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Design Engineering: Take-Home Essay

The Design Engineering class this year was a very exciting and challenging class that challenged your inventiveness and your intelligence to create your own projects that were made up by you. We have learned how to make presentations about or product or our projects to possibly sell and promote to users descriptions of the product and key details. The class has also taught me to work more independently while also learning how to work in group settings on various projects.

In the Design Engineering course we have completed various projects from electronic projects to cosmic ray experimentation. An interesting project from the class the year before us was the LED project. This project was not completed by them and we were given the opportunity to finish what they started. We had to construct the LED kit and figure out what went wrong with their kit so we could fix the problem and order new kits that did not have the major flaw in them. The class was able to fix the problem that was embedded within the kits to make it easier for the buyer of the project to construct and finish with a great finishing product where the LED's made a continuous circle around the circuit board. This project made me realize from the mistake of the class the year before that you need to make sure that all components and all the circuits within the circuit board before ordering the parts from the company that you order them from. The problem that the class before us had was that they constructed the board themselves and in one spot didn't complete the circuit so when the board was ordered and shipped to them the kit didn't work properly. So they had to go in and add bridges to the board which made it messy and complicated. So our Design class went in and order new boards that had finished circuits and we are now selling the LED kits to people who want to

learn how to solder LED's and components together or people that just like to finish fun kits.

In the Design class we got the chance to implement the skills we learned from the LED kit to complete circuits to make a robot perform certain commands and move in certain directions or perform certain maneuvers. This project was worked on from a BOE-BOT kit which was bought for us to work on and learn from. We read through packets in which we learned how to make the BOE-BOT perform certain maneuvers. We then wrote our own programs in the BASIC Stamp module that came with the BOE-BOT kit so we could command the BOE-BOT to perform maneuvers. The BOE-BOT would perform avoidance, navigation, and following maneuvers from what we told it to do from our Stamp program writing module. The BOE-BOT would avoid and follow with Infrared Sensors or "whiskers" that would bump into a wall and tell the BOE-BOT to turn the other way. When we finished learning about the BOE-BOT we made a competition within the class where we would perform certain challenges and the group who performed the task the best would win the challenge. My groups BOE-BOT won the challenge of navigation and we were then the leader in the following challenge. With the BOE-BOT project I learned a lot more about how to make a robot perform certain maneuvers.

A big project that our class has worked on since we were in the Introduction to Engineering class was the Hot Air Balloon project. In this project we build our own hot air balloons out of tissue paper and normally we would fly eggs in it and see who out of the class could fly the farthest and highest. Something different about this year was that instead of eggs we would be flying telemetry systems. My group, Inferno, decided we

wanted to fly our balloon with a GPS system in its gondola so we could map out the flight course and eventually put it on Google earth. We had to come up with the shape that our balloon would be and make orthographic, isometric, and flat pattern drawings of our balloon and gondola. We then had to make calculation of our balloon to figure out the volume and surface are so we could find out if we had enough lift for the payload we were carrying. We had plenty of lift and were able to be approved by Mr. Kliewer to begin building. Unfortunately we were unable to get the GPS system to work so were kind of stuck with no where to go. But we were able to use another group's video system to record video from our flight. The hot air balloon project is probably my most favorite project of the whole class and I feel that I benefit a lot from this project because working in groups helps me to develop skills in working with others and all the steps that we take to build the balloon teach me skills about making calculations to find the lift a hot air balloon.

Towards the end of the year we began working on projects that we cam up with ourselves that we wanted to build, market, and sell. My group decided we wanted to make an amplifier or a speaker system that could be put into a cracker box so it could play an MP3 player. We came up with the idea from a magazine where they had somewhat of the same idea. We used the same circuit that the people in the magazine used and we built our own speaker. We have a potentiometer and a rheostat which control the volume and the on/off switch. Then we incorporated another switch on the side to turn off the battery so it won't drain out while the amp is turned off. The project was very confusing to us since we were basing it off of the one from the magazine but my group mates and I were able to figure it out and make it work. From this project I learned that I

need to be creative and inventive when you’re trying to figure out a problem or trying to understand something that might be confusing to you.

This year in Design Engineering was a very exciting and challenging year that gave the class some challenging projects to conquer. With these projects I learned a lot and will definitely use some of the skills I developed when I am studying how to be a mechanical or an electrical engineer and I am very glad that I got the chance to take the this exciting class.