

Career Readiness Challenge

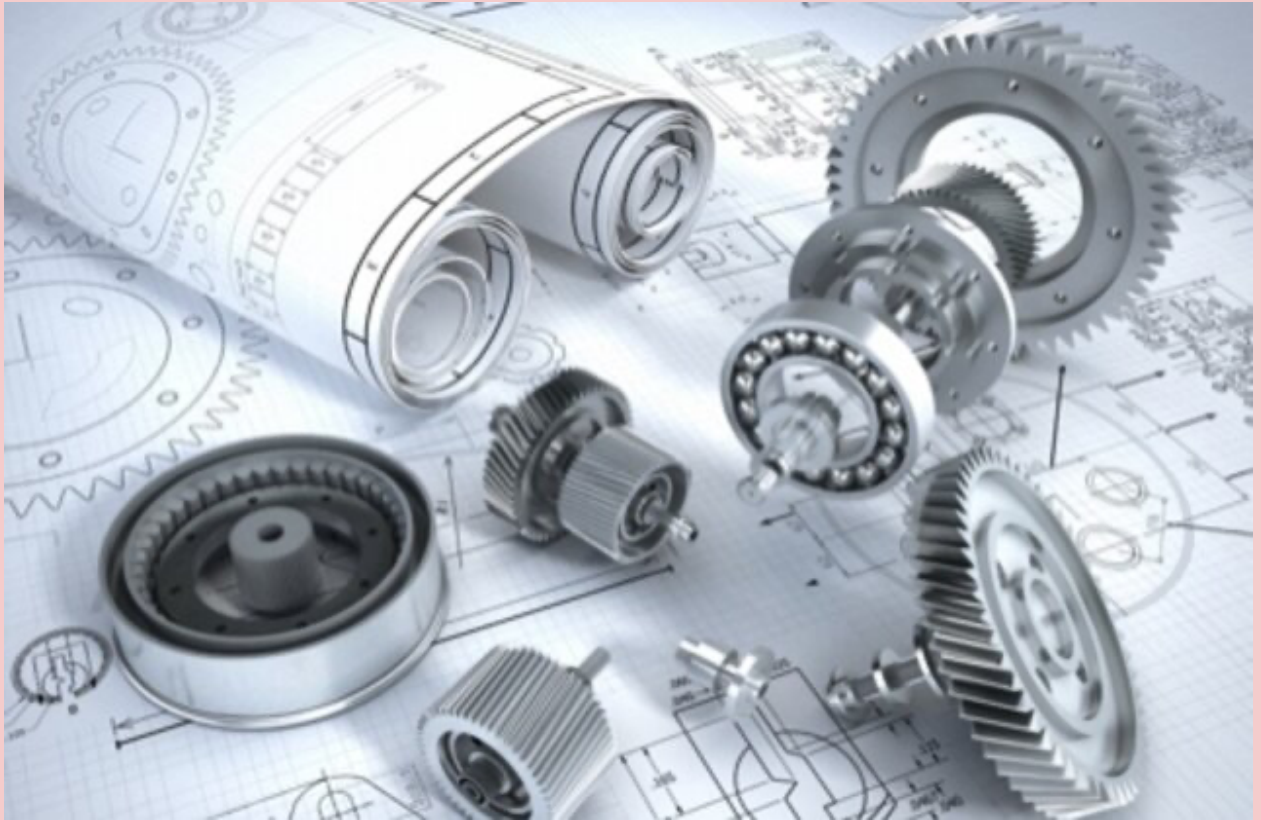
Team 750S

The STEM career that we have chosen is Mechanical Engineering. Using various problem-solving techniques and strategies, Mechanical Engineering creates technologies and machines for the betterment of the world. These engineers are involved in fixing other aspects of the world such as healthcare, transportation, space exploration, climate change, and many more fields. I selected this topic because robotics is closely related to the work that mechanical engineers do, and our team members are collectively interested in this field of work. Mechanical Engineering has aspects of both programming and building. It is essential that Mechanical Engineers be familiar with the different programming languages since it makes it easier for them to build the necessary objects, with reduced human effort. It also significantly reduces the amount of time when building, and it makes it easier for these engineers to spend more time on the other parts of the engineering process. Mechanical Engineers follow the Engineering Process very closely.

In the Engineering Process, there are seven essential steps that Mechanical Engineers must follow in order to achieve success in the products that they build. The first step in the Engineering Process is to Ask. Mechanical Engineers analyze the different problems around them and they look deeper at the problems that they can solve. The second step in the Engineering Process is Research. Mechanical Engineers will research intensely the problem that they faced because they want to create the best possible solution so that they don't have to continuously make changes to it. The third step in the Engineering Process is to Design. After continuously researching, Mechanical Engineers have to start to choose some solutions that are reasonable to them as it depends on the budget, time, and manpower. The fourth step in the Engineering Process is Plan. Now, they must choose the solution that stands out the most to them and that also meets all of the requirements. The fifth step in the Engineering Process is to Create. After finding the most favorable solution, the Engineers must start to create a prototype of the solution. The sixth step in the Engineering Process is Test. After creating a prototype of the solution that is stable, the

Engineers must test it out to see the advantages and disadvantages of the build. The seventh and final step in the Engineering Process is to Improve. Once the Engineers find out the advantages and disadvantages, they must improve the prototype and create a final product that can be used. All of these steps in the engineering process are crucial and important because skipping a step can cause failure in the final product.

Our robotics team follows the Engineering Process closely. First, we looked at the game manual, looking at the different rules and regulations, and we made sure that we knew everything about the game. Then we researched different solutions, which includes the build and how we should strategically get our points. Finally, we picked one build and a strategy with that build and we are continuously improving our robot to get the maximum points possible. Participation in VEX taught all of the members various skills such as building and programming which can help us in our future careers. Not only have we learned these essential skills, but we have also learned numerous qualities such as teamwork and patience that will help us a great deal in the future.



```
src > subsystems > C:\autonomous.cpp > [e] chassis
1  #include "main.h"
2  #include "okapi/api/units/QAngle.hpp"
3  #include "okapi/impl/chassis/controller/chassisControllerBuilder.hpp"
4  #include <cmath>
5
6  using namespace okapi;
7
8  std::shared_ptr<ChassisController> chassis =
9  ChassisControllerBuilder()
10 .withMotors(
11     1, // Top left
12     -2, // Top right (reversed)
13     -3, // Bottom right (reversed)
14     4 // Bottom left
15 )
16 // Green gearset, 4 in wheel diam, 11.5 in wheel track
17 .withDimensions(AbstractMotor::gearset::green, {{4_in, 11.5_in}, imev5GreenTPR})
18 .build();
19
20 okapi::Motor intake_roller_motor(8);
21
22
23 void auton_run1() {
24     int disks_carried = 0;
25
26     Task turntableTask(fixTurntableOffset, TASK_PRIORITY_DEFAULT, TASK_STACK_DEPTH_DEFAULT, "turntable");
27
28     while (disks_carried < 2) {
29         double closest_disk_heading = 0;
30         double closest_disk = 9999999999999999;
31     }
}
```

Sources:

1.

<https://www.mtu.edu/mechanical/engineering/>

2.

<https://jobs.newscientist.com/article/what-does-a-mechanical-engineer-do-/>

3.

<https://www.usnews.com/dims4/USNEWS/2ad0127/2147483647/thumbnail/640x420/quality/85/?url=https%3A%2F%2Fwww.usnews.com%2Fcmsmedia%2F07%2F00354c85a0a99b4abfd67d48bd3e4c%2Fjobs-job-photo-101.jpg>