

# **S4 ICT**

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# **TOPIC 15: BASIC SOFTWARE MANAGEMENT**

Senior One ICT | Operating Systems, Application Software, Installation & Troubleshooting

# Lesson 1

# Connecting to What You Already Know (Topics 1, 2 & 3)

- Before we begin, make sure you can answer YES to all of the following:
  - I understand the difference between hardware and software. (Topic 1)
  - I know how an operating system manages a computer. (Topic 2)
  - I have experience navigating the desktop and managing files and folders. (Topic 3)
  - I have installed and opened applications before.
- **The BIG IDEA for this topic:**
  - Without software, a computer is just a collection of useless hardware. In this topic you will learn WHAT software is, the TYPES that exist, how to INSTALL and REMOVE it, how to TROUBLESHOOT problems, and which UTILITY TOOLS keep a computer healthy.



**Quick Recall:** Name ONE example of: (a) hardware (b) system software (c) application software. What is the job of an operating system?

# What You Will Learn in This Topic

- **By the end of Topic 15, you should be able to:**
  - Define an operating system and explain its core functions.
  - Distinguish between system software, application software, and programming software.
  - Compare operating systems and application software using a feature table.
  - Describe the steps to install a Windows operating system using a bootable USB drive.
  - Install and uninstall application software on Windows.
  - Troubleshoot common software and operating system problems.
  - Use utility programs to optimise and maintain a computer.
  - Use keyboard shortcuts for efficient software management.

# 15.1 What is an Operating System (OS)?

- **An operating system (OS) is the MOST IMPORTANT software on a computer.**
- It is the FOUNDATIONAL LAYER between the computer hardware and the user (or application software). (Silberschatz et al., 2018)
- **The OS is a set of programs that MANAGES ALL hardware resources:**
  - CPU (Central Processing Unit) – the processor that executes instructions.
  - Memory (RAM) – temporary storage for running programs.
  - Storage drives – hard disks, SSDs, USB drives.
  - Input/Output devices – keyboards, mice, printers, monitors.
- **Without an OS, every application would need its own low-level code to talk to the hardware — making software development completely impractical.**
- The OS runs in 'KERNEL MODE' as a supervisor, controlling all user programs running in 'USER MODE'.
- **EXAMPLES of Operating Systems:** Windows 10/11, macOS, Linux (Ubuntu), Android, iOS, ChromeOS

# Understanding the OS – The Manager Analogy

- **Think of the operating system as the MANAGER of a large office building:**
  - The BUILDING is the hardware (CPU, RAM, hard drive, keyboard).
  - The MANAGER (OS) controls who uses which room, when, and for how long.
  - The WORKERS (application software) ask the manager for resources to get their jobs done.
  - Workers do NOT deal directly with the building's electrical system or plumbing — that is the manager's job.
- **KEY INSIGHT: When you use Microsoft Word, YOU interact with Word. Word interacts with the OS. The OS interacts with the hardware. You never deal with the hardware directly.**
- This LAYERED STRUCTURE makes computers easier to use, more stable, and more secure.

 **Discuss:** If the operating system is like a manager, what would happen to the 'office' (computer) if the manager suddenly disappeared? What would the workers (apps) do?

# Functions of an Operating System

| Function            | Description                                                          | Example                                                   |
|---------------------|----------------------------------------------------------------------|-----------------------------------------------------------|
| Process Management  | Manages execution of programs; allocates CPU time to processes.      | Windows Task Manager shows running processes.             |
| Memory Management   | Allocates RAM to programs; uses virtual memory when RAM is full.     | Too many browser tabs → OS moves data to disk.            |
| File Management     | Organises files in folders; handles reading and writing of files.    | Windows File Explorer; Linux 'ls' command.                |
| Device Management   | Controls hardware devices through drivers.                           | Installing a printer driver so OS can use the printer.    |
| User Interface      | Provides a way for users to interact with the computer (GUI or CLI). | Windows Desktop (GUI); Linux Terminal (CLI).              |
| Security Management | Controls access through passwords and permissions.                   | Windows UAC; Linux file permissions (rwx).                |
| Networking          | Manages network connections and communication.                       | Connecting to Wi-Fi; sharing files over LAN.              |
| Error Handling      | Detects and responds to hardware and software errors.                | 'Blue Screen of Death' in Windows; kernel panic in Linux. |



## Quick Check: OS Functions

- **Match each situation to the correct OS function:**
- 1. You open 15 browser tabs and the computer slows down — the OS moves data to the hard drive.
- 2. You type a password to log into the computer.
- 3. Your computer connects to the school Wi-Fi network.
- 4. You plug in a printer and the computer recognises it automatically.
- 5. You save a document and find it in the Documents folder later.
- 6. Windows shows a blue screen with an error code after a crash.
- 7. You click on the Start Menu and open Microsoft Word.
- **MATCHING OPTIONS: Process Management | Memory Management | File Management | Device Management | User Interface | Security | Networking | Error Handling**

## 15.2 Operating System vs. Application Software

- It is important to distinguish between system software (e.g. the OS) and application software:

| Feature      | Operating System                                  | Application Software                          |
|--------------|---------------------------------------------------|-----------------------------------------------|
| Purpose      | Manages hardware and system resources             | Performs specific user tasks                  |
| When it runs | Starts automatically when computer is switched on | Started by the user when needed               |
| Examples     | Windows 10/11, macOS, Ubuntu Linux, Android       | Microsoft Word, Google Chrome, VLC, Photoshop |
| Dependency   | Does NOT need other software to run               | REQUIRES the OS to function                   |

 **Key Insight:** Microsoft Word CANNOT run without Windows (or macOS). But Windows can run WITHOUT Microsoft Word. The OS always comes first.

## 15.3 Categories of Computer Software

- **ALL computer software falls into THREE broad categories:**
  - 1. SYSTEM SOFTWARE – programs designed to operate, control, and extend the processing capabilities of the hardware. Runs continuously in the background.
  - 2. APPLICATION SOFTWARE – programs that allow end-users to accomplish specific real-world tasks. Installed and used by the user.
  - 3. PROGRAMMING / DEVELOPMENT SOFTWARE – tools used by developers to write, test, and debug other software.
- **IMPORTANT: System software and application software are INTERDEPENDENT.**
  - The OS provides a stable environment and essential services that application software relies on. When you open Word, it sends requests to the OS to access the CPU, memory, and storage — without needing to know the technical hardware details

 **Think:** Where does antivirus software fit? It manages system health — so it is SYSTEM SOFTWARE (utility). Where does a game fit? It is used by the user for a task — APPLICATION SOFTWARE.

# System Software – The Computer's Foundation

- **System software is typically installed when the computer is first set up and runs CONTINUOUSLY IN THE BACKGROUND.**
- **The FOUR subcategories of system software:**
  - 1. OPERATING SYSTEMS – the master controller of all hardware and software. Examples: Windows, macOS, Linux, Android, iOS.
  - 2. DEVICE DRIVERS – software that allows the OS to COMMUNICATE with specific hardware. Without the correct driver, a device will not work. Examples: Printer driver, Graphics card driver, Sound card driver.
  - 3. UTILITY PROGRAMS – tools for MAINTAINING and OPTIMISING the system. Examples: Antivirus (Windows Defender, Avast), Disk Cleanup, Disk Defragmenter, File Compression (WinRAR, 7-Zip).
  - 4. FIRMWARE – LOW-LEVEL software embedded directly inside hardware devices (stored in ROM chips). Examples: BIOS/UEFI on a motherboard, firmware in a router or printer.

## Lesson 2

- Lesson 2

# Application Software – Programs for Users

- **Application software is designed for end-users to perform SPECIFIC, REAL-WORLD TASKS. It runs ON TOP of the operating system.**

| Category        | Examples                                                 |
|-----------------|----------------------------------------------------------|
| Word Processing | Microsoft Word, LibreOffice Writer, Google Docs          |
| Spreadsheets    | Microsoft Excel, LibreOffice Calc, Google Sheets         |
| Presentations   | Microsoft PowerPoint, LibreOffice Impress, Google Slides |
| Web Browsers    | Google Chrome, Mozilla Firefox, Microsoft Edge, Opera    |
| Media Players   | VLC Media Player, Windows Media Player                   |
| Image Editing   | Adobe Photoshop, GIMP (free), Paint.NET                  |
| Database        | Microsoft Access, MySQL, LibreOffice Base                |
| Communication   | WhatsApp, Zoom, Skype, Microsoft Teams, Gmail            |
| Education       | GeoGebra, Khan Academy App, Duolingo                     |

# Programming / Development Software

- **Programming software is used by DEVELOPERS to write, test, debug, and maintain other software.**
- Computers only understand MACHINE LANGUAGE (binary: 0s and 1s). Humans write in high-level languages (Python, Java, C++). Programming software TRANSLATES between the two.
- **KEY TYPES:**
  - Text Editors / Code Editors – Write and edit plain code. Examples: Visual Studio Code, Sublime Text, Atom.
  - IDEs (Integrated Development Environments) – All-in-one suite combining editor, compiler, debugger. Examples: Visual Studio, Eclipse, PyCharm, NetBeans.
  - Compilers – Translate ENTIRE source code to machine language and produce an executable (.exe) file. Examples: GCC (C/C++), javac (Java).
  - Interpreters – Translate and execute code LINE BY LINE (no separate executable). Examples: Python interpreter, Ruby interpreter.
  - Debuggers – Find and fix ERRORS ('bugs') in code. Allow stepping through code line by line. Examples: GDB, LLDB.
  - Version Control Systems – Track changes to code over time; allow teams to collaborate. Examples: Git, GitHub, GitLab.



## Classification Activity: Which Type of Software?

- **Classify each item below as: SYSTEM SOFTWARE (OS / Driver / Utility / Firmware) or APPLICATION SOFTWARE or PROGRAMMING SOFTWARE.**
- 1. Windows 11   2. Microsoft Word   3. Python Interpreter   4. VLC Media Player
- 5. Printer driver   6. BIOS/UEFI   7. Google Chrome   8. Visual Studio Code
- 9. Windows Defender (Antivirus)   10. Microsoft Excel   11. Disk Defragmenter   12. GCC Compiler
- 13. Android OS   14. Adobe Photoshop   15. Git (Version Control)   16. WinRAR
- **CHALLENGE QUESTIONS:**
  - (a) Can application software run without an operating system? Explain your answer.
  - (b) What would happen to your printer if its driver was deleted?
  - (c) Give ONE example of a program that could be classified as BOTH system software and a utility.

## 15.4 Installing an Operating System – Pre-Installation Requirements

- Installing an operating system (OS) is a **FUNDAMENTAL** skill for ICT students. These steps describe how to install Windows 10/11.
- **WHAT YOU NEED BEFORE YOU BEGIN:**
  - A computer with compatible hardware (check minimum specs on Microsoft's website).
  - An empty USB flash drive of AT LEAST 8 GB.
  - Rufus – a free media creation tool used to create a bootable USB drive. Download from: [rufus.ie](https://rufus.ie)
  - Windows ISO file – the installation image. Download from: [microsoft.com/en-us/software-download/windows11](https://microsoft.com/en-us/software-download/windows11)
  - A valid Windows product key (or use a free evaluation copy for learning).
-  **CRITICAL WARNING: BACKUP ALL IMPORTANT DATA BEFORE PROCEEDING. The installation process WILL ERASE the entire hard drive.**
- An ISO file is a single compressed file that contains the complete contents of an installation disc.

# Creating a Bootable USB Drive Using Rufus

- **A BOOTABLE USB drive is a flash drive that a computer can start (boot) from instead of the hard drive.**
- **STEP 1 – DOWNLOAD RUFUS:**
  - Open your browser → Go to [rufus.ie](https://rufus.ie) → Download the latest version (Portable) → Double-click to run (no installation needed).
- **STEP 2 – INSERT USB DRIVE:**
  - Insert your USB flash drive (8 GB or larger). Backup any important files first — the process ERASES everything.
- **STEP 3 – SELECT THE ISO FILE:**
  - In Rufus, under 'Boot selection', click SELECT → Browse and choose your Windows 11 ISO file.
- **STEP 4 – CONFIGURE SETTINGS:**
  - Partition scheme → Select GPT (for modern computers with UEFI).
  - Target system → Select UEFI (non-CSM).
  - File system → Select NTFS.
  - NOTE: For OLDER computers with legacy BIOS, choose MBR instead of GPT.
- **STEP 5: Click START in Rufus. Wait for the process to complete. Your bootable USB is ready.**

# Installing Windows – Step by Step

- Step 1 – Insert the bootable USB drive into the computer's USB port.
- Step 2 – RESTART the computer. During boot, press the BIOS/UEFI key (usually F2, F12, DEL, or ESC — varies by manufacturer) to enter BIOS setup.
- Step 3 – In BIOS, CHANGE THE BOOT ORDER so that USB Drive is the FIRST boot device. Save and exit BIOS.
- Step 4 – The computer will boot from the USB and the WINDOWS SETUP screen appears.
- Step 5 – Select Language, Time Format, and Keyboard Input Method. Click NEXT.
- Step 6 – Click INSTALL NOW.
- Step 7 – Enter the product key, or click 'I don't have a product key' to continue.
- Step 8 – Accept the License Terms and click NEXT.
- Step 9 – Select CUSTOM (ADVANCED) installation for a clean install.
- Step 10 – Select the hard drive partition. Delete old partitions if needed. Click NEXT.
- Step 11 – Windows copies files, installs features and updates. The computer RESTARTS SEVERAL TIMES.
- Step 12 – Complete the SETUP WIZARD: set region, language, Wi-Fi, create a user account.
- Step 13 – Install HARDWARE DRIVERS (graphics, audio, network) from the manufacturer's website.

# OS Installation – Key Concepts to Know

- **BIOS (Basic Input/Output System) / UEFI (Unified Extensible Firmware Interface):**
  - Firmware stored on a chip in the motherboard. Runs before the OS loads. Identifies hardware and manages the boot process.
- **BOOT ORDER:**
  - The sequence in which the computer checks storage devices for an OS to load. We change it to USB first so Windows can install.
- **ISO FILE:**
  - A compressed image file containing all OS installation files. Must be 'written' to USB using Rufus — simply copying does not work.
- **GPT vs MBR (Partition Schemes):**
  - GPT (GUID Partition Table) – for modern computers using UEFI. Supports drives larger than 2 TB.

 **Activity:** Why must you change the boot order before installing Windows? What happens if you forget and leave the hard drive first in the boot order?

## 15.5 Installing Application Software on Windows

- **METHOD 1 – FROM AN .EXE OR .MSI INSTALLER FILE:**
  - Step 1 – Download the installer from the OFFICIAL WEBSITE (e.g., vlc-media-player.exe).
  - Step 2 – Double-click the installer file.
  - Step 3 – Click YES if a User Account Control (UAC) prompt appears.
  - Step 4 – Follow the on-screen wizard: Accept the licence agreement, choose installation folder, select components.
  - Step 5 – Click INSTALL. Wait for the installation to complete.
  - Step 6 – Click FINISH. The programme may open automatically or appear on the Start Menu and Desktop.
- **METHOD 2 – FROM THE MICROSOFT STORE:**
  - Click Start → Open Microsoft Store → Search for the application → Click GET (free) or BUY → App installs automatically.
-  **SAFETY RULE: ALWAYS download software from OFFICIAL or TRUSTED sources only. Unofficial sources may contain viruses and malware.**

# Lesson 3

- Lesson 3

# Uninstalling Application Software on Windows

-  **NEVER** simply delete a programme's folder or shortcut — this does **NOT** fully uninstall it. Files remain scattered on the drive.
- **METHOD 1 – VIA SETTINGS (Recommended):**
  - Press Windows Key + I to open Settings.
  - Go to Apps → Installed Apps (or Apps & Features on older Windows).
  - Find the application → Click on it → Click UNINSTALL.
  - Follow any on-screen prompts. Restart the computer if prompted.
- **METHOD 2 – VIA CONTROL PANEL:**
  - Press Windows Key + R → Type 'control' → Press Enter.
  - Click Programs → Programs and Features.
  - Double-click the programme you want to uninstall → Follow the uninstall wizard.
- **WHEN SHOULD YOU UNINSTALL SOFTWARE?**
  - When it is no longer needed. When it is causing problems. When it is taking up too much disk space. When a newer version requires a clean install.

# Keyboard Shortcuts for Software Management (Windows)

| Action                      | Shortcut Key(s)                               |
|-----------------------------|-----------------------------------------------|
| Open Settings               | Windows Key + I                               |
| Open Control Panel          | Windows Key + R, then type 'control'          |
| Open Task Manager           | Ctrl + Shift + Esc                            |
| Open Run dialog             | Windows Key + R                               |
| Force quit unresponsive app | Ctrl + Alt + Delete → Task Manager → End Task |
| Open Device Manager         | Windows Key + X, then M                       |
| Open Disk Management        | Windows Key + X, then K                       |
| Open Event Viewer (logs)    | Windows Key + X, then V                       |
| Search Start Menu           | Windows Key (then type to search)             |
| Open Microsoft Store        | Windows Key, then search 'Store'              |
| Switch between open apps    | Alt + Tab                                     |
| Close current application   | Alt + F4                                      |



## Keyboard Shortcuts Practice Activity

- **Using the school computer, practise each shortcut below and record what happens:**
- (1) Press Ctrl + Shift + Esc. How many processes are currently running?
- (2) Press Windows Key + I. Which section would you click to uninstall an app?
- (3) Open Notepad. Type your name. Press Alt + F4. What happened?
- (4) Press Windows Key + R. Type 'control' and press Enter. Where does it take you?
- (5) Press Alt + Tab. What does this allow you to do?
- **(6) CHALLENGE: Which shortcut would you use if an application STOPS RESPONDING (freezes)? Write the steps you would take.**
- **(7) CHALLENGE: Which shortcut opens Device Manager? When would you use Device Manager?**

## 15.6 Troubleshooting an Operating System and Software

- **TROUBLESHOOTING** is the systematic process of **IDENTIFYING**, **DIAGNOSING**, and **FIXING** problems with a computer system.
- A good troubleshooter **FOLLOWS A LOGICAL, STEP-BY-STEP APPROACH** — never guess randomly.
- **THE 7-STEP TROUBLESHOOTING PROCESS:**
  - Step 1 – **IDENTIFY** the problem. What exactly is wrong? What error message appears? When did it start?
  - Step 2 – **GATHER INFORMATION**. Has anything changed recently? New software installed? Updates applied?
  - Step 3 – **GENERATE POSSIBLE CAUSES**. List the most likely causes (hardware failure, software corruption, virus, user error).
  - Step 4 – **TEST THE MOST LIKELY CAUSE FIRST**. Try the simplest fix first (e.g., restart the computer).
  - Step 5 – **EVALUATE THE RESULT**. Did the fix work? If yes, document it. If not, move to the next cause.
  - Step 6 – **IMPLEMENT THE SOLUTION**. Apply the correct fix (reinstall software, update drivers, restore a backup).
  - Step 7 – **DOCUMENT THE SOLUTION**. Record what the problem was and how it was fixed — for future reference.

# Common Software Problems and Solutions

| Problem                     | Likely Cause                                                 | Solution                                                            |
|-----------------------------|--------------------------------------------------------------|---------------------------------------------------------------------|
| Programme won't open        | Corrupted installation, missing files                        | Uninstall and reinstall; run as Administrator                       |
| Computer very slow          | Too many startup programmes, full drive, malware             | Disable startup programmes; free disk space; run antivirus          |
| Blue Screen of Death (BSOD) | Driver conflict, hardware failure, RAM problem               | Note error code; update drivers; run memory diagnostics             |
| Software keeps crashing     | Outdated software, incompatible updates, low RAM             | Update software; check compatibility; increase RAM/virtual memory   |
| Cannot install software     | Insufficient permissions, antivirus blocking, low disk space | Run as Administrator; disable AV temporarily; free disk space       |
| Missing DLL error           | Corrupted or deleted system file                             | Run sfc /scannow in Command Prompt as Administrator                 |
| Device not recognised       | Missing or outdated driver                                   | Download and install the correct driver from manufacturer's website |



## SCENARIO: The Teacher's Slow Computer

- **A teacher at your school complains that her computer has become very slow over the past month:**
  - It takes 10 MINUTES to start up.
  - Microsoft Word CRASHES FREQUENTLY.
  - The antivirus has NOT BEEN UPDATED in 6 months.
  - She has IMPORTANT END-OF-TERM REPORTS on the computer and is worried about losing them.
- **QUESTIONS — Answer in your exercise book:**
  - (a) List FIVE possible causes of the computer's slow performance.
  - (b) What is the FIRST THING you should advise the teacher to do BEFORE attempting any fixes? Why?
  - (c) Write a STEP-BY-STEP TROUBLESHOOTING PLAN for the teacher's computer.
  - (d) Which UTILITY PROGRAMMES would you run, and in what ORDER? Explain the purpose of each.
  - (e) What PRECAUTIONS should be taken to protect the teacher's important documents during the fixing process?

## 15.7 Utility Programs for Computer Maintenance

- **Utility programs are SPECIALISED SOFTWARE TOOLS that help MAINTAIN, OPTIMISE, and PROTECT a computer.**
- They work in the background or are run MANUALLY to keep the system running efficiently.

| Utility Program         | Purpose                                                                     | Examples                                          |
|-------------------------|-----------------------------------------------------------------------------|---------------------------------------------------|
| Antivirus / Antimalware | Detects and removes viruses, spyware, and malware                           | Windows Defender, Avast, Kaspersky, Malwarebytes  |
| Disk Cleanup            | Removes temporary files, cache, and junk to free space                      | Windows Disk Cleanup (built-in); CCleaner         |
| Disk Defragmenter       | Reorganises fragmented files on HDD for faster access (not needed for SSDs) | Windows Defragment & Optimise Drives; Defraggler  |
| Backup Tools            | Creates copies of files to protect against data loss                        | Windows Backup; Acronis True Image; Google Drive  |
| Compression Tools       | Compresses files into smaller archives for storage or transfer              | WinRAR, 7-Zip (free), Windows built-in ZIP        |
| System Monitoring       | Displays CPU, RAM, disk, and network usage in real time                     | Task Manager (built-in); CPU-Z; HWMonitor; Speccy |
| Partition Manager       | Creates, resizes, and manages hard drive partitions                         | Windows Disk Management; EaseUS Partition Master  |
| Screen Capture Tools    | Captures screenshots or records the screen                                  | Snipping Tool (Win+Shift+S); ShareX; OBS Studio   |



## Class Exercise 15.1 – Software Management Tasks

- **Complete ALL tasks on the school computer. Record your findings in your exercise book.**
- **TASK 1 – TASK MANAGER INVESTIGATION:**
  - Open Task Manager (Ctrl + Shift + Esc). Record: (a) How many processes are running. (b) CPU and RAM usage percentage. (c) Which application is using the MOST memory. Write a short report on your findings.
- **TASK 2 – DISK CLEANUP:**
  - Search 'Disk Cleanup' in Start. Identify how many MB of temporary files could be removed. Record the types of files and total size BEFORE and AFTER cleanup.
- **TASK 3 – SOFTWARE DIAGRAM:**
  - Create a diagrammatic representation of the THREE categories of computer software (hand-drawn or digital). Show at least 3 subcategories with 3 examples each.
- **TASK 4 – FLOWCHARTS:**
  - Draw a flowchart for: (a) Installing a new application on Windows, from download to first launch. (b) Troubleshooting a computer that is running very slowly.
- **TASK 5 – PRACTICAL UNINSTALL:**
  - Uninstall a test application (confirm with your teacher first). Use Settings → Apps method. Record EVERY STEP you took.



## Homework Assignment – Topic 15

- **Complete ALL THREE tasks and bring your work to the next lesson:**
- **TASK 1 – RESEARCH: 32-BIT vs 64-BIT OPERATING SYSTEMS:**
  - Research the difference between a 32-bit and a 64-bit operating system. Write a half-page report explaining: what the terms mean, which is better and why, and how to check whether your computer is running a 32-bit or 64-bit OS.
- **TASK 2 – WINDOWS 11 HARDWARE REQUIREMENTS:**
  - List the MINIMUM HARDWARE REQUIREMENTS for installing Windows 11. Compare these with the hardware of the school computers. Are the school computers capable of running Windows 11? Explain your findings.
- **TASK 3 – PRACTICAL COMPRESSION:**
  - Download and install 7-Zip (free) on a home computer. Compress a folder of documents into a .zip file. Record: (a) Original folder size. (b) Compressed file size. (c) Calculate the PERCENTAGE OF COMPRESSION achieved. Show your working.



## Revision Questions – Topic 15

- **Answer the following questions in your exercise book:**
- 1. Define 'operating system'. State FOUR functions it performs and give one example of each.
- 2. State the difference between system software and application software. Give TWO examples of each.
- 3. Classify the following: Windows 11, VLC, BIOS, Python Interpreter, Disk Defragmenter, Git, Gmail.
- 4. What is a device driver? What happens when a driver is missing or outdated?
- 5. Describe the difference between a COMPILER and an INTERPRETER. Give one example of each.
- 6. State the SEVEN STEPS of the troubleshooting process in the correct order.
- 7. A student tries to install software but gets an error saying 'Insufficient permissions'. What should they do?
- 8. What is the purpose of: (a) Disk Cleanup (b) Antivirus (c) Disk Defragmenter (d) Backup Tools?
- 9. What is a bootable USB drive and why is it needed to install an OS?
- 10. What keyboard shortcut would you press to force-quit an app that has stopped responding?



## Key Terms – Topic 15 Glossary

| Term                  | Definition                                                                                                    |
|-----------------------|---------------------------------------------------------------------------------------------------------------|
| Operating System (OS) | The most important software on a computer; manages hardware and provides a platform for application software. |
| System Software       | Programs that operate and control the computer's hardware (OS, drivers, utilities, firmware).                 |
| Application Software  | Programs designed to help users accomplish specific tasks (Word, Chrome, VLC).                                |
| Device Driver         | Software that allows the OS to communicate with a specific hardware device.                                   |
| Firmware              | Low-level software permanently embedded in hardware (e.g., BIOS/UEFI on a motherboard).                       |
| Utility Program       | Specialised tool for maintaining, optimising, and protecting a computer (antivirus, Disk Cleanup).            |
| IDE                   | Integrated Development Environment — an all-in-one tool for writing, testing, and debugging code.             |
| Compiler              | Translates entire source code to machine language and produces an executable file.                            |
| Interpreter           | Translates and executes source code line by line without producing a separate file.                           |
| Bootable USB          | A flash drive configured to start a computer and run an OS installer.                                         |
| ISO File              | A compressed image file containing all files of an OS installation disc.                                      |
| BSOD                  | Blue Screen of Death — a Windows error screen indicating a critical system failure.                           |

# **End of Topic 15**

Basic Software Management

Next Topic: Advanced Software Applications