

Progress Reports are graded on the (i) write-up of what has been accomplished and (ii) the amount of said progress on the overall project.

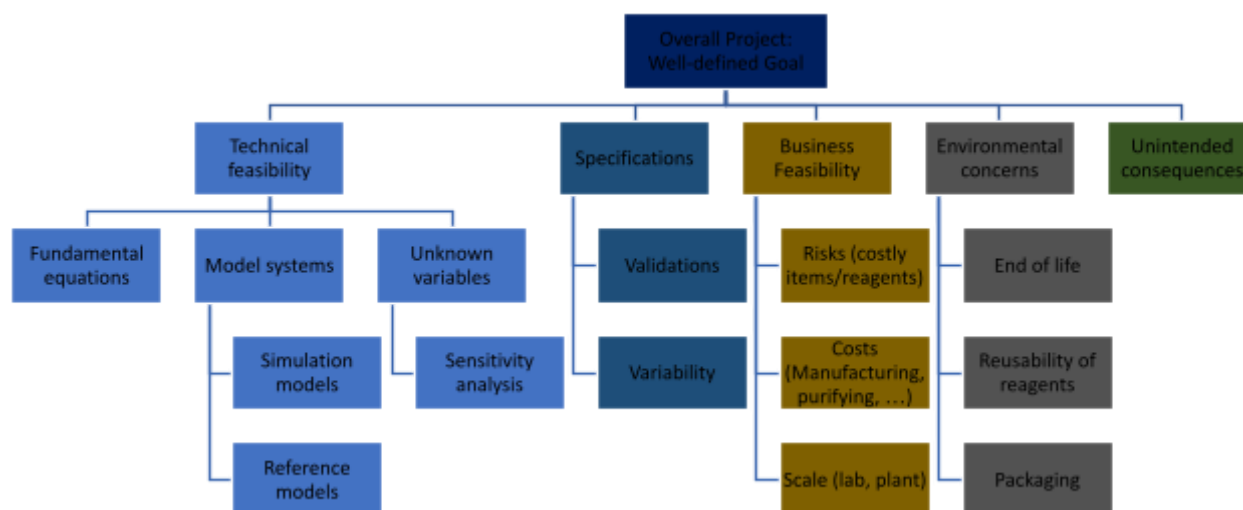
1. Group Number and Title: Group 11 – Sustainable Polymers

2. Week 11/16 and Date: 4/11/2025

Understand	Synthesize	Ideate	Prototype	Implement
Explore	Debrief	Brainstorm	Create	Support
Observe	Organize	Propose	Engage	Sustain
Empathize	Define	Plan	Evaluate	Evolve
Reflect	Interpret	Narrow Concepts	Iterate	Execute

3. Provide a brief list of activities that were done and their corresponding HCD space(s) and subspace(s) (add rows if necessary):

Activity	HCD space(s)	HCD subspace(s)
Conducted mechanical testing	Prototype	Evaluate
Finished poster draft	Synthesize, Prototype	Organize, Engage
SEM imaging of degraded samples	Prototype	Evaluate
Prepared prototypes for poster presentation	Prototype	Engage



4. What branches/blocks were work focused on this week?

Technical feasibility - model systems (reference models)

Specifications - validations and variability

5. What was accomplished? (4-5 bullet points, include data/charts if applicable)

- Conducted mechanical testing on 20 wt% PEG/PLA and pure PLA fibers
- Finished and submitted poster draft
- Conducted SEM imaging on degraded samples
- Prepared prototypes for the poster presentation

6. What challenges are still outstanding? (2-5 bullet points)

- Need to clean up lab space
- Rheology measurements for the 10 wt% PEG/PLA were different from the 5% and 20%; unsure why
- Calculation of Young's modulus from the mechanical testing is difficult to do according to the ASTM standard

7. As you engaged in human-centered engineering design activities this week, do you think you became curious about any new content? If yes, how?

We became curious about how we can best present our results to a general audience. We thought about the potential options for what to display and how, consulting the professor/TAs and decided to use glass petri dishes to show our degraded, pristine, and fiber samples. We also became curious about what happens with our project once we finish the semester.

8. As you engaged in human-centered engineering design activities this week, do you think you made any new connections (e.g. connections between ideas, connections between people, etc.)? If yes, how?

We learned in MSE 404 that the addition of plasticizer to polymers decreases the T_g of the matrix polymer, which is consistent with the DSC measurements we were getting.

9. As you engaged in human-centered engineering design activities this week, do you think you created any value (e.g. identified a way to work together more efficiently, found a way to improve your idea or design, etc.)? If yes, how?

We created value while analyzing the mechanical testing data and found that our polymer blends had a lower Young's modulus and ultimate tensile strength in comparison to pure

PLA. When comparing the data to the literature values of PET fibers, we found that Young's modulus and ultimate tensile strength was much lower for polymer blends. This shows that further work needs to be done in creating polymer blend that can match the strength and modulus values of PET.

10. What feedback did you obtain from the instructor or TA last week that you addressed in your work this week?

We did not meet with TA last week due to EOH.