Executive Summary

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We set out to create a variable DC power supply that could provide 2-14V at up to 1.5 amps across two separate channels. It needed to be programmable through SCPI code, safe to use, and accurate.

To achieve these goals, we designed a system around an Arduino Nano and its PWM signals. We broke the project into seven separate parts. Designing and fabricating the enclosure, connecting the system to wall power, creating our SCPI commands, designing the DC-DC converter for the output, creating the voltage regulation code, building the current and voltage sensing block, and designing the human machine interface. We then defined the interfaces between each block and divided up the blocks between us.

We then started the second phase which was the development of each of our blocks. This had its ups and downs, we had to revise multiple interfaces as well as remake part of our power supply. With the necessary revisions, once put together the system did work.

For our third and final phase we connected our blocks together, placed them into the enclosure, and completed the system verification as well as document the results and prepare for presentation. We learned a lot through this project. We learned technical skills like designing circuits, making PCBs, using Arduino Nanos, and reading data sheets. We also learned a lot about project planning, like buying extra parts in case something burns out and using common off the shelf parts so that they can easily be replaced.
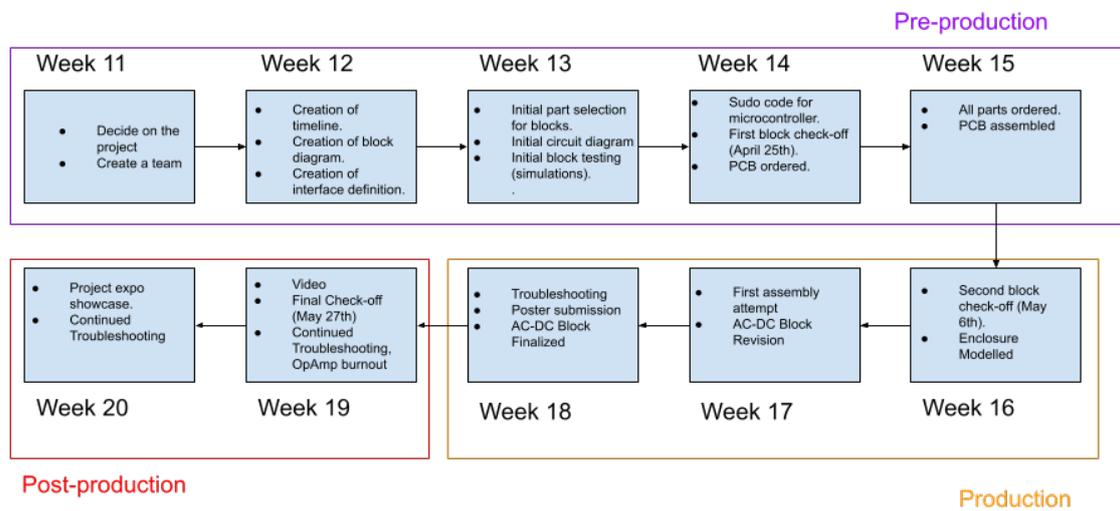

Figure 1: Project Timeline