CPT 122 – Introduction to computer Hardware

Module 3, Unit 2: Assembling a Computer System

Building a computer system is a rewarding experience, allowing you to customize a machine that perfectly fits your needs. This presentation will guide you through the process of assembling a computer system, covering each step from component selection to final setup.

Component Selection

Motherboard

The motherboard is the foundation of your computer system. It holds all the essential components together and provides the pathways for data to flow between them. Choose a motherboard that supports your desired CPU, RAM, and storage options.

Step 2: CPU

The CPU is the brain of your computer. It handles all the calculations and instructions that power your applications and games. Consider your budget and the types of tasks you plan to perform when choosing a CPU.

RAM

RAM is the computer's short-term memory. More RAM means faster performance for multitasking and demanding applications. Choose RAM that is compatible with your motherboard and the speed requirements of your CPU.

Storage

Storage devices hold your operating system, applications, and files. Choose between hard disk drives (HDDs) for large capacity and affordability, and solid-state drives (SSDs) for faster performance and quieter operation.

Case Installation

Case Selection

The computer case houses all the components and provides ventilation. Choose a case that is the right size for your components and that has features like cable management and good airflow.

Motherboard Installation

- ✓ **Install the I/O shield:** This metal plate goes in the back of the case and aligns with the ports on your motherboard.
- ✓ **Install the standoffs:** Screw these small brass or metal pegs into the case where the motherboard will be installed
- ✓ **Place the motherboard:** Carefully lower the motherboard into the case, aligning the ports with the I/O shield and the standoffs with the mounting holes.
- ✓ **Secure the motherboard:** Use the screws provided with your case to secure the motherboard to the standoffs.

Power Supply Connection

- ✓ **Locate the PSU mounting area:** Identify the area in your computer case where the PSU will be installed
- ✓ **Positioning the PSU:** Insert the PSU into the mounting area with the fan facing downward.
- ✓ **Secure the PSU:** Once the PSU is positioned correctly, use the screws provided with your case to secure the PSU in place.

CPU Installation

1

Open the CPU Socket

Locate the CPU socket on the motherboard. Lift the lever or latch to open the socket.

2

Identify the Correct Orientation

Look for the arrow or markings on the CPU and the socket to ensure you're inserting the CPU in the correct orientation. Be very careful not to bend the pins on the CPU.

3

Install the CPU

Holding the CPU by its edges (avoid touching the pins or contacts), gently place it into the socket. Ensure it is properly aligned and fits snugly. Do not apply force or wiggle the CPU once it's in place.

4

Close the CPU Socket

Lower the socket lever/latch to secure the CPU in place. The lever/latch should close easily; if you encounter resistance, check the CPU alignment.

CPU Installation Cont.

5

Apply Thermal Paste

If you are installing an air or liquid CPU cooler, you may need to apply thermal paste to the CPU lid before attaching the cooler. Follow the instructions provided with the cooler for the correct application method.

6

Install the CPU Cooler

Place the cooler on top of the CPU and secure it according to the instructions provided with the cooler. This may involve attaching mounting brackets, screws, or a retention mechanism to hold the cooler in place.

7

Connect the CPU Fan

If your CPU cooler has a fan, connect it to the CPU fan header on the motherboard. Consult the motherboard manual for the location of the CPU fan header.

RAM Installation

1 **Locate the RAM Slots**

Identify the RAM slots on your motherboard. They are typically located near the CPU socket and are longer than other expansion slots.

2 **Open the Clips**

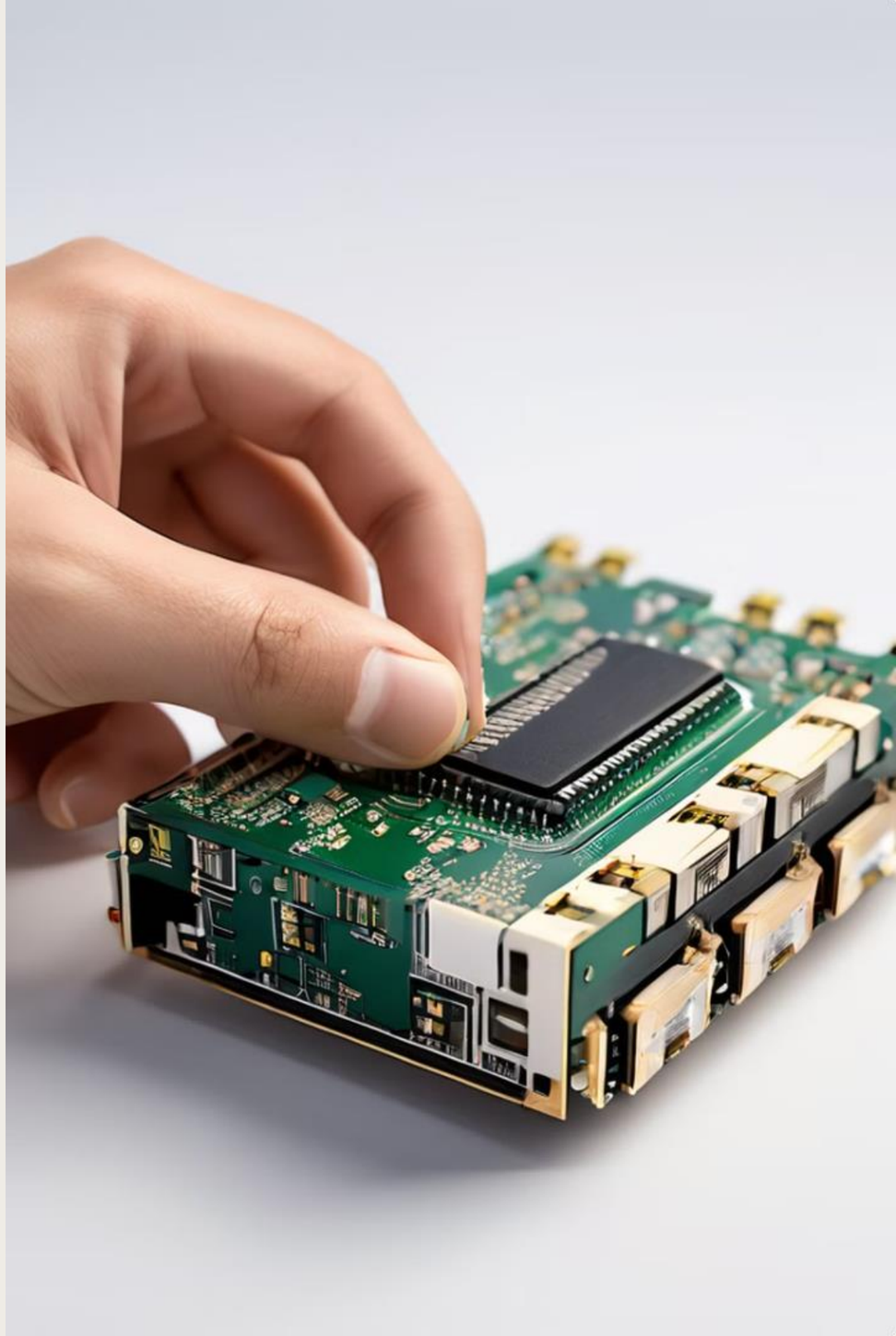
Depending on your motherboard, you may need to open the clips on both ends of the RAM slot. Simply push them away from the slot until they snap into place.

3 **Align the Notches**

Check the notches on the RAM module and the slot to ensure proper alignment. Most RAM modules have a notch in the middle that corresponds to a key in the slot.

4 **Install the RAM**

Holding the RAM module by its edges (avoid touching the gold contacts), gently but firmly push the module straight down into the slot. Apply even pressure on both ends until you hear and feel the clips snap into place.



Storage Device Installation

1

Open Your Computer Case

Depending on your case, you may need to remove a side panel to access the internal components. Consult your case manual for specific instructions on how to open it.

2

Locate the Drive Bays

Identify the drive bays in your case where you can install the storage device. These bays are typically located in the front or side of the case and are designed to hold drives securely.

3

Mount the Storage Device

If you are installing a 2.5-inch SSD or HDD, you may need to use mounting brackets or screws to secure it in a drive bay. For 3.5-inch HDDs, they can slide into dedicated drive caddies or brackets directly.

4

Connect the SATA Cable

Locate an available SATA port on the motherboard and connect one end of the SATA data cable to the port. Connect the other end of the cable to the SATA port on the storage device.

5

Connect the Power Cable

Locate an available SATA power cable from your power supply unit (PSU) and connect it to the power port on the storage device. Most modern PSUs have SATA power connectors specifically for drives.

6

Secure the Cables

Ensure that the SATA data and power cables are connected securely to the storage device to provide stable connectivity.

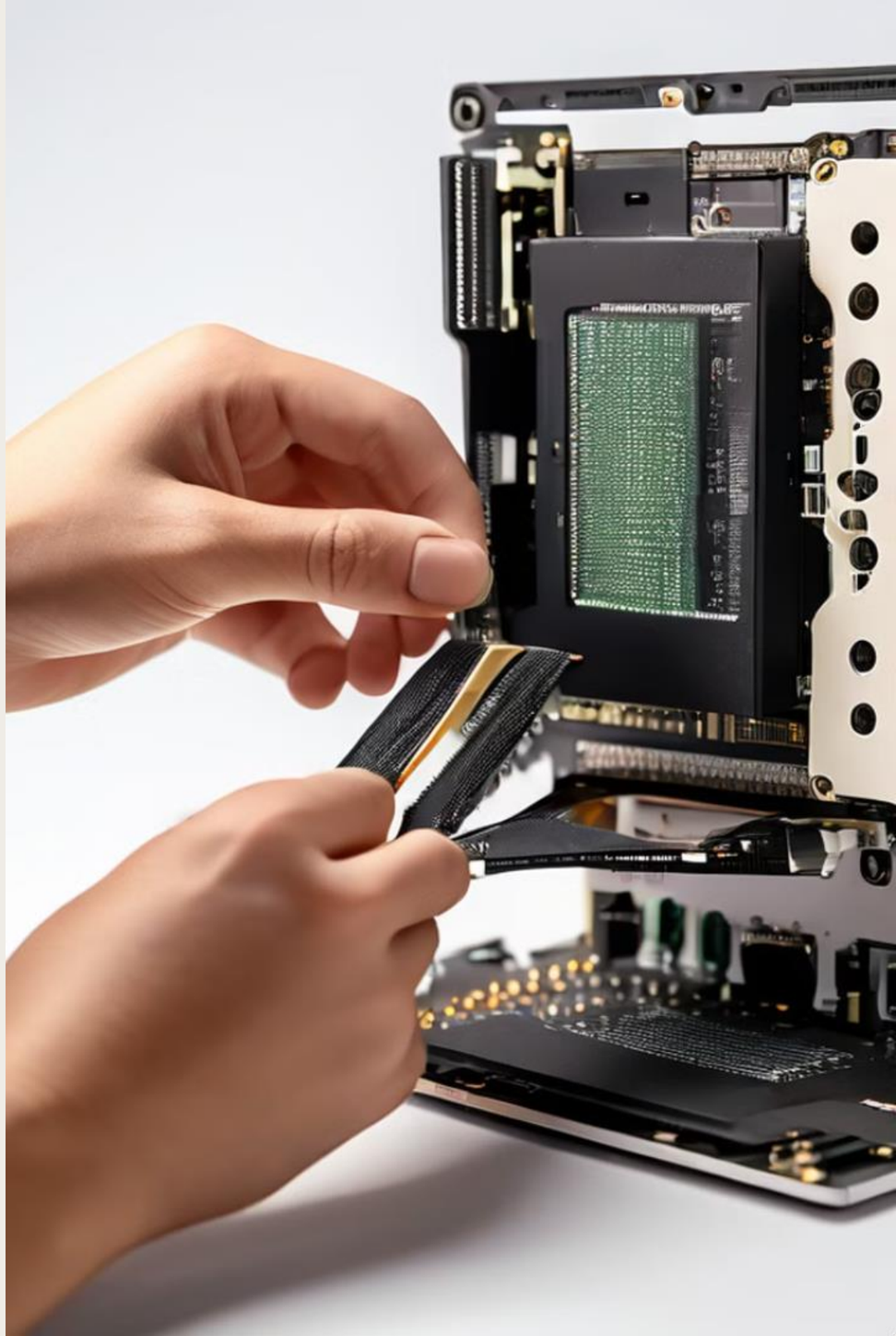
GPU Installation

Locate the PCIe Slot

Identify the PCIe (Peripheral Component Interconnect Express) slot on your motherboard where you'll install the GPU. PCIe slots are typically longer and have a locking mechanism to secure the GPU in place.

Remove the PCIe Slot Covers

Some cases may have metal covers on the PCIe slots to protect them. Remove the appropriate covers to make room for the GPU.



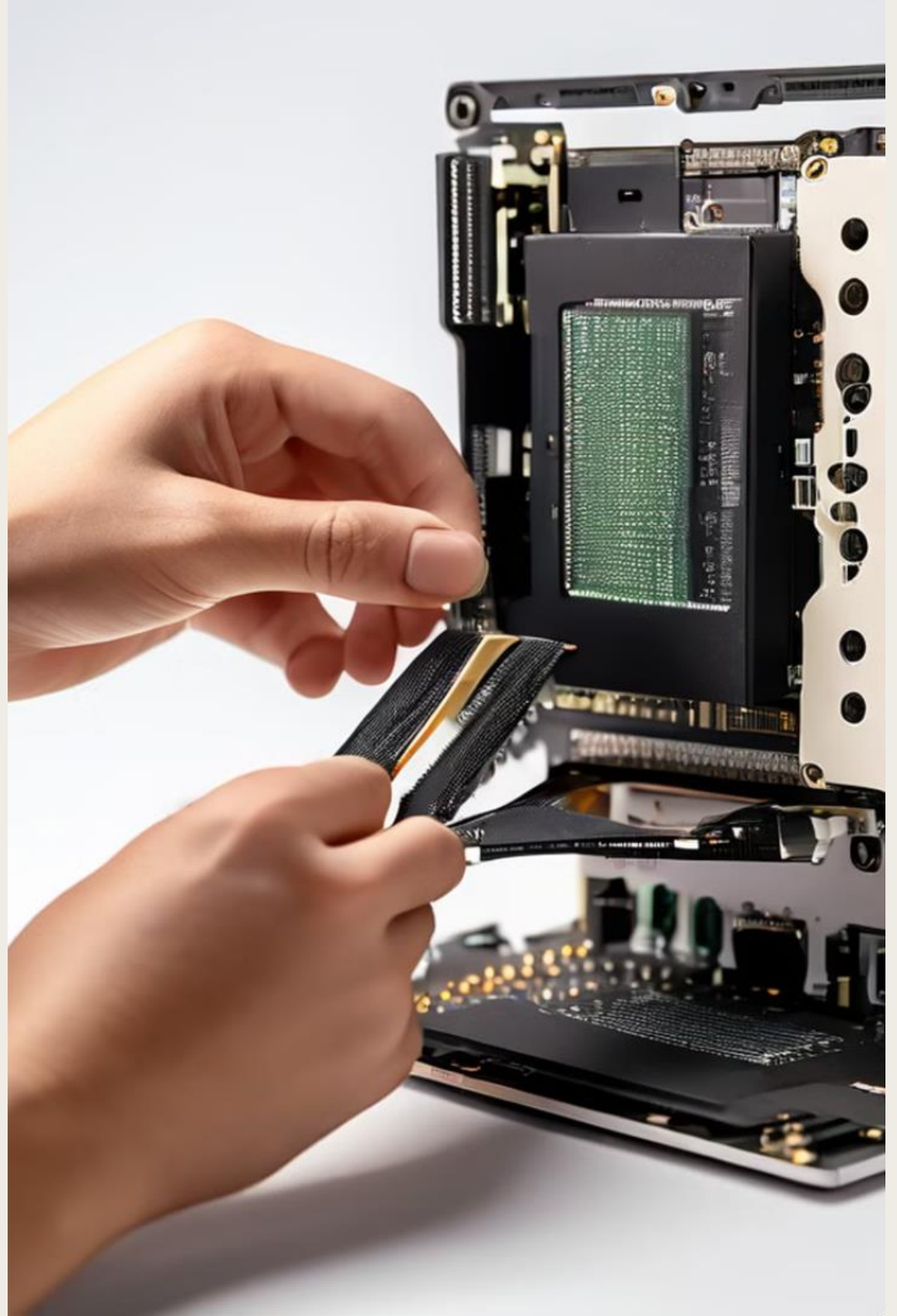
GPU Installation

Prepare your GPU

Carefully remove the GPU from its packaging, handling it by the edges to avoid damaging the delicate components.

Insert the GPU

Align the GPU with the PCIe slot on the motherboard, ensuring that the connectors at the bottom of the GPU line up with the slot. Press down gently but firmly until the GPU is seated securely in the PCIe slot.



Power Supply Unit (PSU) Installation

1 **Locate The PSU Mounting Area**

Identify the area in your computer case where the PSU will be installed

2 **Positioning The PSU**

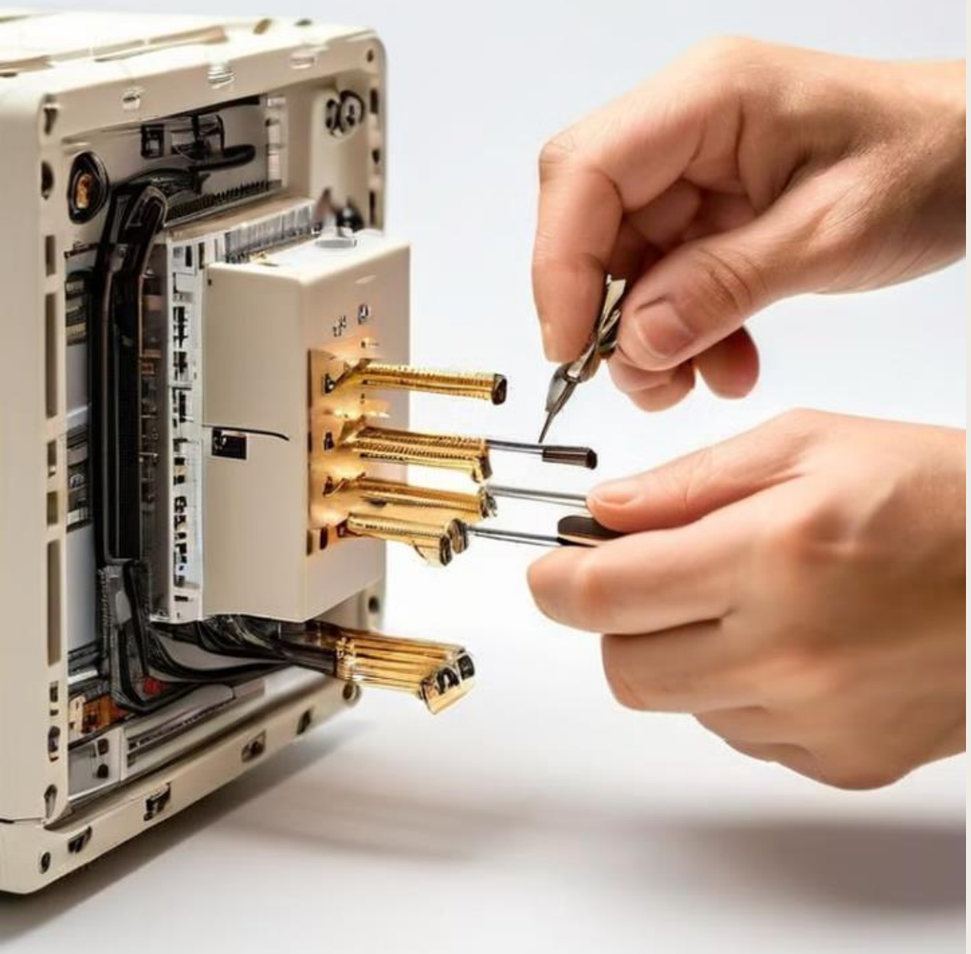
Insert the PSU into the mounting area with the fan facing downward.

3 **Secure The PSU**

Once the PSU is positioned correctly, use the screws provided with your case to secure the PSU in place.

4 **Connect the power cables**

Connect the Motherboard’s main 24-pin power connector, CPU Power connector usually 4-pin or 8-pin, Storage Drives via the SATA power cables and Other Components



Final Connections and Boot-Up

Finalise Internal Connections	Connect the power button, reset button, HDD activity LED, and other front panel connectors to the appropriate pins on the motherboard.
Double-Check All Connections	Before closing up the case, go through each internal connection to ensure everything is properly connected.
Organise Cables	Proper cable management is important for airflow and ease of maintenance. Use cable ties, Velcro straps, or clips to organise and route cables neatly