

ME 160L Project 1 - Preliminary Design Fall 2011

The group project for this term is to design a waterproof casing for a camera. The casing will allow the user to take the camera under up to 150 feet of water and to take pictures. The user will be able to operate all of the controls on the camera (See the attached drawing) with levers or some type of attachments built into the camera casing.

The camera casing will meet the following criterion:

1. The camera casing will be designed for the camera shown on page two of this proposal.
2. The user will be able to operate the levers or other types of attachments without flooding the camera.
3. The camera may be used in cold water so the levers or attachments will be large enough so that the user can operate them while wearing 7mm thick gloves.
4. The camera case must have a lens port that allows light to enter the case so that pictures can be taken. The user will be able to easily change this lens port for ones with different optical properties. Some lens ports may have a flat glass, some may have curved glass, and some might have different colors. The lens port must be large enough so that light coming from an 80 degree cone will enter the lens of the camera.
5. The area over the flash must be transparent and large enough so that a 90 degree cone of light can be emitted by the flash. The transparent area for the flash does not have to be glass.
6. The area over the LDC screen must also be transparent to allow the user to track the motion of animals and see the picture that will be taken. The area over the LCD screen does not have to be glass.
7. The casing will have some type of closure that prevents it from accidentally opening. The user will be able to operate the closure and remove the camera from the casing, remove film from the camera, or replace batteries when the camera is not under water.
8. The casing will have a threaded hole in the bottom to attach a tripod or other camera attachments. Tripods are not used in underwater photography but the threaded hole allows external flashes and other types of equipment to be attached to the camera case. The hole will not extend through the case.
9. Seals (usually o-rings) used on the case will be removable so they can be easily cleaned, lubricated, and/or replaced by the user.

You will turn in drawings of your design. **The drawings should all be isometrics or sectional views drawn as isometrics.** All of the drawings will be hand drawn sketches made without the use of straight edges or rulers. The drawings should contain detailed notes describing how the case and buttons work and they prevent water from entering the case.

The requirements for the preliminary design are:

1. The drawings should show the entire camera case from several different points of view. The parts of the case shown in other drawings should be referenced in notes on these drawings. The notes should be neatly written on the drawings.
2. There should be an individual drawing showing how each button assembly or case attachment is constructed. Notes on the drawing should describe how it prevents water from entering the case. Button assemblies that are the same but are used in more than one place should only be drawn once. Notes on the drawing should explain the various

locations where the button is used. The name of the part should be the same as that shown on the drawing of the entire case.

3. In addition to drawings of the entire camera case and each individual part, there should be drawings showing how the parts are assembled to construct the case. The parts should be named using the same part names that are used on the other drawings.
4. Notes should be placed on the drawings describing what is being shown or how the parts are assembled and how the parts work.
5. There should be sufficient number of drawings to completely describe the camera case. There is no limit to the number of pages in the design package you submit.
6. These drawings should be done by hand without the use of a straight edge but they should be neat, clean, and drawn correctly. The drawings will be isometric or pictorial in nature. Sectional views may be used as necessary to show interior geometry of parts. No multi-view drawings will be used.

Your project will be graded using the following criterion:

- 20% Creativity of the design
- 20% Feasibility of design
- 30% Quality of the drawings - neatness
- 30% Completeness of the drawings

This project is due at the beginning of class on October 17, 2011.