

# Patterns & Model Modification and Concept Selection

ME 170 CADLAB#6 and TEAMPROJ#5

Ben Walt

UIUC

Fall 2022



A reminder:

- Office Hours (MEL 1009):
  - Tuesday Noon-1PM (Before Lab)
  - Wednesday 9-10AM
- CADLAB#6
- TEAMPROJ#5

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.



- CADLAB#4
- CADLAB#5 - Creative Part (Due 10/5 Wednesday)
- CADLAB#6 - Patterns & Model Modification (Due 10/12 Wednesday)
- CADLAB#7 - Detail Drawings (Due 10/19 Wednesday)



# Team Project Progress

- TEAMPROJ#2 and 3
- TEAMPROJ#4 - Product Design Specification (PDS) (Everyone - Due 10/5)
- TEAMPROJ#5 - Concept Selection (Due 10/12 Wednesday)
- TEAMPROJ#6 - Start CAD Modeling (Due 10/19 Wednesday)



# CADLAB#6: Patterns & Model Modification



# CADLAB#6 Goal

This week's CADLAB you will learn to use pattern features and modify your time line. It is intended to be a shorter lab. I have no specific advice.



# TEAMPROJ#5: Concept Selection



This week you will create a Pugh Concept Selection matrix for your project. By now you should have decided on a product and created an initial PDS.

- See the Canvas Assignment page for details.
- Submit your completed matrix and analysis. Either a Word document or pdf is fine.





# Concept Selection Summary

- 1 Develop conceptual designs and create small sketches, all to the same level of detail (One for each team member)
- 2 Create a matrix and list the concepts to be investigated along the top of the matrix (ideally the actual sketches, perhaps photo-reduced)
- 3 List important customer criteria down the left side of the matrix - at least 10 and focus on meaningful ones where they differ.
- 4 Choose one concept (often the original design) as the datum, compare criteria against this datum: +, - , S
- 5 Total the scores: examine concepts of exceptional strength, study each weakness, if weaknesses are acceptable this is a good candidate.



# Controlled Convergence Method

CONCEPT CRITERIA	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Ease of achieving 105-125 DbA		S	-		+	-	+	+	-	-	-	-	S	+
Ease of achieving 2000-5000 Hz		S	S	N	+	S	S	+	S	-	-	-	S	+
Resistance to corrosion, erosion and water		-	-	O	S	-	-	S	-	+	-	-	-	S
Resistance to vibration, shock, acceleration	D	S	-	T	S	-	S	-	-	S	-	-	-	-
Resistance to temperature	A	S	-		S	-	-	-	S	S	-	-	S	S
Response time	T	S	-		+	-	-	-	-	S	-	-	-	-
Complexity: number of stages	U	-	+	E	S	+	+	-	-	-	+	+	-	-
Power consumption	M	-	-	V	+	-	-	+	-	-	-	-	S	+
Ease of maintenance		S	+	A	+	+	+	-	-	S	+	+	S	-
Weight		-	-	L	+	-	-	-	S	-	-	-	-	+
Size		-	-	U	S	-	-	-	-	-	-	-	-	-
Number of parts		S	S	A	+	S	S	-	-	+	-	-	S	-
Life in service		S	-	T	+	-	S	-	-	-	-	-	-	-
Manufacturing cost		-	S	E	-	+	+	-	-	S	-	-	-	-
Ease of installation		S	S	D	S	S	+	-	S	-	-	-	S	-
Shelf life		S	S		S	S	-	-	S	S	S	S	S	S
FIGURE 4.4		0+ 6-	2+ 9-		8+ 1-	3+ 9-	5+ 7-	3+ 12-	0+ 11-	2+ 8-	2+ 13-	2+ 13-	0+ 8-	4+ 9-



All files should be word or pdf - these items can all be in one document if desired. Include:

- Matrix
- New sketches - full size, not just the tiny ones for the matrix
- Results of analysis - concept you selected and reasoning behind it. The reasoning should be a short, well written paragraph looking at strengths and weaknesses. Just because it has the best score doesn't mean it is the best idea!



Thank you for sharing with me.

- People seem generally happy with the presentation.
- People wanted more guidance on CADLABs and TEAMPROJ assignment.

I have included some additional responses in this week's email and in the share folder on Box.



- CADLAB#5 is due October 5 at 11:59PM
- CADLAB#6 is due October 12 at 11:59PM
- TEAMPROJ#4 is due October 5 at 11:59PM
- TEAMPROJ#5 is due October 12 at 11:59PM
- Start preparing for CADLAB#7
- Start preparing for TEAMPROJ#6



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