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| PW-hardware & Networks (30h) |

**General objectives**

At the end of this course, the student will be able to:

* Knowledge of the basic parts of a personal computer PC.
* Role and functioning of each part of a PC.
* Testing different input/output ports and connectors of a PC.
* Assemble and disassemble the different parts of a PC.
* Installation of the operating system.
* Troubleshooting and diagnostic.

* **Chapter-1-: Electrostatic Discharge ESD: (2h)**
  1. Using and connecting an ESD wrist strap and workstation and floor mat.
  2. Apply precautions when handling and working with electrostatic sensitive devices.

* **Chapter-2-: Identification of essential parts: (4h)**
  1. Visualize the different parts (main board, VGA, sound card, HDD, ODD, RAM, CPU, check the connectors (input/output), pack and unpack parts.
  2. Check the output voltage of the power supply.
  3. Check the output voltage of the CPU and chassis fans.

* **Chapter-3-: Input/output Ports: (4h)**
  1. Check the pin out of the following ports: VGA, LAN, USB, Fire-wire, HDMI, eSATA, parallel, serial, sound connectors.
  2. Test the functionality of the ports above using appropriate peripherals (monitor, printer, external HDD…)
* **Chapter-4-: Assembling and disassembling PCs: (10h)**
  1. Essential elements needed to assemble a PC.
  2. Assembling the parts step by step by order using appropriate screws, tools and ESD wrist strap.
  3. Power on the system and check if all the parts are recognized in the system BIOS.
  4. Disassembling the parts by order after disconnecting all input/output peripherals and cables.
* **Chapter-5-: Installing the operating system: (4h)**
  1. How to access the system BIOS and change parameters in the system configuration.
  2. How to choose a suitable operating system.
  3. Install the operating system through ODD.
  4. Check the drivers and install them if necessary.
  5. Test the system performance.
* **Chapter-6-: Troubleshooting: (6h)**
  1. Beep codes errors.
  2. Failure detection.
  3. Troubleshoot and specify if the defect is related to the software or due to a hardware failure.
  4. Check misconnections.
  5. Replace the defected part and test the system.