Module 1: Digital Fundamentals and Hardware

This module is the foundation of everything. We'll explore how technology has transformed our society and dive into the essential components that make this revolution possible. We will also analyse the trends that are defining the future of hardware.

Theoretical Content: The Theory in 2025

The Digital World

Today, we live in the era of digital transformation. The Internet of Things (IoT) is no longer a novelty but a daily reality. Millions of smart devices—from home appliances to industrial sensors—communicate with each other, generating massive amounts of Big Data.

This information is processed in the Cloud and analysed with Artificial Intelligence (AI) to make more efficient decisions. The connected society brings crucial challenges, such as cybersecurity and data privacy.

Components and Peripherals

Hardware is the backbone of any computer system. In 2025, the CPU (Central Processing Unit) and GPU (Graphics Processing Unit) are still the most important components, but they are now complemented by the NPU (Neural Processing Unit), a specialised chip for AI tasks.

The motherboard acts as the computer's nervous system, connecting all the components: the RAM (Random Access Memory), which temporarily stores data, and the storage drives.

Hardware Trends

Hardware innovation focuses on miniaturisation and mobility. Mobile devices—smartphones, tablets, and the new foldable smartphones—are the most used computers. Wearables, such as smartwatches and augmented reality (AR) glasses, are increasingly integrated into our daily lives.

One of the most revolutionary trends is Edge Computing. Instead of sending all data to the Cloud for processing, critical tasks are executed locally, close to the data source.

Every digital interaction leaves a digital footprint that must be protected. The ability to understand this ecosystem is key for any professional in the sector. It is crucial to differentiate between an SSD (Solid-State Drive) and a hard drive (HDD), with the NVMe SSD being the high-speed standard for modern computers.

As for peripherals, they are no longer just accessories. Monitors with high refresh rates, webcams with AI functions, and headphones with noise cancellation are essential elements for both work and leisure. This drastically reduces latency and is vital for real-time applications like autonomous vehicles, drones, and industrial automation.

Vocabulary, Expressions, and Grammatical Structures

Here is the language your students will need to speak fluently about these topics.

General & Digital World

- **Digital evolution:** Evolución digital
- **Internet of Things (IoT):** Internet de las Cosas (IoT)
- **Connected society:** Sociedad conectada
- **Big Data:** Big Data
- **Cloud Computing:** Computación en la Nube
- **Cybersecurity:** Ciberseguridad
- **Digital footprint:** Huella digital
- **Technology ecosystem:** Ecosistema tecnológico
- **Latency:** Latencia
- **User interface (UI):** Interfaz de usuario

Hardware & Components

- **Internal components:** Componentes internos
- **Motherboard:** Placa base
- **Central Processing Unit (CPU):** Unidad Central de Procesamiento (CPU)
- **Random Access Memory (RAM):** Memoria de Acceso Aleatorio (RAM)
- **Storage:** Almacenamiento
- **Solid-State Drive (SSD):** Unidad de Estado Sólido (SSD)
- **Hard Disk Drive (HDD):** Disco duro (HDD)
- **Input/output peripherals:** Periféricos de entrada/salida
- **Power Supply Unit (PSU):** Fuente de alimentación
- **Cooling system:** Sistema de refrigeración
- **Bandwidth:** Ancho de banda

Trends & Concepts

- **Mobile devices:** Dispositivos móviles
- **Wearables:** Wearables
- **Edge Computing:** Computación en el borde (Edge Computing)
- **Artificial Intelligence (AI):** Inteligencia Artificial (IA)
- **Augmented/Virtual Reality (AR/VR):** Realidad Aumentada/Virtual (AR/VR)
- **Obsolete hardware:** Hardware obsoleto

To describe importance

- "It's crucial to understand how the CPU works."
- "It plays a key role in system performance."
- "Cybersecurity is of vital importance."

To compare technologies

- "The SSD is much faster than the HDD."
- "Edge Computing offers a significant advantage over Cloud Computing in terms of latency."

To talk about trends

- "The market is evolving towards mobile devices."
- "Edge AI is expected to be a dominant trend."
- "The technology is at the forefront of innovation."

To express functionality

- "The processor is responsible for executing instructions."
- "Peripherals allow the user to interact with the system."

Grammatical Structures

Simple Present Tense: To describe facts and functions. Example: "The CPU processes information. The motherboard connects the components."

Modal Verbs (can, could, should): To express ability, possibility, or recommendation. Example: "A good cooling system can prevent overheating. You should consider a fast SSD for your PC."

Passive Voice: To describe processes where the subject is the object of the action (common in technical language). Example: "The data is processed by the CPU. The components are connected to the motherboard."

Comparative and Superlative Clauses: To compare hardware. Example: "The NVMe drive is the fastest storage option. The new GPU is more powerful than the previous model."

Functional Language

The goal is for students to be able to do things with the language.

Describing a component

"This is a graphics card. Its main function is to render images."

Explaining a process

"First, the data is loaded into the RAM. Then, the CPU processes the information and sends the results to the GPU."

Comparing two systems

"The mobile device is more portable, but the desktop PC offers better performance for gaming."

Expressing a technical opinion

"In my opinion, Edge Computing is the future of IoT because it reduces latency significantly."

"I believe that the NPU will become a standard component in all computers soon."

Practical Part: Applying the Theory in 2025 💻

This practical plan is designed for you to actively engage with the updated theoretical content on digital fundamentals and hardware. These activities will help you use new vocabulary and grammatical structures, preparing you for real-world scenarios.

Activity 1: The Digital World & Its Language

This section focuses on helping you understand key concepts of our connected society through targeted exercises.

01

Read and Define

You will read a list of the updated vocabulary and match each term with its correct definition. Example: Match the term Cloud Computing to "The practice of using a network of remote servers hosted on the internet to store, manage, and process data."

- A. Edge Computing
- B. NPU
- C. Digital Footprint
- D. Latency
- E. Big Data

Match with definitions like: "A chip specialised for AI tasks," "The trail of data left by a person's online activity," "The delay before a data transfer begins," "Processing data close to the source," "Extremely large data sets that may be analysed to reveal patterns and trends."

02

True or False

Decide whether the following five sentences are true or false based on the theoretical content.

1. The Internet of Things (IoT) connects only computers and smartphones.
2. An NPU is the primary processor responsible for general-purpose computing tasks.
3. Edge Computing is designed to significantly reduce latency by processing data locally.
4. Protecting your digital footprint is considered a key aspect of cybersecurity.
5. Cloud Computing requires all data to be processed on-site, in your own office.

03

Dialogue Completion

Complete the following dialogue using the words provided. (Words: digital, IoT, footprint, security, devices)

> **A:** I've heard a lot about our (1)... world. It seems like everything is connected now.
>
> **B:** That's right. The (2)... is everywhere. I have so many (3)... in my house, from my fridge to my doorbell.
>
> **A:** I worry about my online (4).... Is it easy to protect?
>
> **B:** It can be challenging, but using strong passwords and understanding (5)... protocols is key.

Activity 2: Hardware in Action

You will apply your knowledge of modern hardware components and trends.

Compare and Contrast

In pairs, you will use a table to compare three different types of storage drives: a traditional HDD, a standard SSD, and a modern NVMe SSD.

CRITERION	HDD (Hard Disk Drive)	SSD (Solid-State Drive)	NVMe SSD
Speed	Slowest	Fast	Fastest
Cost	Least expensive	More expensive	Most expensive
Use Case	Data archives, backups	General-purpose computing	High-performance computing, gaming, AI
Noise	Noisy (moving parts)	Silent	Silent
Physical Size	Largest	Compact	Smallest

Case Study: The PC Upgrade

Read the following scenario and propose a solution.

"A client is complaining that their computer is very slow when using a new AI image-generation program. Their PC has an i5 CPU, a standard SSD, and a good GPU. The client wants to know why the program is so slow and what they should upgrade. You must identify the problem and make a specific recommendation, explaining your reasoning."

Model Response:

"Based on your description, the likely issue is the lack of a dedicated NPU. While the CPU and GPU can handle some AI tasks, the new AI programs are optimised for the specialised Neural Processing Unit. We recommend you upgrade your motherboard and processor to one that includes an integrated NPU, which will dramatically increase the speed and efficiency of your AI applications."

Activity 3: Future Trends & "Your Turn"

This section is for you to think critically and express yourselves professionally about cutting-edge technology.

Group Discussion

Divide into three groups. Each group will discuss a specific trend based on the theoretical content. After a brief discussion, a group leader will present a summary to the class. 🗣️

Group A: The Future of Wearables

Task: Discuss the potential of AR glasses and new health sensors in wearables.

Example Discussion Points: "I think AR glasses could be used for interactive learning in schools. For a professional, they could overlay instructions on a machine in real time. Also, new sensors in smartwatches could predict health issues before they become serious problems."

Group B: Edge Computing in Everyday Life

Task: Brainstorm examples of how Edge Computing could be used in smart cities or for delivery drones.

Example Discussion Points: "For a smart city, Edge Computing would allow traffic lights to react instantly to traffic flow without sending data to a central cloud. For a delivery drone, it would process obstacle data in real-time, preventing crashes and ensuring a faster response."

Group C: AI-Powered Peripherals

Task: Talk about how AI could improve webcams, headphones, or monitors in the future.

Example Discussion Points: "An AI webcam could automatically frame the speaker during a video call. AI headphones could intelligently block out specific sounds while letting others through, like a car horn. A monitor could use AI to automatically adjust settings for better eye comfort based on the user's focus."

Your Turn: The Technology Consultant

This is a role-playing activity.

Student A (The Tech Consultant)

You are a professional at a tech conference. Your goal is to advise a client on how to use modern technology to solve a problem.

Student B (The Client)

You are a small business owner. Explain a problem you have. For example, your inventory tracking is too slow, or your security cameras have too much latency.

Example Dialogue:

Client: "My small business is growing, but our security cameras have a big delay. When someone enters the store, it takes a few seconds to appear on the monitor, which is a problem for us."

Consultant: "Ah, I see. That sounds like a classic latency issue. In my opinion, the best solution would be to integrate Edge Computing into your security system. It processes the camera's video data on-site, right where it's collected, instead of sending it all to the cloud. This reduces the delay to virtually zero, giving you real-time monitoring. You'll also get a faster alert system, which is crucial for cybersecurity."