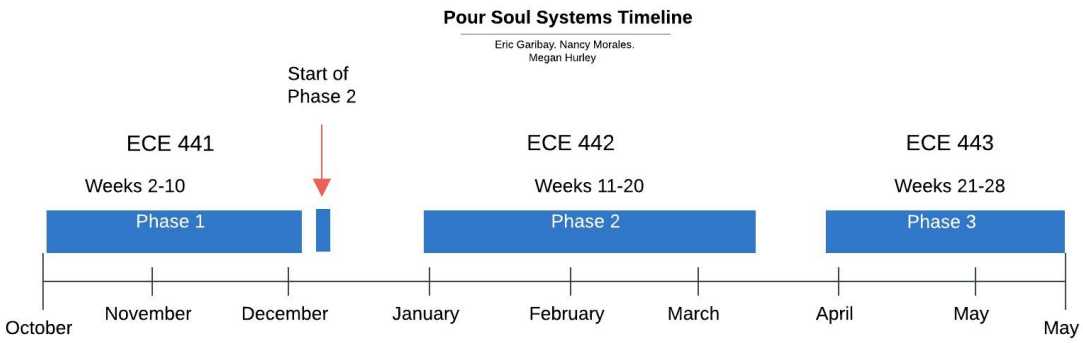
Executive Summary for Group 20: Pour Soul Systems

For the 2020-2021 academic year school year, engineering students Eric Garibay, Megan Hurley, and Nancy Morales are tasked to improve the current prototype Pour Soul Systems have with one that is more energy-efficient and waterproof. The goal of the Pour Soul System digital tap handle project is to optimize the power consumption of the microcontroller used inside the tap handle. What the project sponsor is expecting of the engineers is to decrease the amount of power used in the handle, as well as decrease how often the tap handles are charged. Ideally, the sponsor would like to see them charge every month, but understands that a more realistic goal would be every week.

The project sponsor, Timothy Armstrong, founded his company Pour Soul Systems in 2015 to create the first of its kind, digital tap handles. Traditional beer taps lose 10-20% of the keg due to factors such as flow rate, stealing, or a broken tap. One other struggle the company faces is the battery life on their current prototypes of the digital tap handle since the current battery life makes it so the user must recharge the device every other night. Hence, once this digital tap handle is up to par with their standards, the device will be able to collect and report how much of the keg is used when pouring to customers, see trends of which beers are the most popular to customers in their area, as well reduce how often they need to restock beer since the handle will let them know how much of the keg has been used. The usage of this device will immensely help bar owners, beer makers, and customers alike get some out of their time in a bar while not having to overcompensate their prices for a good beer. As of May 2021, the current design the company is using for a test batch consists of a Raspberry Pi, an accelerometer, and a battery of 2000 mAh that is wirelessly rechargeable.

Currently, the engineering team is nearing the end of phase three of the development process. The team has been working very hard this past year to create the low-energy device that Pour Souls Systems has requested. As we begin closing out this project, there were many challenges and accomplishments the team had. One of our main challenges was the Bluetooth communication between the software hub and the microcontroller. A lot of communication and work went into troubleshooting the issue but this will need to be developed further. However, the main accomplishment we are all proud of is the PCB design since this was the first time any of us had designed one. The end product that we implemented and tested should only need to be charged every week to every couple of weeks and is lighter given the replacement of the Raspberry Pi for an Adafruit itsybitsy microcontroller.



Phase 1:

Requirements Finalized: Week 8
Research Implication Report: Week 10
Project Charter: Week 10

Phase 2:

Technical Demo: Week 11
First Block Check-Off: Week 14
Second Block Check-Off: Week 17
Final Block Check-Off: Week 20

Phase 3:

Initial System Check-Off: Week 25
Final System Check-Off: Week 28
Project Close Out: Week 28
Project Showcase: Week 28

The main thing we learned is that there's no such thing as too much communication. It always helps to over clarify details because even if you think you're talking about the same thing as someone else, it's very possible that you aren't. Over the course of the term we got really good at this with each other but we could have used more of that with the project partners. Through working on communication we learned about how to be adaptable and flexible. Sometimes things just change and you need to change the direction you're going in. Finally, the last key lesson was how to ask for help and use all of our available resources. This proved especially vital in the covid environment because of our own limitations and limits of some traditional resources.