

Executive Summary

The purpose of this project is to create an actively heated enclosure for a 3D printer. This is an improvement on current solutions, which are usually heated passively by the printer's bed and are unable to maintain high temperatures within the enclosure. This enclosure will instead use a stand alone electric heater. Allowing it to reach a much higher temperature, along with being able to set the temperature to a much more precise value. Additionally, the chamber temperature could be set up from the cloud service (Mainsail) which is pre-built for this project by the project partner.

We began by dividing the workload appropriately which was based on the block diagram of our design. Every team member would pick two interesting blocks. By doing this, it allowed us to develop, debug, and implement our each block as an individual system which would also help later down the line during integration. Once we had our individual working parts which have been verified, we started to assemble the project. This came with its own set of challenges as the project partner requested that we integrate the enclosure into his Mainsail server. But with plenty of assistance from our project partner, we were able to monitor and set the temperature of the enclosure. Now all that was left to do was to make sure the enclosure was capable of reaching and maintaining 70°C. This became an issue we had not seen coming. Although our enclosure was able to be remotely controlled, the power supply unit we originally had was not able to maintain the current necessary to reach the 70°C we had hoped. With more research and planning, we had purchased a new power supply that would later

solve this problem. After the assembling process, we applied several testing to ensure that the enclosure is functioning in its entirety. Finally, the enclosure is working properly and we started dressing up by painting it orange. We had a schedule that we kept for working times on the project, this helped us keep track of how much time we were spending on this individually. We would also meet at least once a week to update the other team members of the progress, and discuss any difficulties we were experiencing. The project timeline image can be seen below.

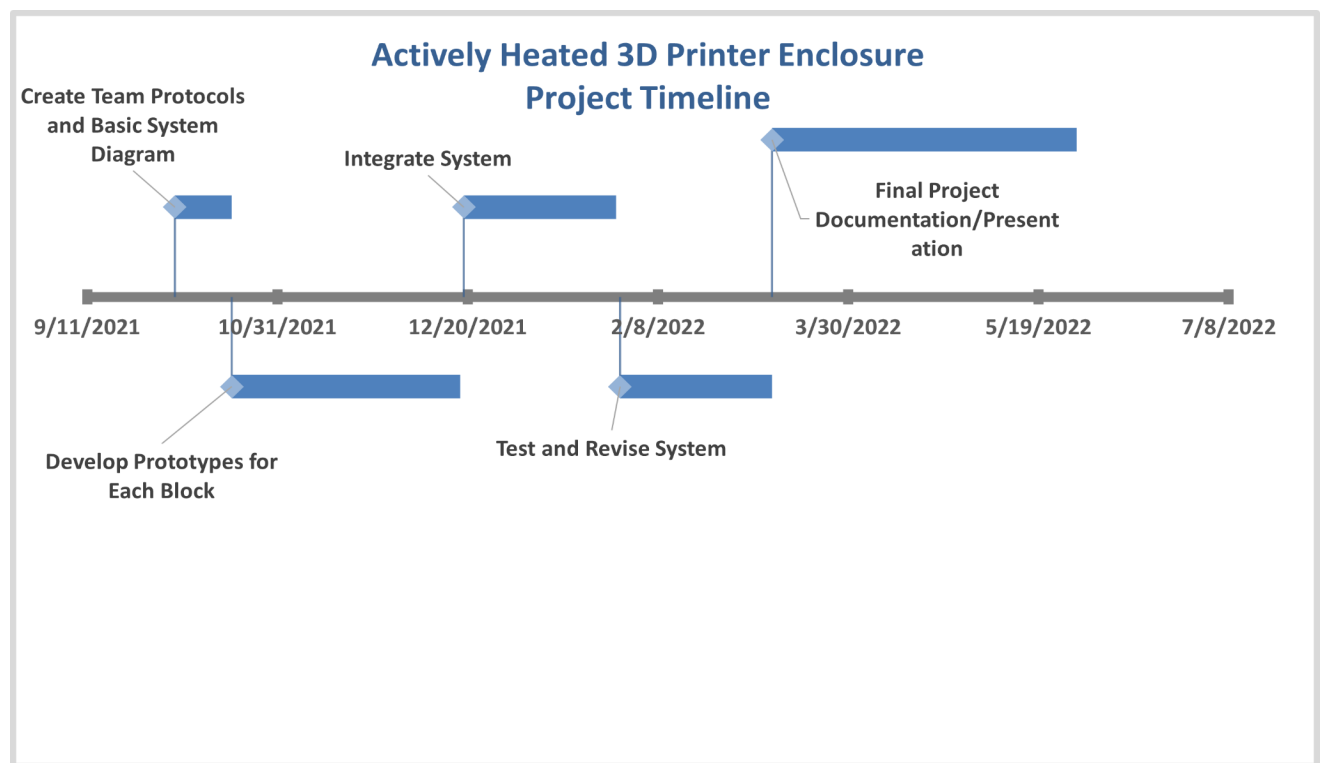


Figure 1: The timeline image of our group from beginning the design process to the final state of assembling

Overall this project helped us develop many different skills such as time management and communication, along with a plethora of technical skills. Through the course of working on this project, we had developed a good understanding and trust between the

team members which is essential for any project whether in school or in the workplace. Additionally, working on a project that had clear goals set by the customer gave the team a very good look into what exactly is needed to accomplish a project with a clear deadline and demands.