

The Sky's not the Limit!



Team 6722B - The Insomniacs

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Career Readiness Online Challenge

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Why Astronautical Engineering?



When we saw the prompt for the **Career Readiness Project**, we knew that we wanted to learn more about Astronautical Engineering. As students who are very interested in planetary studies, and learning more about this great void that surrounds our planet, we believed learning more about the engineers that build spacecrafts to traverse this void we call “Space” would be very beneficial for us, as well as an interesting topic to gather research on.

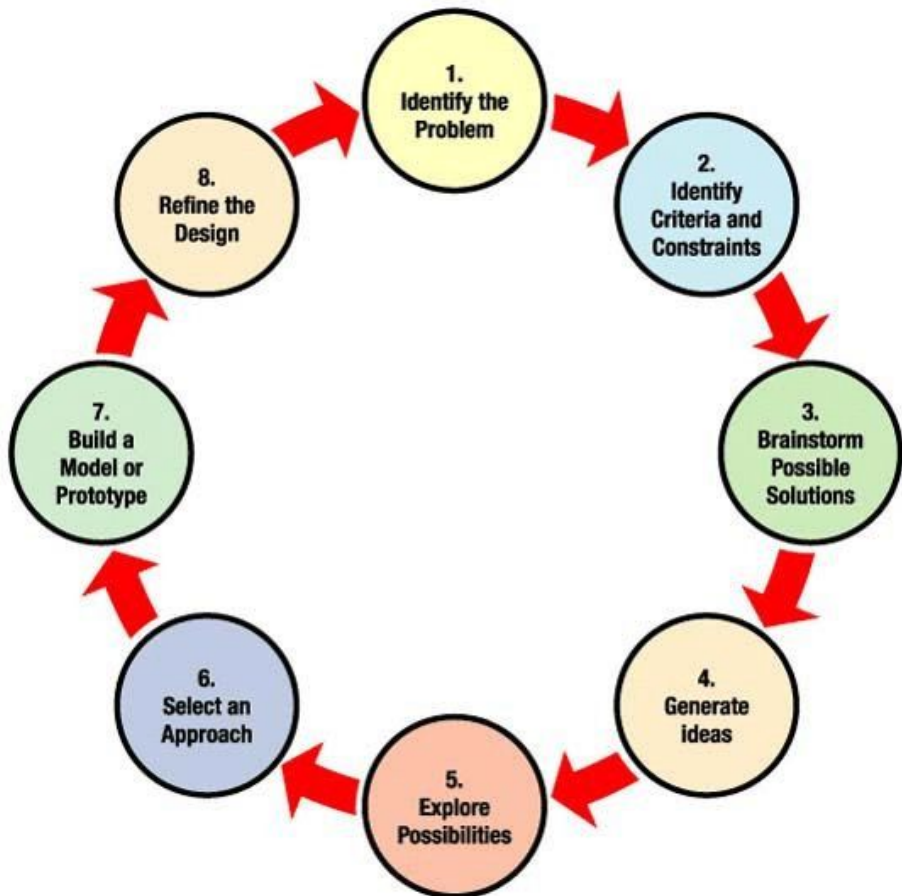
What is Astronautical Engineering?



Astronautical engineering is the field in which spacecrafts, such as planetary probes and satellites, are designed and developed. Astronautical engineering focuses on space and is a subfield of aerospace engineering. Professionals in this field typically have a deep understanding of astrophysics and control systems, both of which are key in creating efficient and successful spacecraft. Astronautical engineers also develop systems to help navigate and communicate to/from space.

Engineering & Design Process

The Engineering & Design Process is implemented to help plan, design, and develop when building. This process, which is implemented by both NASA Astronautical engineers, is similar to the process our team uses in the VEX engineering program. The engineering and design process helps ensure the best possible outcome and efficiency, and involves a broad range of ideas, which allows for a variety of design choices. We use the Engineering & Design process to plan out, design, and then build our bot. In the same way, Astronautical Engineers use the process to plan out, design, and then build their spacecrafts.



Testing is a huge part of our team's Engineering & Design Process. After developing subsystems or prototypes, our team tests the subsystem, and records results from careful observations we made. After, we refine the subsystem, and make it better if we can. Unlike the NASA engineers, we do not share our results with other people or in their case, different departments.

How is VEX a stepping stone for Astronautical Engineering?



VEX Robotics has allowed our team to grow and develop many necessary skills for the field of Astronautical Engineering. Over the years, VEX has also allowed us to strengthen these skills. Building and competing in VEX has allowed us to strengthen our creativity in designing, an essential skill when planning out modern spacecrafts. Additionally, our team has grown, and together we have become great collaborators in team environments, another essential skill for working in big group or team projects. We have also gotten better at documentation and research, which will be incredibly important if we choose to pursue a career in Astronautical Engineering.

How is VEX a stepping stone for Astronautical Engineering?

```
18
19 # Robot configuration code
20 brain_inertial = Inertial()
21 left_drive_smart = Motor(Ports.PORT6, False)
22 right_drive_smart = Motor(Ports.PORT10, True)
23 drivetrain = SmartDrive(left_drive_smart, right_drive_smart, brain
24
25
26 def calibrate_drivetrain():
27     # Calibrate the Drivetrain Inertial
28     sleep(200, MSEC)
29     brain.screen.print("Calibrating")
30     brain.screen.next_row()
31     brain.screen.print("Inertial")
32     brain_inertial.calibrate()
33     while brain_inertial.is_calibrating():
34         sleep(25, MSEC)
35     brain.screen.clear_screen()
36     brain.screen.set_cursor(1, 1)
37
38 # Begin project code
39 # Calibrate the Drivetrain Inertial
40 calibrate_drivetrain()
41
42 # Reset Rotation and Heading values
43 drivetrain.set_heading(0, DEGREES)
44 drivetrain.set_rotation(0, DEGREES)
45
46 # Change the font size to fit on the EXP Brain's Screen
47 brain.screen.set_font(FontType.MONO15)
48
49 drivetrain.drive(FORWARD)
```

Programming is an important part of the VEX program. Whether one is coding an autonomous program for matches or skills, or even coding a PID or the controls of a robot. Coding and programming skills are taught in the VEX programs, and these skills are essential in Astronautical Engineering. These skills could be used to program different functions of a spacecraft, or certain databases and protocols that the spacecraft follows, as well as controls so the Astronauts on the spacecraft can control it, or engineers on the ground, in a control room.

Takeaways



Throughout the whole process of completing this challenge, our team bonded over our research on a topic that we shared an interest in. We have noticed, that this challenge did not only help us grow our research skills and our ability to present information, but it has also allowed us to bond and grow together as a whole. Our bond has strengthened, and will continue to strengthen as we proceed into the season. We have realized that bonding over interests that we all share is incredibly helpful for building team chemistry, and something that we all will take away from working on this challenge is that VEX is a journey that is preparing us for STEM careers in engineering after graduation, and that this preparation will be what will help us succeed.

Citations

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