

## **ME450: Additional Guidelines for Assignment #2: Detailed Design**

For Assignment #2, you will present a Detailed Design of your project. This will be based upon your Design Specification and initial concepts (Assignment #1), plus any additional Ideas you have had since you turned in Assignment #1.

Once again, 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:

The first slide is a statement of the Design Intent: What are you going to build and why. What need does this design address? Be extremely concise.

Next slide: This is a summary of your current "best" design concept. Assume you will go forward with this at least to the  $\alpha$ -Prototype. Stick with the major points: primary design requirements, key features, etc. You could combine the first two slides into one slide if appropriate.

The next few slides will be for your Detailed Designs. You should have a few formal 3-view drawings, but you may also use sketches, photos, etc. Not every component in your design needs to be modeled. Some components will be fabricated in our machine shop, some will be purchased, others may be donated or scrounged from a scrap heap. You should model the components only so far as is necessary: if you need to fabricate the component, you will need to specify all dimensions; if you bought, scrounged, or found the component, only model the critical features to show how it will be placed into the assembly. **EACH MEMBER OF THE TEAM IS REQUIRED TO GENERATE AT LEAST ONE SOLID MODEL.** We will use UniGraphics for all mechanical modeling in this course. For non-mechanical components (such as circuit diagrams) you may use any software that is available, or you may simply provide clear sketches, as appropriate.

**NOTE:** in this course, some of the projects are quite small and incorporate a few components, others are much larger and may have hundreds or thousands of components. For the purposes of this assignment, you should use your judgment and model only a few components, as described above. For example, if you are building an entire vehicle, don't try to model the entire thing with every component in place. **RULE OF THUMB:** if all of a sudden your project seems enormously complex and will require an unreasonable amount of work, you are probably correct. Use your best professional judgment, make sound decisions as a team, and do a reasonable amount of work. If, on

the other hand, there are only one or two components in the design, be creative to allow each member of the team to generate one solid model each.

The next slide should be an assembly drawing, made using UniGraphics. The assembly drawing does not need to be for your entire design: select an interesting or important subsystem or mechanism and show how the final assembly will look. Ideally, your assembly drawing will demonstrate a key functional concept of a mechanism that is an important part of your design. Not all projects will present an opportunity to do this, so do the best you can given the limitations of your project. The GSI can help you with the assembly drawings in UG.

You should include engineering analysis, rough calculations & estimates, etc. as you see fit on the slides, or you may include a separate Engineering Analysis slide.

You should also specify the manufacturing processes that will be required for the component fabrication and prototype assembly. These can be discussed as appropriate on each slide, or may be tabulated on a separate slide.

Next slide (optional): Bill of Materials (BoM): List of major components that will need to be purchased, scrounged, etc. You should include the source(s), cost, & estimated delivery time for all critical components.

Final slide: a Milestone chart (a.k.a. Gantt or Timeline). Show major tasks and anticipated times for beginning and finishing each one. How does this compare with the Gantt Chart you presented for Assignment #1 (are you still on schedule?)

Most important: be receptive to comments and criticism from the class and instructor. This is the purpose of a Design Review, and it will improve your final design.

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.

The written portion of this assignment should be handed in either before, during, or after your oral presentation, depending upon the arrangements you have made with your section instructor. The written component should be BRIEF. Once again, this is NOT a full-length formal *report*, it is a brief technical document that should be as concise as possible.

Bob