List of Materials for the *Raspberry Pi and Arduino* course

In this document, you will find instructions so you can easily get the components to get started with the course. I have created 2 main categories: Raspberry Pi materials, and Arduino materials.

For most of the components, I haven't included links because:
1. As the course receives students from all over the world, stores/suppliers can be different for each country.
2. It's very easy to find all the components on big websites such as Amazon, eBay, or even in online stores specific to your own country.

Note: if you already have a Raspberry Pi and Arduino board, you can already start now with the Installation and Serial communication sections, while waiting for the other components to arrive.

Raspberry Pi Materials

Raspberry Pi board

If you're buying a new one, choose Raspberry Pi 4. You'll have the choice between 3 configurations: 2GB, 4GB, or 8GB of RAM. The more the better, but of course it becomes more expensive. I personally use the 2GB version and it works perfectly fine for most projects. I would recommend buying the 2GB or 4GB version. Unless you plan on executing high demanding programs, 8GB is something you probably don't need.

If you're using a previous version of the board (RPi 2 or 3) that's fine too and you will be able to follow all the lessons/activities/projects.

Power supply for the Pi

For Raspberry Pi 4 you'll need to power your board with an USB-C connector. For Raspberry Pi 2-3 you'll need a micro-USB connector.

Important: do not power your Pi directly from your computer. This may seem to work, but the delivered current will be too low. Use a proper power supply, for example a smartphone power supply.

Power supply requirements:

- For Raspberry Pi 4, try using a power supply which can deliver 5V - 3.0A min
- For Raspberry Pi 2 and 3: 5V - 2.5A min.

If you can't get those values, the minimum you should aim for is 5V - 2.0A.

The power supply can be a dedicated power supply for Raspberry Pi, or simply a phone charger with the minimum specs described above.

micro SD card

2 important criterions here: the class and the storage capacity.

For the class, choose at least class 10. You should see a "10" inside a circle on the card. Some new cards are even more powerful, if you see a "3" inside a U shape it's even better. If the class of your SD card is too low then it won't be fast enough for the Raspberry Pi OS to run properly.

For the storage capacity, choose at least 8GB, so you have enough space for the operating system and some additional files. 16/32GB is better especially if you plan on installing more software and store image/video files. You can go with more than 32GB but it might require some formatting from your side. In this course I personally use a 16GB micro SD card.

PiCamera V2

You will need the camera if you want to follow the camera part as well as completely finish the final project.

2 options here:
- "Standard" Pi camera V2 (recommended for this course), mounted on a green board.
- "NoIR" Pi camera V2, mounted on a black board. This camera doesn't need light to operate so you can use it in the dark. Note however that in daylight the images will not look as good as the standard camera.

The instructions in this course apply to both cameras, as the way to control them is the same.

Arduino Materials

Everything in an "Arduino kit", or Arduino board + "Breadboard Kit"

If you want to get all the hardware components to finish the course, I recommend you to buy an "Arduino starter kit", or if you already have an Arduino board, buy a "breadboard kit". You'll have to check different kits, as not every one of them will contain all the components you'll need.

As a reference you can search for the Elegoo Arduino Starter Kit, here is the kit on Amazon (US website), with the Arduino Uno (unofficial board - "clone" - made by Elegoo). This kit costs less than 40 US dollars - in the US, and contains all you need for the course plus more.

Depending on your country, you can find the same kit from your local Amazon, other online stores (eBay, Aliexpress), or in more local marketplaces in your country. No need to buy this kit on Amazon, it's widely available. I'm not giving more links for components because it will widely depend on availability and on different suppliers for different countries.

If you don't find the exact same kit, then find a similar kit which contains the following list of components. The brand doesn't matter as long as you have all the components.

If you already have most of the components, you can buy the rest separately (note that you'll often need to buy them in bulk - minimum 5-10 parts).

Arduino board

Almost any Arduino board will do for this course, if you have at least 12 available digital/analog pins, and 3 of them which are PWM compatible.

You can get an official Arduino board, or a clone, they work the same and can be cheaper.

I will personally use an Arduino Uno clone. If you want to follow the course with the exact same circuit/setup and be sure everything is working 100%, then I suggest you get an Arduino Uno.

Hardware components

Again, if you already have an Arduino board, you might find all those components at once in a "breadboard kit".

Here is the list of components:
- USB cable (usually shipped with the Arduino board or in the kit)
- Breadboard
- Set of male-male wires
- Set of resistors containing 220 Ohm and 10k Ohm (super standard values)
- RGB LED, or if you can't find one, 3 LEDs
- Push button
- Passive buzzer (the back should be green)
- LCD screen 16x2
- Potentiometer
- Hobby servo motor
- (optional) External power supply for the servo motor - make sure to respect the max voltage of the servo!!!