

Design Exercise #3. Design of Frame - Calculations

Assigned: 3/30/15, Due: 4/6/15

This is the first major element of your machine that will be designed and built this semester.

The top level functional requirement for your design will be a single-human-powered catapult to hurl a potato that fits within a 1m x 1m x 0.5 m box when cocked.

Grading:

This report is for feedback and will not be graded.

The second level functional requirements for your design will be

- A) a machine frame to contain all components and allow adjustment of the range
- B) an element to store energy for release on firing and transfer that energy to the potato**
- C) a latch to hold the catapult in the loaded position, released by the supplied an automatic latch mechanism
- D) a cocking mechanism designed around a single-human-powered energy input mechanism, such as a ratchet or a hand pump

This design exercise is to develop a design to fulfill functional requirement B.

Constraint One: The device in one configuration must fit into a box 1m x 1m x 0.5 m in the loaded and cocked position.

Identify the third level functional requirements for FR B (call them B1, B2, ...).

Design Output: Produce a report that includes the mapping of Functional Requirements to Design Parameters.

Provide a rough design of your energy storage and potato coupling device. Hand sketches are acceptable.

Deliver the report via email in a PDF.