



NORTHEASTERN UNIVERSITY CAPSULE PD for Teachers

Capstone Project: Design Your Dream Multi-purpose Closet (Armoire)

Description:

As you did in the design challenge on the first day, you still work for the PIC Design Department. Your design team is charged by your company to produce a sustainable design of a multi-purpose closet (Armoire), i.e. minimize the impact of the closet design on the environment. Within this context, your team must come up with a design that minimizes the material consumption to create the closet.

Design Goal:

Design a durable and sturdy multi-purpose closet to store clothes, jewelry, etc. Your ideal closet may move on wheels and may even fold into a suite case size.

Design Specs: Closet must

- Be 4 feet wide x 6 feet high. Select the depth that best meets your design requirements.
- Be stable and safe; i.e. bookcase would not fall easily
- Each shelf and/or hang bar be as strong as possible
- Be aesthetically pleasing (e.g. use boxed design, curved-contour design, etc.)
- Closet weight should not exceed 25 lbs.

Design Constraints: closet must

- Use the least amount of material and be as light as possible (volume calculations)
- Have a sustainable design (sustainability calculations using at least two material options)
- Cost under \$100
- Provide the maximum storage space possible
- Use a low center of gravity as much as possible for safety concern (centroid location)
- Provide maximum shelf and/or hang bar strength (stress analysis) for maximum load carrying capacity
- Calculate the factor of safety of the shelf and/or hang bar

Team Work:

Your design team consists of three designers: you and two other teachers

Design Resources:

It is up to you and your team member

Deliverables:

- A written report
- A CAD prototype (included in the report via screenshots)
- Slide presentation
- Poster

Tools and Skill Set:

Math, geometry, and physics concepts; written and oral communication skills; EDP; Web search for ideas; and SolidWorks CAD (3D modeling, volume, FEM/FEA, sustainable design, prototyping).