

Creative Part Modeling and PDS

ME 170 CADLAB#5 and TEAMPROJ#4

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UIUC

Fall 2022



A reminder:

- Office Hours (MEL 1009):
 - Tuesday Noon-1PM (Before Lab)
 - Wednesday 9-10AM
- CADLAB#5
- TEAMPROJ#4

If you have questions on CADLAB, you should plan to visit office hours - email is not an effective way to solve issues with CADLAB problems.



Catching Up Monday Sections

MONDAY ONLY

- I want to get the Monday sections back on track with the other sections.
- I am “combining” TEAMPROJ#2 and 3 as I think they go well together.
- The new due date for both TEAMPROJ#2 and 3 is 10/2 (Sunday) at 11:59PM.
- Be aware that we start TEAMPROJ#4 this week and it is due 10/5 - Don't wait!
- I encourage you to start early and if you want feedback on TEAMPROJ#2 prior to working on 3, please ask me.



- CADLAB#3
- CADLAB#4 – Loft & Sweep Features (Due 9/28 Wednesday)
- CADLAB#5 - Creative Part (Due 10/5 Wednesday) - This is a more involved lab, so don't wait to start it!
- CADLAB#6 - Patterns & Model Modification (Due 10/12 Wednesday)



- TEAMPROJ#2 – Synthesis (Monday Sections 10/2)
- TEAMPROJ#3 - Sketching (Due 9/28 Wednesday)(Monday Sections 10/2)
- TEAMPROJ#4 - Product Design Specification (PDS) (Everyone - Due 10/5)
- TEAMPROJ#5 - Concept Selection (Due 10/12 Wednesday)



CADLAB#5: Creative Part Modeling



This week's CADLAB you will do some creative part modeling. This is a chance to experiment with the techniques you have learned and to learn some new ones.

For Part I, you will model a:

- Drinking Glass
- Mouse
- Shirt Button

I suggest focusing on simple objects. Make sure the scale is reasonable and you capture the big picture of the object. Use the tools and techniques you have learned and ensure your drawings are fully constrained.



Some advice:

- Focus on simple objects
- Make sure the scale is reasonable
- Capture the big picture of the object - Grader should easily identify the object
- Use the tools and techniques you have learned - logical design intent
- Ensure your drawings are fully constrained



CADLAB#5 Goal - Part II

For Part II, you will create a part that connects or assembles to at least one of your teammates parts (All of your parts should assemble together.)

- This should be a meaningful connection that requires you to consider the shape and dimensions of the other parts.
- It does not need to latch, clip or form a fixed connection - just more than a trivial touching.
- It does not need to have any logical purpose or function, but you will be evaluated for creativity, aesthetics and complexity.

You will print these parts in the innovation studio and submit a photo of the assembly. Think carefully about your tolerances.

[Innovation Studio Sign Up Sheet](#)



TEAMPROJ#3: Sketching



Using your HMWs developed as part of Team Project Assignment #2, develop ideation sketches. These ideation sketches should:

- Be on a single piece of paper
- Have multiple views
- Annotations of 1 - 5 words
- Clearly communicate the solution the HMW addresses
- Be signed and dated

Each team member should contribute at least one sketch. Scan or photograph each sketch.



- Simple is okay. I don't expect masterpieces of industrial art.
- Focus on the "How might we...?" and not on a finished product.
- Help the viewer understand the concept.
 - Sense of scale
 - Use/Function
 - Shape
 - Configurations
 - Materials
 - Key parts
- Show the mechanism (You need a mechanism!)
- One idea per page
- Include the inspirational HMW question.



TEAMPROJ#4: Product Design Specifications (PDS)



TEAMPROJ#4 Activities

This week you will be creating the Product Design Specification document.
From Canvas:

- Create a Product Design Specification (PDS) for the team-selected product concept.
- Create a PDF document with all 29 of the primary elements as numbered sub-headings: i.e. 1.Performance, 2.Environment, 3.Service Life etc.
- Under each heading create a set of bullets each, ideally, with one or more **measurable** specifications of actual values with units.
- Depending on your product, you will have different bullets and different data values.
- These are design goals or targets for your product and these are decisions you should make as a reasonable guess.
- You should do some research online using product sales sites such as Amazon.com to find typical PDS items and values for your particular product

This is an example of what your PDS should look like. It should be very quantitative - numbers and units. Avoid vague expressions like strong, fast, heavy, small, etc.

Product Design Specification

1. Performance

- Ability to rotate on two axes on adjacent ends of the door.
- Can be pushed or pulled in either direction on both ends.
- Robust design allows continual use throughout product lifespan.
- Intuitiveness / ease of use for user.
- Increased traffic flow.

2. Environment

- Buildings in urban environments / Urban offices with modern and sleek looks.
- Door can handle range of temperatures, pressures, and humidity conditions.
- Resistant to water, dirt, and bugs.

3. Service Life

- Door structure will keep its integrity for a decade.
- Stepper Motors might have limited life so can be replaced easily.

4. Maintenance

- Regular cleaning of glass panes.
- Modular replacement of damaged parts.

5. Target Cost

- Target manufacturing cost is roughly \$200 per unit.
- Target retail price will roughly be \$700 per unit.
- Shipping costs will be included in the retail price.

6. Competition

- Other types of high traffic doors that include sliding and revolving doors.

7. Shipping

- Orders only, product will be shipped from warehouse directly to consumer.

8. Product Volume (Quantity)

- Assembly line with continual production of product throughout the year.
- Minimum production of 50,000 units per year for two years.
- More production in the future based on success of this version.

- CADLAB#4 is due September 28 at 11:59PM
- CADLAB#5 is due October 5 at 11:59PM
- TEAMPROJ#2 is due September 21 at 11:59PM (Monday sections 10/2 Sunday)
- TEAMPROJ#3 is due September 28 at 11:59PM (Monday sections 10/2 Sunday)
- TEAMPROJ#4 is due October 5 at 11:59PM
- Start preparing for CADLAB#6
- Start preparing for TEAMPROJ#5



- Ben Walt - walt@illinois.edu
- Graders:
 - Monday 1-2:50PM (AB1) - Aryan Shroff - aryans4@illinois.edu
 - Monday 3-4:50PM (AB2) - Patrick Li - pyli2@illinois.edu
 - Tuesday 1-2:50PM (AB3) - Nishesh Arora - nishesh2@illinois.edu
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