The second project for ME 160L is a continuation of the work you started in the first project. In that project, you designed a underwater housing for a camera. In this project, you will refine that design and create Pro/E drawings of the underwater housing. You will work in the same groups for the second project as you worked in with the first.

In this assignment, you will write a brief report describing your design and use Pro/E to create a set of working drawings for the underwater housing. The report will be typed and will be no longer than two pages. It will include at least one paragraph on each of the following topics:

1. Brief description of the housing and how it is used. This is not a commercial. It is a description of the features and capabilities of the housing.
2. A description of the changes you made to the original design to improve the functionality of the case.
3. A description of the changes you made to your original design to ease its manufacturability.
4. A description of changes you made to your original design to facilitate the assembly of the housing.
5. A description of how this housing could be recycled.
6. A spreadsheet showing the buoyancy calculations for the camera and case. Individual parts should be listed in a spreadsheet. The spreadsheet should list the name of the part, the number required to construct the case, the volume of the part in mm$^3$, the density of the material in grams / mm$^3$, the mass of the part in grams, the volume of water displaced by the part, and the mass of the displaced sea water in grams / mm$^3$. The columns containing the mass of the part and the volume of water displaced should be summed to calculate the total mass of the case and camera and the mass of the water displaced. The camera has a mass of 350 grams.
7. Case thickness calculations – assume a maximum stress in the plastic of 1000 psi. These calculations will be typed and included as a part of the report.

The report should reference specific Pro/E drawings by both the name and page number of the drawing.

The Pro/E working drawings must include:

1. An assembled view of the entire underwater housing. The visible parts will be labeled with a number (balloon). These numbers will refer to the part in the bill of materials.
2. The bill of materials will list all of the parts used to construct the housing, the material used in the construction, and the number required for a single camera housing. All standard parts such as o-rings, bolts, screws, washers, and nuts will be listed in the bill of materials.
3. An exploded assembly view of the housing showing all its parts. All of the parts will be labeled with a number (balloon). The name of the part can be found in the bill of materials for the housing by looking up this number. This exploded assembly view may be spread out over several sheets if necessary for clarity.
4. The button sub-assembly will be displayed on one or more separate sheets in both exploded and unexploded states. Balloons will be used to identify these parts. The numbering will be the same as in the bill of materials.
5. Detailed drawings of **4 major parts** (not assemblies) showing their shape and size. **All dimensions must be in millimeters.** The name of the part must be same as the name used in the bill of materials.

6. Create at least two sectional views from these major parts.

7. At least one detailed or exploded view of an area of one of the major parts.

The drawings will be placed on Pro/E A (use a.fmt for the sheet borders and title block) sized drawing format and will contain the following information. The drawings will include.

1. A Cover page with your company name (make up one) and the Class IDs of each of your group members who participated in the project.

2. A title block - (every sheet) containing:
   a. The name of the company make up one
   b. Name of the part or assembly
   c. The scale of the drawing
   d. The sheet number
   e. The date it was drawn
   f. Your name - if several of you worked on the drawing then list each person

3. General notes - (where needed)

4. Local notes - (where needed)

The Pro/E assembly and parts for the camera can be downloaded from my web site. Use this camera to establish the size of the housing and the placement of the controls.

The project will be due December 6, 2007 (Thursday) at the end of your lab.