

**University of Portland, Shiley School of Engineering**  
 ME 403/503 – Engineering Design, Product Realization, Fall 2016

- 1) Continue to work on the Silly Putty DOE as will be discussed in class on Tuesday (10/11)
- 2) You should have card access to SH102 (or will soon). On the table near the door are toolboxes labeled “MODULE 1” or “MODULE 2”. The shop techs have been developing hands on modules to help students learn basic fabrication. You are the Gennie pigs! Paige has developed online videos, etc. to go along with the hands-on stuff (<https://sites.up.edu/manufacturingintro/>). So – go at it (the first 4 modules are there)! DO NOT FORGET THE SAFETY GLASSES (on the wall, by the door in SH102) and DO NOT FORGET THE NUMBER ONE SAFETY RULE: NEVER WORK ALONE! Always bring a safety buddy – someone from our class. ALSO – please be respectful of all the other things in the room – please don’t touch anything besides the modules. Complete the 4 modules, plus provide me any feedback as to how to improve any of the modules.

Lean:

- 3) The so-called time value of money is real. When a company wishes to make money, it has a choice – it can put its current money in a bank and draw interest, make investments in other companies, or it can invest in its own production. Typically, they choose to invest in production (product development, equipment, etc.) since the ROI (return on investment) is expected to be greater than a bank can offer. If the company doesn’t have money, it will borrow money in order to invest in production. In either case, the time value of money is real. Use an online calculator or other resource for determining compound interest on a \$1 investment. Fill in the table – what is the value of \$1 at 5% compounded annually for 5 years, etc.

Years	5%	10%	25%
5 years			
10 years			
20 years			
40 years			

- 4) Assume you had to borrow the money right now in order to purchase the inventory for producing a new product. Determine what the interest on this money would be after 10 years assuming 5% interest, and 25% interest based on the following two processes:
  - a. The inventory for “traditional” processes is \$100,000
  - b. The inventory for “lean” process is \$25,000
- 5) Conveyance (the task of moving materials, parts, etc. within the factory) has a multitude of costs associated with it. For example, a fork lift, crane, or other material handling equipment may be required. Identify and briefly discuss at least six separate costs associated with having a fork lift in a factory. For example, the fork lift itself, the operator...(that’s two, now you need identify only four more...and discuss all six).

- 6) Consider the assembly shown below (left side view and front view). It is a very simple design consisting of a steel plate bolted to vertical structure. Briefly discuss this design from a DFA (design for assembly) perspective – what’s good and not so good about this? Then suggest two alternative designs that may improve the overall cost of this assembly. Suggest one alternative that uses only one fastener size but assures the plate is oriented in one specific way (one specific orientation).

