



Applied Dynamics Initiative

ENIGMA FTC 16265, Mechanical Error FTC 33778, ENIGMA FRC 9080

a 501(c)3 Non-Profit Youth Program - FEIN: 47-3176068

4301 Hillspire Ave. NW, Albuquerque, NM 87120

(505)-225-8520 (please leave a voicemail)

applieddynamicsinitiative@gmail.com

adisteam.org / enigmarobotics.org

OnShape CAD Workshop

Learn to CAD FTC Robots and Robot Parts

Workshop Format

The goal of this workshop is to help students learn how to use the CAD software Onshape for designing FTC robots and parts.

The workshop will consist of weekly hour-long meetings (day tbd), and assigned “homework”, where we will learn basic principles and apply them throughout the week. The weekly meetings will be recorded and posted to YouTube, and help with the homework will be provided on Discord.

The workshop will require having access to Discord and a computer that can run Onshape (most laptops can; Onshape is easy to run).

What is CAD?

CAD is the most widely used software for aiding the design and drafting of parts and assemblies in engineering. In FTC, CAD is used to make 3D models of robots as well as design custom parts. For FTC, Onshape is often considered the best CAD software because it can run on basically any computer, has easy collaboration between multiple students, and has the best FTC part library.

Why CAD?

CAD helps you design and plan your robot in 3D before it is built. This is beneficial for a couple of reasons:

- Allows for the design of custom plates and custom 3D printed parts
- Helps solve preventable issues before the robot is built (sizing issues, clipping issues, etc)
- Helps minimize the cost of the robot, ensuring that only necessary parts are bought.
- CAD is an important long-term skill for those looking into a career in engineering.
- Helps with awards, judges love to see CAD in the design process (think, innovate, design)

Onshape Setup

An additional benefit of Onshape is that it has the most learning resources available by a large margin.

The first step to learning Onshape is creating your account. An Onshape student account is free for all students and comes with all the features necessary for FTC design.

After creating your Onshape account, follow the FRCdesign.org account setup and optimization in order to ensure your Onshape runs as smoothly as possible.

Learning Onshape

In order to build a fundamental understanding of both working in Onshape, as well as basic mechanical principles, we will work through parts of FRCdesign.org stage 1. While the program is designed for FRC, Stage 1 is primarily focused on learning basic design principles and working on understanding the Onshape workspace.

After completing stage 1 of FRCdesign.org, we will move to creating ftc specific mechanisms, such as a basic parallel plate drivetrain, an intake for next year's game piece, and a servo powered arm.

Contact

If interested, please join our Discord: <https://discord.gg/TskvddrdD5>

Additionally, you can also email at lcuo0728@gmail.com.