

## 12-5-17 ROV ASSIGNMENT

This assignment has been created based on what was (and was not) requisitioned for group ROV's, . Individual grades will be assigned for this assignment and will depend upon individual participation, individual effort, the completeness of the response to the task, and the complexity of the task that the individual undertakes. Each large ROV group must assign someone(s) to each of the topics listed below -- all topics need to be addressed.

**WHAT TO TURN IN: A hardcopy of a document that completes the tasks listed below.** The topic name, and a list of all individuals who contributed to the document in a meaningful way should be placed at the top. Groups may determine how many students to assign to each topic. A word of caution however -- numerous students assigned to an easier topic will not receive as high a score based upon complexity. Students who do not have a task, or have only a simple task, can inform the instructors so they can be given additional items that need to be addressed -- there are some that will benefit all four group and that are not listed here specifically.

### TOPICS

TOPIC NAME	TASKS TO BE COMPLETED
Pressure Canister Design	<ul style="list-style-type: none"><li>• Complete a detailed drawing with written descriptions, that answers the following questions. If you cannot place all the information you need to on a single drawing, complete additional drawings (for instance, a drawing of just wire penetrations).</li><li>• What material will the canister be made from?</li><li>• What will the caps for the canister be made from? Where will they be obtained?</li><li>• How will the canister be sealed?</li><li>• Describe how all canister penetrations (for wires, the tether, etc...) will be made and sealed.</li><li>• Your answers should be complete enough so that someone who is not in your group could use your description to build what you intend.</li><li>• Provide a requisition (shared with both Mr. Beran and Mr. Kirsch) for all parts and materials that are needed. If you know something has already been ordered, you do not need to supply a requisition. In general, there has not been much that has been ordered.</li><li>• If you do not get everything completely scoped out by the end of the period, provide a list of action items and who will get those items completed by 12/7.</li></ul>
Video	<ul style="list-style-type: none"><li>• Given the camera(s) you intend to use, describe, in detail, how video signals will get back to the surface and be processed. You may simply be recording to a card or chip on the camera for the recording, but you will have to get signals back to the surface for the live-view. How?</li><li>• Be sure to indicate all necessary hardware and wiring, including the camera(s).</li><li>• Be sure to indicate whether a laptop, monitor, or other device will be necessary to process the video.</li><li>• Provide a requisition (shared with both Mr. Beran and Mr. Kirsch) for</li></ul>

	<p>all parts and materials that are needed. If you know something has already been ordered, you do not need to supply a requisition. In general, there has not been much that has been ordered.</p> <ul style="list-style-type: none"> <li>• If you do not get everything completely scoped out by the end of the period, provide a list of action items and who will get those items completed by 12/7.</li> </ul>
Thruster Control	<ul style="list-style-type: none"> <li>• Provide a drawing(s) that, schematically, depicts your current plan for controlling and powering the thrusters for your ROV. Include thorough written descriptions on your drawing(s).</li> <li>• List all hardware that will be required.</li> <li>• Describe any software that will be necessary (although at this point you do not need to provide programs, Arduino sketches, etc...).</li> <li>• Provide a conceptual description for how your ROV thrusters will be controlled by the operator.</li> <li>• How do thrusters operate in conjunction with one another?</li> <li>• Do thrusters reverse? If so, how is this initiated?</li> <li>• You will be using 500 GPH Johnson bilge pump motors -- they are already ordered.</li> <li>• Provide a requisition (shared with both Mr. Beran and Mr. Kirsch) for all parts and materials that you are sure will be needed.</li> <li>• If you do not get everything completely scoped out by the end of the period, provide a list of action items and who will get those items completed by 12/7.</li> </ul>
Frame Parts	<ul style="list-style-type: none"> <li>• Provide a three-view drawing of your frame.</li> <li>• Provide a complete list of all of the parts and pieces you will need to build your frame. Your list should be detailed to the point where someone who is working by your list and drawing would have EVERYTHING they would need to build the frame of your ROV.</li> <li>• Include details for attaching the pressure canister to your frame.</li> <li>• Provide a requisition (shared with both Mr. Beran and Mr. Kirsch) for all parts and materials that are needed IF they cannot be acquired at Home Depot or Spaeth Hardware.</li> <li>• If you do not get everything completely scoped out by the end of the period, provide a list of action items and who will get those items completed by 12/7.</li> </ul>
Tether	<ul style="list-style-type: none"> <li>• Describe all of the wires that will be a part of your tether. Include all details -- wire size, the purpose of each wire, and the material.</li> <li>• Provide a drawing that shows a cross section of your tether and how it will be kept bundled together.</li> <li>• Describe your plan for making your tether naturally buoyant.</li> <li>• Describe your plan for strain relief. Where will the connection be made on the ROV? How will it be made? And how will the strain relief rope or wire be combined with the other tether components?</li> <li>• Describe how all connections for the tether are to be made, both above and below the waterline.</li> <li>• Provide a requisition (shared with both Mr. Beran and Mr. Kirsch) for all parts and materials that are needed. If you know something has already been ordered, you do not need to supply a requisition.</li> <li>• If you do not get everything completely scoped out by the end of the period, provide a list of action items and who will get those items</li> </ul>

	completed by 12/7.
3D Printed Parts	<ul style="list-style-type: none"> <li>• Provide a list of all 3D printed parts you intend to make for your ROV.</li> <li>• Provide a simple sketch for each of these parts. Specify the kind of material you intend to use.</li> <li>• Start modelling the parts you intend to 3D print using Solidworks. Before the end of the period, print out a screenshot of your progress in Solidworks. For these screen shots, place your name on the page so the instructors know who worked on the part.</li> </ul>