ESG 21W.732 PROJECT I OVERVIEW
CONCEIVE, DESIGN, PROTOTYPE, & EVALUATE A COFFEE CUP INSULATOR

Problem Statement:

- Proposition 1: hot coffee gets cold
- Proposition 2: Elizabeth and Dave are less happy when their coffee is cold
- Proposition 3: Elizabeth and Dave drink coffee from re-used XXX containers
- Proposition 4: the world is a better place when Elizabeth and Dave are happy

Taken together, these propositions suggest the imperative of conceiving, designing, prototyping, and testing a product that will keep a XXX container ¾ full of coffee hot for the 2 hour duration of a 21W.732 class. The product shall be made from scrap cardboard.

In addition to the requirement that the coffee remain hot, the product must satisfy three subsidiary requirements:

- The product must not expose the coffee drinker to undo hazard
- The product must be ergonomic and aesthetically pleasing
- The product must have a small ecological footprint, both in terms of the materials used to construct the product and the labor required to produce the product.

These requirements factor into the ultimate requirement that the coffee remain hot according to the rubric in Table 1.

Table 1 "cost" of subsidiary requirements

requirement	cost incurred
Safe	The product must pass the tilt test, the pour test, and the roving eye test of due diligence. Any product that does not pass these tests is disqualified.
Ergonomics & Aesthetics	A panel of experts will judge your prototype and place it in one of three categories: top quartile, middle quartiles, and bottom quartile. • Products in the top quartile will have 10 minutes deducted from the time at which the temperature is measured. • Products in the bottom quartile will have 10 minutes added to the time at which the temperature measured.
Eco-friendly	• If the mass of the product is less than the mass of the coffee, 10 minutes deducted from the time at which the temperature is measured. • If the mass of the product is more than twice the mass of the coffee, 10 minutes will be added to the time at which the temperature is measured. • If the product can be assembled in fewer than 15 minutes, 10 minutes will be deducted from the time at which the temperature is measured. • If the product requires more than 15 minutes to assemble, 10 minutes will be added to the time at which the temperature is measured.

Table 2 project 1 workflow, roughly in order of occurrence

activity	deliverables	due dates
brainstorming	sketches and scrawlings in your notebook that identify: • functions and configurations suitable for cardboard (~10) • design spaces for coffee container insulators (~3) in notebook • designs of container insulators (~3 for each *space*, ~9 total)	 Sept. 9 (done in class) Sept. 10 (for class) Sept. 10 (for class)
FRDPARRC & selection	• rough FRDPARRC table for each design space (in notebook) • selection criteria table (in notebook) • typed FRDPARRC table for chosen design space & design • informal presentation of spaces and designs • at least one back of the envelope calculation • at least one each of the following references of importance to your design: o web site o refereed journal article o patent o standard o book or textbook	Sept. 10 (in class) Sept. 10 (in class) Sept. 14 (for class) Sept. 14 (for class) Sept. 14 (for class) Sept. 14 (for class)
propose design	madlib project proposal pitch for review (semi-formal presentation)	Sept. 14 (for class) Sept. 14 (for class)
prototype	product prototype documentation of the construction (photos and notebook)	Sept. 16 (for class) Sept. 16 (for class)
test	test results in notebook photo documentation of results	Sept. 16 (for class & done in class)
report	oral presentation written report graphics package	Sept. 21 (for class) Sept. 21 (for class) Sept. 21 (for class)
other things	• weekly progress memo for week 0 • reading commentary on in your notebook http://web.mit.edu/sp.784/www/DOCUMENTS/Process%20of%20Design%20(Slocum,%20MIT).pdf • reading commentary on Oakley's effective teams article and Philip's member of a team article, and question you might ask (courtesy of the MIT leadership folks); available at https://web.mit.edu/21w.732-esg/www/reading/ in your notebook • Take the myers-briggs test, printout the results, and read how to interpret the results. Test at: http://www.engr.ncsu.edu/learningstyles/ilsweb.html field guide to the results at: http://www4.ncsu.edu/unity/lockers/users/f/felder/public/ILSdir/styles.htm	Sept. 14 (before class) Sept. 10 Sept. 16 Sept. 16

Expect project II to start on Sept. 9, so during the first week of class, give consideration to which other students you'd like to work with on the 2nd project. The Sept. 18 class will probably be devoted to the hobby shop orientation.& team meeting 1 for project II.