

SYEN 3379. Spring 2015  
Conceptual Design of Catapult  
Assigned: 2/18/2015, Due: 2/27/2015

The functional requirements for a manually cranked, manually loaded potato-hurling catapult that can fit into a 1 m x 1 m x ½ m space when cocked are:

FR1: an energy storage element with one-human powered manual transfer and manual release

FR2: component containment and support (machine frame) and aiming

FR3: an element to hold the potato and allow energy to be transferred to the potato and which can release the potato at the desired release point

Write a brief, two-page report detailing a conceptual design for a catapult that satisfies these functional requirements.

Format:

1. (20 points) Hand sketch of concept. Scan this into your document. Phone picture is fine. One to two paragraph description of concept that cites the figure.
2. (20 points) Back of the envelope calculations of how much energy you can store. What is the transfer efficiency (guess)? How far can a 200 g potato travel under this circumstance? What is the initial velocity of the potato? Word-process these equations, don't hand-write. Should be 3-4 paragraphs.
3. (20 points per FR ... total of 60 points) Describe in words and pictures the design element corresponding to each functional requirement. Should be 1-2 paragraphs per element. Cite your figures in the text.