ME450: Additional Guidelines for Assignment #1: Design Specification

Your section instructors will set a date and time for your oral presentations, which should each be limited to 10 minutes in length, followed by 5-10 minutes of class discussion and critical analysis. The Oral Presentations should have a format loosely based on the following guidelines:

1- Use PowerPoint or overhead transparencies. You may need to arrange for an LCD projector & laptop.
2- Everyone on the team should present a slide or two at least.
3- Do not exceed 10 minutes, but shorter times are OK.
4- Prepare about 5-10 slides (figure on about 1 minute per slide)
5- General outline for slides follows:

First slide is the Team name, Project Name, and Team Members, then a brief statement of the Design Problem or Opportunity.

Second slide is a bulleted outline of the Design requirements: what features MUST the design incorporate, what features are optional, etc. This should be brief and well-organized.

The next few slides will be for your design concepts. Use sketches, quick calculations, photos...anything to get the basic concept across.

Then, a single slide for the Pugh chart, so you can summarize your concepts and compare them. At this point you can briefly discuss how you narrowed down your concepts from 5-6 down to the 1 or 2 best ones.

NOTE: Use the Pugh chart to compare and narrow down your design concepts. When you eliminate a concept, see if you can keep some of the best features, and combine them with one or more of the remaining concepts. (general rule: try to keep the good stuff and throw out the bad stuff from each concept). Thus, you will naturally find yourself developing at least 2 Pugh charts; Initial concepts (many) -> best concepts incorporating the best overall Ideas (fewer total concepts, but each is more refined). You can show both of these Pugh charts in your presentation.

Next slide can also be a Pugh chart, or optionally, could be a QFD. On this slide you compare your best 1-2 concepts (from the previous Pugh chart, and modified appropriately to incorporate as many good Ideas as possible). You may also compare them with a known "benchmark" standard product, if appropriate. Note: You do NOT have to show a QFD chart; this is optional. You should have one or 2 Pugh charts, though.

Next slide: This is a summary of your current "best" design concept. Assume you will go forward with this. Based on this and the design requirements, list the major Functional Metrics for your design: What will you measure to test your prototype, and how will it be measured.

Final slide: a Milestone chart (a.k.a. Gantt or Timeline). Show major tasks and anticipated times for beginning and finishing each one.

Most important: be receptive to comments and criticism from the class and instructor. This is the purpose of a Design Review, and it will help your final design. Don't "defend", rather listen to and consider the input of your peers.

Since you will be limited to 10 minutes, and you will have a lot of information to convey in that limited time, I strongly suggest you practice your presentation beforehand and make sure to monitor the time.

Your written Design Specification should be handed in either before, during, or after your oral presentation, depending upon the arrangements you have made with your lab instructor. The written component should be BRIEF. This is NOT a lengthy formal report, it is a brief technical document that should be as concise as possible. Here are some general guidelines:

Design Problem or Opportunity: try to keep this to one sentence if possible.

Brief Design Description: State the design requirements in bulleted form. List the most important first. Indicate what is REQUIRED, vs. what is desirable, etc...

At least 5 alternative design concepts: Sketch out on a single page each one; add notes and calculations, etc. This can be messy...you may use crayons and finger paint if that helps. You may also include photographs if appropriate. Collect these together and use a Pugh chart to summarize...

Pugh Chart; Use this to list and compare your design concepts. Limit to one page: compare your concepts on the basis of important metrics (safety, form, function, cost, ...)

QFD: Least important page. Take a stab at this, but do not allow yourself to get too frustrated by it.

Definition of Functional Metrics: You will eventually test your prototype. When you test it, what will you measure, and how will you measure it? (size, mass, functional performance, cost, ...). Include the appropriate physical units. If you intend to exceed the Design requirements, so state.

Gantt Chart: This is basic Project management. Plan out how you will accomplish your design in the time allowed. Put together a one-page timeline chart. Show major milestones, and indicate time dependencies (point out if Task "K" must be completed before Task "M" can begin, for example). Include at least 3 major and 3 minor milestones.

I hope you find this helpful,

Bob