Masterclass: From Concept to Prototype to Market for Your New Electronic Product

Hardware equipment:

We will begin building the prototype in the 3rd week of this course, so you have plenty of time to order the hardware equipment specified below:

For the Proof-of-Concept prototype we'll be using the *Arduino Nano 33 BLE Sense* board. This is an amazing little board that will give you plenty of room to grow and expand on the prototype functionality.

This board includes built-in Bluetooth functionality and is based on a powerful Cortex-M4 microcontroller from Nordic called the nRF52840.

It also includes an accelerometer, gyroscope, and magnetometer.

The "Sense" at the end of the board name means it also has lots of other sensors including temperature, humidity, pressure, light, and even a microphone.

There is also a non-*Sense* version which only includes the accelerometer, gyroscope, and magnetometer. It's the same board they just leave off the other sensors.

You can build some amazing products with this board without needing any other boards or circuits.

You can purchase the Arduino Nano 33 BLE Sense from Amazon here.

If you want a version that includes header pins so you can test it in a breadboard

then you can purchase this version.

I won't be breadboarding in this course so I'm using the smaller version without headers. You can always solder on headers if desired in the future.

If you want to be able to run your board from a rechargeable battery then you'll need to also purchase this SparkFun board, and a lithium polymer battery with a JST connector like this one.

If you choose to add this battery functionality just be aware you'll need to solder two wires. No soldering is required for this prototype otherwise.

Then you'll also need a micro-B USB cable to connect the board to your computer for programming. You likely already have plenty of these from previous products but if not here is one you can purchase.

After building the Arduino-based prototype then we'll design a custom board to replace it for mass production.

If you actually want to order samples of this custom board and program them then you'll need a special piece of equipment called a In-Circuit Serial Programmer (ICSP).

Although we'll be programming mostly via a USB port with no special hardware required, on a fresh custom board you need to upload what is called a "bootloader" program which then enables programming via the USB port.

So the first time you program the board you must use an ICSP, but afterwards you can just use the USB port.

Unfortunately, an ICSP is not exactly cheap, and the full commercial version sells for over $500.

You can also purchase this cheaper model that is only supposed to be used for non-commercial educational purposes.

If any of this is confusing, don't worry, and I'll be explaining it all in more detail as we get closer to prototyping.