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 transparent glass window that allows light to enter the case so that pictures can be taken. The glass window 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.
6. The area over the view finder and the information screen must also be transparent and large enough for the user to use while pointing the camera or reading information from the display.
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. The case will have an attachment on the top that aids in framing the desired picture. View finders are difficult to use underwater because the user is probably wearing a mask that prevents them from placing the camera near their eye. This attachment should fold out of the way when it is not needed.
10. Seals (usually o-rings) used on the case will be removable so they can be cleaned, lubricated, and/or replaced.

You will turn in drawings of your design. The drawings should all be isometrics unless there is a specific reason for using another type of view. All of the drawings will be hand drawn sketches made without the use of straight edges or rulers.

Stage I - Preliminary Concept

Each member of the group will submit an isometric drawing and brief description of their proposed design item. The concept should be derived without consultation with other members of the group. The purpose of this exercise is to generate as many different ideas as possible. These preliminary concepts will be used to generate ideas for the design item. This preliminary concept drawing and description is due Monday, September 24, 2007.
The preliminary concept should show an overall view(s) the camera case and a separate view(s) the mechanism used to push the camera buttons. Put labels with a short description on the drawings.

Stage II - Preliminary Design

The group will evaluate each preliminary concept and decide upon the case to be designed. The case may be one developed in Stage I, a combination of several ideas developed in Stage I, or something totally different. Once the selection is made, the group will continue working to complete the preliminary design of the underwater camera 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 written on the drawings.

2. There should be an individual drawing showing how each lever or case attachment works and how it prevents water from entering the case. A single drawing can illustrate parts which are used more than once. 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.

In addition to the drawings, you should write a short paragraph describing how the camera case is 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 8, 2007.