

Final Project: Introduction to Engineering Design

Directions: Review the information below about kitchen cabinets. Based upon the constraints given complete the following tasks.

1. Construct components for a standard sized base cabinet that is 30 inches wide with a single upper drawer and a lower area accessible by a door as shown in the base cabinet diagram below. [10pts]
2. Assemble the components to create a 3D model of the cabinet. [10pts]
3. Create a drawer organizer and a cabinet organizer that will fit within the cabinet you created above to match the following criteria.
 - (a) Pots and pans are to be stored in the bottom. Create a way to efficiently organize pots, pans, and lids beyond simple shelves. This must be an assembly since it needs to organize both sides of the space at the bottom in addition to fit into a fully assembled cabinet. [40pts]
 - (b) Spatula and stirring spoons are to be stored in the drawers. Create a way to efficiently organize these items beyond a simple open drawer. This may be a single unit or an assembly. [40pts]
 - (c) An animation file showing the door and drawer open in addition to any movements that your organizer can make should be provided in an ipn file.[20pts]
 - (d) Multiple entries must be included in the engineering notebook that document the process from brainstorming through final modeling.
 - Table of contents entry(s) for this project.[10pts]
 - Brainstorming sketches. (minimum of 3)[10pts]
 - Commentary on progress with each days entry associated with the project.[10pts]
 - Evidence of multiple entries commensurate with the length of time spent on the project.[10pts]
 - Ideas that you generate during the project whether ultimately used or not.(Could be a part of comentary.)[10pts]
 - Screen shots of your virtual model at a few points during your virtual construction process.[10pts]
 - Screen shot of your final virtual model.[10pts]
 - Summary of project including your thoughts on:
 - what went well[10pts]
 - what did not go well[10pts]
 - what you would do if you were to pursue the project further.[10pts]
4. Create a Powerpoint to present your drawer and cabinet storage solution. It should contain the following information.
 - (a) A title slide with your name and a fictitious company for which you are designing the storage solution. [10pts]
 - (b) A design brief that introduces the need for the storage solution. [10pts]
 - (c) Appropriate constraints both from the information below and the tasks above. [10pts]
 - (d) A picture and brief pro/con list for existing storage solutions. (At least 3.) [10pts]
 - (e) A picture and dimensions of sample items that will be stored. (At least 3.) [10pts]
 - (f) Sketches that have been scanned from your brainstorming process. [10pts]

- (g) A decision matrix that indicates the criteria you used to choose among the designs generated during the brainstorming process. [10pts]
- (h) A screen shot of your design. (Drawer and cabinet.) [10pts]
- (i) A brief pro/con list for your design. (Drawer and cabinet.) [10pts]
- (j) A listing with brief explanation of ways you can improve your design in the future. [10pts]

The following information was taken from
 (http://www.highlandsdesigns.com/content.php?content_id=10) on May 10, 2010.

Base Cabinet Features:



- 1 doors - 3/4" solid wood
- 2 drawer fronts - 3/4" solid wood
- 3 face frames - 3/4" solid wood
- 4 adjustable shelves - 3/4" plywood
- 5 european-style metal drawer glides
- 6 concealed adjustable hinges
- 7 sides - 1/2"- thick birch plywood
- 8 back - 1/4" - thick plywood
- 9 base shelves - 1/2"- thick plywood
- 10 adjustable 3/4" half shelf
- 11 solid wood drawer boxes
- 12 hanging rail- 1/2" plywood
- 13 optional pine, maple, oak and cherry sides

Cabinet Details

Base Cabinets:

- Standard base cabinets are 34 1/2" high and 24" deep, have working drawers, one base shelf and one half-shelf.
- Sink bases have one base shelf and false drawer fronts.
- Sink fronts are fronts only, with a toe kick attached.
- Three-drawer base cabinets have one 3 1/4" and two 8" drawers.
- Minimum cabinet width and depth for drawers: 12"
- Cabinets less than 12" wide have a solid door (raised, flat panel, cathedral and arch not available).
- Toe kick cutout: 4" high x 3" deep