective	Evaluate a free online course.
Required tools	Khan Academy, Coursera, edX or another platform; browser.
Step-by-step instructions	**1.** Visit the platform and choose a free beginner course (for example, spreadsheets or digital literacy). **2.** Create an account or browse as a guest. **3.** Watch one lesson and complete one practice question. **4.** Record the course duration, level, cost, certificate options and instructor. **5.** Decide whether this course suits your needs, and justify it in three lines.
Expected outcome	A short evaluation note of the course.
Self-check questions	a Is the course free? Are certificates free? b How much time per week does it require? c How reliable is the instructor or provider?

6.13 Classroom Discussion Questions

1. Which is better for you: online classes, on-campus classes or a mix? Why?
2. How can universities support students who lack Internet access?
3. Should online quizzes be monitored? Discuss fairness and privacy.

6.14 Chapter Summary

- EdTech uses ICT to support teaching and learning.
- An LMS gathers course content, assignments, quizzes and grades in one place.
- Moodle, Canvas and Google Classroom are examples of LMS.
- Submit assignments carefully and keep proof.
- Coursera, edX, Udemy and Khan Academy offer online courses.
- E-learning is flexible but needs Internet, discipline and honesty.

6.15 Quick Revision Notes

QUICK REVISION

- LMS = course content + assignments + quizzes + grades
- Moodle, Canvas, Google Classroom
- Coursera, edX, Udemy, Khan Academy
- Blended = online + face-to-face
- Always confirm submission

6.16 Key Points to Remember

REMEMBER THIS

- Define LMS and give three examples.
- State the steps to submit an assignment online.
- List three benefits and three limitations of e-learning.
- Name four online learning platforms.

6.17 Short Questions

1. What is educational technology?
2. Define LMS.
3. What is blended learning?
4. What is a virtual classroom?
5. Name two advantages of online quizzes.
6. What is the digital divide?
7. Name two free learning platforms.

6.18 Long Questions

1. Explain the digital learning ecosystem with a diagram.
2. Describe the working of an LMS and a student workflow.
3. Compare Coursera, edX, Udemy and Khan Academy.
4. Discuss the benefits and limitations of e-learning with examples from Pakistan.

6.19 Multiple-Choice Questions

Choose the best answer. Attempt all questions first; then check your answers and explanations in the Instructor/Revision Support section at the end of this book.

1. Which of these is an LMS?

   (A) Moodle
   (B) Excel
   (C) Chrome
   (D) Instagram

2. Blended learning combines:

   (A) Only videos
   (B) Online and face-to-face learning
   (C) Two LMS
   (D) Social media and games

3. After uploading an assignment you should:

   (A) Close the browser immediately
   (B) Check the submission status and keep proof
   (C) Delete the file
   (D) Email it to everyone

4. Which platform is known for free school-level lessons and practice?

   (A) Khan Academy
   (B) Dropbox
   (C) Outlook
   (D) Zoom

5. A limitation of e-learning is:

   (A) Flexible time
   (B) Need for Internet and self-discipline
   (C) Repeating lessons
   (D) Wide choice of courses

6.20 Self-Assessment Exercise

Tick each statement you can honestly say is true. Revisit the relevant section for any statement you cannot tick.

- ■ I can explain what an LMS is.
- ■ I can submit an assignment and verify it.
- ■ I can describe four learning platforms.
- ■ I can list benefits and limitations of e-learning.
- ■ I can apply digital study strategies.

CHAPTER 07

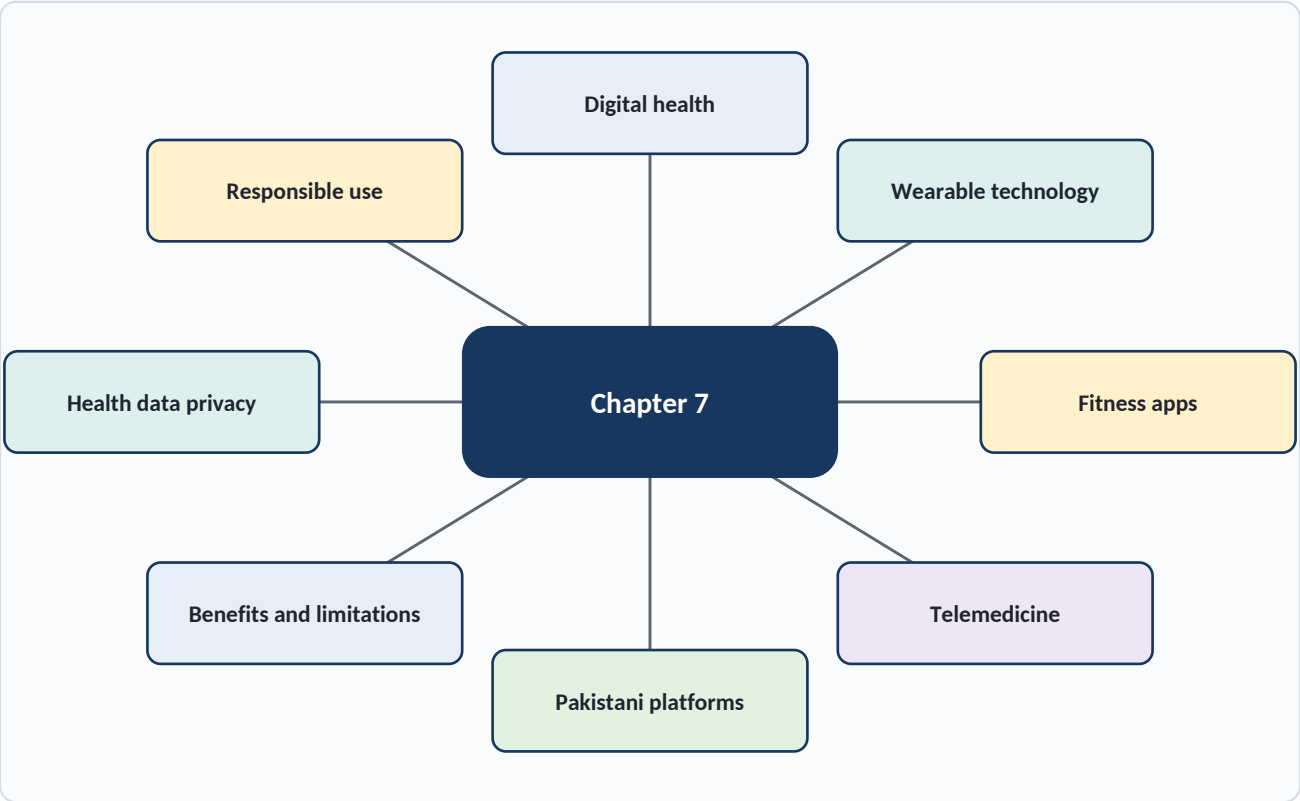
ICT in Health and Well-being

Your phone can count your steps and a doctor can consult you by video. This chapter explains how technology supports health, and, just as importantly, where its limits lie.

Chapter Learning Objectives

After studying this chapter, you will be able to:

- Explain digital health and healthcare technology.
- Describe wearable technology and health monitoring devices.
- Compare fitness apps such as Google Fit (and its replacement), Samsung Health, Apple Health, Xiaomi wearables and Runkeeper.
- Explain telemedicine and its workflow.
- Describe Pakistani telemedicine platforms such as OLADOC, Sehat Kahani and Marham.
- List the benefits and limitations of telemedicine.
- Protect personal health data and use health apps responsibly.



Chapter map: the main topics of this chapter

7.1 Why This Chapter Matters

Health information is among the most personal data you own. Understanding digital health helps you use useful tools safely, avoid misleading health advice, and remember that apps and devices support, but never replace, qualified medical professionals.

> **EXAM FOCUS**
> **Important statement:** Digital health applications and devices do not replace qualified medical professionals. They provide information and support but cannot diagnose or treat you. In an emergency, go to the nearest hospital.

7.2 Introduction to Healthcare Technology and Digital Health

Digital health is the use of ICT to improve health and healthcare. It includes electronic medical records, appointment booking apps, wearable devices, fitness tracking, online consultation (telemedicine), and health information websites.

Table 7.1: Areas of digital health

Area	Description	Example
Health records	Patient information stored digitally	Hospital information system
Monitoring	Sensors that measure body signals	Smartwatch heart rate
Fitness and wellness	Tracking exercise, sleep and habits	Step counter app
Telemedicine	Remote consultation using audio, video or chat	Online doctor appointment
Health information	Educational content	Health awareness websites

7.3 Health Monitoring Devices and Wearable Technology

Wearable technology means electronic devices worn on the body, such as smartwatches and fitness bands. They contain sensors that measure movement, heart rate and sometimes other signals. Data is sent via Bluetooth to a phone app and often stored in a cloud account.

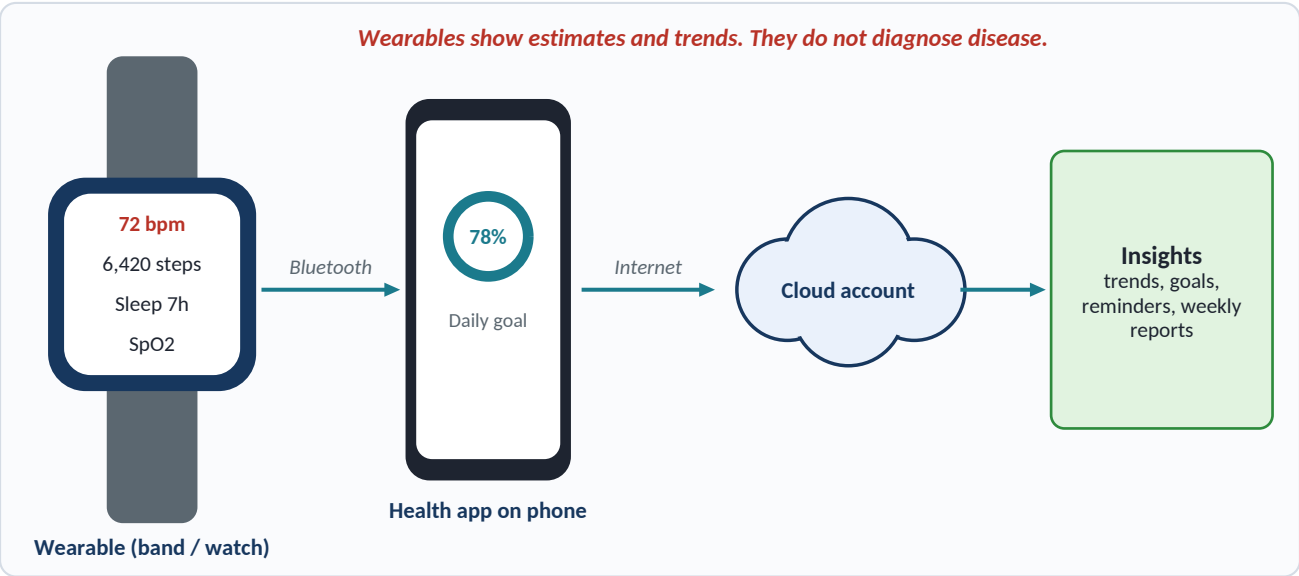


Figure 7.1: How a wearable device sends data to an app and cloud account

Table 7.2: Common sensors and what they estimate

Sensor / feature	What it estimates
Accelerometer	Steps, movement, workout type
Optical heart-rate sensor	Heart rate, resting heart rate
GPS	Distance and route of walks or runs
Sleep tracking	Sleep duration and phases (estimates)
Blood oxygen (in some devices)	Estimated oxygen saturation

COMMON MISTAKE

Treating a wearable reading as a medical diagnosis. These devices give estimates and trends. If a number worries you, or you feel unwell, consult a qualified doctor, not an app.

7.4 Fitness Tracking Applications

Table 7.3: Popular fitness and health applications

Application	Platform	What it does	Notes
Google Fit	Android, Wear OS	Tracks activity, steps and goals	Google has been replacing Fit with the Google Health app and Health Connect; check the current status
Samsung Health	Samsung phones and watches (some features on other Android)	Steps, sleep, exercise, heart rate and more	Works best with Samsung devices
Apple Health	iPhone and Apple Watch	Collects health data from apps and devices	Data stored mainly on the device with options to share
Xiaomi wearables (Mi Band / Smart Band)	Android and iOS via Xiaomi companion app	Steps, sleep, heart rate, workouts	Low-cost option; app names change by region and model
Runkeeper	Android and iOS	Running and walking tracker with routes and goals	Focused on running activities

NOTE

App names, owners and availability change. At the time of writing, Google has announced that Google Fit is being phased out in favour of the Google Health app. Always check the official app store page for the current situation.

PROFESSOR'S TIP

Set small realistic goals, such as 6,000 steps a day, then increase slowly. Tracking should motivate you, not create anxiety.

7.5 Telemedicine

Telemedicine is the delivery of healthcare advice and consultation at a distance using ICT, such as video calls, audio calls or secure chat. It is especially useful when travelling to a clinic is difficult, expensive or unnecessary for a minor issue.

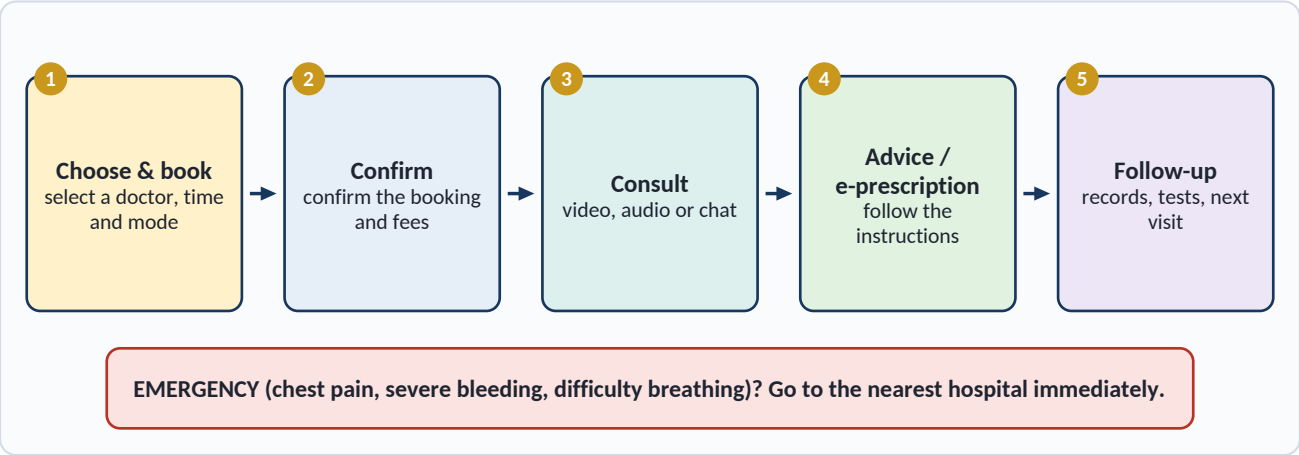


Figure 7.2: A typical telemedicine workflow

Figure 7.2 shows the usual steps: choose and book, confirm, consult, receive advice or an electronic prescription, and follow up. Note the emergency message: serious symptoms require immediate in-person care.

Online medical consultations in Pakistan

Table 7.4: Examples of Pakistani digital health platforms

Platform	Typical services
OLADOC	Search doctors, book appointments, online consultation (check current services)
Sehat Kahani	Telehealth connecting patients with doctors, many of them women doctors; also health centres and online consultation
Marham	Find doctors and hospitals, book appointments and consult online

These examples show the type of services available. Services, fees and availability can change, so verify them on the official website or app and always check that the doctor is registered.

Benefits and limitations of telemedicine

Table 7.5: Telemedicine: benefits and limitations

Benefits	Limitations
Saves travel time and cost	Doctor cannot physically examine you
Access to specialists from other cities	Not suitable for emergencies
Convenient for follow-ups and minor concerns	Needs good Internet and a suitable device
Lower exposure to infection in crowded clinics	Risk of fake doctors or unsafe advice if the platform is unverified
Digital records are easy to keep	Privacy risks if data is handled carelessly

7.6 Privacy of Personal Health Data

Health data (diagnoses, prescriptions, test reports, heart-rate history, location from fitness tracking) is sensitive. Misuse can lead to embarrassment, discrimination or fraud.

- Install apps only from official app stores and read the permissions requested.
- Share health data only with people and services you trust.
- Protect devices with a PIN or biometric lock and keep apps updated.
- Use strong passwords and 2-Step Verification for health accounts.
- Do not post medical reports or prescriptions on social media.
- Check whether the platform explains how it stores and shares your data.

7.7 Responsible Use of Health Applications

- Use apps for information, motivation and record keeping, not for self-diagnosis.
- Do not start, stop or change a medicine because of an app or an online post; ask a qualified doctor or pharmacist.
- Beware of miracle cures and unverified health tips on social media (see Chapter 12).
- Do not become obsessed with numbers; sleep, mood and general wellbeing matter too.
- Balance screen time with sleep, exercise and real-life social contact.

> **REAL-LIFE CONNECTION**
> A student uses a fitness band to walk 7,000 steps a day and gets a good sleep routine. During exam week the heart-rate reading seems high because of stress and caffeine; she books an online consultation, and the doctor advises her to visit a clinic for a check-up. The technology helped her to notice, but the doctor made the decision.

7.8 Important Terminology

Table 7.6: Key terms of Chapter 7

Term	Meaning
Digital health	Use of ICT to support health and healthcare.
Wearable	Electronic device worn on the body.
Sensor	A component that measures a physical signal.
Telemedicine	Remote medical consultation using ICT.
E-prescription	A digital prescription issued by a doctor.
Health data	Personal information about physical or mental health.
Bluetooth	Short-range wireless link between devices.

7.9 Common Mistakes

COMMON MISTAKE

- Using health apps to diagnose serious conditions.
- Choosing a doctor on an unverified platform.
- Sharing medical reports on social media.
- Ignoring emergency symptoms because an online appointment is available.
- Trusting every reading from a low-cost wearable as exact.

7.10 Practical Activities

Complete these hands-on activities on your own device or in the computer lab. Interfaces change with updates, so if a button has moved, look for the same command by its name.

Activity 18: Explore a fitness app and record your activity	
Learning objective	Understand how a fitness application records and displays health data responsibly.
Required tools	Smartphone with a pedometer or health app (Samsung Health, Apple Health, Google's current app, or another).
Step-by-step instructions	**1.** Open the health or fitness app that came with your phone. **2.** Review the permissions it asks for. **3.** Note your steps for three days. **4.** Set a modest daily goal. **5.** List two benefits and two limits of the data you see. **6.** Check the privacy settings and who can see your data.
Expected outcome	A three-day activity record and a short note about benefits, limits and privacy settings.
Self-check questions	a Which permissions did the app request? b How accurate do you think the step count is? c Would you share this data? With whom?

Activity 19: Understand a telemedicine workflow	
Learning objective	Describe the steps of an online consultation safely.
Required tools	Notebook; website or app of a telemedicine platform (view only, do not book unless you need to).
Step-by-step instructions	**1.** Visit the website or app of OLADOC, Sehat Kahani or Marham. **2.** Find how a patient searches for a doctor and books a consultation. **3.** Note how the platform shows a doctor's qualifications and fees. **4.** Draw the workflow as a flowchart. **5.** Write three safety checks before consulting online.
Expected outcome	A flowchart and a three-point safety checklist.
Self-check questions	a How does the platform show that a doctor is genuine? b What would you do in an emergency? c What personal data is requested?

7.11 Classroom Discussion Questions

1. Can a smartwatch replace a doctor's check-up? Why or why not?
2. What are the privacy risks of sharing health data with apps?
3. Would you use telemedicine for a minor illness? When would you avoid it?

7.12 Chapter Summary

- Digital health uses ICT for health records, monitoring, wellness and telemedicine.
- Wearables estimate steps, heart rate and sleep; they do not diagnose.
- Fitness apps include Samsung Health, Apple Health, Xiaomi apps, Runkeeper and Google's health apps.
- Telemedicine provides remote consultation and suits minor, non-emergency needs.
- OLADOC, Sehat Kahani and Marham are Pakistani digital health examples.
- Protect health data with strong security and sharing habits.
- Digital health tools never replace qualified medical professionals.

7.13 Quick Revision Notes

QUICK REVISION

- Digital health ≠ doctor
- Wearables = estimates
- Telemedicine: book → consult → advice → follow-up
- Emergency = hospital, not an app
- Protect health data

7.14 Key Points to Remember

REMEMBER THIS

- State clearly that digital health tools do not replace doctors.
- Describe a telemedicine workflow.
- List three benefits and three limitations of telemedicine.
- Name three fitness apps.
- State three ways to protect health data.

7.15 Short Questions

1. What is digital health?
2. Define wearable technology.
3. What is telemedicine?
4. Name two Pakistani telemedicine platforms.
5. List two limits of fitness trackers.
6. Why is health data sensitive?
7. Name two features of a fitness app.

7.16 Long Questions

1. Explain wearable technology with a diagram and discuss its limitations.
2. Describe the working of telemedicine and discuss its benefits and limitations.
3. Discuss how a student can use health apps responsibly.
4. Explain the importance of protecting personal health data and suggest safety practices.

7.17 Multiple-Choice Questions

Choose the best answer. Attempt all questions first; then check your answers and explanations in the Instructor/Revision Support section at the end of this book.

1. Telemedicine means:
   - **(A)** Medicine sold online only
   - **(B)** Remote healthcare consultation using ICT
   - **(C)** A hospital building
   - **(D)** A kind of fitness band
2. A smartwatch heart-rate reading should be treated as:
   - **(A)** A final diagnosis
   - **(B)** An estimate or trend
   - **(C)** A prescription
   - **(D)** Always exact
3. In an emergency, you should:
   - **(A)** Wait for an online appointment
   - **(B)** Go to the nearest hospital
   - **(C)** Post on social media
   - **(D)** Check your fitness app
4. Which is a Pakistani telemedicine platform?
   - **(A)** Sehat Kahani
   - **(B)** Runkeeper
   - **(C)** Dropbox
   - **(D)** Zoom
5. Which protects health data best?
   - **(A)** Posting reports publicly
   - **(B)** Strong passwords and careful sharing
   - **(C)** Sharing a password with friends
   - **(D)** Using any app without checking

7.18 Self-Assessment Exercise

Tick each statement you can honestly say is true. Revisit the relevant section for any statement you cannot tick.

- ■ I can explain digital health and wearables.
- ■ I know the limits of health apps.
- ■ I can describe the telemedicine workflow.
- ■ I can protect my health data.
- ■ I understand when to seek real medical help.

CHAPTER 08

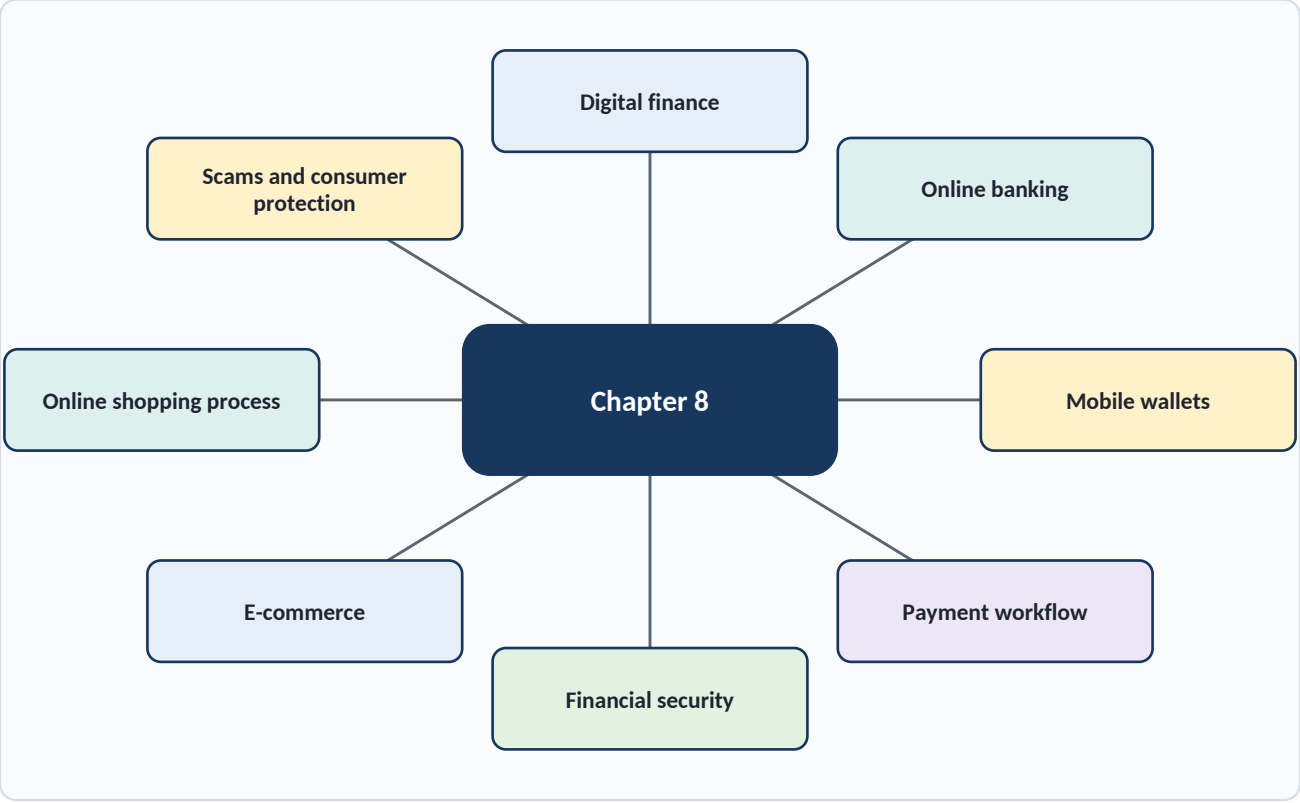
ICT in Personal Finance and Online Shopping

Banks, wallets and online stores have moved into your phone. This chapter explains how digital money and e-commerce work, and how to use them safely and wisely.

Chapter Learning Objectives

After studying this chapter, you will be able to:

- Explain digital finance, online banking and digital payments.
- Describe mobile wallets such as JazzCash, Easypaisa and Zong PayMax.
- Explain how a digital payment is verified and recorded.
- Describe e-commerce and platforms such as Daraz.pk, Telemart and Shophive.
- Follow the online shopping process: compare, order, pay, receive and return.
- Identify online shopping scams and fraud warning signs.
- Apply safe digital financial practices.



Chapter map: the main topics of this chapter

8.1 Why This Chapter Matters

Students and families increasingly pay bills, send money and shop online. Digital finance saves time, but fraud attempts are also common. Knowing how the system works and what to never share protects your money and your identity.

> NOTE
> This chapter explains concepts only. Never share real account numbers, PINs, passwords or one-time codes in class, on social media or with anyone. Practice activities use no real transactions.

8.2 Introduction to Digital Finance

Digital finance (financial technology or **fintech**) means using ICT to provide financial services such as saving, sending, paying and borrowing money. Instead of cash and paper, money is recorded and moved as electronic data.

8.3 Online Banking and Digital Payments

Online banking lets account holders use a bank's website or mobile app to check balance, transfer funds, pay bills and view statements. **Digital payments** are payments made electronically, using cards, bank transfers, QR codes or mobile wallets rather than cash.

Table 8.1: Common digital payment methods

Method	How it works	Example
Bank app / internet banking	Transfer from account to account	Paying tuition fees from a bank app
Debit or credit card	Card details or chip and PIN authorise payment	Paying at a store or an online shop
Mobile wallet	Money stored in a mobile account and sent by phone	Sending money to a family member
QR code payment	Scan a code to pay a merchant	Paying at a shop
Instant payment systems	Fast bank-to-bank transfers, supported by banks and wallets	Raast, the instant payment system launched by the State Bank of Pakistan
Cash on delivery (COD)	Pay the courier when the parcel arrives	Many online orders in Pakistan

8.4 Mobile Wallets

A **mobile wallet** (mobile money account) lets you hold and move money using your phone number and a PIN. In Pakistan, widely known wallets include **JazzCash**, **Easypaisa** and **Zong PayMax**. People use them to send money, pay utility bills, buy mobile credit and pay merchants.

Table 8.2: JazzCash, Easypaisa and Zong PayMax

Feature	JazzCash	Easypaisa	Zong PayMax
Linked to	Jazz (mobile operator) with a financial partner	Telenor Pakistan family with Telenor Microfinance Bank (check current ownership)	Zong (mobile operator)
Common services	Money transfer, bill payment, mobile top-up, merchant payments	Money transfer, bill payment, mobile top-up, merchant payments	Mobile wallet and payment services
Access	App, USSD codes and agent network	App, USSD codes and agent network	App and agent network
Rules	Account limits and verification (CNIC) requirements apply	Account limits and verification requirements apply	Account limits and verification requirements apply

> NOTE
> Ownership, partners, features and limits change. Always check the provider's official website or app, and the State Bank of Pakistan's official information, for current rules.

8.5 Payment Networks and Financial Technology

When you pay, several parties are involved behind the scenes: your bank or wallet provider, the merchant's bank, and a payment network that connects them securely. You see only a confirmation, but the system checks your identity, the balance and the transaction rules in seconds.

8.6 The Digital Payment Workflow

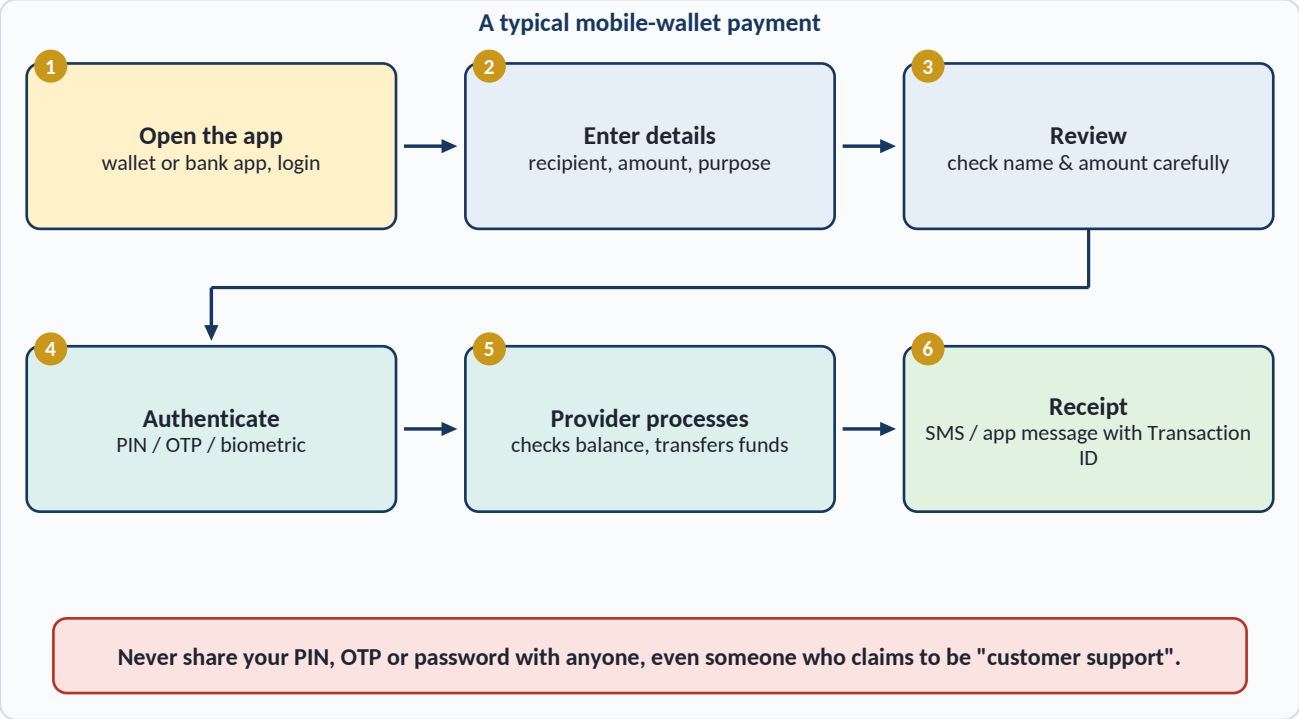


Figure 8.1: A typical mobile-wallet payment from start to receipt

Figure 8.1 shows six steps. Opening the app and entering details is your part; authentication proves it is really you; the provider processes the transaction, and you receive a receipt with a unique **Transaction ID**.

Transaction verification and digital receipts

- **Review** the receiver's name and number, and the amount, before confirming.
- **Authenticate** with PIN, biometric or a one-time password (OTP) that you request yourself.
- **Check the confirmation** SMS or in-app message; note the Transaction ID.
- **Keep digital receipts** as proof of payment, especially for fees and online orders.
- **Check your statement** regularly for transactions you do not recognise.

COMMON MISTAKE

Pressing "Confirm" without reading the recipient's name. A transfer to a wrong number may be difficult or impossible to reverse.

8.7 Safe Digital Financial Practices

Table 8.3: Do and do not for digital money

Do	Do not
Use official apps from the real app store	Install apps from links sent by messages
Keep PIN and OTP secret	Share PIN, OTP, password or CVV with anyone, including "bank staff"
Use a screen lock and update your phone	Leave your phone unlocked or lend it
Check the receiver before paying	Pay quickly because of urgency
Contact the official helpline printed on the official site or card	Call numbers sent by unknown callers or messages
Report suspected fraud immediately to your bank or wallet provider	Ignore unexpected transactions

REMEMBER THIS

No genuine bank or wallet will call you to ask for your PIN, OTP or password. If someone does, it is fraud. Hang up and contact the provider yourself through official channels.

REAL-LIFE CONNECTION

A common trick is a call or SMS saying "your wallet will be blocked, send the code you will receive". The code is actually the key to the fraudster's own login attempt. Sharing it gives them access to the account.

8.8 E-Commerce Fundamentals

E-commerce (electronic commerce) means buying and selling goods and services over the Internet. Pakistani platforms such as **Daraz.pk** (a marketplace where many sellers list products), **Telemart** and **Shophive** (online stores focusing largely on electronics and technology) show different business models.

Table 8.4: Marketplace versus online store

Feature	Marketplace (for example Daraz.pk)	Online store (for example Telemart, Shophive)
Sellers	Many independent sellers on one platform	One company sells under its own name
Choice	Very wide range	Narrower, specialised range
Responsibility	Platform and seller share responsibility; check the seller rating	Store is directly responsible
Products	Wide category range	Mainly electronics and related items (at the time of writing)
Delivery and returns	Defined by platform and seller policy	Defined by store policy

NOTE

Descriptions of platforms are general; their services and policies change. Read the current policy pages before ordering.

8.9 The Online Shopping Process

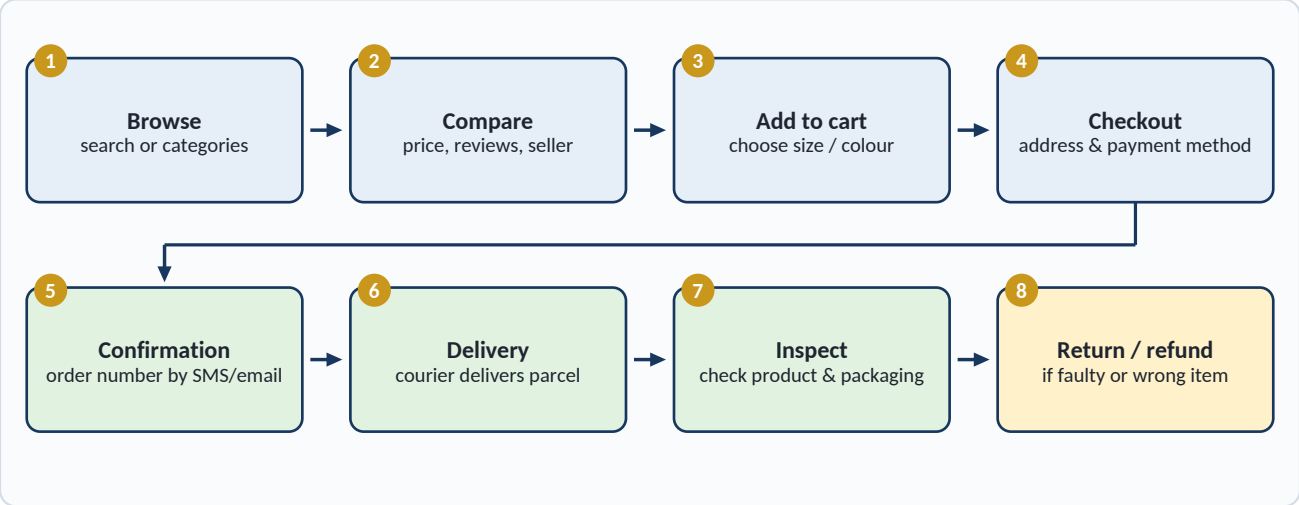


Figure 8.2: The e-commerce process from browsing to return

1. **Search and browse** products by name or category.
2. **Compare** price, specifications, ratings, seller reputation and delivery time across at least two sources.
3. **Add to cart** and review quantity, colour, size and warranty.
4. **Checkout:** confirm address and choose payment method (COD, card, wallet).
5. **Receive confirmation** by SMS or email; keep the order number.
6. **Delivery:** track the parcel.
7. **Inspect** the parcel on arrival, ideally in front of the courier, and take photos if damaged.
8. **Return or refund** within the stated period if the item is faulty or different from the listing.

Table 8.5: Online payment options for shopping

Method	Advantage	Risk / note
Cash on delivery	Pay only after receiving	May cost extra; some items excluded; keep exact change
Wallet	Fast and convenient	Make sure you use the official checkout
Card	Easy for online shops	Use only secure (HTTPS) pages, never share the PIN or CVV by message
Bank transfer to a personal account	None for beginners	High risk: avoid unless you fully trust the seller

8.10 Consumer Protection and Online Shopping Scams

Consumers have rights: to receive the item described, to know the price and policies, to ask for a refund or replacement for faulty goods, and to have complaints heard. Keep order screenshots, receipts and messages as evidence. Use the platform's complaint system first; if the matter is serious, seek help from consumer protection authorities.

Table 8.6: Signs of an online shopping scam

Warning sign	Why it is suspicious
Price far below the market	Too good to be true; may be a fake offer
Seller asks you to pay by transfer to a personal account outside the platform	No protection if the seller disappears
Pressure to buy immediately	Scammers do not want you to think or compare
Brand-new account with no reviews	Cannot judge reliability
Copied photos and poor spelling	May be a fake page
Website with no contact details or return policy	Not accountable
Link arrives via unknown message	May be a phishing website

PROFESSOR'S TIP

Before buying from an unknown website, search for its name along with "reviews" or "scam", check for contact details and a clear return policy, and use cash on delivery or a protected checkout whenever possible.

8.11 Important Terminology

Table 8.7: Key terms of Chapter 8

Term	Meaning
Fintech	Technology-based financial services.
Mobile wallet	A phone-based account for holding and sending money.
OTP	One-Time Password used to verify a transaction.
Transaction ID	Unique reference number for a transaction.
E-commerce	Buying and selling over the Internet.
Marketplace	Platform where many sellers list products.
COD	Cash on delivery.
Phishing	Fraud that tricks you into revealing private data.

8.12 Common Mistakes

COMMON MISTAKE

- Sharing PIN or OTP with a caller.
- Paying before comparing sellers.
- Skipping parcel inspection.
- Using public Wi-Fi for banking.
- Trusting offers that arrive via unknown links.

8.13 Practical Activities

Complete these hands-on activities on your own device or in the computer lab. Interfaces change with updates, so if a button has moved, look for the same command by its name.

Activity 20: Understand a digital payment workflow	
Learning objective	Describe each step of a mobile payment and its security checks without performing a real transaction.
Required tools	Notebook, a mobile-wallet or bank official help page or tutorial.
Step-by-step instructions	**1.** Open the official help page of a wallet or bank app (do not log in). **2.** List the steps for sending money to another person. **3.** Mark the steps where you must check details. **4.** Mark where authentication (PIN/OTP) is required. **5.** Draw the workflow in your own diagram. **6.** Write three actions that protect you from fraud.
Expected outcome	A labelled workflow diagram and three security rules.
Self-check questions	a At which step is identity verified? b What is a Transaction ID for? c Who should you contact if you send money to the wrong person?

Activity 21: Identify signs of an online shopping scam	
Learning objective	Analyse a shopping offer and identify risk signs.
Required tools	Printed or on-screen sample offers prepared by your teacher, or a sample you create.
Step-by-step instructions	**1.** Read the sample offer (price, seller, payment instructions, contact details). **2.** Underline suspicious points. **3.** Compare it with the “Signs of an online shopping scam” table in this chapter. **4.** Rate the offer: Safe, Doubtful or Scam. **5.** Write what you would do next.
Expected outcome	A completed analysis with a rating and recommended action.
Self-check questions	a Which two signs were most convincing? b Which payment method would be safest? c Where could you check the seller’s reputation?

8.14 Classroom Discussion Questions

1. Is cash on delivery better than digital payment? Discuss safety and convenience.
2. Why do fraudsters create a feeling of urgency?
3. How can the elderly in your family be protected from digital fraud?

8.15 Chapter Summary

- Digital finance moves money through electronic systems.
- Online banking, cards, QR codes and mobile wallets are common payment methods.
- JazzCash, Easypaisa and Zong PayMax are mobile wallet examples.
- A payment is verified by authentication, checked by the provider and confirmed with a receipt.
- Never share PIN, OTP or passwords.
- E-commerce platforms include marketplaces and online stores.
- Compare, check reviews, inspect parcels and keep proof.
- Learn scam signs and report fraud immediately.

8.16 Quick Revision Notes

QUICK REVISION

- PIN, OTP, password = secret
- Review → Authenticate → Process → Receipt
- Marketplace = many sellers; store = one seller
- Compare, inspect, keep receipts
- Too good to be true = suspicious

8.17 Key Points to Remember

REMEMBER THIS

- List five safe digital finance practices.
- Explain the digital payment workflow.
- Differentiate marketplace and online store.
- List five scam signs.

8.18 Short Questions

1. What is digital finance?
2. Define mobile wallet and give two examples.
3. What is an OTP?
4. What is e-commerce?
5. Differentiate COD and wallet payment.
6. Name two online shopping scam signs.
7. Why should you keep digital receipts?

8.19 Long Questions

1. Explain the digital payment process with a diagram.
2. Describe the online shopping process and the consumer's rights.
3. Discuss online fraud and the practices that keep digital money safe.
4. Compare JazzCash, Easypaisa and Zong PayMax and explain how mobile wallets work.

8.20 Multiple-Choice Questions

Choose the best answer. Attempt all questions first; then check your answers and explanations in the Instructor/Revision Support section at the end of this book.

1. Which should never be shared?
   - **(A)** Transaction ID of a completed payment you want to verify
   - **(B)** OTP
   - **(C)** Store name
   - **(D)** Product price
2. Daraz.pk is an example of:
   - **(A)** A marketplace
   - **(B)** A search engine
   - **(C)** An LMS
   - **(D)** A browser
3. Which payment option lets you pay after receiving the parcel?
   - **(A)** Wallet
   - **(B)** Cash on delivery
   - **(C)** Bank transfer
   - **(D)** Card
4. A "too good to be true" price is:
   - **(A)** Always safe
   - **(B)** A possible scam sign
   - **(C)** A government rule
   - **(D)** A delivery method
5. After a successful mobile payment you should:
   - **(A)** Delete the SMS
   - **(B)** Keep the Transaction ID and receipt
   - **(C)** Share it publicly
   - **(D)** Share your PIN

8.21 Self-Assessment Exercise

Tick each statement you can honestly say is true. Revisit the relevant section for any statement you cannot tick.

- ■ I can explain digital finance and mobile wallets.
- ■ I can follow a payment workflow safely.
- ■ I can compare marketplaces and stores.
- ■ I can spot a shopping scam.
- ■ I know which information must never be shared.

CHAPTER 09

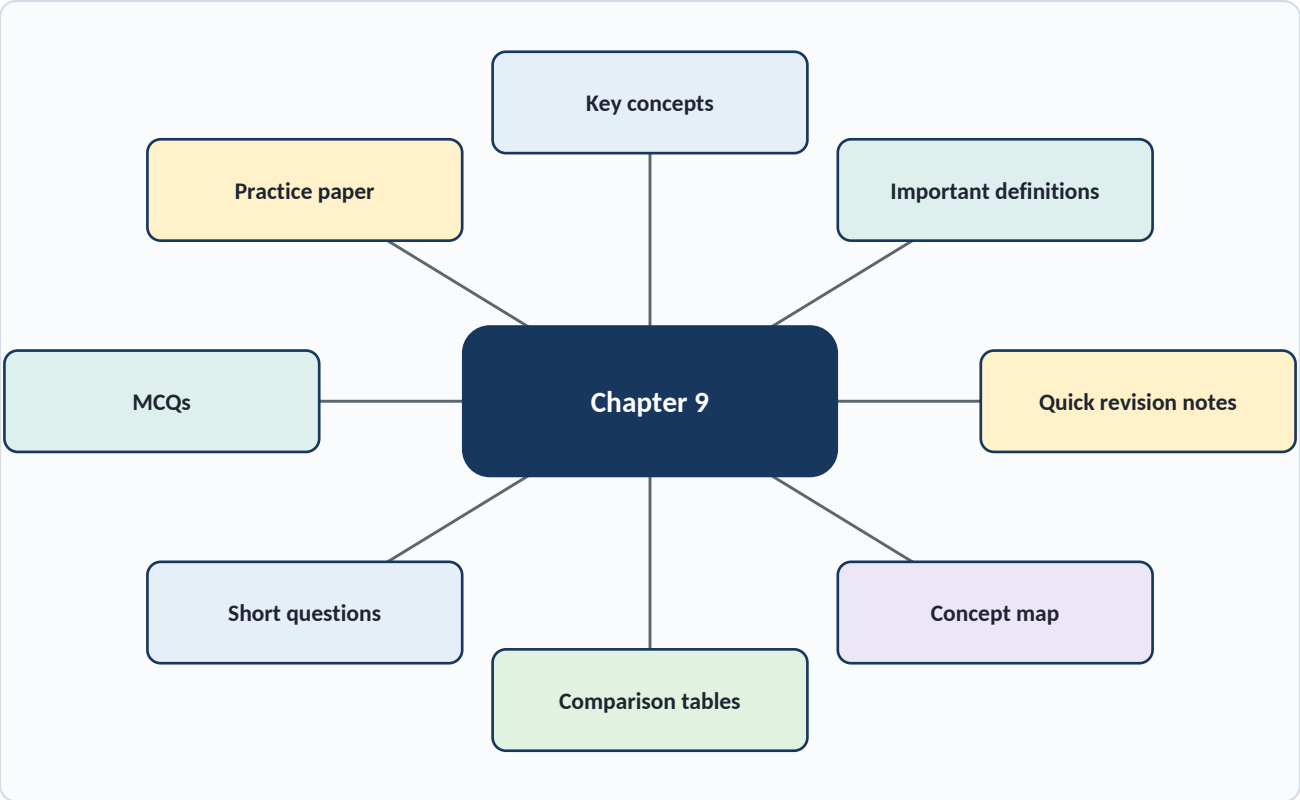
Mid-Term Examination Preparation and Revision

This chapter gathers everything from Chapters 1 to 8 into one revision pack: key ideas, definitions, concept maps, comparisons, practice questions and a full practice paper.

Chapter Learning Objectives

After studying this chapter, you will be able to:

- Revise the key concepts of Chapters 1–8.
- Recall important definitions accurately.
- Use concept maps and comparison tables to connect ideas.
- Practise short questions, conceptual MCQs and application questions.
- Attempt a mid-term practice paper under exam conditions.



Chapter map: the main topics of this chapter

9.1 Why This Chapter Matters

A good revision plan turns scattered knowledge into confidence. Students who revise from summaries, practise questions under time limits and correct their mistakes usually perform much better than those who only reread notes.

9.2 Key Concepts from Chapters 1–8

QUICK REVISION

Chapter 1: Introduction to Information and Communication Technologies

- ICT combines information technology (processing and storing) and communication technology (sending and receiving).
- ICT systems have six components: hardware, software, people, data, networks and communication.
- Data become information after processing; information supports decisions.
- Networks range from PAN to WAN; the Internet is the largest.

QUICK REVISION

Chapter 2: Basic ICT Productivity Tools and Internet Skills

- The Internet is the global network; the Web is one service on it.
- A browser displays web pages; a search engine finds them.
- Good searching uses specific keywords, quotation marks and operators.
- Evaluate sources by author, date, evidence, purpose and agreement with other sources.

QUICK REVISION

Chapter 3: Microsoft Office and Google Workspace

- Office programs share the ribbon–tab–group–command structure.
- Word is for documents: format text and paragraphs, set margins, add headers, page numbers, tables and images; export to PDF.
- Excel is for calculations: workbooks contain worksheets of cells; formulas start with =.
- SUM, AVERAGE, MIN, MAX and COUNT are the essential functions.

QUICK REVISION

Chapter 4: Cloud Storage and Digital Note-Taking

- Cloud computing delivers storage and software over the Internet.
- Cloud storage keeps copies of your files on remote servers accessible from any device.
- Google Drive, OneDrive and Dropbox are popular services.
- Organise files with a clear structure and file naming convention.

QUICK REVISION

Chapter 5: Digital Communication and Social Media

- Digital communication may be synchronous or asynchronous.
- Meet, Teams and Zoom support online meetings with similar controls.
- Mute when not speaking, check what you share, and follow meeting etiquette.
- Facebook, Instagram and LinkedIn serve different purposes.

QUICK REVISION

Chapter 6: ICT in Education

- EdTech uses ICT to support teaching and learning.
- An LMS gathers course content, assignments, quizzes and grades in one place.
- Moodle, Canvas and Google Classroom are examples of LMS.
- Submit assignments carefully and keep proof.

QUICK REVISION

Chapter 7: ICT in Health and Well-being

- Digital health uses ICT for health records, monitoring, wellness and telemedicine.
- Wearables estimate steps, heart rate and sleep; they do not diagnose.
- Fitness apps include Samsung Health, Apple Health, Xiaomi apps, Runkeeper and Google's health apps.
- Telemedicine provides remote consultation and suits minor, non-emergency needs.

QUICK REVISION

Chapter 8: ICT in Personal Finance and Online Shopping

- Digital finance moves money through electronic systems.
- Online banking, cards, QR codes and mobile wallets are common payment methods.
- JazzCash, Easypaisa and Zong PayMax are mobile wallet examples.
- A payment is verified by authentication, checked by the provider and confirmed with a receipt.

9.3 Important Definitions

Learn these definitions in your own words. In exams, a correct definition followed by one example earns the best marks.

Table 9.1: Chapter 1: key definitions

Term	Meaning
ICT	Technologies used to capture, store, process, transmit and present information.
Hardware	The physical parts of a computer system.
Software	Programs that instruct hardware what to do.
Data	Raw facts and figures.
Information	Data processed into a meaningful form.
Network	Connected devices that share data and resources.
Internet	The global network of networks.
WWW	Web pages and websites accessed through a browser.

Table 9.2: Chapter 2: key definitions

Term	Meaning
URL	The web address of a page.
Browser	Software used to view web pages.
Search engine	A website that finds pages from its index.
Keyword	An important word used in a search.
Crawler	A program that discovers web pages for the index.
HTTPS	Secure version of the web protocol, using encryption.
Email attachment	A file sent with an email message.
CC / BCC	Visible copy / hidden copy of an email.

Table 9.3: Chapter 3: key definitions

Term	Meaning
Ribbon	The strip of tabs and commands at the top of an Office program.
Style	A saved set of formatting, such as Heading 1.
Margin	Blank space between text and page edge.
Workbook	An Excel file.
Worksheet	One sheet inside a workbook.
Cell reference	The address of a cell, such as B2.
Function	A built-in formula such as SUM.
Absolute reference	A reference locked with $ signs.

Table 9.4: Chapter 4: key definitions

Term	Meaning
Cloud storage	Saving files on a provider's remote servers.
Data centre	A secure facility housing many servers.
Synchronisation	Keeping files identical across devices.
Backup	An extra copy kept for recovery.
Permission	The level of access given to someone (view, comment, edit).
Encryption	Scrambling data so that only authorised people can read it.
2-Step Verification	A second proof of identity in addition to a password.
Notebook (OneNote)	A collection of sections and pages for notes.

Table 9.5: Chapter 5: key definitions

Term	Meaning
Video conferencing	Real-time audio and video meeting over the Internet.
Synchronous	Communication at the same time.
Asynchronous	Communication at different times.
Screen sharing	Showing your screen to meeting participants.
Social media	Online platforms for sharing and interacting.
LinkedIn	A professional networking platform.
Digital identity	How you appear online.
Privacy settings	Controls over who sees your information.

Table 9.6: Chapter 6: key definitions

Term	Meaning
EdTech	Technology used to support education.
LMS	Learning Management System for courses, assignments and grades.
Blended learning	Mix of face-to-face and online learning.
Virtual classroom	Online live class environment.
MOOC	Massive Open Online Course available to large numbers of learners.
E-learning	Learning using electronic media and the Internet.
Digital divide	Unequal access to technology and the Internet.

Table 9.7: Chapter 7: key definitions

Term	Meaning
Digital health	Use of ICT to support health and healthcare.
Wearable	Electronic device worn on the body.
Sensor	A component that measures a physical signal.
Telemedicine	Remote medical consultation using ICT.
E-prescription	A digital prescription issued by a doctor.
Health data	Personal information about physical or mental health.
Bluetooth	Short-range wireless link between devices.

Table 9.8: Chapter 8: key definitions

Term	Meaning
Fintech	Technology-based financial services.
Mobile wallet	A phone-based account for holding and sending money.
OTP	One-Time Password used to verify a transaction.
Transaction ID	Unique reference number for a transaction.
E-commerce	Buying and selling over the Internet.
Marketplace	Platform where many sellers list products.
COD	Cash on delivery.
Phishing	Fraud that tricks you into revealing private data.

9.4 Quick Revision Notes

EXAM FOCUS

Chapter 1

- ICT = IT + Communication
- Hardware (touch) vs Software (instructions)
- Data (raw) to Information (meaningful)
- PAN < LAN < MAN < WAN
- Internet = network of networks; WWW = web pages

EXAM FOCUS

Chapter 2

- Internet = network, WWW = pages
- Browser ≠ search engine
- “Quotes” = exact phrase
- To = main, CC = visible copy, BCC = hidden copy
- Never share password, PIN or OTP

EXAM FOCUS

Chapter 3

- Ribbon → Tabs → Groups → Commands
- Ctrl+S save, Ctrl+C/X/V, Ctrl+Z undo, Ctrl+F find, Ctrl+H replace
- Cell = column + row (B2); range = B2:D4
- =SUM, =AVERAGE, =MIN, =MAX, =COUNT
- H1 = absolute; E2 = relative
- F5 starts slide show

EXAM FOCUS

Chapter 4

- Cloud = remote servers via Internet
- Viewer < Commenter < Editor
- Sync ≠ Backup; follow 3-2-1
- Restricted sharing is safest
- Notebook → Section → Page

EXAM FOCUS

Chapter 5

- Meet / Teams / Zoom: join, mute, camera, chat, share
- Sync vs Async
- LinkedIn = career; Instagram = visual; Facebook = community
- Think before posting
- Check privacy settings

EXAM FOCUS

Chapter 6

- LMS = course content + assignments + quizzes + grades
- Moodle, Canvas, Google Classroom
- Coursera, edX, Udemy, Khan Academy
- Blended = online + face-to-face
- Always confirm submission

EXAM FOCUS

Chapter 7

- Digital health ≠ doctor
- Wearables = estimates
- Telemedicine: book → consult → advice → follow-up
- Emergency = hospital, not an app
- Protect health data

EXAM FOCUS

Chapter 8

- PIN, OTP, password = secret
- Review → Authenticate → Process → Receipt
- Marketplace = many sellers; store = one seller
- Compare, inspect, keep receipts
- Too good to be true = suspicious

9.5 Concept Map

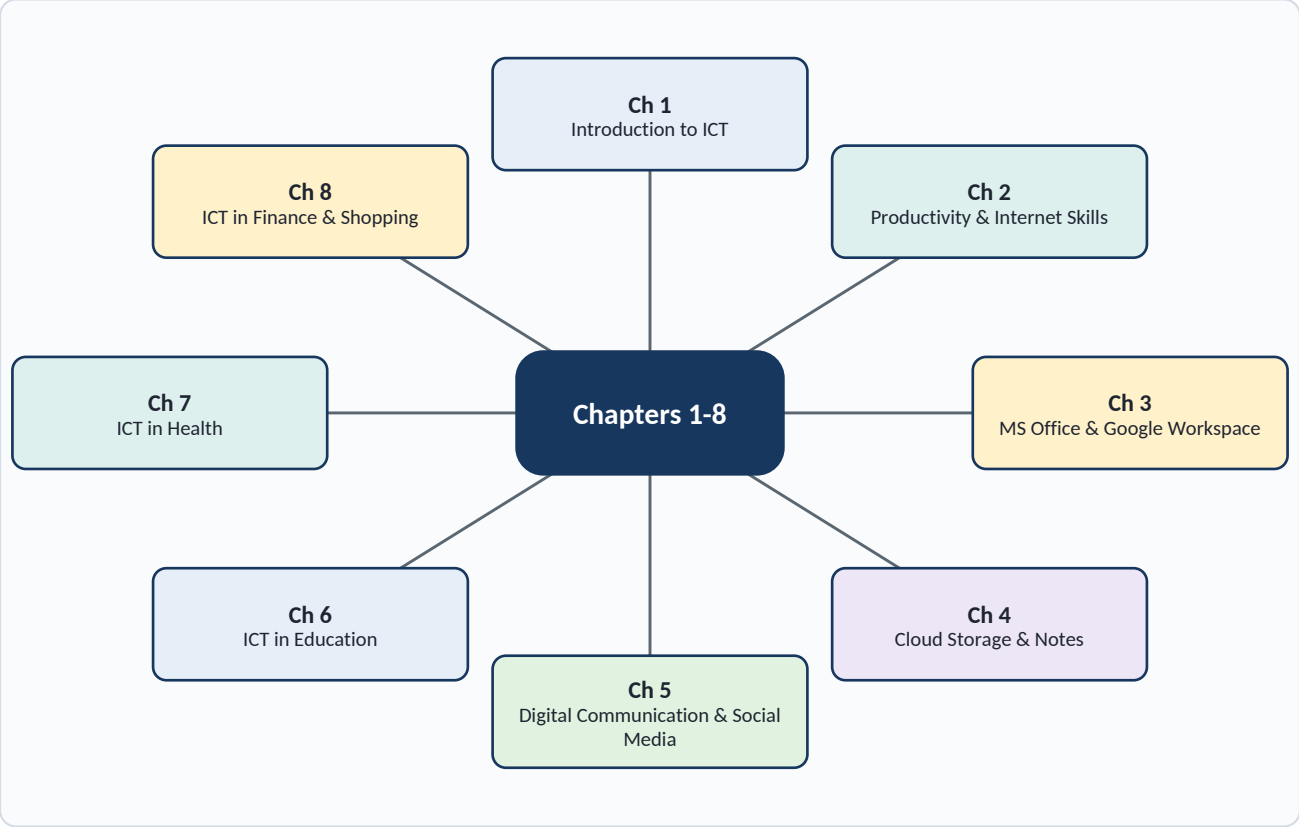


Figure 9.1: Concept map of Chapters 1 to 8

Figure 9.1 places the eight chapters around the course. Notice how they connect: Chapter 1 gives the foundation; Chapters 2 to 5 teach tools and communication; Chapters 6 to 8 apply ICT in education, health and finance.

9.6 Comparison Tables

Table 9.9: Frequently compared concepts (Chapters 1–8)

Pair	Difference in one line
Hardware vs Software	Hardware is physical; software is instructions.
Data vs Information	Data are raw facts; information is processed meaning.
IT vs ICT	IT is computing; ICT adds communication and networks.
Internet vs WWW	Internet is the network; WWW is web pages on it.
Browser vs Search engine	Browser displays pages; search engine finds them.
CC vs BCC	CC recipients are visible; BCC recipients are hidden.
Relative vs Absolute reference	Relative changes when copied; absolute ($) does not.
Local vs Cloud storage	Local is on your device; cloud is on remote servers.
Sync vs Backup	Sync mirrors changes; backup keeps a recoverable copy.
Synchronous vs Asynchronous	At the same time vs at different times.
Marketplace vs Online store	Many sellers vs one seller.
Wearable vs Doctor	Wearable estimates; doctor diagnoses.

9.7 Important Short Questions

1. Define ICT.
2. Differentiate between hardware and software.
3. What is the difference between data and information?
4. Differentiate between a browser and a search engine.
5. What is a URL?
6. What is the use of quotation marks in a search?
7. What is a ribbon?
8. Differentiate between a workbook and a worksheet.
9. Write the formulas to find sum and average of cells B2 to D2.
10. What is cloud computing?
11. Define cloud storage.
12. Differentiate local and cloud storage.
13. Define digital communication.
14. What is video conferencing?
15. Name four meeting controls.
16. What is educational technology?
17. Define LMS.
18. What is blended learning?
19. What is digital health?
20. Define wearable technology.
21. What is telemedicine?
22. What is digital finance?
23. Define mobile wallet and give two examples.
24. What is an OTP?

9.8 Conceptual MCQs

Attempt these before checking the answers in the Instructor/Revision Support section.

1. A user opens a Word file, edits it and saves it. Which two parts of ICT are mainly involved?

   (A) Hardware and nothing else
   (B) Software and data
   (C) Only the Internet
   (D) Only people

2. Which statement correctly describes email?

   (A) It needs no Internet
   (B) It is asynchronous communication
   (C) It is only for companies
   (D) It cannot carry attachments

3. If you copy the formula =B2*H1 from row 2 to row 3, it becomes:
   (A) =B3*H1
   (B) =B3*H2
   (C) =B2*H1
   (D) =C3*I1
4. Which best protects you from losing an assignment if your laptop fails?
   (A) Keeping it only on the desktop
   (B) A cloud copy and a USB backup
   (C) Printing and deleting the file
   (D) Emailing it to nobody
5. A caller says they are from your wallet company and asks for the OTP. You should:
   (A) Share it quickly
   (B) Refuse and report
   (C) Share half of it
   (D) Ask them to call later and then share
6. Which platform is mainly a Learning Management System?
   (A) Moodle
   (B) Instagram
   (C) Excel
   (D) Outlook
7. A wearable reports a high heart rate. The most sensible action is to:
   (A) Self-medicate
   (B) Consider it an estimate and consult a doctor if concerned
   (C) Ignore all symptoms
   (D) Post it online
8. A site offers a new phone at half price and asks you to transfer money to a personal account. This is likely:
   (A) A good deal
   (B) A scam warning sign
   (C) A government offer
   (D) A warranty

9.9 Practical Application Questions

1. Draw the data processing cycle and apply it to the marks of ten students in your class.
2. Write the Excel formulas to find total, average, highest and lowest marks for marks stored in B2:D11.
3. Write a formal email to your instructor requesting a quiz date confirmation; label To, CC and Subject.
4. List the steps you would follow to share a Drive folder with three group members as Editors and your teacher as Viewer.
5. Prepare a six-line checklist to verify a seller on an online marketplace.
6. Suggest three safety rules for using a fitness app and a telemedicine app.

9.10 Mid-Term Practice Paper

Instructions: This is a practice paper for revision. It follows the style of typical examination papers; the official paper format, marks and time are decided by your instructor. Attempt without looking at notes. Time suggested: 60–75 minutes.

Section A: Multiple-Choice Questions (1 mark each)

1. Which is an example of system software?

   (A) Microsoft Word
   (B) Android
   (C) Google Chrome
   (D) Zoom

2. Raw facts are called:

   (A) Information
   (B) Data
   (C) Output
   (D) Network

3. A network that covers a university campus is a:

   (A) PAN
   (B) LAN
   (C) WAN
   (D) Cloud

4. Quotation marks in a search query are used to:

   (A) Search an exact phrase
   (B) Exclude a word
   (C) Search images only
   (D) Search offline

5. Which email field hides recipients from others?

   (A) To
   (B) CC
   (C) BCC
   (D) Subject

6. Which Excel function finds the smallest number?

   (A) MAX
   (B) MIN
   (C) SUM
   (D) COUNT

7. Which permission only allows reading a shared file?

   (A) Viewer
   (B) Editor
   (C) Owner
   (D) Commenter

8. Which of these is a synchronous communication tool?
   - **(A)** Email
   - **(B)** Forum post
   - **(C)** Video meeting
   - **(D)** Voice note
9. Coursera is best described as:
   - **(A)** An online learning platform
   - **(B)** A mobile wallet
   - **(C)** A browser
   - **(D)** A telemedicine app
10. A wearable device mainly provides:
   - **(A)** Medical diagnosis
   - **(B)** Estimates and trends
   - **(C)** Prescriptions
   - **(D)** Surgery

Section B: Short Questions (answer any five, 4 marks each)

1. Define ICT and differentiate it from IT.
2. Differentiate hardware and software with two examples each.
3. What is the difference between the Internet and the WWW?
4. List four rules of professional email etiquette.
5. Differentiate relative and absolute cell references with an example.
6. What is cloud storage? State two advantages.
7. Explain two benefits and two limitations of telemedicine.
8. List four signs of an online shopping scam.

Section C: Long Questions (answer any two, 10 marks each)

1. Explain the components of ICT with a labelled diagram. Describe the data processing cycle with an example.
2. Explain how a search engine works and describe five techniques for effective searching. Why must we evaluate online sources?
3. Describe how to prepare a student marksheet in Excel, including formulas, sorting and a chart.
4. Explain the working of an LMS and the steps of submitting an assignment online; discuss two benefits and two limitations of e-learning.

Section D: Practical Application (10 marks)

1. A friend receives an SMS saying “Your wallet will be blocked in one hour. Send the code you will receive.” Explain what the message is, what the friend should do, and how to protect the account in future.

9.11 Chapter Summary

- Revise by chapter, using the summaries, quick notes and comparison tables.
- Practise questions in exam conditions.
- Check the answers and correct your mistakes.

9.12 Quick Revision Notes

QUICK REVISION

- Revise actively, not passively
- Definition + example = full marks
- Practise under time limits

9.13 Key Points to Remember

REMEMBER THIS

- Revise definitions, comparisons and procedures.
- Prepare concise answers.
- Practise MCQs and short questions daily.

9.14 Self-Assessment Exercise

Tick each statement you can honestly say is true. Revisit the relevant section for any statement you cannot tick.

- ■ I have revised all chapters from 1 to 8.
- ■ I can write the key definitions.
- ■ I have attempted the practice paper.
- ■ I have corrected my mistakes.

CHAPTER 10

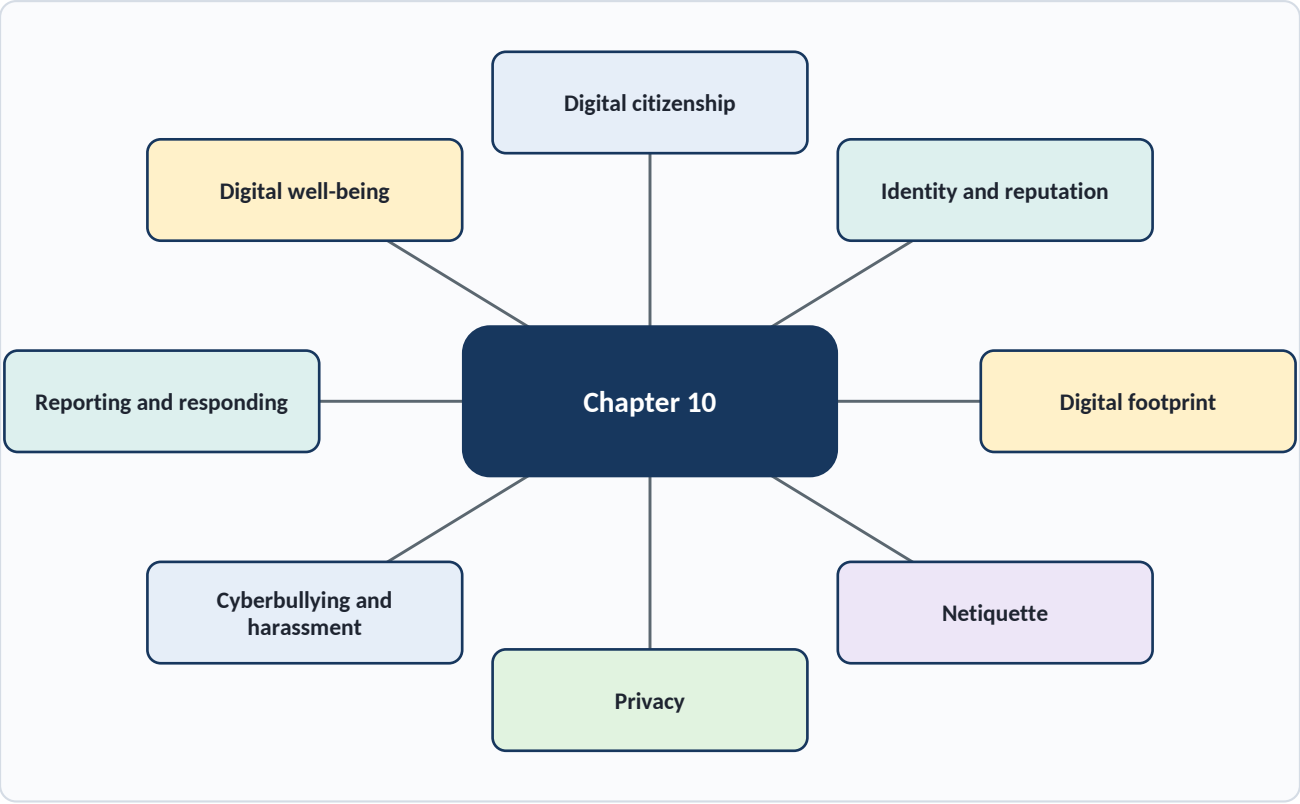
Digital Citizenship and Online Etiquette

Being online is like being in a very large public place where everyone can hear you, and where nothing you say is truly forgotten. This chapter teaches you how to be a respectful, safe and responsible member of the digital community.

Chapter Learning Objectives

After studying this chapter, you will be able to:

- Define digital citizenship and responsible technology use.
- Explain digital identity, online reputation and digital footprint.
- Apply netiquette in emails, messages, forums and social media.
- Communicate respectfully and professionally online.
- Protect your online privacy.
- Identify cyberbullying and online harassment and respond to them appropriately.
- Explain how to report abuse in Pakistan and on platforms.
- Practise digital well-being.



Chapter map: the main topics of this chapter

10.1 Why This Chapter Matters

Every message, photo and comment you post becomes part of your digital record. Employers, universities and strangers may see it. Good digital citizenship protects your reputation, your safety and the people around you.

10.2 Meaning of Digital Citizenship

A **citizen** is a member of a community with rights and responsibilities. A **digital citizen** is a person who uses technology and the Internet responsibly, safely and respectfully. Digital citizenship means that the same values you follow in real life (honesty, respect, kindness, responsibility) also apply online.

Table 10.1: Nine elements of digital citizenship (simplified)

Element	Simple meaning
Access	Fair and equal access to technology
Communication	Clear and respectful messages
Literacy	Knowing how to use tools and evaluate information
Etiquette (netiquette)	Polite behaviour online
Law	Following laws and rules
Rights and responsibilities	Respecting others' rights, claiming your own
Health and well-being	Healthy use of devices
Security	Protecting yourself and your data
Commerce	Buying and selling safely

10.3 Digital Identity and Online Reputation

Your **digital identity** is the collection of information that represents you online: your name, profile photos, usernames, posts and activity. Your **online reputation** is the opinion others form about you based on that identity.

> **REAL-LIFE CONNECTION**
> A company in Lahore shortlists three graduates. The hiring manager searches their names online. One profile has professional posts, another has no information, and the third has insulting comments. Reputation often decides who gets the interview.

10.4 Digital Footprint

A **digital footprint** is the trail of data you leave online. It has two parts.

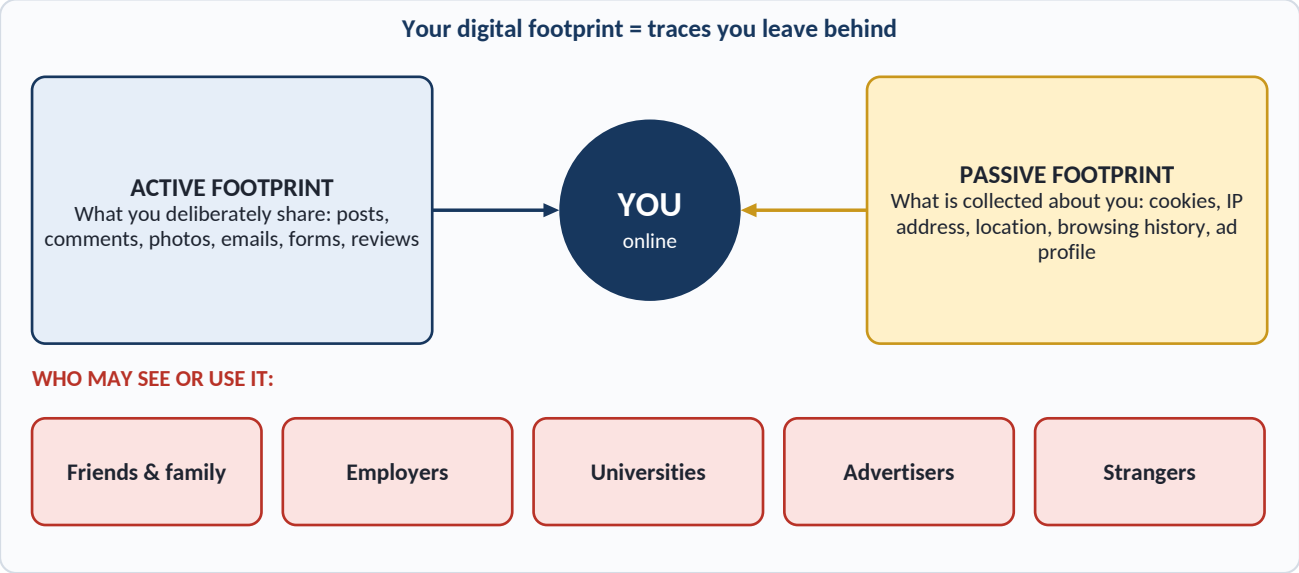


Figure 10.1: Active and passive digital footprint and who may see it

Table 10.2: Active and passive digital footprint

Type	Meaning	Examples
Active	Information you deliberately share	Posts, comments, photos, emails, online forms, product reviews
Passive	Information collected without you actively posting	Cookies, IP address, location data, browsing history, advertising profile

> **REMEMBER THIS**
> Deleting a post does not guarantee that it has disappeared. Others may have copied, screenshotted or shared it. **Think before you post.**

10.5 Netiquette

Netiquette (network etiquette) means the rules of polite and respectful behaviour online.

Table 10.3: Netiquette rules with examples

Rule	Example
Remember the human	Would you say this to the person's face?
Be respectful in tone	Disagree with the idea, not with the person
Avoid ALL CAPITALS	They look like shouting
Respect privacy	Do not share someone's photo or chat without permission
Be accurate	Check facts before posting
Use clear language	Avoid slang and abbreviations in formal messages
Respect others' time	Do not spam groups or send messages at midnight to a teacher
Respond appropriately	Do not reply with anger; pause first

Respectful and professional online communication

- Greet politely and use titles (Sir, Madam, Professor) when writing to teachers.
- Keep academic group chats focused on study topics.
- Do not forward chain messages without checking them.
- Use humour carefully; jokes can be misunderstood without tone of voice.
- Do not tag or share photographs of others without permission.
- Admit mistakes and apologise if you hurt someone.

10.6 Online Privacy

- Do not share your CNIC number, address, phone number, passwords or financial information publicly.
- Use strong, different passwords and 2-Step Verification.
- Check app permissions (camera, microphone, location).
- Turn off location tagging when posting photos.
- Use privacy settings to limit who sees your content.
- Log out of shared devices.
- Be careful of public Wi-Fi for sensitive tasks.

10.7 Cyberbullying and Online Harassment

Cyberbullying is repeated, deliberate harm to a person using digital tools: insulting messages, spreading rumours, posting embarrassing photos, creating fake accounts or excluding someone from groups. **Online harassment** is unwanted, threatening or offensive behaviour directed at a person online, including stalking, blackmail and unwanted sexual messages.

Table 10.4: Forms of cyberbullying and harassment

Form	Example
Harassment	Repeated insulting messages
Exclusion	Removing a classmate from a group to humiliate them
Impersonation	Creating a fake profile in someone's name
Outing / doxxing	Sharing private information or photos without permission
Threats and blackmail	Threatening to share private pictures unless the person obeys
Trolling	Posting hurtful comments to provoke

EXAM FOCUS
Know the difference: cyberbullying is mostly peer-to-peer abuse using digital tools; harassment is a wider term including threats and stalking. Be ready to give three examples and three actions a victim can take.

Reporting and responding to abuse

1. **Do not respond with anger** and do not retaliate.
2. **Save evidence:** screenshots with date, usernames, and links.
3. **Block** the person and **report** the content on the platform.
4. **Tell** a trusted adult, family member, teacher or university authority.
5. **Use official channels** for serious cases: in Pakistan, cybercrime complaints can be made to the National Cyber Crime Investigation Agency (NCCIA), which has a helpline (1799 at the time of writing) and an online reporting system; verify the current contact details on the official website. Serious threats can also be reported to the police.
6. **Seek support:** talk to a counsellor or someone you trust if you feel distressed.

NOTE

Pakistan's law on electronic crimes is the Prevention of Electronic Crimes Act (PECA), which has been amended in recent years. Laws and agencies can change, so rely on current official sources.

PROFESSOR'S TIP

If you see someone being bullied online, do not join in and do not stay silent. Report the content and support the person privately. Being a responsible bystander matters.

10.8 Digital Well-being

Digital well-being means using technology in ways that support your physical, mental and social health.

- Set limits on screen time and use "focus" or "do not disturb" modes during study.
- Follow the 20-20-20 habit: every 20 minutes look at something 20 feet (6 metres) away for 20 seconds.
- Avoid screens before sleep; keep the phone away from the bed.
- Notice how social media makes you feel; unfollow accounts that make you anxious.
- Meet friends and family in person; stay active outdoors.
- Seek help if technology use feels out of control.

10.9 Safe Social Media Participation

- Keep your accounts private unless you have a reason to be public.
- Think about who can see your post: friends, friends of friends or everyone.
- Do not accept requests from strangers.
- Report suspicious or abusive accounts.
- Never meet an online friend alone without a trusted adult's knowledge.
- Review old posts and delete those that no longer represent you.

10.10 Important Terminology

Table 10.5: Key terms of Chapter 10

Term	Meaning
Digital citizenship	Responsible and respectful use of technology.
Digital identity	How you are represented online.
Online reputation	Public opinion about you formed online.
Digital footprint	The trail of data you leave online.
Netiquette	Rules of polite online behaviour.
Cyberbullying	Repeated digital harm to a person.
Online harassment	Unwanted, offensive or threatening online behaviour.
Digital well-being	Healthy use of technology.

10.11 Common Mistakes

COMMON MISTAKE

- Posting while angry.
- Believing that deleted posts are gone forever.
- Sharing others' photos without permission.
- Replying to bullies with insults.
- Keeping serious harassment secret.

10.12 Practical Activities

Complete these hands-on activities on your own device or in the computer lab. Interfaces change with updates, so if a button has moved, look for the same command by its name.

Activity 22: Audit your digital footprint	
Learning objective	Identify what information about you is visible online and decide what to change.
Required tools	Browser, your social media accounts.
Step-by-step instructions	**1.** Search for your own name using a search engine (use quotation marks). **2.** Note what appears: profiles, photos, posts. **3.** Open the privacy settings of one social media account and note who can see your posts. **4.** Mark any content you should delete or make private. **5.** Write three actions to improve your online reputation.
Expected outcome	A short audit report listing what is visible and three improvement actions.
Self-check questions	a Did anything surprise you? b What does your profile photo say about you? c Which posts would you be uncomfortable showing a future employer?

10.13 Classroom Discussion Questions

1. A classmate posts an embarrassing photo of another student as a joke. What should happen?
2. Can a person be fully anonymous online? Discuss.
3. What are healthy rules for using phones in class and at home?

10.14 Chapter Summary

- Digital citizenship means applying real-life values online.
- Digital identity and reputation are shaped by what you share.
- Your footprint has active and passive parts.
- Netiquette promotes respectful online behaviour.
- Protect your privacy and use settings.
- Respond to cyberbullying by saving evidence, blocking, reporting and seeking support.
- Digital well-being keeps technology healthy.

10.15 Quick Revision Notes

QUICK REVISION

- Think before you post
- Active vs passive footprint
- Evidence → Block → Report → Tell
- Respect, privacy, kindness
- Balance screen time

10.16 Key Points to Remember

REMEMBER THIS

- Define digital citizenship, identity and footprint.
- List five netiquette rules.
- State four steps in responding to cyberbullying.
- List three privacy practices.

10.17 Short Questions

1. What is digital citizenship?
2. What is a digital footprint?
3. Differentiate active and passive footprint.
4. Define netiquette.
5. What is cyberbullying?
6. What should you do if you are harassed online?
7. Define digital well-being.

10.18 Long Questions

1. Explain digital identity, reputation and footprint with a diagram.
2. Discuss netiquette in email, social media and online classes.
3. Explain cyberbullying and online harassment and how to respond and report.
4. Discuss how a student can protect privacy and well-being online.

10.19 Multiple-Choice Questions

Choose the best answer. Attempt all questions first; then check your answers and explanations in the Instructor/Revision Support section at the end of this book.

1. Cookies and IP address are examples of:
   - **(A)** Active footprint
   - **(B)** Passive footprint
   - **(C)** Netiquette
   - **(D)** Cyberbullying
2. A good first step after receiving abusive messages is to:
   - **(A)** Retaliate
   - **(B)** Save evidence
   - **(C)** Delete everything
   - **(D)** Ignore forever
3. Writing in ALL CAPITALS usually means:
   - **(A)** Politeness
   - **(B)** Shouting
   - **(C)** Formal tone
   - **(D)** A heading
4. Online reputation is:
   - **(A)** Your password
   - **(B)** Opinion others form from your online identity
   - **(C)** Your Internet speed
   - **(D)** Your computer's name
5. The 20-20-20 habit helps:
   - **(A)** Typing speed
   - **(B)** Eye comfort
   - **(C)** Password security
   - **(D)** Battery life

10.20 Self-Assessment Exercise

Tick each statement you can honestly say is true. Revisit the relevant section for any statement you cannot tick.

- ■ I can explain digital identity and footprint.
- ■ I can follow netiquette rules.
- ■ I know how to protect privacy.
- ■ I know how to respond to cyberbullying.
- ■ I can describe healthy digital habits.

CHAPTER 11

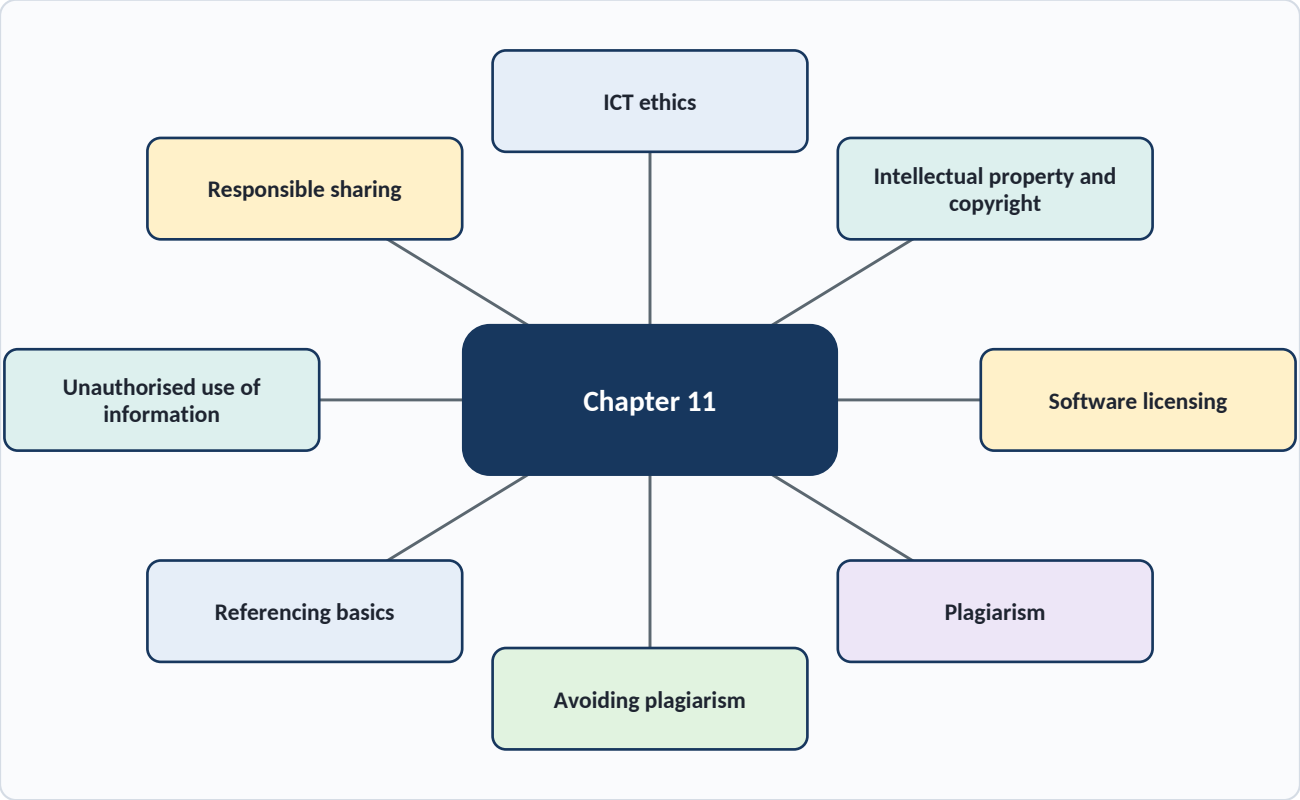
Ethical Considerations in the Use of ICT

Technology gives us the power to copy, share and create instantly. Ethics tells us how to use that power fairly. This chapter explains copyright, licensing, plagiarism and academic integrity.

Chapter Learning Objectives

After studying this chapter, you will be able to:

- Explain ICT ethics and responsible technology use.
- Define intellectual property, copyright and copyright infringement.
- Explain software licensing and open-source software.
- Define plagiarism and academic integrity and describe how to avoid plagiarism.
- Quote, paraphrase and cite sources correctly (fundamentals).
- Explain unauthorised use of information and responsible sharing.
- Distinguish acceptable from unacceptable academic practices.



Chapter map: the main topics of this chapter

11.1 Why This Chapter Matters

In university, your marks depend not only on what you know but also on the honesty of your work. Under the course's academic honesty policy, identical or partially identical assignments receive zero. Understanding ethics protects your degree and builds a reputation that employers trust.

11.2 Introduction to ICT Ethics

Ethics means principles of right and wrong that guide behaviour. **ICT ethics** applies those principles to technology: how we use computers, data and the Internet in ways that are honest, fair and respectful. Something can be technically possible (like copying a whole book to a USB drive) yet still be unethical or illegal.

Table 11.1: Core principles of ethical ICT use

Principle	Meaning
Honesty	Do not cheat, deceive or claim others' work as yours
Respect for ownership	Respect copyright and licences
Privacy	Do not access or share others' data without permission
Responsibility	Accept consequences of your digital actions
Fairness	Do not gain unfair advantage through technology
Security	Do not harm systems or data

11.3 Intellectual Property and Copyright

Intellectual property (IP) means creations of the mind: writings, music, designs, software, logos and inventions. The creator has legal rights over them. **Copyright** is the legal right of the creator to control copying, distribution and use of an original work such as a book, article, photograph, video, song or software program. In Pakistan, copyright is protected by national law and international agreements; always check current rules.

Copyright infringement means using a copyrighted work without permission or a valid exception. Common examples: downloading pirated movies or software, copying a book into your assignment without credit, or uploading someone else's photograph as your own.

Table 11.2: Copyright: allowed and not allowed (general guidance)

Usually acceptable	Usually not acceptable
Using your own work	Selling or sharing pirated software and films
Using material with a licence that allows your use (and following its conditions)	Copying whole chapters or articles into your work without permission
Short quotations with proper citation	Using someone's photo or music in a business video without permission
Linking to an original source	Cracking software to remove licence checks

> NOTE
> Copyright law has exceptions such as "fair use" or "fair dealing", which differ by country and cannot be judged by a simple rule. When in doubt, ask your instructor or choose openly licensed material.

11.4 Software Licensing and Open-Source Software

When you install software you usually do not buy the program itself; you buy (or are given) a **licence**, which is permission to use it under conditions. Using software without a valid licence is software piracy.

Table 11.3: Common software licence types

Type	Meaning	Example
Commercial (proprietary)	Paid licence; source code is not shared	Microsoft Office, Adobe tools
Freeware	Free to use, but code is not open	Many free utilities
Shareware / trial	Free for a limited time or with limited features	Trial antivirus
Open-source	Source code is available; licence allows use, study, modification and sharing under conditions	Linux, LibreOffice, Moodle
Subscription	Pay periodically to use	Microsoft 365

> **SIMPLE EXPLANATION**
> **Free** does not always mean **open-source**, and open-source does not mean **no rules**. Always read the licence terms.

11.5 Plagiarism and Academic Integrity

Plagiarism is presenting another person's words, ideas, images or data as your own without proper credit. **Academic integrity** is the commitment to honesty, trust, fairness and responsibility in learning. Plagiarism includes copying from the Internet, buying an assignment, using work from a classmate, and submitting AI-generated or paraphrased text as if it were your own thinking when your instructor does not allow it.

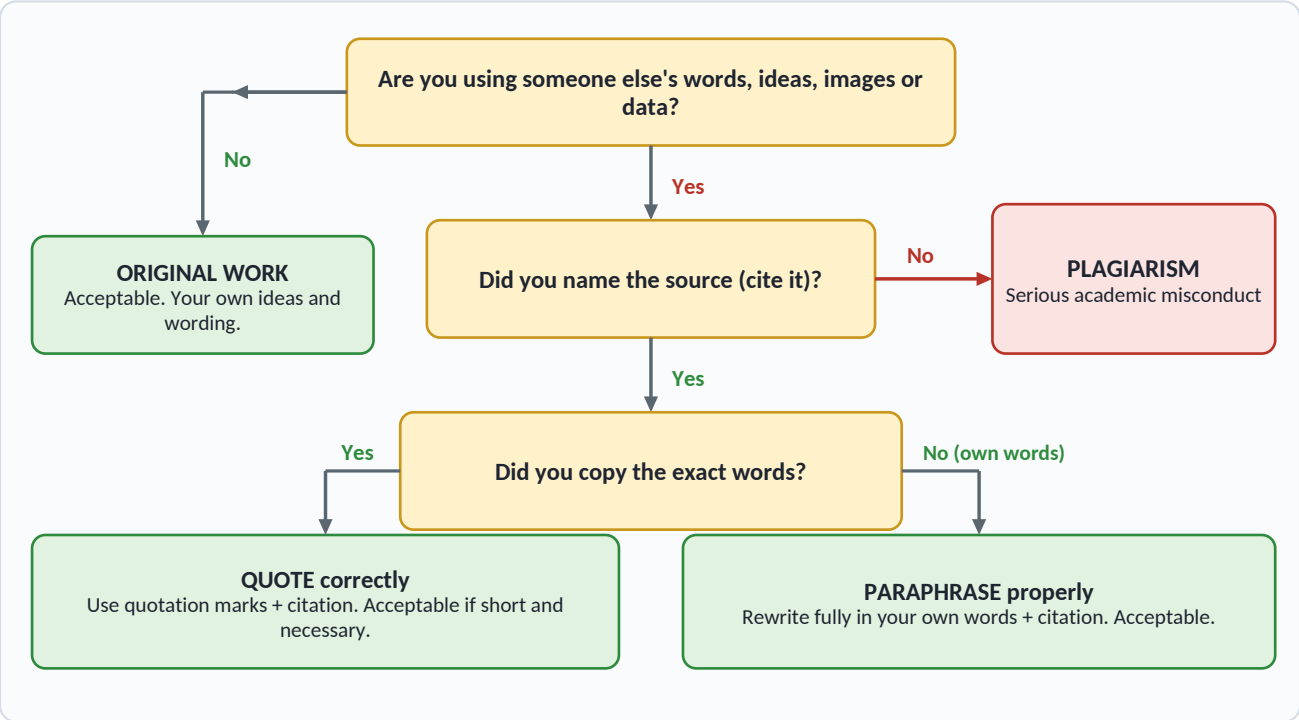


Figure 11.1: Decision flow: Is this plagiarism?

Figure 11.1 gives a simple test. If you used someone else's work, you must name the source. If you copied the exact words, put them in quotation marks and cite them; otherwise rewrite fully in your own words and still cite the source.

REMEMBER THIS

Course policy: if any two projects or assignments are identical or partially identical, a zero will be awarded. Repetition may lead to an F grade in the course. This applies to everyone involved, whether they copied or allowed copying.

How to avoid plagiarism

- Start early so you are not tempted to copy.
- Take notes in your own words and record the source immediately.
- Use quotation marks for exact words.
- Paraphrase properly: understand the idea, close the source and write it your own way.
- Cite every source, including images, charts and videos.
- Do not share your assignment file with friends; help them to understand, not to copy.
- Use plagiarism checkers only as a learning aid, and follow your teacher's instructions.

11.6 Referencing and Citation Fundamentals

A **citation** inside your text tells the reader where an idea came from; a **reference list** at the end gives full details of each source. Universities require a consistent style such as APA, MLA or Harvard; your instructor will tell you which to use. The general pattern for a book looks like the template below (the placeholders show what information is needed; fill them with real source details).

NOTE

Template (book): Author surname, Initial. (Year). *Title of the book*. Publisher.
Template (web page): Author or organisation. (Year). *Title of the page*. Website name. URL (date accessed if required).
Use the exact details printed on your real source. Never invent a source.

Table 11.4: Quoting, paraphrasing and summarising

Method	What you do	Cite?
Quote	Copy exact words inside quotation marks	Yes
Paraphrase	Express an idea fully in your own words and sentence structure	Yes
Summarise	Give the main points briefly in your own words	Yes
Common knowledge	Facts everybody knows (for example, Lahore is a city in Pakistan)	Usually no, but check with your teacher

Table 11.5: Acceptable and unacceptable academic practices

Acceptable	Unacceptable
Discussing ideas with classmates, then writing alone	Sharing your file so a friend can change the name and submit
Using a quotation with quotation marks and citation	Copying paragraphs from a website without quotation marks
Using the library or the Internet to learn, then explaining in your own words	Paying someone else to complete your assignment
Asking the instructor for clarification	Changing a few words in someone else's text
Using a tool the instructor allows and declaring it	Hiding the use of tools that the course forbids
Citing images and data with their source	Presenting someone else's chart as your own

COMMON MISTAKE

"I changed some words so it is not copied." Replacing a few words (patchwriting) is still plagiarism if the structure and ideas are taken without credit.

11.7 Unauthorised Use of Information and Responsible Sharing

- Do not access someone else's account, device or files without permission.
- Do not use confidential data (for example, exam papers or personal data of others) that you were not meant to see.
- Do not share paid course material or teacher's files outside the allowed group.
- Do not post private chats, photographs or documents without permission.
- Give credit when sharing others' work; link to the source rather than copying everything.
- Check licences before reusing images, music or code.

11.8 Ethical Content Creation and Digital Responsibility

When you create content such as videos, posts or presentations, use original material or properly licensed material. Free image sites offering licences such as Creative Commons ask you to give credit; read the terms. Be truthful, do not mislead with edited images, and respect the dignity of people shown in your content.

PROFESSOR'S TIP

Before using any image or music, ask three questions: Who made it? Do I have permission or a suitable licence? Have I given credit?

REAL-LIFE CONNECTION

A student presents a business plan using a competitor's logo and a photo from a news website without credit. The teacher marks down the project for missing sources. A short list of image credits would have avoided the loss.

11.9 Important Terminology

Table 11.6: Key terms of Chapter 11

Term	Meaning
Ethics	Principles of right and wrong.
Intellectual property	Creations of the mind protected by law.
Copyright	Legal right of a creator over an original work.
Infringement	Use of protected work without permission.
Licence	Permission to use software or content under conditions.
Open-source	Software whose source code is available under a licence.
Plagiarism	Presenting others' work as your own.
Paraphrase	Rewriting ideas in your own words and structure.
Citation	Credit given to a source inside your text.
Academic integrity	Honesty in academic work.

11.10 Common Mistakes

COMMON MISTAKE

- Copying and pasting without a citation.
- Believing that anything found on the Internet is free to use.
- Sharing an assignment file with a friend.
- Changing a few words and calling it paraphrasing.
- Using pirated software to save money.

11.11 Practical Activities

Complete these hands-on activities on your own device or in the computer lab. Interfaces change with updates, so if a button has moved, look for the same command by its name.

Activity 23: Quote, paraphrase and cite	
Learning objective	Practise acceptable ways of using information.
Required tools	A short paragraph from a textbook or reliable article (about 60 words).
Step-by-step instructions	**1.** Read the paragraph carefully. **2.** Write it as a direct quotation with quotation marks and mark where the citation will go. **3.** Close the source and write a paraphrase in your own words. **4.** Compare your paraphrase with the original to check that the sentence structure is different. **5.** Write the reference in the style your instructor prefers, using the real details of the source.
Expected outcome	A quote, a paraphrase and a correct reference for one source.
Self-check questions	a Is your paraphrase too close to the original? b Where is the citation placed? c Which method is better for an important definition?

Activity 24: Classify academic practices	
Learning objective	Decide whether cases are acceptable, doubtful or unacceptable.
Required tools	The "Acceptable and unacceptable academic practices" table and five short cases from your teacher.
Step-by-step instructions	**1.** Read each case carefully. **2.** Decide whether it is acceptable or not. **3.** Write one sentence giving the reason. **4.** Suggest a correct alternative action. **5.** Discuss your answers with a partner.
Expected outcome	A table of five cases with decisions, reasons and alternatives.
Self-check questions	a What is the main test for plagiarism? b How could the student have avoided the problem? c What does the course policy say about identical assignments?

11.12 Classroom Discussion Questions

1. A friend says: "Everyone copies; it's no big deal." How would you respond?
2. Is it ethical to use pirated software if you cannot afford the licence? What alternatives exist?
3. Should students declare when they have used digital tools to help with writing?

11.13 Chapter Summary

- ICT ethics applies honesty, respect and responsibility to technology.
- Copyright protects original works; infringement is using them without permission.
- Software is licensed, not simply bought; open-source software has its own licences.
- Plagiarism is presenting others' work as your own; academic integrity is the opposite.
- Quote exact words, paraphrase fully and always cite sources.
- Unauthorised access and sharing are unethical and may be illegal.

11.14 Quick Revision Notes

QUICK REVISION

- Quote + cite, or paraphrase + cite
- No citation = plagiarism
- Licence = permission with conditions
- Open-source ≠ no rules
- Identical assignments: zero (course policy)

11.15 Key Points to Remember

REMEMBER THIS

- Define plagiarism and academic integrity.
- Differentiate copyright and licence.
- State four ways to avoid plagiarism.
- Name three types of software licences.
- State the course policy on identical assignments.

11.16 Short Questions

1. What is ICT ethics?
2. Define copyright.
3. What is software piracy?
4. What is open-source software?
5. Define plagiarism.
6. Differentiate quoting and paraphrasing.
7. Why is citation necessary?

11.17 Long Questions

1. Explain intellectual property, copyright and infringement with examples.
2. Describe software licences and the meaning of open-source software.
3. Explain plagiarism, its types and the steps to avoid it.
4. Compare acceptable and unacceptable academic practices with examples from university life.

11.18 Multiple-Choice Questions

Choose the best answer. Attempt all questions first; then check your answers and explanations in the Instructor/Revision Support section at the end of this book.

1. Plagiarism means:

   (A) Using your own ideas
   (B) Presenting others' work as your own
   (C) Reading a book
   (D) Citing sources

2. Which is an example of open-source software?

   (A) Linux
   (B) A pirated game
   (C) A cracked tool
   (D) A stolen file

3. When you copy exact words, you should:

   (A) Hide the source
   (B) Use quotation marks and cite
   (C) Change one word
   (D) Remove the date

4. Which action protects academic integrity?

   (A) Sharing your file
   (B) Paraphrasing properly with a citation
   (C) Buying an assignment
   (D) Copying from a classmate

5. A software licence is:

   (A) Permission to use software under conditions
   (B) A type of virus
   (C) A computer part
   (D) A Wi-Fi password

11.19 Self-Assessment Exercise

Tick each statement you can honestly say is true. Revisit the relevant section for any statement you cannot tick.

- ■ I can define intellectual property and copyright.
- ■ I can explain different software licences.
- ■ I can quote and paraphrase with citations.
- ■ I know the course academic honesty policy.
- ■ I can classify academic practices.

CHAPTER 12

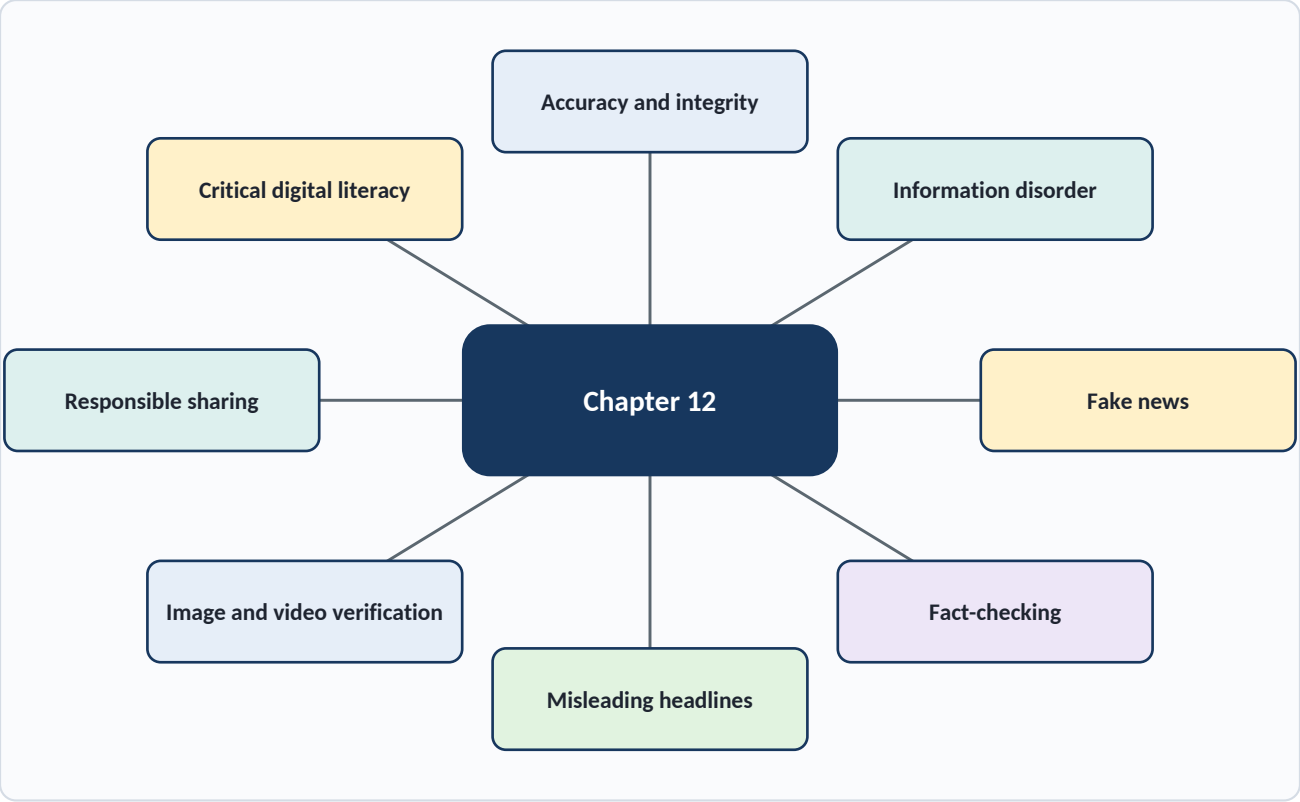
Information Accuracy, Integrity and Responsible Digital Information

A false message can travel across Pakistan in minutes. This chapter teaches you to question what you see online, verify it, and share only what is responsible.

Chapter Learning Objectives

After studying this chapter, you will be able to:

- Explain information accuracy and information integrity.
- Differentiate misinformation, disinformation and malinformation.
- Identify fake news, manipulated content and online rumours.
- Apply a fact-checking process step by step.
- Identify misleading headlines.
- Use basic image and video verification techniques.
- Share information responsibly and develop critical digital literacy.



Chapter map: the main topics of this chapter

12.1 Why This Chapter Matters

Rumours about health, exam results, prices or religion can cause panic, financial loss and even violence. Employers and universities value people who verify before they speak. Critical digital literacy is a skill that protects you and your community.

12.2 Information Accuracy and Integrity

Information accuracy means that information is correct, precise and free from errors. **Information integrity** means that information is complete, trustworthy and has not been altered improperly from its original form. Accurate, intact information helps good decisions; inaccurate or altered information leads to bad ones.

12.3 Misinformation, Disinformation and Malinformation

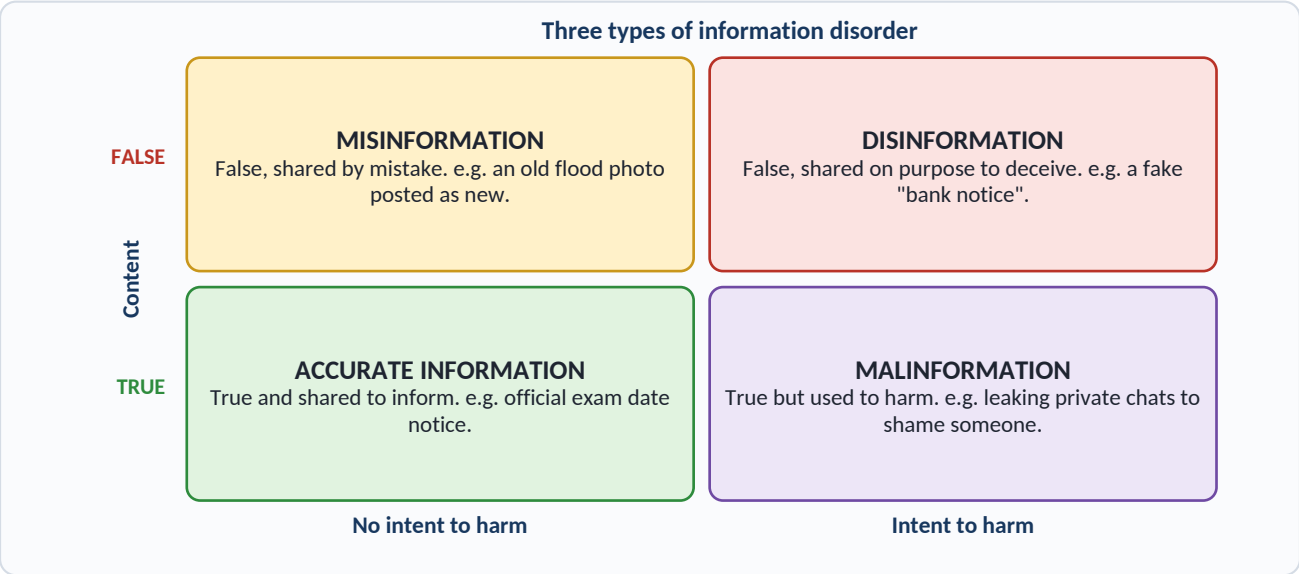


Figure 12.1: Three types of information disorder

Table 12.1: Types of problematic information

Type	Is it false?	Intent to harm?	Example
Misinformation	Yes	No (shared by mistake)	Forwarding an old flood photo believing it is current
Disinformation	Yes	Yes	A fake notice claiming a bank will close accounts, created to steal data
Malinformation	No (true)	Yes	Leaking someone's private chat to embarrass them

SIMPLE EXPLANATION

Ask two questions: **Is it true?** and **Why is it being shared?** False and harmless = misinformation. False and harmful on purpose = disinformation. True but used to harm = malinformation.

12.4 Fake News, Manipulated Content and Rumours

Fake news is false or misleading content presented as real news. **Manipulated content** is real material altered to mislead, for example a cropped photo, an edited video, a fake screenshot, or a voice or face created using AI (sometimes called a **deepfake**). An **online rumour** is an unverified story that spreads rapidly, especially through messaging groups.

Table 12.2: Common forms of manipulated content

Form	How it misleads
Old content, new claim	An old photo or video is presented as a current event
Cropped image	Removing parts changes the meaning
Fake screenshot	A message or news post that never existed
Edited video	Cutting words out of context
AI-generated image or voice	Looks and sounds real but was created artificially
Fake accounts and pages	Pretend to be an official organisation or a person

REAL-LIFE CONNECTION

During heavy rain, a video of a flood from another country circulated in family WhatsApp groups as though it were from a Pakistani city. Many forwarded it in good faith. A quick reverse image search would have revealed the real location.

12.5 Evaluating Sources

Review Chapter 2's five questions. Add these checks: Who benefits if I believe it? Is there evidence, such as documents or official statements? Do official sources (government departments, the organisation concerned) confirm it?

12.6 Identifying Misleading Headlines

Table 12.3: Signs of a misleading headline

Sign	Example
Extreme emotion	"SHOCKING!" "You won't believe…"
Not matching the article	Headline promises more than the text says
Missing source	"Experts say" without naming anyone
Urgency	"Share before it is deleted!"
All capitals and many exclamation marks	"BREAKING!!! BIG NEWS!!!"
Question as a hook	"Is this the end of…?" (the answer is usually no)

PROFESSOR'S TIP

Read beyond the headline. Many people share articles they have not opened. Read the full text and check who wrote it and when.

12.7 Fact-Checking: A Step-by-Step Process

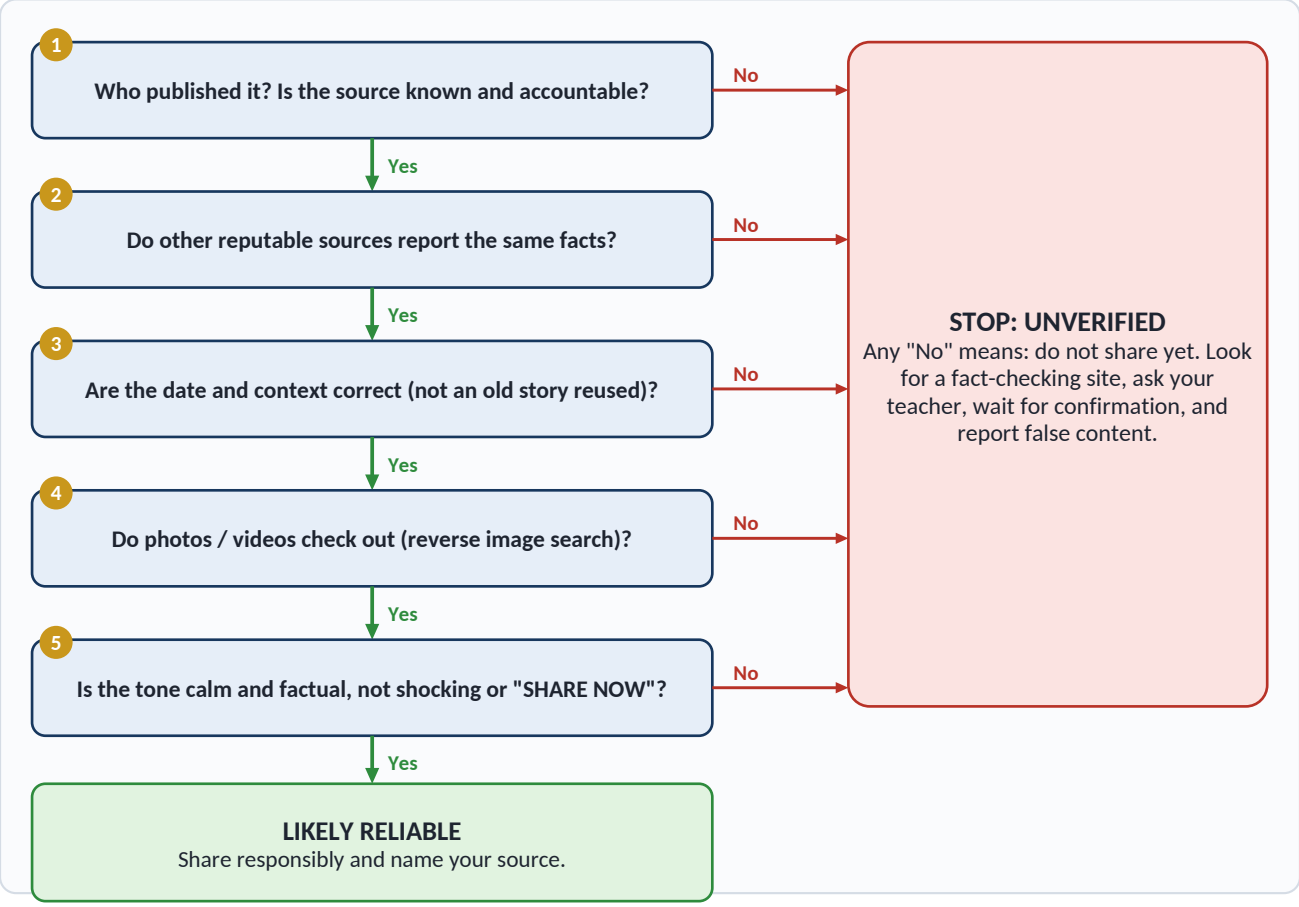


Figure 12.2: Fact-checking decision flow

Figure 12.2 shows five checks. If the source is unknown, other reputable sources do not report it, the date or context is wrong, the media does not check out, or the tone pushes you to share fast, stop and treat it as unverified. Only when all checks are passed is the information likely reliable.

1. **Pause.** Notice your emotional reaction; strong emotion is a warning.
2. **Identify the source** and check whether it is accountable.
3. **Search** for the claim using keywords; see what reputable outlets and official sources say.
4. **Check the date and context.**
5. **Verify media** (see below).
6. **Consult fact-checking organisations** or ask a teacher or expert if still in doubt.
7. **Decide:** share responsibly, wait, or report false content.

12.8 Image and Video Verification Fundamentals

- **Reverse image search:** use a tool such as Google Images or Google Lens to upload the image or paste its link and see where else it appeared and when.
- **Check details:** shop signs, language, clothing, weather, vehicle number plates, and shadows may reveal that the location or date does not match the claim.
- **Look for distortions** such as strange hands, text, edges or lighting in suspected AI images.
- **Find the original source:** check the account that first posted it.
- **Watch the whole video** instead of a short clip, to see the context.

- **Remember:** verification tools help but are not perfect; combine several checks.

12.9 Responsible Information Sharing

- Verify before you forward, especially health, religion, politics, safety and money messages.
- If you shared something false, correct it publicly or tell the group.
- Cite your sources when you share facts.
- Do not share private information or images of people without permission.
- Do not amplify hate or rumours, even to criticise them.
- Report false content and scams using platform tools.

12.10 Developing Critical Digital Literacy

Critical digital literacy is the ability to find, evaluate, create and share information online with understanding and responsibility. It includes technical skills (using tools) and thinking skills (asking questions and weighing evidence).

Table 12.4: The SIFT habit

Step	Meaning
Stop	Pause before reacting or sharing
Investigate the source	Who is behind it?
Find better coverage	What do other reliable sources say?
Trace claims to the original	Find the original context of quotes, images and data

EXAM FOCUS
Examiners like: "Differentiate misinformation, disinformation and malinformation" and "Explain how to verify an online news item". Prepare one definition and one example for each, plus the five checks of the fact-checking flow.

12.11 Important Terminology

Table 12.5: Key terms of Chapter 12

Term	Meaning
Accuracy	Correctness of information.
Integrity	Information remains complete and unaltered.
Misinformation	False information shared without intent to harm.
Disinformation	False information shared deliberately to deceive.
Malinformation	True information used to cause harm.
Fake news	False content presented as news.
Deepfake	Synthetic media created with AI to imitate real people.
Fact-checking	Verifying claims against reliable evidence.
Reverse image search	Searching the Web using an image.

12.12 Common Mistakes

COMMON MISTAKE

- Sharing messages because they came from someone you trust.
- Believing that a large number of shares means truth.
- Reading only the headline.
- Assuming that photos and videos cannot be altered.
- Forwarding “urgent warnings” without checking.

12.13 Practical Activities

Complete these hands-on activities on your own device or in the computer lab. Interfaces change with updates, so if a button has moved, look for the same command by its name.

Activity 25: Evaluate the credibility of an online news article	
Learning objective	Apply fact-checking steps to a real article.
Required tools	Browser, an online news article on a current topic (selected by you or your teacher).
Step-by-step instructions	**1.** Read the full article. Note the headline, author, date and source. **2.** Check the “About” page of the website. **3.** Search for the same story on at least two other reputable sources. **4.** If there is an image, run a reverse image search. **5.** List any emotional or exaggerated language. **6.** Use the five checks from the flow diagram and write a decision: Likely reliable, Unverified or Likely false. **7.** Write three lines explaining your decision.
Expected outcome	A one-page credibility report with evidence and a decision.
Self-check questions	a Who wrote the article, and what do you know about them? b Did other sources confirm the main claim? c Would you share it? Why or why not?

12.14 Classroom Discussion Questions

1. Why do false messages spread faster than corrections?
2. Is it the platform’s or the user’s responsibility to stop fake news? Discuss both.
3. Have you ever shared something that turned out false? What did you learn?

12.15 Chapter Summary

- Accuracy is correctness; integrity is completeness and trustworthiness.
- Misinformation is false without intent; disinformation is false with intent; malinformation is true but harmful.
- Manipulated content includes old media, edits, fake screenshots and AI-generated media.
- Fact-check by pausing, checking source, other reports, date and context, media and tone.
- Use reverse image search and details to verify pictures and videos.
- Share responsibly and correct mistakes.

12.16 Quick Revision Notes

QUICK REVISION

- Mis = mistake; Dis = deliberate; Mal = malicious use of truth
- SIFT: Stop, Investigate, Find, Trace
- Reverse image search
- Strong emotion = pause
- Verify before you share

12.17 Key Points to Remember

REMEMBER THIS

- Define the three types of information disorder with examples.
- List five checks to verify a news item.
- List three signs of a misleading headline.
- Explain reverse image search.

12.18 Short Questions

1. Define information accuracy.
2. Differentiate misinformation and disinformation.
3. What is malinformation?
4. What is a deepfake?
5. List two signs of fake news.
6. What is reverse image search?
7. What is critical digital literacy?

12.19 Long Questions

1. Explain misinformation, disinformation and malinformation with examples.
2. Describe the process of fact-checking an online news story using a flowchart.
3. Explain how images and videos can be manipulated and how to verify them.
4. Discuss why responsible information sharing matters in society.

12.20 Multiple-Choice Questions

Choose the best answer. Attempt all questions first; then check your answers and explanations in the Instructor/Revision Support section at the end of this book.

1. False information shared by mistake is:

   (A) Disinformation
   (B) Misinformation
   (C) Malinformation
   (D) Netiquette

2. True information used to harm someone is:

   (A) Malinformation
   (B) Misinformation
   (C) A fact-check
   (D) A citation

3. Which tool helps find the origin of an image?

   (A) Spell checker
   (B) Reverse image search
   (C) Slide show
   (D) Sort filter

4. A message says “Share now before it is deleted!” You should:

   (A) Share immediately
   (B) Pause and verify
   (C) Believe it
   (D) Forward to everyone

5. SIFT begins with:

   (A) Share
   (B) Stop
   (C) Search
   (D) Save

12.21 Self-Assessment Exercise

Tick each statement you can honestly say is true. Revisit the relevant section for any statement you cannot tick.

- ■ I can differentiate the three information disorders.
- ■ I can apply the fact-checking steps.
- ■ I can spot misleading headlines.
- ■ I can use reverse image search.
- ■ I verify before I share.

CHAPTER 13

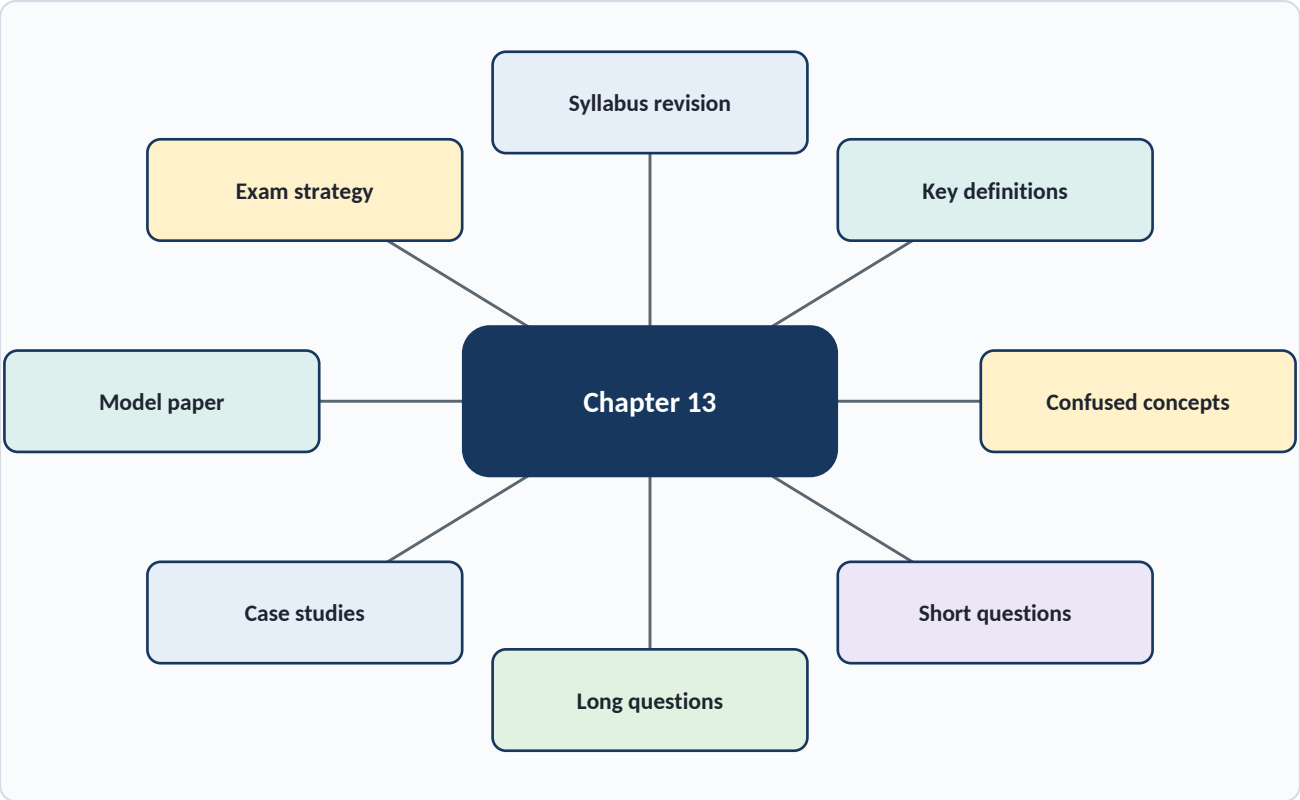
Complete Course Revision and Examination Preparation

The final chapter brings the whole course together: definitions, differences, questions, case studies and a model examination paper, with a clear strategy for the final exam.

Chapter Learning Objectives

After studying this chapter, you will be able to:

- Revise the complete syllabus chapter by chapter.
- Distinguish frequently confused concepts.
- Practise short, long, multiple-choice, practical and case-study questions.
- Attempt a model examination paper.
- Apply an effective final examination strategy.



Chapter map: the main topics of this chapter

13.1 Why This Chapter Matters

The final examination covers the whole course, and many students lose marks by confusing similar concepts. This chapter helps you to see the course as one connected whole and to practise answering in the way examiners expect.

13.2 Complete Syllabus Revision

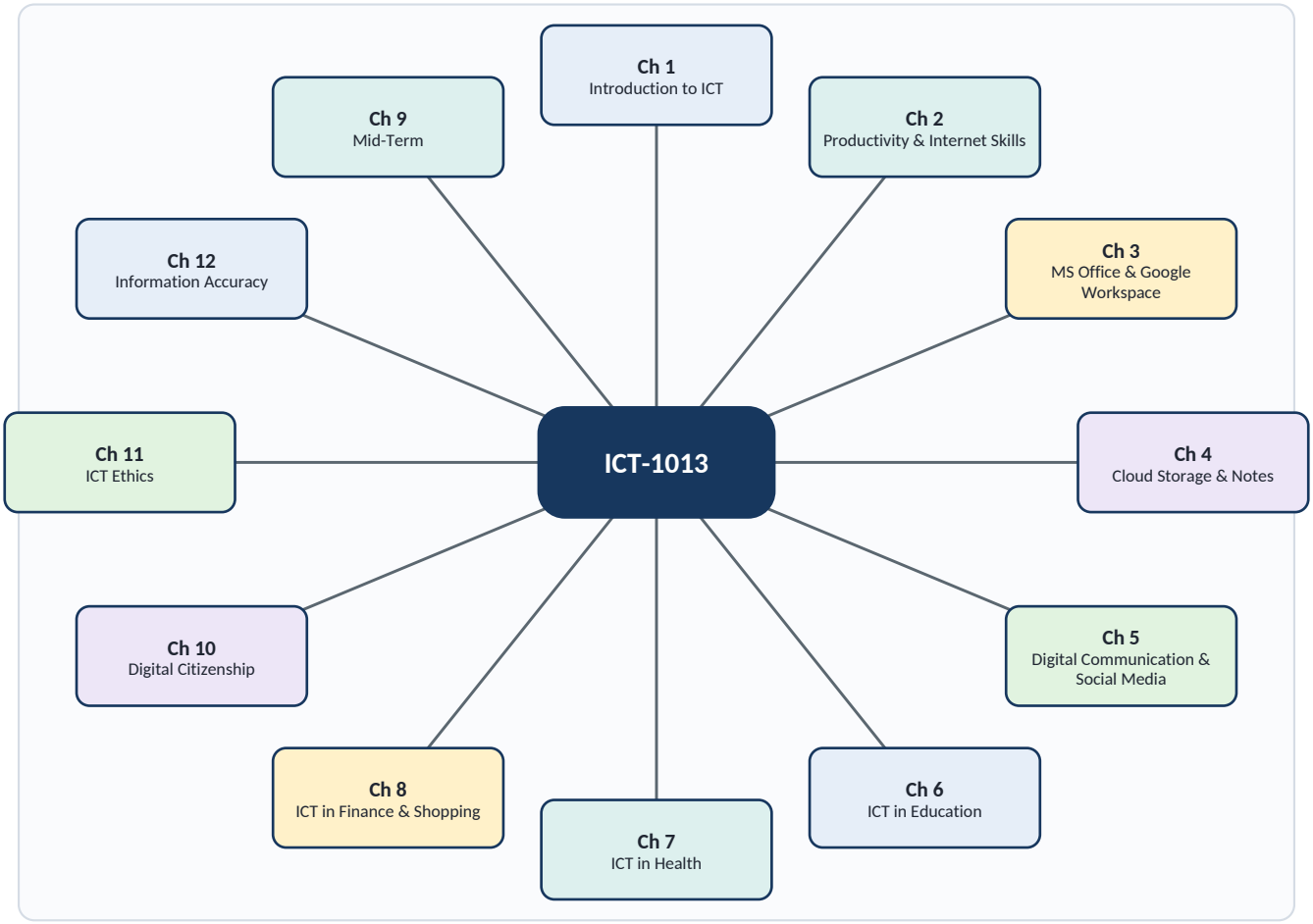


Figure 13.1: Concept map of the complete course

Table 13.1: Chapter-wise syllabus overview

Chapter	Core ideas to revise
1 Introduction to ICT	IT, ICT, components, data to information, networks, Internet, cloud, emerging technologies
2 Productivity and Internet skills	Internet vs WWW, browsers, search techniques, source evaluation, email, phishing
3 Office and Workspace	Word formatting, Excel formulas and charts, PowerPoint design, Google Workspace
4 Cloud and notes	Cloud storage, sharing permissions, backup vs sync, OneNote and Evernote
5 Digital communication	Video meetings, etiquette, social media, LinkedIn, privacy
6 ICT in Education	LMS, online platforms, workflow, benefits and limitations
7 ICT in Health	Wearables, fitness apps, telemedicine, privacy, limits
8 Finance and shopping	Wallets, payment workflow, e-commerce, scams, consumer protection
10 Digital citizenship	Identity, footprint, netiquette, cyberbullying, well-being
11 Ethics	Copyright, licences, plagiarism, citation, academic honesty policy
12 Information accuracy	Mis/dis/malinformation, fake news, fact-checking, verification

13.3 Chapter-Wise Key Definitions

Table 13.2: Chapter 10: key definitions

Term	Meaning
Digital citizenship	Responsible and respectful use of technology.
Digital identity	How you are represented online.
Online reputation	Public opinion about you formed online.
Digital footprint	The trail of data you leave online.
Netiquette	Rules of polite online behaviour.
Cyberbullying	Repeated digital harm to a person.
Online harassment	Unwanted, offensive or threatening online behaviour.
Digital well-being	Healthy use of technology.

Table 13.3: Chapter 11: key definitions

Term	Meaning
Ethics	Principles of right and wrong.
Intellectual property	Creations of the mind protected by law.
Copyright	Legal right of a creator over an original work.
Infringement	Use of protected work without permission.
Licence	Permission to use software or content under conditions.
Open-source	Software whose source code is available under a licence.
Plagiarism	Presenting others' work as your own.
Paraphrase	Rewriting ideas in your own words and structure.

Table 13.4: Chapter 12: key definitions

Term	Meaning
Accuracy	Correctness of information.
Integrity	Information remains complete and unaltered.
Misinformation	False information shared without intent to harm.
Disinformation	False information shared deliberately to deceive.
Malinformation	True information used to cause harm.
Fake news	False content presented as news.
Deepfake	Synthetic media created with AI to imitate real people.
Fact-checking	Verifying claims against reliable evidence.

Definitions for Chapters 1 to 8 are collected in Chapter 9 and in Appendix A (Glossary).

13.4 Frequently Confused Concepts

Table 13.5: Frequently confused pairs (whole course)

Concept A	Concept B	Remember
Data	Information	Raw vs processed
IT	ICT	ICT adds communication
Internet	WWW	Network vs pages
Browser	Search engine	Program vs website
CC	BCC	Visible vs hidden
Sync	Backup	Mirror vs recoverable copy
Relative reference	Absolute reference	Moves vs locked ($)
Misinformation	Disinformation	Mistake vs deliberate
Disinformation	Malinformation	False vs true-but-harmful
Copyright	Licence	Right of creator vs permission to use
Quote	Paraphrase	Exact words vs own words (both need citation)
Active footprint	Passive footprint	You share vs collected about you
Cyberbullying	Harassment	Peer harm vs wider unwanted or threatening behaviour
Telemedicine	Medical diagnosis by app	Doctor via ICT vs automated estimate
Marketplace	Online store	Many sellers vs one seller

13.5 Important Short Questions

1. Define ICT.
2. Differentiate between hardware and software.
3. Differentiate between a browser and a search engine.
4. What is a URL?
5. What is a ribbon?
6. Differentiate between a workbook and a worksheet.
7. What is cloud computing?
8. Define cloud storage.
9. Define digital communication.
10. What is video conferencing?
11. What is educational technology?
12. Define LMS.
13. What is digital health?
14. Define wearable technology.
15. What is digital finance?
16. Define mobile wallet and give two examples.
17. What is digital citizenship?
18. What is a digital footprint?
19. What is ICT ethics?
20. Define copyright.
21. Define information accuracy.
22. Differentiate misinformation and disinformation.

13.6 Long Questions

1. Explain ICT and describe its main components with a labelled diagram.
2. Explain how a search engine works, with a diagram.
3. Explain the steps to prepare a professional university assignment in Word.
4. Explain how cloud storage works with a diagram and compare it with local storage.
5. Explain the workflow of an online meeting and the controls a participant should know.
6. Explain the digital learning ecosystem with a diagram.
7. Explain wearable technology with a diagram and discuss its limitations.
8. Explain the digital payment process with a diagram.
9. Explain digital identity, reputation and footprint with a diagram.
10. Explain intellectual property, copyright and infringement with examples.
11. Explain misinformation, disinformation and malinformation with examples.

13.7 Multiple-Choice Questions

1. Which pair correctly matches component and example?

   (A) Hardware – Windows
   (B) Software – Keyboard
   (C) Network – Wi-Fi
   (D) Data – Router

2. Cloud storage mainly requires:

   (A) Internet access and an account
   (B) A USB drive
   (C) A printer
   (D) A projector

3. A student shares an assignment file with a friend who changes the name and submits it. Under the course policy:

   (A) Only the friend is punished
   (B) Both submissions may receive a zero
   (C) Nothing happens
   (D) Marks are doubled

4. Which is the best defence against phishing?

   (A) Click the link quickly
   (B) Verify through official channels and never share PIN/OTP
   (C) Reply with your details
   (D) Forward the message

5. Which action is a good response to cyberbullying?

   (A) Retaliate
   (B) Save evidence, block, report and tell someone
   (C) Delete everything and say nothing
   (D) Post the abuser's address

6. Which source is generally most reliable for a university assignment?

   (A) An unsigned blog
   (B) A peer-reviewed article or official organisation page
   (C) A forwarded message
   (D) An advertisement

7. A video shared widely shows a flood in your city but is actually from another country and year. This is:

   (A) Misinformation or disinformation depending on intent
   (B) Malinformation
   (C) Copyright
   (D) A licence

8. In Excel, which formula uses an absolute reference?

   (A) `=B2*C2`
   (B) `=B2*$H$1`
   (C) `=SUM(B2:B5)`
   (D) `=AVERAGE(B2:B5)`

9. Which statement about health apps is correct?
   (A) They replace doctors
   (B) They can support healthy habits but do not replace professionals
   (C) They diagnose all diseases
   (D) They never need privacy care
10. Which is an acceptable academic practice?
   (A) Copying a paragraph without citation
   (B) Paraphrasing in your own words with citation
   (C) Buying an assignment
   (D) Using a friend's file

13.8 Practical-Based Questions

1. Describe how to make a professional assignment in Word and export it as PDF.
2. Write formulas for total, average, maximum and minimum for marks in B2:D11, and explain how to create a chart.
3. Explain how to create a folder structure in Drive for four courses and share one folder with a group.
4. Explain how to join a Meet class, mute yourself and share your screen safely.
5. Describe a step-by-step method to check whether a viral picture is genuine.
6. Prepare a checklist for safe online shopping.

13.9 Case Studies

Case 1: The urgent SMS

Hina receives an SMS: "Dear customer, your bank account will be closed today. Verify at the link below." The link opens a page that looks like her bank's site and asks for her card number and PIN. **Questions:** (a) Identify the type of attack. (b) List three warning signs. (c) What should she do? (d) Which chapters help you answer?

Case 2: The group assignment

Four students prepare a presentation. Ali shares the Google Slides file with "Anyone with the link can edit". Later, parts of another group's presentation appear identical to theirs. **Questions:** (a) What mistake did Ali make? (b) What permission should be used? (c) What may happen under the academic honesty policy? (d) How can students avoid the problem?

Case 3: The viral health message

A WhatsApp message claims that a common drink cures a serious disease and urges everyone to share it before it is deleted. **Questions:** (a) Which signs show that the message is suspicious? (b) Apply the fact-checking steps. (c) Why is it dangerous to share? (d) Where should health advice come from?

Case 4: The online order

Usman orders headphones at an unusually low price from an unknown page. The seller asks him to send money to a personal wallet number. After payment the seller blocks him. **Questions:** (a) Identify the scam signs. (b) What safer payment option exists? (c) What should he do now? (d) What checks should he do next time?

13.10 Model Examination Paper

Instructions: This is a model paper for practice. The official final examination is set by the university; formats, marks and time may differ. Suggested time: 2 hours.

Section A: Multiple-Choice Questions (1 mark each)

1. ICT stands for:

   (A) Information and Communication Technologies
   (B) Internet and Computer Technology
   (C) Input and Control Technology
   (D) Information and Cable Technology

2. The CPU is part of:

   (A) Software
   (B) Hardware
   (C) Cloud
   (D) Network protocol

3. A secure website address begins with:

   (A) http
   (B) https
   (C) ftp
   (D) www only

4. Which Word shortcut saves a document?

   (A) Ctrl+P
   (B) Ctrl+S
   (C) Ctrl+H
   (D) Ctrl+Z

5. =AVERAGE(B2:D2) returns:

   (A) Sum
   (B) Mean of the values
   (C) Largest value
   (D) Count

6. A person with Commenter access can:

   (A) Only read
   (B) Read and comment
   (C) Delete the file
   (D) Change ownership

7. Zoom, Meet and Teams are examples of:

   (A) Video conferencing tools
   (B) Spreadsheets
   (C) Search engines
   (D) Operating systems

8. Which is an LMS?

   (A) Canvas
   (B) Dropbox
   (C) Instagram
   (D) Easypaisa

9. Which wallet is a Pakistani mobile wallet example?

   (A) JazzCash
   (B) Moodle
   (C) LinkedIn
   (D) Evernote

10. Your digital footprint includes:

    (A) Only posts
    (B) Active and passive data trails
    (C) Only passwords
    (D) Only photos

11. Quotation marks around copied text show:

    (A) A direct quote that still needs a citation
    (B) That no citation is needed
    (C) That the text is yours
    (D) A spelling error

12. True information used to harm is called:

    (A) Misinformation
    (B) Disinformation
    (C) Malinformation
    (D) Fact-checking

Section B: Short Questions (answer any six)

1. Define ICT and give two examples.
2. Differentiate between data and information.
3. List three emerging technologies and their uses.
4. Differentiate local and cloud storage.
5. Write two rules of email etiquette.
6. Write the formula to calculate the total of cells B2 to B10.
7. What is a virtual classroom?

8. State two limits of fitness trackers.
9. What is a Transaction ID?
10. Define netiquette.
11. What is plagiarism?
12. Differentiate misinformation and disinformation.

Section C: Long Questions (answer any three)

1. Explain the components of an ICT system and the data processing cycle with diagrams.
2. Explain how to prepare a student marksheet in Excel and create a chart, including relative and absolute references.
3. Discuss cloud storage: how it works, permissions, backup and security.
4. Explain telemedicine and digital payments, giving benefits, limitations and safety practices.
5. Explain plagiarism, copyright and academic integrity, and describe how to avoid academic dishonesty.
6. Discuss misinformation and describe a step-by-step method to verify online information.

Section D: Case Study (answer one)

1. Use Case 1 (urgent SMS) from this chapter and answer all its questions.
2. Use Case 2 (group assignment) from this chapter and answer all its questions.

13.11 Final Examination Preparation Strategy

Table 13.6: A four-week plan before the final examination

Period	Focus
Week 1	Read all chapter summaries; prepare your own one-page notes per chapter
Week 2	Practise Excel formulas, Word formatting and presentation skills again on a device
Week 3	Solve short questions and MCQs; review Chapter 9 and this chapter
Final week	Attempt the model paper under time limits; revise definitions and comparison tables; sleep well

- Read the whole paper first and plan your time by marks.
- Answer easy questions first to build confidence.
- For definitions, give a clear sentence, then an example.
- For long questions, use headings, a diagram where useful, and a short conclusion.
- For practical questions, write steps in order and name the commands correctly.
- Keep writing neat; label diagrams clearly.
- Check your paper for unanswered questions before finishing.

> **PROFESSOR'S TIP**
> On the last day, do not learn new material. Revise your own one-page notes, the comparison tables and the definitions, then rest. A calm mind remembers more.

13.12 Chapter Summary

- Use concept maps and tables to connect the chapters.
- Learn the frequently confused pairs.
- Practise all question types, especially short questions and practical steps.
- Follow a calm, structured revision plan.

13.13 Quick Revision Notes

QUICK REVISION
- Definition + example
- Steps in order for practical questions
- Diagram + headings for long answers
- Time by marks

13.14 Key Points to Remember

REMEMBER THIS
- Revise the 15 confused pairs.
- Practise the model paper.
- Plan your exam time.

13.15 Self-Assessment Exercise

Tick each statement you can honestly say is true. Revisit the relevant section for any statement you cannot tick.

- ■ I have revised all chapters.
- ■ I can explain the confused pairs.
- ■ I have solved the model paper.
- ■ I have a revision plan.

Assessment Resources

This part contains supplementary assessment resources: four assignment briefs, four chapter-aligned quizzes, a final project guide and a self-assessment checklist. The mid-term practice paper is in Chapter 9, the final examination practice paper (model paper) is in Chapter 13, and the practical skills checklist is in Appendix H. Answer keys are in the Instructor/Revision Support section.

> NOTE
> **Course requirements and supplementary material.** The assessments, deadlines and marks of the course are decided by the university and the instructor. The briefs, quizzes and rubrics below are **practice and support material** aligned to the course outcomes. If your instructor gives a different brief, follow the instructor's version.

Table R.1: Assessment resources and the official calendar

Resource	Official week	Main chapters	Course learning outcomes
Assignment brief 1	Week 3	Chapters 1–3	CLO 1, 2, 3
Quiz 1 (practice)	Week 4	Chapters 1–4	CLO 1, 2
Assignment brief 2	Week 6	Chapters 4–6	CLO 2, 3
Quiz 2 (practice)	Week 7	Chapters 5–7	CLO 1, 2, 3
Mid-term practice paper	Week 9	Chapters 1–8	CLO 1, 2, 3
Assignment brief 3	Week 11	Chapter 10	CLO 3, 4
Quiz 3 (practice)	Week 12	Chapters 10–11	CLO 3, 4
Assignment brief 4	Week 14	Chapters 11–12	CLO 3, 4
Quiz 4 (practice)	Week 15	Chapters 1–12	CLO 1–4
Final project guide	Week 16	All chapters	CLO 1–4
Final examination practice paper	Week 17	All chapters	CLO 1–4

Table R.2: Course learning outcomes (for reference)

CLO	Outcome
CLO 1	Explain the fundamental concepts, components, and scope of ICT.
CLO 2	Identify uses of various ICT platforms and tools for different purposes.
CLO 3	Apply ICT platforms and tools to address basic needs in daily, academic and professional life.
CLO 4	Understand the ethical and legal considerations in the use of ICT platforms and tools.

Assignment Brief 1: ICT in My Daily Life (Word and Excel)

Suggested week: Week 3 | **Outcomes:** CLO 1, 2, 3

Task. Prepare a two-to-three page Word document that explains how you use ICT in one ordinary day, from morning to night, and add an Excel table recording the time you spend on five digital activities for three days.

Requirements

- A cover page with title, name, roll number, section, course code and date.

- Headings and subheadings formatted using Styles; body in a clear font, size 11–12, justified or left-aligned.
- At least one table in Word and one bulleted list.
- The Excel sheet must use SUM and AVERAGE formulas and a column chart; paste the chart into the document.
- Header with the course code and page numbers in the footer.
- A short list of sources, if any were used.

Deliverable. One PDF of the Word document (with the chart) and the Excel file, named Assignment1_RollNo_Name.

Table R.3: Suggested marking guide: Assignment 1

Criterion	Weight	What is expected
Content and explanation of ICT use	30%	Correct use of ICT terms; relevant examples
Word formatting	25%	Consistent headings, tables, page numbers
Excel work	25%	Correct formulas and a clear chart
Presentation and neatness	10%	Spelling, layout, file naming
Originality	10%	Own work and own examples

EXAM FOCUS

Academic honesty: your work must be your own. Identical or partially identical assignments receive a zero under the course policy.

Assignment Brief 2: Organise, Share and Study Online (Cloud, Meeting, LMS)

Suggested week: Week 6 | **Outcomes:** CLO 2, 3

Task. Create a cloud folder structure for your semester, share one folder with your instructor or a classmate with the correct permission, join an online meeting or class session, and write a two-page reflection with evidence.

Requirements

- A screenshot of your folder structure showing at least four course folders and three sub-folders in one of them.
- A screenshot of the sharing settings showing a person with Viewer or Commenter access (hide private email addresses if instructed).
- A short account (5–6 lines) of how you joined an online session and used mute, chat or screen sharing.
- A comparison table of two cloud services or two LMS platforms (use the chapters and official pages).
- A paragraph on two advantages and two limitations of e-learning from your own experience.

Deliverable. A single Word or PDF file with screenshots and text, named Assignment2_RollNo_Name.

Table R.4: Suggested marking guide: Assignment 2

Criterion	Weight	What is expected
Folder structure and naming	25%	Logical, consistent, clear names
Sharing and permissions	25%	Correct role; explanation of why
Online session account	15%	Accurate steps and controls
Comparison table and reflection	25%	Accuracy and clear thinking
Presentation and originality	10%	Neatness, own work

EXAM FOCUS

Academic honesty: your work must be your own. Identical or partially identical assignments receive a zero under the course policy.

Assignment Brief 3: My Digital Footprint and Safe Online Behaviour

Suggested week: Week 11 | **Outcomes:** CLO 3, 4

Task. Audit your own digital footprint and write a responsible-use plan. Then design a one-page awareness poster or infographic about cyberbullying and how to respond to it.

Requirements

- A footprint audit table listing at least five sources of information about you (without writing private data such as passwords or ID numbers).
- A privacy settings review of one social media account, written in your own words.
- A personal plan with five rules for netiquette and privacy.
- A poster or infographic (Word, PowerPoint or Canva-style tool) with a clear message, four response steps and the reporting channels you learned.
- Do not include real names or photos of other people without permission.

Deliverable. A PDF with the audit, plan and poster, named Assignment3_RollNo_Name.

Table R.5: Suggested marking guide: Assignment 3

Criterion	Weight	What is expected
Audit quality and honesty	25%	Realistic and thoughtful
Plan quality	25%	Specific, practical rules
Poster message and design	30%	Accurate, readable, respectful
Referencing and originality	10%	Sources named; own work
Presentation	10%	Neatness and file naming

EXAM FOCUS

Academic honesty: your work must be your own. Identical or partially identical assignments receive a zero under the course policy.

Assignment Brief 4: Original Work and Reliable Information

Suggested week: Week 14 | **Outcomes:** CLO 3, 4

Task. Choose a viral claim or news article (agreed with your instructor), verify it using the fact-checking process, and write a short report that demonstrates correct quoting, paraphrasing and referencing.

Requirements

- State the claim and where you found it (with date).
- Apply the five checks of the fact-checking flow and record evidence for each.
- Use at least three reliable sources. Quote once with quotation marks and paraphrase once, citing both.
- Include a reference list in the style your instructor prefers, using the real details of your sources.
- End with a decision: likely reliable, unverified or likely false, with reasons.
- Do not invent any source or detail.

Deliverable. A Word document of 2–3 pages exported to PDF, named Assignment4_RollNo_Name.

Table R.6: Suggested marking guide: Assignment 4

Criterion	Weight	What is expected
Fact-checking process	30%	All checks applied with evidence
Quality of sources	20%	Reliable, relevant and real
Quoting, paraphrasing and referencing	30%	Correct and consistent
Clarity and conclusion	10%	Reasoned decision
Originality	10%	Own work

EXAM FOCUS
Academic honesty: your work must be your own. Identical or partially identical assignments receive a zero under the course policy.

Quiz 1 (Practice): Chapters 1 to 4

Official week: Week 4. Time: about 15 minutes. Answer all questions; then check the key in the Instructor/Revision Support section.

1. Which is system software?
   - **(A)** Microsoft Excel
   - **(B)** Windows
   - **(C)** Chrome
   - **(D)** WhatsApp
2. Processed data that has meaning is:
   - **(A)** Information
   - **(B)** Hardware
   - **(C)** A network
   - **(D)** A browser

3. A network inside a university campus is usually a:

   (A) PAN
   (B) LAN
   (C) WAN
   (D) MAN

4. Which search puts words together as an exact phrase?

   (A) cloud storage
   (B) “cloud storage”
   (C) cloud-storage-
   (D) cloud OR storage

5. Which email field hides recipients from others?

   (A) To
   (B) CC
   (C) BCC
   (D) Subject

6. Which function adds numbers in Excel?

   (A) SUM
   (B) MAX
   (C) MIN
   (D) COUNT

7. A fixed cell reference is written:

   (A) B2
   (B) B2
   (C) B:2
   (D) [B2]

8. Which sharing role is safest for read-only access?

   (A) Editor
   (B) Commenter
   (C) Viewer
   (D) Owner

Short questions:

1. Differentiate the Internet and the WWW.
2. Why is sync not the same as backup?

Quiz 2 (Practice): Chapters 5 to 7

Official week: Week 7. Time: about 15 minutes. Answer all questions; then check the key in the Instructor/Revision Support section.

1. Which communication is synchronous?

   (A) Email
   (B) Live video class
   (C) Forum post
   (D) Voice memo

2. Before screen sharing you should:

   (A) Close private tabs and notifications
   (B) Open private messages
   (C) Turn off camera only
   (D) Do nothing

3. LinkedIn is mainly used for:

   (A) Professional networking
   (B) Photo filters only
   (C) Online games
   (D) Video editing

4. Which is an LMS?

   (A) Moodle
   (B) Instagram
   (C) PowerPoint
   (D) Gmail

5. A key limitation of e-learning is:

   (A) Flexible time
   (B) Reliance on Internet and self-discipline
   (C) Recorded lectures
   (D) Wide choice

6. A fitness tracker gives:

   (A) Diagnoses
   (B) Estimates and trends
   (C) Prescriptions
   (D) Surgery

7. Telemedicine is unsuitable for:

   (A) Follow-up of a minor issue
   (B) Emergency conditions
   (C) Booking an appointment
   (D) Asking basic advice

8. Health data should be:

   (A) Posted on social media
   (B) Protected and shared carefully
   (C) Shared with strangers
   (D) Printed and displayed

Short questions:

1. List four meeting etiquette rules.
2. State two benefits and two limits of telemedicine.

Quiz 3 (Practice): Chapters 10 and 11

Official week: Week 12. Time: about 15 minutes. Answer all questions; then check the key in the Instructor/Revision Support section.

1. Your digital footprint is:

   (A) The trail of data you leave online
   (B) A type of virus
   (C) A shoe size
   (D) A website

2. Cookies and IP addresses form the:

   (A) Active footprint
   (B) Passive footprint
   (C) Netiquette
   (D) Citation

3. First step after receiving abusive messages:

   (A) Retaliate
   (B) Save evidence
   (C) Share widely
   (D) Delete account at once

4. Netiquette means:

   (A) Rules of polite online behaviour
   (B) A network cable
   (C) A password
   (D) A file type

5. Copyright protects:

   (A) Original works of creators
   (B) Passwords
   (C) Internet speed
   (D) Hardware only

6. Open-source software:

   (A) Has no rules
   (B) Has available source code under a licence
   (C) Is always illegal
   (D) Cannot be used by students

7. Copying exact words requires:

   (A) Quotation marks and a citation
   (B) Nothing
   (C) Only a friend’s permission
   (D) Changing the font

8. Identical assignments under the course policy receive:

   (A) Extra marks
   (B) A zero
   (C) A warning only
   (D) Full marks

Short questions:

1. Define cyberbullying and give two examples.
2. Differentiate quoting and paraphrasing.

Quiz 4 (Practice): Chapter 12 and complete course review

Official week: Week 15. Time: about 15 minutes. Answer all questions; then check the key in the Instructor/Revision Support section.

1. False information shared without intent to harm is:

   (A) Misinformation
   (B) Disinformation
   (C) Malinformation
   (D) Copyright

2. A message says “share before it is deleted!” This is a sign of:

   (A) Reliability
   (B) Manipulation through urgency
   (C) Official notice
   (D) A licence

3. Which tool helps trace an image’s origin?

   (A) Reverse image search
   (B) Spell check
   (C) Sort and filter
   (D) Slide show

4. Which of these should never be shared?

   (A) OTP
   (B) Product name
   (C) Shop name
   (D) Public price

5. A marketplace is a platform with:

   (A) Many sellers
   (B) One seller only
   (C) No sellers
   (D) No products

6. Which is a good backup practice?

   (A) One copy on one device
   (B) Copies in different places including the cloud
   (C) Deleting old copies
   (D) Sharing files publicly

7. The Web is:

   (A) The same as the Internet
   (B) One service running on the Internet
   (C) A browser
   (D) A search engine

8. What does a padlock in the browser indicate?
   (A) The site is safe
   (B) The connection is encrypted
   (C) The site is free
   (D) The site is fast

Short questions:

1. List three steps of fact-checking.
2. State the academic honesty policy of the course.

Final Project Guide (Week 16: Project Presentations)

The final project brings your skills together. Your instructor will tell you whether it is individual or in small groups, the exact deadline and the marks. The guide below is a practical suggestion.

Project theme: "Going Digital: A Small Business or Student Initiative." Imagine a small business, society or student project in Pakistan (for example, a home bakery, a tutoring group, a clothing shop or a campus society) and show how ICT can improve it.

Table R.7: Project components

Component	Tool	Description
Presentation	PowerPoint or Google Slides	6–8 slides, 5–7 minutes: problem, ICT solution, tools, benefits, risks, conclusion
Short report	Word or Google Docs	2 pages: description, tools used, safety and ethics, references
Budget or data sheet	Excel or Google Sheets	Simple costs or sales with SUM and AVERAGE and one chart
Digital organisation	Drive or OneDrive	Organised project folder shared with the instructor (Viewer)
Ethics statement	Within the report	Sources, licences of images, privacy and honesty

Suggested steps

1. Choose the idea and write one sentence about the problem.
2. Select at least five ICT tools from the course and explain what each does for the project.
3. Build the Excel sheet and chart.
4. Write the report in your own words and list sources honestly.
5. Create slides with short points and one visual per slide.
6. Rehearse and time yourself; prepare answers to likely questions.
7. Submit the folder link and files on time.

Table R.8: Suggested rubric for the final project

Criterion	Weight	Expected
Understanding of ICT concepts and tools	25%	Accurate use of terms from the course
Practical work (Word, Excel, slides, folder)	25%	Correct, tidy and complete
Presentation delivery	20%	Clear, confident, on time
Digital citizenship and ethics	15%	Safety, privacy, referencing
Originality and teamwork	15%	Own work; fair contribution

Student Self-Assessment Checklist

Tick each statement that is true for you at the end of the course.

- ■ I can explain ICT, its components and its scope (CLO 1).
- ■ I can use search engines and evaluate online sources (CLO 2).
- ■ I can write professional emails (CLO 2, 3).
- ■ I can create professional documents, spreadsheets and presentations (CLO 3).
- ■ I can organise and share files in the cloud safely (CLO 3).
- ■ I can take part in online meetings and use social media professionally (CLO 2, 3).
- ■ I can use an LMS and online learning platforms (CLO 2, 3).
- ■ I can use health and finance apps safely and know their limits (CLO 2, 3, 4).
- ■ I can behave responsibly online and respond to cyberbullying (CLO 3, 4).
- ■ I understand copyright, plagiarism and academic honesty (CLO 4).
- ■ I can verify information and avoid sharing false content (CLO 3, 4).
- ■ I can prepare and deliver a short presentation (CLO 3).

Instructor/Revision Support

For students: please attempt every question yourself first. Use this section to check your answers, understand mistakes and revise. **For the instructor:** the keys and model-answer outlines below can be adapted for marking and feedback.

> NOTE
> Short and long answers are given as **key points**, not as the only acceptable wording. Award or earn marks for correct ideas expressed clearly in your own words with relevant examples.

Answer Keys: Chapter MCQs

Table S.1: Chapter 1: Introduction to Information and Communication Technologies

Q	Answer	Explanation
1	C	Word helps you perform a task (writing documents). The others are system software.
2	B	Data are unprocessed facts; processing turns them into information.
3	B	A LAN covers a limited area such as a building or campus.
4	B	The Internet is the infrastructure; the Web is one of the services running on it.
5	B	RAM holds data in use and is cleared when power is off.
6	A	IoT objects have sensors and connect to the Internet.

Table S.2: Chapter 2: Basic ICT Productivity Tools and Internet Skills

Q	Answer	Explanation
1	B	A browser requests and displays pages.
2	B	Quotation marks tell the engine to match the exact phrase.
3	B	BCC addresses are hidden from other recipients.
4	A	Genuine organisations do not ask for PINs or one-time codes.
5	B	HTTPS encrypts data in transit, but a site can still be untrustworthy.
6	C	It is specific and includes course code and name.

Table S.3: Chapter 3: Microsoft Office and Google Workspace

Q	Answer	Explanation
1	B	The SUM function with a range is correct; formulas begin with =.
2	B	Dollar signs lock the column and row.
3	B	Ctrl+S saves; Ctrl+P prints.
4	C	MAX returns the greatest value in a range.
5	B	Animations control objects; transitions control change between slides.
6	B	Multiple users can edit the same document at once.

Table S.4: Chapter 4: Cloud Storage and Digital Note-Taking

Q	Answer	Explanation
1	B	Cloud services run on servers in data centres.
2	C	Viewer permits reading but not changing.
3	B	Deleting a synced file can remove it from all devices.
4	B	Restricted limits access to those you add.
5	A	Notebook > Section > Page.
6	B	It spreads risk across copies, media and locations.

Table S.5: Chapter 5: Digital Communication and Social Media

Q	Answer	Explanation
1	B	Email does not require both people to be present at the same time.
2	C	LinkedIn focuses on careers and professional profiles.
3	B	Prevents accidental exposure of private information.
4	B	Muting avoids noise; punctuality shows respect.
5	B	They determine visibility of posts and personal information.

Table S.6: Chapter 6: ICT in Education

Q	Answer	Explanation
1	A	Moodle is a Learning Management System.
2	B	Blended learning mixes both modes.
3	B	Confirm that the submission was completed.
4	A	Khan Academy offers free lessons and exercises.
5	B	Internet access and discipline are common challenges.

Table S.7: Chapter 7: ICT in Health and Well-being

Q	Answer	Explanation
1	B	It delivers advice and consultation at a distance.
2	B	It is useful for trends but not a medical diagnosis.
3	B	Emergencies need immediate in-person care.
4	A	Sehat Kahani is a Pakistani telehealth organisation.
5	B	Security and careful sharing reduce risk.

Table S.8: Chapter 8: ICT in Personal Finance and Online Shopping

Q	Answer	Explanation
1	B	The OTP authorises transactions and must stay secret.
2	A	Daraz hosts many sellers.
3	B	COD means paying the courier on delivery.
4	B	Extremely low prices are a common fraud tactic.
5	B	Receipts are proof of payment.

Table S.9: Chapter 9: Conceptual MCQs (Chapter 9)

Q	Answer	Explanation
1	B	The user works with application software that creates and changes data (the file).
2	B	The sender and receiver need not be online together.
3	A	B2 is relative and changes; H1 is absolute and stays.
4	B	Multiple copies in different places follow the 3-2-1 rule.
5	B	OTP must never be shared.
6	A	Moodle is an LMS.
7	B	Wearables estimate; doctors diagnose.
8	B	Unrealistic price and personal-account payment are scam signs.

Table S.10: Chapter 9: Mid-term practice paper, Section A

Q	Answer	Explanation
1	B	Android is an operating system (system software).
2	B	Data are raw facts.
3	B	LAN covers limited areas.
4	A	They match the exact phrase.
5	C	BCC hides recipients.
6	B	MIN returns the smallest value.
7	A	Viewer is read-only.
8	C	A live video meeting is synchronous.
9	A	Coursera offers online courses.
10	B	Wearables estimate; they do not diagnose.

Table S.11: Chapter 10: Digital Citizenship and Online Etiquette

Q	Answer	Explanation
1	B	They are collected without you actively posting.
2	B	Evidence supports reporting and action.
3	B	It is seen as shouting.
4	B	It is public perception.
5	B	It reduces eye strain.

Table S.12: Chapter 11: Ethical Considerations in the Use of ICT

Q	Answer	Explanation
1	B	It is using others' work without credit.
2	A	Linux is released under open-source licences.
3	B	Exact words require quotation marks and a citation.
4	B	Proper paraphrasing with citation is honest.
5	A	It defines how you may use the software.

Table S.13: Chapter 12: Information Accuracy, Integrity and Responsible Digital Information

Q	Answer	Explanation
1	B	Misinformation lacks the intent to harm.
2	A	Malinformation is truthful but used harmfully.
3	B	It shows where else and when the image appeared.
4	B	Urgency is a manipulation signal.
5	B	Stop and think before reacting.

Table S.14: Chapter 13 MCQs

Q	Answer	Explanation
1	C	Wi-Fi is part of a network; Windows is software, a keyboard is hardware, and a router is network hardware.
2	A	Access is through the Internet after login.
3	B	Identical or partially identical work receives a zero.
4	B	Verification and secrecy of codes protect you.
5	B	Evidence, blocking, reporting and support are recommended.
6	B	Authoritative, accountable sources are preferred.
7	A	It is false context; intent decides the type.
8	B	H1 is locked.
9	B	They support but do not replace.
10	B	Proper paraphrasing with citation is honest.

Table S.15: Chapter 13: Model examination paper, Section A

Q	Answer	Explanation
1	A	ICT means Information and Communication Technologies.
2	B	It is a physical component.
3	B	HTTPS indicates encrypted communication.
4	B	Ctrl+S saves.
5	B	AVERAGE returns the arithmetic mean.
6	B	Commenters read and add comments.
7	A	They support online meetings.
8	A	Canvas is a Learning Management System.
9	A	JazzCash is a mobile wallet.
10	B	Footprint covers both what you share and what is collected.
11	A	Quotes still need a source.
12	C	Malinformation.

Answer Keys: Practice Quizzes

Table S.16: Quiz 1 key (Chapters 1 to 4)

Q	Answer	Explanation
1	B	Windows is an operating system.
2	A	Information is meaningful processed data.
3	B	LAN covers a limited area.
4	B	Quotation marks search for the exact phrase.
5	C	BCC is hidden.
6	A	SUM adds.
7	B	Dollar signs lock a reference.
8	C	Viewer can only read.

Table S.17: Quiz 2 key (Chapters 5 to 7)

Q	Answer	Explanation
1	B	Live video happens at the same time.
2	A	Avoid exposing private content.
3	A	LinkedIn is for careers and networking.
4	A	Moodle is an LMS.
5	B	Internet and discipline are challenges.
6	B	Estimates, not diagnoses.
7	B	Emergencies need in-person care.
8	B	It is sensitive.

Table S.18: Quiz 3 key (Chapters 10 and 11)

Q	Answer	Explanation
1	A	It is your online data trail.
2	B	Passive footprint.
3	B	Evidence first.
4	A	Netiquette is online etiquette.
5	A	It protects original works.
6	B	Licence terms still apply.
7	A	Quote and cite.
8	B	Zero is awarded.

Table S.19: Quiz 4 key (Chapter 12 and complete course review)

Q	Answer	Explanation
1	A	Misinformation.
2	B	Urgency is a warning sign.
3	A	Reverse image search finds earlier appearances.
4	A	OTP authorises transactions.
5	A	Daraz is an example.
6	B	Follow 3-2-1.
7	B	The Web is one service.
8	B	It indicates HTTPS encryption, not guaranteed trustworthiness.

Table S.20: Quiz short-question key points

Question	Key points
Q1: Internet vs WWW	Internet = global network of networks; WWW = web pages accessed via browsers; Web is one service on the Internet; give an example of another service (email).
Q1: Sync vs backup	Sync keeps files identical across devices and may propagate deletions; backup is a separate recoverable copy; use the 3-2-1 rule.
Q2: Meeting etiquette	Join on time; mute when not speaking; camera and background suitable; do not record without permission; respect others; check screen before sharing.
Q2: Telemedicine	Benefits: saves time and cost, access to specialists, convenient follow-up. Limits: no physical examination, unsuitable for emergencies, needs Internet, privacy and fake-doctor risks.
Q3: Cyberbullying	Repeated digital harm to a person; examples: insulting messages, fake accounts, sharing embarrassing photos, exclusion from groups.
Q3: Quote vs paraphrase	Quote = exact words in quotation marks; paraphrase = own words and structure; both need citation.
Q4: Fact-checking steps	Pause; check the source; find other reputable reports; check date and context; verify images and video; check tone; decide.
Q4: Honesty policy	If any two projects or assignments are identical or partially identical, a zero will be awarded; repetition may lead to an F grade in the course.

Model-Answer Outlines: Mid-Term Practice Paper (Chapter 9)

Table S.21: Section B: short questions

Question	Key points
1. ICT vs IT	ICT = technologies to capture, store, process, transmit and present information; IT focuses on computing and information processing; ICT adds communication and networks.
2. Hardware vs software	Hardware = physical parts (keyboard, CPU); software = instructions (Windows, Word).
3. Internet vs WWW	Network vs service on the network of web pages; example of other services.
4. Email etiquette	Clear subject, greeting, purpose first, polite closing, proofreading, correct attachment; avoid capitals and slang.
5. Relative vs absolute	Relative changes when copied (B2 to B3); absolute is locked with $ (B2). Show a formula example.
6. Cloud storage	Files stored on remote servers accessed via Internet; advantages: access from any device, backup, easy sharing.
7. Telemedicine	Benefits: saves time, access to specialists; limitations: no physical exam, unsuitable for emergencies.
8. Scam signs	Too-low price, pressure, personal-account payment, no reviews or contact details, poor spelling, suspicious link.

Table S.22: Sections C and D: outline of expected answers

Question	Outline
C1	Six components (hardware, software, people, data, networks, communication) with a diagram; data processing cycle: data, processing, information, communication, with storage and feedback; example such as marks to class average.
C2	Crawling, indexing, ranking; techniques: specific keywords, quotation marks, minus sign, site: and filetype:, evaluate sources by author, date, evidence, purpose and agreement; reasons for evaluation: anyone can publish.
C3	Layout of headings; formulas SUM and AVERAGE copied by fill handle; MAX and MIN; absolute reference for totals; sort whole table; insert column chart with title and labels.
C4	LMS = central platform; examples Moodle, Canvas, Google Classroom; steps: log in, open course, read, attempt, submit, check status, view feedback; benefits and limits of e-learning.
D1	It is a phishing/social-engineering attempt; do not send the code; do not click links; contact the provider through the official helpline or app; report and warn others; protect the account with strong PIN, no sharing of OTP, check statements.

Model-Answer Outlines: Final Practice Paper (Chapter 13)

Table S.23: Section B: short questions

Question	Key points
1	ICT = technologies for information and communication; examples: smartphone, email, video meeting.
2	Data = raw facts; information = processed meaningful data; example with marks.
3	AI (smart assistants, spam filters), IoT (smart meters), cloud (Drive), Big Data, blockchain, VR/AR; one use for each chosen.
4	Local = on your device; cloud = remote servers via Internet; difference in access, sharing, risk.
5	Clear subject; polite greeting; proofread; correct use of CC/BCC.
6	=SUM(B2:B10)
7	Online live class space using video tools, chat, polls, breakout rooms.
8	Estimates, not diagnoses; accuracy varies; privacy risks; cannot replace a doctor.
9	Unique reference number given for a payment; used as proof and to track disputes.
10	Rules of polite and respectful online behaviour.
11	Presenting others' work or ideas as your own without credit.
12	Misinformation: false, no intent to harm; disinformation: false, deliberate.

Table S.24: Section C and case studies: outline of expected answers

Question	Outline
C1	Components with diagram; data processing cycle with example.
C2	Marksheet layout; SUM and AVERAGE; relative vs absolute references; chart creation.
C3	How cloud works (data centres, login, encryption); local vs cloud; roles Viewer, Commenter, Editor; backup vs sync; 2-step verification.
C4	Telemedicine workflow, benefits and limits, emergency warning; payment workflow with authentication and receipts; safety rules.
C5	Definitions; examples; avoiding plagiarism through citation, paraphrasing, quoting, early start; course policy.
C6	Three types of information disorder; fact-checking steps; reverse image search; responsible sharing.
Case 1	Phishing (fake bank SMS and website); warning signs: urgency, threat, link, request for card and PIN; do not click or enter data; contact bank through official channels; report; related chapters 2 and 8.
Case 2	Mistake: "Anyone with the link can edit"; use restricted access with Viewer/Commenter or Editor only for group members; similarity between groups may cause a zero under the honesty policy; avoid by controlling access and writing your own work.
Case 3	Signs: miracle cure, urgency, no source; apply SIFT and the five checks; consult qualified doctors and official health sources; do not share; correct if shared.
Case 4	Signs: too-low price, unknown page, payment to a personal wallet; safer: cash on delivery or protected checkout; report to platform, wallet provider and authorities; keep evidence; check reviews and contact details next time.

Assignment Marking Notes

- Use the suggested marking guides in the Assessment Resources as a starting point and adapt marks to the instructor's scheme.
- Compare submissions for similarity; the academic honesty policy applies to identical or partially identical work.
- Give feedback on one strength and one improvement for each student.
- Accept alternative correct tools and examples if the learning outcome is achieved.

Appendix A: ICT Glossary (A–Z)

Terms are listed alphabetically. For fuller explanations, see the chapters.

Table A.1: ICT glossary (A to Z)

Term	Meaning
2-Step Verification	A second proof of identity beyond a password.
Application software	Programs that help users perform tasks, such as Word or Chrome.
Artificial Intelligence (AI)	Software that performs tasks that normally need human intelligence.
Attachment	A file sent with an email.
Backup	An extra copy of data kept for recovery.
Bandwidth	The amount of data that can be sent over a connection in a given time.
Big Data	Extremely large datasets analysed for patterns.
Blockchain	A shared digital ledger that is hard to alter.
Browser	Software for viewing web pages.
Cell	The intersection of a row and column in a spreadsheet.
Cloud computing	Using remote servers over the Internet for storage and computing.
Copyright	Legal right of a creator over an original work.
CPU	The processor that executes instructions.
Cyberbullying	Repeated digital harm to a person.
Data	Raw facts and figures.
Database	An organised collection of data.
Digital footprint	The trail of data you leave online.
Disinformation	False information spread to deceive.
Domain name	The readable name of a website, such as example.com.
E-commerce	Buying and selling online.
Encryption	Scrambling data so only authorised people can read it.
File extension	Letters after a file name showing its type, such as .docx.
Firewall	A security system that filters network traffic.
Hardware	Physical parts of a computer.
HTTPS	Secure web protocol using encryption.
Information	Processed data with meaning.
Internet	Global network of networks.
IoT	Internet of Things: connected objects with sensors.
IP address	A number identifying a device on a network.
LAN	Local area network.
LMS	Learning Management System.
Malware	Software designed to harm or steal data.
Misinformation	False information shared without intent to harm.
Netiquette	Rules of polite online behaviour.

Term	Meaning
Network	Connected devices sharing data.
Open-source	Software with publicly available source code under a licence.
Operating system	System software that manages hardware and runs programs.
OTP	One-time password for verification.
Phishing	Fraud that tricks people into revealing private data.
Plagiarism	Presenting others' work as your own.
RAM	Temporary working memory.
Router	A device that directs data between networks.
Search engine	A website that finds pages from an index.
Server	A computer that provides services to other computers.
Software	Instructions that tell hardware what to do.
Spreadsheet	A grid for calculating and organising data.
Synchronisation	Keeping files identical across devices.
Telemedicine	Remote healthcare using ICT.
URL	Web address of a page.
USB	A standard connection for devices and storage.
Virtual reality	A computer-created environment.
Wearable	Electronic device worn on the body.
Wi-Fi	Wireless local network technology.
World Wide Web	Linked web pages accessed through browsers.

Appendix B: Important Keyboard Shortcuts

On a Mac, use the Command key instead of Ctrl for most shortcuts.

Table B.1: General (Windows)

Shortcut	Action
Ctrl+C / Ctrl+X / Ctrl+V	Copy / Cut / Paste
Ctrl+Z / Ctrl+Y	Undo / Redo
Ctrl+A	Select all
Ctrl+S	Save
Ctrl+P	Print
Ctrl+F	Find
Alt+Tab	Switch between open windows
Windows key + D	Show the desktop
Windows key + L	Lock the computer
Ctrl+Shift+Esc	Open Task Manager

Table B.2: Microsoft Word

Shortcut	Action
Ctrl+B / Ctrl+I / Ctrl+U	Bold / Italic / Underline
Ctrl+L / Ctrl+E / Ctrl+R / Ctrl+J	Left / Centre / Right / Justify
Ctrl+H	Find and Replace
Ctrl+N / Ctrl+O	New / Open document
F7	Spelling and Grammar
Ctrl+Enter	Insert a page break

Table B.3: Microsoft Excel

Shortcut	Action
F2	Edit the active cell
F4	Toggle relative / absolute reference while editing a formula
Alt+=	AutoSum
Ctrl+Shift+L	Turn filter on or off
Ctrl+Home	Go to cell A1
Ctrl+Arrow keys	Jump to the edge of data
Ctrl+1	Open Format Cells

Table B.4: PowerPoint and browser

Shortcut	Action
F5	Start slide show from the beginning
Shift+F5	Start slide show from current slide
Ctrl+M	Insert a new slide
Ctrl+T / Ctrl+W	New tab / Close tab (browser)
Ctrl+Shift+T	Reopen a closed tab
Ctrl+L	Select the address bar
Ctrl+D	Bookmark the page
F5 / Ctrl+R	Reload the page

Appendix C: Common File Extensions

Table C.1: Common file extensions

Extension	Type	Opened with
.docx	Word document	Word, Google Docs
.xlsx	Excel workbook	Excel, Google Sheets
.pptx	PowerPoint presentation	PowerPoint, Google Slides
.pdf	Portable document	PDF readers, browsers
.txt	Plain text	Notepad, any text editor
.csv	Comma-separated data	Excel, text editors
.jpg / .jpeg	Compressed photo	Image viewers
.png	Image with transparency support	Image viewers
.gif	Simple animated image	Browsers
.mp3	Audio	Media players
.mp4	Video	Media players
.zip	Compressed folder	File explorer, archive tools
.exe	Windows program (install or run only trusted files)	Windows
.apk	Android app package (install only from trusted sources)	Android
.html	Web page file	Browsers

COMMON MISTAKE

Never open unexpected files ending in .exe, .scr or unusual double extensions such as invoice.pdf.exe.

Appendix D: Basic Computer Terminology

Table D.1: Basic computer terminology

Term	Meaning
Boot	Start a computer
Desktop	Main screen area of an operating system
Icon	Small picture representing a file or program
Folder	A container for files
File	A named collection of data
Motherboard	Main circuit board that connects components
Peripheral	External device such as a printer
Port	Socket for connecting devices
Bit and byte	Smallest unit of data; 8 bits make one byte
KB, MB, GB, TB	Units of storage: kilobyte, megabyte, gigabyte, terabyte
Driver	Software that lets the OS use a device
Update	New version that fixes problems or adds features
Install / Uninstall	Add or remove a program
Cursor	Marker showing where you type or click
Shut down / Restart	Turn off / turn off and on again
Cache	Temporary storage for faster access
Pixel	Smallest dot of a digital image
Resolution	Number of pixels on a screen or image

Appendix E: Microsoft Office Quick Reference

Table E.1: Microsoft Office quick reference

Task	Word	Excel	PowerPoint
Save	Ctrl+S	Ctrl+S	Ctrl+S
Bold text	Ctrl+B	Ctrl+B	Ctrl+B
Insert table	Insert > Table	Select cells > Format as Table	Insert > Table
Insert picture	Insert > Pictures	Insert > Pictures	Insert > Pictures
Insert chart	Insert > Chart	Insert > Chart	Insert > Chart
Page margins	Layout > Margins	Page Layout > Margins	Not applicable
Page numbers	Insert > Page Number	Insert > Header and Footer	Insert > Slide Number
Spelling	Review > Spelling	Review > Spelling	Review > Spelling
Print	File > Print	File > Print	File > Print
Save as PDF	File > Export or Save As	File > Export or Save As	File > Export or Save As
Themes	Design	Page Layout > Themes	Design

NOTE

Names of tabs and commands can vary slightly between versions. Use the search box in the program if you cannot find a command.

Appendix F: Essential Internet and Email Terminology

Table F.1: Essential Internet and email terminology

Term	Meaning
ISP	Internet Service Provider, the company that provides your Internet connection
Router / modem	Devices that connect your network to the ISP
Wi-Fi	Wireless connection to a local network
Hyperlink	A clickable link to another page or file
Download / Upload	Receive a file from / send a file to the Internet
Bookmark	Saved web page address
Cookie	Small data file saved by a website
Inbox / Sent / Drafts	Email folders for received, sent and unfinished messages
Spam	Unwanted bulk messages
Signature	Text automatically added to the end of emails
Reply All	Reply to the sender and everyone else on the message
Forward	Send a received message to someone else
Archive	Move a message out of the inbox without deleting it
Domain	The part of an email or web address after @ or www
VPN	A service that creates a private encrypted connection

Appendix G: Digital Safety Checklist

Use this checklist regularly.

- I use a strong, unique password for every important account.
- I have switched on 2-Step Verification for email and cloud storage.
- I never share my PIN, OTP or password.
- I keep my phone and computer updated.
- I have antivirus or built-in protection switched on.
- I install apps only from official stores.
- I check the sender and link before clicking.
- I log out of shared computers.
- I back up important files (3-2-1).
- I review privacy settings every few months.
- I verify news and health messages before sharing.
- I use secure (HTTPS) websites for sign-in and payments.
- I do not use public Wi-Fi for banking.
- I know how to report fraud and cyberbullying.

Appendix H: Practical Skills Checklist

Tick each skill when you have performed it yourself. Activity numbers refer to the practical activities in the chapters.

- Identify hardware and software on a device (Activity 1).
- Show how data becomes information (Activity 2).
- Perform an effective Google search (Activity 3).
- Create a professional Gmail account with 2-Step Verification (Activity 4).
- Compose and send a formal email with attachment (Activity 5).
- Create and format a Word document (Activity 6).
- Prepare a professional assignment (Activity 7).
- Create an Excel marksheet with totals and averages (Activity 8).
- Generate an Excel chart (Activity 9).
- Prepare and present a PowerPoint presentation (Activity 10).
- Create and organise cloud folders (Activity 11).
- Share a document with correct permissions (Activity 12).
- Create digital notes (Activity 13).
- Join a Google Meet session (Activity 14).
- Create a professional LinkedIn profile (Activity 15).
- Submit an assignment through an LMS (Activity 16).
- Explore an online learning platform (Activity 17).
- Use a fitness app and review privacy (Activity 18).
- Describe a telemedicine workflow (Activity 19).
- Describe a digital payment workflow (Activity 20).
- Identify signs of an online shopping scam (Activity 21).
- Audit my digital footprint (Activity 22).
- Quote, paraphrase and cite (Activity 23).
- Classify academic practices (Activity 24).
- Evaluate the credibility of an online news article (Activity 25).

Appendix I: Chapter-Wise Quick Revision Sheets

One-page revision sheets for each chapter. Revise them just before quizzes and examinations.

QUICK REVISION

Chapter 1: Introduction to Information and Communication Technologies

- ICT = IT + Communication
- Hardware (touch) vs Software (instructions)
- Data (raw) to Information (meaningful)
- PAN < LAN < MAN < WAN
- Internet = network of networks; WWW = web pages

Remember:

- Define IT, communication technology and ICT.
- Name and explain the six ICT components.
- Draw the data processing cycle.
- State two differences between local and cloud storage.
- Give one example of each emerging technology.

QUICK REVISION

Chapter 2: Basic ICT Productivity Tools and Internet Skills

- Internet = network, WWW = pages
- Browser ≠ search engine
- “Quotes” = exact phrase
- To = main, CC = visible copy, BCC = hidden copy
- Never share password, PIN or OTP

Remember:

- Differentiate Internet and WWW.
- Explain how a search engine works in three steps.
- Write a good subject line.
- List three signs of phishing.
- State the purpose of CC and BCC.

QUICK REVISION

Chapter 3: Microsoft Office and Google Workspace

- Ribbon → Tabs → Groups → Commands
- Ctrl+S save, Ctrl+C/X/V, Ctrl+Z undo, Ctrl+F find, Ctrl+H replace
- Cell = column + row (B2); range = B2:D4
- =SUM, =AVERAGE, =MIN, =MAX, =COUNT
- H1 = absolute; E2 = relative
- F5 starts slide show

Remember:

- Name five Home tab groups in Word.
- Write the formula for the total of B2 to D2.
- Explain absolute reference with an example.
- State three rules of good slide design.
- List two advantages and two limitations of Google Workspace.

QUICK REVISION

Chapter 4: Cloud Storage and Digital Note-Taking

- Cloud = remote servers via Internet
- Viewer < Commenter < Editor
- Sync ≠ Backup; follow 3-2-1
- Restricted sharing is safest
- Notebook → Section → Page

Remember:

- Define cloud storage and give two advantages.
- List the three sharing permissions.
- Explain the difference between backup and sync.
- Name three cloud storage services.
- State two cloud security practices.

QUICK REVISION

Chapter 5: Digital Communication and Social Media

- Meet / Teams / Zoom: join, mute, camera, chat, share
- Sync vs Async
- LinkedIn = career; Instagram = visual; Facebook = community
- Think before posting
- Check privacy settings

Remember:

- List five meeting etiquette rules.
- Compare Facebook, Instagram and LinkedIn in two lines each.
- Name four parts of a LinkedIn profile.
- State three social media risks.

QUICK REVISION

Chapter 6: ICT in Education

- LMS = course content + assignments + quizzes + grades
- Moodle, Canvas, Google Classroom
- Coursera, edX, Udemy, Khan Academy
- Blended = online + face-to-face
- Always confirm submission

Remember:

- Define LMS and give three examples.
- State the steps to submit an assignment online.
- List three benefits and three limitations of e-learning.
- Name four online learning platforms.

QUICK REVISION

Chapter 7: ICT in Health and Well-being

- Digital health ≠ doctor
- Wearables = estimates
- Telemedicine: book → consult → advice → follow-up
- Emergency = hospital, not an app
- Protect health data

Remember:

- State clearly that digital health tools do not replace doctors.
- Describe a telemedicine workflow.
- List three benefits and three limitations of telemedicine.
- Name three fitness apps.
- State three ways to protect health data.

QUICK REVISION

Chapter 8: ICT in Personal Finance and Online Shopping

- PIN, OTP, password = secret
- Review → Authenticate → Process → Receipt
- Marketplace = many sellers; store = one seller
- Compare, inspect, keep receipts
- Too good to be true = suspicious

Remember:

- List five safe digital finance practices.
- Explain the digital payment workflow.
- Differentiate marketplace and online store.
- List five scam signs.

QUICK REVISION

Chapter 9: Mid-Term Examination Preparation and Revision

- Revise actively, not passively
- Definition + example = full marks
- Practise under time limits

Remember:

- Revise definitions, comparisons and procedures.
- Prepare concise answers.
- Practise MCQs and short questions daily.

QUICK REVISION

Chapter 10: Digital Citizenship and Online Etiquette

- Think before you post
- Active vs passive footprint
- Evidence → Block → Report → Tell
- Respect, privacy, kindness
- Balance screen time

Remember:

- Define digital citizenship, identity and footprint.
- List five netiquette rules.
- State four steps in responding to cyberbullying.
- List three privacy practices.

QUICK REVISION

Chapter 11: Ethical Considerations in the Use of ICT

- Quote + cite, or paraphrase + cite
- No citation = plagiarism
- Licence = permission with conditions
- Open-source ≠ no rules
- Identical assignments: zero (course policy)

Remember:

- Define plagiarism and academic integrity.
- Differentiate copyright and licence.
- State four ways to avoid plagiarism.
- Name three types of software licences.
- State the course policy on identical assignments.

QUICK REVISION

Chapter 12: Information Accuracy, Integrity and Responsible Digital Information

- Mis = mistake; Dis = deliberate; Mal = malicious use of truth
- SIFT: Stop, Investigate, Find, Trace
- Reverse image search
- Strong emotion = pause
- Verify before you share

Remember:

- Define the three types of information disorder with examples.
- List five checks to verify a news item.
- List three signs of a misleading headline.
- Explain reverse image search.

QUICK REVISION

Chapter 13: Complete Course Revision and Examination Preparation

- Definition + example
- Steps in order for practical questions
- Diagram + headings for long answers
- Time by marks

Remember:

- Revise the 15 confused pairs.
- Practise the model paper.
- Plan your exam time.

Appendix J: References and Further Reading

Prescribed Textbooks

- Vermaat, Shaffer and Freund. *Discovering Computers*.
- Gaskin, Vargas and McLellan. *GO! with Microsoft Office* series.
- Grauer and Poatsy. *Exploring Microsoft Office* series.

Reference Books

- Morley and Parker. *Computing Essentials*.
- Evans, Martin and Poatsy. *Technology in Action*.

Official Documentation and Further Reading

- Microsoft Support: official help for Word, Excel, PowerPoint, OneDrive, OneNote, Outlook and Teams (support.microsoft.com).
- Google Help and Google Workspace Learning Center: official help for Gmail, Docs, Sheets, Slides, Drive and Meet (support.google.com).
- Zoom Support: official help for Zoom meetings.
- Official help centres of Dropbox, Evernote, Moodle, Canvas, Coursera, edX, Udemy and Khan Academy.
- Websites and apps of JazzCash, Easypaisa and Zong, and the State Bank of Pakistan for official financial information.
- Official websites of the Pakistan Telecommunication Authority (PTA) and the National Cyber Crime Investigation Agency (NCCIA) for current guidance and reporting channels.
- Higher Education Commission (HEC) of Pakistan for official guidance on academic integrity and plagiarism.

> **NOTE**
> Edition numbers, publication years and page references are intentionally not listed here; please use the editions recommended by your instructor and the university library. Websites and policies change, so always consult the current official page.