Executive Summary:

The objective of this project given to this team of three was to design and implement a budget lawn mower that is battery powered and joystick controlled. The TekMow is a robotic lawnmower system for productive and efficient mowing. The target consumers of the project would be anyone looking for a cost-effective method to chop, trim or mow grass patches, fields, lawns and gardens to ensure that the grass is well-groomed and grows at an even, appropriate height. The users of this project will have the ability to manually enter commands to control the i.e., an instruction to move the device straight forward.

In order to meet this goal of efficiency and productivity, we designed a system with two communication modules (NRF, GPS), a sensor module(accelerometer), a motor, a microcontroller and a vesc. The motor was used to power the movement of the TekMow, as well as the blades cutting the grass. A Vesc was used to control the speed due to the motors, and also return some information regarding the TekMow(temperature, RPM, current draw). The lawn mower also has features such as location mapping, stability sensing, among many others. The accelerometer was utilized to measure the tilt of certain terrain to ensure the TekMow is always laying as flat as possible on the ground. Additionally, it will test to see if the TekMow has been jostled a certain amount due to some external forces.The GPS was used to track the position of the TekMow, specifically limiting the area in which it can travel within. If the TekMow goes out of communication range, a watchdog timer is set to shut it off. All serial commands including blade usage and movement would be received by the TekMow using the NRF, and any data the TekMow needs to send back to the user is done using the transmitter part of the NRF. Any data packet loss issues from the NRF would be solved by having a checksum in place. Ongoing discussions will strive to perfect the working of this project.

Our team learnt a lot throughout the course of this project. It was a project meant to teach incoming TekBots employees how to use various modules offered in the store, proper project planning and implementation, and augmented our skills such as Arduino familiarity and UART understanding. Finally, we learned how to independently work on sections of an engineering project that will connect with other components to create a complex system from a basic one.