

# ROBOTICS

*a newsletter about IMSA's FRC season*



## New Updates about IMSA's Repopulation Plan

*By the FRC Business Team*

On November 18th, our school administration had a meeting to discuss the possibility of repopulating campus in the spring semester, and it was decided that we would not come back in January, opting for continued online learning instead.

When the school year began this fall, two prerequisites to return to in-person learning were decided. One, Illinois must be in Phase 4 of the state's reopening plan. Two, there must be an approved vaccine as well as access to rapid testing at IMSA.

Since these criteria have not yet been met, our team will not be able to return to campus and meet in-person in the following months. However, a detailed plan for repopulation was finalized in mid-November, and it was decided that the decision to return would be re-evaluated by administration in February or March of 2021.

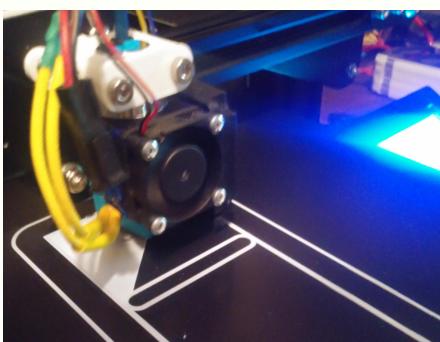
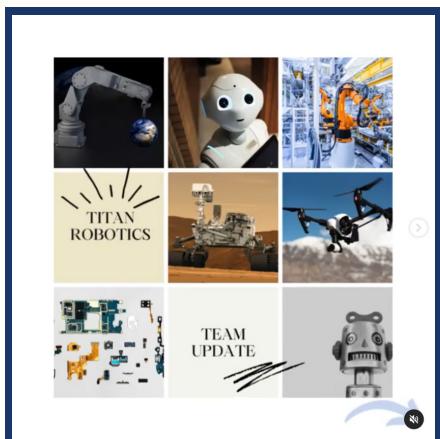
In light of this, our team plans to continue our online projects and curriculum to try to educate our members and do all that we can to help out our community and bond as a team in these trying times.

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## Business

The Business team has begun a regularly posting on the Titan Robotics Instagram and Facebook accounts (@titanrobotics2022 for both - see below for full social media tags). We primarily post updates on the team's general activities, and we have also launched a new series called Member Biographies where we introduce members of the team to friends, family, and sponsors. This month, we have also started working with Girls IN2 STEM, a program that empowers girls to pursue STEM interests. Together, we plan to create a workshop for the spring. The team has also started designing team merchandise and looking into competition materials that might still be applicable in the online competition setting. Another large project that we have is the monthly newsletter, which you are reading right now! Moving forward, the Business team will continue working on our various projects, updating the team website, and looking into the Innovation Challenge and any other new online FIRST competitions.



## Design Integration

The DI team has finished learning different design principles and topics such as strategic design, how to pocket materials, how to design for CNC manufacturing, and how to use a master sketch to determine the overarching dimensions of a robot. We are still learning more advanced Solidworks practices, especially concerning assemblies. Another project the team has just begun is designing the foundation of a new robot to potentially compete in next year's robot matches if in-person competitions resume. One exciting thing that happened this month was the DI team's recent participation in the Chezy CAD CADathon, hosted by Team 254. With only 2 days to work, the team successfully created a compact mechanism that could successfully climb a 130 inch pole in under 10 seconds, placing 3rd out of 44 teams. Our goals for December are to finish all training and begin working in smaller groups, each with the goal of modeling a configurable mechanism that the team can use for future years.

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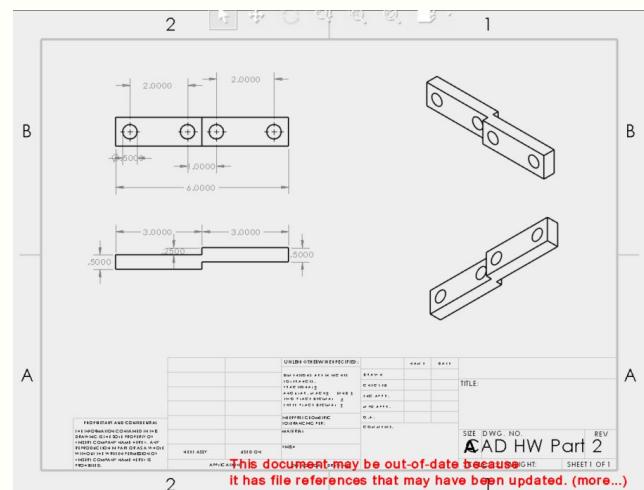
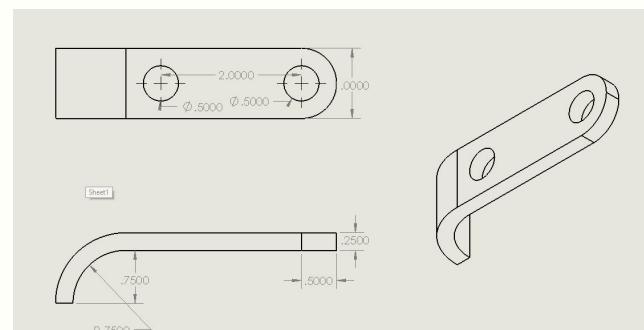
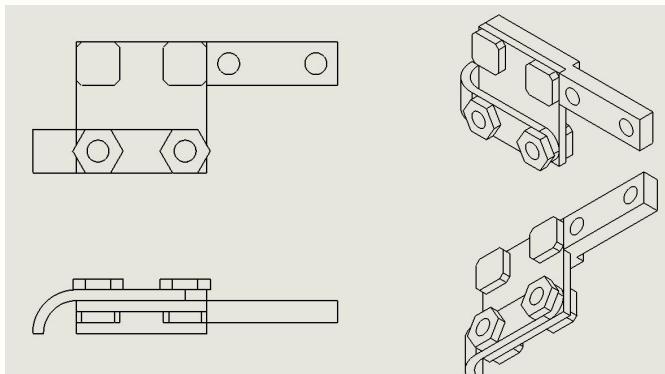
titanrobotics2022@imsa.edu



<http://titanrobotics2022.com>

## Electrical

The Electrical team has finished learning about all of the possible robot systems on a basic level. We are also nearly finished with the basic electrical training, but we still need to talk about details and specific applications of the electrical layouts. In December, we hope to begin creating more functional electrical systems using past robots as models.



## Mechanical

The Mechanical team has finished basic CAD training. We have covered all basic sketching, modeling, and assembly features required to make the CAD Models used in Titan Robotics. Additionally, the team has been introduced to GRABCAD, the project management software that we use. These tools have already been used to complete several homework assignments as a way to get students comfortable with our expected workflow. We have continued to work on homework assignments so that by the new year, the team will be able to work on our project assignments in smaller groups. The next month will primarily be spent on finishing up any homework that needs to be submitted, as well as possibly introducing one or two of the projects that we will be working on during second semester, time-permitting.

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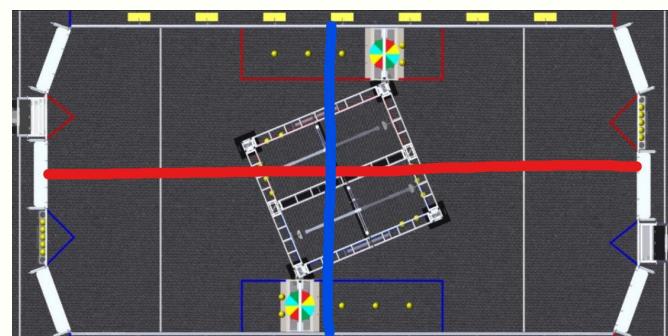
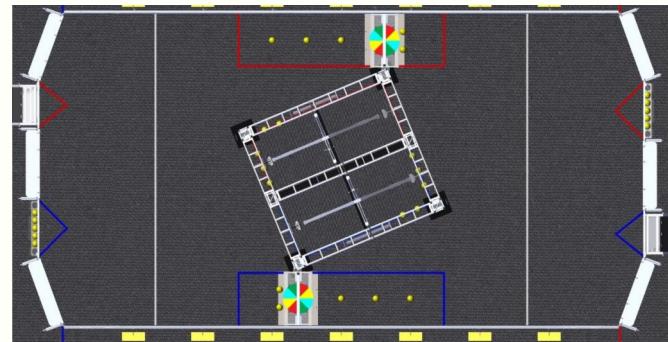
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# Programming

The Programming team has been working on completing our many first semester projects. Thus far, we have finished the implementation of the D\* Lite path planning, allowing us to generate optimized paths to get around the field. We have also updated our motion generation framework, RMPFlow, with another motion policy for dampening motion, and implemented a limelight vision to allow us to find the distance from the camera to field targets. The team is currently looking to purchase an NVIDIA Jetson Nano and an Intel Realsense Stereo Depth camera so that we can start working on more advanced technologies in machine learning, vision, and environmental perception. We are excited to have fulfilled our first pull request and to step into more robust version control standards. The code that each of us writes will continue to be utilized year after year with our project management changes. Next month, we will be working on finishing up the rest of our projects and starting to put together each other's systems so that one system can flow into another and so on.

# Titan Software

The Titan Software team has been able to streamline the development and deployment environment of our app to reduce case-by-case and consistency issues amongst users. With ambitious goals for the season, we have started many new projects this past month. Team members are working on future-proofing the backend and improving analysis performance. We have also begun developing a user-friendly interface to visualize analysis data as well as improve the mobile app UI and processes. The team plans to continue work in this area this coming month to improve appearance, accessibility, and performance.



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## THANK YOU FOR READING!

Look out for the December issue in a few weeks!

