

## SYDE36I – Mechanical Design Diagrams

**Grading:** 10% Team Submission

**Due Date:** Sunday, June 25<sup>th</sup> by 8pm ET on LEARN

All submissions must be submitted as **PDF files unless otherwise specified.**

### General Rubric

Missing components = 0

0 – 40%	U = Unsatisfactory (clearly below standard for a 3 <sup>rd</sup> year SYDE student);
50%	M = Marginal (meets minimum expectations, but not more);
60%	S = Satisfactory (demonstrates basic design and engineering effort);
70%	G = Good (demonstrates average design and engineering effort);
80%	VG = Very Good (demonstrates above average design and engineering effort);
90%	E = Excellent (exceeds expectations);
100%	O = Outstanding (I think this component is award-worthy).

## REQUIRED COMPONENTS

### 1. Component diagrams

Create PDF drawings of all custom components to be used for the prototype. This includes raw materials that are machined or modified. If off-the-shelf components are used, they may be excluded from the submission unless they perform a relevant mechanical function within the assembly (like attaching two custom parts together). In this case, a basic mock-up of the part should be drawn that can imitate its functionality (movement of the assembly through part mates) unless a CAD file can be obtained online (e.g. from McMaster-Carr.com) that can perform the same purpose. Include such components in individual design schematics (dimensions not required) and note where the item will be sourced.

Include: dimensions, units, name of part and material used: 3D printed (ABS), laser cut (acrylic/wood), or other sourced material.

### 2. Assembly diagram

Show the assembled prototype (dimensions not required) consisting of the individual parts. An isometric view may suffice as long as it is clear.

### 3. Z-Suite project for 3D printed components (if required)

If using SYDE department 3D printing, submit a single .zprojx file containing all parts to be printed. Consult the department 3D printing instructions ([LEARN > Project Folder](#)) to create the file using the Z-Suite software.

Prints will begin the week of June 26<sup>th</sup>.

## **GRADING**

### **CAD Drawings (3 marks)**

- Drawings are complete: contain all dimensions, specify units
- Parts have unique names and specify the material or manufacturing process that will be used
- Drawings clearly communicate part design using appropriate views

### **Design quality (5 marks)**

- Are the components simplified to reduce material/waste
- Are they designed to be adequately robust for prototyping
  - Use of fillets, fasteners, minimum feature sizes are appropriate
- Use of appropriate fits for assembled components

### **Material selection (2 marks)**

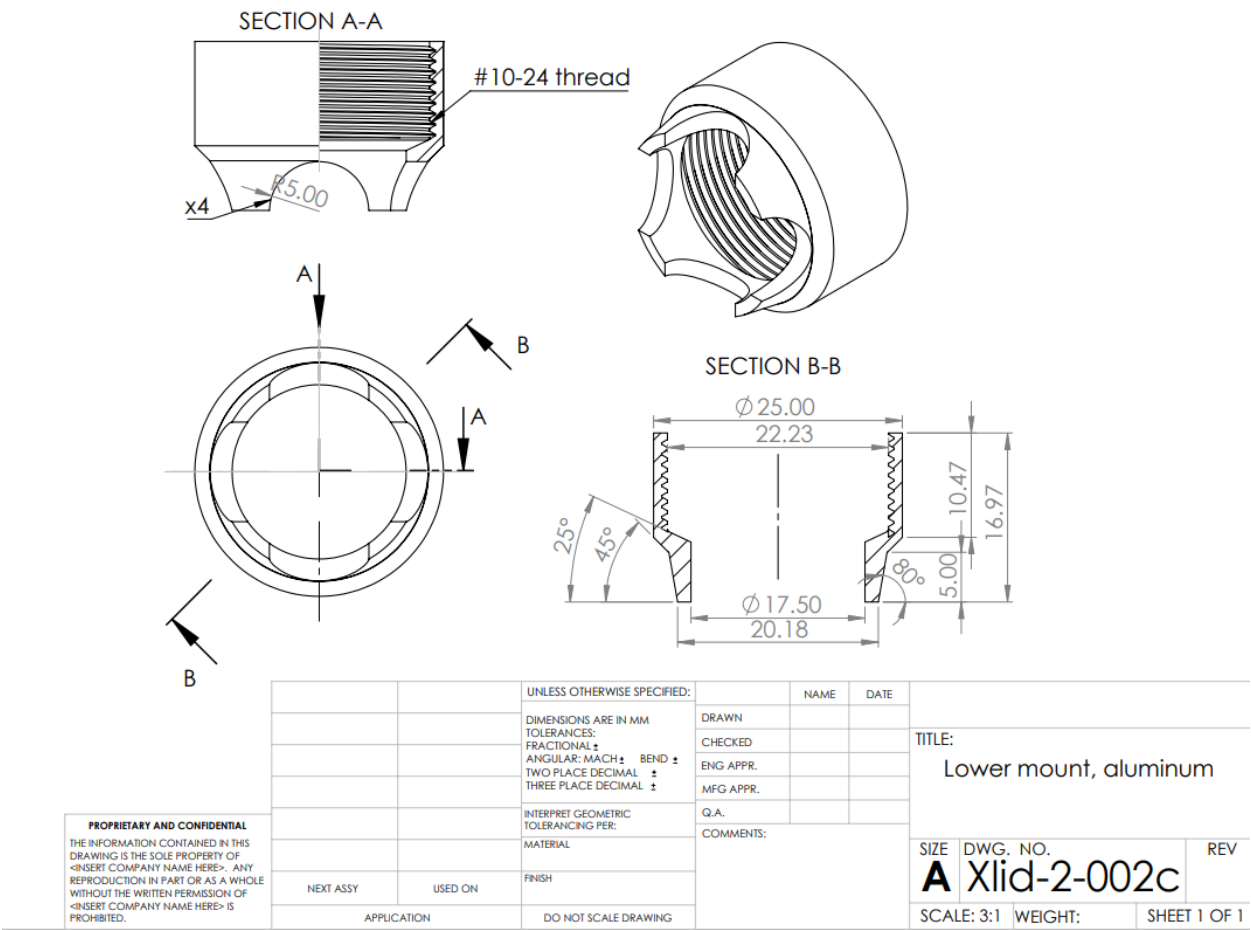
- Design leverages existing/available materials appropriately
- Chosen materials are suitable for the expected loads

(If using SYDE 3D printing:)

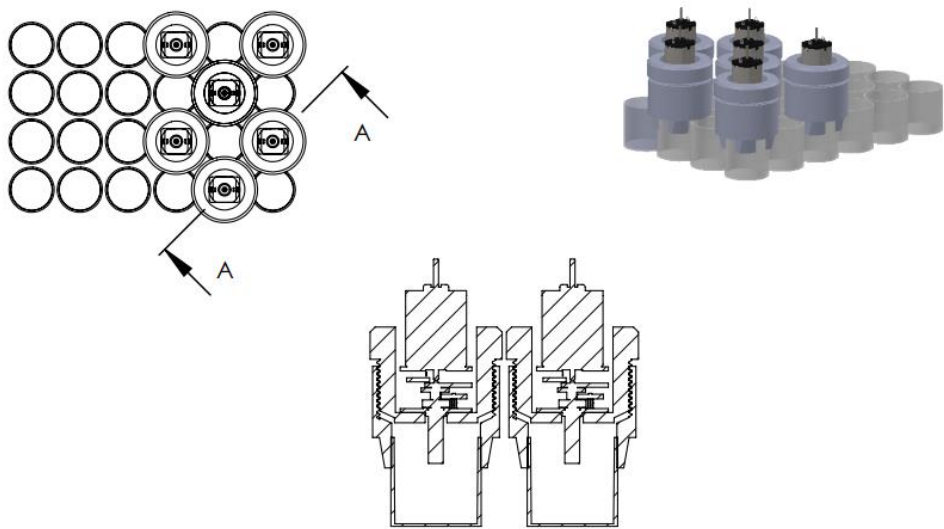
- Parts are designed within the allowed size constraints (16 x 16 x 16 cm)
- Print times are within allowed limits (18 hours)
- Use of correct file format

EXAMPLE DIAGRAMS

Component Diagram



Assembly diagram



SECTION A-A  
SCALE 1 : 1

		UNLESS OTHERWISE SPECIFIED:		NAME	DATE		
		DIMENSIONS ARE IN INCHES		DRAWN		TITLE:	
		TOLERANCES:		CHECKED			
		FRACTIONAL $\pm$		ENG APPR.			
		ANGULAR: MACH $\pm$ BEND $\pm$		MFG APPR.			
		TWO PLACE DECIMAL $\pm$		Q.A.		SIZE DWG. NO. REV	
		THREE PLACE DECIMAL $\pm$		COMMENTS:		A iso	
PROPRIETARY AND CONFIDENTIAL THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF <INSERT COMPANY NAME HERE>. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF <INSERT COMPANY NAME HERE> IS PROHIBITED.		INTERPRET GEOMETRIC TOLERANCING PER:				SCALE: 1:2 WEIGHT: SHEET 1 OF 1	
		MATERIAL					
		FINISH					
NEXT ASSY		USED ON					
APPLICATION		DO NOT SCALE DRAWING					