The background of the entire page is a dense, overlapping collage of colorful sticky notes. The colors include bright yellow, light blue, light green, and light pink. Each sticky note has a large, bold, black question mark printed on it. The sticky notes are scattered across the page, creating a vibrant and curious atmosphere.

ROBOTICS ALLIANCE PROJECT DESIGN GUIDE

Assigned Reading &
Reflection Questions

Published September 2021
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Revised August 2022 (V3)

READING ASSIGNMENT #1

- ❑ Sections 2.1–2.38 (pages 10–30)
- ❑ Reflection Questions (listed on following slides)
- ❑ 5 points per question x 9 questions = 45 points total

QUESTION 1: CNC ROUTER

- ❑ Sketch a sample part to create on a CNC router out of 1/4" polycarbonate sheet.
 - ❑ Hand sketch
 - ❑ Onshape part studio
 - ❑ Onshape formal drawing

QUESTION 1: SUBMIT SKETCH & PART STUDIO SCREENSHOT HERE

QUESTION 1: SUBMIT DRAWING HERE

QUESTION 2: CAD, CAM & CNC

- ❑ Define CAD, CAM and CNC (list what each acronym means)
- ❑ Why do you think it is important to understand both CAD and CAM/CNC when designing a part?

QUESTION 3: 3D PRINTER

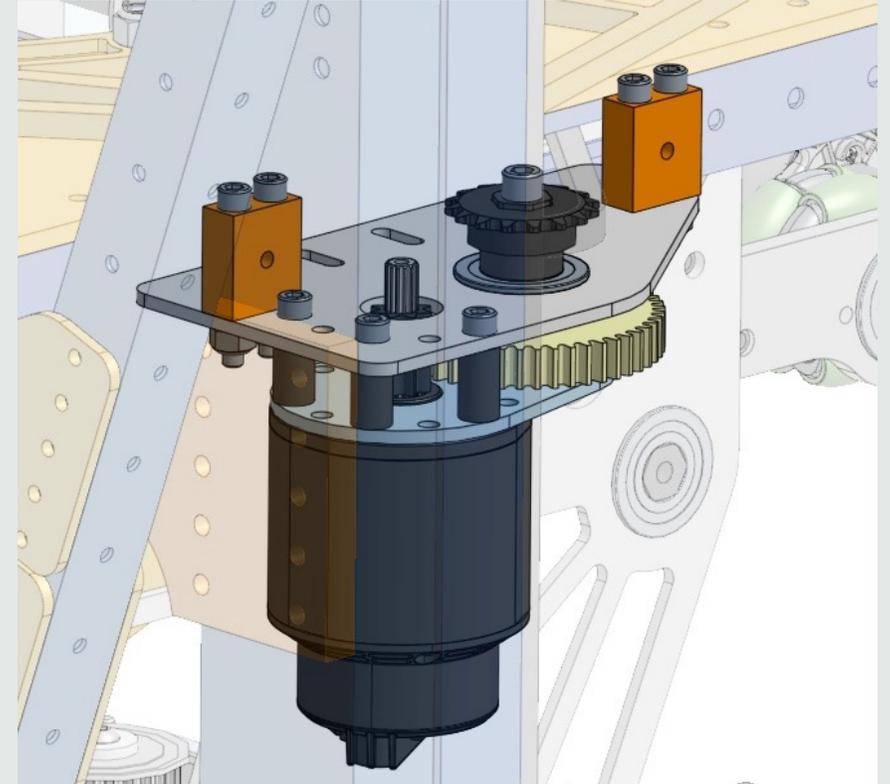
- Write out procedural steps for taking a part from CAD to the following 3D Printers:
 - Airwolf EVO 22
 - Markforged

QUESTION 4: TOLERANCING

- How should you adjust dimensions based on tolerancing for 3D printed parts?

QUESTION 5: BILL OF MATERIALS

- ❑ Create a list of bill of materials for the gearbox that powers the turret in linked model ([CAD Model](#))
- ❑ Use Excel spreadsheet template (attached in Canvas)
- ❑ Include costs, quantities, part numbers and links



QUESTION 5: SUBMIT SCREENSHOT OF SPREADSHEET HERE

QUESTION 6: BOLT SIZE NOTATION

- What do the numbers in 10-32, 8-32 and $\frac{1}{4}$ -20 mean?

QUESTION 7: TAPPING

- Practice tapping the end of a Thunderhex shaft as a part of the prototyping project.
- Paste picture of tapped shaft below.

QUESTION 8: LOCTITE

- ❑ What is Loctite? What is it used for?
- ❑ Make a Loctite color usage chart

QUESTION 9: MISCELLANEOUS FASTENERS

- What is a shaft collar? How do they work? Draw an image of a shaft collar with labels showing how it works.