Operating Systems

- Tells the hardware what to do.
- Allows the computer to run other applications.
- Controls the operations of a computer.
- Provides an interface between the computer and a user.
- Hides the complexities of the hardware from the user.

Examples include:
- Microsoft Windows
- Apple OS X
- Linux
- Android
- Apple IOS

Operating System Features

User Management	File Management
• Individual users can be created and deleted. • Allows more than one person to use a computer with their own files and settings. • Access levels control user access to systems for security. • A log is kept of files a user creates, accesses, edits and deletes.	• All files are given a name. • Files are stored in folders. • Users can create, modify, move, and delete files and folders. • Users can sort or search for files and folders. • Users can restore deleted files. • Users can set access rights to files.

Multitasking	Peripheral Management

• Many tasks can be executed on a computer simultaneously.
• An operating system has several processes running at the same time.
• Processor is given a small part of each task one after the other.
• All tasks appear to be executing at the same time.
• In reality, resources are shared between tasks.
	• Allows devices to communicate with the computer.
	• Data is transferred between devices and the processor.
	• Controlled using Device Drivers:
	  ○ Contain instructions on how to control a device.
	  ○ Each device has its own driver.
	  ○ Any device can be used if a driver is available.
	  ○ Drivers can be updated to give better performance or fix bugs.

1.5 – Systems Software

| Interface between the hardware and applications | Programs that run application software. | Software that helps the computer to run |

User Interfaces

- Allow the user to interact with the computer in a visual way.
- Graphs, text or audio are presented to the user.

GUI

- A type of interface that uses Windows Icons Menus and Pointers (WIMP) to represent the interaction between the user and a computer.
- Users use a mouse to interact with features displayed on the monitor.
- Powerful and easy to use but require a lot of processing power.

CLI

- User types a text command using the keyboard.
- The computer displays the results on the monitor.
- Requires little processing power and is extremely powerful.

Memory Management

- The management and organisation of memory at the system level.
- Memory is allocated between the different programs which are open.
- Programmers and users need not know where in memory data is held.
- Allocates free memory to programs that need it
- Frees up memory which is no longer needed.
- Controls the computer's memory to optimise performance.

Utility Software

Defragmentation Software	Encryption Software	Data Compression
• Files on a disk are broken down into a series of segments. • When files are deleted, the segments where they were stored are made available for new files. • The new file may need more segments than the old, and so the segments allocated to it are not together on the disk. This is known as fragmentation. • A fragmented disk takes longer to read from and write to, making the computer slower. • Defragmentation software rearranges the segments so that they are stored next to each other. • This decreases read/write time and improves performance.	• Scrambles the contents of files so they can only be understood by authorised users. • A key or secret code is needed to descramble the content. • Takes longer for messages to be sent and received. • Increases security as data cannot be read if stolen. • Can encrypt individual files or the whole hard disk.	• Reduces the size of a file. • Uses algorithms. • Smaller files are easier to transmit. • Allows more files to be stored in the same space. • Lossless - no data is lost and the original can be recreated. • Lossy - some data is lost and the original file cannot be recreated.