

**ENSE 481 – Winter 2025**  
**Matthew Ross 200265265**  
**Parts**

I exclusively recommend AliExpress for parts because of my strong capitalistic values. Be sure to get the “Choice” shipping options, it is ~3 weeks to Regina, SK and free shipping for \$10 minimum order.

**Microcontroller Development Board (STM32F103RB Nucleo):**

You probably already have this.

Order Link	<a href="https://www.aliexpress.com/item/1005006878732789.html">https://www.aliexpress.com/item/1005006878732789.html</a>
Price	\$22.64
Datasheet	<a href="https://www.st.com/content/ccc/resource/technical/document/data_brief/c8/3c/30/f7/d6/08/4a/26/DM00105918.pdf/files/DM00105918.pdf/jcr:content/translations/en.DM00105918.pdf">https://www.st.com/content/ccc/resource/technical/document/data_brief/c8/3c/30/f7/d6/08/4a/26/DM00105918.pdf/files/DM00105918.pdf/jcr:content/translations/en.DM00105918.pdf</a>

**E-Paper (WeAct 2.9”):**

This is a clone of the WaveShare brand. I compared with a WaveShare and it takes the same code and seems to perform exactly the same. These were on sale recently for like \$4 a pop.

Order Link	<a href="https://www.aliexpress.com/item/1005004644515880.html">https://www.aliexpress.com/item/1005004644515880.html</a>
Price	\$11.87
Datasheet	<a href="https://github.com/WeActStudio/WeActStudio.EpaperModule/blob/master/Doc/ZJY128296-029EAAMFGN.pdf">https://github.com/WeActStudio/WeActStudio.EpaperModule/blob/master/Doc/ZJY128296-029EAAMFGN.pdf</a>

**K-Type Thermocouple and Digital Converter (MAX6675):**

I am pretty sure this is a cloned chip because it is too cheap but it works flawlessly.

Order Link	<a href="https://www.aliexpress.com/item/1005006604967539.html">https://www.aliexpress.com/item/1005006604967539.html</a>
Price	\$5.89
Datasheet	<a href="https://www.analog.com/media/en/technical-documentation/data-sheets/MAX6675.pdf">https://www.analog.com/media/en/technical-documentation/data-sheets/MAX6675.pdf</a>

**Solid State Relay (SSR-50 DA):**

This is rated for 50A but that is Chinese 50A, so more like 25A but that is way more than enough anyways. I put a silicone pad between this and the junction box to use it as a heatsink but it isn't required.

Order Link	<a href="https://www.aliexpress.com/item/32824320011.html">https://www.aliexpress.com/item/32824320011.html</a>
Price	\$9.18
Datasheet	<a href="https://www.fotek.com.tw/en-gb/download/61">https://www.fotek.com.tw/en-gb/download/61</a>

**The junction box, outlet, cover plate, plug, wire clamp, and wiring can all be bought from your local hardware store. ~\$20**

### **Other Jellybean Parts:**

25-box of buttons.

Order Link	<a href="https://www.aliexpress.com/item/1005006639978083.html">https://www.aliexpress.com/item/1005006639978083.html</a>
Price	\$4.56

480-box of various capacitors.

Order Link	<a href="https://www.aliexpress.com/item/1005006882595026.html">https://www.aliexpress.com/item/1005006882595026.html</a>
Price	\$10.77

600-box of various resistors.

Order Link	<a href="https://www.aliexpress.com/item/1005006706508149.html">https://www.aliexpress.com/item/1005006706508149.html</a>
Price	\$5.31

5 colour box of 22ga silicone wire, silicone insulation is great because it is so flexible and doesn't melt easy.

Order Link	<a href="https://www.aliexpress.com/item/1005008465689313.html">https://www.aliexpress.com/item/1005008465689313.html</a>
Price	\$14.91

20-pack of various soldering protoboards

Order Link	<a href="https://www.aliexpress.com/item/1005006066687667.html">https://www.aliexpress.com/item/1005006066687667.html</a>
Price	\$8.60

625-box of various heatshrink tubing

Order Link	<a href="https://www.aliexpress.com/item/1005002441952057.html">https://www.aliexpress.com/item/1005002441952057.html</a>
Price	\$10.28

30 (5 x 6 colours) 40pin breakable male headers

Order Link	<a href="https://www.aliexpress.com/item/1005007039504981.html">https://www.aliexpress.com/item/1005007039504981.html</a>
Price	\$3.60

3mm silicone pad 100x100mm

Order Link	<a href="https://www.aliexpress.com/item/1005002842166246.html">https://www.aliexpress.com/item/1005002842166246.html</a>
Price	\$4.25

400-box of various rubber grommets

Order Link	<a href="https://www.aliexpress.com/item/1005007523645215.html">https://www.aliexpress.com/item/1005007523645215.html</a>
Price	\$16.48

1000pcs 60mm x 1.8mm nylon zip ties

Order Link	<a href="https://www.aliexpress.com/item/4001244519197.html">https://www.aliexpress.com/item/4001244519197.html</a>
Price	\$11.64