Student Sample
IN4—Instructions Assignment 2021

How to Assemble a PC

Introduction:

These instructions have the purpose of generally explaining how to assemble a computer as the process may differ depending on the components that are being used. These instructions are meant to be used after selecting all the components needed to assemble a computer. Before beginning a build, it should be known that components must be compatible with one another, for example, if you are to use an AMD CPU it must be paired with an ASUS, MSI, or Gigabyte motherboard. This concept also applies to limitations such as the amount of MHZ a stick of RAM has and its compatibility with the motherboard, almost all the components rely on compatibility with the motherboard. The motherboard also should be researched so the contact points and outlets can be easily found because all motherboards differ from each other. Finally, before the process begins make sure to not power the PC until the build is finished and to treat all parts carefully as they are all fragile and expensive.

> ***NOTE**: this guide will not contain the instructions needed for custom water cooling. This will only contain all in one water cooling and fan cooling. This is also not a guide for what parts to buy and their compatibility. For building guides visit a trusted PC building website such as https://www.newegg.com.

Components/ Tools Required

- **Case**
- **Motherboard**
- **Central Processing Unit (CPU)**
- **Solid State Drive (SSD)**
- **Graphics Processing Unit (GPU)**
- **CPU Cooling System**
- **Random Access Memory (RAM)**
- **Thermal Paste**
- **Power Supply Unit (PSU)**
- **Phillips Screwdriver**
- **Hard Drive (Optional)**
- **Additional cooling systems (Optional)**
- **All manuals for each component** (*****can be found online if not provided)

Recommended Components (for quality of life)

- **Zip ties (for cord management)**
- **Scissors**
- **Something to organize screws with (such as a pill organizer or pill bottle)**

Step1: Create a Space to Work

- This step is important as all components are small.
- Preferably a flat open space with lots of room to work where you are comfortable working.

Step 2: Installing Motherboard/ Central Processing Unit (CPU)

- Unlatch the CPU housing and avoid touching the golden contact points.
- Gently grab the CPU avoiding the golden pins on the back side. Carefully place the CPU in the housing in the correct orientation which should be marked with a symbol or notches which are on both the CPU and motherboard. This should fit easily and shouldn't need to be forced in the socket.
- After the CPU is in the housing, close the latch on the housing. This part may need to be forced and some motherboards come with a plastic piece that will pop off the front once closed, this part should be saved.

Step 3: Applying Thermal Paste/ Installing the cooling system

***NOTE:** Before applying thermal paste make sure that the cooling system doesn't obstruct the orientation of the RAM sticks, if it does you may need to reorientate the sticks or downsize the cooling system.

- After the CPU is installed apply a pea-sized amount of thermal paste directly in the center of the front of the CPU. If too much is applied, it will spill over and this can be cleaned with rubbing alcohol and a cotton swab/ paper towel.
- After the paste is applied view the instructions that come with the cooling system to finish installation as all cooling systems differ based on the type of cooling being used.
- Plug in the cooling system into the motherboard that is labeled 'CPU fan' or 'CPU fan header' to power the system, if an all-in-one system is being used there should be a place labeled 'AIO pump' to plug a second cable in to.

Step 4: Installing the Solid-State Drive (SSD)

- This step requires you to find the contact points, which should be easily found by looking at the motherboard's manual.
- After the SSD is plugged in you will want to secure it with the screw that is provided, this may require a small amount of force to install.

Step 5: Installing the Random-Access Memory (RAM)

- Before installing make sure the clamps that house the RAM are open.
- Align the RAM sticks so they correspond with the breakpoints on the motherboard, avoid touching the golden contact points. This shouldn't have to be forced and should fit with ease.
- Once installed close the clamps that house the RAM to secure. Refer to the motherboard's manual for optimal placement of RAM.

Step 6: Installing input Output shield (I/O shield)

- Before installing align with your motherboard so it is in the correct orientation with the ports. The I/O shield should come with your motherboard.
- Then place into the case in the correct orientation which should match with the placement of your motherboard. This part will most likely have to be forced into position but it is important to get it secure so the motherboard doesn't fall out in the upcoming steps.

Step 7: Installing the motherboard into the case

***NOTE:** Cases vary widely in size depending on the size so these instructions may not directly apply to all cases, such as cases with doors instead of removable panels.

- Remove both side panels on the case and place them in a safe place with the screws
- Once the interior is visible tuck away the cords, so the installation is more manageable.
- Most cases have a noticeable place to place the motherboard, usually noticeable by at least the screw-holes that correspond to the holes along the side of the motherboard.
- Once putting the board in the correct orientation matching the input output shield as discussed in the previous step, secure the board with the provided screws but make sure to not screw them too tightly to avoid damaging the motherboard. The motherboard should be budging once installed.

Step 8: Installing additional hard drive (optional)

***NOTE:** This is optional and only applies if installing additional storage.

- Locate the bays where the storage units are placed which will vary depending on the case used.
- Remove the bay from the case.
- Depending on the storage unit you are using you will have to visit your cases manual on how to install them as this step varies depending on the storage device used and the type of case.

Step 9: Installing additional cooling systems (optional)

***NOTE:** This step is optional and required only if you bought extra fans for your build. Additional cooling is recommended depending on the heat given off by the components installed to prevent damage. However, most cases come with built-in fans.

- This step also varies widely depending on the size of your case, and the slots available for additional fans. Visit the manual of your case for instructions.
- Orient the fans to make sure the air is flowing into the case which should be visible by the cross bars on the back of the fans.
- Once the fans have been installed make sure to plug them into the fan headers on the motherboard to provide power, this is also where it might be useful to have zip ties for cord management to keep the interior looking neat.
- **This part only applies if you are using an all-in-one cooling system.** Once you have your fans installed, attach the radiator to the main fans/fan, the radiator tends to be large, so you'll want to make sure there is enough space for it.

Step 10: Installing the power supply unit (PSU)

***NOTE:** This step varies on case and power supply unit. Typically, the housing is oriented on the bottom of the case. Some PSUs have a lot of cords while others have little. Most cases make it easy to manage these cables and it is important to do so to avoid obstructing air flow into the case.

- Slide the PSU into the designated location and make sure the fan is oriented pointing outside the case.
- Use the screws provided to lock the PSU into the correct place.
- The motherboard will have a 24-pin connection that will need to be plugged in, and a 4-8-pin connector for the CPU that needs to be connected.
- The hard drives that you may have installed will require power as well.
- You will have to connect the cords into the corresponding outlets which should be labeled.
- To connect all switches and USB ports you will have to pull out the cords that were tucked away in step 6.
- Inspect each cord to find the corresponding port on the motherboard.

Step 11: Installing the Graphics Processing Unit (GPU)

***NOTE:** This step will vary on the size of your GPU so make sure to check how many slots it will take which can be single, double, or triple slots.

- Remove as many barrier slots as you need depending on the size of your GPU. These slots are located on the outside of the case between the input output shield and the back of the PSU. These may have to be unscrewed or just removed with force depending on the case.
- Gently pick up the GPU and avoid touching the golden contact points.
- Align the GPU with the PCI lane which is on the motherboard and should be running horizontally and be next to the shields previously removed.
- This should be placed without much force and once placed if you removed screws from the slots the screws should be replaced to secure the GPU.
- If your GPU has a cord to connect power, plug that into the corresponding slot into the PSU.

Conclusion

The build should now be completed. Plug in a mouse and keyboard and connect the monitor to the PC, after it is all connected plug in the PSU into an outlet and turn it on. If it does not turn on review all steps and make sure all cords are connected to the right place.