CAD Training Plan

Last year's Plan: CAD/Design Training Plan
Onshape Learning Path:
https://learn.onshape.com/learn/learning-path/onshape-fundamentals-cad/

- Goals for New Members
  - High Level: Be able to design a machined part for the 2023 robot
    - Setup
      - Sign up for an Onshape Education account
      - Get access to the 4909 Onshape Team
      - Install the MKCad app
      - ~~Get the box tube featurescript~~
    - Intro
      - Goal: Basic understanding of navigating onshape
        - Move View (Middle Mouse Button to pan)
        - Zoom (Scroll wheel to zoom)
        - Select single
        - Select Multiple
        - Measure
        - ~~Hide (Y)~~
        - ~~Transparent (T)~~
        - ~~Isolate (Shift+I)~~
      - Show Pandora Robot Cad
        - Down -> Top
          - Sketches -> parts -> assemblies
        - Show the Shooter concept sketch
        - Make sure something moving is shown
      - Go look at another design to practice navigating
        - 319
        - Everybot
      - CERT: Intro 1
        - Show some robot cad and get a dimension (TBD)
    - Part Studios 1
      - Goal: Be able to model a part
      - Sketches
        - Sketch Entity / Geometry:
          - Rectangle, Line, Circle
        - Constraints:
          - Equals

            - Coincident
            - Vertical
            - Horizontal
            - Dimension
    - 3D Geometry
        - Features:
            - Extrude (Boss and Cut)
                - Blind and Through all
        - Know how to add to geometry
- Part Studios 2
    - Goal: Accomplish the high level goal
        - Sketches
            - Sketch Entity / Geometry:
                - Arc, Hexagon, Point
            - Sketch Feature
                - Linear Pattern, Circular Pattern, Use
            - Constraints:
                - Parallel
                - Perpendicular
                - Tangent
                - Midpoint
                - Concentric
        - 3D Geometry
            - Features:
                - Box Tube Converter
                - Revolve
                - Fillet / Chamfer
                - Hole
                - Mirror
                - Linear Pattern
                - Circular Pattern
            - End Conditions
                - Up to Face
                - Up to Next
                - Symmetric
        - Exercises
            - Box, Rectangle cut out of a box, Box Tube, Stepped Shaft, Power cell
            - Challenge: UFO, etc.
- Master Modeling
    - Goals: Be able to add parts to part studios and assemblies
        - Part Studios
            - Creation of new parts
                - Extrude: New

            - Renaming parts
            - Reference Planes
        - Assemblies
            - Mates
                - Fastened
                - Revolute
                - Planar
                - Slider
        - Mate Connectors
            - Make Mate Connectors in both Part Studios and Assemblies
            - Realign / Offset
    - Exercises
        - 2 Boxes, Box w/ pin revolve, Linear Sliding Boxes, Screws into a box
        - Challenge: finish later
    - Evaluation
- Advanced Sketches
    - Goals: idk Peyton pls hlp
    - Construction Geometry
    - Driven Dimensions
    - Design Intent
- Implementations
    - Know the construction styles that the team has used in the past
        - Plates, Box Beams, Angle etc.
- Conventions
    - Be able to name parts according to defined conventions
    - Use Onshape file conventions in all of their practice modeling files
- Know the manufacturing capabilities of the team so they can design around them

● Weekly Goals

○ Week 1

- NAMETAGS/Preventing video game play

○ Week 2

-

○ Week 3

-

○ Week 4

-

- Week 5
  -
- Week 6
  -
- Week 7
  -
- Week 8
  -
- Week 9
  -

- Certifications
  - Intro 1
  - Get some number of measurements (define later) from the Swerve Chassis CAD
    - Chassis
  - Cad Basics
    - Final Evaluation: Make a plate and a giant bearing
    - Sketches
      - Content
        - Basic 2D geometry creation
        - Know how to make / use:
          - Rectangle, Circle, Arc, Line, Point
          - Dimension, Equals, Concentric, Coincident, Tangent, Midpoint, Vertical, Horizontal
          - “Use”
    - 3D Geometry
      - Content
        - Basic 3D geometry creation

        - Know how to use:
            - Extrude, Revolve, Fillet
            - Hole, Linear Pattern, Planes
            - Very basic Boolean usage
            - Box Tube converter
            - Mate Connector Feature
    - Final Evaluation
        - Note: We should start them off with a sketch so that they are only tested on creation of 3D geometry
- Practices:
    -

Assemblies 1

- Content
    - Basic Assembly creation
    - Know how to:
        - Insert from: MKCad and Part Studios
        - Use: Fasten, Revolute, Slider
- Final Evaluation
    - Make a simple swerve bot
        - Chassis + Some simple actuator